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# POPULAR COMMUNICATIONS

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JANUARY 1989

VOL. 7, NO.5



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### INTERNAL VIEW Wilson 1000



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### Lockheed - California Company

31011 - 1144g - 331 Dept. 40-70  
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Aug. 21, 1987

Wilson Antenna Company Inc.  
3 Sunset Way Unit A-10  
Green Valley Commerce Center  
Henderson, Nevada 89015

Subject: Comparative Gain Testing of Citizen's Band Antennas  
Ref: Rye Canyon Antenna Lab File #870529

We have completed relative gain measurements of your model 1000 antenna using the K-40 antenna as the reference. The test was conducted with the antennas mounted on a 16" ground plane with a separation of greater than 300" between the transmit and test antennas. The antennas were tuned by the standard VSWR method. The results of the test are tabulated below:

FREQUENCY(MHZ)	RELATIVE GAIN(dB)	RELATIVE POWER GAIN(%)
26.965	1.30	35
27.015	1.30	35
27.065	1.45	40
27.115	1.60	45
27.165	1.50	41
27.215	1.60	45
27.265	1.75	50
27.315	1.95	57
27.365	2.00	58
27.405	2.00	58

**58%  
MORE  
POWER GAIN  
THAN THE  
K40**

A complete description of this test is contained in file #870529. Excerpts of this report are enclosed.

Louis Wilson, Antenna Engineer  
Electromagnetics Laboratory

Approved:  
W. C. Weikel, Group Engineer  
Antenna/ATS Support Laboratory

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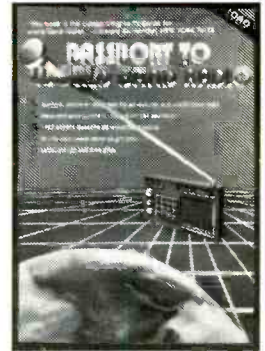
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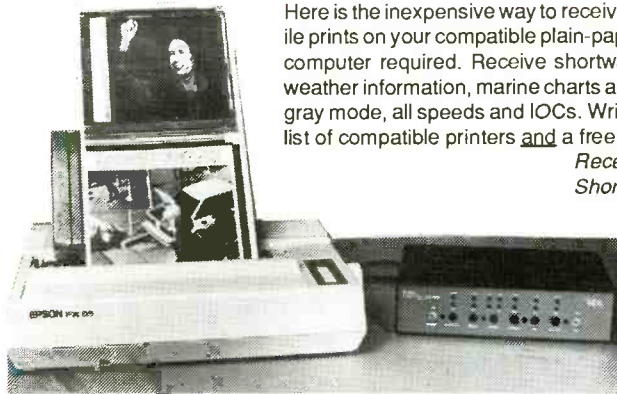


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# BEAMING IN

BY TOM KNEITEL, K2AES

## AN EDITORIAL

**W**hen January rolls around, it's time for Ray Briem's annual call-in program devoted entirely to radio monitoring and DX'ing. Ray's show, which is carried on the nationwide ABC Talkradio network has, in past years, proven to be interesting, a wonderful public relations effort for the monitoring hobby, and (mostly) lots of fun. Of course, it's a plus for the whole thing that, more than a dispassionate moderator, Ray Briem (N6FFT) is, himself, active in DX'ing and knows a lot about the hobby.

On hand with Ray to field questions and chat with callers will be several folks who are deeply involved in the monitoring hobby in one aspect or another. As this is written, it is anticipated that this year's panel will include Radio West's Steve Miller, Monitoring Times' Bob Grove, the American Shortwave Listeners' Club's Stewart MacKenzie, propagation expert George Jacobs, and even yours truly. A few others may also be signed on by air time.

In past years, these programs have had an emphasis on international shortwave broadcast monitoring. Ray tells me, however, that he sees no reason why they have to be limited to that area of the hobby. Therefore, he welcomes calls from those interested in long/mediumwave DX, utility station DX'ing, FM/TV DX'ing, and scanners, in addition to SWBC.

This year, the special program will air live for three hours on Saturday morning, January 7th, starting at 3:06 AM EST (12:06 AM PST, 0806 UTC). The network call-in number is 1-(213)-879-8255—let it ring until someone answers. If you are in the Los Angeles area, use the local numbers announced over KABC/790.

Key stations in the ABC Talkradio Network carrying this program include: WABC/770 New York City; WSB/750 Atlanta; KABC/790 Los Angeles; KTAR/620 Phoenix; KPRC/950 Houston; WJBO/1150 Baton Rouge; WIOD/610 Miami; KSTP/1500 Saint Paul; WISN/1130 Milwaukee; WKOX/1200 Boston; KOH/630 Reno; WERC/960 Birmingham; KXIA/101.7 FM Albuquerque; WNIR/100.1 FM Akron; and WHYN/560 Springfield, MA. There are many other stations in this network, so if you aren't within range of those listed here, find out the ABC Talkradio station carrying Ray Briem's program that's local (or closest) to your area.

Station KGU/1160 in Honolulu carries the program later on tape delay.



*Someone wanted to know if there were any awards to be earned by working all states on a cellular phone! Maybe Telco will issue you a 24K gold credit card.*

Ray tells me that this year he'll probably have most of the panel members on tap throughout the entire program, as opposed to previous programs where individual guests were available only for segments of the show. Hope that POP'COMM readers will turn out en masse (as usual) to say *Howdy*. Talk to you then! *Mark the date on your calendar.*

### **Little Memos**

Ever jot down little memos to yourself? I do, lots of them. Mostly they're short fragments of ideas that I scribble on file cards or self-stick note papers. The intention is to jog my memory or serve as the kernel of an idea for some lengthier comment I figure to use in the magazine at some future date.

These are placed in a colorful collage on my office bulletin board, although some manage to drop off and get trampled into oblivion before they evolve into any later stage of development. Others just hang around waiting to be selected for immortality. Even so, by the beginning of each new year I clear off the bulletin board and start all over again.

The other day as I was clearing off the bulletin board for 1989, Zelda LaFong, as I call my secretary, went to bat for these orphaned snippets of leftover information, opinions, and ideas. Large, glistening tears streaming down over the freckles of her chubby cheeks, she holds out a small batch of cards she has managed to salvage from the harvest and begs for clemency. These were her favorites, selected from the hundred or so that adorned the chalkboard. "Share them with your readers, Boss," she pleads. How could anyone say *no* to those cocker spaniel eyes? So be it!

Therefore, according to what I read on the memos to myself, in recent months, it has occurred to me that . . .

. . . it's long overdue for the FCC to come up with an Amateur Broadcaster type of ham ticket that will permit low-power non-commercial broadcasting activities on at least a few of the frequencies dotted across the HF and VHF spectrum.

. . . CB'ers who persist in calling others of their ilk *goodbuddy* should have all their CB

*(Continued on page 72)*



# MAILBAG

## LETTERS TO THE EDITOR

**Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted for consideration must be signed and show a return address. Upon request, we will withhold sender's name should the letter be used in Mailbag. Address letters to Tom Kneitel, Editor, Popular Communications Magazine, 76 North Broadway, Hicksville, NY 11801.**

### **Everything's OK In L.A.**

I read with interest about the eagle-eared agents of the FCC's New York City office described in your June issue. The FCC agents in the Los Angeles branch don't appear to be quite as gung-ho in the checking out of strange doings of broadcasters. Let me relate some tales from this Land of Forgotten Transmitters:

1. Pasadena, CA has one of the nation's only nighttime-only AM stations. In 1924, KPPC asked to broadcast only on Wednesday night and Sundays to carry services of the Pasadena Presbyterian Church, its licensee. The current licensee, Universal Broadcasting, got these limits expanded to local sunset to sunrise. In addition, KPPC broadcasts continuously from Saturday sunset to Monday sunrise. KPPC's 250 watt signal on 1240 kHz wreaks havoc with KGFJ (1230 kHz in Los Angeles), KLFE (1240 kHz in San Bernadino), and KGIL (1260 kHz in San Fernando).

Unfortunately for KGFL, KLFE and KGIL, the operators of KPPC regularly wander off after the broadcast night, leaving their transmitter (located in the basement of the church), still feeding the old KPSN clothesline antenna atop the Pasadena Star-News Building, on the air. The station uses its AM studio for production during the day, so the open carrier periodically springs to life with a recording session for a talk show, complete with expletives when errors are made, or you can hear a series of Spanish-language commercials.

My call to the FCC about this was a lesson in bureaucracy. I was first told to send in an SASE for a brochure that would help me get the interference out of my radio. I persisted. "If the station is quiet, how do you know it's on the air?" they asked me.

"Because it is interfering with KGFJ," I said.

"Then why don't you call KGFJ?" the FCC man inquired.

"Well, I thought you might want to know," I offered.

"But you are the one having the interference."

"But you license the offending station."

"I'll have someone call you." And three days later, a laid-back FCC man did get back to me, offering the news, "That station is only on the air Wednesdays and Sundays."

"No, sir, it's now on the air dusk-to-dawn daily," I advised.

"You don't say."

Most amazing of all, none of the stations assaulted by KPPC's carrier seem to care, either.

2. At Santa Anita Racetrack, a small transmitter operating on 1500 kHz is tied to the PA system. When the track ended its spring season last April, the transmitter was left on the air. Since it was poorly installed, it emits strange rumbles on its carrier, clearly audible from the nearby 210 Freeway. Wonder if the licensee of the now-dark Burbank station on 1500 kHz knows that his frequency has a squatter?

3. FM tuners in Pasadena set to 104.7 MHz sometimes pick up KDES-FM, Palm Springs. At other times, an automated music station takes over, with no commercials, just a "KCHC (KCHZ?) 104.7" promo every hour. I'd love to tell you its city of license, but in four days, it never broadcast a legal station ID. Then it drifted away.

4. Both KPZE (Anaheim) and KIEV (Glendale) must drop power substantially at sunset. But both seem to forget regularly and blast away through the night. I'm sure some lonely shepherd in New Mexico wonders why WWL in New Orleans, the dominant clear on KIEV's frequency, is sometimes there, and sometimes garbled by peddlers hawking gold, silver, and new hair.

5. So the story goes, years ago, the staff at KDGO, Durango, CO suddenly walked off the job en masse, even leaving the pizza festering by the microphone. Guess what else they forgot? (You're catching on fast.) For two months, the dead carrier remained on the air until a prospective buyer unlocked the door to tour the facility.

According to the story you ran last June, shipboard broadcaster *Radio Newyork International* was quickly hassled by the New York FCC. The advice to RNI is obvious. Steam down the coast, through the locks at Lake Noriega, and right up to Tinseltown. Drop anchor, stand and deliver! Nobody will notice. Nobody will care!

JohnPrice  
Pasadena, CA

### **Calling Miss Anna Gram**

When you dropped the hint (last August) that "Alice Brannigan" was an anagram, it challenged me as a puzzle aficionado. I quickly saw that Alice is an anagram for Brian, but the three times "n" shows up in Brannigan makes the last name difficult to unravel. Besides, Celia isn't a very common name in the U.S.A. I wrote out, and am en-

closing some of, a lengthy listing of possible names that might be made up of from Alice Brannigan; including Cannelbria Binnacle, Angela Ribannic, Celia Ragabinn, Lana Ricebaning, and Erin Gilbananac. However, upon a midnight dreary, inspiration suddenly struck in a flash and I knew that Alice Brannigan was none other than Regina Cannibal!

Tom Breccello,  
Toronto, Ontario

*Quite some time ago, Alice mentioned that her pen name was an anagram for "Nice gal in a barn." On the other hand, ever since your letter arrived, everybody here has picked up on your revelation and agrees it has a certain je ne sais quoi. In the meantime, best guess here is that your name is an anagram, too. Nobody likes a wiseguy.*

—Editor

### **Come Out, Come Out, Wherever You Are!**

Several times your publication has mentioned the EMTJ (Eleven Meter Times & Journal) newsletter and given the address. I have tried unsuccessfully to reach EMTJ via the address you've given and am wondering if they've moved to a different known address.

Brent Wilson,  
Moncton, New Brunswick

*A number of EMTJ fans have written similar comments. One day it was in Lemon Grove, CA and the next day it was off somewhere in the Twilight Zone. Although we used to hear from EMTJ's "Dr. Rigormortis" from time to time, he has not been heard from of late, and we've been wondering about him, too. If anybody out there has a current address for EMTJ, please let us know.* —Editor

### **Handled With Care**

Can't tell you how much I enjoyed the *Return of The Living Dread* comments (December issue) concerning the "impassioned" banquet speech the fellow made about the sarcastic letter you had written him earlier. Maybe one of the reasons I got such a blast from your comments was because I attended that banquet and heard the speech in person. You neglected to mention in your commentary that the chap was still carrying around the original copy of the letter you had sent him in 1968, offering to show it to anyone who wanted to see the dastardly epistle. It was handled with reverence, as if it were the original of a historic document. He held it out with pride as the small crowd "ood" and "ahhhd" as they viewed the words that had caused him so much anguish. This was far better than the speech itself, and that was something else altogether.

"Buckshot,"  
California

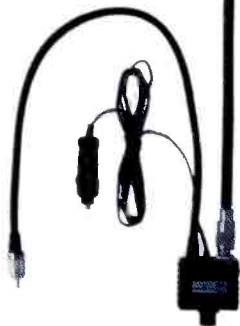


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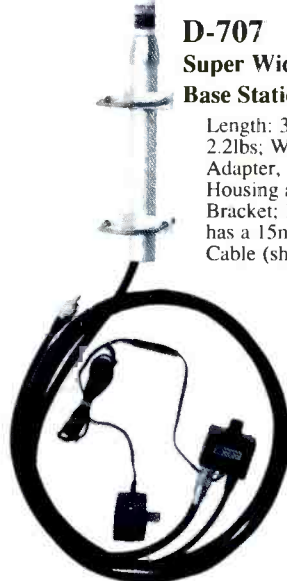
## D-505 Super Wideband Mobile Whip Antenna

Length: 29.1"; Weight: .35lb; With 12-volt DC Cigarette Lighter Power Adapter; Model D-505C has a 5m Coaxial Cable



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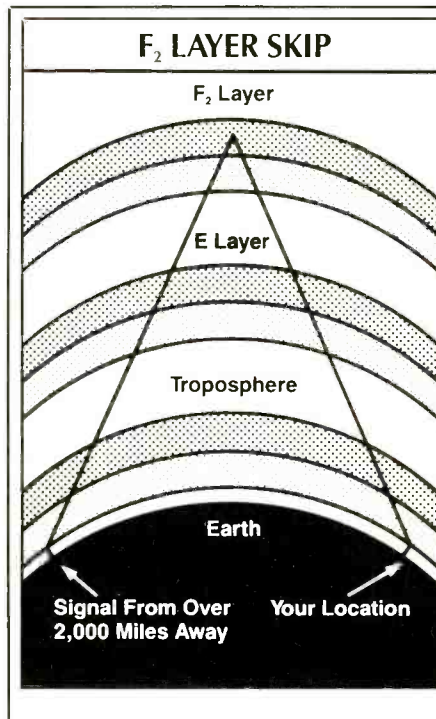
OFFICIAL NEWS COLUMN OF THE SCANNER ASSOCIATION OF NORTH AMERICA

### **Sunspots Bring Exciting And Confusing Scanner Listening!**

One of the most interesting and exciting (or, depending on your viewpoint, confusing and frustrating) eras of scanner listening is just beginning! From all accounts, it appears that this will be the most dramatic event in scanner listening since its invention. Hold on for some amazing listening to occur during the months and year, or two, ahead! It all has to do with "sunspots" which are actually explosions on our sun. Because they can easily be seen from earth (not without special eye protection!) they have been counted for the last 200 years by curious scientists. It turns out that each 11 years, regular as clockwork, the number of explosions peaks. In between peaks, there is a lack of explosions, sometimes called the sun's "quiet period". The only difference between the 11 year peaks is their intensity, which vary from minor, to spectacular. It now looks like the peak we're approaching will be one of the most dramatic ever, perhaps the largest since sunspot record keeping began! The result is that many of our limited range communications channels will suddenly turn into long distance frequencies, almost like shortwave. That means that Highway Patrol officers in Georgia might suddenly find themselves talking to the California Highway Patrol . . . or even Australia!

The reason for this dramatic turn of events is that sunspots control the earth's F2 layer which reflect radio waves back to earth. That layer nearly always reflects the "short wave" frequencies permitting us to listen to the BBC in London and other broadcast outlets from all over the world. But the F2 layer rarely reflects the frequencies we listen to on our scanners, allowing those frequencies to pass into space and limiting the range on earth to local communications. Even the peak of many sunspot cycles doesn't change that. But will change dramatically as this super cycle hits its peak! In fact, there are already ham radio reports of F2 layer long distance contacts in the 50-54 MHz band. Since the sun's explosions cause the F2 layer to move up to effect higher and higher frequencies, that means that during these reported F2 contacts at 50 MHz the lower frequency 30-38 MHz frequencies, including many state highway patrols and some local police frequencies, were surely open to long distance communications too. The first few experiences will be scattered and brief, but as the cycle heads towards a peak they will become longer and occur much more often. As the cycle reaches its peak you can expect similar action on high band at 150 MHz and higher.

You can imagine the surprise, disbelief, and confusion this can cause. Sometimes it



*This illustration shows how signals bounce off the F2 layer for long distance reception. Normally scanner frequencies are not reflected by the F2 layer and continue into outer space. But, as the sunspot cycle begins reaching its peak, higher and higher frequencies are reflected. Just how high it goes depends on how big the peak of each cycle is. The current cycle shows every sign of reaching historic levels . . . perhaps the greatest number of sunspots ever recorded in the 200 years that records have been kept. This could be a once-in-a-lifetime scanner listening opportunity!*

becomes dangerous with transmissions blocked, or instructions misunderstood. But most of the time it is very amusing and interesting for both the radio user and the scanner listener. When an officer suddenly finds himself talking with another officer 2,000 miles away, some casual conversations occur and are definitely not regulation! Or the officer may think that a hoax is being played on him, with the question, "Who are you, really?"

What special equipment do you need to listen to these long distance signals? Probably none at all! Signals will usually be so strong that your indoor, or simple outdoor antenna, will work just fine. In fact, it is better than a big directional beam on a tower because you never know what direction these long distance signals will be coming from! There are some helpful tricks in alerting yourself to long distance reception that we will be covering in future columns. In the meantime, Good Listening!

### **Award Winners**

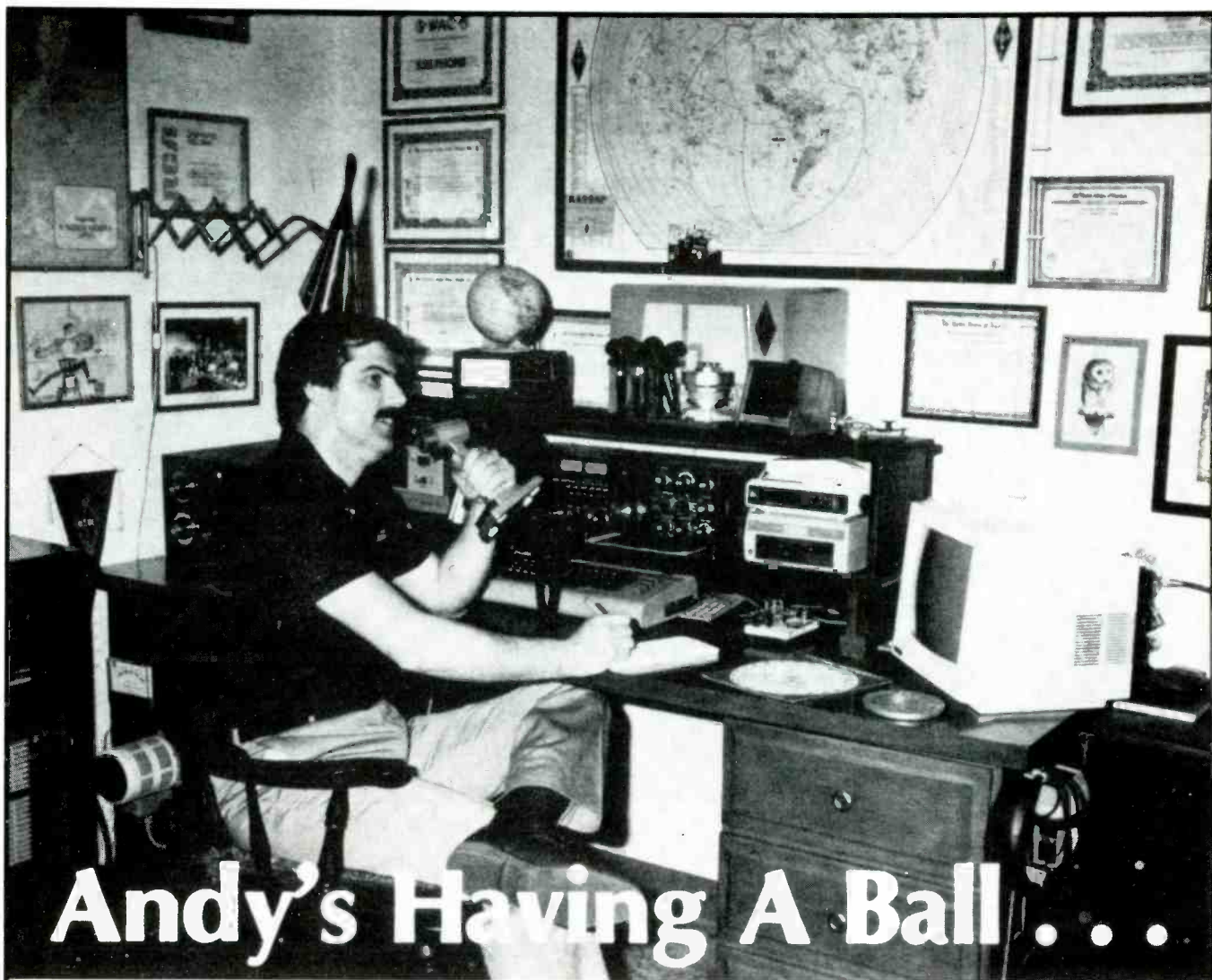
Since we began our Public Service Award program, SCAN has given away over \$8,000 in cash awards to the winners. All SCAN members can feel especially proud of this program since it is supported entirely by member dues to SCAN. But there is special satisfaction when you nominate the winner, because both of you will receive hand-somely engraved award plaques. Your nominee also receives \$100 cash from

SCAN. These people are the true heroes in this country, quietly risking their own lives while working long hours as underpaid or volunteer public servants. They deserve any recognition we can give them. Often our award is the catalyst for newspaper publicity, as in the case of Paramedic Richard Strange of the Rowlett (Texas) Fire Department. The newspaper photo shows Strange receiving his award plaque and cash prize. SCAN member John Crist, a volunteer with the Dallas County Fire Marshall's office, nominated Strange for the award. The \$100 cash prize was generously returned by Richard Strange for help in continuing the SCAN Award Program!

### **Speaking of Generosity . . .**

We recently received a \$100 donation check from Ray Babecki of New Jersey to help support the SCAN Defense Fund to protect our scanner rights. While the largest single donation received so far, we appreciate the hundreds of other scanner owners who have sent in what they could afford, generally from \$5 to \$25. As a token of our appreciation, we are still offering the new SCAN Frequency Allocation wall banner with 800-900 MHz listings added. If you haven't yet contributed and wish to, we ask that checks be made out to SCAN Defense Fund. Address your envelope to SCAN Defense Fund, P.O. Box 414, Western Springs, IL 60558. You'll be helping fight unfair legislation and rulings that could have an important effect on your listening rights.





# Andy's Having A Ball . . .

## and you can too!

Andy is a Ham Radio operator and he's having the time of his life talking to new and old friends in this country and around the world.

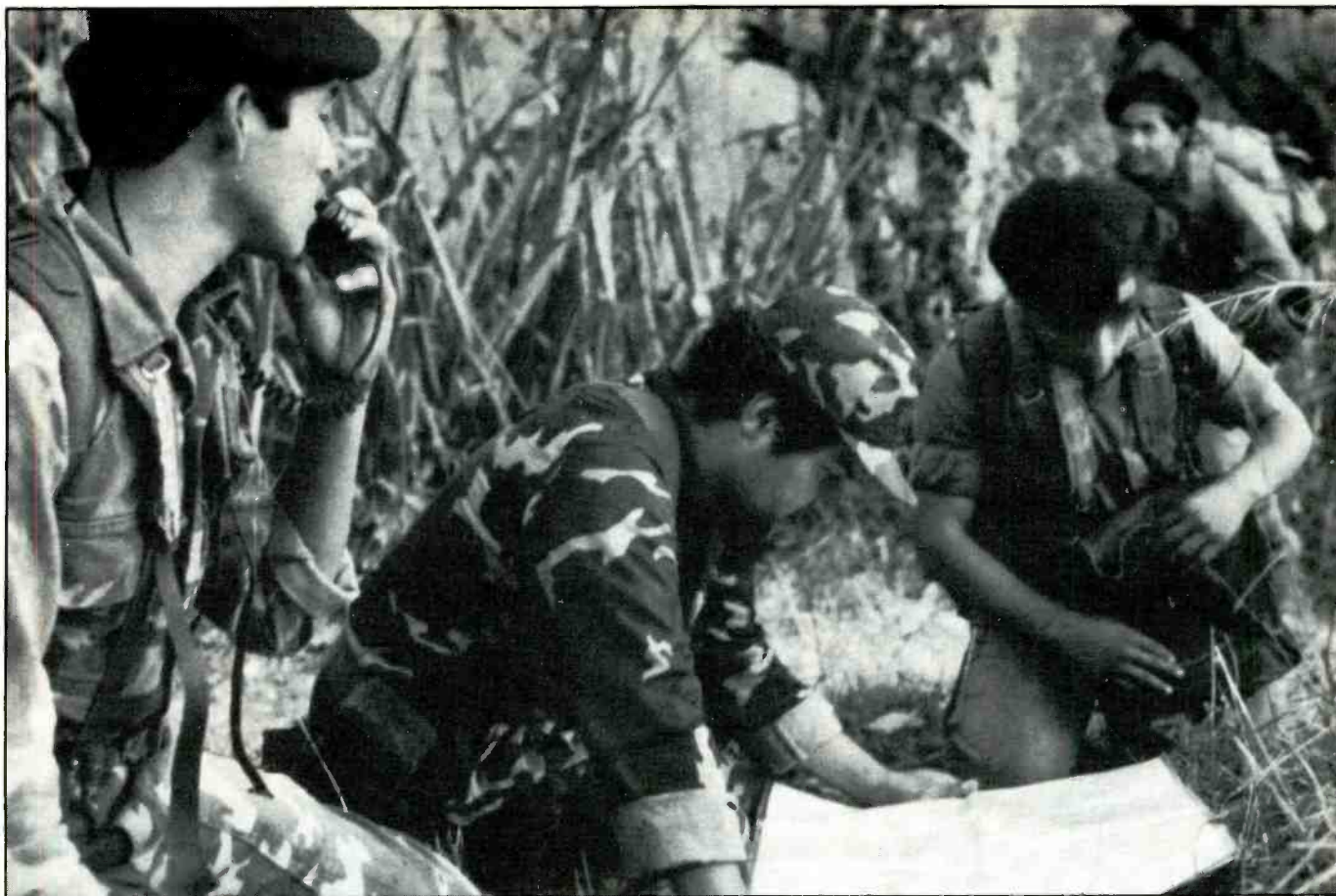
You can do it too! Join Andy as he communicates with the world. Enjoy the many unique and exclusive amateur bands . . . the millions of frequencies that Hams are allowed to use. Choose the frequency and time of day that are just right to talk to anywhere you wish. Only Amateur Radio operators get this kind of freedom of choice. And if it's friends you're looking to meet and talk

with, Amateur Radio is the hobby for you. The world is waiting for you.

If you'd like to be part of the fun . . . if you'd like to feel the excitement . . . we can help you. We've got all the information you'll need to get your Ham license. Let us help you join more than a million other Hams around the world and here at home. Who are we? We're the American Radio Relay League, a non-profit representative organization of Amateur Radio operators.

For information on becoming a Ham operator  
circle number 11 on the reader service card or write to:

**AMERICAN RADIO RELAY LEAGUE** Dept CQ, 225 Main Street  
Newington, Conn. 06111.



# Combat Weaponcraft

## *Third World Command And Control*

BY GERRY THOMAS

### INTEL SPECIALIST

Lieutenant Commander Gerry S. Thomas, USN, has served with the Defense Intelligence Agency, Pacific Fleet Marine forces, and is currently an analyst on the staff of the Chief of Naval Operations.

**“T**he enemy’s radio traffic must be paralyzed.” We might easily believe that this quotation comes from a current Soviet military manual addressing the importance of radio-electronic combat in a showdown with the West, at the leading edge of a new technology. But, the presumption that military command and control is the exclusive province of technological superpowers, is as false as it is common.

The speaker of these words was, in fact, a young South African mercenary attached to

the legendary “Wild Geese” under Colonel “Mad Mike” Hoare in the Congo of the early 1960’s. His radio traffic analogy referred to the village drums, which were a key communications link among native settlements in areas where the mercenaries were conducting pacification operations. This simple means of communication was very effective in broadcasting information and, if necessary, in quickly summoning reinforcements. Thus, the village drums became a standard target for priority interdiction whenever the mercenaries entered an insurgent area.

This single example illustrates an important aspect of modern warfare that is often taken for granted, or simply overlooked, in contemporary military analysis. Understanding command and control in unconventional warfare is all the more important today, because of the increasing possibilities of low intensity warfare in relation to the decreasing likelihood of a direct superpow-

er confrontation. And command and control is predicated upon communications.

It is thus the swamps, jungles and deserts of the Third World which draw our attention further away from the set-piece exercises in central Europe. And there we find a diverse array of unconventional forces who continue to demonstrate an amazing adaptability in command and control, under the widest variety of circumstances.

### **Broadcasting Facilities**

For purposes of discussion, this article adopts the broadest definition of *unconventional warfare*, a term often used interchangeably with *low intensity conflict* in describing insurgency warfare in its various stages. Our focus here is on partisan, irregular and mercenary forces, and includes operations in Africa, Latin America and Southeast Asia, and the communications and intelligence systems developed to support these unconventional force operations.





From whispered meetings in covert cells to encoded manpack transmitters, unconventional forces have proven themselves to be remarkably innovative and adaptable in communication systems development. Overall, the key elements of simplicity and opportunity have remained paramount, and it is useful to take a system approach to see how various insurgent groups have exploited specific communications systems.

Drawing on the experience of his success with Castro in Cuba, Che Guevara considered radio broadcast as "a factor of extraordinary importance" for the insurgent group, and he advocated the use of a radio transmitter even in temporary camps. He espoused radio as the most effective modern propaganda tool, also noting its unique capabilities to support an armed struggle with efficient communications. For example, he proposed that all manner of information be discussed with the target populace over the airwaves, including location of enemy forces, their means of defense, and practical aspects of combat weaponry. Imagine, if you will, how effective a broadcast radio feature like "The Revolutionary Chef" could be in disseminating recipes for Molotov cocktails and home-brew poisons.

The use of radio broadcast is particularly important in the early phases of a movement when the leadership is attempting to mobilize the population to support its cause. By establishing credibility, the radio broadcasts condition the populace for acceptance of the movement's ideas, and prepares them for a call to action at the appropriate time. Radio Hanoi's broadcasts to the south and Radio Athens programs beamed to Greek activists in Cyprus are two examples where such influence has had a demonstrable effect. In Africa, the Mozambique National Resistance (Renamo) used this technique in broadcasting their "Voice of Free

Africa" programming from Rhodesia until the late 1970's.

The recent history of Nicaragua provides an interesting study in the use of broadcast media by both sides of the struggle. As opposition to the Somoza regime grew more active, the Sandinistas established Radio Sandino in March 1979, based in Costa Rica. This broadcast capability allowed the Sandinistas to mount nationwide operations and to respond proactively to developments, maintaining the initiative. May 1979 saw the opening of a southern front. By June, there were uprisings in the capital and other urban areas. By the middle of July, Somoza was on his way to exile and the path was open for the final Sandinista move.

Not long after the establishment of the Sandinista government, the opposition groups, or *contras*, began their own radio broadcasts. Based in Honduras, Radio 5 September broadcasts news and information to anti-government resistance forces within Nicaragua. Other resistance stations include Radio Miskud, and the Voice of Sandino, used by Eden Pastora who withdrew from the mainstream Sandinista movement.

As an interesting sidelight, broadcast media can also be instrumental in assisting a ruling regime to retain power when faced with an unanticipated military crisis. For example, one night in 1970, waves of unidentified armed men began to come ashore in Conkary, the capital of Guinea, with obvious designs on certain military objectives. Unable to take the radio station, the strike force was forced to withdraw in less than 24 hours because President Toure used the airwaves to summon thousands of Peoples' Militia into the streets to support his regime. Similarly, a mercenary-led coup strike group which landed by air in the capital of Benin in 1977 was quickly forced back

aboard their aircraft, when President Kerekou called squads of outraged, machete-wielding civilians to drive the force back.

## Landline Facilities

Although many Third World countries lack an extensive telephone network, some insurgent groups have found this common link to be tactically useful and expedient.

Using the established telephone links can, however, present some obvious hazards for operations security. For example, international phone service from Afghanistan was formerly routed through Paris. Under Soviet occupation, outside telephone links were routed through Moscow.

Nevertheless, within secure areas, telephone systems had been established to support the mujahideen. During a period of important tactical operations in the Hazara region, the mujahideen established a telephone link between their military headquarters and five other outlying towns. The open link provided adequate message capability and afforded an exceptional degree of control, allowing for timely redirection of reinforcements during the operation.

Some Afghan leaders found it useful to string telephone lines themselves, as did Castro during the Cuban insurgency. A typical example is that of the *Jamiat-i-Islami* mujahideen in the Marmoul gorge. The site, at the base of the dizzying cliffs, could only be approached frontally through a narrow entrance. Within was a command center, a mosque, assembly hall, kitchens, foundry and quarters, with electricity supplied from diesel generators. Located high on crags above the gorge were 24-hour lookout positions with a commanding view of the airfield at Mazar-i-Sharif. Connected by telephone to the headquarters below, the lookouts could report any activity by Soviet choppers on the field in time for defensive actions to be taken.

A final illustration of the utility of the telephone system in unconventional applications comes from the Congo of 1960. There, one of the most effective urban nets was established in Elizabethville, when European settler women would pass the positions of the U.N. occupation troops to the mercenaries' command post, and would even provide telephone spotting for mortar assaults.

## Two-Way Radio

Tactical radio equipment among insurgent forces can be generally characterized as simple and opportunistic; opportunistic in the sense that much of their gear is actually captured enemy communications equipment. It is simple in that much of what actually is purchased is commercial, off-the-shelf hardware usually intended for some other application. Sophisticated systems with encryption devices and high-power, long-haul communications are rare.

The most common radio is the walkie-talkie type, and it is in general use with insurgents around the globe. The contra

forces are reported to be well equipped with this type of hand-held radio and many news service photos show one or more squad members holding a Motorola-type walkie-talkie. Reports from El Salvador suggest widespread use of Japanese commercial-grade, hand-held transceivers among insurgents there.

Even in the impoverished wastelands of the Ethiopian insurgency, guerrillas of the Oromo Liberation Front operating near the Sudanese border use walkie-talkies for squad coordination within their columns and for scouting reports.

Use of captured equipment offers significant advantages to the insurgent forces and, whenever possible, communication gear is liberated as a priority item along with weapons and ammunition. This is equally true with the contras who, for example, after downing a Soviet-built aircraft, removed two pieces of equipment—a 7.62mm machine gun and a badly damaged radio. If operable, captured equipment could permit the insurgents to more easily monitor enemy communications. It could also provide equipment for their own use which would “blend” into the electromagnetic spectrum, especially in the case of Afghanistan where Soviet communications gear is apparently very standardized. Finally, and this is particularly true in Afghanistan, captured communications equipment without immediate value can be sold or exchanged for more urgently needed equipment. This type of barter is efficiently used by the mujahideen.

Some insurgent forces such as the contra groups have been able to obtain additional types of equipment for longer range communications. PRC-25 field radios were noted in use for intelligence reporting in 1983. In November 1987, a contra group in Jinotega Province, some 100 miles north of the capital, was photographed by the *Washington Post* using a field radio with what was described as a “computerized decoder” for tactical communications.

Other groups have made innovative use of off-the-shelf commercial equipment to satisfy their tactical communications requirement. One typical example is found with the Karen National Liberation Army (KNLA), conducting an insurgency against the Burmese government from base areas along the Thai border. Here, the KNLA Seventh Brigade uses a Japanese CB radio as its primary link to subordinate command posts. The antenna is very practically hooked to a bamboo rafter of the thatched command hut.

Similarly, taxi radios are reported in use among other insurgent forces. These offer the advantages of easy procurement, blending with existing communications, and portability. In El Salvador, government forces recently ambushed a guerrilla column of five trucks led by a passenger car equipped in this manner as a command vehicle.

The ability to make do with whatever equipment is on his shelf is a hallmark of a guerrilla. This innovativeness in communi-

cations techniques is well-illustrated by a description of communications coordination during a contra airdrop. One typical mission involved a low-level drop of supplies from a Caribou flying out of Honduras. Most aviators in the lift group spoke only English, while the contras on the ground in general spoke only Spanish. Therefore, as a rule, most resupply missions flew with a contra radioman. In fact, one of the three men killed in action on the Hasenfus flight was just such a “talker.”

About 20 miles out from the drop zone (DZ), the aircraft would attempt radio contact. But, the noise from the engines was so loud that the talker had to jam the speaker against one ear while covering the other to block the background noise. Once contact was made, the talker would ask the DZ for directions based on the sound of their approaching aircraft, and the pilot would maneuver north/south, left/right as the talker yelled up directions to the cockpit. Once the flight crew spotted the contras’ signal fires, they would have the talker confirm the number by radio to make sure of the DZ before making the drop pass. Not an easy way to make a living—and this was an example when everything went according to the plan.

### Signal Intercept

“Any tendency to consider the guerrilla force too unsophisticated to acquire communications intelligence must be avoided.” These words from the U.S. Army’s field manual on low intensity conflict should be well marked, and heeded by any counter-insurgency force.

Virtually all unconventional forces have displayed an awareness of the value of signals intelligence and the ability to exploit it. As early as 1961, Katangan mercenaries were able to copy United Nations reports on their strength and disposition, and to exploit these to their own advantage. Under siege at Bukavu in 1967, one of the Belgian mercenary pilots trapped with the ground forces was able to enter the radio net of the attacking aircraft, determine its objectives, and evacuate the target area before the attack. Similarly, there were many instances during the Biafran insurgency where rebels were able to successfully intercept and exploit communications of the federal Nigerian forces.

Reports from Central America indicate that contra forces are able to tune in and copy certain Sandinista radio traffic as well. In some cases, both Cuban advisors to the Sandinistas and contra opposition are reported to have entered each other’s nets to exchange boasts, challenges, insults, and to feed deception schemes.

In Afghanistan, it is interesting to note that the initial and much ballyhooed Soviet troop withdrawals probably included their sophisticated electronic combat units, which had proved to be of little practical value against the mujahideen. Since that time, some Afghan units are reported to



have been able to intercept Soviet and Afghan Army transmissions, but there is little evidence that they have been able to exploit this to much tactical advantage.

One of the most dramatic examples of sophisticated mujahideen communications involves Ahmad Massoud, the Panjsher regional leader whom the Soviets are reported to have targeted for assassination in 1984. It is reported that he uncovered, and therefore escaped, the assassination plot, and within hours of the overly optimistic Soviet announcement of his death, Massoud was able to impudently intrude on Soviet military nets to describe the weather, Soviet positions, and the casualties of the day.

In discussing communications operations, it must be remembered that signals intelligence is a double-edged sword for the insurgent. A good example is the recent experience of the Farabundo Marti National Liberation Front (FMLN) in El Salvador. Here the government has set up tracking stations on the higher elevations, equipped with scanners to pick up the low power guerrilla radios. A collocated direction finder provides bearing information for the government forces. This can also provide an approximate strength count by applying a rough rule of one radio for each for each 8-10 insurgents. This simple approach, using readily available, lightweight equipment similar to that of the USMC radio recon teams, is suitable for widespread use by both government and insurgent forces worldwide.

In summary, we can conclude that communications to support unconventional forces evolve as the scope of their operations expand. While relying on simplicity and innovation to fulfill communications requirements, the opportunity to take advantage of captured enemy equipment is seldom overlooked.

Supporting the overall force and its tactical operations is an intelligence network based primarily on human intelligence (HUMINT). While heavy reliance is placed on the HUMINT system, insurgent forces are demonstrating a capability for signals intelligence of increasing sophistication.

Our challenge, faced with such an innovative and adaptable adversary, is to be open-minded in our evaluation of his true capabilities and equally flexible in developing an effective counter-strategy.

PC

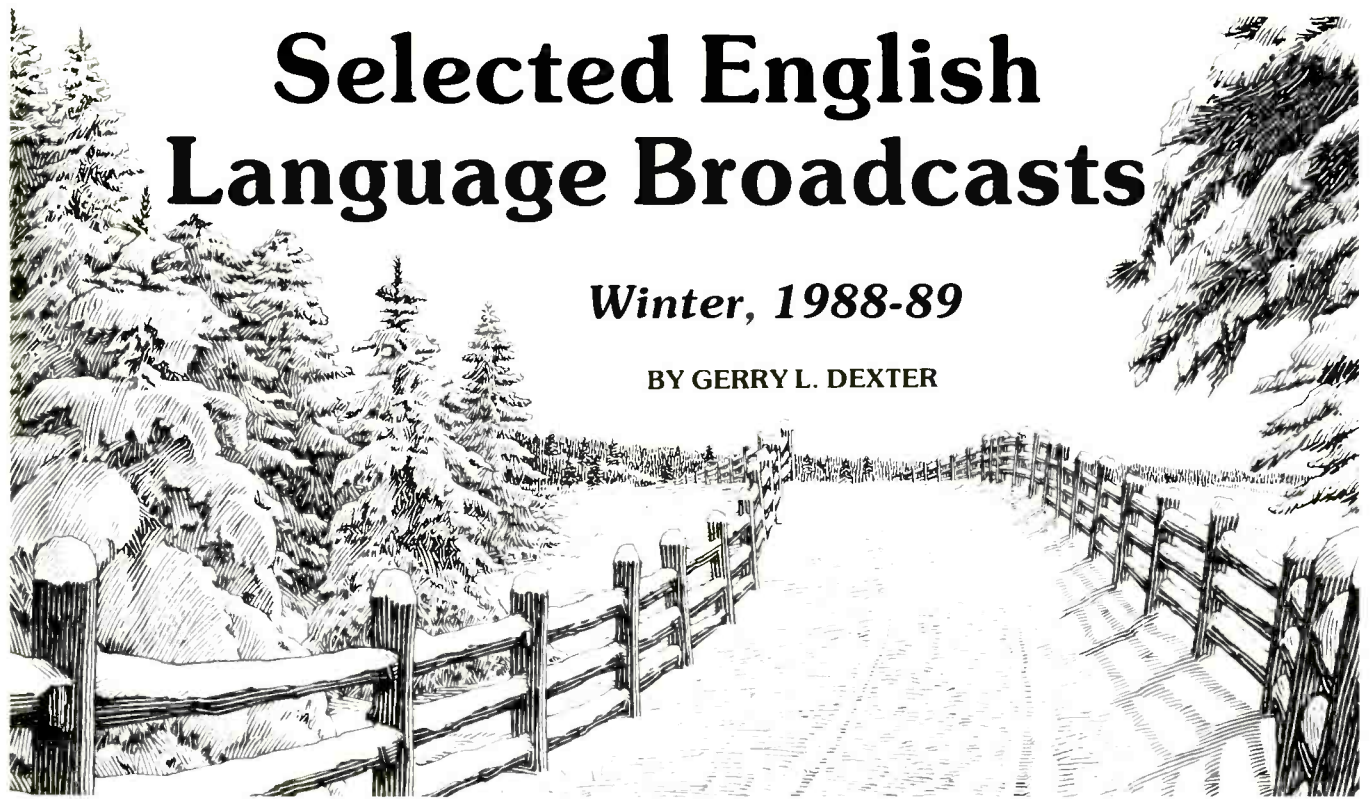
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# Selected English Language Broadcasts

Winter, 1988-89

BY GERRY L. DEXTER



**N**ote: There are hundreds of broadcasts aired in the English language every day on the shortwave broadcast bands. Many of them are directed to audiences in North America. This is a representative listing and is not intended to be a complete guide. The listing is as accurate as possible, however stations often make changes in their broadcasting hours and/or frequencies, often with little or advance notice. Some broadcasters air only part of the transmission in English or may run into the hour or hours following. Some may have an altered schedule on weekends. Numbers in parenthesis indicate a starting time for English that many minutes past the start of the hour. All times are given in UTC.

