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NOVEMBER 1983 \$1.75

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POPCOMM

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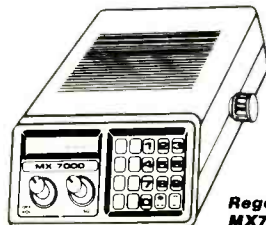
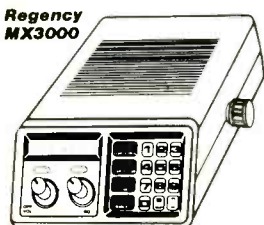
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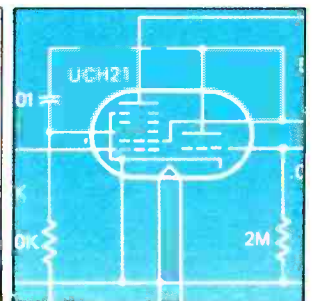
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This month's cover: Border Patrol Agent Tom Moss talks with agent on the ground by HT radio as he flies over on routine patrol outside Miami, Florida. Photo by Larry Mulvehill.

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BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Far Out Humor

There's nothing funny about the Space Program. The whole budget-strapped concept has enormous commercial, military, political, and scientific ramifications and potentials. The *Apollo* manned program has ended and there's nothing to replace it waiting in the wings. The *Viking* landers went to Mars and are now history. As to the future prospects for similar explorations, well, they're still in the hopeful idea stages. Even the SETI (Search For Extra Terrestrial Intelligence) projects are trying to gather sufficient funding to get a full head of steam; radio telescopes require an infusion of dollars to do their thing. The Space Shuttle is presently our highest profile space project and the eyes of the world are watching us.

Unfortunately, the ears of the world are listening to us. It's not funny. No, I really mean it.

Ever since the first shuttle mission and continuing through to the present operations, the project has been a curious mixture of scientific triumph and feeble attempts at fun and humor. TV pictures sent back from the orbiter depict multi-colored jellybeans floating around without benefit of gravity. Radio communications with the ground almost unfaillingly are peppered with forced joviality. The daily pace for all of this is set by Houston beaming up novel "wake-up" music for the crew. The rest of each day is filled with witty repartee between the crew and mission control. All of this is given massive coverage in the news media and can even be dialed up by means of a special "900" telephone number. Not only that, the transmissions are monitored by countless governmental monitoring stations operated by the nations of the world, as well as many private listeners—the frequencies are well known and the equipment to listen is within the means of many persons. It's fun and games on an international basis as our astronauts play to the grandstands with their poor imitation of *The Three Stooges In Orbit* and *Abbott and Costello In Outer Space*.

One can only speculate as to the reasons why NASA has not only permitted but even encouraged this demeaning approach. In the days when the FCC seemed to be enforcing its CB regulations, people were given violation notices and even fines for less horsing around than has been put out over the airwaves during the Space Shuttle missions; and much of the stuff heard on CB was lots funnier to the bargain. I've even heard funnier chatter on the VHF marine and mobile telephone channels. There's a guy in my neighborhood whose cordless telephone conversations with his girlfriend offer more laughs than the Space Shuttle crews.

The Space Shuttle brand of radio humor

would never have been tolerated by Captain Kirk on the *USS Enterprise*, and can you imagine the repercussions if the entire crew of an SAC bomber radioed back to SKY-KING an imitation of the signoff from *The Waltons*?

"Goodnight Colonel."

"Goodnight Navigator."

"Goodnight Captain."

"Goodnight Sergeant."

"Goodnight SKYKING."

"Goodnight Mrs. Calabash, wherever you are."

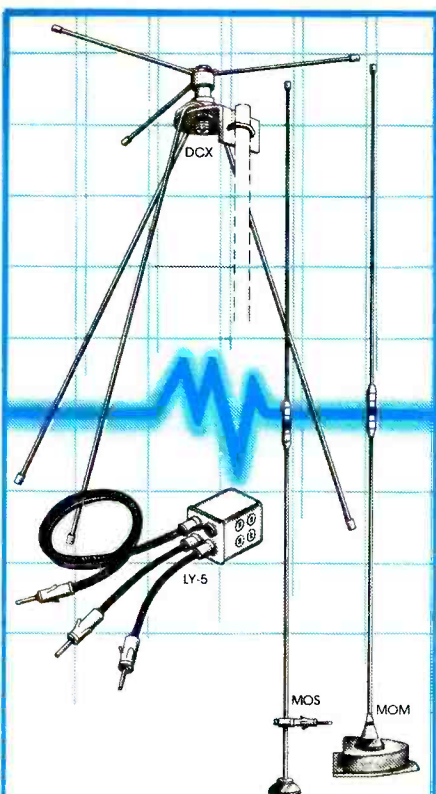
Hey, don't laugh, they actually played out the whole Walton's nighty-night routine over the air on the *Challenger* mission last June. Mission Control in Houston was in stitches, as was the news media. This was funny? I didn't laugh. On the other hand, I thought it was pretty dumb when the Waltons themselves did it first.

Look, I don't want to appear to be Mr. Sourpuss, and I like a joke as well as the next guy—but I just don't think that it's very appropriate from the Space Shuttle crew, especially since it isn't very funny. Maybe they should sign up Robin Williams as an astronaut.

Audience surveys have long shown that anything scientific or cultural lays a real egg with the American public. There's no doubt that while *Laverne and Shirley* or 30 year old *I Love Lucy* reruns can attract and hold an audience, programs such as *Cosmos* or *The Ascent of Man* are relegated to limited audience exposure on non-commercial "educational" channels. Maybe NASA therefore came to feel that the bloom came off the rose after the early space shots and nowadays the only way to capture the audience is with the same type of dumb humor the public seems to enjoy every night on TV. Frankly, while the public was overwhelmed with the first *Apollo 11* manned lunar landing, by the third manned lunar landing the public had become bored. Most people don't even realize that there were six manned lunar landings. By the final *Apollo* mission (#17), the audience had long since fled back to TV sitcoms and media coverage was practically nil. *Apollo* communications, however, weren't very entertaining from a kidding around standpoint. So maybe that's the reason for this strange new approach.

If that's the case, then NASA ought to think about doing it right if they're going to do it at all. Let's get writers to generate some snappy material for the astronauts. All NASA has to do is eliminate one single pre-

(Continued on page 74)



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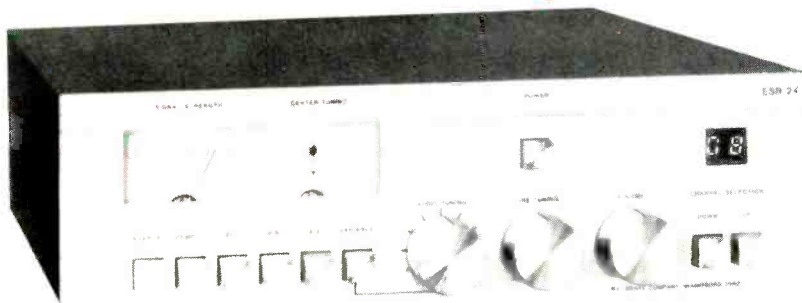
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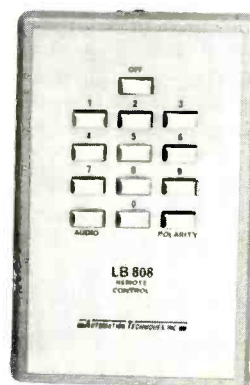
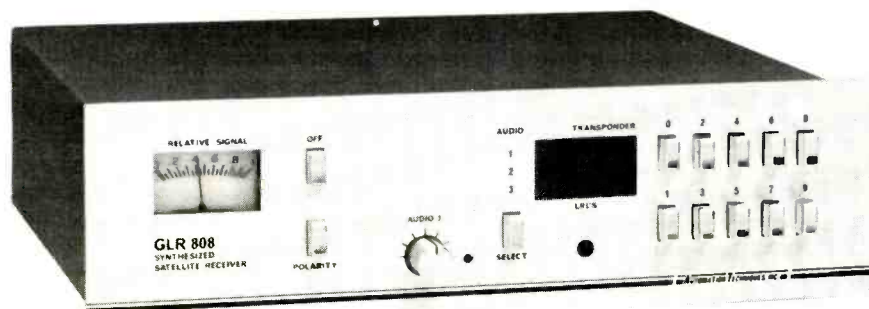


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LETTERS TO THE EDITOR

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

Where Do You Draw The Line?

I appreciate *POP'COMM's* variety of articles from "build it" to "where to hear it" and the historical-cultural aspects of listening. The legal news is also professionally interesting to me. It has been my great joy to see that there is finally a magazine given over to those of us who derive our pleasures from "fishing" in the electronic ocean in which we live. I have the opinion that the correct state of the law is that if the waves pass through my person, or on my property, I should be able to inspect them for my own sake. I have no problem with restrictions upon divulging what I hear, but I am totally unable to accept the idea that I can be prosecuted for possessing a device to monitor the electromagnetic spectra as it exists in my presence. My subscription is enclosed.

Jay S. Jackson, Atty. at Law
Nacogdoches, Texas

When I hear news of those who attempt to restrict persons from freely monitoring electromagnetic waves (via radar detectors, TVRO earth stations, SCA receivers, MDC receivers, etc.) I wonder where one draws the line. Since our bodies and clothing produce all sorts of electromagnetic waves (color, heat, etc.) do we then have the right to ask others not to look at us, or do they violate secrecy of communications laws if they should tell someone what we're wearing? I share your views on the state of the law. — Editor

Mid-Eastern Correspondent

Just a note to let you know that you have at least one reader in the United Arab Emirates. I've been an avid reader of *POP'COMM* since its inception. It's great! You'll never know how thrilled I was to find the first issue. Whomever conceived *POP'COMM* must have had me in mind because I couldn't have covered my interests better had I designed the magazine myself. If I can be of any assistance to *POP'COMM* readers with communications information from this part of the world, I'll be glad to give it a try.

John J. Crippen
c/o D.P.C.,
Box 2222,
Dubai, U.A.E.

John, you're possibly in a position to pass along scanner frequencies in the Middle East. If so, we'd be happy to run them here for our readers. Your kind words about POP'COMM are appreciated. — Editor

VHF Voice Of America?

Living near a Voice of America transmitter site (as I do) has made me curious as to the two-way communications frequencies used for on-site operations by VOA personnel, such as security, etc. Do they use frequencies that I can hear on my scanner?

E.R. Azevedo
Pixley, CA

I understand that this agency uses the following frequencies at their various offices and installations around the country: 149.75, 164.70, 166.6375, 168.05, and 173.9625. These frequencies are all within the range of most scanners. I wonder if they respond to reception reports with a standard VOA QSL card? — Editor

Poor Selectivity

On the VHF aero band I've noted "U.S. Air Force 38," "U.S. Air Force 67," and other aircraft with similar identifiers working New York City's LaGuardia Airport on 130.1 MHz. Since LaGuardia is a civil airport, I don't understand why these military aircraft are not only calling in to say that they're landing, but also ordering food and soft drinks for their "passengers." Several times they've requested wheelchairs to help "passengers" off the aircraft. Crazy, no?

George Vavoudis
Astoria, NY

I suspect that the problem was correctly analyzed when you said that you didn't understand. The frequency 130.1 MHz is the company flight operations channel used by the airline called "USAir" (formerly "Allegheny Airlines"). Inasmuch as LaGuardia Airport is on the US Air route, what you're hearing (or mis-hearing) are airliners actually announcing "USAir 467," etc. You'd hardly be expected to hear a military aircraft on 130.1 MHz. Monitoring is usually simplified by spending a few moments analyzing the information you have at hand and then coming to reasonable conclusions. Based upon the information in your letter, it shouldn't have been that difficult to figure out what you were hearing. — Editor

Broadband

Here's the problem. There's a 50 kW broadcasting station on 1540 kHz located about 5 miles from my location. Their equipment generates harmonics on 540 and 635 kHz. Is there any way I might filter out their harmonics and also limit the width of their signal (it occupies all frequencies between 1500 and 1580 kHz)?

Robert Ellis
Cookeville, Ontario

Your problem isn't the broadcasting station. It's the bomb you're using for a receiver. If you don't want to invest in a new receiver, try disconnecting the antenna from the set you're using. Or take up home movies. — Editor

CB Or Not CB?

What about starting up a CB column in POP'COMM? It's the only thing missing from an otherwise perfect publication.

Rod Hughes
Andover, Ohio

There are absolutely no plans to cover CB in POP'COMM. However, you might be interested in what appears to be the only publication devoted to 27 MHz communications. It's a newsletter called The Eleven Meter Times & Journal, and it's published from P.O. Box 10723 Edgemont Station, Golden, CO 80401. Check directly with EMTJ for subscription costs (please include a self-addressed stamped reply envelope with your request).

Better Than Cordless 'Phone Monitoring

Yesterday I bought wireless intercoms. These plug into wall outlets with no need for any additional connection between units. We purchased them to permit my wife and me to monitor the children's bedroom at night. This morning we were jolted awake by voices coming from the intercom. A man and a woman were speaking. She was telling him to get up or he'd be late for work. He was telling her to stop making breakfast because he had some alternate suggestions which he thought would definitely make them both very late for work. This then developed into a highly detailed outrageous discussion between the two of them about what he had in mind. We were hysterical with laughter as we immediately realized we were listening to our neighbors. Our laughter turned to horror when we started wondering if these people could hear things we were saying in our own home. Can they hear us? If so, how can this be corrected?

Name withheld upon request
Myrtle Beach, SC

Your units are actually miniature carrier current radio transceivers operating around 175 kHz under Part 15 of the FCC regulations (same rules governing cordless phones and hands free communicators on other frequencies). Once in a while, it happens that a person finds that their neighbors have wireless intercoms using the exact same frequency that they themselves are using. This means that both households are party to the communications of one another. As you suspected, your neighbors will be able to hear everything said over your intercom system. The dealer who sold you the system should be able to change the frequency of your system or exchange the system for another one operating on a different frequency. In your specific case, if I were you I'd leave things the way they are. Say nothing over your system and use it only to keep monitoring the antics of your fun-loving neighbors. They sound more interesting than anything you're going to hear coming from Junior's nursery. Change frequencies? You've stumbled into an eavesdropper's fantasy—a busybody's Big Rock Candy Mountain!—Editor

Subversive Radio?

I have a Yaesu FRG-7000 communications receiver. This receiver is designed to operate as low as 150 kHz in frequency (this is below the standard AM broadcasting band). I noticed, however, that if I continue turning the main tuning control, the digital display will read out frequencies below 150 kHz. In fact, it will read right down to 0 kHz, and even past that to below 0 kHz! At that point, the digital display starts going a little crazy and begins flashing wildly. It never occurred to me that a receiver's tuning could read out in negative frequencies below 0 kHz, or even that there might be such frequencies. What might such frequencies be used for, and are they referred to as Hz, kHz, MHz, or what?

Clifford Ackley
Lexington, KY

Don't know what anybody else might call 'em, but my natural inclination is to call them "NegaHertz" and ignore any attempts by others to say "gesundheit" upon hearing the term. Say, if you ever hear anything on those frequencies, be sure to let us know about it. Whatever it is you might eventually hear there, I'm pretty certain that nothing good will come of it. —Editor

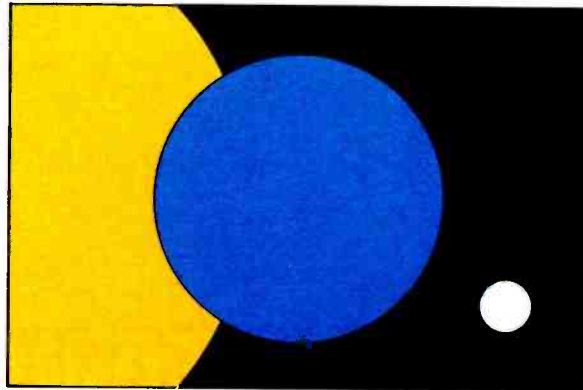
Getting Patched Up

As an adjunct to my interest in monitoring law enforcement agencies, I've been collecting uniform emblems (patches) representing the agencies I've heard. When low band skip comes in, I can hear a large number of stations from many areas, and then I attempt to obtain patches. So far I've collected more than 80 patches, all of which I've used to decorate the walls of my radio room. I've even been able to obtain several badges. Too bad this material is so difficult to obtain. POP'COMM should run some information on this aspect of the hobby.

Larry Farnsworth
Albuquerque, NM

Collecting law enforcement badges and patches is a popular hobby and we have received a number of letters from other scanner users mentioning an interest in such collections. One of the best sources I know of for authentic patches and badges is Dever Communications, Rt. 2 Box 277, Hot Springs, AR 71901. Bill Dever is a scanner fan who has hundreds of badges and emblems available for collectors. Write to him for his catalog (he'd probably appreciate it if you included a self-addressed office-size return envelope). —Editor

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and then
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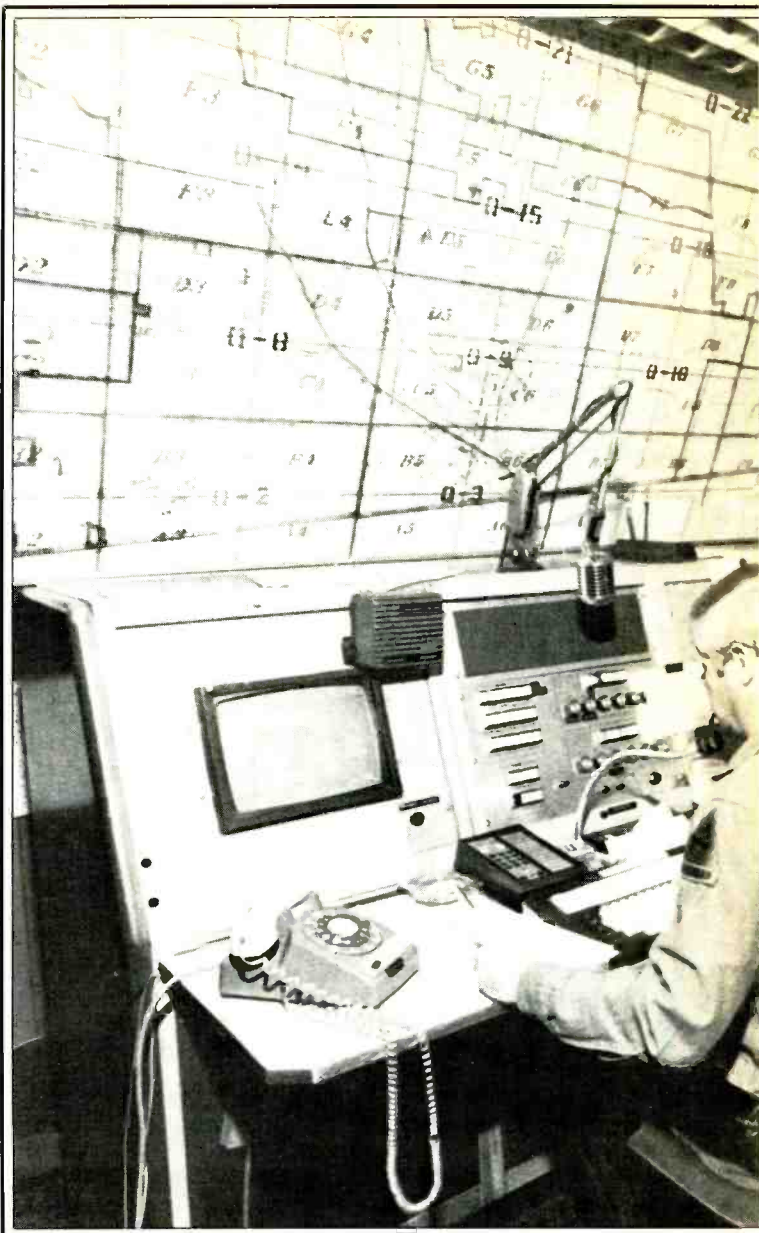
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CIRCLE 34 ON READER SERVICE CARD



Strategically scattered Border Patrol agents are deployed on radio-equipped 3-wheeled all-terrain cycles. (UPI photo)



Border Patrol agents along California's Mexican border are shown at the San Ysidro communications center. (UPI photo)

Cover Story

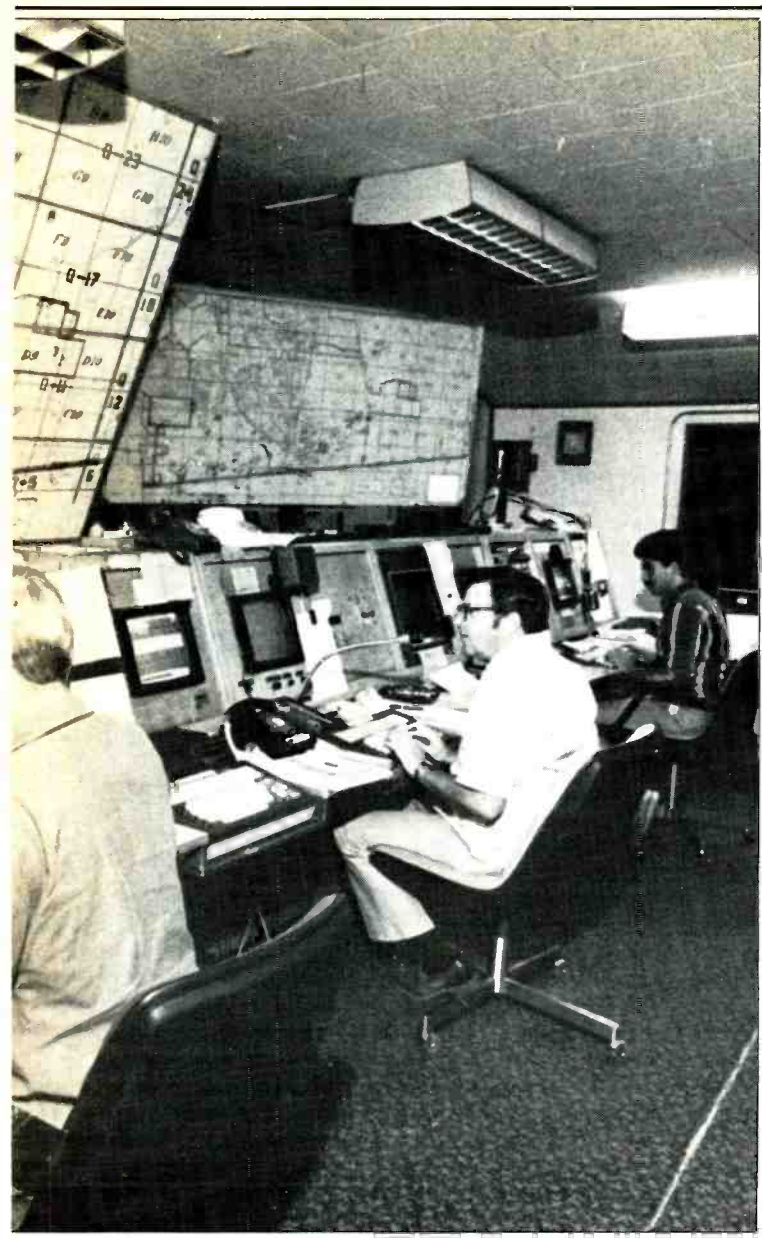
RADIO HELPS TO WIN THE BORDER WARS

On The Land, Sea, And Air, The U.S. Border Patrol Makes Heavy Use of Radio

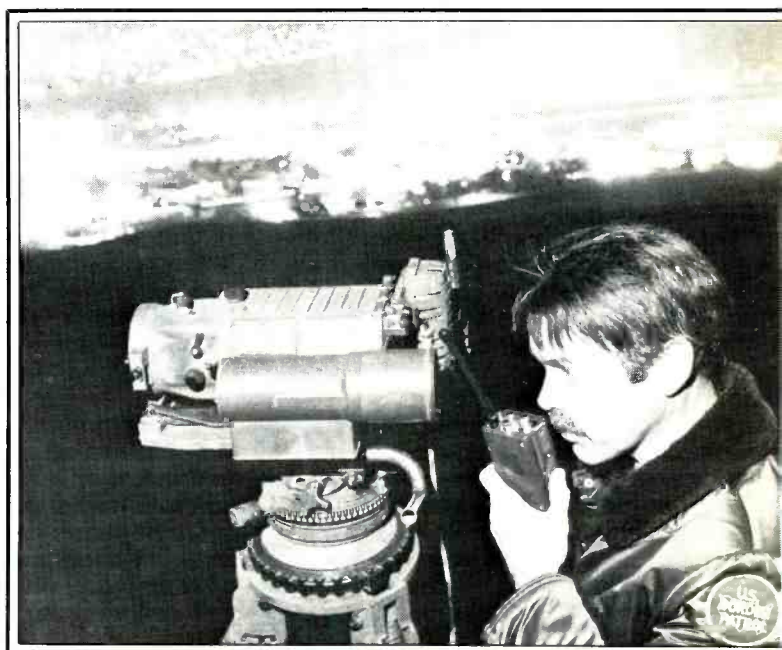
BY MARK O'HALLORAN, KCA6RJ

It's ironic! Eastern European nations build walls and have armed guards in order to keep the residents in. In the United States we maintain a large and well-trained force of agents to guard our borders in order to keep out those who would enter illegally. And enter they do. These agents are busier than ever and apprehending more illegal aliens than ever before! They require an ever increasing technological arsenal in order to stem the influx of illegals, and radio communications is the tool which ties their efforts together.

The busiest border is along the Pacific coast where California adjoins Mexico. In one single day last March they apprehended



A Border Patrol agent radios the location of illegal aliens sneaking across the border. They were spotted by the use of an infra red scope which can see in the dark. (UPI photo)



2,442 persons attempting to sneak across the border. Last February they apprehended 34,750 illegal aliens; in January it was 39,199!

As you might imagine, "they" (those who do the patrolling along the borders) are busy folks. The U.S. Border Patrol has offices and agents deployed at all points where illegal aliens might enter, each area having its own specialized problems and approaches to those problems. In the Miami area, for instance, it's a matter of patrolling vast expanses of open seas (and the skies above them) for those who would enter by boat or aircraft. In the San Diego area, it involves watching the desert-like border where men, women, and even children flock to California (usually) to find work. The flow of illegal aliens across the border from Mexico is highest in March and April when jobs on the California farms begin opening up. The San Diego Border Patrol station has 486 field

agents working on a 'round-the-clock basis.

Traditional border patrol tools (helicopters and fixed wing aircraft) are used—three choppers serve as nighttime lighting platforms, two fixed-wing spotter aircraft are used during daylight hours. There are also twelve 3-wheeled all-terrain motorcycles and also five standard motorcycles in operation. Six trucks, with infrared scopes (range: 3 to 4 miles) are used for night patrols. Some agents are even deployed with newly developed infrared goggles. Metal sensing devices (so sensitive that they can detect the eyelets on shoes) are scattered throughout the area.

All Border Patrol operations (regardless of the area) are coordinated by two-way radio. Not only do agents have hand-held transceivers, but radios are located in choppers and fixed-wing aircraft, on cycles, and in all patrol vehicles. Using these radios, agents can communicate with one another

and also with their headquarters' communications centers.

For many years, Border Patrol operations were exclusively on frequencies below 15 MHz (commonly reported frequencies have included 2710, 2770, 4618, 5912.5, 9435, 14578, and 14585 kHz; some of these still appear to be in use). Communication these days, however, appears to rely primarily upon frequencies above 160 MHz. The bands which are suggested by listeners as being in use by the Border Patrol are: 162.825 to 163.085 MHz, 170.625 to 170.70 MHz, 408.20 to 408.40 MHz, and 417.025 to 417.125 MHz, with the 162 MHz frequencies most often reported. All ports of entry and borders (including our border with Canada) can be expected to have communications in evidence. In addition, areas where illegal aliens are sought (such as large cities) and detained have been reported to have communications activity.

Israeli Military Communications Equipment

Locally Made High Technology Commo Gear Is Rugged, Versatile

BY TOM KNEITEL, K2AES, EDITOR

Israel is in the world headlines on a daily basis and has found it necessary to maintain a high peak of military readiness. Defensive actions in 1967 and 1973 required a wide range of ready-to-go communications equipment which was specially suited to fighting highly-mobile desert actions. Again, in 1976, when Israeli commandos raided the airport at Entebbe (Uganda) to free 103 hostages from Arab and German terrorists, their rugged and versatile communications capabilities played a vital role.

More recently during the ongoing hostilities in Lebanon, the constant threat of terrorist attacks and/or all out war with its neighbors has required that the relatively small nation maintain its forces in a constant state of readiness. While various pieces of military hardware have been obtained from other nations, Israel has learned that those supply lines can be elusive and sometimes rather tenuous with promised equipment subject to delays or cancellation as the winds of politics and public opinion continue to shift and change almost without warning.

As a result of these factors, Israel appears to have come to the conclusion that their most reliable source of military hardware is through its own technology and resources. Israeli fighter aircraft are now considered to be equal (or even better) than those produced anywhere in the world. Although perhaps not as well known to the general public, Israel has also developed a series of gutsy pieces of communications gear which it produces within its own borders, equipment so good that the nation has found ready export markets for the gear with NATO nations, nations in the Middle East, and in South America. Some of the manufacturers whose names now appear on Israeli communications equipment include Tadiran Electronics Industries, Ltd., Keren Electronica Ltd., Elta Electronic Industries Ltd., and Electronic Corporation of Israel. These companies, and others, are currently producing a wide variety of high quality Israeli military radios which have earned a worldwide reputation.

One very formidable piece of equipment, in fact, is made primarily for the rapidly



Photo by Helen Comneck.

growing export market. That would be Tadiran's spectacular MRC-107T "Communications Central." The MRC-107T is a vehicular mounted communications command post which can operate in voice and non-voice modes on 289,360 frequencies between 2 and 400 MHz for communication with aircraft or fixed/mobile ground stations. Incorporating its own (trailer installed) power sources, the MRC-107T equipment is ruggedly built of modular units which assure maximum reliability under combat conditions. Frequencies are all synthesizer-controlled, and the entire station can be run by remote control. As you can see, this communications package (which runs 400 watts PEP on frequencies below 30 MHz) has many possible applications and takes a backseat to nothing else. It can be used as the headquarters for a small war, it can be an airport control tower, and it's highly transportable and can even be air dropped for instant field use at almost any location.

Other HF Units

Other interesting Israeli units operating in the high frequency (HF bands) include, for instance, Tadiran's PRC-74T/VRC-740T



Photo by R. Kneitel.



Photo by Helen Comneck.

medium and long range voice/CW tactical ground radio sets. This equipment is similar to the U.S. Army's AN/PRC-74 which was developed by The Hughes Aircraft Company. This set runs 15 watts PEP SSB and can also operate with AM and CW. Frequency range is 2 to 18 MHz. The VRC-40T is a mobile version of this equipment.

Tadiran also produces the HF-700 family of HF equipment which consists of the PRC-174 portable, VRC-176 mobile, and VRC-476 mobile/fixed versions. These all-mode transceivers can run as much as 500 watts PEP (certain versions) between 2 and 30 MHz. The PRC-174 version of this set is a lightweight (13 lb.) manpack which runs 20 watts. The two VRC versions are somewhat heavier, weighing close to 100 lbs.

Keren Electronica produces a military linear amplifier known as the HFWB. The unit

operates from 2 to 12 MHz and different versions are offered which deliver 2 kW, 5 kW, and 10 kW. It can be remote controlled from a distance of more than 1500 miles! The HFWB is compatible with the HF-700 and other HF units, however it isn't portable (requiring 117 VAC 50/60 Hz).

VHF Low Band

The VHF low band (30 to 50 MHz in the most popular frequency range familiar to American/Canadian scanner monitors, but actually running to 88 MHz for tactical military purposes in many areas of the world) is always in heavy use for desert communications where long distances must be covered. In fact, Israeli military forces do not generally rely upon high band VHF (118 to 174 MHz).

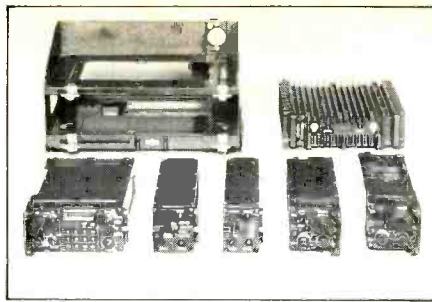
Tadiran's VRC-650 unit is narrow/wide band FM mobile transceiver operating with 40 watts (also 2 watts) output between 30 and 75.95 MHz in 50 kHz increments. Using a center-fed mobile whip, the VRC-650 has a 40 mile range. This transceiver has been in service with the Israeli forces since 1977 and is a popular unit for Jeep-type vehicles.

Tadiran also produces an AN/PRC-77 and PRC-377 series of FM low power (1.3 to 2 watts) transceivers which are essentially the same as the units of the same name produced in the USA. These operate between 30 and 76 MHz (the AN/PRC-77 has 920 channels spaced at 50 kHz while the PRC-377 offers 1840 channels spaced at 25 kHz). These units are fully compatible with the VRC-650 and are manpacks.

A family of transceivers known as the VHF-88 ECCM series consists of three different related systems. Also made by Tadiran, these are electronic counter-countermeasure transceivers designed for military use. Operating with voice or data between 30 and 88 MHz, the TAD-80 and TAD-800 versions each operate with 1/4 and 4 watts output, however the TAD-8000 version uses 1/2, 4, and 50 watts output. These are anti-jam units which operate in frequency hopping mode on up to 32 channels selected from the 2320 available. The TAD-800 is a manpack while the TAD-80 is designed for mobile use. The TAD-8000 is intended for mobile or fixed station use. Modular design permits quick repair or modifications.

Tadiran's PRC-613 is a hand-held portable transceiver intended for combat forces. It puts out 1 watt FM on frequencies between 36 and 53 MHz (25 kHz spacing). Frequencies are synthesizer-generated and are selected by miniature digital pushbuttons. The antenna is a 36" flexible leaf-type whip. A version known as the PRC-614 is similar but covers 53 to 76 MHz. Range is 3 to 4 1/2 miles.

Another low band hand-held unit is Tadiran's PRC-601 which has been used by the Israelis since 1976. This set is used by forward platoon and squad commanders and is a very small palm-sized unit operating on 6 crystal-controlled frequencies between 47 and 57 MHz. The 1 watt set has a 3 to 4 mile range. A similar unit covering 70 to 80 MHz is known as the PRC-602.



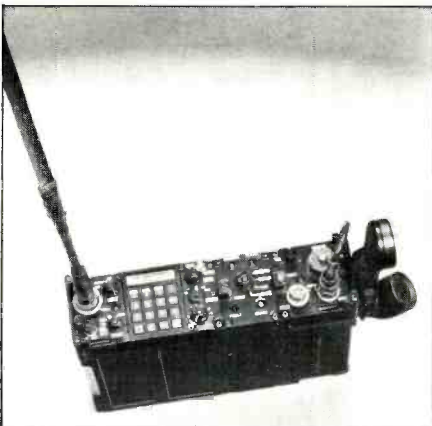
Members of VHF-88 series of VHF-FM radio sets.



The ARC-240 is a UHF unit used in aircraft.



VRC-800, the short range vehicular version in Tadiran's VHF-88 series, the new generation of VHF-FM, frequency hopping tactical radio systems for meeting the sophisticated demands of modern combat communications—crowded frequencies and severe EW environments.



PRC-80 with modules for secure voice and ECCM. Developed and produced by Tadiran Israel Electronics Industries.