Time	Country/Station	Frequencies
0000	Voice of Israel Radio Moscow	9435, 11605, 12077 6000, 6170, 7115, 7165, 7195, 9530, 9600, 9610, 9675, 9865, 11710, 11750 9720, 11775, 11910, 15115
	HCJB, Ecuador (30)	9875
	Radio Austria International	9655
	Radio Havana Cuba	9620, 11850
	Radio Norway (Mon)	
	Voice of the People of Kampuchea	9695, 11938
	Radio Budapest, Hungary (30)	6110, 9520, 9585, 9835, 11910, 15160
	WCSN	9850
	Radio Baghdad, Iraq	11775
	BBC	5975, 6175, 7325, 9515, 9915, 12095
	Radio Beijing, China	9770, 11715, 15455
	RBI, East Germany	9730
	REE, Spain	9630, 11880
	Vatican Radio (50)	6150, 9605
	KUSW	11695
	WHRI	7400
	WRNO	7355

Time	Country/Station	Frequencies
0100	Voice of Greece (30) Radio Japan	7430, 9420, 11645 5960, 15195, 17810, 17845
	RAI, Italy	9575, 11800
	HCJB	9720, 11755, 15155
	Voice of Germany	6040, 6085, 6145, 9565, 9735, 11785
	Radio Finland	9635, 11605
	Voice of Israel	9435, 11605
	RFPI, Costa Rica	7375
	Radio Prague, Czechoslovakia	5930, 7345, 9540, 11990
	Voice of America	5995, 7280
0200	Voice of Nicaragua	6100
	Radio Bucharest, Romania	5990, 6155, 9510, 9570, 11830, 11940
	Radio Portugal	6060, 9680, 9705
	Swiss Radio International	5965, 6135, 9725, 9885, 12035
	Radio RSA, South Africa	6010, 9580, 9615
	Radio Kiev, Ukraine SSR	5980, 7165, 7205, 11790, 13645, 15180
	Radio Tirana, Albania (30)	7065, 9500
	Radio Havana Cuba	6140, 9770, 11760
	RAE, Argentina	11710
	Radio Belize	3285
	WCSN	9850
	Radiobras, Brazil	11745
	Radio Cairo, Egypt	9475
	Radio Netherlands (30)	6020, 6165, 9590, 9895
	Voice of Free China, Taiwan	5985, 9680
0300	BBC	5975, 6175, 7325, 9410, 9575, 9915

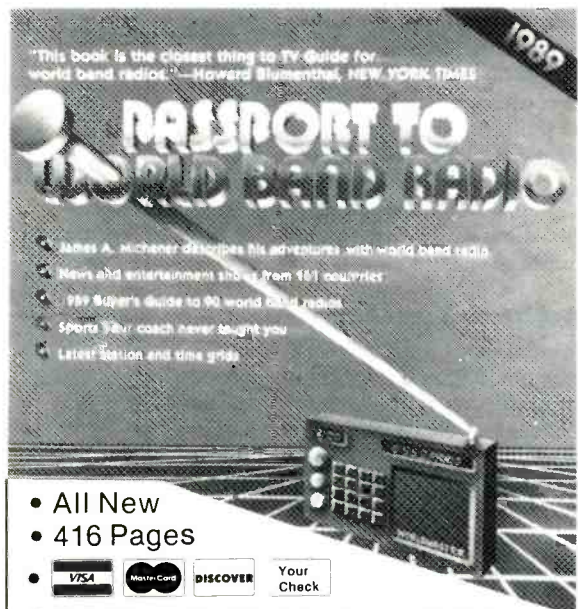
Time	Country/Station	Frequencies	Time	Country/Station	Frequencies
	KUSW	9815	0900	KYOI Saipan	11900
	WRNO	6185		KUSW	6153
	Radio Moscow	11770, 12050, 12060, 13605, 13645, 15245, 15405, 15425, 15455		RBI, East Germany	9665
	Voice of Greece (40)	7430, 9395, 9420		Radio Korea (15)	9570, 13670
	TWR Bonaire	9535		RCI, Canada (30)	5960, 9755
	Radio Japan	7125, 11840, 15195, 17810	1000	Radio Norway (Sun)	15235
	Voice of Germany	6010, 9545, 9605		Radio New Zealand	6100, 9540
	Radio RSA, South Africa	6010, 9580, 9615		Radio Netherlands (30)	6020, 9675
	Radio Tirana, Albania (30)	7065, 9500		BBC	11750, 12095
	Radio Sofia, Bulgaria	7115		Voice of America	6160, 9590
	Radio Dublin Int'l., Ireland	6910		WHRI	7355
	Radio New Zealand (30)	12045		Voice of Vietnam	9840, 15010
	HRVC, Honduras	4820		Voice of Nigeria	15120
	TGNA, Guatemala	3300	1100	TWR, Bonaire	11815, 15345
	Voice of Turkey	9460		Radio Thailand	9655, 11905
	Radio Beijing, China	9770, 11715, 11860		Radio Beijing, China	15455
	Radio Prague, Czechoslovakia	5930, 7345, 9540, 11990		NBC, Papua New Guinea	4890
	Radio France Int'l. (15)	9800, 11670		Radio Japan	6120, 11815
	RBI, East Germany	9620, 11720		AIR, India	11860, 11920, 15185
	Vatican Radio (30)	6150		VOIRI, Iran (30)	11790
0400	Radio Bucharest, Romania	5990, 6155, 9510, 9570, 11830, 11940		Radio Pyongyang, North Korea	6576, 9600, 11735
	Swiss Radio International	6135, 9725, 9885, 12035		Radio Korea	15575
	Voice of Israel	9010, 9435, 11605, 11655, 12077, 13725		Radio Austria International	15320
	Radio Austria International (30)	9875		Radio Pakistan (05)	15606, 17660
	Radio Havana Cuba	5965, 6035		Radio Bangladesh (45)	15255, 17740
	RAE, Argentina	11710	1200	Radio Pyongyang, North Korea	9555, 9600, 11735
	WCSN	9870		RCI, Canada	5960, 9755
	Radio Botswana	4820		Radio Finland	11945, 15400
	WMLK	9465		Radio Bangladesh (30)	15250, 17870
0500	Voice of Nicaragua	6100		Voice of People of Kampuchea	9695, 11938
	HCJB, Ecuador	6230, 9720, 11775		Radio Ulan Bator, Mongolia	9615, 12015
	Voice of Germany	5960, 6120, 6130		WCSN	5980
	FIBS, Falkland Islands	3958		Radio Beijing, China	7405, 15455
	Voice of Nigeria	7255		BBC	9510, 11775, 12095
	Radio Netherlands (30)	6165, 9715		Radio Australia	9580
	REE, Spain	9630		Radio Singapore	5010, 5052, 11940
	Vatican Radio	6150	1300	BRT, Belgium (30)	15510, 15590
	Radio Lesotho	4800		R. Finland	11945, 15400
0600	ELWA, Liberia	4760		Radio Korea	9570, 9750, 15575
	Radio Sofia, Bulgaria (30)	9700, 11720		Radio Norway (Sun)	6035, 9590, 15310
	WCSN	9495		UAE Radio (30)	11955, 15435, 17865
	BBC	5975, 9640		FEBC, Philippines	11850
	Voice of America	5995		R. Tashkent, Uzbekistan SSR(30)	7325, 9540, 9600, 9715, 11785, 15460
	GBC, Ghana	4915		Voice of Vietnam	9840, 15010
	TWR Monaco (25)	7105		All India Radio (30)	11810, 15335
	Swazi Radio, Swaziland (30)	4980	1400	Radio Japan	9695, 11780, 11815
0700	HCJB, Ecuador	6205, 9675, 9745, 11925		Radio Sweden	15345, 15590
	Radio Cook Islands	11760		Radio Norway (Sun)	15190, 15280, 15310
	CFRX, Canada	6070		WCSN	13760
	Radio Netherlands (30)	9630		BBC	12095, 17705
	Voice of Free China, Taiwan	5985		WYFR	5950, 9535, 11830, 13695, 15215
0800	Radio Australia	9580, 11720		Radio Yugoslavia (30)	9620, 15240, 15415
	SIBC, Solomon Islands	5020, 9545	1500	KNLS	7355
	WHRI	7355		Voice of Indonesia	11790, 15150
	BRT, Belgium	11695, 15510		UAE Radio	9550, 11730, 11955, 15300
	KNLS	11815		Radio Jordan	9560
				Radio Veritas, Philippines	11820, 15220
				Voice of Nigeria	11770
				WRNO	11965
				Voice of Greece (40)	9425, 11645, 15630



Time	Country/Station	Frequencies
1600	BSKSA, Saudi Arabia Radio Norway (Sun) WCSN Radio Pakistan WINB Radio Polonia, Poland Radio Jordan Radio Nacional, Angola RFI, France  SLBC, Sri Lanka	9705, 9720 9590, 15310 21640 15135, 17800 15145 6135, 9540 9560 9535, 11955 6175, 11705, 15360, 17620, 17795 15425
1700	Radio Norway (Sun) BBC  Voice of America KUSW WYFR WMLK Radio Surinam (30) RAE, Argentina (30)	9655, 15310 11775, 12095, 15070, 15260 15205, 15580, 15600 15255 13760 9465 17875V 15345
1800	Voice of Ethiopia BSKSA, Saudi Arabia WCSN Voice of Nigeria WRNO Radio Jamahiriya, Libya Africa No. One, Gabon (55) RCI, Canada (30)	9660 9705, 9720 15390 15120 15420 15450 15475 9555, 11945, 15325, 17875
1900	AIR, India VOIRI, Iran (30) Voice of Israel  Radio Korea (30) Radio Afghanistan Radio Norway (Sun) Radio Kuwait KUSW	9545, 11810, 15335 9022 9010, 11605, 13625, 13725, 15485, 15585 7550, 15575 9655, 11755 15220, 15310 11685 15690
2000	BSKSA, Saudi Arabia Radio Damascus, Syria (05) Radio Norway (Sun) Radio Kuwait WCSN Radio Baghdad, Iraq KVOH	9705, 9720 11625, 12085, 15095 6010, 9590, 15310 11685 15390 15230 17775
2100	BRT, Belgium Voice of Israel (30)  Radio Damascus, Syria (10) RFPI, Costa Rica Radio Africa, Eq. Guinea Voice of Nigeria Voice of Turkey	9925, 11695 11605, 12077, 13625, 13725, 15585, 15640 11625, 12085, 15095 13660 9553 15120 12035
2200	RCI, Canada Radio Korea (30) Radio Norway (Sun) WCSN Voice of Turkey	5960, 9755 15575 11850, 15180 15300 9445





Time	Country/Station	Frequencies
	BBC  Radio Vilnius, Lithuanian SSR Radio Mediterranean, Malta Radio Jamahiriya, Libya (30) KGEI	6175, 7325, 9590, 9915, 12095, 15070, 15260 9640, 11790 6110 11815 15280
2300	Radio Thailand Radio Japan  Radio Pyongyang, North Korea Radio Sweden RCI, Canada (30) BRT, Belgium (30) Voice of Israel Radio Kiev, Ukrainian SSR (30)  Radio Tirana, Albania (30) Radio Sofia, Bulgaria Radio Riga, Latvian SSR  Radio Budapest, Hungary  Radio New Zealand (45)	9655, 11905 11800, 11815, 15195, 15230, 17810 11735, 13650 9695, 11705 5960, 9755 5910, 11695 9435, 11605, 12077 5980, 7165, 7205, 11790, 13645, 15180 7065 9700, 11950 7165, 7400, 11790, 13645, 15180 6110, 9520, 9585, 9835, 11910, 15160 15150

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CIRCLE 84 ON READER SERVICE CARD

# Uncle Harry's Secret Guide To Do-It-Yourself Bugs

**A Pro Can Spend Thousands On a Single Piece Of Bugging Equipment Custom Designed For A Specific Job. But What About The Low Cost Stuff Anybody Can Buy?**

BY HARRY CAUL, KIL9XL

Without subjecting you to my life story, let me say that there have been many times over the years that I have had the occasion to spend large sums of money for the custom design and construction of miniaturized electronic equipment to be used for specific surveillance applications. *Black bag jobs* (break-ins) are illegal, so are many uses of miniature room bugs and telephone transmitters. It doesn't mean that *all* uses for such equipment are illegal.

Professionals either build all of their own equipment, or else they bring their ideas to small shops run by one or two trusted people who will do the work. Those professionals who are in a hurry, or who have a non-critical application can locate some of the off-the-shelf equipment available at high cost from specialty suppliers.

## The Do-It-Yourself Kid

What has always tantalized me, however, are the possibilities and potentials some of the relatively low-cost equipment available and offered to the general public by many companies. Of course, this stuff isn't specifically offered for surveillance purposes, but it doesn't take a lot of imagination to fantasize about the many varied applications for any miniaturized radio transmitter. Sure, you can use one for making your own wireless mike, or radiosonde balloon, or for tracking the migratory habits of a wild chipmunk, but what else might you do with the miniature transmitting gizmos you see offered in to the public.

After seeing these offers for years, I decided to scope the literature to see exactly what the average man-in-the-street could purchase in the way of miniaturized radio gear at reasonably low prices. I sent away for lots of information, some of the actual hardware, and I certainly got an education in an area that (until now) nobody has yet explored.

Most companies offering miniaturized transmitting equipment to the public specifically point out that their products are to be

### Tie CIA to canal talk bugging

The Senate Intelligence Committee is investigating allegations that the CIA electronically eavesdropped on Panamanian officials during the recent Panama Canal treaty negotiations, CBS News reported today.

CBS quoted sources as saying the Panamanians learned of the bugging and related by threatening to "blackmail" the U.S. negotiators.

**SECRET SESSION**  
Ambassador Ellsworth told the Senate panel that "no threat was made of the bugging and related to the investigation of the network."

**THREATS DENIED**  
According to CBS, Bunker Hunt is expected to tell the Senate panel that "no threat was made of the bugging and related to the investigation of the network."

**Bonn Minister Assailed for Bugging**  
By CRAIG R. WHITNEY  
Ambassador Ellsworth told the Senate panel that "no threat was made of the bugging and related to the investigation of the network."

**RCMP story differs on bugging, PM says**  
From our Ottawa bureau since he got from the se- Trudeau said Solicitor-  
OT Carter Signs Secret Directive

### Furor Starts In Puerto Rico On Wiretaps

By David Vidal  
SAN JUAN, Puerto Rico, Nov. 30 (UPI)—In a town that has been over Watergate scandal, congressional investigators charged government-owned Telephone Co. with spying on hundreds of citizens in political in Washington last week thought their rooms were private telephone of "bugged" for listening devices. Members of the New York Times magazine says its current issue. But a spokesman for Mr. Rabin's delegation said to

### MI5 'Bugged' Wilson, U.K. Paper Claims

LONDON, July 30 (UPI)—The Daily Express said today British intelligence "bugged" former Home Secretary James Callaghan's office during his second term in office. Conservative Members of Parliament or deny the revelation. James Callaghan seems very in three claims. He told the House to "quite militant security air-Downing St. have information

### EX-ENVOY TO SEOUL CONFIRMS BUGGING

The Acknowledges U.S. Had Device in President Park's Office

By RICHARD BALLOGAN  
Special to The New York Times

WASHINGTON, April 2—A former United States Ambassador to South Korea, William J. Porter, has confirmed that an American intelligence agency placed an electronic listening device in the executive mansion of President Park Chung Hee in Seoul.

Mr. Porter's statements, given in an interview to be broadcast tomorrow night by CBS News, provide the first substantiated confirmation of earlier reports of the president's office.

A Blue House spokesman has said that the device had never been used. Official to confirm or deny the reports.

Mr. Porter, who is retired now, was asked in the interview about reports that American intelligence agents had placed the listening device in the Blue House. He replied: "I was told it had stopped before my arrival."

Mr. Porter, who was ambassador in Seoul from 1967 to 1971, was asked again about the device and replied: "I was told that it was not functioning." He added: "I gave a specific order that it was not to be removed."

Asked why Mr. Porter said "Because I didn't feel that the risks warranted what we could get."

Mr. Porter, whose remarks are to be part of a program called "Anatomy of a Scandal," could not be reached at his home in Westport, Mass. for elaboration. But he has added new information to what has been reported earlier. The sequence of events, as pieced together from reports here, appears after President Park's office here, after a coup in 1961, by general, was

### CIA Bugging, Panama 'Blackmail' Reported

Senate Investigates Allegation Torrijos Put Pressure on U.S.

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### U.S. Launches Fight on Foreign Eavesdropping

By David Burnham  
New York Times News Service

President Carter has approved a broad government program to make it more difficult for spies of the "Soviet Union is conducting surveillance from four sites in three cities. They said that the "targets of concern are clear: the government it

### Moynihan Urges That U.S. Act to Stop Soviet Phone Monitoring

By DAVID BURNHAM  
Special to The New York Times

WASHINGTON, July 10—Senator Daniel Patrick Moynihan, a member of the Senate Select Committee on Intelligence, said today that the Soviet Union was violating the constitutional rights of millions of Americans by secretly intercepting their telephone calls.

Mr. Moynihan, charging that the Soviet surveillance program meant Russian agents were "committing crimes on a staggering, unprecedented scale" in the United States, urged the Carter Administration to demand "that the Soviet Union immediately cease and desist in its espionage campaign."

statement and was subsequently inter-land forbidding that for years now the Part I—Sat, Sept. 17, 1977 Los Angeles Times \*

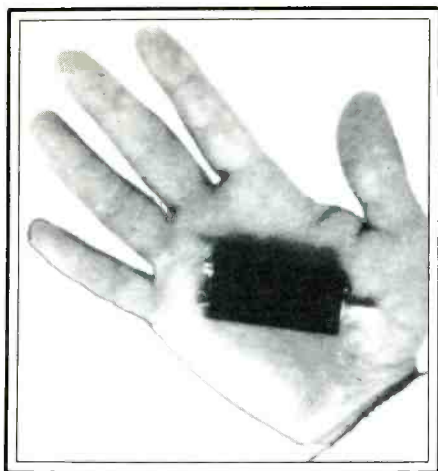
### Senate Panel Investigates Report of CIA Panama Bugging and Torrijos 'Blackmail'

Continued from First Page

Thursday, as were members of the Senate Select Intelligence Committee and the Senate majority and minority

"makes it much less likely that the treaties will be ratified." The first report of the bugging and the allegation of blackmail came in a CBS News account from Washington





A custom designed surveillance transmitter can cost thousands.



Garrison Electronics' Model NCZ-10 receiver (left) and transmitter.

ble frequency range between 92 and 112 MHz. Claims 500 hour battery life, but transmitting range not specified. This costs about \$230.00. Their "Telephone Line Transmitter" (about \$200) operates between 82 and 112 MHz without a battery. The transmitting range "varies according to local conditions."

Securetronics, P.O. Box 18696, Tucson, AZ 85731 sent a free booklet of electronic devices containing a "small concealable FM transmitter" that probably operates in the FM broadcasting band. It operates from a 9-volt battery and has an "unbelievable" range. Priced around \$50. A "long range" transmitter they offer is similar and is claimed to have a transmitting range "in excess of one mile." Price about \$75.

USI Corporation, P.O. Box 2052, Melbourne, FL 32902 asked for \$2 and sent a nice looking 50-page catalog of electronic security and surveillance devices. This included a micro "super powerful FM transmitter" offering "up to 1/4-mile" range in the 88 to 108 MHz band. This unit was about \$20, a version described as "professional quality" is offered for about \$75. They also offer (for about \$1450) a cordless telephone with a 10 to 15 mile range.

CCS Communications Control, Inc., 630 Third Avenue, New York, New York 10017 wanted \$25 for their complete catalog which consisted of about 50 loose brochures and flyers for all sorts of devices from CCTV cameras to X-ray viewers. No prices were shown for any products, but they all appeared expensive from this upscale supplier.

Products that looked especially interesting included the small and sensitive UT-4000 transmitter that operates between 400 and 450 MHz for about 140 hours on a lithium battery. They also offered the SW-4000 VHF or UHF body transmitter that works for 24-hours from a 2.7-volt mercury battery. No range is specified for either the UT-4000 or SW-4000. The company also offers a "wireless telephone" called the Secret Connection 225 promising an operating range

of 3,100 miles from your car or boat. This is a 250 watt transmitter that operates between 1600 and 14000 kHz and appears to be a standard SSB maritime transceiver being marketed in a most unconventional manner.

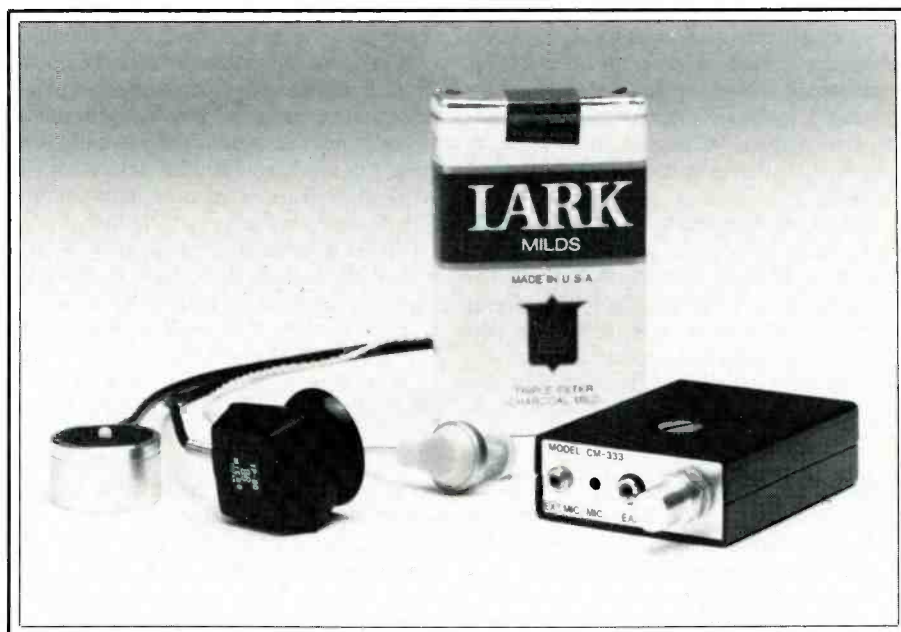
Garrison Protective Electronics, Box 39, Allenhurst, NJ 07711 has a catalog (\$2) offering an excellent line of security electronics. Especially interesting are the NCZ-10 miniature transmitter and receiver that both operate from small 6-volt camera batteries. Can be used as a wireless microphone, or a unit in a tactical communications system, or any number of other applications. Transmitter/receiver about \$500.

The Garrison CM-333 is a 88 to 108 MHz transmitter with a 1500-ft. range. Operating from a single AA-size cell, it has a plug-in contact mike that's sensitive enough to pick up the sound of a wristwatch ticking

through a brick wall. Another accessory is a pickup coil that can monitor activity on a telephone line by placing it next to an on-hook telephone or alongside the wiring. This, complete with three plug-in accessories, is about \$300.

The Garrison RT-2004 is a capacitance tuned miniature transmitter offering about a quarter mile range from a 1.5-volt N-size cell. Since the power transistor looked rather rugged, I tried it with a 9-volt cell and noted a dramatic increase in its coverage range. The board is so small, that it attaches right to the side of a standard 9-volt battery. It's only about \$35, too.

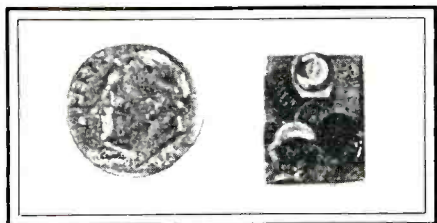
Protector, P.O. Box 520294, Salt Lake City, UT 84152 asked for \$5 for their catalog and sent a booklet of all sorts of things from blowguns to surveillance cameras and stun guns. Quite a bit of electronics in their catalog, too. They have a large assortment



Garrison Electronics' Model CM-333 multi-purpose transmitter.



Radio Shack's versatile (and inexpensive) wireless mike.



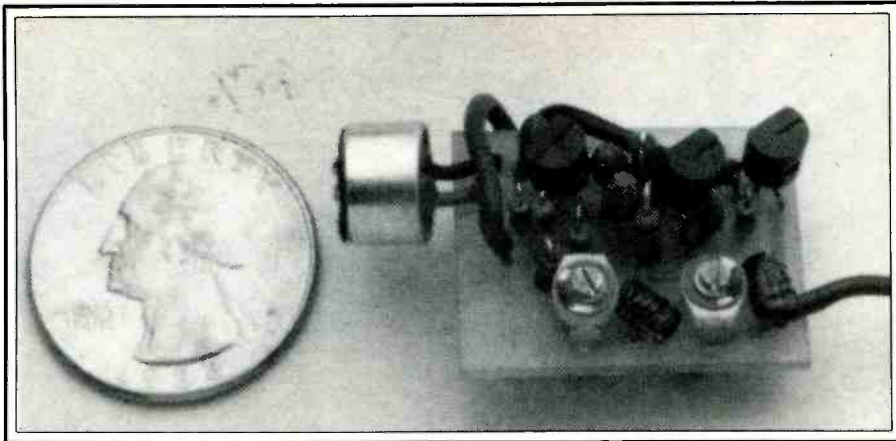
Executive Protection Products' FM telephone kit is the size of a dime and offers up to 1/8-mile transmitting range.

of miniature FM transmitters including one in a ball point pen case for about \$175.

Technology Services, 829 Ginette Street, Gretna, LA 70056 has a \$2 catalog consisting of about a dozen pages of dot matrix printing duplicated on an office copier and stapled. There are no illustrations. The catalog describes many wireless mikes, tailing transmitters, infinity transmitters, telephone transmitters in the \$20 to \$90 price range.

Executive Protection Products, 1834 First Street, Suite C, Napa, CA 94557 asked for \$3 and sent a slick looking 18-page illustrated catalog. This has scramblers, audio jammers, spike mikes, and an aerosol spray that lets you see through envelopes. They offer an *Ultra Bug II* (about \$150) that is a miniature FM transmitter about the size of a 25-cent coin. The range is approximately 1/4-mile in the 88 to 108 MHz band. For about \$60, you can get an unassembled kit that builds into a telephone bug about the size of a dime. They claim up to 660-ft. range in the 88 to 108 MHz band.

Pan-Com International, P.O. Box 130-P, Paradise, CA 95967-0130 is a supplier of inexpensive but effective kits who has been around for many years now. Their good



Executive Protection Products offers this *Ultra Bug II* transmitter. Note the size in comparison to a quarter.

looking and informative catalog is free and includes kits such as a drop-in telephone bug with a 1-block transmitting range (about \$9.50); telephone line bug transmitter (about \$8.50); fountain pen bug (about \$7.50); wall receptacle room bug (about \$7.50); body transmitter (about \$8.50); and an "itty-bitty" bug (about \$7.50). There are many other items, too.

Information Unlimited, P.O. Box 716, Amherst, NH 03031 has a \$1 catalog showing numerous plans, kits, and assembled "amazing scientific and electronic products," some from within the area of surveillance. An FM voice transmitter kit promising a three mile range is less than \$50, a telephone transmitter kit with the same range is below \$40, an assembled telephone "infinity" transmitter is about \$170. An infinity transmitter permits a room to be bugged, via the telephone, even when the phone isn't in use.

Radio Shack (7,000 local stores) lists in its latest catalog a small wireless mike (item #33-1076) that operates in the FM broadcast band. Smaller than 2-inches high, it's made with a clip that permits it to be hooked to clothing, furniture, or many other places. It's rated for up to 250-ft. transmission range (outdoors), the built-in mike is quite sensitive. For less than \$20, this device has definite possibilities as an expendable (that is, left unrecovered after service) unit.

Xandi Electronics, Box 25647, Tempe, AZ 85252 wanted \$1 and sent back an illustrated brochure of security and satellite TV electronics kits. Of special interest was the ZFM-1 mini FM transmitter that promises a 1-mile range on frequencies between 70 and 130 MHz while being powered from a 9-volt battery. The kit is about \$30. A \$22 phone bug transmitter kit (Model XPB-1) offers up to 1/4-mile in the 70 to 130 MHz band, and is powered by the 'phone lines. The XXT-1 is a more powerful version with the kit selling for about \$30. This company also offers a SWL active antenna kit for about \$10.

Epsilon Company, P.O. Box 291513, Los Angeles, CA 90029 said their catalog

was \$1 but turned out to be disappointing little leaflet offering two pairs of binoculars, a microphone mixer, and a few other things. It did offer, however, a miniature FM transmitter kit for about \$20 that claims a range of 200 to 600 feet ("or more, depending upon the terrain"). A 9-volt battery powers the device for about a day and a half.

Matson Elect. Mfg., 1269 Broadway, Suite 196, El Cajon, CA 92021 doesn't seem to have a catalog but offers a Model FM-5 mini-transmitter that claims a 2-block range from a 9-volt battery. Price is in the \$25 ballpark.

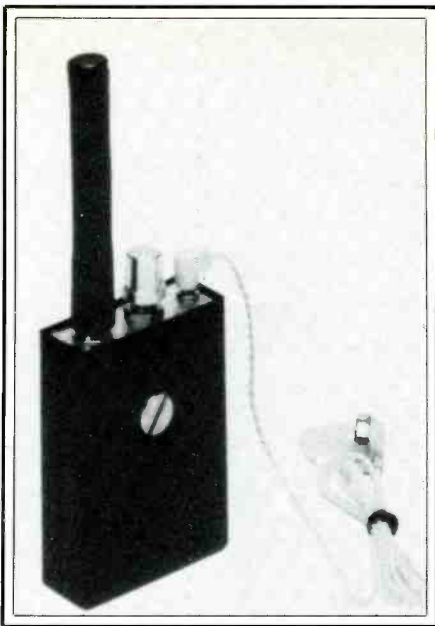
Deco Electronics, Box 607, Bedford Hills, NY 10507 also doesn't seem to offer a catalog, but had a Model WAT-50 4-stage FM transmitter operating from a 9-volt battery with up to 1-mile of transmitter power on frequencies between 70 and 130 MHz. This is a kit that's offered for about \$30.

Pershing Technical, P.O. Box 1951, Ft. Worth, TX 76101 doesn't offer a catalog, just a kit that assembles into a matchbox-sized FM transmitter (60 to 95 MHz) powered by an N-size cell. They get about \$18 for this.

Catoosa Electronics, Rt. 1, Box 2007, Tunnell Hill, GA 30755 is another company that may not have a catalog, but offers a wireless telephone-powered FM-band transmitter (kit about \$15, assembled about \$25). They also have an FM-band "room bug" with a 1/2-mile range; same prices as the other unit they sell.

Microcom Technology, P.O. Box 347341, Cleveland, OH 44134 wanted \$2 for their catalog of "microbugs" and "highly advanced bugging equipment, ultra small transmitters, concrete mics.," and other items at "unbeatable prices." I sent them \$2, they sent me a little 4-page flyer. At that point, I noticed that their "unbeatable prices" were quite a bit higher than other suppliers of the exact same items. Protector, for instance, sells most of the same products for a mere fraction of the cost. The ball point pen transmitter that Protector sells for about \$175, is offered by Microcom for almost \$1400!





The UT-4000 UHF hidden "body transmitter."

Microtron, 42 38th Street, Wheeling, WV 26003 collected my \$2 for a catalog of electronic surveillance equipment and sent nothing in return!

The Spy Shops International, P.O. Box 1738, Englewood Cliffs, NJ 07632 was a company that promised an "illustrated brochure" for \$1 but kept my buck and sent nothing.

RF Electronics, 826 W. Valley Blvd., Suite 135, Alhambra, CA 91803 was asking \$2 for a catalog of FM bugs in the \$10 to \$80 price range. They also decided to keep my \$2 and forget about my request for a catalog.

As you can see, there is no shortage of companies offering this type of gear to the general public. The companies listed here are by no means all who offer these products, just a representative assortment selected at random. Of course, as in many fields of endeavor, companies tend to come and go at a moment's notice. While researching this information, in fact, mail I sent to two companies came back as undeliverable for one reason or another. They were: CASElectronics in West Covina, CA; and Mason, of Hattiesburg, MS.

For this reason, and because prices and product availability seem to change even with the most stable of companies, I have given only approximate prices and have not included any shipping/handling cost information. Persons seeking more product information, exact pricing and shipping data, and other data on the items discussed here are invited to contact the various companies directly and obtain their catalogs.

## The Overview

Planting little hidden transmitters in order to surreptitiously listen in on private room or telephone conversations of others has be-

come somewhat of a national and international obsession. Governments do it to one another and even to their own citizens. Professional and amateur snoops have picked up the ball and run with it, too. If you knew how much was going on, you'd be amazed and, well, if you've read this far it should be obvious to you that it's created a rather booming market in these miniature transmitters intended for (or at least *suitable* for) non-professional and non-critical audio surveillance jobs.

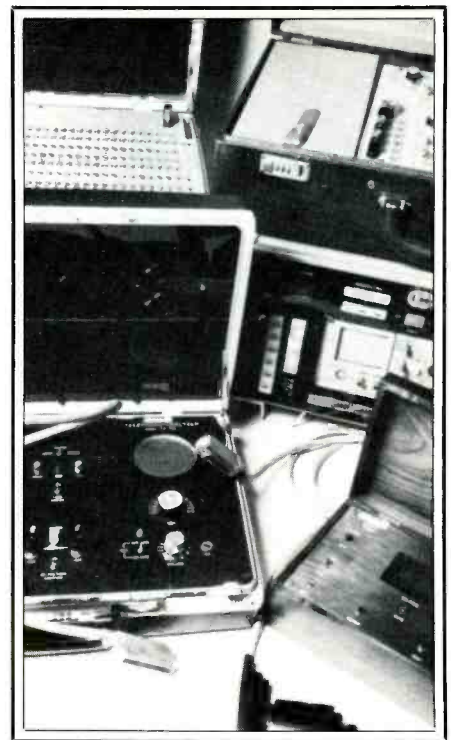
What are the differences between these units and those intended for critical and professional uses? The two most obvious indicators are price and availability, and they go hand in hand. The majority of hardware used by governments and professionals is either custom made by, or for, its intended user, and at prices that can run into the thousands of dollars. This equipment isn't offered for sale to the general public on a ready-to-use basis.

Another indicator is that most transmitters intended for federal, or other professional audio surveillance uses, do not operate within the 88 to 108 MHz FM broadcasting band. On the other hand, the majority of units offered to the general public use these frequencies for several reasons, the most important being that they can be picked up on an ordinary FM car, portable, or home receiver. Professional eavesdroppers are willing to spring for the extra money to get away from the FM broadcasting band to lessen the possibilities that their activities will be discovered by random people trying to tune in an FM broadcaster. Just imagine the feedback squeal if the surveillance subject *himself* happened to tune past the critical FM-band transmitting frequency!

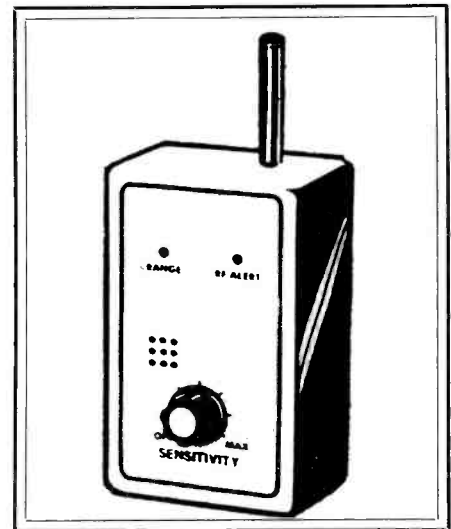
Hint: Room and telephone transmitters, and body mikes used by the feds, by the police and professionals can turn up on *any* frequency, including those often used for professional grade wireless microphones. For your own information, I have placed, detected and heard about such units operating on many frequencies, including: 30.84, 33.12, 33.14, 33.40, 35.02, 42.98, 149.35, 150.775, 150.79, 154.57, 154.60, 165.9125, 167.3375, 167.3425, 167.4875, 168.0115, 169.20, 169.445, 169.505, 170.245, 170.305, 171.045, 171.105, 171.45, 171.845, 171.905, 172.00, 172.20, 173.3375, 457.525, 457.55, 457.5625, 457.575, 457.60, 467.75, 467.775, 467.7875, 467.80, 467.825, 467.85, 467.875, 467.90, and 467.925 MHz.

For general do-it-yourself type snooping activities, with reliable transmitting ranges of one block to about a quarter mile, a person can probably do some effective low-cost audio snooping with ready-to-use equipment. Best bet is not to place the transmitter in the same room as an FM broadcast receiver.

These miniature transmitters actually do work! When shopping, check to see if the unit you're thinking of purchasing comes with a built-in or plug-in mike. Some do,



A few of the tools of the professional bug and telephone-tap hunters' trade.

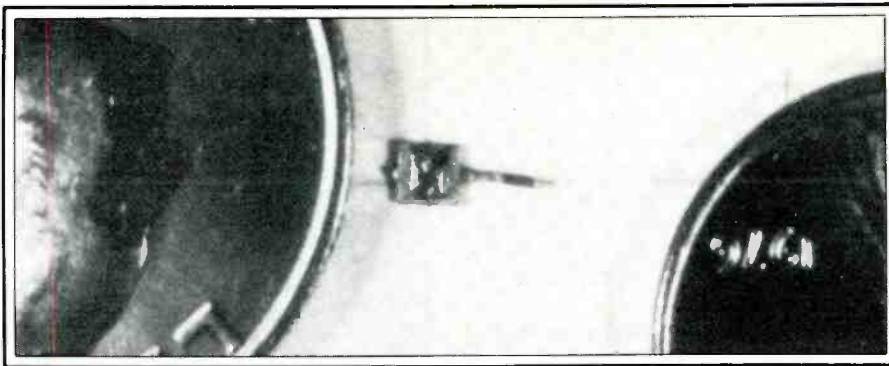


This low priced (\$100 price range) bug detector should be suitable for most applications required by non-professionals. They're offered by Capri Electronics, P.O. Box 589-G, Bayfield, CO 81122.

some don't. If you've got to buy one, it will add to the cost.

## Avoiding Bugging

Avoidance of bugging is easily grist for an entire story, in a nutshell, it breaks down into several categories: detection and removal of bugs from premises and telephones; countermeasures (jamming, voice scrambling devices, use of encoded messages, for example), or simply not discussing sensitive matters under conditions, or



Think small! Only a professional could root out this ultra-mini transmitter the size of a letter "L" in "Liberty" on a quarter.

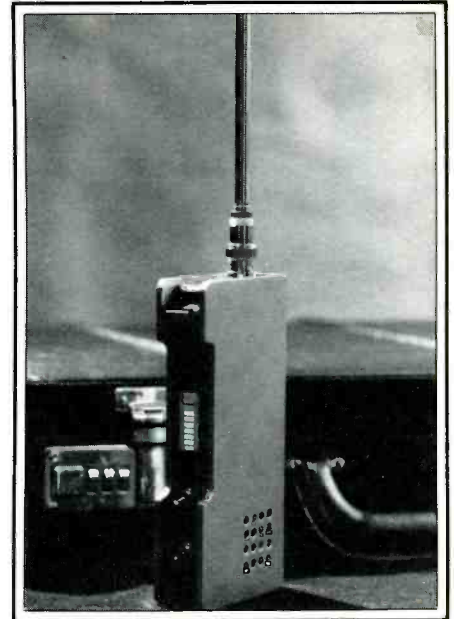
in locations, where snooping is likely, or convenient.

First, you must ask yourself if your office, home, store, factory, or telephone is bugged. Chances are no, not unless you're cheating on your spouse (or with someone else), your employer, or your taxes. Not unless you're involved in transporting, selling, or buying drugs, industrial or government secrets, stolen property, or contraband. Not unless you're involved with organized crime, embezzling, professional gambling, prostitution, fraud, or blackmail, or you believe your spouse, boss, law enforcement agencies have reason to be suspicious of your past, present, or future activities. If you don't fit into any of these slots,

than chances are that nobody is nearly as interested in what you're saying as you are, yourself.

Second, take into account that while you, personally, may not think deliberate efforts have been made to eavesdrop on your conversations, you may not be entirely out of the woods. Perhaps one or more of your family members, suppliers, customers, business associates, co-workers or friends fits into one of those categories, and your conversations might be monitored as part of their surveillance. Or maybe you have a sensitive job, or an overly suspicious spouse and you've been targeted for electronic surveillance on that basis alone; as a preventive measure.

Third, today's communications technology makes enormous use of the airwaves in conjunction with telephone calls. Persons engaged in Long Distance calling, or using cordless telephones, or talking to persons in vehicles, on trains, in aircraft, or aboard any type of small or large vessel have conversations that, at some point, are definitely being transmitted by radio. As such, the conversations can be overheard by persons with scanners, communications receivers, or other monitoring equipment easily available to the general public. The book *Tune In On Telephone Calls*, by Tom Kneitel, shows the many facets of this type of eavesdropping.



The System II is a moderate priced (\$880) professional grade bug detector made by Advantage Systems Ltd., of Vancouver, BC.

For bugs planted by non-professionals, remedies by others of that ilk are more practical. Since most do-it-yourself bugs operate in the 88 to 108 MHz FM broadcasting band, try carrying a small transistor FM portable around to different areas you suspect may be the site of being bugged, like offices, bedrooms, dens, washrooms, living rooms. In each of those areas, turn up the volume on the receiver and then slowly tune across the entire band. If you hit a strong signal that produces a loud squeal (feedback) then you've probably located your local non-pro bugging transmitter.

Another inexpensive approach would be to improvise with a Field Strength Meter (FSM). You may have one on hand from your CB or hamming operations, or you can locate one for about \$19 (like the Radio Shack #21-525). An FSM should be able to detect the presence of nearby micro transmitters if you move the FSM's sensing probe (antenna) around a room: curtains, lamps, vents, baseboards, windows, paintings, walls, beds, nightstands, ashtrays, intercoms, phones, TV's, VCR's, stereos, radios, vases, ceiling fixtures, furniture, edges of carpeting, bookshelves, humidors, etc.