Advanced direction finding system for tactical applications, operating on the principles of interferometry and notable for high accuracy, quick response, and processing capability. The TDF-3090 may be used independently or as an integral part of a large COMINT system. It is suitable for installation in mobile shelters, APC's, small naval craft, and other vehicles. Modems are available for high-speed data transmission via radio or wire. This equipment is produced by Tadiran, Israel Electronics Industries Ltd.



The PRC-613 and PRC-614 are palm-held VHF-FM radios covering 33 to 53 MHz and 53 to 76 MHz respectively in 25 kHz steps. Both employ digital frequency synthesizer controlled by miniature pushbuttons. They feature advanced circuitry and thick-film modules using monolithic IC's. One WRF output. Developed by Tadiran.



PRC-77 units produced in Israel are essentially the same as the units of the same name manufactured in this country.

UHF Band

The Israelis make heavy use of the 225 to 400 MHz band for air/ground and air/sea communications and they have an interesting selection of equipment in use on this UHF band.

Tadiran's popular series of PRC-660T/VRC-240T units are solid-state IC transceivers offering 3500 channels at 50 kHz spacing or optional 7000 channels at 25 kHz spacing between 225 and 399.975 MHz. The set puts out 1.7 watts in both the man-pack (PRC-660T) and mobile (VRC-240T) versions. The mobile version comes with a 16 watt RF amplifier.

Elta Electronic Industries produces a model EL/K-1001A UHF transceiver for the Israeli forces and also for several NATO

nations. This is a 7000 channel manpack which puts out 2 watts. It weighs about 11 lbs. Frequency range is 225 to 400 MHz.

Another Elta UHF rig is the EL/K-1106A mobile transceiver which covers 7000 channels between 225 to 400 MHz. Power output is about 2 watts. A shipborne version is also made, running 35 watts, and known as the Elta EL/K-1004A. This unit is used by the Israelis, several NATO and South American nations.

Elta's EL/K-1005 UHF transceiver runs 10 watts from 225 to 400 MHz (50 kHz channel spacing). Twenty preset channels are selected from a remote control head. This unit is designed for aircraft use.

Tadiran's entries in the UHF area are varied. The URC-240T is a large rack mounted fixed-station transceiver intended for ground/air service. Operating capabilities include selectable secure mode, 20 preset channels, non-voice modes. The transmitter runs 35 watts (unmodulated), 140 watts PEP when modulated, and can be increased to 400 watts PEP by the addition of an amplifier.

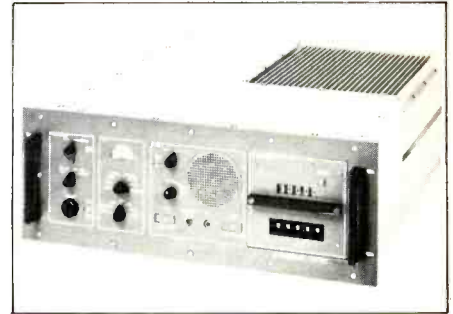
The Tadiran GRC-340T is smaller than the URC-240T but offers similar operation, having 100 watts PEP between 225 and 400 MHz.

Tadiran's ARC-240 series of airborne UHF transceivers operate over the entire 225 to 400 MHz range and can be used in jet fighters, helicopters, and propeller aircraft. The output is 10 watts but this can be increased to 35 or 100 watts by the addition of optional linear amplifiers.

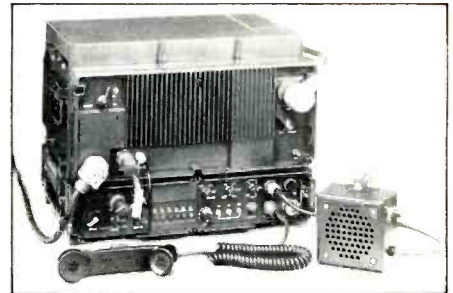
The ECI type ATC-4952 is mounted in a truck designed for operation in extreme environmental conditions. The station can be put into full use within minutes of arrival at the aerodrome site.

Another unit which can be set up for full aerodrome control operation in a few minutes is the ATC-4954. This unit has a control tower facility which elevates from its truck bed for greater visibility. The control tower enclosure is fully air conditioned.

These are some of the sophisticated military communications units presently being produced within Israel for use by the nation's military forces as well as those also being exported to other nations.



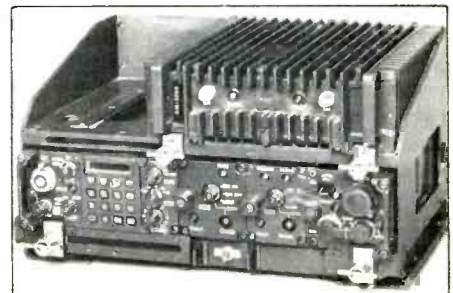
Here's the GRC-340T UHF transceiver.



The VRC-476 is an all-mode transceiver for HF operations.



Tadiran's VRC-650 operates between 30 and 75 MHz.



The TAD-8000 is a mobile or fixed unit with anti-jam features.

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The TAD-200 UHF unit is a radiotelephone relay station intended for CD and military applications. Operating in the 610 to 960 MHz band, it offers 2800 channels (24 simultaneous voice channels). This is a solid-state station mounted in a shock resistant enclosure. It puts out 10 watts.

The Tadiran TRC-645T is a 610 to 960 MHz terminal/repeater station mounted in a shelter which can be moved by truck. It puts out 10 watts of FM on up to 24 multiplex voice channels.

Direction Finders

Tadiran's TDF-3090 is a precision direction finding unit designed for surveillance applications such as might be required by COMINT (communications intelligence) military units. It can be used in aero, mobile, marine, or fixed installations and features microprocessor components in its design.

Air Traffic Control Towers

A company called Electronic Corporation of Israel (ECI) produces a series of three self-contained mobile units which are highly transportable air traffic control towers.

The ATC/4950 is mounted in a unit about the size of a Jeep and is, essentially, a complete control tower. It can be driven over almost any type of terrain and parked alongside an area suitable for aircraft operations.

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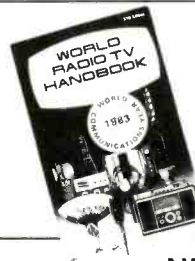
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Capt. DET. R. Poirier.

During the 1930's and 40's, public service monitoring was mostly a matter of tuning below 2.5 MHz. This QSL card from Montreal (Quebec) police station VY50 shows that in 1948 it was operating on 1.706 MHz. (Courtesy Tom Kneitel)



Hallicrafters' venerable Civic Patrol receiver
(shown in use with a UHF converter.)



Lafayette produced several series of tunable
PSB receivers.



Public Service Monitoring

These Are Our Roots

An Illustrated History Of VHF Monitoring BY KNY2AP

Shortwave listeners, Amateur Radio Operators, and other communications enthusiasts can easily trace their roots back into the spark gap days. It's a rich heritage that can be reviewed and discussed with pride and also many anecdotes. While it's true that those who today spend their leisure hours monitoring scanners are able to lay some claim to being related (perhaps as nieces and nephews) to those who were the early SWLs, we are nevertheless of a slightly different and varied lineage than SWLs of today who listen to the shortwave bands (although many scanner users also pursue that hobby too).

Monitoring of the VHF bands is a somewhat different pursuit than general short-

wave listening and has grown so rapidly in popularity in the past 10 years that it seems the majority of those involved in it don't realize that what has, today, become known as "scanner monitoring" does go back before the invention of the scanner in 1968. The reality is that we aren't quite the *Johnny-come-lately* members of the monitoring game most people think we are. We do have roots that go back into the past and maybe it's about time we stopped to see exactly how far back they go, and check out some of the almost-forgotten monitoring equipment used in days past. Hopefully it will dispel the lack-of-roots feelings monitoring fans have.

Of course, there is no intention to imply that VHF public service monitoring goes

back to the days of the spark gap. This is because VHF didn't really come into its own until the technology developed during WWII made it a practical tool. In pre-WWII days, police and fire stations used frequencies between the high end of the AM broadcasting band and about 2.5 MHz, while business and industry made almost no use of two-way radio at all. Even so, there were those who were avid monitors of low frequency public safety stations.

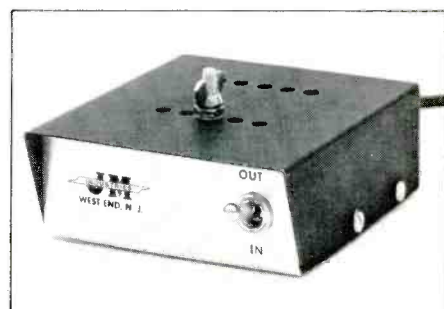
At the end of WWII there was a giant step taken in the field of two-way radio. Not only had public safety stations started moving into the VHF low band (30 to 50 MHz), there were also many business and industrial frequencies made available in this band. Some



Petersen offered this MC-1 mobile converter in the hopes of capturing the imaginations of PSB monitors. It didn't.



The Mobilefone 191 promised much but delivered minimal results.



JM Industries was another disappointing hopeful in the mobile converter market.

that they were especially efficient at those frequencies. Many monitors got their first taste of the hobby on a Hallicrafters S-38, S-40, SX-42, or similar communications receivers made by Hammarlund or National Radio.

It wasn't very long before Regency Electronics issued a pair of tunable public service band (PSB) receivers to appeal to those who wanted to monitor the high and low PSB's. These were in plastic cases and looked pretty much like AM broadcast table radios, but they were the pioneer equipment issued especially for this hobby. One set was for the low band, the other was for high band. The calibration on the dial was not especially accurate or exacting—you knew that you were tuning in the general area of 155 MHz, or whatever, but that was the extent of it. The first Monitoradio (Regency's trade name for PSB receivers) was born. This was in the late 1940's or early 50's.

Taking the initiative in this field was certainly to Regency's credit and it was quite



Radio Shack's PRO-2 was an early tunable PSB receiver which covered the hi and lo VHF bands. It was a solid-state receiver.

stations were even using the VHF high band (152 to 162 MHz). Many of these stations were operating under FCC experimental call signs in those days since the technology and the applications of the services involved were still in the formative stages. If there are stations on the air, then obviously there are those who will want to monitor them. Those post-WWII days were probably the starting

point for the eventual development of the scanner (some 22 years later) and the roots of where we are today.

Early Gear

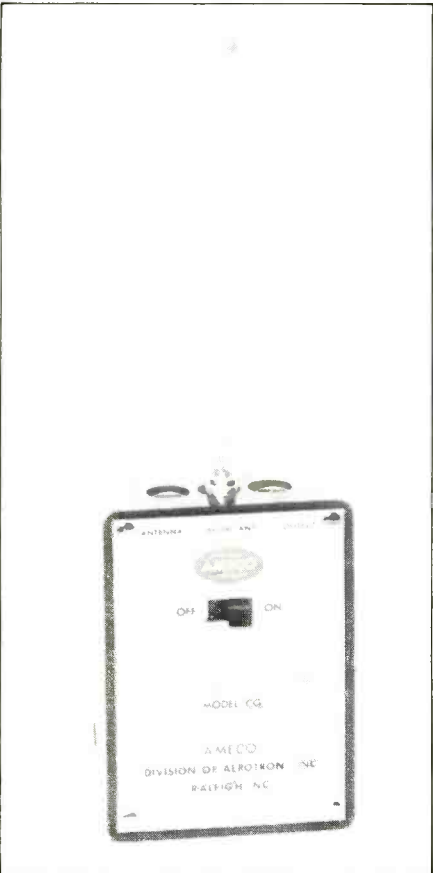
As luck would have it, much of the early post-WWII communications receiving equipment consisted of shortwave receivers which tuned up as high as 40 or 50 MHz, not



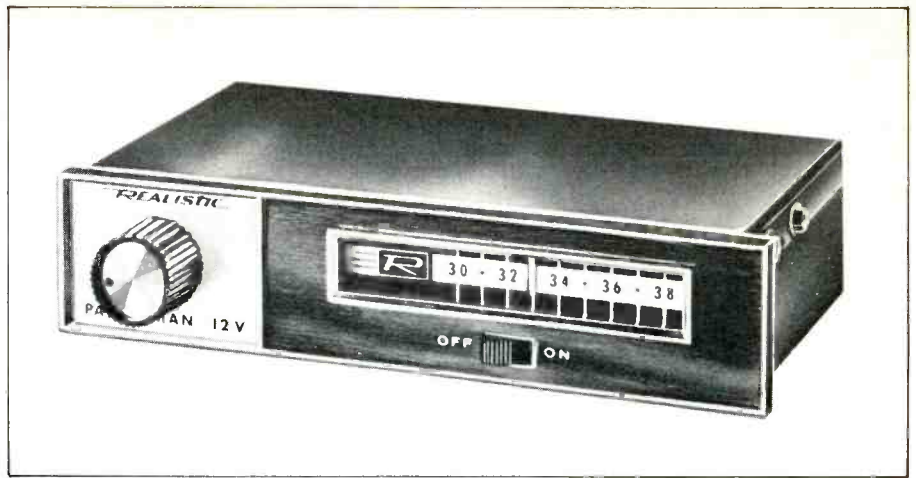
Regency put its faith in PSB monitoring by redesigning their very early models in this rugged cabinet.



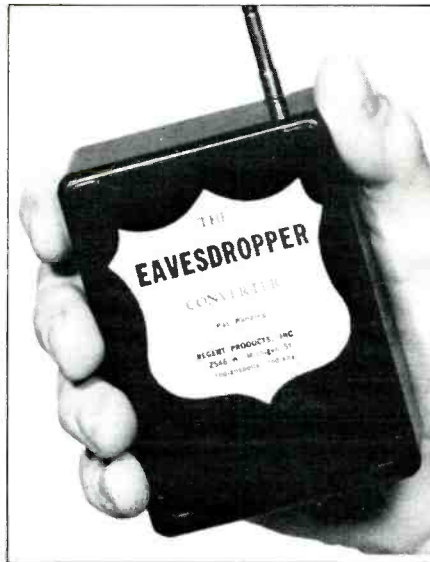
Sonar was an early hopeful in the PSB monitoring sweepstakes. This is one of their first tunable receivers, the FR-101, which had a crystal for single frequency reception.



Ameco's approach to the converter sought to retransmit PSB signals to a nearby AM radio receiver.



Radio Shack had a whirl with a tunable mobile converter but it was short-lived. Several models were offered.



Looks as though the makers of the Eavesdropper converter hoped to let monitoring fans think their gizmo was made by Regency of Indianapolis. Regent of Indianapolis was a far cry from well-known Regency, however.



Tuning the converter was thought to be an idea whose time had come. It hadn't. This Tompkins Radio Products Tunavert was a good try at it.

Converters

Seeking to progress the PSB marketplace to a new stage of technology and buyer appeal, a virtual flood of PSB converters arrived on the scene in the mid-1960's. Many of these were brought out by smaller companies that felt it was a good way to get into this market without going to the trouble and expense of developing, manufacturing, and merchandising complete receivers. The converters could be designed and constructed quickly and inexpensively and sold for far less than a complete receiver. Unfortunately, unlike modern, highly efficient converters (which perform very well), those designed in the 1960's didn't provide very much in the way of performance and therefore their stay in the marketplace was brief and generally unexciting. This isn't to say that the basic concept of converters wasn't any good—it was good. It's just that the state of the art in the 1960's didn't permit decent results for the relatively cheap prices the manufacturers wanted to sell these for. However, the converters did show an amazing variation in approaches to the situation and some were exceptionally inventive.

The majority of converters were intended to be used in mobile installations. You placed the (self-contained battery powered) converter between the AM car receiver and the vehicle's antenna. You tuned to a specified

a while before any other companies offered hobby-oriented equipment for PSB frequencies. Eventually, Hallicrafters brought out their Civic Patrol high band and companion low band receivers which also featured tunable operation which was (they felt) enhanced by little marker words printed at points along the dial indicating "police," "fire," "taxi," etc.

Other manufacturers began joining the market which, by the mid-1950's, had begun to show signs of a growing popularity. Some of the early tunable PSB receivers came from Lafayette, Radio Shack, and Sonar. Regency had also added several new models, including units in metal cabinets which had circuitry that was more advanced than their first units.

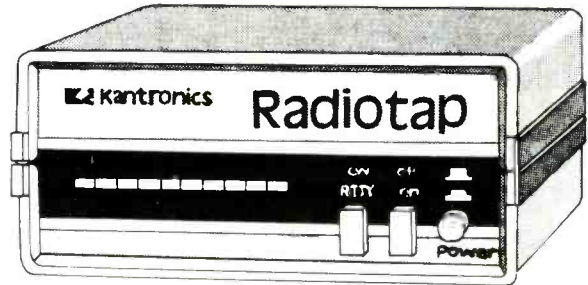
Interestingly, manufacturers later dropped their lines of tunable PSB receivers. Despite their versatility and appeal, tunable PSB receivers dropped by the wayside after the appearance of scanners in the late 1960's.

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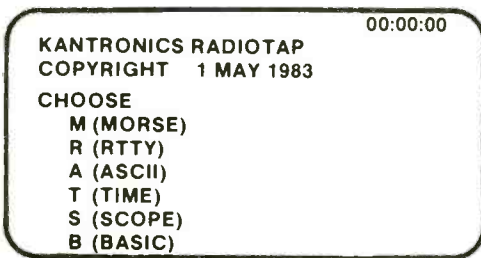
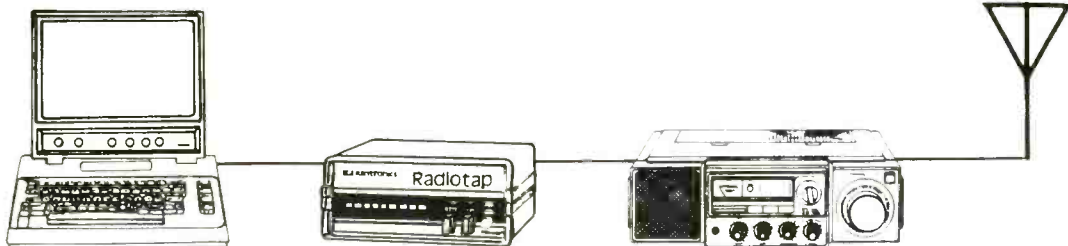
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Radiotap™ System Diagram



Main Menu

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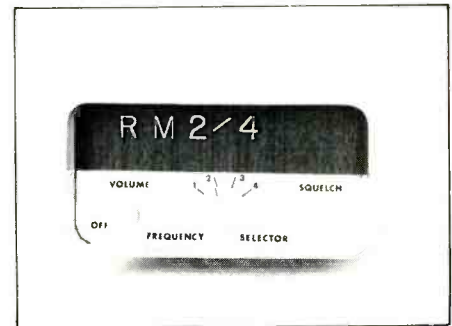
Regency offered their fixed channel PSB receiver in a version which could tune 6 frequencies via crystal switch. These were tube-type sets.



Later refinements in circuitry permitted Regency to produce this 6-channel solid-state receiver.



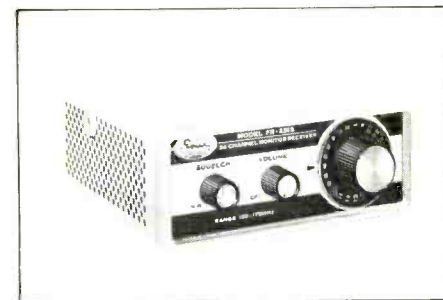
Nice looking, but bulky and cumbersome. That was the trouble with this interesting 6-channel pushbutton portable receiver called the Ultra/Monitor.



Petersen's RM 2/4 was a nice little 4-channel crystal controlled receiver.



Sonar was in there trying with the FR-105.



The ultimate in idiocy, Sonar's mating of a PSB monitor with a CB channel selector. It produced a 24-channel monstrosity that was nobody's baby.



Even Allied Radio had a small hand-held cheapo special PSB receiver.

point on the AM dial, switched the converter "on," and then you were supposed to receive one particular PSB frequency very well, plus (by varying the tuning of the AM receiver) adjacent frequencies to either side of the primary frequency you expected to hear. The tuning range was about 500 kHz above/below the primary frequency, and you had to specify that frequency when ordering the converter. Units which fell into this category included one from International Crystal, also the Petersen MC-1, the Mobil Electronics Co. Mobilphone Model 191, and a unit from JM Industries.

A refinement of this theme called for converters which, themselves, were tunable. The AM car radio was left tuned to one particular frequency and you selected the frequencies you wished to hear by adjusting a control on the converter. These promised reception over a wider range of frequencies than the original converter designs. Unfortunately, as with the original converter models, they didn't seem to be able to pick up any stations more than about a mile away. The two leading contenders in this field were Radio Shack (Realistic) and Tompkins Radio Products. The complete line of Tompkins Radio Products' Tunaversers (as they were called) actually incorporated a large number of units designed to cover many different bands.

Yet one more idea was brought before the commercial marketplace in an attempt to merchandise PSB converters. These were small units which required no direct connection with the AM radio. Operating in a manner similar to other converters (which required tuning of the AM receiver to vary the received frequency), these converters all



Cheaper sets, often combined with an AM radio, were always able to find an audience but had limited appeal to serious monitors.

had little whip antennas sticking from their plastic cases. All you had to do was turn them on, place them within a foot or so of an AM receiver, and they supposedly caused the AM receiver to turn into a PSB receiver. Most of these were also disappointing in their operation. Some of the units which were offered were the Ameco Model CG, Petersen PRM-1D, and the Trojan Piggy Back. There was even one such device brought out by a company calling itself Regent (not Regency), which was located in Regency's hometown of Indianapolis. Despite the similar sounding name, their Eavesdropper was a real bomb.

No matter how many clever approaches



Sonar was one of the early manufacturers of scanners as evidenced by this primitive unit. The company bailed out of scanners when the going got rough.



Heath came up with a scanner kit called the GR-110. Quite a nice set, too.



Electra's early scanner. It had only 8 channels, no lockouts, no delay, no search or scan-speed features. The public loved it anyway and it opened the door for modern PSB monitoring.



E.F. Johnson never could seem to achieve any success in the scanner market even though their Amateur and CB equipment was highly regarded.

were tried, it didn't seem that the 1960's were ripe for PSB converters. Modern PSB converters make those designed 20 years ago look like toys by comparison. The units soon faded from the scene as the next industry approach began phasing in.

The Next Step

After wondering for a while where to head next with this blossoming market, manufacturers apparently figured that the way to go was with fixed frequency receivers that could pick up, with far more accuracy than any tunable job, a particular desired channel. They probably saw the potentials such units would have with volunteer firemen, police buffs, and others who were really interested in hearing only a single frequency and didn't want to twiddle around with a tuning dial. Thus did we see the introduction of Regency's single channel crystal-controlled Monitoradio and others similar in approach from several manufacturers.

It wasn't very long before someone figured out that with very little trouble, a rotary



One of Regency's early scanners which was popular.

switch could be included in these receivers which would permit more than one frequency to be monitored at the discretion of the operator. This saw the introduction of multi-channel selectable frequency receivers from Regency (6 and 12 channels), Petersen (4 channels), and Sonar (6 channels). Sonar eventually realized that they could utilize some left over channel sectors from their CB equipment and thus gave birth to their 24-channel monitoring monstrosity known as the FR-2513. Other companies which had decided to market similar multi-channel receivers included: Sears, Craig, RCA, Pearce Simpson, Fanon/Courier, Electra Bearcat, Lafayette, and others.

One of the more unusual entries in this market approach came from Squires-Sanders. They produced a nice looking 6-channel push-button portable unit known as the Ultra/Monitor. Despite its clever concept, it was a flop. It was too bulky and too heavy.

Portables, however, were still thought of as a viable approach and manufacturers produced a line of such units (often including the AM broadcast band) with tunable PSB coverage for the low-price market. Besides the countless off-brands being imported from Japan, some of the better known companies offering such receivers included Allied, Lafayette, and Radio Shack.

Enough Fooling Around

By the mid-1960's there had grown a thriving market of persons who enjoyed monitoring the PSB's, and yet (despite many different approaches to the market) it still was lacking that certain something to make it as popular as many thought it really should be. Surveying the industry's past triumphs and tragedies, manufacturers attempted to assess their potentials and draw from their experiences.

They rationalized that if a monitoring enthusiast had several frequencies upon which he wanted to keep tabs, then there should be a method of designing a receiver which would quickly sample each of those frequencies to see if it was active. It would stop and monitor the active frequencies and pass over the inactive ones, scanning the selected channels on a continuing basis. Thus was born the scanner. Bearcat introduced the



Electra's Jolly Roger, a 2-channel scanner with accompanying AM band—one of the many unusual scanners which have been marketed over the years.



The Trojan Piggy Back was one company's attempt to break into the PSB monitoring market, but the unit simply wasn't accepted by the public.

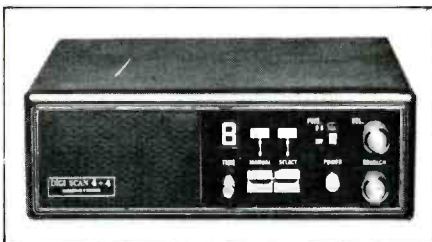
first model in 1968, others soon followed—Regency, Tennelec, Sonar, and many more.

The very first scanners produced were still rather primitive as compared to modern equipment. They scanned 8 channels, but had no lockout or scan-delay features, and they usually covered only one single band. They were crystal controlled and offered no "search" or scan-speed capabilities.

Even so, the public absolutely loved the idea of the scanner and that's when PSB monitoring really took off. Some of those who produced early scanners were E.F. Johnson, Hy-Gain Electronics, Midland, Unimetrics, Surveyor, Sears, Pearce Simpson, Pace, Petersen, Penncrest, SBE-Linear Systems, T-Berry, Robyn, RCA, General Electric, Heath (a kit!), Globe, Gemtronics, Radio Shack, Drake, Kris, B&K Cobra, and Fanon/Courier. While some of these units enjoyed moderate popularity, many were on and off the market in short order for one reason or another. The reason that some failed to endure was that the public kept demanding various refinements and



SBE's Opti-Scan took a novel approach to being programmable.



Unimetrics tried to sell this programmable scanner, then dropped it.



A monumental disaster was the Tennelec MCP-1 Memory Scan, an early programmable unit which didn't work worth a hoot and had more service problems than a used VW. What a bomb!

features in the scanners. Almost as soon as a scanner would arrive on the market in those days, it was practically obsolete because within a few months new units would appear with all sorts of new features. Some manufacturers were simply not able to keep up with this type of a highly charged design and manufacturing pace. They were hoping to get in on what looked to be an easy market to service. It wasn't an easy market. It was probably a case of insufficient dedication to that market.

The Test of Steel

After the initial scanner (and ensuing refinements) became a popular piece of equipment, the industry found a way of offering a scanner that didn't require plug-in crystals and which could be programmed to scan thousands of potential frequencies by the unit's owner telling the scanner which frequencies to scan. That was the development which sorted out the men from the boys. The programmable scanner was a far more complex piece of electronics than many companies wanted to tackle. Although some companies pulled out of the



In the early days of PSB monitoring, it was necessary to use a communications receiver which tuned up to the VHF low band, like this Hallicrafters S-40B.

market almost instantly, a few did try to compete with Electra Bearcat, Regency, Fanon/Courier, and Radio Shack before calling it quits with scanners.

Early programmable scanners required the frequencies to be set up in the equipment by means of complex binary code instructions, as opposed to modern keyboard programmables which require only that the user punch-in the digits of the frequency to be installed. So, with the older units, you needed a code book which told you how to convert the desired frequencies into the binary codes. It was not very convenient and companies such as Unimetrics and Tennelec tried but failed to survive the production of such equipment.

SBE-Linear Systems avoided the snags encountered with the binary codes, developing their Opti-Scan (SBE-12SM) programmable. Their approach was to have the user program the desired frequencies by the use of marking the appropriate boxes on little cards which could be inserted in the front of the scanner, 10 frequencies to a card, one frequency for each of the 10 channels the unit would scan. It was a good approach, but the set never seemed to achieve the popularity it probably deserved.

When the smoke from all of this settled, it seemed that it was the original companies that managed to survive, accompanied by several more recent entrants in the scanner sweepstakes. The most popularly seen scanners these days includes Electra (Bearcat), Regency, Radio Shack (Realistic), Fanon/Courier, Fox, and J.I.L.

Along the way there were many successful and unsuccessful units which we didn't get a chance to explore in this feature—unforgettable units such as the Regency WHAM-O, the Bearcat Jolly Roger, and—well, don't get me started on *all* of the scanners that have marched by in the passing parade. We'll need a dozen more pages!

The fact is that when you see some of the fantastic and sophisticated scanners recently brought onto the market—ones which scan from HF through to microwave and do everything except whistle *Dixie*, feel proud that they are the current evolutionary stage in a fascinating hobby which traces its roots back several decades further than you probably imagined.



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Secrets Of American Guerrilla Broadcasters

From The Hidden Recesses of Nowhere, Pirate Political Broadcasters Foment Civil Unrest – Unlicensed, Uncontrolled, Unbelievable!

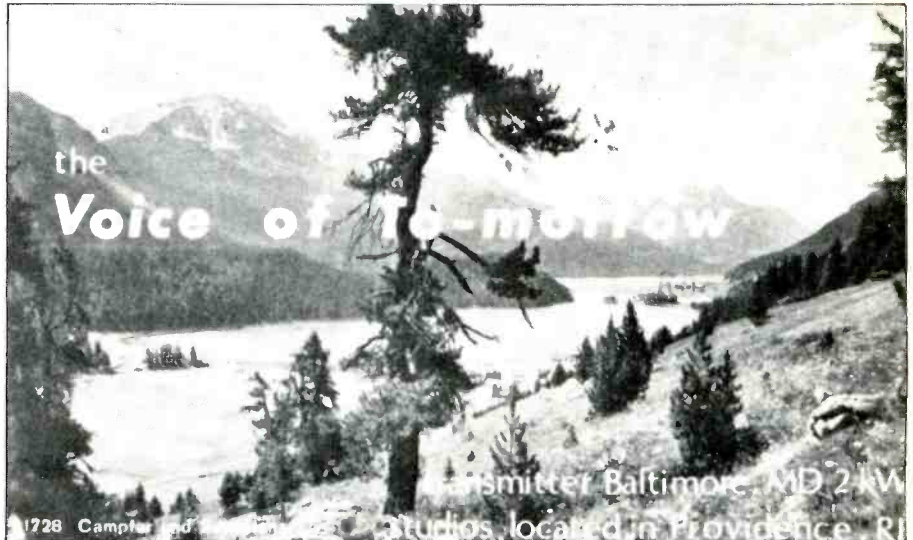
BY TOM KNEITEL, K2AES, EDITOR

Unlicensed broadcasting stations (a/k/a a pirates or bootleggers) are presently filling the airwaves on frequencies ranging from the standard broadcasting band, through the shortwave frequencies, and into the FM broadcast and TV channels. There are even broadcasters on CB channels these days. For the most part, these stations are operated by folks who've always wanted to own and operate their own broadcasting station in order to bring their own tastes in music or entertainment to the public but couldn't get an FCC license.

Far less commonly encountered than the garden-variety pirates are those from the political underground. As controversial as the run-of-the-mill pirates may be, few are as controversial, bizarre, interesting, or sought after by monitors (including those of the FCC) than those operated by left or right wing political persons or groups. These stations usually promote political views which are adamantly opposed to governmental authority and which fly in the face of community sensitivities or standards.

This is no mere political propaganda such as encountered when you tune in stations such as Radio Moscow, Radio Prague or even our own Voice of America. The things which separate the "above ground" propaganda broadcasters from the underground political propaganda stations (a/k/a guerrilla broadcasters) are that the guerrilla stations are unauthorized, may preach hate and revolution, intolerance for specific groups (political, ethnic, racial, etc.), and they tend to operate from locations which are either not clearly defined or which change regularly. Generally they are operated by those who claim to be disenchanting members (or former members) of the groups they'd like to see dumped. Such stations presently abound throughout Central America and the Caribbean, but it's when they have made an appearance within the borders of the United States that eyebrows begin to raise, tempers start to boil, the FCC monitors roll out the mobile units, and monitoring enthusiasts tune up their receivers all the more carefully.

Actually, there have been many clear-cut examples of homegrown guerrilla broad-



Amongst the present day breed of pirates, the Voice Of To-morrow seems to lead the pack of those considered within the guerrilla camp. (QSL courtesy of Darren Leno)

casters, just as there have been several marginal stations which some would debate as to whether or not they should be classified as bona fide guerrilla stations; they meet some of the criteria but still they don't exactly fit the bill.

One such example was Radio Swan (a/k/a Radio Americas) which operated for many years on the broadcast band (1160 kHz, 50 kW) and also on the shortwave bands (6000 kHz). The anti-Castro station, claiming to be operated by expatriate Cubans and privately financed, was located on tiny Swan Island in the western Caribbean. The station was active in sending coded instructions to espionage agents and even directed troop movements during the ill-fated Bay of Pigs invasion in 1961. In actual fact the station was owned and operated by the CIA and was located in territory which, at that time, was claimed by the United States. Its operations created havoc with American broadcasters on 1160 kHz, and yet the FCC hadn't licensed or authorized its operation and even denied any knowledge of its existence. Some would consider this a guerrilla operation, others wouldn't. I visited the station in the 1960's and it certainly didn't

look like an "underground" station—with its large transmitters, broadcast towers, and air conditioned studios. While the on-the-air personalities were real Cubans, the technicians were as American as corn fritters and freely chatted about the station—but grew annoyingly taciturn when questioned about CIA involvement in its operations.

Throughout the years there have been far more clear cut examples of local revolutionary stations which have been monitored by North American listeners; some have even offered QSL cards! These stations have made appearances on various bands; some have even popped up in the ham bands and led some to believe that the broadcaster was either a revolutionary ham licensee, or else revolutionaries had ripped off a rig from a ham. Of course, no license of any kind is required to purchase transmitting gear and therefore there's always the possibility that they simply purchased the rig and fired it up on a convenient frequency.

American Guerrillas

American guerrillas have been especially active in connection with urban crises and in support of a number of volatile "causes."

a QSL from

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the North Parallel
and North of the
South Parallel

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"Master Control" was a group operating back in 1967. Running 100 watts with broadcasts on CB, they also operated at least one (and possibly several) 100 watt bootleg broadcast stations in the Indiana-Illinois area. This was their QSL.

kHz running 100 watts and using the self-assigned identification of WMMO. In actuality, it appears that WMMO was only one of several similar affiliated stations located along the Illinois-Indiana border, each running 100 watts, and presenting programming which mostly contained menacing messages threatening physical harm to various persons, groups, and business concerns who had irked the operators of the stations. The organization behind WMMO was a shadowy group known only as "Master Control," which had also set up 100 watt stations on several CB channels in order to specifically harass operators on those frequencies who ran afoul of Master Control's sponsors. In some instances, programs were simulcast over WMMO on the broadcast band and also over several CB channels. However, on the CB channels, the Master Control stations were open for two-way communications and would come back and respond to their critics. These stations also issued QSL cards.

In 1979 there took place one of the most novel uses of what many people considered to be some sort of guerrilla radio. In a dispute with the management of New York City non-commercial FM broadcast station WBAI (99.5 MHz), staff members resigned en masse.

They claimed that the station's management refused to permit them to discuss their gripes over the air so that the audience (which supported the station with voluntary contributions) would be able to decide who was right and who was wrong in the dispute. By some means, the departed staff members were able to hook into the telephone



"NTS Free Russia" was a 1960's shortwave pirate which, like many other guerrilla stations, understood the appeal of a QSL card. This was an anti-communist station operating in Europe. From the illustration on the QSL, the station was located in a mobile unit, a practice still popular even today.