There are any number of do-it-yourself bug-detection and telephone tap warning devices offered to the general public; \$100 or less should do the job, too. Of course, more sophisticated units range in price up to \$1,000 and are available to the more ambitious non-pro snoop detection expert.

What about defeating bugs by playing a radio to mask the conversation taking place in a room? Others may scoff, but I'd say a tape of *Motley Crue* or *AC/DC* played at a hefty audio level will not only defeat most room bugs, it will also severely punish the person doing the eavesdropping, if it doesn't get you first!

PC

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— 10 Meter Antennas — Coax

LONG DISTANCE — LOCAL — GROUND WAVE — DX  
"COMBINATION TALKING"

**JG-3 STAR**

**Specifications**  
Type: Horiz. & Vert.  
Polarization: Twin Feed  
Gain: 14.5 DB  
Front to Back Ratio: 40 DB True  
Side Rejection: 40-45 DB True  
Back Rejection: 40 DB True  
Weight: 28 Pounds  
Length: 8 Feet  
SWR: 1.1  
Horiz. to Vert. Separation: 20-25 DB  
Wind Survival: 100 MPH  
Power Multiplication: 40X  
Audio Gain: 18 DB  
Wind Load: 2.8

**JG-4 STAR**

**Specifications**  
Gain: Horizontal - 5.25 DB  
Vertical - 4.75 DB  
Multiplication Factors:  
Horizontal - 17 Times  
Vertical - 15 Times  
Horiz. to Vert. Separation: 20 - 25 DB  
Power Rating: 2000 CW, 4000 PEP  
Height: 11 Feet  
Weight: 10 Lbs.  
Materials: Anodized 6063T-6 Aircraft Aluminum Tubing  
Requires 2 Separate Coaxial Cables for Hook-Up

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Please send all reader inquiries directly.



# Utility Worker Helps Save Two Unconscious Children

David M. Regan was driving his truck for Niagara Mohawk in downtown Buffalo, New York, when he was flagged down by Richard Little. Little's children, Richard, 5, and Melissa, 3, were unconscious in the back seat of their parents' car. Thanks to the quick action of both Regan and Little, the children were saved.

Mr. and Mrs. Little were running an errand on Delaware Avenue in Buffalo. While Little left the car, Mrs. Little waited for her husband with the two children. She saw the five-year-old doze off and appear to fall asleep.



was on his way home to suburban Orchard Park. Regan said that when he saw both children they were blue and limp.

"There was no way in hell we could call an ambulance and get them to the hospital in time," Regan told the *News*. "I said, 'Get them in the truck and let's go.'"

Regan flashed his lights and leaned on the horn of his truck as he tried to get through afternoon rush hour traffic on the way to Mercy Hospital.

While he was fighting traffic, Regan told Richard Little how to revive the children with cardiopulmonary resuscitation. "I said to tip his head back, blow in his mouth and hold his nose," he said.

Regan then used the company radio in the truck to contact police and the hospital.

Regan said that Niagara Mohawk encourages its workers to use their radios to help in emergencies, and his truck was identified as a "Radio Watch" vehicle.

Meanwhile, Little went from child to child in the back seat of the truck, employing CPR.

"He never let up and didn't panic," Regan said. "He stayed right with them. You've got to give him all the credit in the world. I don't know how I would have done it if it were my two kids."

Both children appeared to be conscious by the time Regan reached the hospital. Regan carried Melissa into the emergency room and Little carried his son. Mrs. Little had followed the truck in the family car. The two children were treated and released.

Regan, Niagara Mohawk's regional superintendent for special equipment, said that he had learned CPR techniques two years earlier, but had failed to update his training one year before the incident. "This year, I'm going back to renew it," he said.

Buffalo Police Capt. William Mullen praised Regan for his efforts, and recommended that he receive a citizen's commendation. The Littles' car was impounded for a safety check, and a preliminary investigation found speaker openings in the back seats through which fumes may have seeped.

For his quick thinking and actions, David M. Regan will receive the SCAN Public Service Award, which consists of a special commendation plaque and a cash prize. For making the nomination, James D. Liss of Cheektowaga, New York, will also receive a plaque. Congratulations to both of you.

## SCAN PUBLIC SERVICE AWARD

"Then her daughter also dozed off and neither she, nor her husband, thought anything was wrong when he returned, and they drove off," Buffalo Police Officer Denise Kinsella told the *Buffalo News*.

When Mrs. Little turned around to check the children, she found them listless. Unable to wake them up, the father then stopped the car and both parents tried to wake them up.

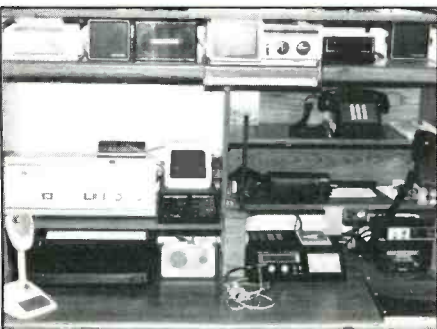
"They tried to revive them with mouth-to-mouth resuscitation," Kinsella said. "When that failed they panicked and ran into the road where they frantically waved for help."

That's when they saw David Regan, who

## Best Appearing

It's safe to say that Gary Webbenhurst is not only an interested listener. He is involved! Gary monitors communications from over 100 agencies within his listening area around his Sacramento, California, home. He also serves as a volunteer for the local chapter of the American Red Cross.

His radio room is equipped with a Bearcat 100 handheld scanner, Regency MX-3000 scanner and a Realistic PRO-2004, along with auxiliary speakers. A citizens band radio monitors channel 9 exclusively.



## SCAN PHOTO CONTEST WINNERS

A Motorola base station is used for his work with the Red Cross. A Honda EX-1000 generator is on stand by to keep Gary on the air in the event of a power failure.

Gary also uses a black and white television, telephone and typewriter in his shack, and has rooftop antennas for all of his scanners and receivers. He says the Diamond D-130 antenna works well in the valley that surrounds Sacramento.

## Best Equipped

This nice selection of old and new equipment belongs to W. Wesley Blackwell of Toms River, New Jersey.

Wesley uses a Bearcat 300 scanner,



Bearcat IV for the fire bands and another Bearcat IV for the police bands. Receivers include a National 300 with speaker, Hallcrafters S-118 and Hallcrafters 76. He also has a Heathkit 1680, President Washington citizens band unit and Microlog. A Commodore 64 computer and Autek Q1 filter round out the equipment shown here.

Not shown in this photo are several old military surplus receivers and pieces of related equipment. Antennas used consist of a longwire, discone, Big Stick and others that Wesley describes as "changeable."

# Recalling Radio Of Old

## Return To Those Thrilling Days Of Yesteryear When Adventure Rode The Airwaves

BY ALICE BRANNIGAN

**I**n the past, we have devoted our principal attention to broadcasting and communications stations in North America. This isn't to say that the rest of the world was standing by and watching as early radio took off in the U.S. and Canada. Indeed, right from the git-go, there were broadcasters in many nations around the world. This was brought to mind when I received a letter from *Corky McCorkle* of Dunedin, New Zealand asking why I've ignored the *Zedders*.

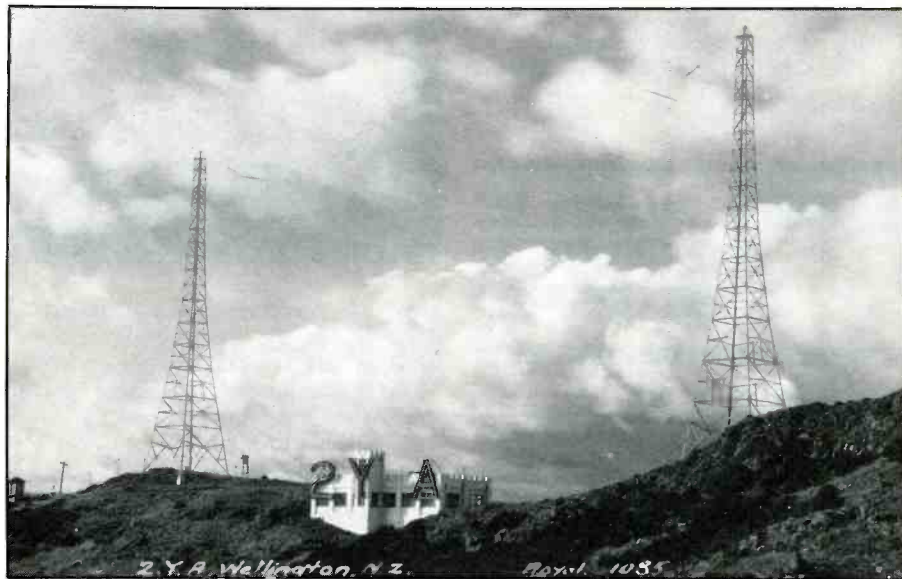
Well, he's right. New Zealand was one of the nations that got into broadcasting early. One station, 2YA, for instance, was operating well back into the mid-1920's; I traced it back to at least 1925 when the Wellington station was owned by the Dominion Radio Company and ran 500 watts on 1090 kHz.

By 1929, 2YA had become owned by the Radio Broadcasting Company of New Zealand and was operating on 714 kHz with 5 kW. The next couple of years saw more changes as the station worked its way towards one of its goals, that of running high power. That goal was achieved at midnight on December 17th, 1936 when 2YA's new 60 kW transmitter was given its first on the air test. By December 29th, all of 2YA's programming was being fed through the new rig. The 60 kW transmitter was officially dedicated with special programming on January 25th, 1936. By then, 2YA had moved to 570 kHz.

The next major step in 2YA's evolution was in the early 1940's, when the station was the programming source for the first shortwave broadcasts from New Zealand. This was when 2YA's local news programming was rebroadcast over point-to-point transmitter ZLT7 on 6715 kHz so that members of New Zealand's armed forces serving in the Pacific could hear the news from home.

The pioneering station is still on the air, now running 100 kW on 567 kHz. It's the most powerful mediumwave station in New Zealand (the second most powerful is Wellington's 2YC with 60 kW on 657 kHz). Station 2YA is the key station in the Radio New Zealand (Broadcasting Corporation of New Zealand) non-commercial "National Programme" network.

A photo we have of 2YA shows it in its early days. Located on top of a mountain, two lattice towers supported a four-wire center-fed antenna system. The turreted transmitter building, located between the



This early photo of 2YA shows its two towers and transmitter shack at a mountain location.

towers, supports huge neon-lit cut-out letters announcing the stations callsign.

A QSL letter dated 1932 was sent to Joe Hueter of Philadelphia to confirm his reception. A QSL card, sent about ten years later, was the way the station verified during the WWII era for MW (and SW relay) broadcasts.

### On Frequency

From time to time, we note that the mediumwave frequencies of stations outside of North America are 657 kHz, 808 kHz, 1314 kHz, or some similar channel that does not exactly match up with broadcasting frequencies used by our local stations in the U.S. and Canada (890 kHz, 1070 kHz, 1540 kHz, etc.). That's because North American stations are spaced at 10 kHz steps, while some other nations use a 9 kHz spacing between channels. The 9 kHz spacing creates more available frequencies and allows a greater number of stations to operate.

Our FCC occasionally mentions that it is studying the possibilities of trading in our nation's 10 kHz spacing format for 9 kHz spacing, and some newer model digital receivers even have a switch that allows tuning at either 9 or 10 kHz steps in the event the receiver is used overseas or if the local station spacing is changed.

This idea is nothing especially new to the FCC. In October of 1936, the FCC held informal discussions with broadcasters on whether 5 kHz or 7.5 kHz spacing between mediumwave frequencies would find favor within the broadcasting industry. Broadcasters generally felt that the receiver technology of the era was not sufficient to permit such a change in channel spacing. As an alternative plan to accommodate more broadcasting stations, not long after these discussions, the FCC decided to extend the high frequency end of the broadcasting band from 1500 kHz to 1600 kHz.

### Operation Crossroads

*Operation Crossroads* was the name of the post-WWII mid-Pacific atomic bomb experiment. This was in 1946, and was an undertaking that involved 42,000 persons, including scientists, military personnel from all services, international observers, and the news media, all in the vicinity of Kwajalein Island for the blast at Bikini Atoll.

Those in charge of the massive operation recalled that all of the important public information communications associated with the original Philippines invasion at Leyte (October, 1944) and subsequent operations were handled through the famous GHQ Communications Ship, the *USAT Apache*, with



## The New Zealand Broadcasting Board.

BROADCASTING STATIONS  
AT  
AUCKLAND,  
WELLINGTON,  
CHRISTCHURCH,  
DUNEDIN.

HEAD OFFICE:  
FEATHERSTON STREET, WELLINGTON, NEW ZEALAND.

ALL COMMUNICATIONS TO BE  
RESERVED TO  
THE GENERAL MANAGER.  
TELEPHONE 200744.  
RADIOBOARD,  
WELLINGTON.

Monday, February 8th, 1932.

Mr. Joseph L. Huster,  
1722 North 18th Street,  
Philadelphia, Pa.,  
U.S.A.

Dear Sir,

I am directed to acknowledge your report dated January 5th on the programme received from Station 2YA Wellington on the 29th November.

In this respect, the details have been checked with the station log for the date in question, and are duly verified herewith.

Yours faithfully,



Acting General Manager.

A 1932 QSL letter to a DX'er in Philadelphia proves that the 5 kW transmitter was doing a good job for 2YA.

The carrier terminal equipment aboard the USAT Spindle Eye permitted simultaneous transmission of voice and RTTY.

the callsign WVLC. They decided that the Operation Crossroads' public information activities would be coordinated through the USAT Spindle Eye, which was the Apache's successor and had even been given the older ship's callsign, WVLC. The USAT Spindle Eye had originally been an Army Transport ship, but had been transformed into a sophisticated floating communications station.

The vessel contained several complete broadcast and recording studios all patched into a master control console the equal of a major network flagship station. Banks of Hammarlund Super-Pro and RCA AR-88 receivers lined the racks in the monitoring room. Photo labs on the Spindle Eye were equipped with Acme 4-channel 4.5 kW radiophoto transceivers.

Long range RTTY was handled through a Wilcox 96-C 4-channel 2.5 kW transmitter together with two Press Wireless FSK units. Short range RTTY was handled via Signal Corps AN/TRC-1 units, plus CF-1 and 2 terminal equipment. The ship was also equipped with two high speed Boehme units which could send/receive standard CW up to 500 WPM.

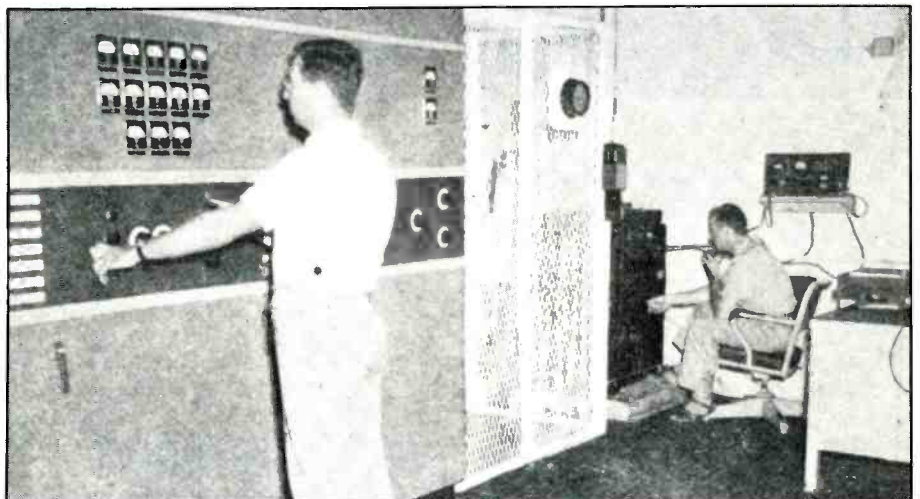
Broadcasting equipment included RCA 7.5 kW HF and Hallicrafters BC-610 transmitters. Special patching arrangements were available to permit these two transmitters to also be used for RTTY or radiophoto purposes if needed. There were, of course,

additional comms facilities for ship/shore, navigational, tactical, and other operational needs of the vessel.

The antennas were all supported by three masts topside. The receiving antennas were strung between the mid and fore masts, while the transmitting antennas were all between the mid and aft masts. The a.c. power was supplied by two 100 kW, 3-phase, 220 volt, diesel driven generators, with a 15 kW motor generator as an auxiliary to run

the monitoring receivers while the transmitters were not being used.

For Operation Crossroads, the Spindle Eye used the special callsign NIGF. The ship was given the mission of handling all voice broadcasts, press dispatches and radiophotos filed by the various broadcast representatives covering the event, and serve as a standby to the administrative communication facilities installed in the joint communications center at Kwajalein.



The Spindle Eye's 7.5 kW RCA broadcast transmitter shown at the left. To the right is the 500 watt BC-610 transmitter.

DOMINION OF NEW ZEALAND.

[N.B.S.—38

## NATIONAL BROADCASTING SERVICE.

### Station 2YA, Wellington.

& ZLT7

To Milton Jarlien

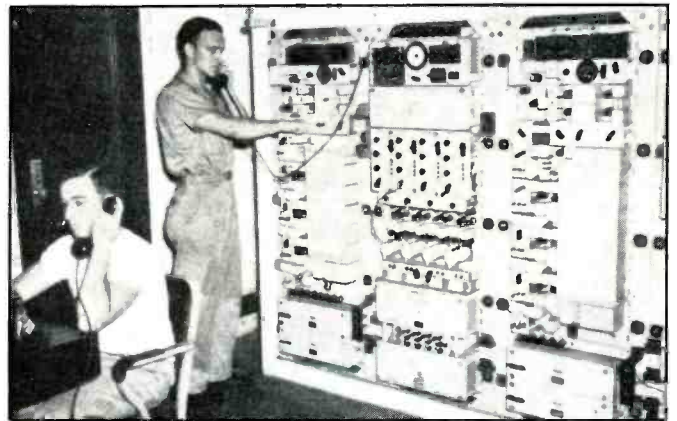
Your report of reception of this Station's transmission on June 6th, 1943 has been checked with the Station Log for the date mentioned.

Your report is duly verified herewith.

~~Your report does not contain sufficient data to permit verification.~~

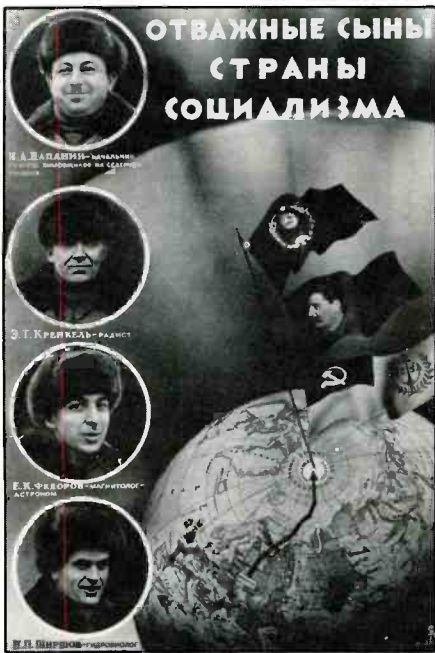
 Station Manager.

During WWII, 2YA's domestic news broadcasts were relayed via shortwave for the benefit of New Zealand's armed forces. These were the first shortwave broadcasts from New Zealand, and this QSL is from the early days of those programs.





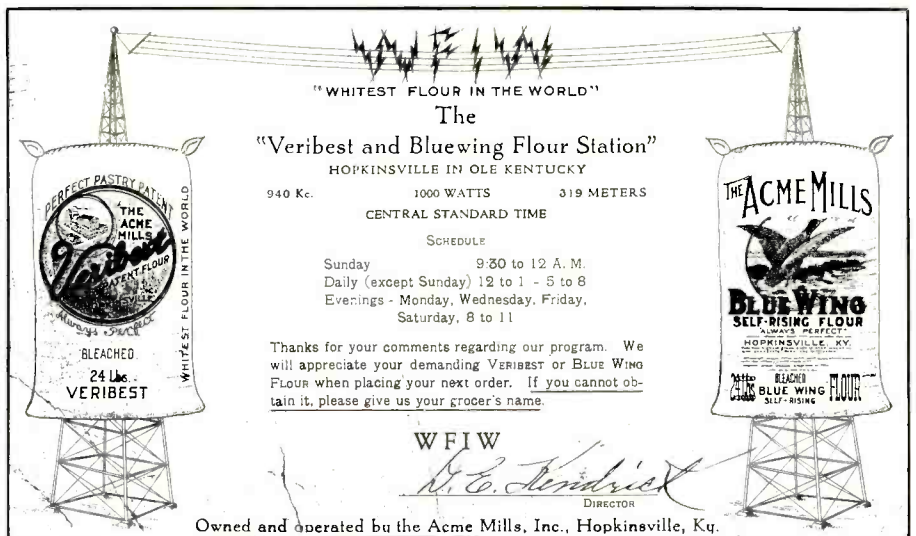
The Spindle Eye's main patch panel in the broadcast control room. The technician is adjusting the compression amplifier. The dark radio midway up the rack is a Hallcrafters S-36 monitor receiver.



This 1937 QSL from Radio Central Moscow depicts the heroes of a Soviet polar expedition led by I. A. Papanin. (Courtesy Edward Bailey)

Spindle Eye was a vital link in the news coverage of this event, which drew worldwide attention and headlines. Many DX'ers heard NIGF/WVLC directly, however, and it was only one of several widely-reported stations connected with the atomic tests at the Bikini Atoll.

NIGF/WVLC was reported on 9065 and 18530 kHz, and occasionally on 13970 kHz working stations KKL, KES2, KBE, and KGTS. Station KU5Q, operated by the



Station WFIW sent this promo card to Bill Parmley's grandparents. Bill found it recently while digging through some old papers in the family barn.

USN on Guam, was part of the event, too, and was noted on 7645, 9670, 15930, and 17820 kHz working RCA in San Francisco (KKL and KES2). KU5Q also ran a sked with WLXJ in Shanghai on 9280 and 13360 kHz.

### A Very Thoughtful Gesture

Edward Bailey, of West Haven, CT sent us a beautiful collection of his QSL cards dating back to 1937. Mr. Bailey advises that, "I am now 73 and I don't want them any longer just lying around gathering dust. I thought that you might be able to use them in your writings, all of which I enjoy immensely."

Yes, indeed, we can and will use the cards sent in by Mr. Bailey. Several readers have presented us with outstanding collections of QSL's. They are sincerely appreciated and are being treated with the care and respect required to maintain them in the best possible condition so that they will never be lost to archivists of our hobby.

Mr. Bailey's QSL collection has many top-notch entries. One that particularly caught my eye was to verify reception of Station RAN, Radio Center Moscow, on 9600 kHz, for 1937 reception. This photographic gem honors four Soviet conquerors of the North Pole. The QSL shows three flags flying over the polar cap. One of the flags depicts Uncle Joe.

We'll be looking at more of this great collection in future issues.

### Found In A Barn

A letter from Bill Parmley, KR8L, of Plainfield, IL proves how little bits of radio history keep surfacing in the most unlikely places. Bill was looking through some old papers he recently found in his (maternal) grandmother's barn and out popped a 1929 card from station WFIW ("Whitest Flour In The World") of "Hopkinsville in Ole Kentucky."

Bill has thoughtfully shared a peek at this

card with all of us and hopes that we can tell him something about this station. He wonders if it is related to present-day WFIW in Fairfield, IL, or either of the two present stations in Hopkinsville, KY, stations WHOP or WKOA. Actually, none of the above, Bill.

WFIW looks to have gone on the air in about 1927, running 500 watts nights, and 1 kW days on 1070 kHz. It was owned by Acme Mills, producers of Veribest and Blue-wing flours. By 1928, WFIW had gone to 1 kW day/night operation on 1150 kHz, and a year later it moved to 940 kHz. The year 1930 saw it located at the corner of Campbell and 17th Streets and under the ownership of WFIW, Inc., a subsidiary of The Acme Mills.

WFIW's offices, by 1933 were at 8th and Main Streets, but not for long. Towards the end of the year, WFIW went silent and was then moved to Louisville, KY where it would still operate on 940 kHz, but under the call sign WAVE. The station later shifted to 970 kHz, then changed its call slightly to become WAVG. Presently, it operates there with 5 kW. WAVG's owners peg the stations starting date as December 30th, 1933, electing to ignore its Hopkinsville years when it was WFIW.

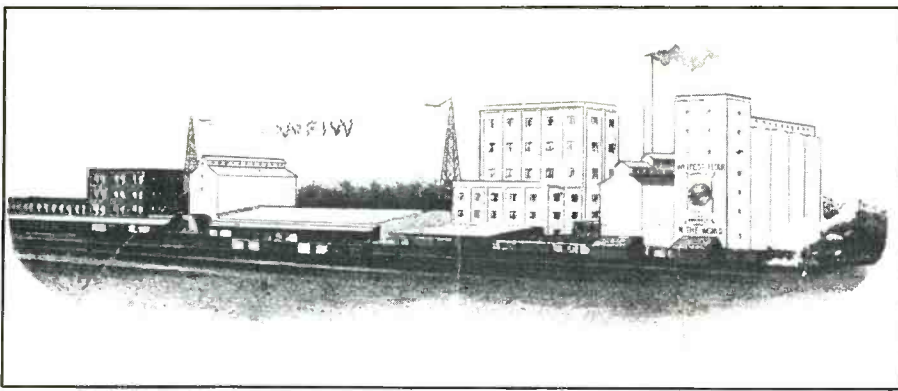
At first glance, the card sent to Bill's grandparents would seem to be a QSL, although (at almost 6 by 9 inches) it's about twice the size of most QSL cards. The wording and illustrations on the card suggest that it's more of a promo sent to potential users of their flour, than a card primarily intended for DX listeners.

A 1931 card we have that was sent to a DX listener was different and had verifying information written in by hand. We can also show you a 1935 QSL from the station (courtesy of Joe Hueter) after it became WAVE in Louisville.

### The FAX Were Known

The popularity of Facsimile (FAX) made me think about how everything old be-





In the early days of WFIW, it was owned by (and located on the grounds of) The Acme Mills, Hopkinsville, KY. (Courtesy Bill Parmley.)

## Thanks!

Your comment regarding our program is appreciated.

We welcome your suggestions

*Our Formal Opening Dec. 1-3,  
From 6 P. M. to 3 A. M. C.S.T.  
Listen in on 9H0K.C.*

We hope to hear from you again and to count you among our regular listeners.

SCHEDULE  
6 A.M. TILL 2 A.M.

*A. E. Hendrick*  
WFIW  
The Veribest and Bluewing Flour Station  
Reception Verified.

This 1931 QSL from WFIW had the verifying info in longhand.

comes new again. FAX has been around for many, many, years although some people seem to think it's a mid-1980's innovation.

One notable FAX experiment was conducted about 1946 to 1948 in Baltimore, MD. The Western Union Telegraph Co. obtained experimental licenses W3XZH (base) and W3XZI (1 mobile unit) for operation on 158.19 MHz. This was for their *Telecar* service, offering *Telegrams by Telefax*.

The idea of *Telecar* was for it to be a telegraph office on wheels since it was a vehicle equipped with a FAX machine wired into a two-way radio system. The vehicle would cruise through an assigned residential district in order to assure prompt delivery of telegrams.

Telegrams addressed to area residents were received at the Baltimore offices and then relayed by FAX to the unit in the *Telecar*, where a printed copy was produced for delivery to the addressee. The driver could deliver the telegram, and then obtain any reply and flash that by FAX back to the central office.

In view of the fact that there was only one *Telecar* ever put into operation, and that service was never opened up in other cities, the impression we get is that maybe it was something cooked up by a FAX equipment

manufacturer who had high hopes that WU would try the concept and eventually purchase thousands of FAX machines. Either way, it was a most interesting practical application of FAX.

### Reader Asks Help

Here's a question from George F. Franklin, W0AV, of Metro North Communications, 4417 N. Elmwood Avenue, Kansas City, MO 64117. He says that he was a radio operator during WWII who eventually became stationed in Germany with the 113th Cavalry (Mechanized) Reconnaissance Squadron. He recalls that during the fall of 1944 and into the winter of 1845, he used to regularly copy a station with the call-sign WLGO at about 2400 kHz. This station had good signal strength in Germany and sent only five-letter coded groups, all night, every night.

Considering the low frequency and solid signal strength, it hardly seems possible that the station was located in the USA, although the call-sign would seem to imply such. George observes. Even so, under the miserable conditions that existed at the time, even the possibility that WLGO might have been a signal from stateside offered him some measure of comfort and pleasure.

# 10 METER DX IS HOT!

AND YOU CAN WORK IT WITH THE NEW RANGER AR 3500



- Compact Mobile Transceiver
- Microprocessor Controlled Design
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- Programmable Band Scan
- Large Six Digit Frequency Readout
- Split Frequency Repeater Operation
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### SPECIFICATIONS

Frequency: Range 28,000-29,999 MHz. in 100 Hz steps.

Sens.: SSB/CW 0.3  $\mu$ V, FM 0.5  $\mu$ V

Power: SSB 25W PEP, 30W, CW, 8W FM

Input: 12.5 V, 6A DC

Dimensions: 2.4"x7.7"x11" Wt: 3 Lbs.

We made a special purchase of these fine transceivers and thus able to offer them at a very attractive price

Our Regular Price \$369.95

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**\$299.95**

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100 Watt model ..... (call for details)  
SP-1 Speech Processor\* ..... \$30.00  
CW Auto break-in & pwr control\* ..... 30.00  
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RS35A Pwr Supply for 100W Ranger ... 134.95

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318.9 METERS

# WAVE

LOUISVILLE, KENTUCKY

940 KCS.

This verifies your reception of WAVE, 1000 watts  
date 5/1/35, time 12:15 P.M. A. M. P. M.

Thank you,

WAVE, Incorporated  
*W. E. Hudson*  
C. E. Engineer

In late 1933, WFIW moved to Louisville and became WAVE. The station is presently on 970 kHz and known as WAVG. (Courtesy Joe Hueter.)

Still, George has always wondered about WLGO, and where it was.

Although I have no specific information on WLGO itself, it could well have been a tactical ID, or a U.S. Army call sign, used by a station in Europe or anywhere in the world. If any of our readers know anything about WLGO, or remember hearing it, George would like to hear from you.

By the way, for those readers who once held GI call signs with D4 and (later) DL4 prefixes, George used to be D4ACD and D4USA. George further observes that he reads lots of electronics and communications mags every month, but POP'COMM is the only one read from cover-to cover because it is enjoyed so completely!

### Starting Small

In 1925, Julius Brunton and Co., of 1380 Bush St., San Francisco, CA decided to get into this new radio broadcasting business

that was all the rage. they started modestly, mind you, a small 5 watt transmitter that was given authorization to operate on 1270 kHz with the call sign KJBS.

A year later, the government moved KJBS to 1360 kHz, but the station's owners didn't care because they were having so much fun. They said the call sign stood for *Kleen Jokes, Better Songs*, and their daily (except Sunday) schedule was filled with zany programs. Friday nights just wouldn't have been the same without the KJBS *Royal Order of Smoked Herring* program!

In 1928, KJBS again had to start over on a new frequency. this time it was sent to 1220 kHz, and rather than grumble about the change, they celebrated by increasing their power to 100 watts. A year after that, they took their 100 watts and moved, along with their growing audience, to 1100 kHz. That didn't last long, because in 1930, they were sent to 1070 kHz.



A 1948 experiment in discovering more uses for FAX found this Western Union courier manning his "Telecar" mobile telegraph office.



Inside the Western Union "Telecar" was a FAX machine hooked to a VHF two-way radio system. Telegrams could be sent/received, by FAX, directly between the vehicle and the central office.

1070 Kilocycles

100 Watts

1380 Bush Street

# KJBS

San Francisco

Dear Radio Friend:

May we take this opportunity to thank you for your recent communication and at the same time, verify your reception of KJBS, as noted below.

We naturally derive considerable pleasure from letters sent to us by KJBS listeners and hope that you will favor us again in the near future.

KJBS is a 100 watt station and broadcasts a continuous program every day of the year from 12:01 a. m. to local sunset, Pacific Standard Time.

Again thanking you for your communication, we are

Sincerely yours,

RECEPTION VERIFIED  
DAY: Jan 23rd 1932  
TIME: 1:00 AM, EST

RADIO STATION K J B S  
*W. E. Hudson*  
Program Director

KJBS started out in the 1920's as one of the many 5-watt backroom broadcasters. Most gave up after the fun wore off, and because the government kept moving them all over the dial. KJBS, however, was made of different stuff and seemed to thrive with each frequency change. A very unusual station, to say the least! (QSL courtesy of Joe Hueter.)

Despite the nomadic character of KJBS, the audience continued to increase and by the mid-1930's, the station was running 500 watts. A major national frequency shuffle just before WWII resulted in another KJBS move, back to 1100 kHz. the station took it all in stride, and by the mid-1940's, they were running a full kilowatt.

Despite its humble beginnings, KJBS' upbeat approach, innovative programming, and dogged determination to hang in there no matter how many times it was forced to change frequency has kept it on the air! You may know it today as San Francisco's KFAX, running 50 kW on 1100 kHz. The station now runs an ethnic, religious, and inspirational format. Nothing, however, could be quite as inspirational as KFAX's own evolution to 50 kW powerhouse from its beginnings 64 years ago as an obscure 5-watt backroom broadcaster.

There's a good moral there to think about as you head into a new year. Also, they're good words to tie the ribbons on it for this month and say that we hope to see you next time around.

PC



# The Moon Waxes and Wanes

## A Curious Collection Of Miscellany

BY HAVANA MOON

The year 1988 was interesting to say the very least. The "numbers," Havana Moon, and POP'COMM have been introduced to millions by way of *Penthouse*! And—without question—a bigger than life thank you goes to Sharon Churcher of *Penthouse* and "U.S.A. Confidential." Thanks again and again, Sharon.

The "numbers." They have really come a long way since Dr. John Santosuosso's Newark News Radio Club days. They really, really have.

### Elusive QSL's

What could be more rare than a Radio Caiman QSL? How about Aeroflot (Soviet airlines) or Cubana Airlines for starters? Send your Aeroflot reception reports to the following: Aeroflot, Leningradsky Prospect, 37, Moscow, USSR.

Send your Cubana reports to: Cubana, Calle 23 No. 64, La Rampa Vedado, Havana 4, Cuba.

Be sure and let us know your results.

### The Elvis Cipher

What could be more exciting than an actual Elvis sighting? An "Elvis cipher," that's what! Need way say more?

EEEE VISSE VIVII IISLL ILSSS

IEESS SIVLS IEEEV SESIE EISIS

Here's a clue or two:

What Elvis might say when sighted at Denny's. Also: "SI" equates to the letter "E."

### Maintain A Close Watch

Saturdays only. No other transmission days or times reported:

2100 UTC 5-D SP on 11,467 kHz. On a few occasions KKN44 marker heard underneath 5-D SP. 2130 UTC 9074 kHz. In mid-1988 this frequency served as a "repeat" frequency for 11,467 kHz. During the latter months of 1988, 4-D SP noted on this frequency. Very Curious!

This (9074 kHz) was also the frequency that the Government of Nicaragua once claimed was used by the CIA.

I have been told by one source that—on

certain occasions—4-digit Spanish transmissions on 9074 kHz were transmitted from the vicinity of Andros Island (The Bahamas)! I, unfortunately, can not ascertain the credibility of this source. Be aware that, at various times, "mis" as well as "disinformation sources" surface!

2200 UTC 12,300 kHz for 4-D EE

2200 UTC 9122 kHz for 5-D SP

### Communications Intercepts Of Infamy

Reacting to Alice's story on Pearl Harbor, I'll add a little more. During 1977, the Department of Defense, acting under Executive Order 11652, released for public use, a multi-volume study of communications intelligence (COMMINT) on the background of the 1941 Pearl Harbor disaster. Here are two of the voluminous intercepts prior to December 7, 1941:

October 24, 1941

Circular -2222

From: Tokyo

To: Washington

(Strictly Secret) At the end of September, we changed the direction, time, and contents of our foreign broadcasts. Will you, therefore, think back in the past and make any suggestions you deem wise concerning technique, contents, priority and so forth.

Relay to San Francisco, Rio, Buenos Aires, Santiago, Panama. Honolulu. Translated 11/4/41.

November 11, 1941

-453

From: Rio de Janeiro

To: Tokyo

Judging from reports from the various districts of late, reception conditions have improved considerably and all are happy over it. In view of the fact that communications with Japan have almost been cut off, and it is impossible to secure newspapers and magazines from home, we would like to have "news" in Japanese broadcast as much in detail as possible. Also, because of the present situation in broadcasting the daily news in Spanish and Portuguese, I think it is very important that discussions of the

principal events and problems of the day be added in order to make this and all South American quarters understand the fairness of our position. Please takes steps to see that this is done immediately. Translated 11/13/41.

### In Memoriam

David Atlee Phillips, 1922-1988

A prolific writer and a former chief of the CIA's Western Hemisphere Division, it was shortly after leaving the CIA in 1975 that Phillips founded the Association of Former Intelligence Officers (AFIO).

Over the next few years, Phillips would author several books including: *Night Watch: 25 Years In Peculiar Service* (Atheneum) and *Careers In Secret Operations: How To Be A Federal Intelligence Officer* (Stone Trail Press).

Phillips was—to Tom Kneitel and others of us—best known for his role in Radio Americas and/or Radio Swan prior to the ill-fated Bay-of-Pigs invasion of the Kennedy era. In *Night Watch*, Phillips touched on his role in this Swan Island operation.

### Just In

An Uzi City (Miami) source has just informed me of heightened activity at the Old Richmond Naval Air Station at Perine. This is somewhat west of the U.S. Coast Guard's NMA in Miami. This air station site was once one of the CIA's operation centers just prior to the "Bay-of-Pigs."

It is thought that KKN39 transmits on 4957.2 kHz from near the above site. Receiver overload on KKN39 noted in that area.

My source tells me of heavy security along with Army, Air Force and Marine detachments at this site. Several log periodic antenna systems observed.

Are the Uzi City spooks at it again?

Time now for a Tecate and . . .

Havana Moon y Amigos

Assisting in the preparation of this article: Diane H., John Fuard and Eric Connors.

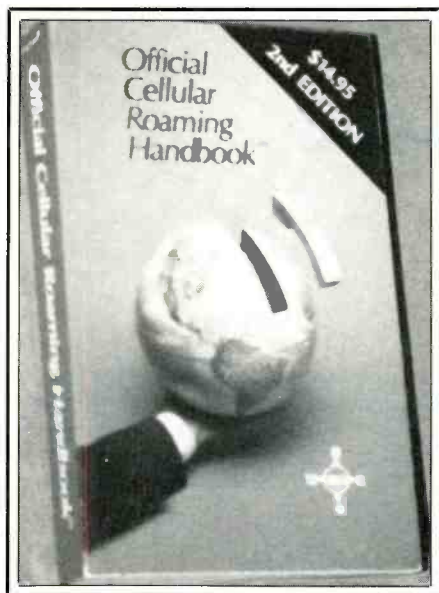
Solution to the "Elvis cipher" is:

"Stay off my blue suede shoes."

PC

# BOOKS YOU'LL LIKE!

BY R. L. SLATTERY



## The Roamin's Had A Book For It

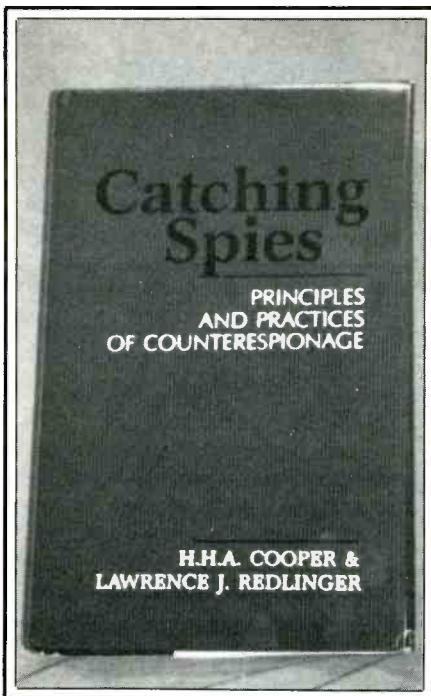
Those of you who are Cellular Mobile Telephone (CMT) users, listeners, technicians, and data collectors will find the *Official Cellular Roaming Handbook, 2nd Edition* to contain a sufficient amount of data to keep you leafing through its 384 pages for many fascinating hours.

In mobile phone lingo, a *roamer* is a mobile phone user that is attempting to make, or receive, calls outside of the normal operating area. If you've got your CMT billing account in Flagstaff, AZ and want to be able to receive mobile phone calls from your office while mobiling in Orlando, FL or Seattle, WA then you're a roamer. Same thing if you want to place calls from these locations. Being a roamer means making various arrangements with the common carriers along your route as well as destination. Those placing calls to you while you're operating as a roamer will require information on how to dial you while you're out of the area. And you, as a roamer, will want to know the air-time rates (cost) as well as the names of the common carrier whose facilities you're using.

This is the book that has this information for CMT companies in the U.S.A., Canada, and the Caribbean. Information provided includes coverage maps, operating company information, roamer rates, roamer dial-up access numbers, dialing patterns, information operator numbers, the credit cards each company accepts, reciprocal agreements, repair service numbers, etc.

The company that puts out this handy pocket-guide also publishes regional roamer's guides and CMT coverage map directories. The *Official Cellular Roaming Hand-*

*book, 2nd Edition* costs \$14.95, plus \$1 postage/handling from Cellular Directions, Inc., P.O. Box 66843, St. Petersburg, FL 33736. A fine reference book for all interested in CMT operations. Florida residents add sales tax.



## The Venus Spy Trap

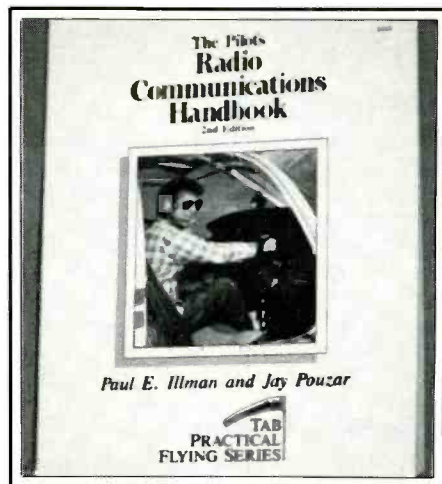
H.H.A. Cooper and Lawrence J. Redlinger have written a new book called *Catching Spies: Principles and Practice of Counterespionage*. Not a novel, but a serious look at techniques used for espionage, and how to detect and thwart those techniques. The book should be of special interest to intelligence professionals and students of intelligence activities.

*Catching Spies* deals with creating identities and personal histories (backgrounding); key areas of identity inquiry; spy detection and identification; unmasking and entrapment; spy types/functions; moles; converts, sleepers; tracking spies; capture and interrogation; effectiveness of espionage, and all other aspects of the tradecraft of counterespionage.

It's a 403-page hardcover book that, despite its serious approach to a serious topic, nevertheless is written in easy-to-read informal style with a large helping of insight and occasional sparkles of wit. The authors seem to recognize that those involved in espionage eventually end up with a certain type of universal spy mindset. Once that mindset can be understood, then it can be used to the advantage of the counterspy in order to catch the spy in his own web.