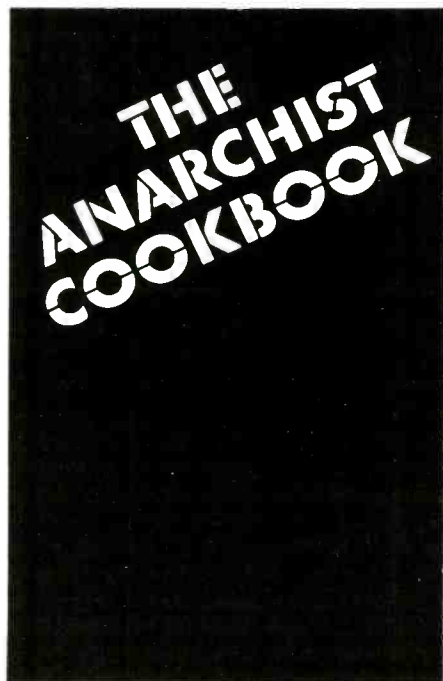
During 1975, at a peak of unrest amongst the Menominee Indians in Wisconsin, just such a station appeared on 1580 kHz. Identifying itself as "The Monomonee Warriors' Station" and located somewhere in the area of Keshena, Wisconsin, the operator(s) of the station had deliberately selected a frequency adjacent to station WAPL (1570 kHz) in Appleton, WI located only 45 miles away. WAPL's listeners found it hard to avoid hearing the bulletins being sent out from the Menominee camp since they splattered right into the WAPL signal! The station was short-lived, the Menominees had a message to deliver to the world and they obviously felt that their unlicensed station was their best way of doing it, and also for exhibiting their defiance of federal regulations. Their message was, indeed, delivered!

In the turbulent late 1960's there was a broadcaster actually called Guerrilla Radio! This station was located in the bell tower of famous St. Marks in the Bowerie Church in New York City and it operated on 1400 kHz. The station's chief operator and on-the-air personality, John Giorno, openly boasted that he was deliberately trying to do just about everything the FCC said he couldn't do. Other than seeming to try to earn the world's freestyle record for breaking every FCC regulation on the books, it was never clear exactly why Guerrilla Radio took to the airwaves, but there did seem to be some vague political statement being made.

During the so-called "long hot summers" of the 1960's, there were dozens of briefly-operated guerrilla broadcasters in operation. These stations, located in cities such as Detroit, Los Angeles, and New York, offered encouragement to the rioters and sought to prolong the civil unrest. As if that weren't enough, they also broadcast information on where some of the remaining unlooted stores were located, as well as providing information on which stores *not* to loot. There was not much the authorities were about to do to attempt to remove any of these stations from the air; the police themselves had a hard enough time trying to function on any level at all in the streets. Broadcasting stations were the very least of their worries.

One underground newspaper of the 1960's, *The Realist*, had a story about a group of radicals who were not only promising to blow up electric power transmission towers in California, but which also had several 100 watt broadcast transmitters ready to tell the local populace a message of some sort about their motives. Apparently they felt that people would listen to their messages via portable radios. When I mentioned this scheme at the time in some of my own writings, I promptly received an inquiry from the FBI asking for additional information and seeking the source of my information. Obviously they had reason to believe that the group was serious in its intentions.

One blatant guerrilla station was on the air in the mid-1960's. This was boldly on 1550



The Anarchist Cookbook, by William Powell, is a current book which offers, in addition to advice on guerrilla broadcasting, a lot more advice than most folks ever knew about bombs, poisons, and other assorted somewhat grisly things.

lines which connected the WBAI studio to the station's transmitter. These lines not only carried the programming material, they were also used to control and adjust the transmitter. While WBAI's outraged management spent several frenzied hours alternately trying to find the location of the "tap" and attempting (without success) to shut down the transmitter (which the dissidents had, in effect, "captured"), listeners were treated to a front row seat for something rather unique in American broadcasting. From a hidden location, the dissidents fed their own unauthorized programming into the WBAI transmitter—offering impassioned pleas for listener support for their cause, singing, chanting, and generally denouncing the station's management.

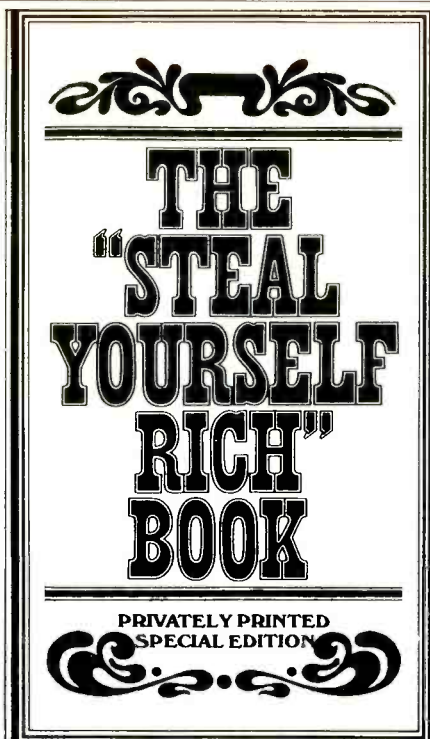
Currently, the contender for radical broadcast honors seems to be the pirate known as The Voice of Tomorrow (which used to be called Radio Vanguard). Claiming to be located in Baltimore and saying that they run a 2 kW transmitter, it has been reported with strong signals on 6240 and 7410 kHz at times between the hours of 2200 and 0400 GMT (according to information reported by monitors in the publication *The ACE*). While there seems to be some doubt that the station is actually running 2 kW, there is no doubt as to its orientation; it seems to be touting the old familiar KKK philosophies of racial and ethnic hatred. Supposedly the studios are in Providence, Rhode Island. The station has sent out QSL cards.

It's a matter of personal opinion if basic political protest stations should be included in the ranks of true guerrilla broadcasters. Stations such as the current KPRC (Pirate Radio Central) from New York City on 1616 kHz, or another New York City pirate, Rebel Music Radio (1620 kHz), seem to content themselves with general anti-war music and commentaries but stop short of preaching revolution or illegal activities. At this point in time, such sentiments have also been heard over many licensed college campus and other non-commercial FM stations.

The Handbooks

Two books appear to be highly regarded by guerrilla broadcasters. One book is called *The Steal Yourself Rich Book* (a/k/a *Steal This Book*), penned by Abbie Hoffman. Hoffman, whose name was seen regularly in the headlines as a political dissident and anti-establishment activist in the 1960's, wrote this 298 page paperback while he was languishing in the Cook County Jail in Illinois more than 15 years ago. The book covers many topics relating to survival on the fringes of urban society. However, Hoffman did devote a tantalizing chapter to guerrilla broadcasting and even to guerrilla TV, instructing his readers on setting up their own stations. As far as I can determine, the book has been reprinted several times. My copy is dated 1971 and is a reprint of an earlier edition.

While Hoffman could well have used some advice from an advisor having a bit of a



"The Steal Yourself Rich Book" by Abbie Hoffman came out in the 1960's in order to advise the youth of the day on clever ways to annoy folks over 30. It had all sorts of free food and free clothing ideas, and it included information on establishing bootleg broadcasting stations. The book is probably out of print by now.

technical background in radio, he does mention that there are actually several methods of performing low powered broadcasting within FCC regulations. However, he didn't wish his readers to be overly bothered by such considerations. In fact, he told of some people in Connecticut who have been

broadcasting illegally with a "large antenna" (100 feet, he reported) whose station covered a radius of 30 miles. He said they broadcast for hours upon end without hassle.

Hoffman's advice for operating a guerrilla broadcasting station without the appearance on the scene of the FCC is by keeping language clean, by not issuing "calls to revolution," and by not broadcasting commercials. Finally, he adds that it's not a good idea to become too well known. Of course, the FCC would have different feelings about such matters, probably pointing out that broadcasting minus benefit of a license (regardless of the programming) could result in fines and/or imprisonment.

Hoffman suggests establishing a transmitter in a panel truck, then changing locations every 15 minutes in order to avoid being tracked down by the FCC. One interesting proposal he sets forth is to locate a number of low power transmitters (all operating on the same frequency but situated at locations far enough apart so they won't jam one another) in a single city. He then suggests feeding all of the transmitters with programming from a central point. By low power transmitters in this context he was apparently making reference to those which are sufficiently low powered to be operated legally under the FCC's Part 15 rules because he then comments that such a system would make it possible "to build a nationwide people's network that is . . . theoretically legal."

A proposal for guerrilla TV is also set forth by Hoffman in his book. He claims the idea is feasible, although some might argue the point with him. His suggestion is to tap into a cable TV's lines and feed in programming to the cable system's customers. He says you'd need a TV camera that provides a low level RF output on the TV channels (this would also be true of VCR's, although they hadn't been invented when Hoffman wrote his book) and that the RF output could be run

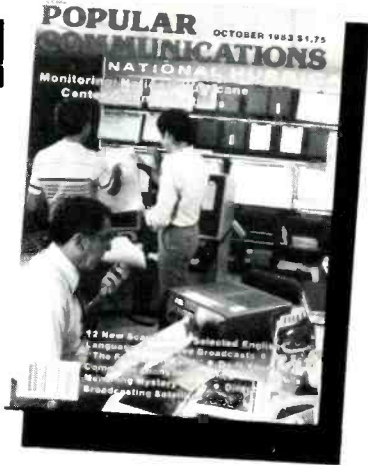


Radio Americas, a station many people feel fit the description of a guerrilla broadcaster. (QSL courtesy of Harold Ort)

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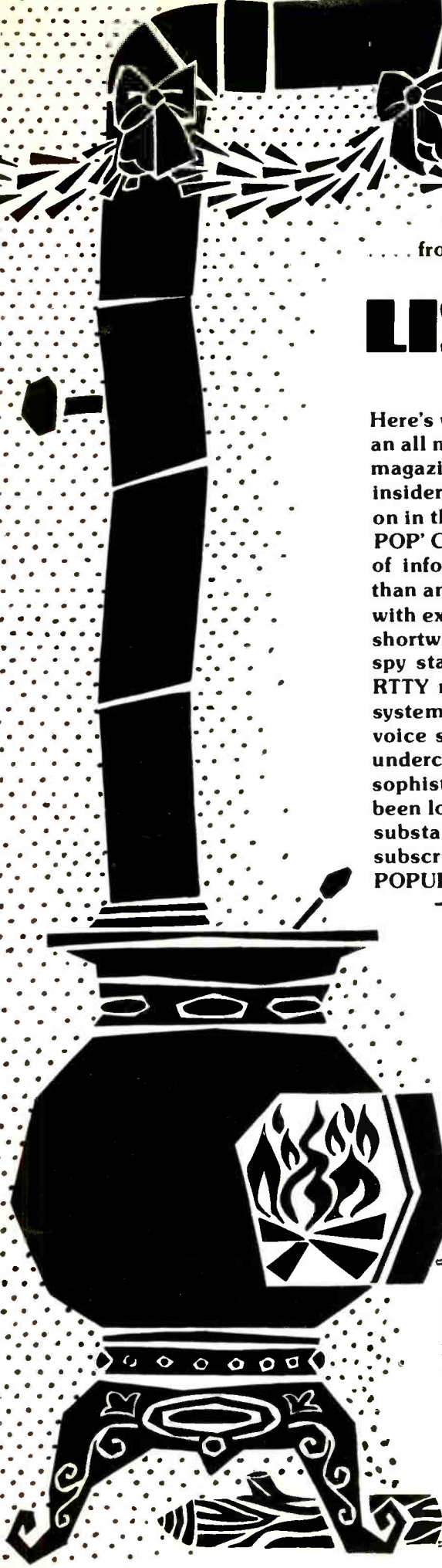
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through an RF amplifier for local coverage. Hoffman predicted that guerrilla TV "is the vanguard of the communications revolution . . . one pirate picture on the sets in . . . living rooms is worth a thousand words."

The Steal Yourself Rich Book has long been an underground classic and has not only influenced, but also instructed, many in the techniques of urban survival on the outskirts of established society.

The "Other" Book

The other book dealing with guerrilla broadcasting is *The Anarchist Cookbook* by William Powell (published in 1971). This book contains 160 pages and is still in print. Like Hoffman's book, the broadcasting section is really just a part of a comprehensive text dealing with many varied topics including electronics bugging, voice scrambling, sabotage of electronics equipment, explosives, weapons, and lots of other things. Want to know how to make chloride of azode? A garrote? Powell's book has it all.

The author points out that the broadcasting of propaganda via radio is vital to all underground movements. He even quotes Che Guevara, a fellow who was apparently a booster of underground broadcasting. Guevara said, "radio should be ruled by the fundamental principal of propaganda, which is truth; it is preferable to tell the truth, small in its dimensions, than a large lie artfully embellished." Che made no comment upon the status large truths or small lies, either plain or embellished.

Kwane Nkrumah is also discussed since his tactics also encouraged underground guerrilla broadcasting.

Powell actually discusses the use of high power mobile transmitters to jam other broadcasters, a policy that is supposedly better than doing nothing at all if a person has nothing much to say on their own behalf; at least it appears to be better than letting the other guy's words be heard. But he suggests that those who actually wish to broadcast check out FCC Part 15 low powered regulations which would at least permit broadcasting over a limited range without adding the FCC to any other problems which might crop up during one's activities. Don't forget that despite their love for guerrilla broadcasting and lack of fear of the FCC, neither Guevara nor Nkrumah are around any longer to observe the scene.

Persons seeking to build a complete reference library on guerrilla radio would certainly want to add these books by Hoffman and Powell to their libraries, although it may be very difficult (if not altogether impossible) to locate a copy of Hoffman's epistle at this point. Possibly it can be located in used book shops or shops catering to counter-culture customers. If there is sufficient reader interest in seeing the entire curious text of Hoffman's words on guerrilla broadcasting, maybe I'll run that chapter in a future issue of *POP'COMM*. Those who are interested, let me know.

In any event, much of the overall information in both books is not specifically about

guerrilla broadcasting and if *all* you're interested in is guerrilla radio, you may find some of the information to be a bit outside your scope of interest. Powell's wild book, in particular, may well cause you to become extremely angry if it doesn't scare the daylight out of you altogether. There is a notice, in fact, on the rear cover of Powell's *Anarchist Cookbook* stating that the book contains topics that are illegal and constitute a threat, some also being dangerous. Well said!

The Guerrillas Speak

In private discussions I've had with those experienced in guerrilla broadcasting, I find that many share a number of practices that they feel offers them some degree of protection from getting caught by the FCC and other agencies that might be seeking to chat with them.

For one thing, they disdain operating on a regular (predictable) transmission schedule, and they prefer operating on weekends or holidays, more often than not after midnight. This, they explain, because they perceive the FCC as basically a "9 to 5, Monday to Friday" operation and that on weekends, holidays, and in the wee small hours, the FCC mobile units only roll by prior arrangement when they expect to hear a station on the air. They theorize that since the FCC has to pay overtime for this, the chances of getting caught in the act are considerably lessened if a station simply pops up unexpectedly at such times. Of course, such a transmission policy makes it difficult for those who would listen to such broadcasts. I might explain that these theories concerning FCC operating practices are only the perception of the broadcasters; the FCC itself would hardly confirm if such views of their operations are valid.

Changing the station location is another tactic used, even though the location change might only be a few miles each time.

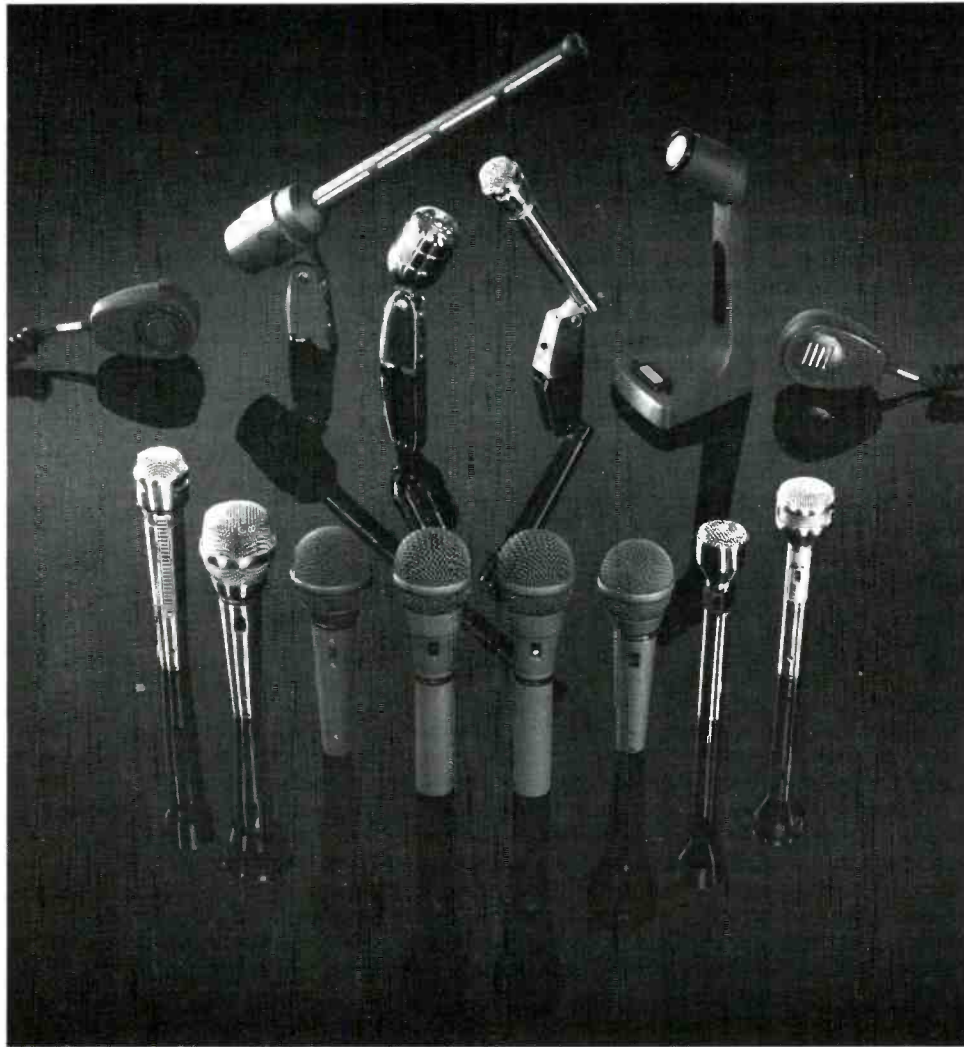
One broadcaster once told me about plans to establish a "moderately powerful repeater" which would pick up his studio's low powered legal (FCC Part 15) signals from a short distance away (maybe 1/4 mile) and then automatically rebroadcast them on another frequency. In this manner, even if the repeater was tracked down, the main station location might easily sign-off quietly to transmit again another day.