It's worth noting that espionage shouldn't be viewed only in terms of governmental agencies operating on an international level. Espionage isn't all that different when it comes to highly trained private professionals who specialize in stealing corporate secrets. Come to think of it, many individuals feel that they are being spied upon by former and present business associates or spouses, or by firms to which they owe money, or by neighbors, or various local or federal agencies, and so on. For those who are spying, or who suspect they are under visual, electronic, or mail surveillance, *Catching Spies* may offer some answers regarding the mentalities, attitudes, and techniques involved, even though the primary thrust of the book is international political/military espionage.

*Catching Spies* comes from Paladin Press, P.O. Box 1307, Boulder, CO 80306. The book is \$24.95. It's quite an excellent exposition of its topic.



## Off We Go!

Several years ago, Paul Illman and Jay Pouzar set out to write a complete explanation of virtually every type of aeronautical communications facility—control tower, ground control, unicom, multicom, weather, VOR's, departure control, FSS, ARTCC, radar control, ATIS, etc. When they got through, they had a fine book called *The Pilot's Radio Communications Handbook*. It was a huge seller and became one of the standard reference guides, not only for private pilots, but also for communications monitors who tune the aeronautical frequencies.

That was in 1984, and now the authors have completely revamped, revised, and updated their famous book and produced an all new second edition. This is a large 224-page fully illustrated book (photos, maps, charts, etc.) that includes informa-



tion on frequency usage, communications procedures, and a first-hand overview of these engrossing air/ground and air/air communications.

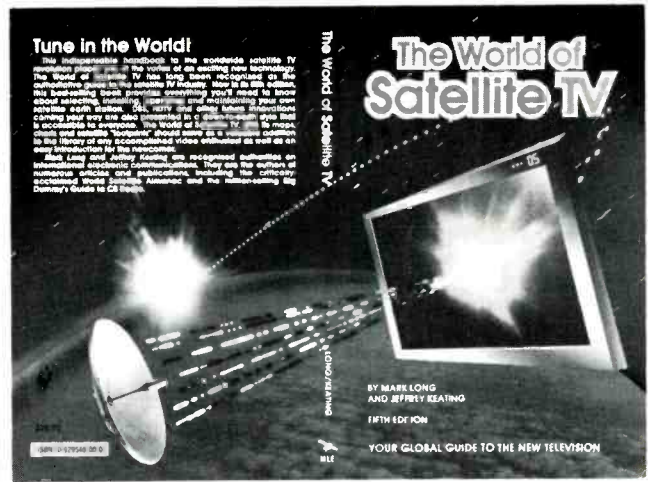
It's the perfect companion to the *Air-Scan* frequency guide, and one of those "must have" books for those who want to get the most from their aero monitoring. An especially interesting chapter provides you with the complete air/ground communications transcript of a cross-country flight as the pilot encounters various ground station facilities with which he must deal—weather stations, centers, flight service stations, and more.

I happen to be a person who has been interested in aero comms ever since I was first exposed to them while in military service. I warn you, monitoring this traffic can be habit forming, and this nifty new second edition of *The Pilot's Radio Communications Handbook* makes that habit all the stronger.

The new second edition of *The Pilot's Communications handbook* is \$14.95, plus \$2 postage/handling to addresses in North America, from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. New York State residents add sales tax. **PC**

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Co-authored by *former POPCOM* editors Mark Long and Jeffrey Keating, this perennial best seller places you at the vortex of the worldwide satellite TV revolution. It provides everything you need to know about selecting, installing, operating and maintaining the latest satellite TV systems and accessories. **THE WORLD OF SATELLITE TV**, with its many satellite TV program grids, wall charts, technical graphs and "footprint" maps, can serve as a valuable reference for both the casual viewer and the dedicated video enthusiast.

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By  
Bob Grove

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- ▲ Spies and smugglers
- ▲ Pirates and clandestines
- ▲ Aircraft and ships

For quick identification of those unknowns, stations are cross-referenced by agency and frequency. An exhaustive glossary gives you the terms, acronyms and abbreviations commonly encountered on shortwave radio networks. Voice and CW listings have been expanded, and the little-used RTTY section of the previous edition has been removed.

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# BROADCAST TOPIK

BY MARK MANUCY, W3GMG

## DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

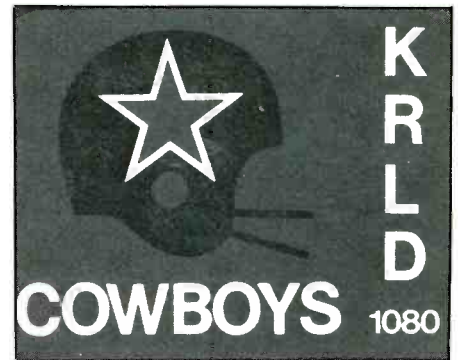
**T**he year 1988 marked the end of WNBC as it has been known for decades. The 660 frequency in New York now becomes the home of WFAN, previously on 1050 and previously WHN. Some months ago, when General Electric bought RCA, the NBC networks came as part of the deal. GE has proceeded to spin off the radio properties one at a time. Westwood One bought the radio networks to add to their collection, which includes Mutual, purchased less than a year ago. WNBC now goes by the boards. Certainly WFAN will benefit for the 660 frequency. As for WNBC... it's been fun, and Don Imus certainly made his mark at the station. Imus, it is rumored, may continue doing the morning show with WFAN.

Canada has added another station on 530 kHz. This one is in High Level, Alberta, operating with 400 watts day and 250 watts night. If you haven't listened for the original 530 kHz station, then it may already be too late. What we might see here is a trip into yesteryear, courtesy of the Canadian government. If they continue to add stations on 530 kHz then those of us who were not around in the early days of radio may see what happens as a frequency becomes populated with stations one at a time. Today, they are called the graveyard channels!

Meanwhile, we are just a year away from the opening of the 1600-1700 kHz band. It seems at the moment the FCC is going to take the AM stereo (marketplace) approach to setting the standards for these channels. At this point in time, all I see happening is more stations vying for the already weak AM band market. There are so few stations making money with AM radio, it seems ridiculous to add more. But that seems to be the way things go today. The NAB is finally

making headway with their experimental station to test for anti-skywave propagation. The frequency should be 1660 kHz and tests should start in the spring. As I mentioned some years back, the operating power will be on the order of 5000 watts.

I receive several letters each month asking for recommendations of specific equipment such as receivers, antennas, etc. I would like to help out, but I cannot recommend equipment which I know nothing about and have not used. Therefore, it is unfair for me to say anything. It is bias on my part to only recommend what I buy. It is not fair to you, the reader, since you may not get both sides of the story (since I may not be aware of special features on a product). However, I can give generic reports on what to look for when purchasing items of interest to the BCB DX'er, which is what I try to do in the column. That is why we speak about receivers every few months and why I give descriptions of how loop antennas operate and what the different types are. If you have specific questions about the generics, don't hesitate to ask, but don't expect me to say which receiver or antenna is the better one to buy.



You know, even the equipment lineup in my shack is not an indication of what to buy. For some of my equipment I have made special swaps, or gotten a good buy, just as you might. My requirements are not going to be the same as most people since I use some of my equipment in earning a living doing free-lance work for radio stations.

How you set up your shack is important, regardless of the amount of equipment you have. Everyone starts with one receiver and one antenna. Over the years the collection

PUTS  
ON  
THE

SOX

### Call Letter Changes

Location	Old	New	Location	Old	New
<b>AM Stations</b>			<b>FM Stations</b>		
San Rafael, CA	KTIM	KCAF	Marshall, IL	New	WMMC
Coleman, FL	WWLW	WFRK	Spencer, IN	WLSO	WSKT-FM
Glasgow, KY	WKAY	WCLU	Lewiston, ME	WAYU	WXGL-FM
Lewiston, ME	WCOU	WXGL	Middletown, MD	New	WAFY
Battle Creek, MI	WCLS	WOLY	Gloucester, MA	WVCA-FM	WBOQ
Aiken, SC	WAKN	WNEZ	Detroit, MI	WDTX	WDFX
Gloucester, VA	WDDY	WXGM	Poplar Bluff, MO	New	KLUH
Vancouver, WA	KAAR	KBMS	Sparta, MO	KJLR	KLTQ
			Fairfield, OH	WLLT	WOFX
			Sulphur, OK	KSDW	KFNC
			Aiken, SC	WNEZ	WLXC-FM
			Lytle, TX	New	KXPZ
			Richmond, VA	WEZS	WMXB
<b>FM Stations</b>					
Colusa, CA	KWBF	KKLU			
Immokolee, FL	WIKX-FM	WCOD			



### Station Update

Call	Location	Freq	Pwr	Ant
<b>AM STATIONS</b>				
KSDP	Sand Point, AK	840	1.0/1.0	NDA
<b>FM STATIONS</b>				
New	Oakridge, OR	92.1	.575	-830'
New	Eager, AZ	92.5	100	984"
WZZR	Stuart, FL	92.7	50	482'
KFSO	Visalia, CA	92.9	17.8	N/C
WFLS	Fredericksburg, VA	93.3	50	492'
New	Port St. Joe, FL	93.5	2.0	394'
WBPM	Kingston, NY	94.3	1.1	554'
WGSQ	Cookeville, TN	94.3	100	1319'
New	Maryville, TN	95.7	3.0	328'
KFMI	Eureka, CA	96.3	100	N/C
WMVQ	Amsterdam, NY	97.7	.79	623'
New	Tuba City, AZ	97.9	3.0	95'
New	Clarksville, TX	98.5	3.0	328'
New	Mount Union, PA	99.5	.15	1420'
KJAS	Jasper, TX	100.7	5.076	N/C
New	S. Whitley, IN	101.1	3.0	328'
WMYI	Hendersonville, NC	102.5	100	1778'
New	Cape Vincent, NY	102.7	3.0	328'
New	Appomattox, VA	102.7	50	492'
New	Mt. Pleasant, MI	104.3	2.6	335'
New	Montauk, NY	104.7	3.0	328'
New	Newport, WA	104.9	2.0	-102'
New	Harlan, KY	105.1	3.0	-250'
KKVU	Tremonton, UT	105.1	100	1099'
KCLQ-FM	Hanford, CA	107.5	20.3	784'
WGTY	Gettysburg, PA	107.7	50	351'
New	Kirkville, MO	107.9	100	466'

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

grows, or the items are "traded up" for a better item. My collection represents about 30 years of collecting and swapping. I just recently reacquired an old SX-62 receiver to go with an old SX-28, a Skyriider 32, and S-36A, NC-125 and I'm saving my pennies for a SX-42. In the modern department I have my R-70, a portable Sony SRF-A100 and ICF-2010.

Some readers would not be interested in older gear at all if they have money to buy newer. Others would have to pay to have the gear repaired, so that would not interest them, either. So your shack becomes very individualized.

If you have more than one antenna or receiver, how do you make them work together? My shack is probably pretty complicated since I also have transmitters and transceivers mixed in with the above mentioned gear, but I want to give you some ideas to work over in your head. The addition of more than one antenna brings complications into the shack setup. Currently, there are switches and a "patch panel" to route the antennas to the equipment. My antenna farm consists of a four foot loop, a 56' vertical, a 136' end fed hertz, a short-

wave vertical, a 40 meter loop and several other odds and ends. The most important things to remember about antennas is being able to disconnect them from the equipment when they are not being used. This is for lightning protection. Remember, it only takes one "hit" to ruin a beautiful setup and even set a home on fire. I know a lot of readers have long antennas so I want to emphasize the importance of a good ground, well used. How much voltage does it take to ignite a fire? A word to the wise.

Make provisions to ground the antennas to a good ground, not just an AC ground. A panel may be built and all the switching can be done by changing the plugs from one jack to another. RCA type phono plugs may be used for a receiving setup or the more expensive UHF or BNC connectors may be employed. Simple switches may also be employed.

An antenna tuner may be brought out to such a panel so that it can be used with several receivers and/or antennas. Try to use all the same type of coax. All 50 ohm or 75 ohm. Do not use hookup wire to wire up a panel, the results will be disappointing. Oh, it will work, but let's get in the habit of doing

# HAM RADIO IS FUN!

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Enclosed is my check or money order for \$15.00 or charge my

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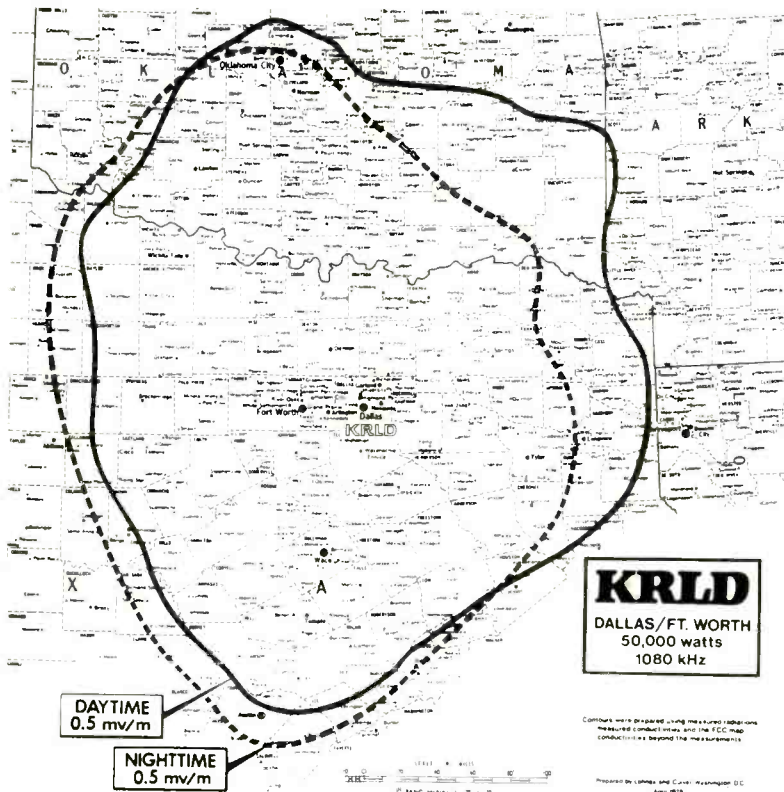
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# COVERAGE



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50,000 watts  
1080 kHz

DAYTIME  
0.5 mv/m

NIGHTTIME  
0.5 mv/m

Coverage was prepared using measured field strength measurements and the FCC map construction beyond the measurements.

Prepared by LORRAINE and Company, Washington, D.C. April 1978

# KRLD NEWS RADIO 1080AM

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Hicksville, NY 11801

the job right! One other thing to avoid is tying the antenna terminals of two or more receivers together. They must be separated and switched individually. It is OK to be able to switch the antennas to more than one receiver at the time, but be able to separate them as well.

With indoor loops, the problem should not be forgotten if an outside wire comes nearby the loop. The induction of the lightning coming down an outside wire into a nearby loop could damage the antenna circuit in a receiver if it is still connected.

One other word of advice since it is free! Basement and ground floor shacks are much easier to provide a good ground. By the time a ground gets to the third floor, it makes a pretty good antenna. With apartments and condos located many floors above terra-firma, it might be best to stick with the loop antennas and operate near a window, or on a balcony.

Then there is the other extreme as reported to me by Brian Webb. Last summer he and Doug Wong set up a 5,000 foot long wire in the Mojave Desert north of Los Angeles. They laid the wire on the ground and proceeded to see what they could hear. Based on the test results (they sent me a

copy) it seems they had a lot of fun, got a little sunburn and produced some information that allowed them to become more knowledgeable about the BC band and antennas than they would have if curiosity had not reigned supreme. By the way, the antenna performed just as it was predicted . . . directional.

Joseph Consuga writes to remind readers to use the Sony ICF-2010 to best advantage by experimenting with its many features. Joe finds the wideband width too wide, and the narrow band width too narrow. So narrow, that the voices are hard to understand. He off-tunes the radio to one side, or the other of the main channel, to get better response in hearing the station. Another trick to try Joe, is using the "sync" mode on the 2010. This automatically tunes the upper or lower sideband, depending on the dial setting, thus increasing the fidelity of reception by setting the radio to receive only one sideband. The IF bandwidth is then used on only one sideband instead of splitting it between two as in normal AM reception. Set the tuning speed to slow. This can really help on the shortwave bands.

This month is good DX'ing on the AM band . . . have fun!

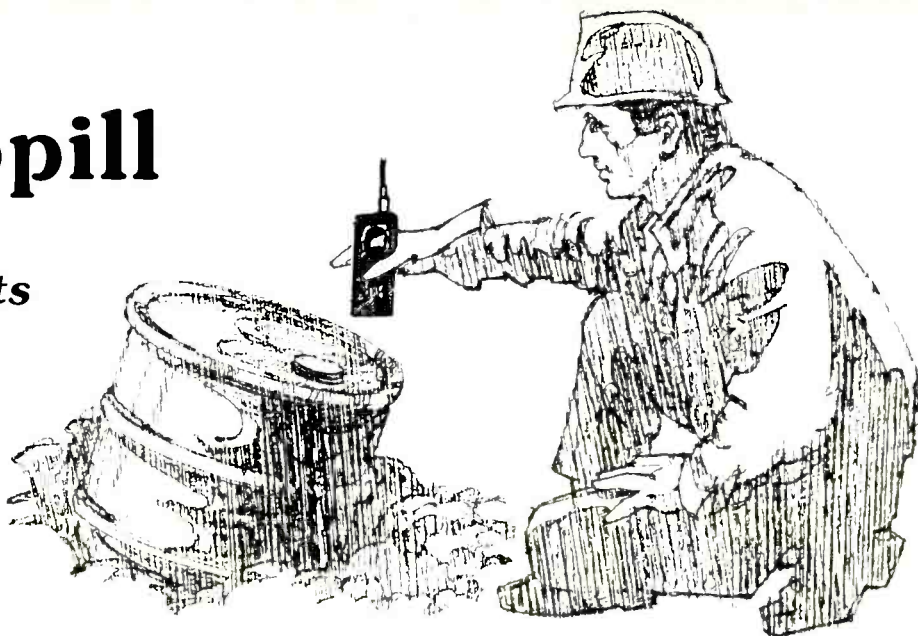
PC



# The Big Spill

## How Radio Played Its Part In A Water Emergency

BY MICHAEL DARBY



**W**heeling, West Virginia in early January of 1988 when a giant oil spill polluted the water of the Ohio River. The spill began in Pittsburgh, PA when an oil storage tank burst while being filled. Drinking water in a multitude of communities, including Wheeling, was declared polluted and alternate means of water sources and water transportation were put into effect. Local public and amateur radio services were involved in this operation.

The Wheeling Fire Department improvised a source of fire fighting water by pumping from hydrant to hydrant. The hydrants were on the opposite sides of the Ohio River and the pipeline to provide the water was laid across an abandoned railroad bridge spanning the Ohio River. A fire truck was placed on either side of the river and attached to a hydrant to supply pressure to the water. Temperatures ranged from zero to thirteen degrees, but the lines did not freeze.

Communications for this operation were carried out on the two local fire frequencies, F1-154.19 and F2-153.95. F2 was used by the engines on the scene to communicate

between the trucks, while F1 was used between headquarters and the truck on the West Virginia side, with that truck relaying traffic on F2 to the truck on the Ohio side.

Ham radio operators provided coordination of the water tanker movement via repeater operation. Delivery operations were conducted on 145.91, the Ohio County repeater. Fill operations were conducted in neighboring Marshall County on 146.91.

The coordination operation helped volunteer fire departments off-load water into their hydrant systems and provided a link between civil defense authorities and various locations within the two county area of Ohio and Marshall counties. The operations were inter-linked via two meter operations which were coordinated from the Wheeling City-County Building. The Northern Panhandle Amateur Radio Club operates a twelve watt two meter and high frequency base station from the basement of the City-County Building.

Another interesting operation was the transfer of clean water from Wheeling Creek, a tributary of the Ohio River. The

creek water was taken to the city's filtration plant in Warwood, via barge, for purification and testing. This operation was monitored on 156.650 and 156.700 MHz.

Various mobile phone operations provided a great source of information. For example, the engineers of a local television station were setting up for live coverage of the barge at Wheeling Creek when a flash fire broke out in a storage trailer on the site. The engineers were able to alert the studio to call the fire department and film the story as it happened. Also, access to these frequencies helped individuals assess how serious the situation was without depending on the interpretations of the media and local governments.

Communication, in this case, was the lifeline of the community. With the sub-zero temperatures, decisions had to be communicated rapidly to those transporting water to keep it from freezing. The communication system worked well. And those using the systems, did so adequately enough to keep the water flowing in Wheeling and the surrounding communities. **PC**

### Wheeling Area Frequencies

155.0100	Wheeling Police (use digital scramble)
155.055	Wheeling Water And Sanitary
155.340	Medical (Ambulances call Hospital)
154.190	Wheeling Fire One
153.950	Wheeling Fire Two (Used at working fires)
154.250	Ohio County Fire (a repeater)
42.100	West Virginia State Police Base
42.250	West Virginia State Police Mobile
39.44	Ohio County Sheriff One
39.98	Ohio County Sheriff Two
154.430	Ohio Fire
163.20	F.B.I. and U.S. Marshal
163.875	F.B.I. and U.S. Marshal
163.925	F.B.I. and U.S. Marshal
163.875	F.B.I. and U.S. Marshal

### Aircraft and Utility Services

118.100	Ohio County Airport Control
148.150	Civil Air Patrol (repeater)
40.900	Army Guard Helicopters
156.650	Pike Island Dam (Army Corps Of Engineers)
156.700	Pike Island Dam (requests and info on tonage)
161.900	Marine Operator
472.250	WTRF TV
483.225	Parcel Shippers
151.805	Wheeling Cable TV (useful in determining storm damage)

### Amateur Repeaters (Two Meters)

146.910	Triple States Amateur Radio Club (TSRAC)
146.715	TSRAC (Has links to 10 meters and 220MHZ)
145.190	Wheeling
146.940	Weirton

# CLANDESTINE COMMUNIQUE

## WHAT'S NEW WITH THE CLANDESTINES

BY GERRY L. DEXTER

There were press reports this spring which indicated that the U.S. intended to put a clandestine radio station on the air, aimed at helping bring down Panama's General Noriega. An anti-Noriega station calling itself *Radio Constitucional* and supporting ousted President Eric Delvalle did come on the air last May using an FM broadcast frequency.

Apparently this wasn't part of a U.S. effort—or if it was—it was quite unofficial and perhaps backed simply by funds and technical support. Since it used an FM frequency around 89 MHz, it's not going to be heard by DX'ers in this country.

That may not be the end of things, however. In late July, President Reagan ordered the Central Intelligence Agency to take some new steps to increase the pressure on

Noriega to leave. These steps were said to include "psychological warfare" such as the "sabotaging of government broadcasts". That could mean jamming, or a US-operated clandestine station or perhaps both. At least one congressman was calling for a US-run anti-Noriega station and it's possible such a broadcaster could be on the air by the time you read this so keep an eye on press reports. The bad news is that it's probably an even bet such a station would not use shortwave.

There's news, albeit very sketchy, of another new clandestine station. This one is called the *Voice of Oromo Liberation* and is operated by the Oromo Liberation Front. It's scheduled from 1530 to 1600 on 9550. No language usage is specified, but it's probably in Oromigna. Oromo is one of the Ethi-

opian provinces which, like Eritrea and Tigre, is seeking independence. So far, there are no known loggings of this in North America.

The long and complicated listing of times and frequencies which made up the schedule of the *Voice of the Broad Masses of Eritrea* has been considerably streamlined. Broadcasts from the station, which is operated by the Eritrean People's Liberation Front, are scheduled on 7485 and 14330 (both variable) from 0400 to 0500 in Tigrina, 0500-0530 in Tigre, 0530-0630 in Arabic, 0630-0700 in Arabic, 1500-1600 in Tigrina, 1600-1630 in Afar and 1630-1700 in Amharic. Although this is a very tough one to hear in the U.S., the revised schedule makes it appear to be a bit easier than it was. Try 7485 at 0400. If you luck out and

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الجبهة الشعبية لتحرير اريتريا

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2

Tigrinya programme - every day at	7-7:30 hrs	18-18:30hrs	21-21:30hrs
Tigre " " " "	7:30-8 hrs	19:30-19 hrs	21:30-22 hrs
Afaar " on Mon., Wedn., Fri., Sat. at	8-8:30 hrs	19-19:30 hrs	22-22:30 "
Amharic " on Sun., Tues., Thr. at	8-8:30 "	19-19:30 "	22-22:30 "
Arabic " every day at	8;30-9 "	19:30-20 "	22:30-21 "

N.B Hours are stated in local time. There is a difference of three hours between GMT and our local time.

We would also like to inform you that our transmission will slightly vary around the indicated frequencies. This has been made necessary to evade the enemy's jamming efforts which have been going on since the begining of last year, in a futile attempt to silence the Voice of the Proad Masses. In this connection, we would appreciate it very much if you would let us know how you receive our broadcasts.

Please give our kind regards and greetings to our friend Frits N. Eisenloeffel.

Michiel Schaay in Belgium received this program schedule for *The Voice of the Broad Masses of Eritrea*. It appears somewhat out of date, now.



do hear the station, the group's U.S. contact would like to know about it. Contact Tesfa A. Seyoum, Executive Secretary, Eritrean Relief Committee, c/o The Interchurch Center, 475 Riverside Drive, Room 251, New York, NY 10115.

The anti-Zimbabwe broadcaster, *Radio Truth*, continues its operations, running from 0400 to 0500 and 1700 to 1730 on 5015. The station is believed to be located in and at least partly supported by South Africa. *Radio Truth* is one of relatively few clandestine broadcasters which not only has some English programming but is also a pretty good verifier of reception reports. There's a U.S. mail drop—Stanley Hatfield, P.O. Box 815, Silver Spring, MD 20910 but reports sent to this address don't seem as readily replied to (and, indeed, sometimes are returned by the post office). So you're better off writing to J. Brown, P.O. Box 4, Stockbridge, Hants, England. Even so, it may take awhile for a response and sometimes a follow-up is needed.

The UNITA station, *A Voz Resistencia do Galo Negro (Voice of the Resistance of the Black Cockerel)* has expanded its broadcasts. The revised schedule lists Program "A" at 0500-0900 on 7130 (alternate 9750) and 9700, 1100-1500 on 9650 (alt. 11930) and 11820, 1800-2200 on 7130 (alt. 7225) and 7145. The broadcast at 0500 includes some programming in English and French, as well as the usual Portuguese. The "B" program airs at 0330 to 0600 on 4975 (actually closer to 4973) also on that frequency at 1730-2000 and 0830-1030 on 9600 (alt. 15167) and 11980 plus 1200-1430 on 9600 and 15170 (probably 15167 here, too). The "A" program is said to come from UNITA owned transmitters at Jamba in UNITA-held southern Angola while the "B" program is via transmitters within South Africa. U.S. listeners best reception opportunities are at 0330 sign on on 4973 and 0500 sign on on 9700 KHz.

With the current much improved reception conditions we're enjoying, this may be a good time to check out some stations which are not normally hearable in the U.S. Among those which fall into this category are the various anti-Chinese outlets which operate at times and on frequencies which make them good targets for reception in North America. The main drawback is apparent low power and the fact that activity seems very sporadic, although one respected Asian DX'er says operations are consistent. Experts are about evenly split as to whether these stations are Soviet operations or come from Taiwanese sources. At any rate, why not check between 1100 and 1400 for broadcasts from the Voice of the People's Liberation Army on 7185, Radio October Storm on 9270 and the Central People's Broadcasting Station on 7525. Some of the transmissions last only around 7 minutes!

Last winter, a series on radio in Vietnam during the war aired on many NPR radio stations. The series included a lot of infor-

mation about clandestine stations run by both sides, as well as pirate broadcasts by U.S. servicemen. Now the producers, Interlock Media Associates, are planning another series—this one based on Central America. If you can supply information about Central American clandestines please send it to Robert Dieterich, Interlock Media Associates, P.O. Box 619, Harvard Square

Station, Cambridge MA 02238.

But we need your information for this column, too. Data on station schedules, locations, addresses, loggings, QSLs and copies, information on groups operating stations; even clues can be very helpful. Your identity can be kept confidential if you wish.

Thanks for your help. Til next month, good hunting!

PC

## DATAMETRICS COMMUNICATIONS MANAGER

SCAN MEMORY FILE  
Filename: MONITOR.FRQ

Parameters		Status Indicators	
Longest duration:	0	Frequency:	800.6000
Minimum duration:	0	Signal:	OFF
Delay:	2	Time:	06:42:51
Autolog (O,S,D):	0	Monitor time:	1.05
Bounceback:	0	Scan rate:	9.65

Air rescue command channel

800.0000	800.1000	800.2000	800.3000	800.4000	800.5000
800.0100	800.1100	800.2100	800.3100	800.4100	800.5100
800.0200	800.1200	800.2200	800.3200	800.4200	800.5200
800.0300	800.1300	800.2300	800.3300	800.4300	800.5300
800.0400	800.1400	800.2400	800.3400	800.4400	800.5400
800.0500	800.1500	800.2500	800.3500	800.4500	800.5500
800.0600	800.1600	800.2600	800.3600	800.4600	800.5600
800.0700	800.1700	800.2700	800.3700	800.4700	800.5700
800.0800	800.1800	800.2800	800.3800	800.4800	800.5800
800.0900	800.1900	800.2900	800.3900	800.4900	800.5900

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**W**hat ham radio contest takes place every year, lasts nine days, overlaps two months and helps thousands of Novice and Technician hams upgrade faster and enjoy ham radio more? Answer: ARRL's Novice Roundup! This year's Roundup starts on the last weekend of January and runs through the first weekend of February. Here's how to get in on the fun.

Object: The Novice Roundup (NR) is an operating contest in which Novice and Technician hams in the United States (and possessions and territories) try to contact as many stations as possible in the Novice bands. (See Table 1 for a list of Novice frequencies.) All authorized emission modes—CW, voice, vision, data—may be used, for scoring purposes, FM and SSB voice count as "voice," and CW includes Morse and digital modes (radioteletype, packet radio, and so on). Novice and Technicians may contact each other and higher-class (General, Advanced, Extra) licensees; General, Advanced and Extra Class licensees, and overseas hams, may work only Novice and Technician hams, and not each other. The idea is to contact other stations only using a given mode—"voice" or "CW"—regardless of band. You can, however, contact the same station using a *different* mode. (Example: If you've just worked KA9MAN on 80-meter CW and hear him calling CQ NR on CW, radioteletype or packet radio in another Novice band, don't call him; he'll tell you that the contact is a *dupe* (duplicate). If you've worked him only on CW and hear him calling CQ NR on SSB, though, go for it! An SSB contact with KA9MAN will count as a new one for you—if you have not *already* worked him on SSB or FM.)

The Novice Roundup runs for the entire nine-day period from 0001 UTC Saturday, January 28, to 2359 UTC Sunday, February 5. (UTC stands for Coordinated Universal Time. If you're confused about how to convert UTC to local time, don't despair! See Table 2 for help.) Contestants (that is, operators who intend to submit their scores to ARRL HQ in competition for NR awards and to be listed in *QST* magazine) operate for no more than 30 hours of this nine-day period; noncontestant stations (including SWL's, of course!) can operate or listen for as much of this period as they please.

What to say on the air in the Novice Roundup: The core of a valid contact in the Novice Roundup is an *exchange* of signal report (three numbers in the RST (readability-strength-tone) signal reporting system) and ARRL/CRRL *section*. (The CRRL—

**Table 1—Novice Frequencies and Operating Modes**

Frequencies	Mode(s)	Notes
80 meters: 3700-3750 kHz	CW	
40 meters: 7100-7150 kHz	CW	
15 meters: 21100-21200 kHz	CW	
10 meters: 21800-28300 kHz	CW & Digital	suggested simplex packet-radio frequencies: †28102.3 and 28104.3 kHz
28300-28600 kHz	SSB‡	
1.25 meters: 222.10-223.91 MHz	All authorized modes	national simplex FM frequency: 223.50 MHz national simplex packet-radio frequency: 223.40 MHz
23 centimeters: 1270-1295 MHz	All authorized modes	national simplex FM calling frequency: 1294.5 MHz

† Please avoid the propagation beacons still operating in the 28200- to 28300-kHz range.  
‡ CW operation is also authorized in this range, but SSB-only operation is recommended.

Canadian Radio Relay League—is the equivalent of the ARRL in Canada. Sections are geographic regions in the ARRL and CRRL field organizations; see page 8 of a recent issue of *QST* for a listing of the ARRL and CRRL sections. You can learn about the RST system from a free info sheet available from the Ham Column; see below for details.) here's a typical NR CW contact in which Technician N1FCH calls CQ NR and ends up contacting your editor:

CQ NR CQ NR CQ NR DE N1FCH/T  
N1FCH/T N1FCH/T K.

Using the CQ (general call to any station) signal, N1FCH adds NR to direct the CQ to any station (not already contacted!) in the Novice Roundup. *DE* is French for *from*, and it's used by Morse code operators to mean just that. Because N1FCH is a Technician, she adds /T to her call sign so receiving stations can determine her license class. (Novices add /N.) K is a procedural signal, or *prosign*, that means "any station transmit." (Need a list of prosigns for CW and voice? See the box for how to get one *free* from the Ham Column.) AK7M checks his NR log, finds he hasn't worked N1FCH yet on CW, and gives her a call:

N1FCH DE AK7M AR.

Ar is the prosign for "end of message" the line over the A and R signifies that the letters should be sent as one Morse character in-

stead of A and R with a space in between. N1FCH hears QAK7M and responds with her Novice Roundup exchange:

AK7M DE N1FCH 479 CT KN.

AK7M's signal report is 479, and N1FCH is located in the Connecticut section of ARRL. KN means "addressed station only"—a good thing to send at this point because it tells other operators that N1FCH is already in contact with a particular station. AK7M responds with:

N1FCH DE AK7M 579 CT BK.

Translation: AK7M reports that he received N1FCH's exchange OK (R), sends her signal report (579) and his and his ARRL section (Connecticut), and turns the contact back over to N1FCH with the abbreviation for "break" (BK). Because N1FCH knows that this NR contact won't be valid until *both* operators have acknowledged receipt of each others exchange, she responds with:

R 73 DE N1FCH/T NR K.

That 73 (the telegraphic abbreviation for "best regards") is a nice touch—it keeps the contest from becoming too businesslike and impersonal. Because N1FCH is now ready to make additional NR contacts, she adds /T to her call sign, sends NR to let others know she's an NR participant, and finishes with K—not KN—so that other operators know it's Ok to call. Keeping things rolling in

**Table 2—Local Times for the Novice Roundup**

	EST	CST	MST	PST
Starts: Friday, January 27, at	7:01 PM	6:01 PM	5:01 PM	4:01 PM
Ends: Sunday, February 4, at	6:59 PM	5:59 PM	4:59 PM	3:59 PM



this way, N1FCH may be able to make several NR contacts in a row without having to call CQ again—and that's good for her NR-contacts-per-hour rate!

Naturally, voice contacts are allowed in the Novice Roundup. Most NR phone action occurs on 28-MHz SSB and nonrepeater 222-MHz FM (contacts made via repeater are disallowed). A NOvice Roundup phone contact might sound something like this:

"CQ, CQ Novice Roundup from KA1NJK/N, Kilo Alfa One November Juliett Kilo slant November. Over."

"KA1NJK, this is W11NF—Whiskey One India November Foxtrot."

"W11NF from KA1NJK. You're 57 Connecticut."

"KA1NJK from W11NF. Rojer. You're 59 Connecticut."

"Rojer. 73 from KA1NJK slant N. QRZ'ed contest."

Yes, phone operation is a bit different from CW. For one thing, it's a good idea to use phonetics—Alfa for A, Bravo for B, November for N, and so on—when you call CQ or another station. Phonetics are important because they take the guesswork out of copying letters of the alphabet that can sound like *other* letters under poor reception conditions. Notice, however, that both stations stop using phonetics as soon as they have established their identities. (Want a free list of phonetics for your shack? See the box for how to get one from the Ham Column!)

Giving signal reports on phone is easy—you just use the RST system, omitting the tone report. The result is a *two-digit RS* (readability-strength) signal report.

The voice equivalents of procedural signals like AR and KN are used less on voice than CW because an operator's tone of voice and inflection are often enough to let other operators know what's going on. *Roger* is the voice equivalent for R on CW; both mean "received." "QRZ'ed" is a modified form of the Q code QRZ, which means "who is calling me?"

Where to find out more: The January 1989 issue of *QST* carries the complete Novice Roundup rules, including how to send for report forms, figure your score and submit your Novice Roundup entry to the Contest Branch at ARRL HQ. (*QST* is sent to ARRL members each month, by the way, so if you are interested in becoming an ARRL member and receiving *QST* at your door, see the advertisement within this issue.)

If you're a Novice or Technician, maybe I'll meet you in the NR! If you hold a General class or higher license, get on the air and work those Novices and Technicians! If you're not licensed yet, *listen* to the NR and make a list of the stations you hear. Send a copy of your list to me at ARRL, Dept PCN, 225 Main St, Newington, CT 06111. If enough NR-hams-heard lists arrive, I'll run a Receive-Only Novice Roundup listing in the Ham Column. How many NR hams will you contact or log? **PC**



To get a free information sheet that explains (1) how to convert UTC to local time; (2) the phonetic alphabet most used by hams; (3) the RST/RS signal reporting system; and (4) procedural signals (prosigns) for use on CW and voice, send a no. 10 SASE (with 25 cents postage) to ARRL, Dept PCN, Main St, Newington, CT 06111. Include a note that says, "OK, send me the FSD-220!"

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P8

# PRODUCTS

## REVIEW OF NEW AND INTERESTING PRODUCTS



### ICOM Announces 1.2 GHz Handheld Transceiver

ICOM is proud to introduce the next dimension in 1.2 GHz activity. The new IC-12GAT handheld transceiver lets you enjoy full base station luxury in a portable unit.

Designed with a rugged, water resistant shell for daily outdoor action, the IC-12GAT boasts ICOM's newest features:

- **SPLASH RESISTANCY.** The IC-12GAT is designed for use in rugged outdoor conditions.
- **WIDEBAND COVERAGE.** The IC-12GAT receives and transmits 1240-1300 MHz.
- **ONE WATT POWER OUTPUT.** Switch to (0.1W) low power instantly.
- **20 MEMORY CHANNELS.** Store any frequency, Tx offset and subaudible tone in any memory. Total flexibility!
- **PROGRAMMABLE SCAN AND MEMORY SCAN.** Programmable Scan function enables you to scan all frequencies between two programmable scan edge frequencies. The Memory Scan function scans all memory channels except those you choose to lockout.
- **MONITOR THE REPEATER INPUT FREQUENCY INSTANTLY.**
- **BUILT-IN 1750 Hz REPEATER ACCESS TONE.** Instant repeater access with the touch of one button!

Additionally, the IC-12GAT includes: built-in battery saver, built-in DTMF key-

board, programmable call channel, all sub-audible tones, multi-function LCD readout and DTMF pad. The new "G Series" handhelds are compatible with all ICOM IC-2AT/IC-02AT series battery packs, headsets and speaker mics.

An optional UT-40 beeper silently monitors a busy channel for your calls. When the pre-programmed subaudible tone and frequency is received, the unit beeps and the LCD flashes.

The ICOM IC-12GAT is now available. Suggested list price is \$529.00. For further information, contact ICOM America, 2380-116th Ave. N.E., Bellevue, Washington, 98004, or circle 101 on our Readers' Service.



### ICOM Announces IC-448 44 MHz Mobile

ICOM introduces the new IC-448 25 watt 440 MHz mobile. The IC-448 features:

- **MULTI-COLORED LCD.** Orange, red and green highlight operating information.
- **FREQUENCY COVERAGE 440-450 Mhz.**
- **20 MEMORY CHANNELS.** Lock-out function allows you to store the frequency, offset and subaudible tone for each memory.
- **PROGRAMMABLE SCAN.** Scan frequencies between two programmable frequencies.
- **MEMORY SCAN.** Scan all memory channels or lock-out channels within the memory sequence.
- **PRIORITY WATCH.** Monitor the call channel, a memory channel, or all memory channels every five seconds while operating on another frequency.
- **COMPACT.** Measures only 5.5"W by 2.0"H by 5.4"D.
- **OPTIONAL UT-40 TONE SQUELCH UNIT.** When the frequency of a received tone equals the tone frequency you've set, a 30-second alarm is emitted. Acts like a beeper/pager.

Suggested retail price is to be announced. For more details, contact ICOM America, Inc., P.O. Box C-90029, Bellevue, WA 98009-9029, or circle 103 on our Readers' Service.

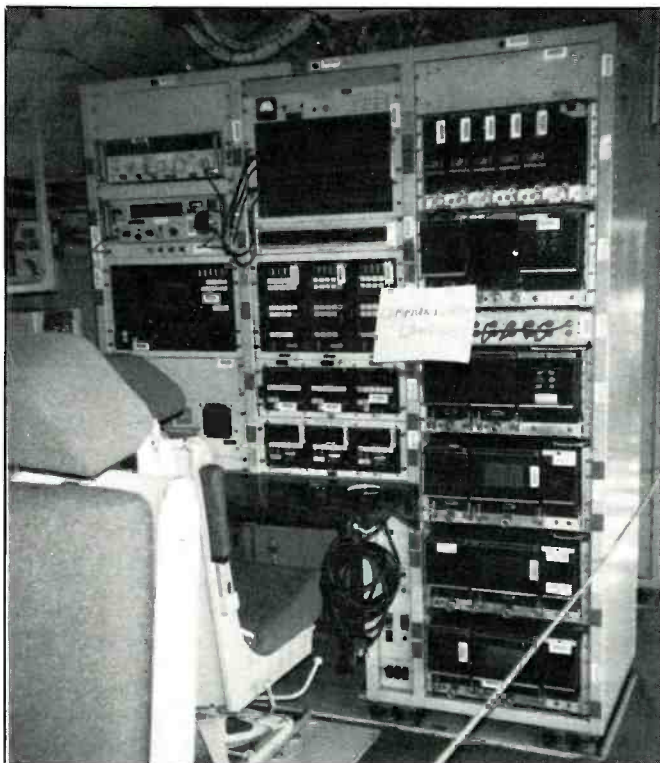
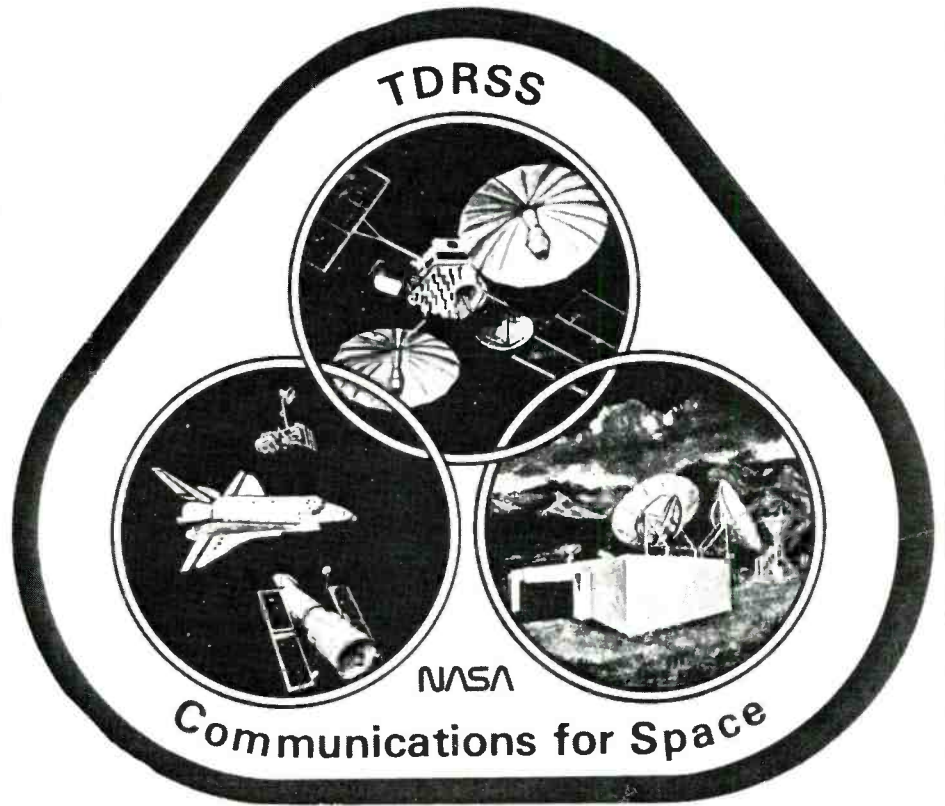


## INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

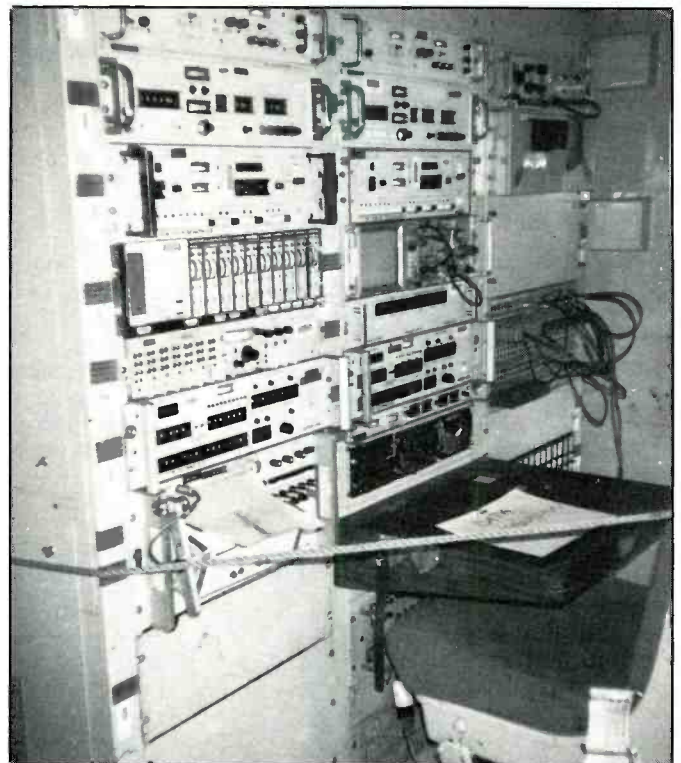
**W**ith the launch of every US spacecraft, Shuttle mission or missile test, the Air Force Aeronautical Systems Division's 4950th Test Wing, stationed at Wright Patterson AFB (Ohio) swings into action.