Legal Guerrillas

Actually, the FCC Part 15 low powered rules do permit what might be termed legal guerrilla broadcasting over limited areas, for instance a neighborhood. I suppose that one could actually transmit propaganda or even radical philosophies within the FCC regulations since FCC Part 15 doesn't regulate or limit program content, although other federal agencies might possibly become interested in the station operations to the dismay of the station proprietors.

*The Anarchist Cookbook is available from CRB Research, P.O. Box 56, Commack, NY 11725. Price is \$13.95 plus \$1 for Book Rate Mail or \$3 for First Class mailing.

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INSIDE THE WORLD OF TVRO EARTH STATIONS

In a recent official statement, the FCC concluded that the viewing of satellite TV programs and the manufacturing and sales of home satellite earth station equipment is perfectly legal. This timely clarification of the home earth station industry's status is largely due to the efforts of The Society for Private and Commercial Earth Stations (SPACE) which is the home satellite earth station industry's lobbying organization. Because of this FCC ruling, no longer can corporate giants like HBO and the Motion Picture Association of America write off home TVRO owners as pirates operating outside the law!

The 2nd annual SPACE Satellite trade show will take place November 3, 4, 5, and 6 in Orlando, Florida. SPACE will put the funds raised by this event to much needed use in their efforts on behalf of the home satellite industry. Announcements by HBO, Showtime, and others of plans to scramble their premium program services have not gone unnoticed. SPACE has been soliciting funds from major earth station manufacturers and distributors to launch anti-trust litigation in order to force these large media corporations into providing descramblers to home TVRO owners in return for a monthly programming and leasing fee.

Since the beginning of this industry, home satellite enthusiasts have offered to pay HBO and others for the right to watch their programs. To date they have rejected our offers and refused to put forward any proposals of their own. Their rationale has been that separate billing would be too complicated and expensive for them to deal with, since they usually bill cable companies which have tens of thousands of subscribers and pay a lump sum each month. SPACE has offered to collect the fees from tens of thousands of earth station owners and pay HBO with a single check, but so far this offer has been rejected.

An alternate solution that has been suggested would involve the payment of a royalty from the sale of each TVRO system. This royalty could be divided among the premium programmers. But this offer was also considered unacceptable by HBO and Showtime.

Since most earth stations are located outside the urban areas now served by cable, future scrambling threatens to make those living in rural areas second class media citizens. The premium program services are realizing millions of dollars in profits each year from satellite technology which by and large was the product of government research and development paid by the taxpayers of our nation. HBO and others are reaping benefits of America's technological know-how. It is my opinion that rural Americans should be provided with access to their services even if it requires an act of Congress or

Galaxy I Transponder Assignments

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2	3740	Group W	Westinghouse	(V)
3	3760	Time, Inc.	HBO (East Coast)	(H)
4	3780	Hughes Comm.	Reserve	(V)
5	3800	Time, Inc.		(H)
6	3820	SIN	Spanish Int. Net.	(V)
7	3840	Turner Broad.	CNN or WTBS	(H)
8	3860	Group W	Westinghouse	(V)
9	3880	Hughes Comm.	Reserve	(H)
10	3900	Times Mirror		(V)
11	3920	Hughes Comm.	Reserve	(H)
12	3940	Group W	Westinghouse	(V)
13	3960	Hughes Comm.	Reserve	(H)
14	3980	VIACOM Int.		(V)
15	4000	SIN	Galavision	(H)
16	4020	VIACOM Int.		(V)
17	4040	Time, Inc.	HBO	(H)
18	4060	Turner Broad.	CNN or WTBS	(V)
19	4080	Time, Inc.	HBO	(H)
20	4100	SIN	SIN or Galavision	(V)
21	4120	Time, Inc.	HBO	(H)
22	4140	Group W	Westinghouse	(V)
23	4160	Time, Inc.	HBO	(H)
24	4180	Hughes Comm.	Reserve	(V)

Note: Group W transponders will likely be used for distribution of the satellite news channels both national and regional. The reserve transponders now held by Hughes Communications will be subleased out to other programmers on a preemptible basis, so that in the event of a transponder failure, Hughes can provide their primary customers with a minimum interruption of service.

antitrust action on the part of the Department of Justice.

In addition to its efforts to solve the scrambling dilemma, SPACE also provides legal services to its members and a series of publications which can expand your understanding of various aspects of this new and exciting industry.

If your local zoning commission is threatening to "exile earth stations to the twilight zone," *SPACE's Zoning Book* is for you. This easy-to-read manual leads earth station owners, dealers, and their attorneys through the legalistic maze surrounding the zoning issue. This book contains sample ordinances with tips on how to fight restrictive legislation.

The SPACE Private Cable Book is an excellent manual for the businessman who is considering entering into the SMATV (Satellite Master Antenna) market which now provides thousands of hotels, condominiums, and apartment complexes with satellite-delivered program services.

The SPACE Question and Answer Book provides a basic outline of the home earth station industry in an easily readable question and answer format. This is a good introduction for newcomers and can be provided to retailers as a promotional item.

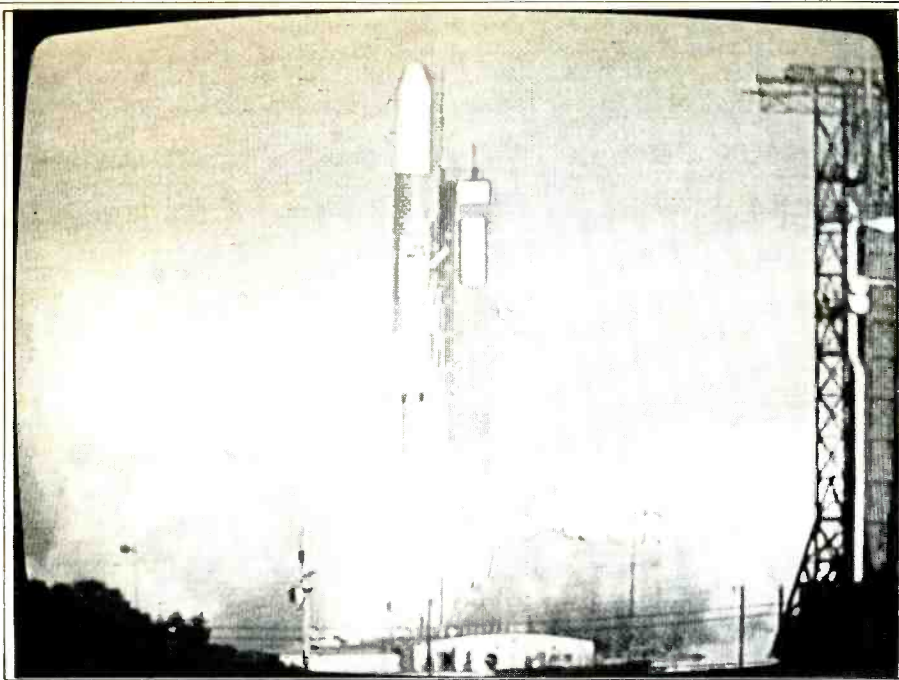
You can join SPACE either as manufacturer, distributor, dealer, retailer, or private earth station user. Members receive a

monthly subscription to the SPACE magazine, *SATVISION*. *SATVISION* updates its readers on current legislation, FCC regulations, and consumer and dealer news items. For further information contact SPACE, 1920 N Street, NW, Suite 510, Washington, DC 20036. Their phone number is (202) 887-0605.

The new Satcom IR satellite located at 139 degrees west longitude has been the home of some very interesting video during the last few months. Although Satcom IR was not originally envisioned as carrying much in the way of video services, the recent failure of half of the available transponders onboard RCA's Satcom II satellite required some shifting in services.

Satcom IR will provide one full-time transponder for the Holiday Inn teleconferencing program. As outlined in our September column, The Armed Forces Radio Television Service (AFRTS), which is beamed to overseas military installations around the world, can be viewed on Satcom IR's transponder 20, (H) polarization. Live coverage of the Space Shuttle Challenger missions can also be seen on IR via transponder 13, (V) polarity.

During the month of June we also noticed two other Satcom IR transponders being used for live coverage of the TDRS and Galaxy missions. The TDRS (Tracking Data



The launch of Galaxy I from Cape Canaveral was carried live via RCA's Satcom IR satellite. (Photo by Michael Bonnicksen)

and Relay Satellite) was launched from the Space Shuttle Challenger earlier in the year. A loss of oil pressure due to a faulty engine seal caused the failure of the second stage rocket engine guiding the \$100 million satellite. This prevented TDRS from immediately achieving a geosynchronous orbit. But, by timely bursts of the satellite's stationkeeping jets, the NASA engineers were able to nudge the satellite within a few miles of its originally-planned orbit. Unfortunately, the loss of stationkeeping fuel will affect the satellite's overall lifetime.

The probable cause of the TDRS failure was only determined after extensive tests and the examination of photographs taken by a secret Air Force camera that is located in the mountains of New Mexico. The high resolution capabilities of this camera allowed the engineers to zoom in on the spacecraft. The launch dates for future TDRS satellites have been postponed until engineering modifications are made which will lessen the probability of another malfunction in space.

Once completed, the TDRS satellite system will allow NASA to receive data from the space shuttle from any point within its orbital flight. Currently there are portions of the Challenger's orbit that lie outside of view of NASA tracking earth stations. TDRS satellites will also be able to relay data communications from all civilian and military satellites in earth orbits below 800 miles. Because of its relaying and monitoring capabilities, the TDRS satellites are given a high priority by the U.S. Department of Defense and the Pentagon.

In late June, we were also able to view the successful launch of the Hughes Communications Satellite Galaxy I (see photos) via Satcom IR. By the time you read this article, Galaxy I will be providing 24 transponders of cable TV programming from its orbital assignment at 135 degrees west longitude. A



Hughes Communications Galaxy I satellite is located at 135 degrees west longitude. (Photo courtesy of Hughes Communications)

preliminary listing of transponder assignments for Galaxy is provided in this column.

So if you are interested in viewing future American space missions involving either the Space Shuttle or the launch of satellites via rockets from the Cape Canaveral Space Center, Satcom IR is the bird to watch!

If you would like to learn more about satellite television, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available from: Solar Electronics International, 156 Drakes Lane, Summertown, Tennessee 38483. The price is \$9.95 plus \$1.00 for shipping and handling. Also available: International satellite coordinates computer printout (please specify site latitude and longitude when ordering). The price is \$6.00. Site Survey Kit has everything you need for finding the satellites, including engineer's compass, inclinometer, computer printout, and *The World of Satellite TV*. Price: \$35.95. *The World of Satellite Television* wall chart: \$3.00.

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CIRCLE 22 ON READER SERVICE CARD

Clandestine Communique

BY GERRY L. DEXTER



Pick up any daily newspaper or news magazine, or watch a network news program, and you're certain to find one or more stories that reflect situations in which clandestine radio is active or may well soon be active.

From Nicaragua to Namibia, clandestine radio stations are on the air. A war here, a guerrilla activity there, a people demanding change on the one side or trying to prevent it on the other. This is the stuff of which clandestine radio is made.

We are not talking about pirate stations here. Even though a pirate station, like a clandestine, is unlicensed, pirate broadcasters have a different goal in mind. Pirates usually go on the air for entertainment purposes (either of the station's audience or for the vanity of the operators). Pirates are rarely politically-oriented and are not backed by political organizations as most clandestines are. Clandestines usually have at least the tacit approval of the country from which they operate. Indeed, the governments themselves often operate or support clandestines. Pirates are individually operated, clandestines are not. It should be noted, however, that the lines of demarcation do get fuzzy from time to time.

Clandestine broadcasting is welded to the politics of a given situation. And these situations are subject to rapid change of course, meaning that clandestines can appear or disappear at any time as a friendship agreement is signed between two countries or a revolution is won. Following clandestines virtually requires one to stay up to date on what's happening throughout the world.

At the moment, there are dozens of clandestine broadcasters on the air—in many forms and guises.

Some are "pure" clandestine operations, complete with studio, transmitter, and antenna tucked away in some remote area, operated by a "revolutionary front" and calling for the overthrow of a government.

Others may pretend such credentials but take a more moderate line, or attempt through the programming to confuse the issue. These are the so-called "black" clandestines which, in actuality, are operated by those being targeted but pretending to be sympathetic to those calling for a change.

Some clandestine "stations" are simply programs aired by revolutionary or resistance groups that do not have their own transmitting facilities but are given time on

stations in sympathetic host countries. Angola and Ethiopia, which air programs produced by the Palestine Liberation Organization and Southwest Africa People's Organization, are examples.

Some others are actually creations of the opposing government. One suspects that in some cases this includes everything right down to the name of the so-called sponsoring organization. Government transmitters are then used to air the "clandestine" broadcasts. Khadafy's Libya is a prime example of this sort of approach.

Like regular shortwave broadcasters, clandestines run the full spectrum from the easy to log to the impossible. Some are just not on the air with schedules and frequencies which allow for reception in North America. But this too can change for any given station at any time.

QSLing the clandestines is usually a study in frustration and failure. There is no *World Radio TV Handbook* or *QSL Address Book* containing addresses for these stations.

Some clandestines do QSL however and have known addresses. Some would reply if only an address could be found, as the detective work of some DXers has proven. For the QSL hound, verifying clandestine stations has to be the ultimate challenge.

Frequencies used by the stations are often highly variable and the operating schedules also may change at any time or begin or end early. Many broadcasts suffer from jamming, for obvious reasons.

Our POP'COMM survey of the clandestines is listed by *target area*, rather than location since the location is often unknown or can only be speculated upon. Frequencies, times, and the very existence of the stations are subject to change at any time; and times are in GMT.

Iran The newest of the many Iranian clandestines is Salvation of Iran. Location and backers are unknown but it supports the monarchy. Scheduled on 11.660 and 9.032—the former from 1830 to 1925, the latter from 0300 to 0400. The station announces an address of P.O. Box 102, Graede Str. 2670 Copenhagen, Denmark.

The Voice of the Iranian Revolution broadcasts in Farsi and Kurdish from approximately 1230 to 1330 on 6.400, though the actual frequency is probably up to 40 kHz lower. The station also uses 7.247 though this too may vary. It has been on the air since mid-1983 but there are no clues as to its location or backing.

The National Voice of Iran is said to operate from Baku in Azerbaijan SSR, the USSR. It is scheduled from 1730 to 2000 on 5.915 and 6.025. It probably uses the facilities of Radio Baku.

Radio Vatan (Homeland) is reported to be Egyptian-sponsored and uses 9.027 and 15.555 from 1700 approximate to 1800, and approximately 0400 to just after 0600. One or two QSLs have been reported as a result of reports sent to Interad, U6 12A, D-6800, Mannheim 1, Federal Republic of Germany.

The Voice of the Mujahedin-e-khalq may

be one of those rare outlets using a mobile transmitter. It's reported to operate from a site near the Iranian border. Frequency is in the range of 6.600 to 6.700 and 9.100 to 9.200 from 1600 to 1700 and 1730 to 1830.

The Voice of Iran, operated by the National Resistance Movement of Iran, is scheduled from 0330 to 0400 on 15.315 and from 1805 on 9.605. This one favors former Prime Minister Bakhtiar. Although it has been off the air since mid May, a return to the air is not unlikely. The Iranians were jamming the transmissions, but there were several loggings in the United States. If it reappears and you hear it, you can try a report to Mouvement de Resistance National Iranienne, P.O. Box 187, 250-17 Besancon Cedex, France.

Radio Iran is another supporter of Bakhtiar and is on 11.640 from 1930 to 2000. It has announced an address c/o J. Lamers, P.O. Box 10603, NL-1001 EP, Amsterdam, Holland, although there are no known replies from this address. A second possibility is CB17, 17 Blvd. Raspial, 75007, Paris, France. Transmissions start at 0400 and run one hour, then again at 0600, both times using 9.570 variable, 7.180, and 3.367. Broadcasts appear to be via the Baghdad radio.

The Free Voice of Iran also uses 7.180 and 3.367 from 1500 to 1600 and a frequency varying between 9.550 and 9.600 from 0300 to 0355.

The Voice of the Iran Nation is reported to operate on 25.530, but there is no other information on that one.

The Voice of Iranian Kurdistan broadcasts in Kurdish, Persian, and Azeri from 1230 to 1440 on frequencies ranging from 6.556 to 6.589. This one may also be a mobile operation, situated near the Iran-Iraq border.

Iraq Iran's answer to the Voice of Iranian Kurdistan is, not surprisingly, The Voice of

Iraqi Kurdistan. It is reported to operate from the border area, possibly at Serdajt.

Also reportedly at this spot is The Voice of the Iraqi People, running from 1600 to 1700 on 7.860. This one supports the Iraqi Communist Party.

The Voice of the Iraqi Revolution uses 6.930 and 7.015 from 1500 to 1600 and 0500 to 0600.