What does an AFB in Ohio have to do with these important NASA and DOD missions? Plenty. Just as the Soviets have a limited number of tracking stations around the world with which to track spacecraft, we too have our limits. The Soviet's use a fleet of ships to track and relay data from their spacecraft. We on the other hand have decided to use aircraft. The EC-135 to be exact. It's the military version of the 707. A fleet of 7 highly modified 135's are used to support our space missions. These aircraft are known as Advanced Range Instrumentation Aircraft or ARIA. There are of course other variations of the 135. Other fleets are used for routine reconnaissance and the KC-135 is used for refueling SAC and MAC aircraft and other tactical aircraft as well.

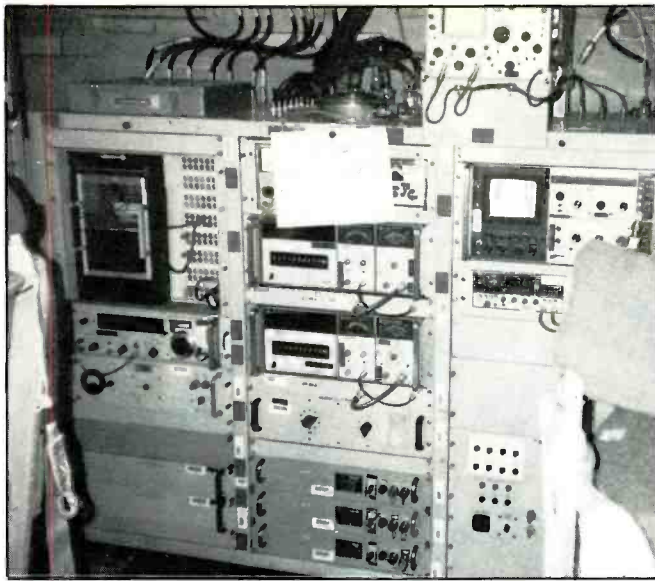
The EC 135 is readily identified by its Jimmy Durante nose. it also carries a skylight type bubble on top. This is the location of the satellite antenna. The large nose houses a 7' dish antenna. It is used for tracking and reception of data from the target craft which



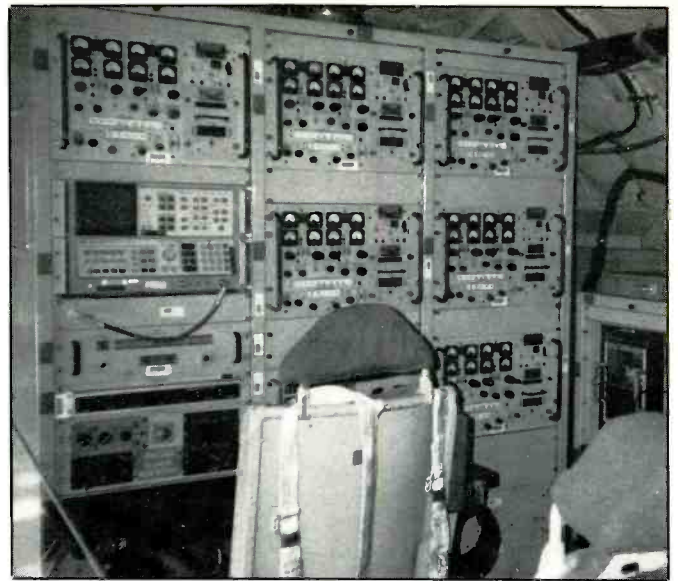
*Communications Console*



*EC-135 Master Control Console*



TLM Receivers



Data Processing Console

### USAF/NASA Frequencies

4.510 MHz	9.974 MHz
4.760 MHz	10.780 MHz
4.855 MHz	11.104 MHz
4.992 MHz	11,414 MHz
5.350 MHz	11,548 MHz
5.810 MHz	14,615 MHz
6.727 MHz	19,303 MHz
6.740 MHz	19,984 MHz
8.993 MHz	20,191 MHz
9.315 MHz	20,475 MHz

### Military Satellites

AFSATCOM	243 to 319 MHz
TACSAT	249 to 328 MHz 335 to 399 MHz 7,252 to 7,989 MHz
DSCS II, III & NATO 3	7,250 to 7,775 MHz 7,900 to 8,400 MHz
SYNCOM	243 to 322 MHz
MARISAT (leased)	243 to 399 MHz
TDRS	2,000 to 2,300 MHz 3,700 to 4,600 MHz 10,700 to 15,500 MHz

### VHF/UHF Military Allocations

Frequency	Mode
30 to 80 MHz	FM
108 to 144 MHz	AM
148 to 150 MHz	FM
162 to 174 MHz	FM/PM
225 to 399 MHz	AM/USB/FM/PM/PSK
406 to 420 MHz	FM/PM/PSK

can be anything from a cruise missile to the Space Shuttle.

There has not been a single launch of a US spacecraft since 1965 that has not been accompanied by a EC-135. When STS-27 is launched a group of 135's will be dispatched to various world-wide locations to relay voice and data communications back to ground stations. When NASA gets the TDRS system in place they will no longer need the 135's for Shuttle communications. They will, however, still be needed to keep an eye and an ear on satellites and SDI experiments launched from the shuttle's cargo bay. Ironically the first spacecraft launched from STS 17 will be a TDRS satellite. The EC-135 fleet will be relaying data from it back to NASA and NSA ground stations.

The crewmen of the 4950th Test Wing go to work several days before a launch. It takes 3 days of calibration test to set-up the 135's equipment. Though the crew may stay airborne for many hours in an emergency, flights are usually kept to under 11 hours. A new crew and aircraft can then take over if necessary. Though the ARIA fleet is a SAC unit and under control of the National Command Authority, they work for all branches of the military. NASA and the Intelligence Agencies.

The EC-135's are equipped with all variety of radio equipment. There are 5 opera-

tor positions or consoles in the aircraft. The position most forward in the cabin is operated by the Operations Manager. It's the rough equivalent of the Head-end of a ground station. This master control console monitors and routes communications between the antenna and the various consoles. The other consoles are for the Antenna operator, the HF/VHF radio operator, the Satellite operator and the TLM/data operator.

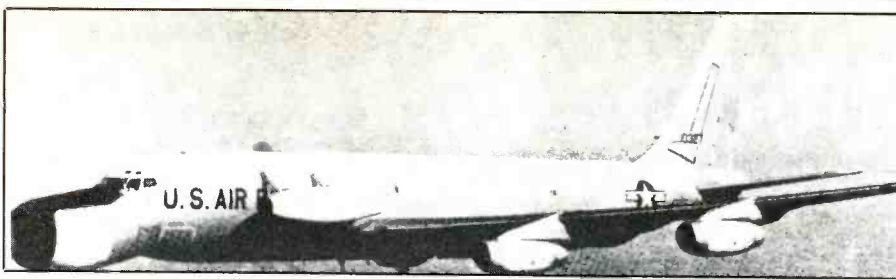
The EC-135 is capable of worldwide communications by HF/VHF/UHF and satellites. It can access AFSATCOM, Tacsat, TDRS DSCS II & III, NATO 3, Syncom (leased satellites) and SDA satellite systems. It's modes of operation are also quite flexible. It can operate VHF/UHF in FM/AM/USB or RTTY, with, or without, encryption. Satellite modes include plain voice, encrypted voice or RTTY in the following formats: AM/FM/PM/PSK or digital with selectable bandwidths of 12, 6, 4, 1.5, .75, .50, .30, or .10 MHz.

The satellite console is called a Tacsat 327, after one of the earliest satellite systems. The actual satellite transceiver is called a Tricom 27. It has 5 satellites programmed into its selectable console each having a selection of 11 channels.

The HF/VHF operator has .30 to 30 MHz transceiver at his disposal. It actually consists of separate transmitter and receiver for possible split and duplex operation. The units are the 941J3 transmitter and the 941J2 receiver. There are also a variety of other black box transceivers and such aboard, including a Subcarrier transceiver and various other units such as the ARC 34 HF 345 etc.

Communications by satellite and routine communications with Air Forces Bases are usually coordinated on HF frequencies. You should search SAC and other military frequencies during Shuttle missions and





EC-135 ARIA (Advanced Range Instrumentation Aircraft) (NASA)

other satellite launches. You will also want to monitor VHF/UHF frequencies if you live near a military base as the 135's fly in and out of various bases across the country on their way to staging areas.

Two good sources for Air Force frequencies are the Top Secret Registry of US Government Radio Frequencies by Tom Kneitel and the Confidential Frequency List by Perry Ferrell. I have included some frequencies to get you started.

The Air Force plans to keep its fleet of 135's in service into the middle of the next century. This will be done by the use of new light weight alloys. Each aircraft will be re-skinned as needed. The Air Force has several hundred KC-135 tankers, two dozen RC-135, unnumbered EC-135 plus the special duty fleet of the 4950th Test Wing.

### Letters

Duane Park of Westminster, California

wrote to give me an update on the TDRS satellites. As an employee of TRW, the builder of the TDRS system and other interesting DOD satellites, Duane points out that the proper name for the TDRS is Tracking and Data Relay Satellite and it carries 32 communication links from other spacecraft not the 23 reported in the TDRS profile in the April 88 issue. Thanks for the information Duane. I am glad to hear you and your fellow employees at TRW find Satellite View of interest.

Peter Wallace of Pittsburg, PA asks for some space shuttle frequencies. The June, July and August issues covered most of the frequencies used by NASA. During some of the shuttle missions NASA radio clubs at Goddard and Johnson Space Centers broadcast live, unedited shuttle audio. Listen for Goddard near 3.860 and 14.295 MHz and Johnson Space Center on 3.850 and 14.280 MHz in the Amateur bands. **PC**

## COMPUTERIZE YOUR SHACK

YAESU 747, 757GX, 757GXII, 767, 9600.  
KENWOOD TS-440, TS-940, TS-140, TS-630.  
ICOM R71A, R7000, 735, 751A, 761, 781.  
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CIRCLE 89 ON READER SERVICE CARD

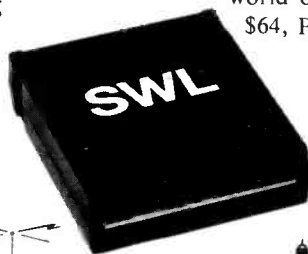
# Copy Worldwide Short-wave Radio Signals on Your Computer

Remember the fun of tuning in all those foreign broadcast stations on the short-wave radio? Remember those mysterious sounding coded tone signals that baffled you? Well, most of those beeps & squeals are really digital data transmissions using radioteletype or Morse code. The signals are coming in from weather stations, news services, ships & ham radio operators all over the world. Our short-wave listener cartridge, the "SWL", will bring that data from your radio right to the video screen. You'll see the actual text as it's being sent from those far away transmitters.

The "SWL" contains the program in ROM as well as radio interface circuit to copy

Formerly Manufactured By:

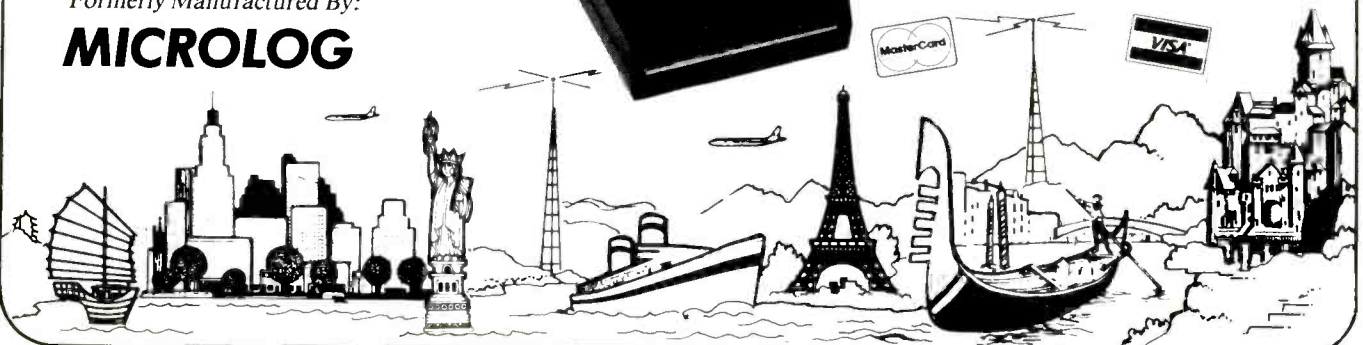
## MICROLOG



Morse code and all speeds/shifts of radioteletype. It comes with a cable to connect to your radio's speaker/earphone jack, demo cassette, and an excellent manual that contains a wealth of information on how to get the most out of short-wave digital DXing, even if you're brand new at it.

For about the price of another "Pax-Zapper" game, you can tie your Commodore 64 or 128 into the exciting world of digital communications with the SWL, \$64, Postpaid, U.S.

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## ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

### 80-160 Duo-Bander

**T**he activity on the 80 and 160 meter bands increases during the cold weather months. There is less QRN for everyone and, for the DX'er, the propagation is more favorable and night time DX'ing rises. Operation on 80 meters requires adequate erection space for an antenna and, 160 meters twice as much if a resonant antenna is to be constructed. A 160 meter dipole is an impossibility for most hams.

However, there are ways to put together antennas for both bands that do not require as much space. Some steps that can be taken are the use of a quarter-wavelength antenna operated against ground, a sloper or an inverted-V dipole. Loading coils cut down the required space considerably. Of course, it is especially helpful when you can combine both bands in one antenna.

W9INN has put these possibilities into the design of his 80/160 duo-bander which operates as a quarter-wave end-fed antenna on each band, Fig. 1. It includes a special coil, referred to as a resonator, Fig. 2, which displays a high reactance on 80 meters and functions as a loading coil for 160. A 5-foot mast, or pole, driven into the ground serves as a simple ground system. For DXing you can use a more elaborate system with four or more radials of the same or varying lengths depending upon the space availability at your mounting site.

In the installation of Fig. 3, a fence pole served as a point of attachment for the feed-point assembly. A second 1-inch diameter pipe was driven into the ground to augment the ground system. You can see the ground wire that connects to the ground pipe coming off of the right side of the clamp that holds the feed-point assembly to the fence pole. The opposite side view of this assembly, Fig. 4, shows the end of the antenna wire as it is connected to the inner conductor of the SO-239 chassis-mount socket.

In the inverted-V arrangement, shown in Fig. 1, the mast was 22 foot tall and positioned some 60 feet (not critical) from the fed end of the wire. The linear space occupied by the antenna was some 90 feet. This can be shortened considerably if you use a higher mast.

The resonant frequency can be adjusted on 80 meters by changing the length of wire between the feed point of the antenna and the resonator coil. When you have this set for the 80-meter resonance you desire, you can establish the 160M resonant frequency you desire by adjusting the wire length be-

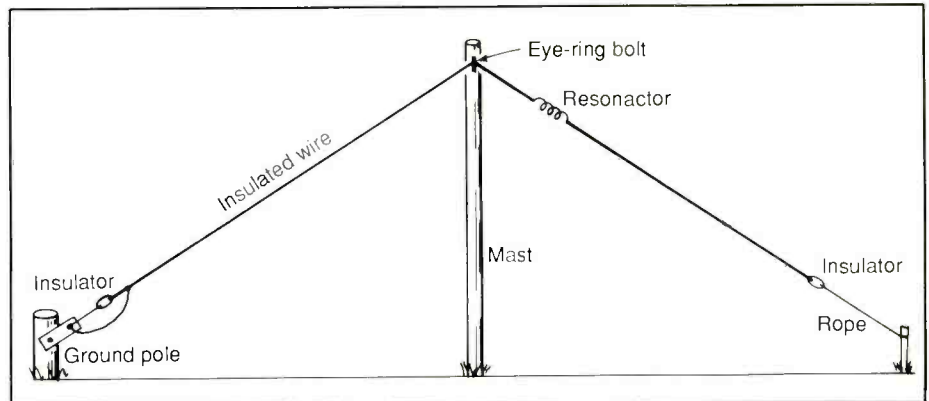


Fig. 1. Feed plan for the end-fed W9INN 80-160 duo-bander.

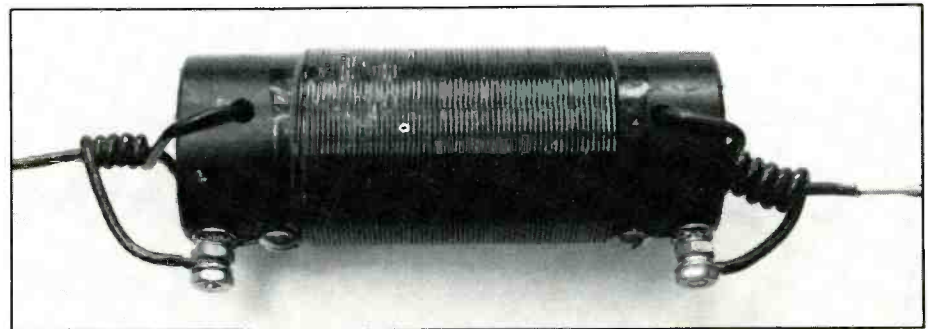


Fig. 2. W9INN resonator coil.

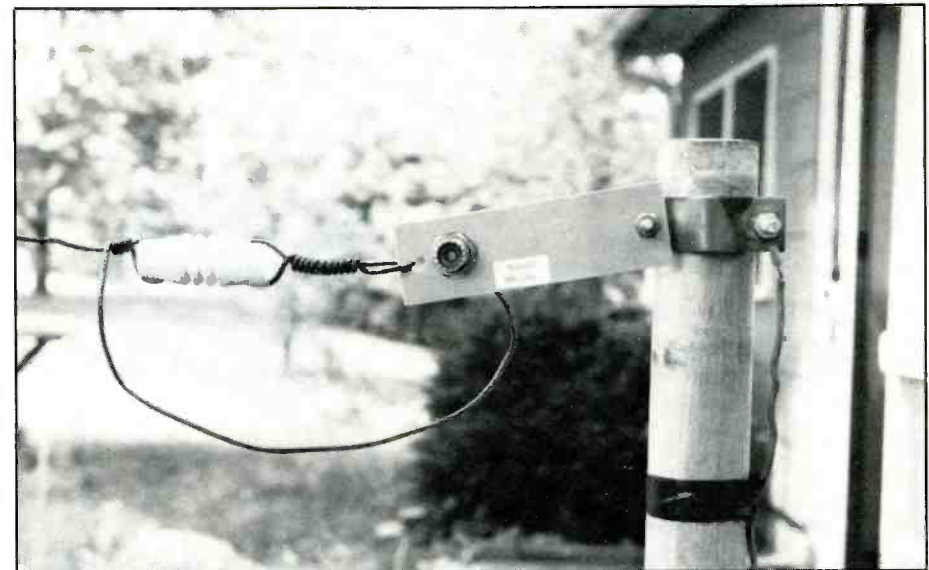


Fig. 3. Ground level feeding of duo-bander. A short length of cable connects antenna to transceiver.



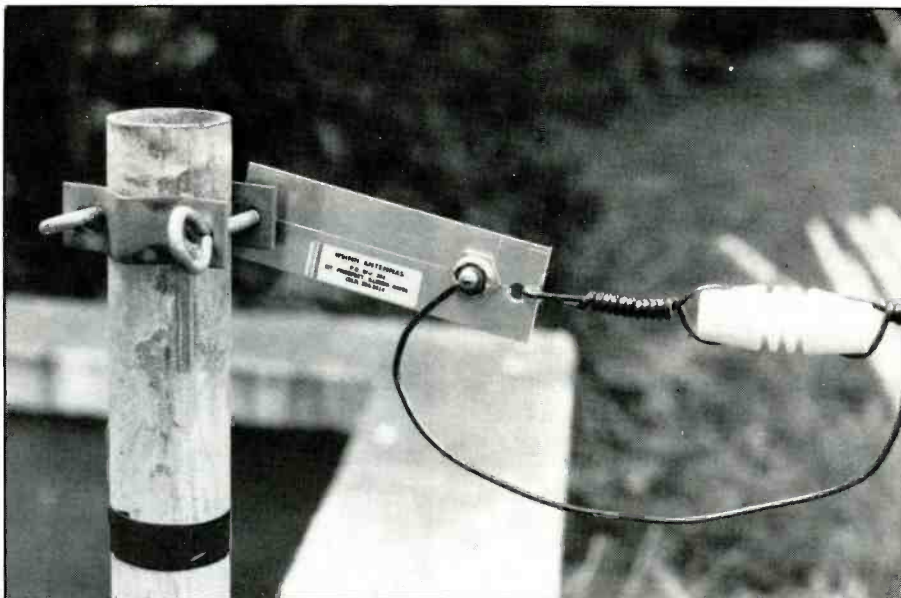


Fig. 4. Opposite side view of end-fed assembly.

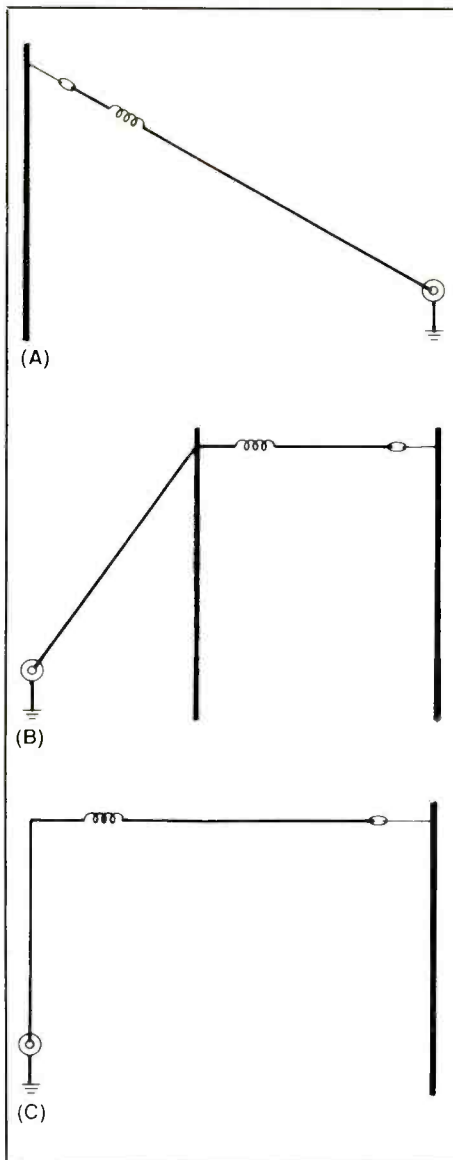


Fig. 5. Various configurations for duo-banders.

tween the coil and the far end of the antenna. Our installation was adjusted to resonate on 3830 and 1875.

In the W9INN design the 2-to-1 SWR range is better than 250 kHz on 80M and better than 120 kHz on 160M. When ordering the antenna from W9INN you can specify the desired resonant points. However, the height above ground does influence the exact resonant frequencies and some adjustment may be necessary if you want to hit an exact center frequency. Actually, a tuner can be used to set-up a low SWR on any other frequency segments of the two bands. Results were excellent without a tuner in the region about the resonant frequency and, with the aid of a tuner, fine operating conditions could be set up over the complete 80 and 160 meter bands. A tuner in the circuit also permitted DX'ing on all the bands up to and including 10 meters.

Antenna can be erected as a sloper, partial flat-top or an inverted-L configuration as shown in Fig. 5. A variety of resonator coil antennas for various band combinations are available from W9INN, P.O. Box 393, Mount Prospect, IL 60056. For multiple band operation more than one resonator coil can be used. Additional information is available from the manufacturer.

The 80-160 broadbender did very well on various SWB bands and other segments of the shortwave spectrum such as the marine band above 2 MHz and frequency bands that were approximately odd harmonics of the resonant cuts. It is also easy to resonate the antenna in the broadcast band (MW) by clipping on 30 foot to 60 foot of wire to the end of the antenna. You can make a surprising improvement in the broadcast band signal levels. If you use insulated wire, just lay it on the ground of wind it among bushes and low branches of nearby trees. Actually the 80-160 duo-bander is quite a good all-around, general-coverage antenna.

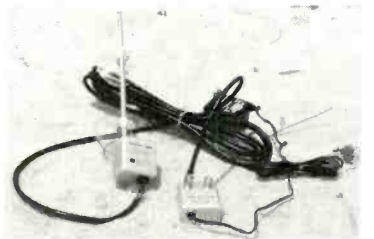
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CIRCLE 22 ON READER SERVICE CARD

# LISTENING POST

BY GERRY L. DEXTER

## WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Every two years, shortwave broadcast DX'ers have been rolling themselves out of bed at a very early hour in the hope that this particular morning would be the one that special broadcasts of Radio TV Hong Kong would pop through at last. Those broadcasts ran for only ten days or so, on an every-other-year basis, when the station provided weather reports and other information for the yacht races held in the South China sea.

On the first of August last year, Radio TV Hong Kong stepped outside the pattern and began a series of test broadcasts on 9685, but still using the little two kilowatt transmitter the station has always had. The purpose of the sudden appearance on shortwave was to test the waters to see if a regular shortwave service was worth the trouble and also to try and dissuade additional Vietnamese "boat people" from coming to Hong Kong. It isn't known how long the tests will continue and, after several weeks, the broadcasts still hadn't been received in North America. Very much worth the attempt, though, so check between 0700 and 1600 UTC.

The new BBC Indian Ocean relay station in the Seychelles Islands is now in full operation. In addition to English, the station is airing BBC programming in Swahili, Portuguese, Somali and French. The initial schedule was from 1645 to 2300 on 6005 and 7185, 0300-0400 on 9600, 0300-0500 on 11750, 1400-1600 on 11860, 0400-0630 and 0900-1600 on 15420 and 0500-0630 and 0900-1400 on 17885.

The shortwave picture in Papua New Guinea is undergoing some considerable changes. Many of the stations are, or have been, just 2 kW, but soon, nearly all the outlets will have new 10 kW transmitters in place. Stations which should be on the air with increased power by now are: Radio Enga, Radio West Sepik, Radio Morobe, Radio West New Britain, Radio Madang, Radio Southern Highlands, Radio Central, Radio Manus, Radio Simbu and Radio Western Highlands. In addition, some stations are changing frequency: Radio West New Britain moves from 3235 to 2435, Radio Manus switches from 3315 to 2465, Radio North Solomons drops from 3325 to 3320, Radio Simbu goes from 3355 to 2490, Radio Western Highlands from 3375 to 2450 and Radio East New Britain slides down from 3385 to 3380. Thanks to David Clark and the *DX Ontario* bulletin of the Ontario DX Association for this information.

The "Media Network" program on Radio Netherlands reports that HCJB plans to erect a shortwave station in Hawaii as a means of improving its Asian coverage. An

FCC license has already been applied for but the station isn't expected to be operational for at least two years. HCJB is already working with the Far East Broadcasting Company to build a jointly operated station in Saipan.

It doesn't seem that the Fiji Islands/University of the South Pacific shortwave transmissions mentioned last month can be considered as broadcasting. They've been noted calling up operators in various campuses across the Pacific and getting responses back before feeding the lecture so this seems much more a utility station. The transmission is quite widely heard on 9070 from 0500 sign on, usually on Monday mornings.

A new private broadcaster in Italy plans to be testing on shortwave about now. IRRS says it will use 7.5 to 10 kW for tests on the weekends in the 7, 9 and 13 MHz bands (specific frequencies haven't been announced). Location is in, or near, Milan in Northern Italy.

Portugal, which cut back on its external broadcasting a couple of years ago, now plans to spend some money on improvements. Eventually this will include new antenna systems and three 250 kW transmitters. One day, we may yet hear Portugal as well as we did back when it called itself "The Voice of the West".

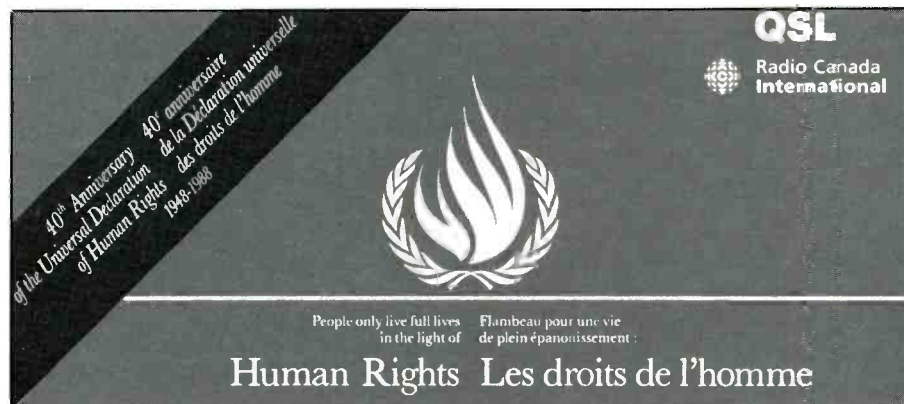
Pierce Communications (10201 Torre Ave., Suite 320, Cupertino, CA 95014) is the sales representatives for the religious programming aired on WRNO in New Orleans. Pierce is now offering a special WRNO QSL card. Two of them, in fact. The first "special edition" card is available for reception reports on any of the religious shows carried on WRNO. The second, a "very special" card is issued after 20 different religious programs on WRNO have been verified. Reports should go to Pierce Communications at the above address.



This Voice of Germany QSL shows the main broadcasting complex for Deutsche Welle.

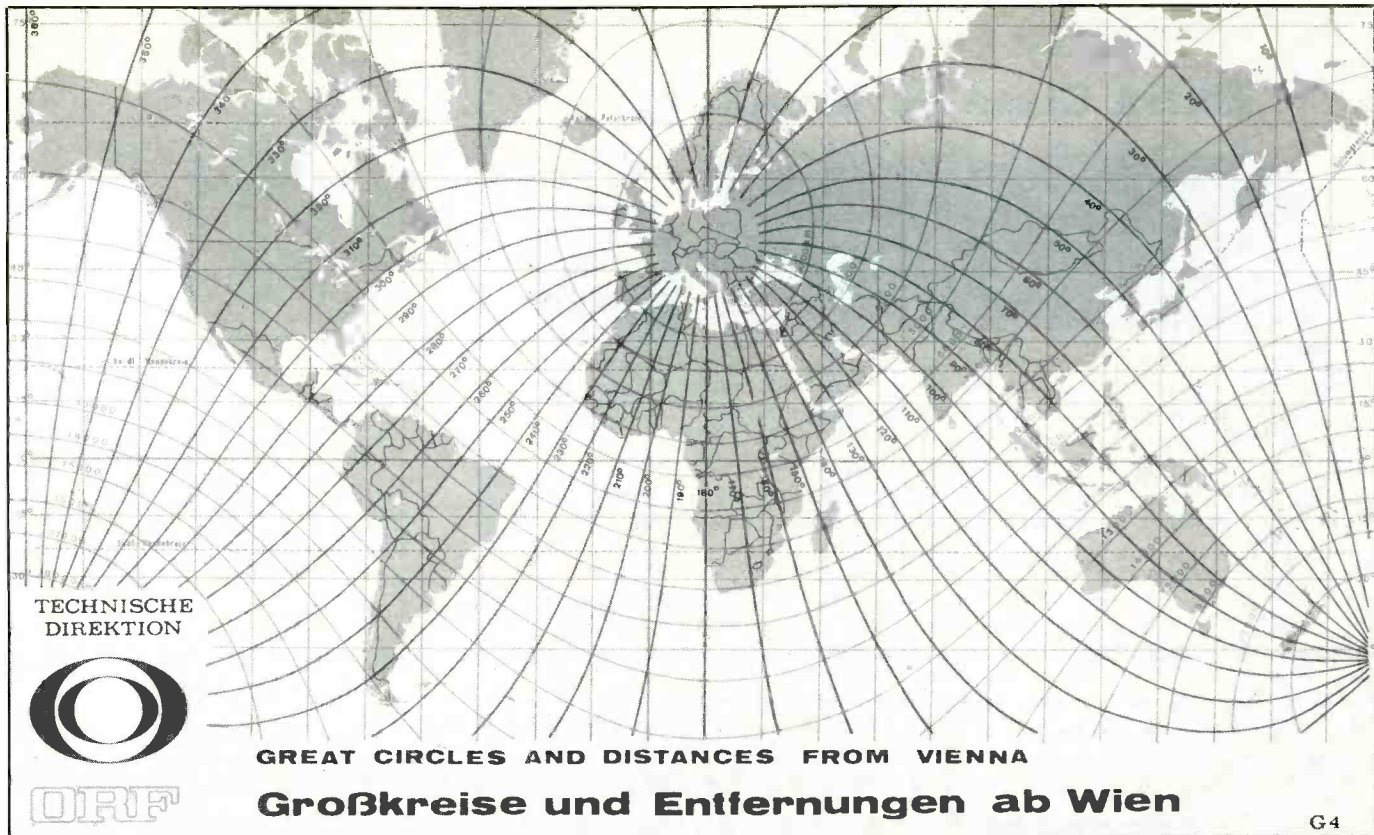


Part of the QSL collection of John Palumbo in Windber, PA.



Radio Canada International's 1988 QSL card. Thanks to Bryan D. Smith in Schuylkill Haven, PA.





Here's how the technical department at Radio Austria International sees the world.

The Southern California Area DX'ers (SCADS) have a list of dates for their 1989 meetings available now. You can get a copy by sending a business size self addressed stamped envelope to the organization in care of Don R. Schmidt, 3809 Rose Avenue, Long Beach, CA 90807-4334.

The Mail brings a letter from Paul Johnson in Phoenix who has managed to make contact with several area listeners but is looking to increase that number. You can reach Paul at 2952 North 53rd Place, Phoenix, AZ 85018.

Donna M. Colter in Houston says she echoes the remarks of Martin Blaise in an earlier column about poor reception in the Houston area. Donna says the hours between 0900 and 1300 are pretty good though. She's very happy with a recent log of Radio Veritas in the Philippines.

Mark Meece checks in again after a time away from listening. He'd like to contact other listeners in the Cincinnati area and you can write him at 7917 Third Street, West Chester, OH 45069.

Wain Buckley in Georgia spotted an unfamiliar interval signal on 9710, sometime between 0130 and 0330 (he neglected to note the exact time). The ID included a short tune on a guitar and then a cock crowing. Wain says it sounded a little like that of Radio RSA, but wasn't. Any "bird spotters" out there who can tell us which station this came from?

Keep those letters coming in! Your log-

ging reports are always welcome. Just be sure to include your last name and state abbreviation after each, and leave some room so they can be cut into strips for sorting. Also welcome are spare QSL's you don't need returned, photos of you and your shack, comments, questions, news clippings, schedules and so on. Hope you'll check in with us often!

Here's what's being heard. Language is English except where otherwise noted.

**SWBC Loggings  
(All Times Are UTC)**

- Afghanistan:** R. Kabul (via USSR xmttr), 15255 at 1000 in Pushto & Dari (Garcia, MD).
- Alaska:** KNLS, 11700 at 1854 w/ID in RR (Duggan, AZ).
- Albania:** R. Tirana, 7065 at 0242 w/mx (Meece, OH); 0345 w/nx (Colter, TX).
- Armenian SSR:** R. Yerevan (tentative logging), 15485 at 1505 in presumed Armenian. Abrupt off 1525 (McKenney, FL).
- Australia:** R. Australia, 11910//11945//15160//15315//17795 at 0600 (Meece, OH); 17795 at 0120 (Mierzwinski, PA).
- Austria:** R. Austria Int'l., 9875 at 0036 w/Report from Austria. Annc't of special modulation experiment (Meece, OH).
- Azerbaijan SSR:** 4785 from Baku at 0730 w/RR mx & talk in home svc (Garcia, MD).
- Belgium:** BRT (tent logging), 9925 at 0515 in FF. Drum IS at closing but carrier remained on for at least 6 mins after (Duggan, AZ); RTB FF svc on 11660 at 0421 w/drim/xylo IS, ID & into FF 0430 (Johnson, AZ).
- Bolivia:** R. Paititi, Guayamerin, 4682 at 0045 in SS mx & annc'ts (Garcia, MD).
- R. Fides, La Paz,** 4845 at 0429 w/romantic mx, SS, ID. Pgm "para esa hora y para ese dia" (mx for lovers) (Garcia, MD).
- R. San Gabriel, La Paz,** 6080 wEZ listening mx, rx talks in SS 0845 (Garcia, MD).
- Brazil:** R. Bore, Manaus, 4895 at 0120 in PP w/mx, local time checks, ID (Garcia, MD).

**Abbreviations Used in Listening Post**

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

- R. Nacional Amazonia, 11780 at 2018 in PP, mx, talk about Para State (Garcia, MD).
- R. Inconfidencia, Belo Horizonte, 15190 at 2300 in PP. In clear after V. of Germany leaves 15195 (Garcia, MD).
- R. Aparecida, 11855 at 1030 in PP w/soccer, nx, commercials. ID 1045 (Garcia, MD).
- R. Cultura Sao Paulo, 17815 at 0115 w/mx, wx, time. ID: Cultura do Brasil (Garcia, MD).
- R. Clube Paranaense, Curitiba, 11935 at 2332 in PP w/nx (Garcia, MD).
- Radiodifusora do Amazonas, Manaus, 4805 at 0057 in PP w/mx & ID (Garcia, MD).
- R. Relogio Federal, 4905 at 0003 w/nx, time checks each minute, all PP (Garcia, MD).
- R. Nacional, Macapa, 4915 at 0023 in PP w/ID's, annc'ts, soft mx (Garcia, MD).
- R. Educadora Braganca, 4825 at 0840 in PP w/mx, local time, ID (Garcia, MD).

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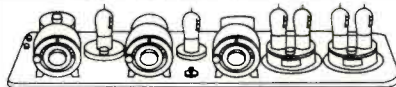
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Bounceback:	0	Scan rate:	9.65
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800 0100	800 1100	800 2100	800 3100
800 0200	800 1200	800 2200	800 3200
800 0300	800 1300	800 2300	800 3300
800 0400	800 1400	800 2400	800 3400
800 0500	800 1500	800 2500	800 3500
800 0600	800 1600	800 2600	800 3600
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R. Nacional Porta Velho, 4945 at 0919 in PP w/ID (McLenney, FL).

Bulgaria: R. Sofia, 11750 at 2051. Moscow on freq at 2100 (Meece, OH); 15310 at 1930 w/IS 'neath Norway (Johnson, AZ).

Cameroon: Yaounde, 4850 at 0408 in vernaculars w/local mx (Garcia, MD).

Canada: RCL, 5960/19755 at 2335 w/As It Happens; also 21555 at 2040 in GG (Meece, OH).

CFRX relaying CFRB, 6070 at 0535 w/folk mx, ID & time check (Garcia, MD).  
CFCX, 6005 at 1238 w/nx, sports, traffic info, ID (Garcia, MD).

Central African Rep.: R. Centrafrique, Bangui, 5034 at 0428 s/on w/onthem, nx in FF (Garcia, MD).

China: R. Beijing, 9770 (via Moli-- Ed.) at 0006 w/nx, heavy QRM from VOA/9775 (Meece, OH).

Central People's BC System, 4760 at 1330; 4840 from Harbin at 1335, 5860 on 1405, 5880 at 1408 (Duggan, AZ).

Colombia: Caracol Bogota, 4755 at 0145 & 0930 in SS (McKenney, FL); 0610 w/nx for citizens outside of the country, ID (Garcia, MD).

La V. del Cinaruca, Arauca, 4865 at 0039 in SS w/mx, commercials, ID (Garcia, MD).

E. Nueva Granada, Bogota, 6160 at 0150 in SS w/farming discussion (Garcia, MD).

Cook Islands: R. Cook Islands, 11760 at 0557 (Duggan, AZ); tentative at 0935 w/mention of Raratonga, nx in presumed Maori (McKenney, FL).

Costa Rica: R. Impacta, 6145 at 1024 in SS (Meece, OH). Nominal 6150-- Ed.

R. Fat Peace Int'l., 7375 w/talks, address (Colter, TX).

R. Relej, 6005 at 0645 w/mx, in SS (Duggan, AZ).

Cuba: R. Havana, 6115 at 0235 w/talks, nx (Colter, TX); 9655 at 0620 w/sports; - 9725 at 0650 in SS (Meece, OH); 11875 at 0117 in SS (Johnson, AZ).

R. Rebelde, 5025 at 1135 in SS (Duggan, AZ).

R. Moscow, etc. relay, 4768 nominal (varies) at 0210, 0944, & 1515 in RR (McKenney, FL); Ending Horizon pgm in SS at 0159, into RR 0200 (Garcia, MD).

Czechoslovakia: R. Prague, 5810 at 0110 (Czaja, WI); 7345 at 0315 w/nx (Colter, TX); 11990 at 0101 w/ID in SS/FF/EE, into nx in SS; + 21505 at 1823 w/ID, IS & off (Duggan, AZ).

Dominican Republic: R. Amanecer, 6025 at 0019 w/callsign, mx, ID in SS 0031 (Garcia, MD).

E. Germany: RBL, 13610 at 1445 in GG (McKenney, FL).

Ecuador: HCJB, 9720/11775 at 0606 w/rx mx under heavy QRM on 9 MHz outlet (Meece, OH).

R. Noc. Progreso, Loja, 5060 at 0208 in SS w/mx, commercials, time checks (Garcia, MD).

Egypt: R. Cairo, 9475 at 0308 w/mx. On 9675 too but QRM from VoFC/9680 (Meece, OH); 9900 at 2115-2245 (Buckley, GA).

England: BBC, 5975/6175/7325/9410/9590 under Newsdesk at 2300; also 11775/115150 at 1704 w/nx (Meece, OH); 6175 at 0330 w/nx (Colter, TX).

Equatorial Guinea: R. Nacional, Malaba, 6250 at 0522 in SS w/mx, time checks, talks (Garcia, MD).

R. Nacional, Bata, 5004 at 0510 in un-ID language (McKenney, FL).

EE: France: EFL, 9815 in FF at 0626; 17620 at 1625 in EE (Meece, OH); 17850 at 1630 (Czaja, WI).

French Guiana: RFO Cayenne, 5055 at 0542 in FF (Duggan, AZ).

Gabon: Africa #1, Moyabi, 14575 at 1915 w/talks & mx, all FF (Garcia, MD).

RT Gabonaise, 4777 at 0630 in FF & vernaculars after anthem (Garcia, MD).

Guatemala, TGNA R. Cultural, 3300 at 0525 in SS w/mx & ID, also at 1200 (Duggan, AZ).

Guinea: R. National, Conakry, 7125 at 0650 in FF (Duggan, AZ); 15310 at 0608 w/nx in FF (Garcia, MD).

Guyana: GBC Georgetown, 5950 at 0825 w/pops & time check (Garcia, MD).

Honduras: HRVC/La V. Evangelico, 4820 at 0150 in SS (McKenney, FL).

La V. de Masquita, 4910 at 0228 w/rx pgms, ID & SS (McKenney, FL).

R. Luz y Vida, 3250 at 0220, ID in SS (McKenney, FL).

Hungary: R. Budapest, 11910 at 2352 w/commentary (Meece, OH).

Indonesia: V. of Indonesia, 15150 at 1311 in FF. Tentative logging (Garcia, MD).

Iraq: R. Baghdad, 11775 at 0028 w/commentary (Meece, OH); 15230 from 2000 (Buckley, GA); 1942 in GG, into EE at 2001 (Johnson, AZ).

Israel: Kol Israel, 9385/11585 at 0258 w/home svc in HH. IS, time pips 0300 & ID, short talk, maybe nx, then mx. Also 17630 in FF at 0419 (Johnson, AZ).

Italy: RAI, 11800 at 0110 w/nx (Meece, OH).

Japan: R. Japan, 6120 (via Canada) at 0115 (Czaja, WI); 9695 at 1528 w/nx, pops (Colter, TX); 11800 (via Gabon) at 2325 w/Tokyo Pop Hits (Meece, OH).

Lebanon: V. of Lebanon (Phalangist Party), 6550 at 2347 in AA (Garcia, MD).

Lesotho: R. Lesotho, 4800 at 0614 w/nx (Garcia, MD).

Libya: Libyan Jamahiriyah BC, 15450 at 0000 in AA w/talks, mx, mentions of Libya. Believed to be home svc relay to W. Africa & S. Europe (Mierzwinski, PA).



Lithuanian SSR: R. Vilnius, 9640 from 2200 (Buckley, GA).

Luxembourg: R. Luxembourg, 15350 in FF at 0100 w/nx, commentary, mx, ID, freq list, FF track (Mierzewski, PA).

Mali: RTM Bamako, 11960 in FF at 0645 w/talks, mentions of Bamako (Garcia, MD).

Mauritania: ORTM, 4845 at 0650 w/rx svcs in AA, mx (Garcia, MD).

Mongolia: R. Ulan Bator, 12015 at 1136 in CC (Garcia, MD).

Morocco: RTM, Tangier, 15335 at 2350-0015 in AA w/talks, ID 0000, mx then YL talking (Mierzewski, PA).

Netherlands: R. Netherlands, 13770 at 1505 w/ID, commentary (McKenney, FL); 15560 at 2051 w/Happy Station pgm; 21485 (via Madagascar-- Ed.) w/letters pgm at 0916 (Johnson, AZ).

Netherlands Antilles: R. Netherlands Bonaire relay, 9590 at 0310 w/mx (Meece, OH).

New Caledonia: RFO Noumea, 7170 at 0658 in FF w/mx (Duggan, AZ).

New Zealand: R. New Zealand, 12045 at 0430 (Meece, OH); 12045//15150 at 0338, bell bird IS, s/on (Johnson, AZ).

Nicaragua: V. of Nicaragua, 6100 at 0550 in SS (Thackley, WA).

Nigeria: V. of Niveria, 7255 w/drums to 0458 when anthem, ID in EE/FF, time check (Garcia, MD); 0545 w/nx & Reflections (Colter, TX).

Northern Marianas: KYOI Saipan, 11900 at 0020 (tentative logging) in Hindi at Urdu (Duggan, AZ). Believe KYOI runs only EE Ed.

Norway: R. Norway, 11840 at 2358 w/IS & ID, anthem, nx, Norway Today, 15310 at 2000; 15325 at 2345 (Johnson, AZ).

Pakistan: R. Pakistan, 17660 at 1100 w/nx (Garcia, MD).

Paraguay: R. Nacional, 9735 at 2330 w/nx in SS, mx (Duggan, AZ).

Peru: R. San Martin, 4810 at 0945 in SS (McKenney, FL).

R. Madre de Dios, Pro. Maitanado, 4950 at 0138 w/ix talks in SS (Garcia, MD).

R. Tarma, 4776 in SS at 0347 w/mx & commercial: in SS (Garcia, MD).

R. Huancayo, 5955 at 0819 in SS w/mx, commercials, time checks (Garcia, MD).

R. Tayabamba, 3290 at 0000 in SS w/Andean mx. Tentative logging (Garcia, MD).

R. Atlántida, Iquitos, 4790 at 0355 in SS w/mx, time checks, ID 0415, s/off 0430 (Garcia, MD).

R. Tropical, Tarapata, 4935 at 0223 in SS w/mx, ID, time check (Garcia, MD).

Philippines: R. Veritas, 9700 at 1300 w/ID, nx (Colter, TX).

Poland: R. Polonia, 15120 at 0414 in possible Polish (Johnson, AZ).

Qatar: QBS, Doha, 11820 at 1939 in AA w/prayers (Garcia, MD).

Romania: R. Bucharest, 11940 at 2025 w/ID, comments on their Listener's Club (McKenney, FL).

Rwanda: DW relay, 11765 at 0430 w/African svc, nx (Johnson, AZ).

Singapore: R. Singapore, 5010 at 1313 in un-ID lang (Duggan, AZ).

So. Africa, Rep. of: R. RSA, 6150 at 0200 (Czaja, WI); 7270 at 0403 w/nx, QRM RFI/7280 (Meece, OH); 11845 at 0426 w/IS into FF; 21590 at 0810 in Afrikaans, into EE 0900 (Johnson, AZ).

R. Oron svc, 3955 at 0050 w/ID, time (Garcia, MD).

R. Five svc, 4880 at 0455 w/ID, nx (Garcia, MD).

R. Orange svc, 7285 at 0807 w/pops (Garcia, MD).

S. Korea: R. Korea, 11730 at 1140, off 1148 (Duggan, AZ); 15575 at 1420 w/pops, talk (Colter, TX).

Spain: REE, 6125 at 0610 w/nx (Colter, TX); 11880 at 0007 w/world nx (Meece, OH); 17845 at 0926 w/IS, anthem into SS (Johnson, AZ).

Sweden: R. Sweden, 11705 at 0150 w/nx in SS, ID in EE/Swedish at 0158, into nx in Swedish (Duggan, AZ).

Switzerland: Swiss R. Int'l., 17730 at 0200 & 0400 to NA (Buckley, GA).

Syria: R. Damascus, 9550 at 2308; 12085 in AA at 0745 (Garcia, MD); 2028 w/ID, mx, nx (McKenney, FL); 15095 at 2110 s/pn, nx, press review, AA Profile, etc. to 2205 off (Johnson, AZ).

Tahiti: P. Tahiti, 11825//15170 at 0950 in EE & FF w/ID (McKenney, FL).

Taiwan: VoFC, 5985 (via WYFR) w/nx, commentary (Meece, OH).

Tanzania: R. Tanzania, 5050 w/national svc at 0300 in EE & Swahili (Garcia, MD).

Turkey: V. of Turkey, 9445 at 0310 w/Outlook (Meece, OH); 15220 at 0745 in Turkish (Garcia, MD); 17760 at 2218 w/week in review (Johnson, AZ).

Ukrainian SSR: R. Kiev, 9640 at 0202 w/nx, into Ukrainian 0230 (Meece, OH).

Unidentified: 5982 at 1505 in SS w/ID: Radio..(?).Guatemala (McKenney, FL). Perhabs Union Radio/AWR. Ed.

4485 in RR at 0950. Ufa? (McKenney, FL).

United Arab Emirates: UAE Radio, Dubai, 15435 //17890 w/nx from 0330 (Buckley, GA).

USA: WYFR, 9505 at 2320 w/ix pgm (Meece, MD); WCSN, 9495 at 0630 w/nx; & 15390 at 1837 (Meece, OH).

R. Marti, 9525 at 2315 w/nx in SS (Meece, OH). WRNO, 7355 at 0200 (McKenney, FL); 11965 at 1508 (Meece, OH).

WVH time sigs, 10000 at 1000 over WVW (McKenney, FL).

V. of The OAS, 11830 at 0028 in SS, w/EE ID 0028 (Duggan, AZ).

VOA, 15230//15325//15430 at 1500 (Meece, OH).

USSR: R. Moscow, 11630 at 0130 w/IS into un-ID lang, 17880 at 0932 w/pgm re ecology (Johnson, AZ); NA svc 9685//11710//17500//15475 at 2345 (Meece, OH).

R. Station Pacific Ocean (R. Tikhv Okean), Vladivostok, 9810//11815 ending EE 0744 & into RR (Johnson, AZ).

Uzbek SSR: R. Tashkent, 9600 at 1200 as Radio Tashkent Calling (Garcia, MD).

Venezuela: R. Maturin, Managás, 5040 at 0248 in SS w/mx, commercials. OK after La V. de Upano

leaves the air (Garcia, MD).

R. Capital, Caracas, 4850 at 0430 in SS to anthem at 0543 & off 0500 (Garcia, MD).

R. Rumbos, 4970 at 0155 in SS w/ID, mx (McKenney, FL).

Ecos del Tarbes, 4980 at 0920 in SS w/ID (McKenney, FL).

YVTO time sigs, 6100 at 0955 w/SS ID (McKenney, FL).

Vietnam: V. of Vietnam, 10010 at 1405 in Vietnamese (Duggan, AZ); 9840//15010 at 1920 in un-ID lang (McKenney, FL).

W. Germany: Sudwestfunk, 7265 in GG at 0300 w/mx (Buckley, GA).

DW, 6120 (via Antigua-- Ed.) at 0507 (Meece, MD); R. Liberty, Lamertheim site on 3990 at 0315 in RR (Garcia, MD).

Yugoslavia: R. Yugoslavia, 9620 at 2115 (Buckley, GA).

PC

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CIRCLE 83 ON READER SERVICE CARD

# PIRATES DEN

BY EDWARD TEACH

## FOCUS ON FREE RADIO BROADCASTING

One pirate broadcaster which gets little or no publicity outside its local area is **WJEF**, which has been on the air periodically since June of 1986. **WJEF** is operated by Jeff F. on CB channel 35 (27355 MHz) lower side-band (LSB). The station is normally on the air on Fridays from "9 to 11 pm", Saturdays 6 pm to 1 am and Sundays 5 to 9 pm, local eastern time. Jeff notes that the station was silent of November, but will resume its schedule on December 5. The program format includes "the best in new music" and there's also a regular program about pirate radio called "Free Radio Broadcasting, a Pirate Update". Also featured on the station is a call in talk show and a weekly music trivia hour. **WJEF** is currently having some antenna problems but hopes to have that solved soon. Station ID's include "The Voice of the North Shore" and "WJEF, the talking pirate." The station welcomes reception reports in care of the North Shore Radio Network, 6 Leonard Road, Peabody, MA 01960.

U.S. Army Staff Sergeant Ed Hutton writes in from Greece and notes that pirate radio is very popular there, especially since the government controls all the media. Ed says there are two privately run radio stations in the Athens area which operate in the 1600 to 1645 kHz frequency range with formats which include Greek bouzouki music as well as top 40 pop. But the audio quality is often very poor, says Ed, since it's illegal to sell factory-produced transmitters there. Ed says radio kits for transmitters are available, though, complete with detailed instructions.

Ed's location has helped him hear **Radio Caroline/Laser 558** on the AM band (558 kHz) as well as the **Voice of Peace**, from Israeli waters on 1538 kHz. Ed is eager to hear from other radio enthusiasts, especially those serving in the military at overseas posts. His address is HHD 558th USAAG, APO NY NY 09256-0006, Attn: C. E.

Jerry Grzelak in Ontario, California forwards an article about pirate radio which appeared in the **Daily Report** paper there. The article mentions pirate station **KRUB** which operates on the FM band from the Los Angeles area. The station has used a number of other calls in the past, including **KAOS** and **KSUX**. Station operators have spent some \$3,000 building the transmitter, mostly from parts bought from military surplus stores or at swapmeets. At least one of the operators is a college student aiming at a career in radio management. The article notes that the FCC Los Angeles office catches six or seven pirates a year. The Los Angeles office, according to the article, "doesn't have the staff to listen for pirates"



# Radio Caroline

SOLE SELLING AGENTS

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Overseas Cables & Telegrams: Palairwave London W1

Telex 261818

8th September, 1966.

### Reception Report.

Thank you for your report which is correct.

Ship "Mi Amigo", off Harwich, 253 metres, TX 50 KW,  
Mast 167 ft. Average crew on board, ships 7, Radio  
Engineers 3, Disc Jockeys 4, Pop Music news 24 hours.

Greetings,

Paul Dale.

DIRECTORS: B.M. ANLEY, E.L. GOMECHÉ, H. GOOD (ERE), R. DRAHILLY (ERE), P.R. ECOLMON, J.E.G. STEVENS, R.L. TRAPNELL

*A 1966 QSL from the original Radio Caroline. Thanks to Bob Combs, California.*

and the station closures which the office has notched into its belt have been the result of complaints from residents or licensed broadcasters in the area.

An article from the **Fine Times**, a Delaware area entertainment paper, was sent in by Glenn A. Loveless of Newark, Delaware. This one has a piece on a pirate that's **really** long in the tooth! **WTFC** has been around for a remarkable 24 years! It first went on the air on Christmas Eve, 1964! The station, operated by "Carl Stromberg" who takes his name from the old Stromberg Carlson radio brand of years ago, was off the air with technical problems at the time the article was

written a year ago, so it may be active again by now. Apparently, the FCC has been after Stromberg since 1966. When active, **WTFC**, gets out for several miles within New Castle County. In the past it has had a regular daily schedule or at other periods has operated only on weekends and holidays. Sometimes it's on the air only when the mood strikes Stromberg, who operates the station from a shed in his backyard. Stromberg has worked in broadcasting at several stations around the country over the years and, on at least one occasion, a cousin kept **WTFC** on the air while Stromberg was employed out of the area. The article, unfortunately,

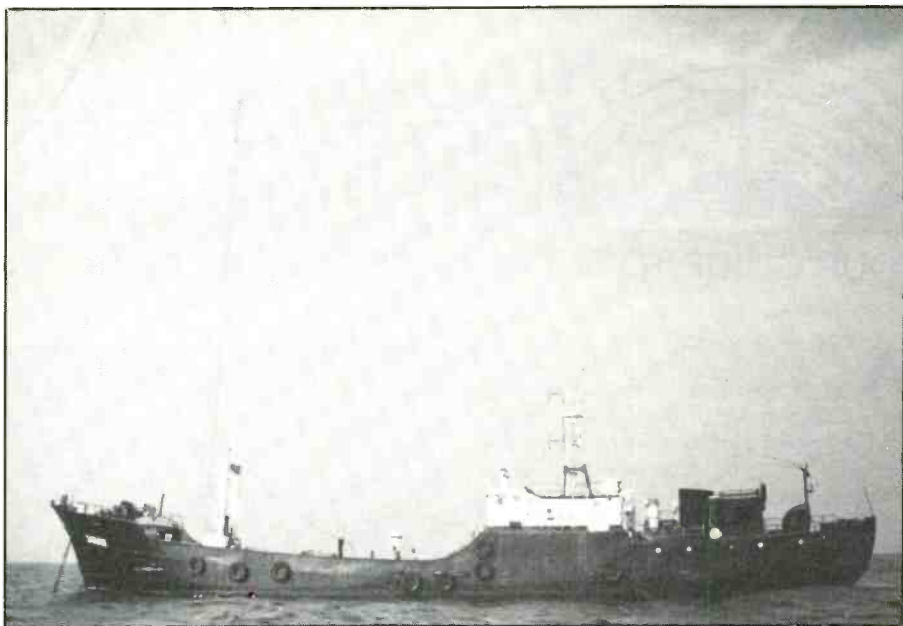


doesn't give **WTFC's** frequency, or even note whether it's on AM or FM.

Adam C. Watkins is doing research on pirate broadcasting and would like station operators to contact him. His school has obtained an FM broadcasting license and he also needs a schematic for an FM stereo generator. If you can help in either area write to him at AW Enterprises, c/o 3EFX-FM, 23 Gloucester Crescent, Shepparton, Victoria 3630, Australia.

Pirate stations active recently on shortwave include **KNBS** (Cannibas 41) on 7413 variable, **Radio Clandestine** in the 7410-7415 range, **Secret Mountain Laboratory** on 7412, the **Voice of Bob** on 7426, **KRVR** (River Radio) on 7414 and the all-girl station **WYMN** on 7425. As usual, most were weekend evening "sightings".

The shipboard European pirate **Radio Caroline** on 6215, which turned over its transmitter to programming from World Mission Radio for a couple of months, is again beaming out Radio Caroline programming. Reception in North America ranges from fairly good on the east coast, to nearly non-existent in the west. To my knowledge, Radio Caroline has still not answered any reception reports. Back in the station's early days (under different ownership) reports were welcome and verified. Note the letter QSL from 1966 featured this month. Thanks to Bob Combs of Campbell, California for sending in this one.



*The M/V Sarah, floating home of RNI shown here off the coast of Long Island, NY last October. It went on the air (1620 kHz) on October 14th, was silenced by a temporary restraining order on October 17th.*

Remember to keep that pirate radio information coming this way. Needed are your pirate station loggings, news clippings, station information from operators, future plans for stations, copies of pirate QSL's

and so on. Your active participation is gratefully received. I'm sorry that time constraints make it impossible for me to reply to each of you personally. Thanks! See you again next month here in the Pirate's Den! **PC**

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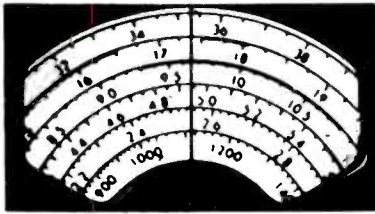
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CIRCLE 4 ON READER SERVICE CARD



# COMMUNICATIONS CONFIDENTIAL

BY DON SCHIMMEL

## YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

**A** list of some jammer stations was sent in by Gary Vendetti, NJ. Gary commented that he logged a jammer with a letter-number ID pointing out that you do not hear many of this type. He added that the jammers heard on 17836 kHz were most interestingly, sounding like a steam locomotive going up a steep grade with a constant chugging sound. (See Table 1 for the jammer list)

Bruce Sebrian, CA wrote saying he was perplexed by the postmark on the envelope containing a QSL from CHU in Ottawa, Canada. The postmark was Burlingame, CA. Bruce, it appears the QSL letter was mailed by a bulk mailer, in this case TNT Mailfast, San Francisco, CA.

A short note from Bob Hartley, PA said "I subscribe to POP'COMM and think the magazine is great. I am very interested in utility stations and my listening post is a Sony ICF-6700W and a Radio Shack DX-440. Antenna-wise I've got a Butternut 5-band vertical hooked to a MFJ Tuner plus a 210' longwire. I'm a city cop and can't spend as much time with the radios as I would certainly like to."

And from George Heresco, NWT, Canada we learn he is using a NRD 525 with an 8 and 5-7 MHz dipoles and a 65' longwire.

Mike Benedetti, WA tells us "I am back into monitoring again after a 10 year absence. I use a Sangean ATS 803A until I up-grade."

Another reader who recently returned to



Andy Gordon, CT sent in this photo he took of the USS Callahan, DDG-994. If you look closely you will spot many different types of antennas.

SWL'ing is Bob Combs, CA. He advised "I was a very active SWL'er, with a keen emphasis on utility stations back in the late 60's and early 70's. I took a break, for one reason or another, and am now back with a newer receiver, new QTH, and renewed enthusiasm for the old hobby."

First time contributor Michael Willmer, MI indicated "I have been a SWL for the past five years. Up until last year I used a poor quality analog receiver. Last year I pur-

chased a JRC NRD-525 and a Dressler active antenna. This combination has greatly expanded my ability to monitor radio communications. I have taken a great interest in utility communications. I noticed in the November 1987 column a reader had reported hearing a Mr. Opey and a Mr. Rooster in a p/p on 10213 kHz discussing Honduran air missions. Frequencies BE and BK were mentioned but not identified. I may have determined the identities of these frequen-

Station EDZ4 sent this confirmation of reception to Hugh Hawkins, TX.

Fred Lesnick, Ontario, received this QSL from the USAF.

DEPARTMENT OF THE AIR FORCE  
EASTH COMMUNICATIONS GROUP (AFCC)  
MACDILL AIR FORCE BASE FL 32408 8345

TO: DDJ/SSgt Schillo  
DATE: 22 March 1988

FROM: Confirmation of Reception  
SUBJECT: Fred Lesnick

This is to confirm your reception report of 9 March 1988. Review of our records indicated that the transmissions you reported did in fact occur. Thanks for your interest.

*Paul S. Schillo*  
PAUL S. SCHILLO, SSgt, USAF  
Chief Operator, GOCSS

Telefónica  
Gen. Vo. 28

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Subdr. Marítimo e Internacional  
Gestión y Operación Marítimo

Sr. D. Hugh M. Hawkins  
U.S.A.

Asunto: Confirmación de QSL. Madrid, 28 junio 1.988

Muy Sr. mío:  
Conforme con su petición, le remitimos tarjeta de confirmación de acuse de recibo de nuestra estación costera de Aranjuez Radio/EDZ4.  
Atentamente le saluda,

*Carlos Gómez Gómez*  
Carlos Gómez Gómez  
DIRECTOR DEPARTAMENTO



REYKJAVIK, the capital of Iceland  
 Centre: The Statue of the first settler in Iceland  
 and founder of Reykjavik, Ingolfur Arnarson (1874)

THE POST AND TELEGRAPH  
 TELECOMMUNICATIONS CENTRE  
 GUFUNES

REYKJAVIK ICELAND

This confirms your reception of Radio Station

*Gufunes.*

on *16915* kHz at *1935* GMT

on the *3<sup>rd</sup>* of *Novemb.* 19 *87.*

TX-power \_\_\_\_\_ kw Emission \_\_\_\_\_

Antenna \_\_\_\_\_

Gufunes Telecommunications Centre

Reykjavik - Iceland

*Asvior Olafsdottir*

*loc* Station Manager

Kerabjörgu Gullmúlar, Hinnmúlar, Reykjavík



*Me. Jeccy Rappel*

Here is a QSL from Reykjavik, Iceland received by Jerry Rappel, IA.

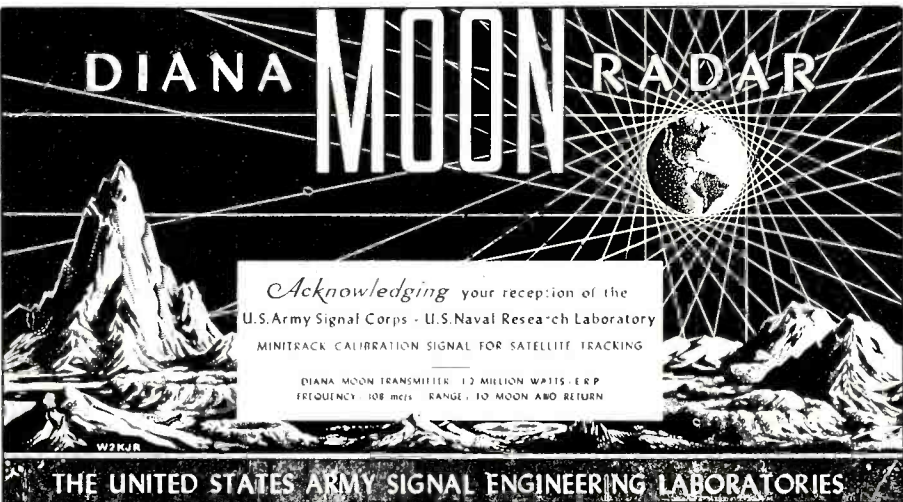
cies. In the article "Strength In Numbers" by Tom Kneitel, June 1987, a list of frequencies reportedly in use by the Warrenton, Virginia Training Center contained designators BE (6795 kHz) and BK (9052 kHz)."

It's a small world! Kelly Mock, TX noted something of interest when he was reading a back-issue (Feb. 1987) and came across an item submitted by Goubeaud, TN for 6218.6 kHz. A conversation was reported between two Tugs and Kelly stated that one of the Radio Operators was his Uncle.

Andy Gordon, CT has furnished some new and changed USN MARS callsigns, NNNØCBC is assigned to NOAA's Miller Freeman, RL-23. NNNØCWB which was formerly assigned to the USS Dixie (now decommissioned) is now assigned to the USS Niagara Falls, AFS-3. Andy also advises that according to the January & February 1988 Master MARS Callsign list,

NNNØCWB is still listed for the USS San Bernardino, LST-1189. Another change was NNNØCWI, formerly the USS Conserver, now is assigned to the USS Wisconsin, BB-64. This latter vessel is the last recommissioned Iowa class battleships to come into service. Andy said he now has 200 QSL's on 333 different USN ships plus 7 caps and various packets of information and photos from some of the ships. In a recent note, Andy stated he had just heard the USS Harry E. Yarnell, CG-17 for the first time in over 2 years. The ship had been undergoing an overhaul and they had arrived back in Norfolk at the time he heard them.

From Steve McDonald, BC, Canada, we received a copy of his PFC for Radiobeacon OR along with the following information: OR runs 1000w into an 88' vertical located on the Western slopes of New Zealand's North Island. Ohura is the hand-off point for



A blast from the past! In the early 1960's the Army Signal Engineering Labs and the Naval Research Labs at Fort Monmouth, NJ had a 12-million watt (ERP) "minitrack calibration" transmitter for satellite tracking on 108 MHz. They'd bounce the signals from this "Diana Moon Radar" off the moon once in a while. Those who reported reception of the signals were rewarded with this 4-color QSL card.

the air t/c between Auckland and Wellington and there is a VOR stn located at this remote site also. OR is hrd on the west coast regularly with an outstanding signal, often at NZ's sunset or our local sunrise; as such it should be a good target for eastern DX'ers to look for. When the AM band expands to 1700 kHz, it won't be so easy to hear! Here is the QSL address for OR. Airways Corporation of New Zealand Limited, Private Bag, New Plymouth-New Zealand, Attn: John Hudson. Thanks so much Steve for the interesting facts and the address.

Utility Station Intercepts  
 (All Times Are UTC)

- 2182: 9MAH3, a Malaysian ship, to KMI w/radio check, USB at 0032 (Saba, CA).
- 2714: NBIO, USS Shenandoah (AD-44) clg QHM (Queen's Harbour Master) Halifax at 0845 (Gordon, CT).
- 2716: NACI, USS Cook (FF-1083) clg San Diego Tug Control at 0935; NTYL, USS Truxton (CGN35) w/radio check to USS Glover (FF-1098) at 1125). The Truxton is in the Pacific while Glover is in the Atlantic. Best time for this type of DX here is down +1 hour. NNJH, USNS Joshua Humphreys (T-AO-188) clg Norfolk Tug Control at 2345, Un-ID "inbound naval unit" wkg Charleston Navy Tug Control at 1000. VIP's were due to transfer from this (probable) sub to a USN tug for return trip to port (Gordon, CT).
- 3292: SS/YL in AM-made at 0506 w/5F text fall by Finale-Finale & then after 2 mins, 2 digits fall by open carrier (Fernandez, MA).
- 3413: Shannon VOLMET, Ireland in USB at 0512. OM w/wx abs for European locations (Fernandez)
- 4066.1: NFZT, USS Henry B. Wilson (DDG-7) clg San Diego CSS-1 at 0300 (Gordon, CT).
- 4125: NEHM, USCGC Sea Hawk (WSE S-2), a Surface Effect Vessel clg CG Key West at 0600 (McDonald, BC).
- 4143.6: Vessel Lady Celeste to Native Echo w/lengthy xmsn re mech problems. Spoke of making a dive at test depth to check out repairs. Was USB at 0225-0253. Next nite same to stas here at 0537 (Saba, CA).
- 4410.1: WGK, St. Louis, MO wkg WRV6051, vessel Normania in USB at 0837 (Saba, CA).
- 4419.4: KPB549, Long Beach, CA wkg WHY6348, M/V Sea Breeze in USB at 0220; WHF, San Francisco, CA wkg WYP6462, M/V Gladiator (Saba)
- 4490: "218 Base," Okanagan, BC in USB at 1530 wkg 30 & 214 of the Okanagan Helicopter Co. (Heresco, NWT).
- 5080: AF to U, then to O to say that U's 3-letter ID was A4M. Was USB at 0625. This channel used by USN, Pt. Mugu, CA (Saba, CA).
- 5271: NMQ, USCG Group Long Beach, CA wkg Y8P & A3J in clear & scrambled comms till 0438 (Saba, CA).
- 5320: USCG stas N0H & N8R in USB at 0501. In comms w/scramblers then kept switching over to USB to discuss the scrambled xmsns, which they called "secuie." This freq noted previously used for cutter/cutter comms (Fernandez, MA).
- 5547: Qantas 4 a/c to San Francisco Aeradio w/pos report, USB at 0558. Mentioned secondary freq as 3413 kHz (Saba, CA).
- 5616: TWA 242 wkg Gander in USB at 1430 w/pos report (Szalony, CA).
- 5626: Japan Air 62 in USB wkg Honolulu w/pos rpt (Szalony, CA).

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

6200: WYA4674, R/V New Horizon wkg NMC w/coded wx at 0317; 6YSJ, un-ID vessel w/similar t/c to NMN. CG stas replied on 6506.4 kHz, USB (Sabo, CA).

6276.1: UGSP, Soviet refrigerated fish carrier (mother ship) Ussuriyskaya clg UKA in CW at 0959 (McDonald, BC).

6506.4: NOJ, USCG Kahiok, AK in USB clg an NOAA ship at 0058; ZLW, Wellington, New Zealand in USB to an un-ID sta at 0644 (Combs, CA).

6616: Aero t/c in CC, USB at 1242. Possible Jinan Aeradio, PRC (Sabo, CA).

6679: Honolulu Valmet at 0435; OM w/wx in USB. Something must have been pretty funny as he kept laughing (Hartley, PA).

6753: Halifax Military, NS in USB at 0525 w/wx info (Fernandez, MA).

6802: YL/SS w/callup of 313 (X3) the 1-0 count at 0000. At 0010 10-beeps, Gruppo 123 & into 4F grps, ending promptly 0030 (Hartley, PA).

6860: YL/GG in AM-mode with 3/2F text (not //6825) (Fernandez, MA).

6878/7550: P7X w/5L grps in CW at 1603 (J.M., KY).

7430: Un-ID sta w/MCW time pips on the second at 0415, weak sigs (J.M., KY). May be FTH42, St. Assise, France on 7428 kHz-- Ed.

7552.1: WNEC703/Unit 1 giving pos as just north of Birmingham, AL to WNEC703/Unit 3 & Unit 5 in USB at 1628. Heard WNEC703 stas last month ID'ing only as "Units" (J.M., KY). This call belongs to Technical Systems En., for use around USA on 2194, 3155, 4438, 5005, 6763, & 7300 kHz, also a base sta at Overbrook, KS. This freq not listed-- Ed.

7672: YL/EE in USB, 1135 w/callup og 630 (X3) 1-0 count fall by short pips then Count 90 (X2) & into 3/2F (Mueller, Switzerland).

8502: PPL, Belem, Brazil w/CW marker at 0800 (Combs, CA).

8560: XSV, Tianjin, PRC in CW clg CQ at 1548 (McDonald, BC).

8570.6: JNA, Tokyo, Japan clg CQ in CW at 1440 (Szalony, CA).

8579.6: DZO, Bulacan, Philippines clg CQ in CW at 1439 (Szalony, CA).

8646.2: FUJ, Naumea Navrad, New Caledonia w/VVV marker in CW at 0730 (Combs, CA).

8690: 3DP3, Suva, Fiji in CW at 0730 w/VVV marker (Combs, CA).

8866: Un-ID USB net at 0305 w/ID's including GVH, KMF, KMJ, JKV, & COI. T/c composed of 3F/IL grps (Heresco, NWT). Believe this is a fishing boat network w/t/c relating to pos & catch info. Previously reported on other freqs-- Ed.

8867: Hong Kong Aeradio in USB at 0735 with a/c pos reports & ATC info. Also hrd here: Honolulu & Nandi (Fiji) (Thomas, TX).

8912: Anti-smuggling ops, USB mode at 0719-0818. Slingshot wkg Almighty & a/c a/c. Slingshot seemed to be directing Omaha 33 to a target. Whole scene seemed to be in the area of the Bahamas (Sabo, CA). Kneitel's Top Secret Registry lists this as freq "Yonkee Charlie" at 8912.5 kHz-- Ed.

8930: Pilot of Flight 644 (un-ID airline) asking max landing weight of Gander's runway #22. Gave his weight as 390 & estimated 387 for arrival at Gander. Gander estimated a/c at 28,000 lbs overweight & suggested they dump some fuel. Pilot rejected that idea. Maintenance Control asked pilot for a burn report, but pilot appeared annoyed & said he was too busy to give it. Maint Control then tried to contact 644 several times without any reply. Gander ATC gave 644 permission to land & gave instructions not to use antiskid braking on the 8,000 foot wet runway (Wilmer, MI). Burn report was most likely info on fuel consumption rate-- Ed.

8984: USCG Honolulu, HI in USB at 1620 wkg Rescue 1602 which on scene of vessel w/injured person on board (Heresco, NWT).

8989: AKA5, Elmendorf AFB, CA w/Skyking bc at 0310 & 0612; Old Salt (USS Nimitz) w/patch to Beaver via McClellan at 1626 in USB (Sabo, CA).

9132: AFE71, Cape Canaveral, FL w/t/c in USB at 0630 (Combs, CA).

9307: KKP854, Cardiff Radio, w/patches in USB at 0510 to Canadian oil platforms (Sabo, CA).

9351: BPM, Xian, PRC time sig sta w/time ticks at 0715 (Combs, CA).

9761: Un-ID OM's (EE) in USB w/lots of profanity about having to "wait at this location every night." Heard from 0340-0405, & right in the middle of the 31 meter SWBC band (Benedetti, WA).

10057: T8, un-ID sta w/callsign in CW several times in CW at 0135 (J.M., KY).

10153: Un-ID (prob fed) net in USB 0019-0027. ID's were Sculptor, Fishnet, Horsefly & Prime 1. Called this freq Foxrot 311. Horsefly asked Fishnet if he should stand by for "noise isolation procedures" (Sabo, CA).

10636.5: KKN50, State Dept., Washington, DC in CW at 0536 w/QRA marker (Szalony, CA).

10830: Werewolf (apparent British) to N3L (apparent American) w/USB & RTTY comms at 0601 (Sabo, CA).

TABLE 1

Freq	Time	ID	Freq	Time	ID
11726	0034	LK	15381	1913	SU
11772	2329	R9	15405	1650	HP
11856	2327	MG	17591	1603	ND
11856	0030	ZG	17686	1600	SU
1876	2325	VK	17711	1559	SU & MG
11881	2322	SE	17725	1600	LV
11886	2318	SU	17750	1919	MG
11917	0029	SU	17761	1558	SU
11932	2030	Warble	17770	1421	MG
11970	1934	KV	17796	1556	XD
11970	2028	NI	17836	1920	UN & UD
15095	1605	GA & FR	17866	1921	MG & VA
15114	1514	GB	17886	1645	BF & MR
15116	1608	AH	17886	1923	MX & SU & GK
15116	1917	GZ & AH	17893	1427	MG
15130	1916	RT	17896	1859	MX
15131	1608	KV	17896	1458	KK
15170	1505	XN	17896	1923	GV
15255	1455	KV	17898	1423	MG
15289	1503	LK & MG	21501	1418	PL
15290	1653	NK	21626	1416	RD & WK
15291	1609	UA,AR,FL,SM	21735	1451	MG
15291	1914	HP & VA	21735	1414	MG
15381	1429	DF	21747	1554	AS
15381	1458	BA			

NOTE: All jammers were CW mode.

11220: Runabout, K-10, -11, 12 in USB at 0204. K-10 asks Runabout re landing, giving fuel status. YL/SS #'s sta w/bc in AM-mode on freq was noted by a/c K-10. On another date (same time) units were ID'ing as Yale 23, -24, -25, -26, & -27. Talk of targets & weapons used. Noted use of term "Mighty Warrior Strike Report." One unit called this channel Bravo. Believe this is SAC's Bravo channel (Edler, RI).

11288: Anti-smuggler ops w/Slingshot relaying wx to Omaha 52 from Almighty, USB at 0024. See 8912 kHz intercepts (Sabo, CA). Kneitel's Top Secret Registry notes this freq is called "Yonkee Delta"-- Ed.

11345: OM/EE at 0405 in USB clg Lancer many times till 0415, but no reply (Benedetti, WA).

12535.5: UKUK, Soviet freighter Mezhrögic clg UFB in CW at 0001 (McDonald, BC).

12537.4: UYJI, Soviet bulk carrier Yasenyevyo clg UFB in CW at 0010 (McDonald, BC).

12537.8: UNXG, Soviet freighter Vladimir Mayakovskiy clg UPB in CW at 0001 (McDonald, BC).

12571: EAAAT, Spanish M/V Garcia Lorca sending telegrams in SS to EAD, CW at 0046 (Hall, WA).

12575: 3ELJ5, Panamanian M/V Margrande in CW at 2322 w/telegrams to KPH (Hall, WA).

12642: WCGN, tanker Chevron California at AK wkg NNM w/Amver report at 0437 (McDonald, BC).

12667: JCX, Naha, Okinawa at 0730 w/CW marker (Combs, CA).

12673.5: JOU, Nagasaki, Japan at 0730 w/CW marker (Combs, CA).

12752.5: CBV, Valparaiso, Chile clg CQ in CW at 2310 (Szalony, CA).

12916.5: KLB, Marysville, WA at 2030 w/marker (Combs, CA).

13041: UFB, Odessa R., USSR in CW at 0139 w/t/c for Soviet vessel M/V Kapiton Leontij Borisenko (Halstead, WV).

13085: UFL, Vladivostok, USSR at 1935 in CW w/CW marker tape (Combs, CA).

13261: Hawaiiian 461 a/c to Honolulu Aeradio w/pos report, USB at 0250. Brazzaville Valmet nc in USB at 0537, was //10057 (Sabo, CA).

13273: Honolulu Aeradio in USB at 0312 to various a/c in Pac for pos reports (Thomas, TX).

13385: UGE2, Bellinghaisen Base, So. Shetland islands, Soviet Antarctic in CW at 0611 wkg UUT, Mirny Base, Antarctica (McDonald, BC).

13826: NJZY, USS New Jersey (BB-62) at 1500. Ship about to visit Sidney, Australia; NNNOCWB, USS Niagara Falls (AFS-3) wkg NNNONPN on GU at 2300 (Gordon, CT).

14390.5: USAF MARS net, USB at 0259. AIR, HQ in Pentagon wkg AGA7RM in FRG. Gud sigs both ends (Sabo, CA).

1441.5: NNNOCWS, USS Goldsborough (DDG-20) clg any MARS sta in HI at 0100 (Gordon, CT).

14467: NNNOCYD, USS Sumter (LST-1181) wkg NNNOOTW at 0145. My impression was that this MARS sta had been inactive since 1984 (Gordon)

14686: Swordfish 047 (helo?) in USB clg Satellite several times. A/c asked Satellite to take his radio guard while approaching a landing site. The a/c was 10 mi SW of Miami at 1945 (Fernandez, MA).

Kneitel's Registry lists this as antimugger channel Papa, and Swordfish as a USCG a/c-- Ed.

14908: WGY959, FEMA Honolulu, HI in USB at 0116 w/rest call to WGY946, Baton Rouge, LA (Sabo, CA).

16722.4: EWBK, Soviet pass liner Odessa clg UFB at 0643 (McDonald, BC).

16726.5: PPLA, Brazilian bulk carrier M/V Arabela clg PPO in CW at 2130 (McDonald, BC).

16740: ELAS8, Liberian bulk carrier M/V African Evergreen clg SPH in CW at 1621 (McDonald, BC).

16770: 3EU33, bulk carrier M/V New Progress wkg HLO in CW at 0105 (McDonald, BC).

16952: 9VG56, Singapore clg CQ in CW at 1637. Seems to be a strong 2nd harmonic of their 8476 xmti (McDonald, BC).

17017.5: ZSC, Cape Town R., RSA clg CQ at 1426 in CW (Szalony, CA).

17081.1: JFA, Chau Fisheries, Japan in CW clg CQ at 1421 (Szalony, CA).

17184.4: PKE, Ambino, Indonesia in CW clg CQ at 0605 (McDonald, BC).

17232.5: KFS, San Francisco R., CA w/CW marker at 2015 (Combs, CA).

18666: Anti-smuggling ops in USB at 2008-2030. Atlas wkg Flint 562, 17 Alpha, Panther, Sundance 825, & 875. Talking about deploying helos. This is the Hotel channel (Sabo, CA).

20678.6: USN MARS net in USB at 2210. NNNOPPE in VA wkg NNNOCZ & NNNOCVW w/patches (Sabo, CA).

22230.8: IBVL, liquefied gas carrier M/V Luigi Casale clg FFL in CW at 1617 (McDonald, BC).

22232: 4XLR, Israeli container ship S/S Zim Hong-Kong clg 4XO in CW at 0600 (McDonald, BC).

22431: PKX, Jakarta, Indonesia w/CW marker at 0123 (Thomas, TX).

22463: JCU, Choshi, Japan w/CW marker at 0118 (Thomas, TX).

22533: EAD, Atarjuez, Spain w/call marker in CW at 1852 (J.M., KY).

22320//22595: WLO, Mobile R., AL w/CW marker at 1914 (Combs, CA).

22935: YL/SS w/5F grps in AM-mode at 2117-2127 (Sabo, CA).

23390: FUF, French Navrad, Martinique in CW

2040 w/VVV marker (Fernandez, MA).