And The Voice of the Masses of Iraq signs on at 1430 on 3.762 variable. Like most of the others, it is tough to hear in the United States and is jammed by Iraq.

Somalia The Voice of the Western Somali and Somali Abo Liberation Fronts (some of these names can be a real mouthful!) is aired over Radio Mogadishu facilities from 1200 to 1300 and 1930 to 2100 on 6.095.

Also via Mogadishu is The Voice of the Popular Front for the Liberation of Eritrea on 6.095 from 1830 to 1930.

Radio Halgan, The Voice of The Democratic Front For the Redemption of Somalia and the Somali National Movement is aired from 1800 to 1900 over the Voice of Revolutionary Ethiopia in Addis Ababa on 9.595.

Chad Radio Bardai, claiming to be part of the Chad National Radio, is actually a Libyan effort, hostile to Chad President Hissein Hobre. It claims to operate from the town of Bardai near the northern border of Chad, an area controlled by anti-Hobre, Libyan-backed forces. It also calls itself the Voice of the Chadian National Liberation army and signs on at 0800 on 6.009. To our knowledge, it has yet to be logged in the United States.


Upper Volta The Voice of the Upper Volta Popular Revolution also uses 6.009, scheduled from 2030 to 2130. Both Bardai and this one are via Libyan radio facilities.

Ethiopia The Voice of the Broad Masses of Eritrea is scheduled from 0400 to 0600 on 14.340 variable, 9.950-9.960, 7.450, and 3.760. One European listener has received

a QSL for a report sent to the Information and Propaganda Department, ETLF Base Area, Eritrea, via the Eritrean Relief Committee in Holland. But we've been unable to turn up an address for the committee in Holland. The station is backed by the Popular Front for the Liberation of Eritrea and claims to operate from liberated areas of Eritrea.

Sudan The Voice of the Sudanese Popular Revolution operates on 17.930/940 to sign off at 1730. It's another Libyan-backed effort, and occasionally uses 15.450 as well.

Palestine The Voice of Palestine is a program aired by a number of stations; via Mauritania on Thursdays from 2120 to 2150, via Angola from 2130 to 2200, via Baghdad from 1530 to 1600, over Algerian Radio from 1700 to 1800 and also via the government stations in North and South Yemen. Not all of these are on a daily basis.



Radio Broadcasting to Cuba

Cuba Independiente y Democrática

The current line-up of the C.I.D. network.

CID RADIO BROADCASTING NETWORK

RADIO STATIONS	FREQUENCY	METERS	DAILY HOURS	TIME SCHEDULE (Eastern Standard Time)
Máximo Gómez	11700	25	10	11:30 a.m. to 7:30 p.m. 8:30 p.m. to 10:30 p.m.
Antonio Guiteras*	7352	40	4	7:30 to 10:30 p.m.
José A. Echeverría	7465	40	½	8:00 to 8:30 p.m.
Frank País	7410	40	2	10:00 p.m. to 12 midnight
Antonio Maceo	4980	60	½	8:00 to 8:35 p.m.
Ignacio Agramonte*	5105	60	4	7:30 to 10:30 p.m.

*These radio stations also broadcast from 6:00 to 7:00 a.m.
All radio stations operate from outside the territory of the United States.

Check current frequencies used by these broadcasters for your tuning attempts. Reports on reception of the Angola broadcasts can be sent to P.O. Box 421, Luanda, People's Republic of Angola.

Libya The Voice of the Libyan People, probably a Sudanese operation, uses a number of frequencies including 11.977, 11.285, 11.460, 11.365, 12.645, 12.330, and 9.533 with occasional English programming during their schedule of 1530 to 1600 and 0530 to 0600. The sponsoring organization is the National Front for the Salvation of Libya.

Sahara The Voice of Free Sahara (La Voix du Sahara Libre) is operated by the Polisario Front and is scheduled on 15.150 at 2200 to 2300 (or 2100 to 2200). The address of the Polisario Front is B.P. 10, El Mouradin, Algiers, Algeria.

Angola A Voz de Resistencia de Galo Negro (Voice of Resistance of the Black Cockerel) is very likely backed by South Africa. It supports Jonas Savimbi and the UNITA movement and is scheduled on a Monday-Wednesday-Friday basis on 4.950 from 0430 to 0530.

"Cubanos de Africa" is our name for this unnamed station apparently beaming to Cuban troops in Angola on 6.045 for about a half an hour a day beginning around 0500. This one has been tentatively logged in the U.S. a few times.

Mozambique The Voice of the Mozambique National Resistance, operated by the group of the same name, was until recently "A Voz do Africa Livre" (The Voice of Free Africa). This one can be heard occasionally on 4.764 from 0400 to 0500 in Portuguese. It claims to be operating from inside Mozambique but is more likely to be in South Africa. An unproven address for this one is P.O. Box 169, Caseans 2752, Portugal.

Zimbabwe Another South African effort is Radio Truth, attempting to dislodge the Mugabe government. It has an English program at 0430 on 4.902 (sometimes 5.015 instead) and should be audible in the United States.

Namibia The Voice of Namibia, produced by SWAPO—The Southwest Africa People's Organization is, like the PLO broadcasts, carried over the facilities of a number of broadcasters; via Luanda, Angola on 9.535 at 1630, via Ethiopia on 9.595 from 1900 to 2000, via Tanzania on Sundays at 0415 on 9.750 and weekdays at 1830, and via Zimbabwe on 3.396 from 1900 to 1930 Mondays, Wednesdays, and Fridays.

The African National Congress produces the Radio Freedom program beamed by Addis Ababa on 9.595 from 1930 to 2000, via Angola on 9.535 from 1730 to 1800, via the Cameroons on 9.745 at 1845, via Tanzania on 9.750 at 0415 on Tuesdays, Thursdays, and Saturdays and on Mondays, Wednesdays, and Fridays at 1815. Addresses include C.P. 3523, Luanda, Angola and P.O. Box 7483, Addis Ababa, Ethiopia.

Lebanon The Radio Voice of the Great Homeland—Voice of the People's Revolution is yet another Khadafy original, aired from 1900 to 2000 on 15.235 and 17.930.

The Voice of Arab Lebanon, operated by a Nassarite movement, is on 6.233 from 0400 sign on and has been heard weakly on occasion in the U.S.

Turkey Bizim (Our) Radio, The Voice of the Turkish Communist Party, is on at 0400 on 11.820 (actually more like 11.818 or less) and is also on at 0600, 0800, 1000, 1200, 1600, and 1800; and on 9.585 variable at 2000 and 2200 and at 0000 on 6.200. Bulgaria, East Germany and Rumania are now or have been used as sites in the past.

Afghanistan The Voice of the United Muslim Fighters of Afghanistan is on the air in Pasto and Dari from 0100 to 0155 on 15.460 and 9.710, 1500 to 1555 on 15.305 and 9.710. This has been quite widely heard in the United States but reports to the address in Austria, it has announced, have been returned by the post office there.

Radio Free Kabul, operated by the Mujahadeen but organized and supported by

committees in Paris, London, and America is supposed to have a shortwave frequency, although the major broadcasting effort is through a series of low power FM transmitters. The shortwave frequency, if it really exists, has still not been traced.

South Yemen Another one which can be logged here is The Voice of the Free Sons (or People) of the Yemini South on 11.180 from 1300 to 1500 and 2000 to 2200. This may be a Saudi operation.

People's Republic Of China Radio Sparks, said to be the Voice of the Liberation Army, Proletarian Battle Division, has been on the air since the Cultural Revolution and is a Soviet "black" operation, pretending to be operated by army dissidents. Broadcasts last only five to ten minutes. Try between 0900 and 1130 on 7.170, 7.285, or 7.525.

First August Radio, Radio 8-1, or Radio Ba Yi began in 1979 and also uses the "quickie" broadcast approach. Try 12.120 between 1200 and 1530. We don't know if it means anything or not but "8-1" is also the designation of a Chinese handgun model. It's safe to say that the engineers at both of these anti-Chinese stations drink vodka!

Burma Kawthulay Radio, operated by the Karen National Union, just resumed operating this year and are said to be using a 10 kilowatt transmitter inside Burma. Several locations more specific than that have been reported. At any rate it is probably in Karen-controlled territory near the Thai border. Programming was interrupted recently during an attack by the Burmese army but the station is said to now be back on the air. It's scheduled at 0330 to 0530 on Tuesdays and Fridays on 9.775.

The Voice of the People of Burma, which supports the Burmese Communist Party, uses a variable frequency around 7.570 and occasionally 5.110 as well as 1200 to 1410 and 0030 to 0240, signing on with a clock chime. This one probably originates from China.

Thailand The Voice of the People of Thailand has been on the air for some time but is off at this writing. It may well return. It's said to have operated from Kunming Province in China.

Malaysia The Voice of the People of Malaysia (or Voice of the Malayan People) is on variable 7.050 to 7.070 from 1130 to 1330, 1430 to 1530, and 2130 to 2230.

The Voice of Malaysian Democracy is on 6.500, 6.670, and 8.990 from 1215 to 1330. Both of these stations are Chinese-backed and undoubtedly operate from sites in the People's Republic.

Kampuchea Voice of the National Army of Democratic Kampuchea is a relatively new one. Scheduled on 5.200 from 1000 to 1330 and 2230 to 2300 in Cambodian and Vietnamese.

The Voice of Democratic Kampuchea uses 4.130 and 15.165 from 1200 to 1255; 2330 to 0030 on 15.600, 11.685, 9.530, 8.345, and 6.825; 0400 to 0500 on 15.100 and 11.725; 0900 to 1000 on 15.115 and 11.870; all via Radio Beijing facilities.

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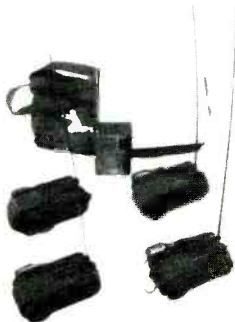
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Nosotros indígenas miembros de Misurata-Sic: Charles Hodgson, Benjamin Joseph, Junior Oum, Stanford Cardenas, Junior Cacho, Rinaldo Kooor, Eduardo Doreen y Nimroy Hodgson huyendo del terror, la represión y genocidio que el FSLN ha emprendido contra los pobladores de la Costa Atlántica de Nicaragua, salimos de Monkey Point el Sábado 29 de enero de 1983 en el barco pesquero Mis Rita denunciando ante los pueblos y gobiernos del mundo, orgnizaciones indígenas, políticas, sindicales y gramales y de Derechos Humanos, las capturas masivas con fines represivos y "jerofiticos" realizadas en el mes de Enero en diferentes zonas de la Costa por el ejército del FSLN en combinación con extranjeros intarventores:



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- Cocal	40
- Tasha Powmy	300
- Orinoco	300
- Marchal Point	50
- Sandya Norte	16
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QSL from the Anti-Chilean clandestine carried over Algerian Radio.

The newspaper published by the Movimiento Democrático Nicaraguense (part of the ARDE), operators of La Voz de Sandino.

North Korea Echo of Hope, a South Korean operation for many years, can occasionally be heard around 1200 on 6.350.

South Korea The answer to Echo of Hope is The Voice of the Revolutionary Party for Reunification, a North Korean invention which has been on the air since 1970 and uses 4.118 and 4.556 from 1000 to 1430 and 1500 to 1700.

Cuba La Voz de Cuba Independiente y Democrática, operated by Cuba Independiente y Democrática, runs several "stations," including Radio Maximo Gomez on 11.700 (over Radio Clarin, Dominican Republic) from 1630 to 0030 and 0130 to 0330 daily. See this month's "Listening Post" column in POP/COMM for a more detailed discussion of La Voz del C.I.D.

The only other of the several anti-Castro broadcasters which were active in recent years and are currently on the air seems to be La Vox de Junta Patriótica Cubana (Radio Mambi), although broadcasting does not seem to be on a regular basis. Try during local evenings around 7.080. If you should hear them, you can try a reception report to Captain A. S. Alvarez, Box 970115, Miami, Florida 33177.

El Salvador The Farabundo Marti Liberation Front (FMLN) operates several stations, including Radio Guazapa, La Voz de Cuscatlan, beamed at the Hector Ramirez Central Front in Cuscatlan Department. It's been on since early 1983 and is heard around 0130 in the 9.830-850 area, moving around to avoid jamming.

The well-known Radio Venceremos operates in the 7.040, 6.667, and 6.957 areas (widely variable) at 0000, 0230, 1200, and 1700. It claims to operate from Morazan

Province. Radio Venceremos does verify reception reports sent to Apartado Postal 7-907, Mexico D.F., Mexico.

Radio Farabundo Marti, operated by the Fuerzas Popular de Liberación (FPL, which is part of the FMLN), says it is in northern Chalatenango Province with a staff of about 15 people operating out of underground studios. Frequencies change often but you can try 6.950 to 7.050 at 0100.

Another FMLN station is Radio Unidad—La Voz de la Resistencia, said to operate weekends at 0100 on 7.000. We know of no definite loggings of this one.

Another station which may, in fact, be operated by the El Salvador government (or the CIA?) calls itself Reorinacion and calls for dialogue rather than war. It's scheduled at 1200 and 1800 on frequencies near to those of the other El Salvadoran clandestines and it may well be one of those black operations claiming to be something it is not.

Nicaragua The increased anti-Nicaraguan government activity over the past couple of years has brought with it a similar increase in clandestine activity aimed at Nicaragua.

Radio Miskus, a "voice against atheistic communism," speaks on behalf of the Miskitos, Sumos, and Ramas Indians. It is scheduled from 0200 to 0300 and 1100 to 1200 on 6.915 and 6.870.

La Voz de Nicaragua Libre opened early in 1983 and is the Voice of the Democratic Revolutionary Alliance (ARDE) with programs at 0000 and 0400. Frequencies used include 5.675, 5.685, 5.893, 5.812, and 5.760, although not all of them at any one period.

Closely linked to the Voice of free Nica-

ragua is La Voz de Sandino which, in fact, may well share transmitting facilities. The Frente Revolucionario Sandino (Sandinista Revolutionary Front) operates this (through ARDE) with broadcasts at 2300, 0400, and 1100, usually on 6.220. The well-known Eden Pastora Gomez (Commandante Cero) is linked to this one.

Radio Quince de Septiembre, operated by the 15th of September Legion, uses frequencies varying around 6900, 7000, 6800, and 5.565 at 0230, 0500, and 1130.

Pacific There is (somewhere!) a quasi-clandestine, sorta pirate calling itself Radio Tropical—The Voice of the Nuclear-Free Pacific, which has been heard in Australia on 7.295 variable at 0815 to 0900. Information on this one is too thin to decide if it's more pirate than clandestine.

As we've pointed out, clandestines can come and go with the rapidly changing political tides in various parts of the world. It's unfortunate that so many do not operate at times or on frequencies which give North American DXers much of a shot at them and do not have stable frequencies or schedules.

It's unfortunate that it's so difficult to get QSLs from clandestines, that so often there are no clues as to where to start even to try to find a potential address. (Incidentally, if you want to play detective, be sure to let us know if you come up with anything!)

And it's too bad that we often don't know who is really behind the voice behind the microphone.

But all of that is part of the fun! If you like to follow world news events and like a good mystery as well, clandestine radio combines both into a fascinating aspect of the short-wave listening hobby.

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Clandestine broadcasting holds a special fascination for many listeners. It incorporates a touch of mystery coupled with a reflection of world politics.

Clandestine radio activity directed towards Cuba was running hot and heavy a year or two ago with some half dozen stations on the air on a more or less frequent basis. The 7 megahertz band was alive with anti-Castro clandestines, mostly operating from the Florida area. Some were busted by the FCC, others seem to have just quietly faded away.

One such station, La Voz de Cuba Independiente y Democratica, hasn't disappeared. In fact, it's expanding.

Cuba Independiente y Democratica was founded in Caracas in 1980 by "a group of professionals" who saw a need for broadcasting to Cuba—and by mid 1981 that's just what they were doing as La Voz del Cuba Independiente y Democratica came on the air. The daily program ran for thirty minutes. Now broadcasts amount to over twenty hours per week, with more to come.

The six station La Voz del C.I.D. network has a total power of over 50,000 watts, although two of the stations used are commercial outlets from whom La Voz del C.I.D. buys air time.

C.I.D. is a political organization that wants to see a democratic system installed in Cuba. The group says it has the backing of a number of governments in Latin America and elsewhere, along with world leaders, labor unions, and others in both America and Europe. Through its broadcasting effort, C.I.D. tries to break the hold of the Castro government on the mass media in Cuba and to inform people on the island of news, trends, and developments of which they might otherwise not be aware. C.I.D. also works at gaining additional support from governments, leaders, political parties, and labor unions around the world and towards the organization of Cuban exiles to make them better able to work toward a solution to the problems in Cuba.

The first La Voz del C.I.D. transmitter went on the air in July, 1981. C.I.D. says that by the end of 1983 there will be ten transmitters on the air (compared to six at this writing). One of these will be a 100 kilowatt medium wave transmitter.

C.I.D. programming consists of music, cultural, sports, religious, political satire, and ideological programs. Books which are banned in Cuba are serialized on the radio.

Broadcasts are aimed at three audience groups—the general population, youth, and the Cuban armed forces and government. Eventually each of these segments will have 18 hours of programming per day tailored to them.



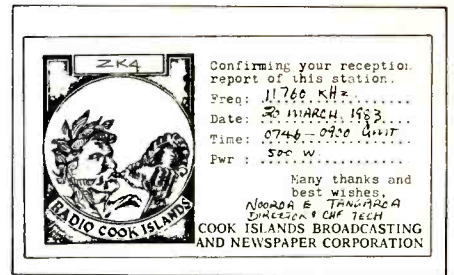
The shack of Elmer J. Cronkright showing his Kenwood R-1000, NC109, NC270, and Sony Earth Orbitor.