## THE EXCITING WORLD OF RADIOTELETYPE MONITORING

**R**eaders are invited to submit their RTTY (including ARQ, FDM/VFT, TDM, FEC, etc.) and FAX loggings. Be sure to include frequency, RTTY settings (shift, baud, polarity), station ID and location, time logged (in UTC), type of traffic intercepted, and other relevant information.

You may also wish to submit photos of your monitoring station, copies of letters and QSL's from RTTY stations, printouts of FAX or RTTY transmissions, RTTY station skeds, etc.

Address all material to: The RTTY Column, Popular Communications Magazine, 76 North Broadway, Hicksville, NY 11801.

### RTTY Loggings (All Times UTC) (Settings= Hz/Baud/Polarity)

- 4223.1: Un-ID USN commsta w/foxes & count at 0231, 850/75R (Ed.).
- 4255.1: UHF, Petropavlovsk R., USSR w/RURY at 0735, 170/50N (Pat Sullivan, CA).
- 4311.5: WX bc in SS either to/from 75FDP of Spanish Navy at 0236, 850/75R (Ed.).
- 4764.7: CCS, Santiago Navrad, Chile w/5L t/c at 0420, 850/50R (Sullivan, CA).
- 5160: VOA Tangier, Morocco w/nx in EE at 0000, 425/75N ("Bunky," IL).
- 5915.7: An AFRTS feed of AP/UPI nx at 1010, 85/75R (Fried Hetherington, FL).
- 6327: Soviet research vessel Viktor Bugaev w/telegrams in RR at 0330, 75R (Seymour, MO).
- 7308: FUM, French Navrad, Papeete, Tahiti w/review of French press relayed at 1415, TDM-96A (Hetherington, FL).
- 7423: 5YD, Nairobi Meteo, Kenya w/wx at 2330, 525/50R ("Bunky," IL).
- 7691: AFA, Andrews AFB, MD w/foxes, counting & "test" at 1502, 85/75R (J.M., KY).
- 7751.5: WFB37, ITT Worldcomm, New York, NY w/t/c to RDD Havana at 1330, 50R (Ronald Seymour, MO). Welcome, Ron, & thanks 10<sup>6</sup> for the great printouts-- Ed.
- 7817: SNK, Kona Aero, Nigeria w/RURY at 0020, 425/50R (Harold Manthey, NY).
- 7845: SOH284, PAP Warsaw, Poland w/RURY at 0015, 425/50 (Michael Ricks, PA).
- 7955: LRN85, DyN Buenos Aires, Argentina w/nx in SS in 850/75N at 0053 (Ed.).
- 7958: Un-ID USN commsta w/very quick brown foxes at 0045, 850/75R (Hetherington, FL).
- 8441.3: 781JU of the Spanish Navy w/RURY & SCSG at 0126, 850/100R (Ed.).
- 8427: Un-ID USN commsta w/foxes & counting at 0254, 850/75R (Ed.).
- 8631.8: NMG, USCG New Orleans, LA w/t/c to NBTC, USCGC Aquidneck at 2038, 170/75R (Dallas Williams, CO).
- 8718: NMO, USCG Honolulu, HI w/wx in FEC at 0340 (Sullivan, CA).
- 8943.6: CLP1, MFA Havana w/SF t/c to Embacuba Luanda w/crypt to after ZZZZ. Was 425/50N at 0316 (Ed.).
- 9252: ELRB, Roberts Field, Montovia, Liberia w/wx at 2325, 300/50R ("Bunky," IL).
- 9265.4: ZRH, Cape Town Navrad, RSA w/RURY to NMN at 0016, 850/75R (Dr. Gary Zaid, WI).
- 9305: BCW30, PTT Shanghai, PRC w/RURY & QRA at 1200, 425/50R (Hetherington, FL).
- 9425.2: Un-ID USN commsta w/very quick brown foxes at 0115, 850/75R (Manthey, NY).
- 9885: Ditto at 1321 (J.M., KY).
- 9961.3: Un-ID idling in ARQ 2130 to 0200 (Hetherington, FL). The op probably forgot to shut down the xmitr when he went home-- Ed.
- 9994: CSY, Santa Maria Aero, Azores w/wx at 0044, 850/50N (Manthey, NY).
- 10105: RKA79, TASS Moscow, USSR w/nx in EE 1900 2300, 425/50R (Hetherington, FL).
- 10169.2: RFTJD, French mil., Libreville, Gabon w/controle de voie at 0145, 72-ARQ-E (Ed.).
- 10224.9: MKD, RAF, Akrotiri, Cyprus w/RYL's & foxes, 50 bauds at 0030 (Hetherington, FL).
- 10232.7: VOA Bethany, OH w/nx in AA at 0203, FDM 85/75R (Ed.).
- 10317: Un-ID USN commsta w/very quick brown foxes at 2332, 850/75N (J.M., KY).
- 10429.5: Un-ID w/5L msg in progress at 1342, 45R. Ended QRU QRU SK SK (A. Nonymous, MO).
- 10465: Un-ID USN commsta w/very quick brown foxes at 0219, 75R (Ed.).
- 10509: 6OM, Muqdisho Aero, Somalia w/RURY at 0008, 425/50N (Manthey, NY).
- 10536: CFH, Canadian Forces, Halifax, NS w/wx at 1645, 850/75R ("Bunky," IL).
- 11010.2: GYA, RN London, England w/freq chart test tape at 0103, 850/75R (Ed.).
- 11027.5: 9PL, Kinshasa Aero, Zaire w/RURY & line test at 0101, 425/50N. Also had a spur on 11031.8 (Ed.).
- 11174.7: SHD, Dar es Salaam Aero, Tanzania w/RURY at 0015, 170/50N (Manthey, NY).
- 11453: IMB33, Rome Meteo, Italy, w/coded wx at 1008, 850/50N (J.M., KY).
- 11500.5: 8BB35, Jakarta Kemaj Meteo, Indonesia w/RURY & wx at 1025 & 1330, 850/50R (Hetherington, FL).
- 11502: LZH4, BTA Sofia, Bulgaria w/RURY at 1330, 425/50N (Ed.).
- 11638: DDK8, Hamburg Meteo, FRG w/RURY at 0140, 425/50R (Manthey, NY).
- 11668.5: Un-ID USN commsta w/very quick brown foxes at 2228, 75R (A. Nonymous, MO & "Bunky," IL).
- 12074: Ditto at 0020 (Hetherington, FL).
- 12141: Un-ID USN commsta w/very quick brown foxes at 1552 & 2219, 75R (Ed.).
- 12188.7: French mil, LePort, Reunion w/DE RFVI but no t/c at 1348, TDM/96A (Ed.).
- 12212.5: YZD7, TANJUG Belgrade, Yugoslavia w/nx in EE at 0000 & 1634, 50R (Ed.).
- 12227.3: HDN, Quito Navrad, Ecuador w/monthly comms report at 1422, 850/75N (Ed.).
- 12251: YZV32, ADN Berlin, GDR w/nx in SS at 2333, 50N. Ended xmsn 2339 (Ed.).

m.a.p./rabat

agence maghreb arabe presse

m.a.p.

here are the frequencies and time tables of map's transmissions

in arabic toward the middle east and africa

from 09h00 to 10h30gmt

----- cnm59/x9 14574.4 khz and cnm80/x11 18496.1khz  
from 3.30 to 5 pm gmt cnm34/x9 10475.2 khz and cnm59/x9 14574.4khz

in french from 10 to 11 am gmt

-----  
toward eastern africa cnm69/1x 115.999.9 khz  
toward western africa cnm76.x9 18220.9 khz  
toward eastern europe cnm29 10213 khz  
toward western europe cnm20/1x 7842.4 khz and cnm61 14760 khz  
toward eastern europe  
and asia cnm719x 16.134.1 khz  
toward northern america  
-----  
cnm66/x2 15752.7 khz

from 3.30 to 5 pm gmt

k8-----9

-----  
toward eastern africa cnm69/1/ 150999999 khz  
towards western africa cnm76/x9 18.220.9 khz  
toward eastern europe cnm29 10.213 khz  
toward western euro  
-----  
lcnm20/1-/ 7842.4 chz and cmlaubtx 10634.1khz

toward eastern europe  
and asia cnm36/x2 10595.2 khz  
toward northern america  
-----  
cnm66/x2 15752.7 khz

in english from 12am to 2pm gmt

-----  
toward the middle east cnm59/x9 14574.4 khz and cnm80/x11 18496.1  
toward eastern africa cnm69/1x 15999.9 khz  
toward western africa cnm76/x9 18220.9 khz  
toward eastern europe cnm29 10213 khz  
toward western europe cnm20/1x 7842.4 khz  
and cnm61 14760 khz  
toward eastern europe  
and asia cnm71/9x 16134.1 khz  
toward northern america  
-----  
cnm66/x2 15752.2 khz

m.a.p./rabat

M.A.P. timetable submitted by Wolfgang Palmberger, West Germany.

ELEX TELEEX TELEEX TELEEX



MONITORING STATION  
SM-6051A-DZER  
HOUSTON, TEXAS U.S.A.

THE OTONIT O TY EE WOTOMN FOX JUMPS OVER THE LAZY DOG. QBERTYU10P

TEST DE NFG THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG.1234567890

TEST DE NFG THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG. QBERTYU10P

TEST DE NFG THE QUICK BROCKY

TODAY AS WE CELEBRATE ARMED FORCES DAY 1988, LET US ALL PAUSE

AND GIVE THANKS FOR THE BLESSINGS OF LIBERTY AND PAY TRIBUTE TO

OUR NATION'S SERVICE MEMBERS SERVING THROUGHOUT THE WORLD AND HERE

SECURING THOSE BLESSINGS WE ALL ENJOY. WORKING IN SUPPORT OF OUR

ARMED FORCES ARE THOUSANDS OF MILITARY AFFILIATE RADIO SYSTEM

(MARS) AND AMATEUR RADIO OPERATORS WHO NOT ONLY PROVIDE AN

EMERGENCY COMMUNICATIONS CAPABILITY WHENEVER AND WHEREVER NEEDED

BUT ALSO, THROUGH THEIR DEDICATED EFFORT AND UNSELFISH

CONTRIBUTION OF TALENT AND TIME, PROVIDE A GREATLY APPRECIATED

COMMON NATIONS LINK BETWEEN OUR SERVICE MEMBERS AND THEIR

FAMILIES. TO YOU ALL, I EXTEND MY SINCERE APPRECIATION AND

COMMEND YOU FOR YOUR UNSELFISH CONTRIBUTION AND SUPPORT.

L  
LUCCI III

FRANK C. CR

SECRETARY OF DEFENSE

Ray Blackstone (upper left) copied this transmission (above) and received this certificate (left) as a QSL.

## Department of Defense

CERTIFICATE OF MERIT



ARMED FORCES DAY 1988

This is to certify that  
MR. RAY BLACKSTONE

has demonstrated unusual proficiency by receiving and transcribing without error the Armed Forces Day message of the Secretary of Defense transmitted via military radio teletypewriter on May 21, 1988.

Washington, D.C.

*Frank C. Cr*  
Secretary of Defense



SECURING THE BLESSINGS OF LIBERTY

- 12265.1: BZR62, XINHUA Beijing, PRC w/nx in EE at 1434, 425/75R (Ed.).
- 12285.1: RKU74, TASS Moscow, USSR w/nx in EE, 1900-2300, 425/50R (Hetherington, FL).
- 12315: RVW57, TASS Moscow, USSR w/nx in EE at 1304, 425/50R (Ed.).
- 12705: LOR, Puerto Belgrano Navrad, Argentina w/5L t/c at 0112, 170/100N (J.M., KY).
- 12786.4: PBC, Goeree Isl. Navrad, Holland w/RVRY & SGSG at 2356, 850/75R (Zaid, WI).
- 12861.9: Un-ID sta repeats "NAWS Charlie Yankee 00002" at 2358, 425/75 (Ricks, PA). Except for the 425-shift, I'd guess it to be one of the many USN RTTY stas anchored here. See 22378.3 for another interesting one-- Ed.
- 12908.9: Y5M, Ruegen R., GDR w/5L t/c to GDR merchant vessels at 2150, 170/50R (Ricks)
- 13095: KLC, Galveston R., TX w/wx & t/c list in FEC at 2018 (J.M., KY).
- 13391: ADN Berlin, GDR w/nx in SS at 2313, 50N (Ed.).
- 13411.3: N. Korean embassy somewhere w/t/c in Korean & 5L t/c, 1020/50N. Off at 1240 (Hetherington, FL).

### Abbreviations Used in The RTTY Column

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

- 13438.6: DFN43, PIAB Bonames, FRG w/nx in GG at 2250 to 2300 s/off, ARQ/96.
- 13440: YZJ5, TANJUG Belgrade, Yugoslavia w/nx in EE at 1407, 425/50R (J.M., KY).
- 13496.5: SPW, Warsaw R., Poland w/t/c in Polish to ships at 1730, ARQ (Hetherington, FL).
- 13503.6: Open Door w/foxes to Daisy Chain, 850/50N at 0122 (Joe Palkovic, FL via Hetherington)
- 13526.2: DJH51, Grogel Meteo, FRG w/wx in GG/EE at 1005, 450/100N (Hetherington, FL).
- 13580: HMF36, KCNA Pyongyang, N. Korea w/nx in EE, 250/50R. RTTY xmsn ended at 2335 & was followed by a Hellschreiber xmsn that faded out at 0050. Didn't know N. Korea used Hellschreiber (Williams, CO). It's been years since anybody reported this teletyping mode, probably 'cause hobbyists don't have equipment to decode it. Ferrell's 2nd Edition ('83) of Guide to RTTY Frequencies devoted a page to describing the mode. If KCNA was actually using it, was probably w/text in Korean characters-- Ed.
- 13670.3: Un-ID USN commsta w/very quick brown foxes at 1917, 850/75R (Ed.).
- 13732.2: RFL1, French Navrad, Fort de France, Martinique w/t/c in FF & crypto at 1935, ARQ-E/72 (Ed.).
- 13815: CXR, Montevideo Navrad, Uruguay w/RVRY, SGSG & foxes at 0235, 900/75R (Williams)
- 13845: RFV1, French mil., LePort, Reunion w/t/c to RFQP at 1330, TDM/96A (Ed.).
- 13880: HMF35, KCNA Pyongyang, N. Korea w/nx in EE pooled from African nx agencies, 1538-1547, 250/50N. Sent only 9 items then QRT (Ed.).
- 13980: RFFXL, French mil., Beirut, Lebanon w/crypto at 0910, ARQ-E/72 (Wolfgang Palmberger, FRG).
- 14360: Un-ID USN commsta w/very quick brown foxes at 1600, 850/75R ("Bunkey," IL).
- 14370: MFA Stockholm, Sweden w/nx in EE, 75R at 1556. On another day at 1600 was relaying diplo telexes from ambassador in Angola to some in Havana (Ed.); HZJ, Jeddah Aero, Saudi Arabia w/RVRY at 0204, 425/50N (Zaid, WI).
- 14376: Un-ID w/5L t/c at 1541, 425/75N (J.M., KY). Likely was CLP1-- Ed.
- 14381.1: 5UA, ASECNA, Niamey, Niger w/RVRY at 2121, 425/50N (Hetherington, FL).

- 14611: PWZ33, Rio de Janeiro Navrad, Brazil w/RVRY, SGSG, foxes, & counting, 850/50N at 0050 (Hetherington, FL).
- 14681.1: V5G, un-ID w/t/c at 1000, 425/75N (Hetherington, FL).
- 14728: DK1, un-ID sta, w/RVRY & crypto at 1951, 425/75N (J.M., KY). The Czech embassy in Havana-- Ed.
- 14760: BAT73, XINHUA Beijing, PRC w/nx in EE at 1908, 425/50R (Williams, CO).
- 14786.6: 9PL, Kinshasa Aero, Zaire, w/RVRY at 1918, 425/50N (Zaid, WI).
- 14975: CLP1, MFA Havana, Cuba w/circulars from Jurimintex at 1513, 850/75N (J.M., KY).
- 15068: Un-ID USN commsta w/very quick brown foxes at 0000, 850/75R (Hetherington, FL).
- 15667: FDY, French Air Force, Orleans, France w/le brick, RVRY & counting at 1658, 425/50R (J.M., KY).
- 15752.8: MAP Tangier, Morocco w/nx in FF re MAP working in cooperation w/AFP Paris. Was 425/50R at 1742. This xmsn not listed on test tape. A few freq? (Williams, CO). Collign here is CNM66, have noted EE nx here at 1222-- Ed.
- 15865: RBK79, TASS Moscow w/nx in FF at 1221, 850/50R (Ed.).
- 15890: RBI79, TASS Moscow, USSR w/nx in PP at 1212, 425/50R (Ed.).
- 15925: RPT32, TASS Moscow, w/nx in FF at 1208, 425/50R (Ed.).
- 15930: RBI78, TASS Moscow, USSR w/nx in FF at 1206, 425/50R (Ed.).
- 15934.2: PWZ, Rio de Janeiro Navrad, Brazil w/"rotina" (routine) msg repeated several times to 5KM at 1158, 850/75R. Msg header was "fm Emiro de Janeiro br to Dicom Bagota Co" (Ed.).
- 16031.5: PTT Kabul, Afghanistan, idling at 1258, TDM/96A&B (Ed.).
- 16046: ITT Worldcomm, New York, NY w/ZCZC, foxes & RVRY, 425/50N at 1207 w/spur on 16125.5. Also logged on 16226.2 - spur on 16258.2 (Ed.).
- 16050: RCE54, TASS Moscow, USSR w/chess results in EE, but printed in algebraic chess notations, a shorthand method of indicating the moves of the chesspieces. Anybody who didn't know the game would think it a strange cryptogram. Was 425/50R at 1209 (Ed.).



16092.7: A6A, un-ID USA mil. w/crypto to M6M, 85/75 at 1506. M6M replied on 16093 RTTY with USB voice on 16090.

16106: FPQ, DIPLO Paris, France w/nx in FF from AFP, 425/50N at 0218 (Ed.).

16136: BZR66, XINHUA Beijing, PRC w/nx in EE at 1433, 50R (Ed.). RB172, TASS Moscow, USSR with nx in EE at 1515 ("Bunkey," IL).

16140: RGW28, TASS Moscow, USSR w/nx in EE at 1439, 425/50R (Ed.).

16145: RWM77, APN Moscow, USSR w/nx in EE at 1230, 425/100R (Ed.).

16183.3-16188.4: 4UN, UN Jerusalem, Israel w/telexes in EE on 8 channels, 170/75N at 0238 (Ed.).

16194.4: NBA, USN Balboa, Panama w/RURY & SGSG to CXR at 1420, 850/75R (Ed.).

16198: CLN526, TASS Havana, Cuba w/RURY & nx in EE. Was 425/50R at 1315. Test tape before nx read CLN451 & CLN530, but these ate on 14901 & 16348. Must've been wrong tape! (Ed.).

16199: Y7A63, MFA Berlin, GDR w/RURY at 1416, 170/100R (Ed.).

17095: 781JU, a Spanish Navy unit w/RURY to 75 RQA at 2002, 850/100R (J.M., KY).

17183: Y5M, Ruegen R., GDR w/nx in FF, 1336-1400, 170/50R (Ed.).

17400: BBE52, PTT Shanghai, PRC w/RURY at 2244, 425/50R (Manthey, NY).

17451: MKK, RAF London, England w/RURY's, foxes & counting, 50R at 1644 (Ed.).

17456.6: Un-ID w/tfc in AA at 1647, ARQ (Ed.).

17468.2: PWZ33, Rio de Janeiro Navrad, Brazil, w/RURY at 2252, 850/75R (Manthey, NY).

17525: CTK Prague, Czechoslovakia w/RURY & sked, 50N at 1623 (Ed.).

18171.5: Italcable Rome, Italy w/tape w/tape to Khartoum asking them to tune 18171.5 for telegraph service & on 18630 for "telephan" (sic) service. Was 425/50N at 1443 (Ed.).

18239.9: VTHO, PTT Ho Chi Minh Ville, Vietnam idling on circuit to SWXQ, Stockholm, TDM/192ABC&D at 1345.

18270.4: Possibly Egyptian diplo w/telexes in AA at 1524, ARQ.

18275: Un-ID w/5L tfc at 1510, ARQ-E/96, s/off in EE got zonked by LSB bc feeder on same freq (Ed.).

18279.2: Un-ID w/tfc in AA, ARQ at 1457. Three days earlier at 1538, noted HBD20 (MFA Berne) here w/telexes in FF & tfc in GG, also ARQ (Ed.).

18295: SDU9, STA Stockholm, Sweden w/tfc to Vietnam at 1603, TDM/96B (Ed.).

18360.7: 7L1, Czech embassy, Havana, Cuba w/RURY & cig OMZ at 1822, 500/75N (Williams)

18363.2: VOA Munich, FRG w/specs of satellite xmsns & HF radio SINPO readings for var freqs to VOA Greenville, 75N at 1423 (Ed.).

18384.2: RRQ20, TASS Moscow, USSR w/nx in EE at 1511, 425/50R (Ed.).

18388.5: Un-ID meteo sta w/NOTAM's from LFMM, Aix-en-Provence, France, 425/50R at 1553. One NOTAM warned of a "dangerous area in force" because of "shooting in Meditrronee (sic) 40:10N 00:71E." Suspect sta was in Tripoli, Libya because circuit was LSA, even tho there are several others on this freq in area (Ed.).

18670.2: FTS67, AFP Paris, France w/nx re Africa in FF at 1624, 425/50N. Just 300 Hz higher at same time there was an AFP nx bc in EE, 350/50N (Ed.).

18678: Un-ID (possibly CLP1) w/RURY at 1234, 425/60R (Williams, CO).

18822.5: Y2V38, ADN Berlin, GDR w/nx in FF at 1415, 50R (Ed.).

18823.5: Y2V38, ditto w/nx in EE, 50R simulcast w/18822.5 in GG (Ed.).

18860.5: ZAT. ATA Tirana, Albania w/nx in EE at 1705, 50N (Ed.).

18990: Un-ID USN commsta w/very quick brown foxes at 1345, 75R (Ed.).

19883.5: SPW, Warsaw R., Poland w/tfc in Polish, ARQ at 1346, then tfc list & PAP nx in Polish, FEC at 1347 (Ed.).

19012: OST, Oostende R., Belgium w/ARQ phasing sig at 1142 + CW ID (Ed.).

19117.5: MFA, Jakarta, Indonesia w/tfc in Indonesia, 1352-1356, ARQ (Ed.).

19421.7: STL15, Sudanese embassy, Kinshasa, Zaire w/5L tfc in ARQ at 1540 (Hetherington, FL). Wow!!-- Ed.

19438.2: LOR, Puerto Belgrano Navrad, Argentina w/5L tfc at 2252, 170/75 (Zaid, WI).

19497.2: RFHI, French Navrad, Noumea, New Caledonia w/tfc for Tahiti at 2253, TDM/96B (Ed.).

19505: RCD36, PL Moscow, USSR w/nx in PP at 1413, 50N (Ed.).

19529.2: JMG5, Tokyo Meteo, Japan w/coded wx at 1407, 50R (Ed.).

20466: 4UA, UN Rawalpindi, Pakistan w/telex in EE at 0827, 170/75N (Polmberger, FRG).

20811.2-20812.7: MKK, RAF London, England w/6 channels of RYI's & foxes at 1744, FDM 325/50N&R (Williams, CO).

22346: GYA, London Navrad, England w/freq chart at 1428, 850/75R (Williams, CO).

22378.3: NAWs DE W2ZF & RYRY + foxes at 1434, 850/75N (Manthey, NY). Odd ID even tho it's known that this freq is used by CFH-- Ed.

22573.3: UJY, Kaliningrad R., USSR w/telegrams in Cyrillic at 1417, 170/50N (Williams, CO).

22728.2: JMG6, Tokyo Meteo, Japan w/wx at 2130, 850/50R (Manthey, NY).

22948.7: MKD, RAF Akrotiri, Cyprus w/RYI's & foxes at 1414, FDM 325/50N&R (Williams, CO).

#### FAX Loggings

8682: NMC, USCG, San Francisco, CA w/wx charts at 2330, 120/576 (Terry Godley, CA). Welcome to the column! We'll be glad to use your

printouts in the column-- Ed.

9396: NPM, USN Pearl Harbor, HI w/wx chart at 0640, 120/576 (Sullivan, CA).

11090: KVM70, Honolulu Meteo, HI w/wx charts at 1225, 120/576 (Ed.); some at 0540 (Godley, CA).

11154: NPM, USN Pearl Harbor, HI w/wx charts at 1303, 120/576 (Ed.).

12125: CKN, Canadian Forces, Vancouver, BC w/wx charts at 2115, 120/576 (Godley, CA).

13597: JMH4, Tokyo Meteo, Japan w/wx chart at 0230, 120/576 (Godley, CA).

14737: RXO72, Khabarovsk Meteo, USSR w/wx map at 0430, 120/576 (Godley, CA).

15644: NPN, USN Apra Harbor, GU w/wx chart at 1653, 120/576 (Ed.).

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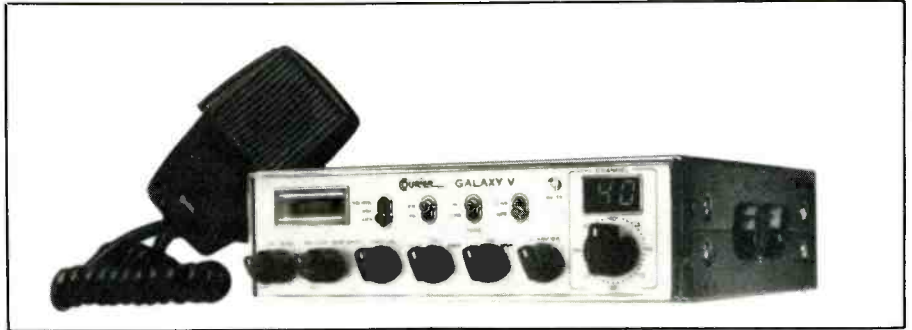
CIRCLE 114 ON READER SERVICE CARD

## 27 MHz COMMUNICATIONS ACTIVITIES

**C**ES means Consumer Electronics Show; it's the leading electronics trade show. One of the biggest hits at the last CES show was Fanon Courier's Galaxy V AM/SSB mobile rig, which was introduced at the show. Those of you who date back to the early days of CB should, of course, easily recall the early Courier 1M that was a sensation when it came out about 1960. This latest Courier proudly carries on that tradition.

Mr. Murray Trotiner, Director of Sales and Marketing at Fanon Courier, offered us the chance to eyeball this rig and we jumped at the chance. In general, the Galaxy V has a highly selective dual conversion receiver, combo noise blanker and automatic noise limiter (switchable), high/low tone audio, instant Channel 9, built-in SWR bridge, CB/PA switch, variable mike gain and RF sensitivity controls, clarifier, LED channel display.

The rig operates on 12 VDC, although it can be run as a base station if you run from a good power supply. We liked the Galaxy V's features, and we also liked its price, since it lists at only \$199.95. Many fancy AM/SSB mobile rigs tend to tote a price tag higher than this. We might also mention that the Galaxy V is housed in a ruggedized cabinet. The front panel is champagne gold with black control knobs.



*The Fanon Courier Galaxy V AM/SSB deluxe mobile rig.*

The Galaxy V jumped this hurdle with ease, thumbing its nose at whatever the overpowered gearjammers both 20 kHz away (while I was on Channel 20), and even 10 kHz away (while I was on Channel 18) could toss my way. Not only were its ears good, but the Galaxy V proved it had a good set of lungs, too. Was working other mobile units ten miles out on AM, and lots further in SSB mode. Several contacts specifically commented on the fine quality of my audio.

I'd like to comment on the fact that this rig seems to have been well thought-out by its designers. When you're operating from a

vehicle the most frequently needed front-panel knob is the volume control. On some rigs, this control is located where you've either got to take your eyes off the road, or else grope around and search for it by braille. On the Galaxy V, it's been placed all the way over on the left, nearest to the driver so it can be easily located.

We liked the Fanon Courier Galaxy V. It's a lot of rig and well worth your serious consideration. Rugged, good looking, well made, and with all of the features you'd want in a good, solid, AM/SSB mobile rig. It's made by Fanon Courier, 14281 Chambers Rd., Tustin, CA 92680.

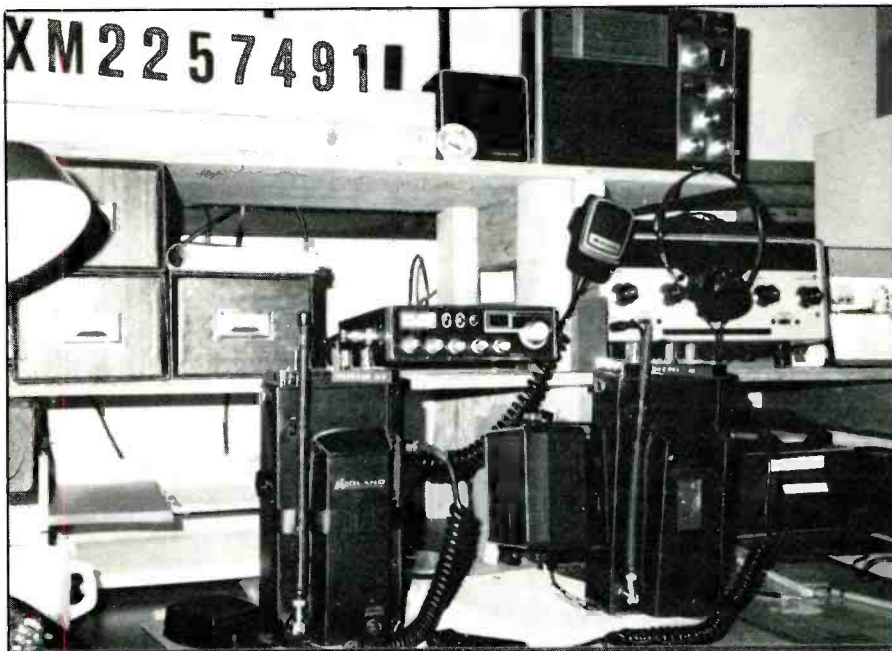
### **Nice Catalog**

Good looking catalog arrived here from Firestik Antennas, 2614 East Adams, Phoenix, AZ 85043. Here's a company that's been making CB antennas for about twenty five years, and has made a good name for itself with its colorful mobile whips and outstanding *Fire-Base Phoenix* omnidirectional base station antenna. You've probably seen plenty of red Firestik mobile whips; they're also made in red and white. You can beat on these antennas like a mangy dog and they still keep working.

They've got a big selection of all colors, sizes, power ratings, and types for just about every installation. Their catalog is free and they'll be happy to send you for the asking. Tell Frank ("Baggy") at the company you're a friend of ours!

### **Also from The Mailbag**

Some thoughts on preventing 27 MHz from turning into the same sorry thing it became a few years ago came in from Stanley Outlaw, Wilmington, NC. Stanley observes that new operators shouldn't even try to transmit before spending at least a couple of days reading the mail on various channels. This will be useful in figuring out the local operating procedures, taboos, etc. I might



*Bryan A. McKay, SSB-67D, shares with us a photo of his well-equipped SSB station. Bryan's address is Box 52, Red Deer, Alta., Canada T4N-5E7 for those who might like to send him a QSL. Says he received numerous cards last time we mentioned his address here.*



add to Stanley's comment that this will also enable you to spot and pick out any ratchet jaws and other boors you might want to avoid. Usually the only people that will answer these ops are greenhorns who don't know any better!

Stanley also reminds everyone that in most areas, the channels between 35 and 40 are used exclusively for SSB mode communications. Unless you've got a SSB rig, have it set to SSB mode (usually LSB), and understand the unique operating procedures used by SSB operators, it's best to stay off those channels.

Speaking of SSB, the Southern Oregon Rural Radio group monitors Interstate 5 from the California border through Klamath County and Highway 35 in Lake County. They're on Channel 39-LSB and are monitoring for emergency calls. More info on SORR can be obtained from Gregg A. Pohl, P.O. Box 725, Chiloquin, OR 97624.

There have been no shortage of letters from readers asking if we know anything about the skip station heard on 27500 kHz with the ID 105AT0 and the announced location of Kalahari Desert, Botswana (Africa). This station was widely reported in early October, with many readers observing it's the first time there seems to have ever been a 27 MHz station in Botswana; if it truly was where it claimed to be.

The station really was there during an DXpedition by Braam and Andre, who went there from RSA dragging along a Kenwood R-2000 receiver, Kenwood TS-430S and TS-440S transceivers, a 400 watt foot-warmer, and a 3-element beam aimed at North America. The actual location of the station was in the town of Macanens. Those who heard this station can get a QSL (they request a \$1 donation to cover QSL printing/ mailing) from Braam at P.O. Box 14986, Verwoerdburg 0140, Republic of South Africa. Anybody who actually worked this station should mention the "QSO log number," which was given them during the QSO. Don't forget the \$1, either.

The warm South Pacific winds blew in a letter and QSL from Michael L. Cote (a/k/a unit 007) of CBU 413 Naval Station, Pearl Harbor, HI 96860. Mike's a CB and scanner fan who says he reads our magazine cover-to-cover every month, finds it interesting, and wishes it would come out more often than only once a month. I've passed Mike's comments along to *the powers that be*, and wouldn't it be great if they made Mike's wish come true!

Roger Tomcat Duke, of the Antique Lamp Shop, in Salem, VA tells us about disabled trucker David C. Bickley, a CB fan from Wytheville, VA. Bickley, 48 years old, spends many hours talking over his radio, although neighbors complained that his signals were messing up their TV reception.

Bickley claimed that the complaints were more the result of an old simmering neighborhood feud than anything caused by his CB'ing. The FCC thought otherwise, and suggested that he turn over to them his 300

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CIRCLE 116 ON READER SERVICE CARD

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CIRCLE 2 ON READER SERVICE CARD

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UNIT 1 CB 777

OPR Rene

QTH Cherbourg - France

CONFIRMING QSO

TO STATION ROPICOMM  
 DATE 15-7-88 TIME 16H10  
 MODE USB R - S -  
 FREQUENCY 27.405  
 PLS QSL TX

I.M.E. 25-Baume-les-Dames

73 + 51 + TO YOU AND YOUR FAMILY.

Our overseas QSL of the month comes from Rene LeGat, 4 rue de Colmar #3, Chersbourg, France. He collects DX QSL's, by the way.

watt linear amplifier. His reply to the FCC was short and not-too-sweet, advising them that no "communist, Marxist \*?!s" were going to take it away from him, and if they wanted his unit, they could stick it somewhere, or else take the matter to court. The FCC selected Plan B, and summoned the feisty operator to federal court.

Judge James C. Turk (of U.S. District Court) put Bickley on probation for a year, although he said that Bickley could continue to operate on 27 MHz so long as he did it without the linear.

Howard G. Kraus, K2UD, of Amherst, NY writes to comment on control tone signals mentioned in this column as having been heard on CB channels. He points out that Part 90 of the FCC rules allow for unspecified types of transmissions on CB Channels 23 through 27. These are listed

under subparts B through E covering Private Land Mobile Services. That means it's not outside the realm of possibility to copy non-CB signals on these frequencies. Good point, Howard.

Harold F. Burchards, of Olympic Communications, Sequim, WA is a new REACT member and likes that we often mention this very worthwhile emergency communications group. Harold says, however, that he knows that there are many other non-REACT groups also monitoring Channel 9 in various areas and he's wondering if anybody has ever published a listing or directory of such organizations. A directory such as Harold describes is issued (and updated from time to time) by the Personal Radio Steering Group, Inc., P.O. Box 2851, Ann Arbor, MI 48106. Contains organization names, local addresses, frequencies, and



John Gabriel, Lombard, IL does his CB'ing with a Royce 642 (picked up at a garage sale) fed into a 10-element beam. Here's his shack. His handle is "The Magic Dragon."

other relevant information. Last I heard, it was being updated again, and anybody interested might wish to check directly with the PRSG for its current status, price, and availability.

One complaint Harold has is that this column needs more letters from CB'ers in the Pacific Northwest. That's a situation that depends solely upon how many readers in Washington, Oregon, and Idaho decide to send us. We are always happy to receive them, all we need are readers to send them in to this column!

## Tech Tip

Reader Jerry LeBeck, Montreal, Que., tells us that he was having problems with the SWR at his base station. At times, it was almost a perfect 1:1, then other days it would be a "dreadful" (although he didn't supply the gory details and exact mismatch numbers). he checked out the connections and they seemed to be OK. He was stymied until he began noticing a correlation between the mismatch and the weather. Inclement weather seemed to aggravate the situation.

After some investigative efforts, Jerry came to the conclusion that the PL-259 connector that joins the coaxial cable to the antenna wasn't watertight, and water getting into the thing was the root of the problem. It was solved with some sealant type of putty-tape (similar to the stuff used to seal plumbing connections) purchased at a local electronics store. Jerry asks that we point out his experience for the benefit of other operators who, like he, were unaware that PL-259's aren't waterproof.

I might add that, while Jerry's solution was the best (and proper) way to deal with a leaky coaxial connector, others have made use of everything from nail polish, to window caulking, to a big wad of chewing gum in an effort to seal the weather out of an antenna connector.

Best wishes for a good 1989!





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CIRCLE 17 ON READER SERVICE CARD



## NEW AND EXCITING TELEPHONE TECHNOLOGY

### Custom Calling . . . Features and Tips

**T**oday's modern telephone exchange is really just a big computer. As with most computers, it is managed with software by people sitting at computer terminals. A far cry from the old days. In the old days, fixing and changing things meant people moving wire and relays.

In the "old days" to disconnect a line would require a technician with a handwritten note and a tool-belt. The technician would wander through all the racks and physically locate the connections. Today, a computer issues the order from the business office to the exchange and a technician sits at a terminal and with a few keystrokes makes a change. Once you have a computer controlling anything, making the hardware do tricks is really a question of writing a program to do it.

The Bell system shortly after they came up with the Electronic Switching System (ESS) soon realized they could rent some of the computer to subscribers. This was sold as "Custom Calling". Some of the phone companies call it other things in order to prove how obscure marketing people can be. It can be called "Office Productivity Services", "Commstar" or some other non-informative title.

Several features are available to make phone use more flexible. The most notorious feature is "Call Waiting", like speakerphones, this is something you either love or loathe. As a caller, being told by the person you are talking to to hold on so they can check to see who else is calling them, can find this rude and insulting. For a busy socialite, or full time gossip, it can be an invaluable feature. If you are using a phone with call waiting you can tell that someone else is calling you because there is a short beep in the earpiece. To talk to the calling party, just flash the hookswitch. The term "flashing the hookswitch" has nothing to do with lurking outside high schools. Flash is telephone company jargon for a rapid disconnect. If you hang up for less than a second, usually by pushing in the hookswitch and releasing it, that is a flash. In electronic speak, it is a momentary disconnect. Some people have trouble getting the flash period right even though the phone company gives a large margin, they either make the flash too short—nothing happens, or too long, they hang up on the first caller.

There is relief for these people. Some companies sell add on flash buttons. Push once, for any length of time and it will disconnect the phone line for exactly half a sec-



ond. Comdial make a telephone with this built in, it is called the TAP phone. The purpose of call waiting is to give subscribers the convenience of a second line without the extra expense and equipment. Some households with teenagers find call waiting essential, it enables adults to call despite hour long teen-age telephone strategy sessions.

There are times when it would be nice to disable call waiting. If you are making an important phone call you don't want to have the receiver beeping in your ear. If you use the phone line with a computer modem, the call waiting beep can cause the modem to drop the line. There is a way to turn off call waiting. The catch is that it will only work for one call. The next time you make a call, it will turn itself back on. This works on most Custom calling accounts. Pick up the phone and dial \*70 or 1170 if you have a rotary phone. You will be returned dial tone if this feature works, now go ahead and dial the number.

The next most popular feature is call forwarding. With this feature your phone calls can follow you wherever you go—anywhere in the world. But don't forget, you pay the long distance bills from your home number to wherever the call is forwarded. It can be fun to get your home calls while you are on vacation in Europe, but can you afford it?

There are some variations to call forwarding. Delayed call forwarding is set up so that if the phone is not answered in say three rings, it is then forwarded to a predetermined number. A nice feature for a small business. Also available is "Busy Call Forwarding", this is really an alternative to call waiting. If the line is busy, an incoming call is forwarded to another number. Coming in the future is the most needed call forwarding feature—remote call forwarding. Once a phone has been forwarded to a number, the only way to change it is to go back home and do it. In future you will be able to call your own phone from the number it is forwarded

to and change the forwarding number. This way your phone calls can follow you round town.

Calls forwarded to a local number are of course free. With this piece of knowledge, you can create your own "tie-line" so you can call across a tool boundary and only pay for a local call which could be free if you have unlimited local calling. The phone company would rather you didn't do this, but they have no way of stopping it. If you have a toll number that you frequently call, usually a friend or relative, find another friend or relative that is a local call to both of you. At the intermediate address, order a phone line with call forwarding. After the line is installed, visit the address and call forward that number to your distant friend/relative. Now to call the distant relative, you call the intermediate number and are immediately call forwarded. No delay and no noticeable loss of quality. You could cover great distances in several hops with this dodge. Isn't modern technology wonderful?

For some reason, Speed Calling is also a popular feature. With so many telephones sold with built in memories, why someone would pay the phone company a monthly charge to store a few numbers is baffling.

Three way calling, or conferencing, is a feature that some families like for powwows. Lawyers like this feature too so everyone gets to hear the same lies.

A feature that is rarely used, but can be handy for small business, is the Direct Connection feature, although a HotShot Dialer from Zoom electronics does the same thing for a one time change of \$50.00. When you lift the phone, it will automatically dial a pre assigned number. The dial is rendered useless, in fact a phone with no dial is ideal for this. When a phone has Direct Connection or a HotShot dialer, it can receive incoming calls.

For large houses, or small business's with lots of extensions, there is the intercom feature. If you dial your own number you get a busy signal. Hang up within fifteen seconds and the phone will start ringing. When the phone stops ringing that means someone else has picked up an instrument. Pick up your phone and start talking. Not very sophisticated, but workable.

Your local exchange may not have all these features available, but you can always ask. In future there will be even more features see the July 1987 issue of Popular Communications for a preview of what you can expect.

PC

## New Radiolocation System This Year

**E**mergency communicators, out in the desert, the sea, or up in the mountains, must know their exact location at all times. This would allow them to immediately call in ground or air support when they have located the disaster or crash site.

This year we usher in a new precision radio navigation system called Global Positioning System (GPS). By November, you should be able to instantly pinpoint your exact location within 10 yards of your exact earth geomagnetic location. In one more year, this same system will also allow for altitude determination, within feet, as well.

Our radio navigation systems are supported and maintained by the United States Government. One of our earliest NAV-aid systems was land-based radio direction finding transmitters. These are still in operation, found between 200 kHz to 500 kHz. Inexpensive, low-frequency receivers with rotatable loop antennas allow you to pinpoint your location using triangulation methods on known position transmitters. The RDF system was principally designed for marine use, with limited usage by aircraft when approaching a low-frequency aero radio beacon. RDF fixes are accurate to approximately 1 mile or better.

Omega, down at 10 kHz, is another land and sea radio navigation system still in service. It offers good characteristics to submarines just slightly below the surface of the water. The equipment is very expensive, the antenna considerations enormous, and accuracy not much better than a mile.

Airplanes continue to use Omni, VOR/DME, Vortac, Tacan, and ILS. These are all useful in populated air corridors and around airports. However, these instrument landing systems are only useable to aircraft operators in the sky using sophisticated equipment.

Now enter Loran-C. It replaced the older Loran-A equipment, and Loran-C receivers now number over a million. Loran chains throughout the country operate near 100 kHz. Loran receivers, priced \$500 to \$1,500, receive the incoming information, compare time differences, and then compute out your latitude and longitude or lines of position (LOP). Unfortunately, signals at 100 kHz are influenced by mountain ranges, tall buildings, and atmospheric phenomena. Out on the water, a position fix better than one-quarter mile is guaranteed for Loran-C users. Repeatability, usually better than several hundred yards. However, on land, Loran signals could become

unpredictable and lead to position errors greater than 1 mile.

Polar-orbiting TRANSIT satellites now give incredible position fixes within 100 yards. The only problem is that it takes approximately 1½ hours for a new updated position fix between passes. For some users, such as a mariner going across the Atlantic, this 1½ hour wait is no problem. However, to vehicles on land, position delays up to 1½ hours would not be acceptable.

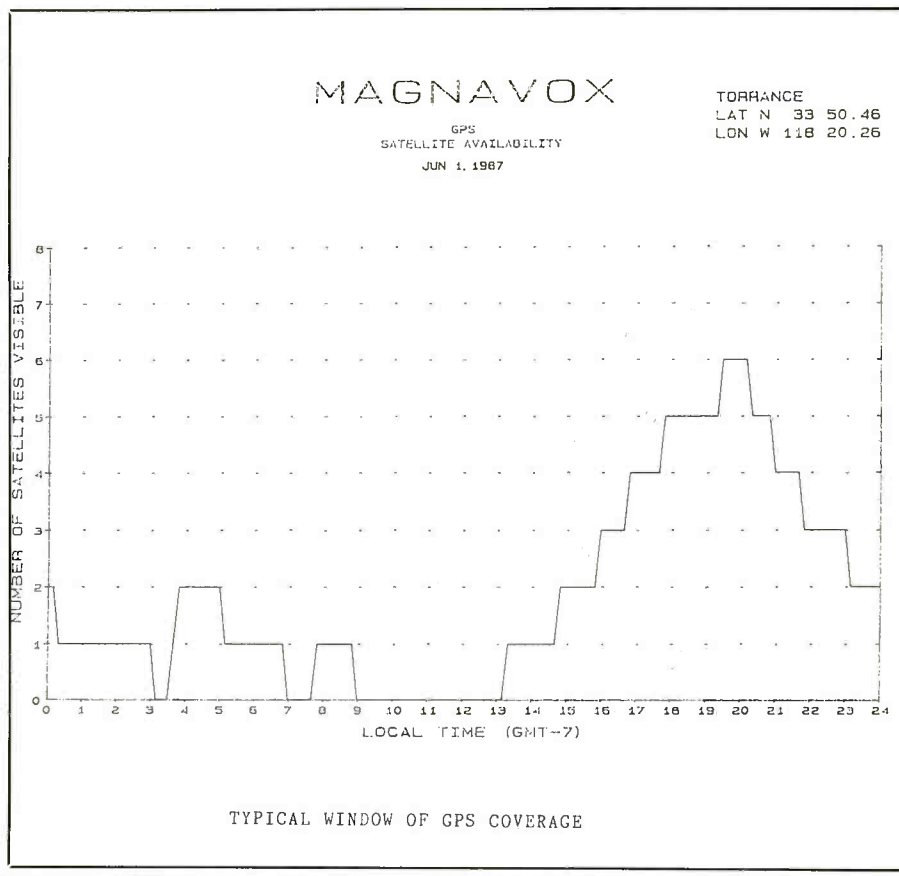
And now the ultimate in radio navigation systems, GPS. The Global Positioning System (NAVSTAR) is a worldwide satellite navigational service developed by the Department of Defense to satisfy military effectiveness by providing precise, continuous, worldwide, all-weather, three-dimensional position information for land, sea, and air applications. Although the primary mission is to meet military requirements, GPS will also be made available for civilian navigation use.

The plan calls for 24 GPS satellites in orbit 20,200 kilometers (roughly 10,900 miles)



Gordon West tries his hand at position finding with a hand-held satellite navigation receiver.

above the earth's surface. This height has been chosen so it takes exactly half an earth's rotation for a satellite to circle the globe. There will be a minimum of 4 satellites, evenly spaced, in each of 6 orbit planes, plus up to 3 active, in-orbit spares. Some of these satellites are up right now giving us incredible GPS navigational fixes within 30 meters!







The GPS satellites will continuously broadcast on 2 L-band frequencies—L1 at 1575.42 MHz, and L2 at 1227.60 MHz. Military satellite receivers will incorporate a P-code (precise) receiver that would allow position fixes down to a few inches! Civilian users will receive the C/A code (course acquisition) that should give us an incredible position accuracy of better than 30 yards. In fact, present GPS receivers are giving us position accuracy within 3 meters!

There have been 10 successful GPS launches. Seven satellites are still operating with atomic frequency standards and giving incredible position fixes. Those satellites are capable of a 2-dimensional fix up to 8 hours a day throughout the country. (2-dimensions means no altitude readout.) As you read this, additional GPS satellites may be going up in orbit every 6 weeks to add more hours to this "almost continuous" coverage. By November of this year, there should be enough GPS satellites in orbit to give us 24-hour-a-day coverage, anywhere in the world.

The GPS program was slowed down because of the Space Shuttle disaster. However, the program is now on track and ini-

tially independent of Space shuttle launches. Every 3 weeks, modified Delta II rockets will head into outer space, and every other launch will carry new GPS "birds".

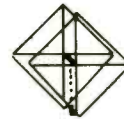
GPS receiver prices started out at \$20,000. Last year they dipped to \$10,000. And now that the system is right around the corner, a new Magellan handheld receiver is offered for \$3,000—and the photos accompanying this article show me actually using the equipment for an accurate position fix.

By the end of the year, 24-hour-a-day, 30-meter-or-better position fixes will be available with moderately priced equipment. Emergency communicators would most likely flock to the new handheld receivers because of their portability and versatility. They will run all day on 4 penlight batteries.

Get set for a whole new way of position finding, vehicle tracking, emergency position indicating, and a whole new world of radio navigation from outer space. It's here right now, about 8 hours a day, blanketing us with microwave signals for precision position fixing. **PC**

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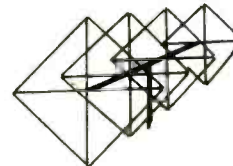
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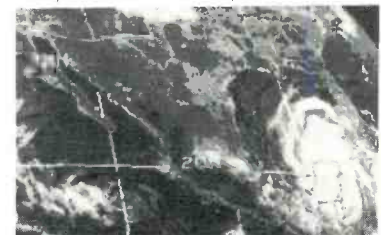
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# SCANNER SCENE

BY CHUCK GYSI, N2DUP

## MONITORING THE 30 TO 900 MHz "ACTION" BANDS

While most of us around the nation are sitting around listening to snow plows on our scanners, we'll take the time to see who has been checking in with Scanner Scene.

To start off, Martin G. Blaise, Registered Monitor KTX5FF, of Houston, Texas asks about something all of us either wondered about at one time or another. Martin asks about the various transmitter types shown in frequency guides—symbols such as BR for base repeater, MR for mobile relay, CO for control, FX for fixed, RP for repeater and TB for temporary base. We'll make an attempt to briefly explain each transmitter type here:

**BR**—base repeater. In this situation, a repeater or relay transmitter is at the dispatch point. First of all, a repeater monitors transmissions on one frequency, called the input frequency, and retransmits what it hears on that frequency on the repeater output frequency. This situation allows mobile and handheld transmitters to extend their area of coverage because their signals are relayed by the repeater transmitter. A base repeater is installed at the dispatch point, usually at a police headquarters or a similar operation on a tower. The dispatcher transmits on the repeater's output frequency and the mobile are retransmitted from the input frequency onto the repeater output frequency. If you can hear the mobiles and handheld transmitters all the time without difficulty or variation in signal strength, then a repeater station probably is being employed.

**MR**—mobile relay. This type of transmitter basically is the same setup, however, the repeater is not installed at the dispatch location. usually it is placed on a high tower or on a mountaintop, which enables extended coverage over a wider area for mobiles and handheld radios. The mobiles and handheld all transmit on the repeater input frequency and monitor the repeater output frequency. In both the base and mobile repeater setups, all you need to be concerned with monitoring are the output frequencies. Sometimes, however, an operator at a base repeater may be able to disable the repeater so that the repeater doesn't retransmit what's being said on the input frequency. This allows law enforcement agencies to pass along confidential information, or conduct surveillance without the communications being retransmitted over the repeaters wide area. Thus, there may be some instances where you may need to listen to the repeater input frequency, but that is rare.

**CO**—control station. This is a low-power base station installed at a dispatch point that enables a dispatcher to communicate with mobile and handheld radios through a mo-

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The subject is described as follows:

WHITE/MALE, 65-75, 5'10, 180-190 lbs., light skinned. He drives a: 1980ish green or blue STATION WAGON, possibly a Chevrolet with a Maryland HANDICAPPED Tag (Registration unknown).

The elderly man interfered with the investigation of a heroin smuggling conspiracy by Pakistani crewmen who attempted to deliver 2 kilograms of heroin on April 21, 1988 on Fort Avenue and Key Highway, Locust Point, Baltimore. The elderly man apparently had a police radio scanner in his station wagon and notified the suspects of police surveillance.

If you have any information, call:

Special Agent Robert Trader  
or any Customs agent at  
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### U.S. CUSTOMS SERVICE

*Joe of Baltimore, Maryland, passes along this copy of a wanted poster to show that there are indeed some bad folks with scanners. It should be noted, however, that these bad apples are few and far between.*

bile relay repeater. The control station operates just like a mobile in a repeater system in that it transmits on the repeater input frequency and monitors the repeater output frequency. If an agency has its repeater installed on a mountaintop, a control station is used at the dispatch point to communicate through the repeater to mobile and handheld radios. It also is possible that a control station may be installed on a base repeater setup for additional dispatch locations not located at the base repeater.

**FX**—fixed station. You don't see too many fixed stations now because the FCC just doesn't allow them much anymore. A fixed station is a base station that communicates exclusively with other base stations in a radio system. A possible use of a fixed station may be several law enforcement agencies all transmitting on the same frequency to relay information such as chases and all-points bulletins from various headquarters to other headquarters.

**RP**—repeater. This was covered under



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Jose Guerra, Registered Monitor KTX5DM, uses this two-color design for his station card. See text for more information on obtaining Registered Monitoring ID's.

base repeaters and mobile relays. Generally a transmitter type showing up as RP is because the FCC didn't know whether it was a mobile or base relay according to the licensee's license application.

TB-temporary base. It's exactly as it implies. A base station operated for temporary periods. A law enforcement agency may license a temporary base if it sets up a base station at annual fairs each year to provide police service. State police may license temporary bases to enable troopers to set up a special station in the event of a major emergency. A temporary base can be set up anywhere: a church, a municipal building, etc.

Other transmitter types you might encounter in frequency guides are intersystem coordination (IO) frequencies, which are used by several agencies within a given area to coordinate efforts; temporary control (TC), which is a control station operated through a repeater on a temporary basis, perhaps also for emergency use; aircraft (AC), which are radios operators on-board aircraft by public safety agencies and news media; handheld (HH) or portable radios, which are walkie-talkies or packset radios; pagers (PG), which is an indication how many pagers an agency may have on its radio system; and of course base and mobile transmitters. I hope that has helped out Martin and any beginning scanner hobbyists who have been confused by all those letter codes in their favorite frequency guides.

Bryan D. Smith of the coal country of Schuylkill Haven, Pennsylvania, reports that several 152 and 454-MHz frequencies are active in his area for mobile telephone service. He also reports 49.845 is active for cordless phones and baby monitors in his neighborhood. Bryan asks what the frequency 158.70 is used for in his area as all he hears is beeps and tones. The 158.70 frequency is used for paging service by paging companies. The tones, br-r-r-r-ps, beeps and other noises you hear are what

sets off pocket pagers.

Joseph Fregapane of Norridge, Illinois, says he bought a Uniden Bearcat 250XLT recently and wondered whether it could be modified to monitor cellular telephone frequencies. Cellular repeater outputs are in the 870-890 MHz band, and it would be possible to modify your radio to hear these frequencies. Only scanners that already cover the 800-900 MHz band can be modified, usually by snipping a diode, to monitor the cellular band. If you want to listen to cellular on your older scanner that doesn't include the 800 MHz band, several converters are available that allow you to convert 800 MHz signals down to frequencies that your scanner can receive.

Marc Thomas of Perth Amboy, New Jersey, said a recent news item mentioned that the Guardian Angels security teams were using walkie-talkies while on patrol in New York City. He wondered what frequencies they were using. The Angels reportedly are using a trunked 800-MHz radio system in New York City on the following frequencies: 861.6125, 862.6125, 863.6125, 864.6125 and 865.6125. The frequencies are shared with other two-way radio users in New York City and because it is a trunked radio system, the Angels can pop up on any of the frequencies while on patrol. The Guardian Angels can be distinguished on the system, however, because of their CB-type slang.

Bill Roads of Grants Pass, Oregon, noticed that many POP'COMM readers have special identifiers after their names such as KPA3CA. These identifiers are known as Monitor Station Registry. While the identifiers aren't intended to allow you to transmit, they identify you as a serious radio monitoring hobbyist. Monitor Station Registry is obtained from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Registration is \$5 and comes with an attractive hand-lettered certificate.

A. Norman of Delta, British Columbia, passes along some frequencies that he is hearing in Canada:

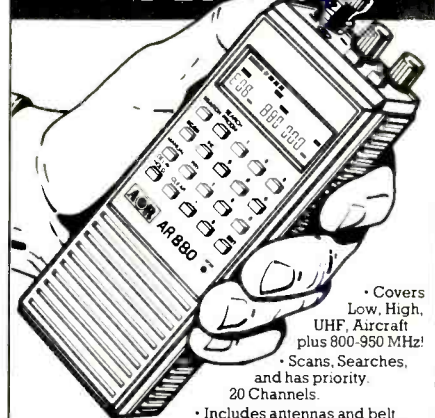
- 139.170 Canadian Security Intelligence Service (repeater input is 139.980)
- 139.500 U.S. Navy Weapons Test Range, Nanoose Bay
- 143.145 Department of Fisheries and Oceans
- 149.080 Department of Communications (Canada's FCC)
- 171.150 U.S. Coast Guard repeater for Coast Guard Station Bellingham, Group Seattle.
- 410.240 Ports Canada police
- 413.2875 Royal Canadian Mounted Police, airport
- 414.590 Royal Canadian Mounted Police
- 460.210 Transport Canada airport operations
- 461.6625 Canada Immigration

Thanks for the good information for the Vancouver area.

We're looking for your input here at Scanner Scene. We especially need photographs of your listening station, dispatch consoles, towers, mobile installations, etc. We welcome your questions, frequency lists and updates, comments and scanner-related QSL cards. Write to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801.

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# WASHINGTON PULSE

## FCC ACTIONS AFFECTING COMMUNICATIONS

### **FCC Takes Action On Unauthorized Descramblers**

Richard Smith Chief, Field Operations Bureau, FCC and Bob Wortham, United States Attorney for the Eastern District of Texas announced that electronic satellite equipment was seized August 30, 1988, as part of a nationwide crackdown involving the marketing of unauthorized satellite television descrambling devices. The seizures were the result of an extensive investigation by the FCC into the marketing of these devices.

United States Attorney Wortham stated that the Marshals, who were assisted by agents of the FCC Dallas Office, executed a search warrant at Satellite Television Center in Palestine, Texas.

The search warrant was issued by the United States Magistrate, U.S. District Court, Eastern District of Texas. The investigation into this case is continuing and an analysis is being conducted of the evidence seized.

U.S. Marshals seized illegal descramblers used for satellite television reception, from a Las Vegas business. The seizure occurred on August 31, 1988 at United Satellite of America located at 3125 South Highland Drive, Las Vegas, Nevada. This establishment was in the business of selling satellite television equipment.

This case is being investigated by United States Attorney William A. Maddox, Assistant U. S. Attorney Russell X. Mayer of the U.S. Attorney's office in Las Vegas, Nevada, and William H. Grigsby from the FCC San Diego office.

An investigation by the Tampa office of the Federal Communications Commission led to the seizure of unauthorized satellite descrambling devices in Ocala, Florida.

On August 30, 1988, engineers from the FCC office assisted United States Marshals in executing search and seizure warrants at V.C. Bytes. Business records, computers, integrated circuits and other related materials were obtained during the search.

This investigation, which continues, was taken as a result of a nationwide enforcement effort to stop the theft of scrambled satellite programming. Emphasis is being placed on those who distribute or sell equipment or technology which is used to enable unauthorized access to scrambled programming.

Marketers are subject to civil sanctions and criminal penalties of as much as \$500,000 in fines and five years imprisonment. Devices associated with unauthor-

ized descrambling activities can be seized and forfeited to the government.

The marketing of technology which is intended to be used for, or which is primarily useful for the surreptitious interception of such communications violates Section 705(d)(4) of the Communications Act and Title 18, U.S.C., Section 2512(1). In addition Section 705(a) of the communications Act and Title 18, U.S. Code, Section 2511(1) prohibit the unauthorized interception and use of satellite and other radio communications, even if done by individuals in the privacy of their homes.

### **Rules To Permit Business Radio Use Of Certain Channels**

The FCC proposed amending its rules to permit the use of certain channels in the 150 MHz band by the Business Radio Service.

If adopted, the proposed rule changes will promote more intensive use of the available private land mobile spectrum in the congested 150 MHz band and will open new opportunities for private paging operations.

This action was initiated by the National Association of Business and Educational Radio, Inc. (NABER) which asked the Commission to assign thirty-four 15 kHz offset channels to the Business Radio Service for use in certain areas, with 22 of these channels for use in the Virgin Islands and Puerto Rico and 12 channels for use in the Continental United States. In addition, NABER requested that high-power paging be permitted on some of these channels and that the Commission affirm that the 1950 census data will continue to be used for determining the use of certain channels in the 150 MHz band. In a counterproposal, the International Taxicab Association (ITA) asked the Commission to assign the 12 continental U.S. channels to the taxicab industry and to abandon its use of 1950 census data in defining the usage of certain 150 MHz band channels.

Because both services have shown a need and because taxicab companies are eligible as businesses to use channels assigned to the Business Radio Service, the Commission has proposed to assign all 12 continental U.S. channels to the Business Radio Service, thus avoiding any arbitrary nationwide division of channels.

Concerning the 22 Puerto Rico and Virgin Island channels, the Commission proposed assigning these channels to the Business Radio Service. It asked for comments

on the need for additional channels by other private land mobile radio service in these territories.

Also, the Commission asked for comments on whether to allow the use of all 15 kHz offset channels in the 150 MHz band that are adjacent to channels already assigned to the Business Radio Service, thereby creating many additional channels in the congested 150 MHz band. Although heavy use of the Business Radio Service channels in the 150 MHz band would limit the availability of the offset channels to new users, the FCC is asking for comments on whether the presence of a frequency coordinator for the Business Radio Service in the 150 MHz band is sufficient justification to make all 15 kHz offset channels available on a routine basis.

### **Amend Maritime Services Rules**

The FCC amended its Maritime Services Rules to allow ships to use Emergency Position Indicating Radiobeacons (EPIRBs) that operate on 406.025 MHz. EPIRBs are used aboard ships for distress alerting, search and rescue functions. Currently, EPIRBs operate on 121.500 MHz and 243.000 MHz and are designed for terrestrial, short range transmissions. The 406.025 MHz frequency is within the 406.000-406.100 MHz band that was allocated by the 1983 Mobile World Administrative Radio Conference for the Mobile Services (MOB-83) to be used in the Global Maritime Distress and Safety System (GMD SS) for earth to space EPIRBs.

In order to ensure the detection of distress signals on a global basis, the United States, Canada, France and the Soviet Union have launched COSPAS and SARSAT low polar-orbit satellites that monitor wide areas of the globe for 406.025 MHz distress signals. The COSPAS/SARSAT satellites relay these signals to special ground stations which in turn alert appropriate search and rescue units. Norway, the United Kingdom, Bulgaria, Finland, Denmark and other countries have joined the four COSPAS/SARSAT partners and participate as "investigators" in this project. The National Oceanographic and Atmospheric Administration (NOAA) of the United States Department of Commerce is the agency that represents the U.S. in the COSPAS/SARSAT joint venture and administers the COSPAS/SARSAT domestically. Using these radiobeacons, the COSPAS/SARSAT system has contributed to the rescue of over 500 individuals.



The CORPAS/SARSAT satellite will assist the 406.025 MHz EPIRBs to provide global coverage of distress signals, detect and recognize multiple numbers of EPIRBs transmitting simultaneously, improve the capability to "track" the position of the 406.025 MHz emitted signals, improve the validity of distress alerting before initiating search and rescue operations, reduce search time and thus save additional lives.

By amending its rules, the Commission incorporated the majority of the recommended standards developed by a special committee which was formed by the Radio Technical Commission for Maritime Services (RTCM). This committee consisted of members who are in the maritime industry, the U.S. Coast Guard, NOAA and other Government agencies. The amended rules authorize the use of 406.025 MHz EPIRBs by any ship or boat equipped with a VHF ship station. Manufacturers of 406.025 MHz EPIRBs who apply to the Commission for equipment authorization must submit with the application a copy of a letter from the U.S. Coast Guard stating that the EPIRBs meet the appropriate RTCM recommended standard.

### Mariner Fined \$1000 For Illegal Marine Radio Operation

A Northport, NY lobster boat captain, Ronald Ringen, has been fined \$1000 for unlicensed VHF marine radio operation, the Federal Communications Commission said. His radio, which was stuck in the transmit mode, caused interference on Long Island Sound to Channel 16 (156.8 MHz)—the international distress and calling frequency and Channel 22 (157.1 MHz)—the U.S. Coast Guard frequency; personnel at the USCG Group Long Island Sound monitored the continuous transmissions.

Using mobile radio-direction finding equipment, the USCG, assisted by FCC Engineer Judah Mansbach, located the transmitter on Ringen's vessel, "Sea Dreamer" which was in the Long Island Sound near Eaton's Neck.

Operation of an unlicensed transmitter is a violation of Federal law and the Commission has an ongoing program to locate, shut down and fine unlicensed radio stations.

The action was taken as part of the Commission's continuing effort to preserve the integrity of the marine radio system, a system that boaters depend on for safety while at sea. The FCC monitors the marine frequencies throughout the boating season to ensure compliance with the Commission's Rules and Regulations.

"Unlicensed marine radio operators may be subject to fines of up to \$100,000 and one year in prison," said FCC spokesperson Kevin McKeon. "It's generally the unlicensed radio operators that abuse the marine radio since they are not familiar with the rules governing radio operation," he said.

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CIRCLE 9 ON READER SERVICE CARD

## Beaming In (from page 4)

rigs ripped off except for one, and that one should be left for an expensive repair.

... people who send me indignant handwritten letters on looseleaf notebook pages are a breed unto themselves. Best one I got in 1988 was a 3-pager from Joe M. Brock, of Kirkwood, MO. It contained a torrent of salty words. It was in response to a sarcastic one I sent him, like the one written to the *Police Call* guy in 1968. Now we'll all have to wait and see if this fellow, too, is still nursing his wounds after twenty years. Anything less than that just won't do anymore!

... leaving my answering machine on to screen incoming calls sometimes produces a golden moment, like when I receive a junk call from a computer selling carpeting or disco lessons. My answering machine begins its message while, simultaneously, the computer plunges directly into its pitch. The two blabbing away at one another while neither one gives a damn about what the other is saying comes very close to most actual conversations.

... radio stations don't play enough music by Mary McCaslin, Leon Redbone, Sam Cooke, Cat Stevens, the Drifters, or Darius Milhaud.

... time has flown and the new 1989 edition of the *World Radio TV Handbook* marks the 43rd consecutive year it has been published. It has managed to get better with each edition and still remains the one, absolutely indispensable reference guide to international broadcast stations.

... the continuous stream of weird mail I receive here from German publisher Joerg Klingenfuss gives me the impression that he envisions himself as a sort of one-man International Telecommunications Union. Aside from the fact that he's annoyed that I dare to run "ute" loggings in *POP'COMM* that do not conform to his directories, he's gone into total meltdown about the very existence of Ferrell's Confidential Frequency List. One of the worst mistakes I ever made was answering his first letter because that opened the floodgates for an unending series of really dumb communications from him.

... on shortwave alone *Radio Free Europe* and *Radio Liberty* utilize more than seventy frequencies sent out from transmitting sites in three nations. Isn't it odd that RFE/RL so seldom show up in our SWBC Loggings?

... the ITU ought to work out an arrangement for all those high powered shortwave broadcasters to get out of the 40 meter ham band. Most of them, like Havana, Moscow, the BBC, and the VOA are operating on twice as many frequencies than they need, anyway. The clutter is a waste of frequency space throughout the shortwave spectrum and serves to take up space that might be used by small, independent, shortwave broadcasters around the world.

... coastal telegraph station WLO (Mo-

bile Radio) in Alabama appears to be occupying more frequencies than any respectable coastal station should need. How many frequencies do these guys require?

... mediumwave and shortwave broadcasters that don't want to bother issuing QSL's should consider making copies of station logs available to a panel of reputable DX'ers, clubs, or publications that have been granted proper authority to print up and issue QSL's on behalf of those stations. Printing, postage and other expenses should be defrayed on a non-profit basis by a nominal fee for each QSL issued.

... selling cellular car phones by implying that the cost is only 99 cents a day is very scuzzy. What with monthly service charges, insurance, air time, etc., the actual cost of having a cellular phone in your car or boat is likely to be as much as six or seven times that amount. All the 99 cents a day covers is the purchase cost of the uninstalled hardware, minus the antenna.

... the Boy Scouts and Girl Scouts should expend more effort in getting members into ham radio. Might also be worthwhile for them to encourage the knowledge and use of communications receivers and scanners.

... the Electronic Communications Privacy Act has backfired on its sponsors. If anything, all it served to accomplish was the arousal of everybody's curiosity as to what's being talked over the frequencies the ECPA has declared to be "off limits."

... a couple of months back, I mentioned in the magazine that the VOA had refused to cooperate with *POP'COMM* in a story about VOA unless I agreed to let them "review" the manuscript prior to publication. Soon after I wrote this, I received a conciliatory phone call from someone at VOA who said that they would be sending me all kinds of VOA materials, stories, photos, etc. That was many months ago and I'm still waiting for this stuff.

... a great way to tell when the 30 to 50 MHz scanner band, as well as the 10 and 6 meter ham bands, are ripe for DX, is to keep an inexpensive CB rig going at all times. When the CB skip starts rolling in, the other bands usually follow in short order.

... the guy was wrong when he told me that the ultimate in one-upmanship was having a vehicle with two car phones. I'd say it was the vehicle with an answering machine for each of the two car phones.

... the VHF marine FM channels don't seem to have been at all enhanced by boat owners who learned their operating habits on CB. The number of meaningless "radio checks," 10-codes, and people calling "breaker-breaker" is astounding.

... aircraft owners should be allocated a couple of VHF aero band channels for chit chat. Their radio service has many times more channels than the marine FM band., yet boaters have a handful of channels that (despite FCC regulations against the practice) are used almost exclusively for small talk. Whenever the FCC catches private pi-



lots doing the same, the agency gets bent out of shape.

... I'll never feel comfortable with all those metric measurements. I know how far 1,200 miles is, but 1,200 kilometers is meaningless to me. What really concerns me is that while I knew where 1,200 kilocycles was in the radio spectrum, after they changed it to 1,200 kiloHertz, I totally lost track of where to fit it into the bands—VLF, HF, VHF, or whatever!

... more than twenty years ago someone came up with an idea for bringing the advantages of radar to small boats operating in busy harbors. A radar station was established at a central point and a TV picture of the radar scope was transmitted "live" over a low-power UHF-TV transmitter. Small craft owners could easily pick this up on inexpensive black/white portable TV's. Still seems like a good concept, but after early experiments, nothing ever came of the project.

... now that I've mastered being able to recite the alphabet without having to sing the *Alphabet Song*, I'm wondering if I'll ever be able to spell Mississippi without having to sing M-i-s-s-i-s-s-i-p-p-i quietly to myself.

... the National Bureau of Standards should transmit data signals via satellite distribution that would produce accurate time readings displayed digitally via special receiver/clocks.

... one of the most unforgettable discussions on communications I ever had was with author and Discordian prophet Robert Anton Wilson while we enjoyed a leisurely repast in the dingy cafeteria of the old Greyhound Bus Terminal in Minneapolis.

... the best reader letter of the week came in from a car phone owner in Texas. Said that he's made long distance calls to more than 30 states and wants to know if anybody offers an award for working all 50. I told him that maybe the phone company will present him with a gold credit card.

... there used to be a time, long ago, when broadcasters viewed their call signs and dial positions as their basic identity as well as valuable asset. Today, things have changed. Broadcasters prefer ID slogans, and don't seem to mind changing call signs and frequencies with each of their regular format modifications. The change seems to be a way of letting prospective listeners know that something new is taking place. Of course, years ago broadcasters stations didn't change formats on a semi-annual basis, and didn't have so many possible formats to sample.

... when I wrote a humor piece in these pages about how the world is supposedly running out of numbers, I wondered aloud what would happen to mail service when we gave out all of the 99999 possible zip codes. I noted facetiously that in Canada they don't have anything to worry about since nobody can figure out their Postal Code system, anyway. That comment earned me no less than five letters from Canadian readers who offered lengthy explanations of the Postal

Code system and how it works. When the magazine ran an offer for readers to send to a club for free gag *Iranian CB Licenses*, a total of 2,500 requests eventually went to the club. The only negative comments received came from three readers in Canada who found no humor at all in the "license." C'mon guys, lighten up!

... there may be no truth to the rumor that several years ago, a U.S. intelligence agency considered the concept of conducting low-level chemical/biological warfare by purchasing air time over all local broadcasting stations in communist nations in or-

der to run thousands of cigarette commercials. An alternate idea was said to have been a similar psychological warfare campaign that called for driving 'em batty by repeated playing of *ring around the collar* commercials.

... an hour after listening to *Radio Beijing*, I feel the need to listen to shortwave again.

That last one used up all of the space I've set aside for my review of these mementos of 1988. Just enough space left to wish all of our readers a happy, healthy, prosperous and DX-filled 1989! **PC**



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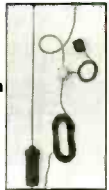
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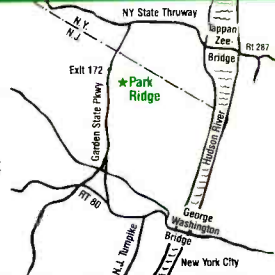


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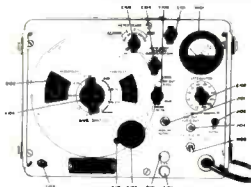
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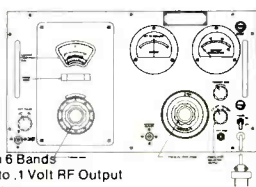
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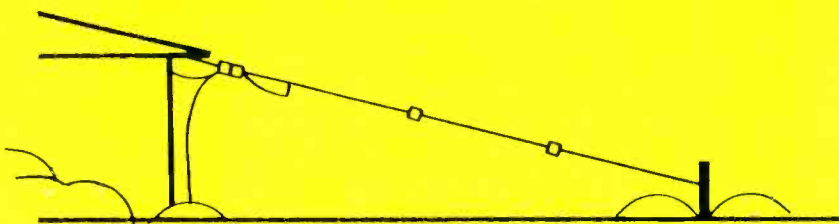
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Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker, one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescopic antenna. All for only \$149.99 plus \$7.00 shipping (optional extended warranty: 3 years \$39.99; 2 years \$29.99.) MX3000 Service Manual \$5.00.

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100 channel pocket sized hand-held scanner (6"Hx1"Dx2.3"W) no crystal portable scanner. 29.54 MHz, 118.174 MHz, 406.512 MHz bank scanning, backlit LCD display, automatic search, lockout, scan delay, priority, key lock, plus much more. Includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter, charger, earphone, and carry case. optional cigarette lighter adapter #15MPC \$12.99

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## Z60

### 60 Channel Automatic Programmable Scanner

Includes Public Service and Aircraft Bands

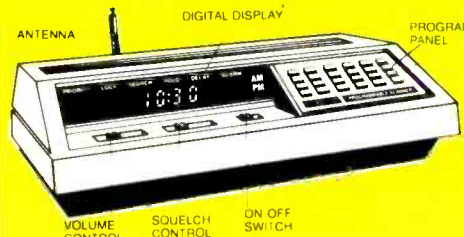
### Scanner World Special

**\$109.99**

(plus \$7.00 shipping each)

#### Optional Accessories:

Cigarette Lighter Plug RGMPC \$4.95  
 Z Mobile Bracket — Special \$5.99



The Regency Z-60 is a compact, programmable 60 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands. 30-50, 118-136, 144-174, and 440-512 MHz. Size 10.3" Wx2.7.8" Hx8.3.8" D

Sophisticated microprocess-controlled circuitry eliminates the need for crystals. Instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The Z60 scans approximately 15 channels per second.

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

Other features include scan delay, priority and a bright dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The Z60 can be operated on either 120VAC or 12 VDC. Includes one year warranty from Regency Electronics (optional 3 yr extended warranty only \$39.99, gives you a total of 4 yrs complete warranty or 2 yr extended warranty only \$29.99, gives you a total of 3 yrs complete warranty)



### UNIDEN

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**\$199.99** (\$7.00 shipping)

#### Digital Programmable 100 Channel Scanner

BC 600 XLT covers the following frequencies: 29.54 MHz, 118.174 MHz, 406.512 MHz. Features compact size of 6.5.16 Wx1.5.8 Hx7.3.8 D, scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket, supplied one year factory warranty, search direct channel access, track tuning, service search, including pre-programmed frequencies by pushing a single button for police, fire, emergency, aircraft, weather, and marine services. Plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$24.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC \$4.99

### BEARCAT BC-950XLT

Same features as BC-600XLT but also receives 800-954mhz.

**\$249.99** (\$7.00 shipping)

### BEARCAT 70XLT

#### 20 CHANNEL HAND-HELD SCANNER

Small size 6"Hx1"Dx2.3"W, full digital readout, priority search, channel lockout, scan delay, key lock. Covers following frequencies: 29.54MHz, 136.174mhz, 406.512mhz. Package includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter/charger, and carry case.

**SPECIAL PACKAGE DEAL \$169.99** (\$6.00 shipping each)

### SCANNER WORLD EXCLUSIVE

### UNIDEN BEARCAT BC205XLT

**\$259.99** (7.00 shipping each)

Digital programmable 200 Channel hand-held portable scanner with raised button keyboard for easy programming of the following frequency ranges: 29.54MHz, 118.175MHz, 406.512MHz, 800-950MHz. Features include: Scan delay, memory backup, key pad lock, sidetalk liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna, carry case are all included. Size is 2.1118Wx1.38"Dx7.12"H, high. (Optional extended 2 yr warranty \$59.99, 3 yr extended warranty \$79.99)



### SCANNER WORLD SPECIAL

**COBRA  
SR-925  
\$99.99**



(plus \$7.00 shipping each)

Digital programmable, 16 channel, AC/DC mobile/base with raised button keyboard for easy programming of the following frequency ranges: 29.54MHz, 118.174MHz, 406.512MHz. Covering aircraft, marine, police, fire, weather, trans public service, plus much more. Features include: digital display, priority, scan delay, weather, tone, channel lockout, search, scan speed, automatic squelch, memory backup, one year factory warranty, external speaker jack. (Extended warranty 2 years extra \$29.99, 3 years extra \$39.99)

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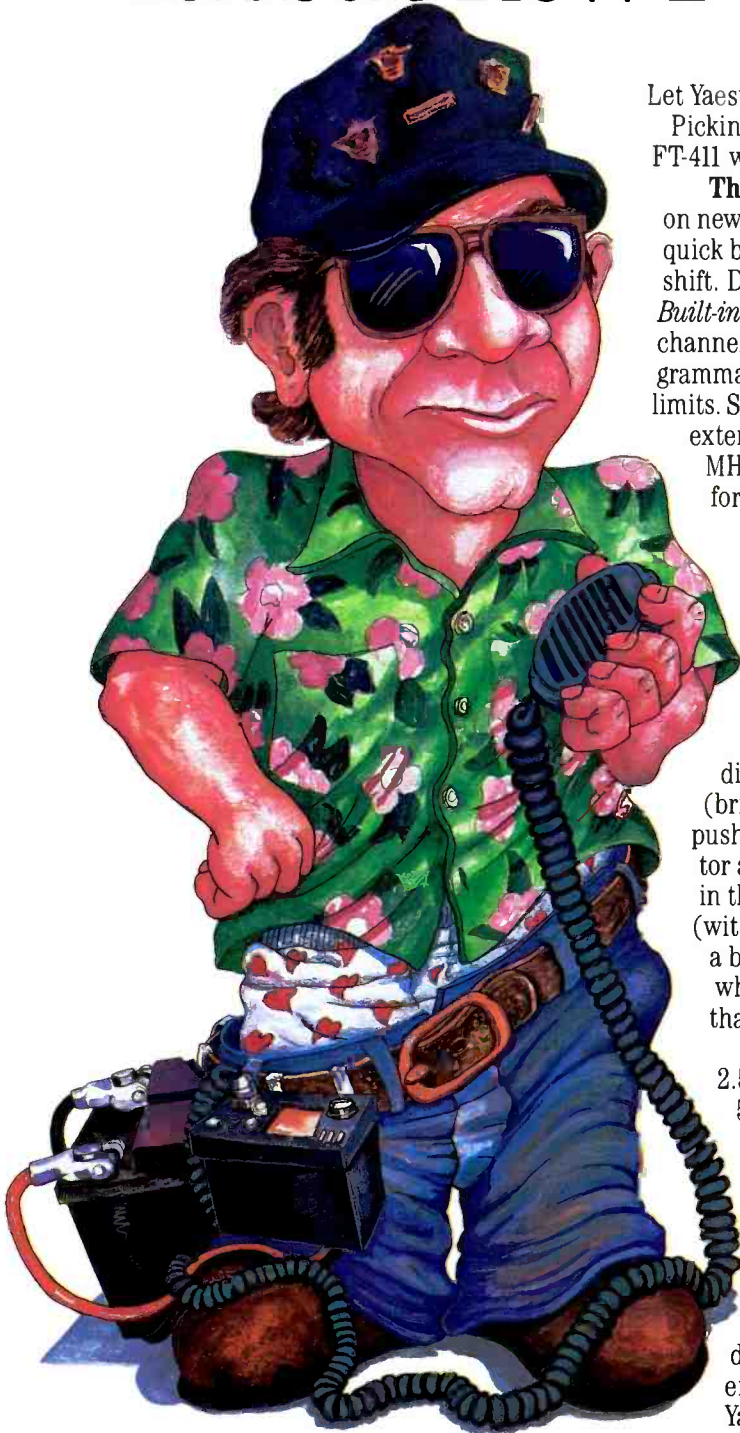
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Not bad for a handheld measuring just 55(w) x 32(d) x 139(h) mm (the same size as our FT-23R Series HTs)!

**Friendly operation.** For operating convenience, the FT-411's keypad features a "do-re-mi" audible command verification. Both the display and keypad can be backlit (brightly!) for night operation at the push of a button. A rotary channel selector allows fast manual tuning. Or key in the frequency directly. Operate VOX (with YH-2 headset option). Plus you get a battery saver to conserve power while monitoring. And a (defeatable) automatic power-off feature that shuts down your radio if you forget to turn it off!

**High power capability.** The FT-411 comes equipped with the 2.5-watt, 600-mAh FNB-10 battery pack. Try our optional FNB-12 5-watt, 500mAh pack or tiny FNB-9 2.5-watt, 200-mAh pack. Or get 6 watts output by applying 13.8-volts DC from an external power supply.

**Swap options with Yaesu's FT-23R Series.** Our rugged best-seller's chargers, batteries, and microphones are fully compatible with the FT-411. The FT-23R is the perfect companion for the FT-411, and at a great price!

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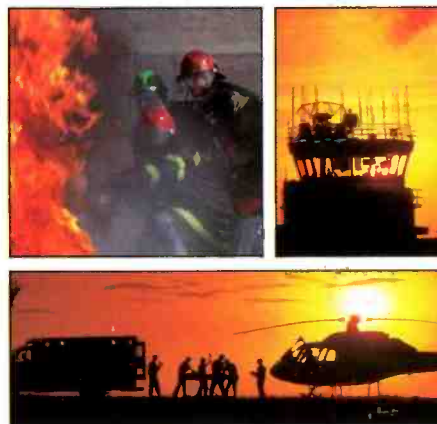


### R-5000

#### High performance receiver

**THE** high performance receiver is here from the leader in communications technology—the Kenwood R-5000. This all-band, all mode receiver has superior interference reduction circuits, and has been designed with the highest performance standards in mind. Listen to foreign music, news, and commentary. Tune in local police, fire, aircraft, weather, and other public service channels with the VC-20 VHF converter. All this excitement and more is yours with a Kenwood R-5000 receiver!

- **Covers 100 kHz-30 MHz in 30 bands, with additional coverage from 108-174 MHz (with VC-20 converter installed).**
- **Superior dynamic range.** Exclusive Kenwood DynaMix™ system ensures an honest 102 dB dynamic range. (14 MHz, 500 Hz bandwidth, 50 kHz spacing.)



- **100 memory channels.** Store mode, frequency, antenna selection.
- **Voice synthesizer option.**
- **Computer control option.**
- **Extremely stable, dual digital VFOs.** Accurate to  $\pm 10$  ppm over a wide temperature range.
- **Kenwood's superb interference reduction.** Optional filters further enhance selectivity. Dual noise blankers built-in.
- **Direct keyboard frequency entry.**

- **Versatile programmable scanning, with center-stop tuning.**
- **Choice of either high or low impedance antenna connections.**
- **Kenwood non-volatile operating system.** Lithium battery backs up memories; all functions remain intact even after lithium cell expires.
- **Power supply built-in.** Optional DCK-2 allows DC operation.
- **Selectable AGC, RF attenuator, record and headphone jacks, dual 24-hour clocks with timer, muting terminals.**

#### Optional Accessories:

- VC-20 VHF converter for 108-174 MHz operation
- YK-88A-1 6 kHz AM filter
- YK-88S 2.4 kHz SSB filter
- YK-88SN 1.8 kHz narrow SSB filter
- YK-88C 500 Hz CW filter
- YK-88CN 270 Hz narrow filter
- DCK-2 DC power cable
- HS-5, HS-6, HS-7 headphones
- MB-430 mobile bracket
- SP-430 external speaker
- VS-1 voice synthesizer
- IF-232C/IC-10 computer interface.

More information on the R-5000 and R-2000 is available from Authorized Kenwood Dealers.

#### R-2000 150 kHz-30 MHz in 30 bands

- All modes
- Digital VFOs tune in 50 Hz, 500 Hz, or 5 kHz steps
- 10 memory channels
- Programmable scanning
- Dual 24-hour digital clocks, with timer
- 3 built-in IF filters (CW filter optional)
- All mode squelch, noise blanker, RF attenuator, AGC switch, S meter
- 100/120/220/240 VAC operation
- Record, phone jacks
- Muting terminals
- VC-10 optional VHF converter (118-174 MHz)



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