C.I.D. admits that, at one time, two of the C.I.D. stations were operating from the Miami area. But now, according to C.I.D., all of its transmitters are outside of the U.S. territory (and thus outside the jurisdiction of the FCC!)

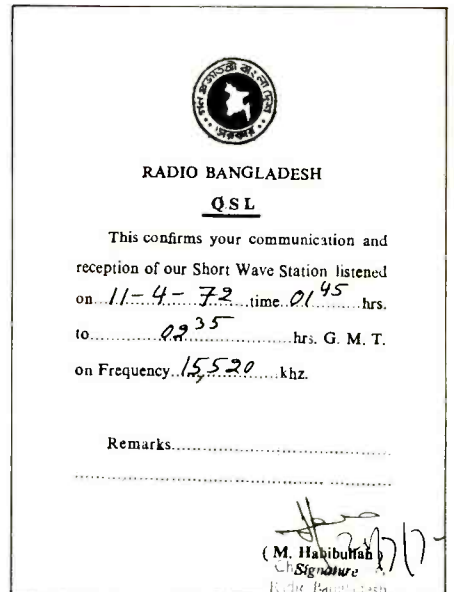
It appears that the C.I.D. programs are getting through to Cuba as reception reports have been received from all of the provincial capitals of Cuba, smaller towns, and the countryside. C.I.D. says that exiles and persons returning from visits to Cuba report the audience in Cuba is large and growing. Reports have also been received from Central America, the Caribbean, Australia, Italy, Africa, Germany, Finland, the United States, and a number of other countries.

Some 36 people are currently involved in producing C.I.D. broadcasts, most of them professionals who have been in broadcasting for years (probably in Cuba). It's eventually planned that the staff will total some 80 persons. A transmission aimed at Cuban troops serving in Africa is also being planned.

C.I.D. places an overall price tag of \$3.5



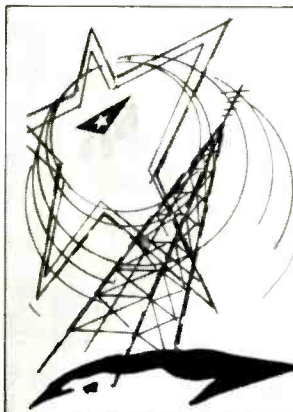
Radio Cook Islands sent this QSL to Mark Konen.



A verification card from Radio Bangladesh, from Mark Konen's collection.

million as the amount it will take to bring the operation up to its planned size and scope. Right now it costs about \$750,000 per year to operate the C.I.D. network. Much of the funding comes from donations through foundations, businesses, and individuals.

La Voz de Cuba Independiente y Dem-

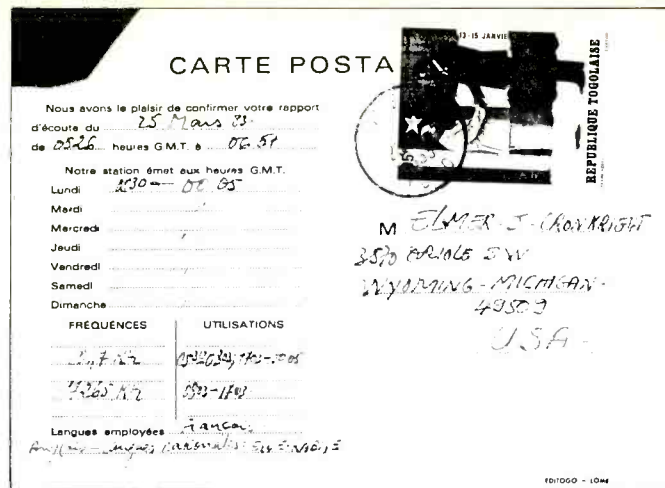
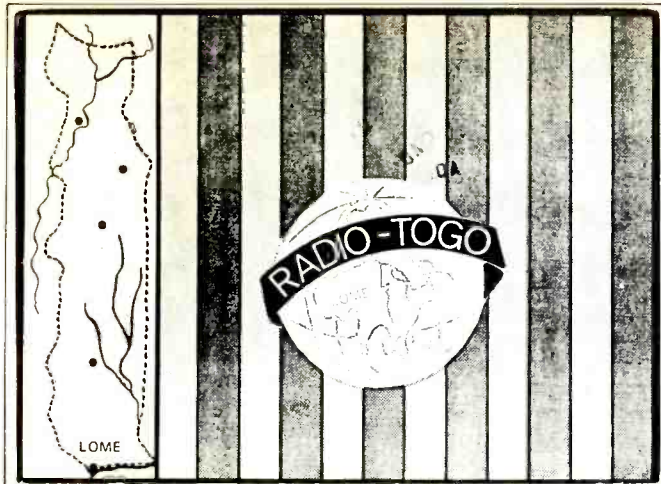


LA VOZ DEL CID

certificado de sintonia

A _____
 QUIEN NOS SINTONIZO EL DIA 10 de mayo de 1983
 DE LAS 1.00 GMT, A LAS 1.30 EMISORA: Antonio Guiteras
 EN LAS BANDAS DE 40 MTS. FRECUENCIA 7352 Kc/s

QSL from La Voz del Cuba Independiente y Democratica confirming reception of Radio Antonio Guiteras on 7.352.



Radio Togo's QSL card, sent to Elmer J. Cronkright.

ocratica's current network line-up is as follows:

Radio Maximo Gomez: on 11.700 (over Radio Clarin in the Dominican Republic) daily from 1630 to 0030 and 0130 to 0330.

Radio Antonio Guiteras: on 7.352 from 1100 to 1200 and 0030 to 0330. Transmitter probably located near Miami, Florida.

Radio Jose A. Echeverria: on 7.465 from 0100 to 0130. But despite many checks over a period of several weeks, this outlet has not been heard.

Radio Frank Pais: on 7.412 from 0300 to 0500. Transmitter probably located in the Dominican Republic.

Radio Antonio Maceo: on 4.980 (over Ecos del Torbes in Venezuela) from 0100 to 0135.

Radio Ignacio Agramonte: on 5.106 from 1100 to 1200 and 0030 to 0330. This is probably located near Miami, Florida.

La Voz del C.I.D. welcomes reception reports and issues its own QSL card. Reports may be sent to Bernardo Morrell, C.I.D. Delagacion de Costa Rica, Apartado Postal 5557, 1000 San Jose, Costa Rica. If you want a quicker reply, try sending a self-prepared card to the C.I.D. Miami office at 10020 SW 37th Terrace, Miami, Florida 33165.

News Views

There's a lot to mention this month, including Alaska. KNLS (for "New Life Station") was to have begun regular programming from its Anchor Point location on July 18th. The fall schedule calls for them to use 9.620 from 0600 to 1100 and 6.170 from 1100 to 2000. The station will carry religious programs in Ukranian, Mandarin, and Russian. Reception reports can be sent to KNLS, Box 473, Anchor Point, Alaska 99556. Some country lists count Alaska as a separate country (along with Hawaii) due to the distance involved from the continental U.S. So, if you use a liberal list, you'll have a new country when you log KNLS.

If you've had trouble hearing Tunisia, you'll be happy to learn that Radiodiffusion Television Tunisienne has put a foreign service into operation. It's beamed to Tunisian

workers in Europe and is on in Arabic only from 1900 to 2100 on 11.745.

La Voz de la Revolution in Burundi has upgraded its facilities, adding a 100 kilowatt transmitter. It's now scheduled from 1600 to 2200 on 7.250, 2200 to 0000 on 15.200, and 0700 to 1000 on 17.800. Be careful of Africa Number One, also using 15.200.

The Far East Broadcasting Company, operators of shortwavers in the Philippines, the Seychelles, and the United States (KGEI) should have tested its new station in Saipan by now. KFBK will join KYOI there. Two high power outlets on one small island. KFBK will program a religious service in English, Chinese, Russian, and Indonesian.

It's reported that the international service from Uganda has been suspended, at least for the time being. However, the regional outlet on 5.026 is apparently still on the air.

Radio Thailand has expanded its hours of English transmissions, now running from 2330 to 0430 on 9.655.

POP'COMM headquarters tells us that several of you have called to ask "what happened to WYFR?" Not only do we not know what happened, we don't know that anything did happen! As this is written, we're receiving WYFR loud and clear in The Listening Post, at 1645 GMT on 15.440 in their Russian service.

Club Call

Local and regional DX clubs are great ways to make personal contact with others of like-minded interests. If you are a member, or the head of such a club, send us the details on your organization and we'll be glad to give it a mention and perhaps send some new members your way.

DXers living in Minnesota can join the Minnesota DX Club, open to DXers and listeners no matter what their bag may be, from shortwave broadcast to TV DXing. Club dues are \$6 per year and regular monthly meetings are held, along with an annual picnic and DXpedition. For more information, write the Minnesota DX Club at 5212 Drew Avenue South, Minneapolis, Minnesota 55410.



For Radio Netherlands program schedule, write the station at P.O. Box 222, 1200 JG, Hilversum, The Netherlands.

Mailbag

Our mail brings an interesting letter from retired SPEEDX QSL editor John M. Kapinos of Shrewsbury, Massachusetts who comments on a couple of answers to questions we posed a few months ago.

It seems there is a digital readout unit that will work with just about any shortwave radio. It's the Torrestronics TK1 which John found worked with the Hallicrafters S-38 series. He also tried it with success on Hammarlund SP600, HQ110, HQ100, HQ129, and HQ180, plus an old National HRO,

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CIRCLE 71 ON READER SERVICE CARD

Yaesu FRG-7, and Radio Shack models DX100, 120, 150, and 160. John says hook-up is very easy (no soldering) and the unit sells for around \$125. For more information contact Torrestronics, 4850 Hollywreath Court, Dayton, Ohio 45424.

John says he's also a member of the rather exclusive club made up of those who've had a file at the CIA as a result of their radio listening. Ye ed's a member too! The CIA had copies of envelopes addressed to John from Radio Moscow, Radio Sofia, and Radio Prague back in the late 1950's. John knows of one listener who was paid a visit by the FBI suggesting that the DXer not send reports to Iron Curtain countries. John points out that this was during the McCarthy era when witch hunts were rampant. Your editor feels there's no need to worry about such things now; send reports to whomever you want and listen to whatever station you like.

Robert Pastrick of Baden, Pennsylvania is a new and soon-to-be regular POP'COMM reader. He's an active CBer and for SWLING uses a Realistic DX200, Nacional NC240, and several portables and scanners. A home-brew multi-band dipole and longwire antenna capture the shortwave signals. Bob's active in listening to ham operators too and also DXers on the utility bands.

Bill Nellman of Norwich, Connecticut uses a Realistic DX150A with 180 feet of longwire antenna. The tropical bands are his favorite hunting grounds. Bill also DXes on the AM and FM broadcast bands and collects stickers from radio and TV stations. He'd like to correspond with other collectors. His address is 8 Autumn Way, RFD2, Norwich, Connecticut 06360.

Lynn Merica of Millersville, Maryland has a 30 foot indoor antenna attached to a DX302 receiver.

Listening Reports

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

Albania Radio Tirana noted on 7.065 from 0000 to 0028 with a talk in English about Yugoslavian propaganda. CW QRM. (Konen, WI) At 0000 in English on 7.065. (Merica, MD)

Algeria Radio Algiers heard on 17.745 with news at 2001, *International Event of the Week* at 2013 and music from 2018 to sign off at 2030. (Cronkright, MI)

Armenian SSR (USSR) Radio Yerevan noted at 0252 on 15.180 in English to sign off at 0259. (Konen, WI) Via USSR transmitters. (Editor)

Belgium Brussels Calling noted at 0100 to 0115 on 9.880 to North America including the P.O. Box 26 mailbag program. (Pastrick, PA)

Bulgaria Radio Sofia heard at 2130 on 11.750, at 1500 on 11.720, and on 15.110 at 0030 according to announcements by the station. (Merica, MD) Noted at 0400 on 11.750 with identification and frequency announcements. (Nellman, CT)

Canada Radio Canada International, announced 15.260 at 1800 and 2100, 11.955 and 17.820 at 1300 to 1600 on Sundays. (Merica, MD)

28 DE JULIO - 45 ANIVERSARIO DE XEQ

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XEQ

Radio Universidad de San Luis Potosi, XEQ, Mexico celebrates 45 years on the air this year. They're on 6.045 MHz.

Canary Islands Radio Exterior de Espana, via Tenerife, heard in Spanish on 15.365 at 0032. Identification at 0044 and 0110; using 9.360 at the same time. (Pasz-kiewicz, WI)

Clandestine Radio Quince de Septiembre heard at 0514 on 6.900 with man announcer in Spanish, occasional music and identification announcements. (Konen, WI)

Colombia Radio Super de Medellin on 4.875 noted at 0327 in Spanish. (Nellman, CT) La Voz del Llano in Villavicencio, heard on 6.115 at 0510 in Spanish with lively Latin music. many identification announcements. (Konen, WI) Lately seems to be on 24 hours. (Editor)

Costa Rica The new Radio Impacto on 6.150 at 0025 with a powerful signal, many "Impacto" IDs, ballads, dance music. (Konen, WI)

Cuba Radio Havana's English service heard beamed at Europe on 11.690 at 2010. (Merica, MD)

Denmark Radio Denmark on 15.165 from 2356 with interval signal, English and Danish announcements, into Danish beamed to Australia at 0000. (Konen, WI)

Dominican Republic Radio Earth International over Radio Clarin, 11.700, heard at 0332 with their program "The World." (Pasz-kiewicz, WI) Late start at 0338 (instead of 0330) for their initial broadcast. (Konen, WI) Radio Earth is aired daily except Sundays at 0330 over Radio Clarin. Reception reports go to Radio Earth, Hilton Hotel, Curacao, Netherlands Antilles. (Editor)

Gabon Africa Number One, at Moyabi, heard on 15.200 at 0930 with modern African rhythms, man announcer in French. (Konen, WI)

Guinea Radio Television Guineenne, La Voix de la Revolution, noted on measured 15.309.8 at 2009 with man reading news in

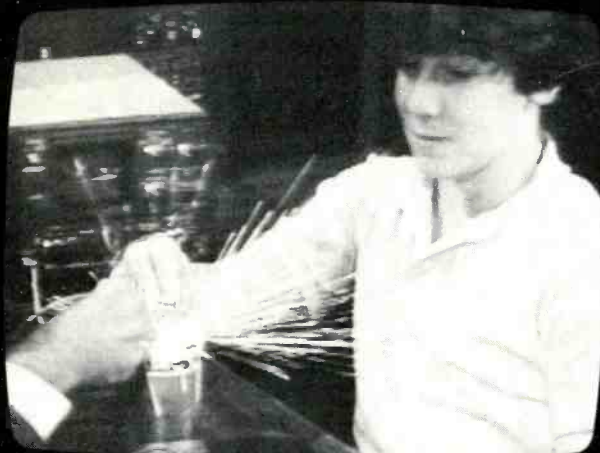
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CIRCLE 66 ON READER SERVICE CARD

French, local music, talk in vernaculars. (Konen, WI)

Guam KTWR heard at 1358 on 9.510 with English, ID, religious program, and address. (Paszkievicz, WI)

Guyana The Guyana Broadcasting Corporation, noted on 5.950 from 1020 to 1100 with programs like "Viewpoint," ads, music, birthday, and obituary announcements. (Cronkright, MI)

Indonesia Radio Republik Indonesia at Jayapura heard on 9611.7 from 1025 to 1105 with instrumental Indonesian music, man and woman announcers. Interference from Australia on 9.610 and KGEI on 9.615. (Konen, WI)

Ireland Radio Dublin International heard with English-speaking disc jockey at 0250 on 6.910, pop and rock music with identification at 0310. (Paszkievicz, WI)

Israel The Voice of Israel, heard from 0015 to 0030 on 9.815 in English with Hebrew lessons. (Pastrick, PA)

Kiribati Radio Kiribati, 16.432.9 noted from 0538 to 0704 in English and Kiribatese, with choral music, BBC news at 0600 after time check and identification. (Konen, WI)

Kuwait Radio Kuwait, 1800 to 1825 on 11.675 with English broadcast and pop music program. (Pasterick, PA)

Libya Radio Jamahiriyah, 11.816 in English with *Happy Music Program*, readings from the Green Book and frequency announcement at 11.816, not 11.815.



News at 2235. (Paszkievicz, WI) Noted in English at 2200. (Merica, MD) This station is now QSLing quite rapidly for reports sent to their European Branch Office at P.O. Box 17, Hamrun, Malta. Director in Malta is Mohammed Sweidan. (Editor)

Netherlands Radio Netherlands is scheduled in English to North America from 0230 to 0325 on 9.590 and 6.165 and again from 0530 to 0625 on 9.715 and 6.165. (station) Heard at 2045 on 11.730. (Merica, MD)

Netherlands Antilles Trans World Radio, Bonaire, identifying in Spanish as "Radio Trans Mundial" heard at 1056 to 1100 sign off on 9.560. (Nellman, CT)

Nicaragua Radio Zinica at Bluefields was noted at 0445 on 6.120 with identification, mention of frequency and romantic Latin music. La Voz de Nicaragua on 5.950 heard at 1123 with man and woman alternating on the news and a brief tone between each item. (Konen, WI)

Paraguay Radio Nacional de Paraguay found on 9.735 at 0232 with a program of live classical music, identification, mentions of Paraguay and then what was probably the national anthem before sign off at 0255. (Paszkievicz, WI)

Papua New Guinea Radio New Ireland, 3.905 heard at 1003 in Pidgin with local music and possibly religious service. (Konen, WI)

Roumania Radio Bucharest heard at 0356 on 11.940 with identification, interval signal, and program in English beginning at 0400. (Nellman, CT)

Spain Radio Exterior de Espana noted broadcasting to Africa on 15.375 at 2000 and to North America at 0100 on 9.630. (Merica, MD)

Somalia Radio Mogadishu noted at 0300 on 6.790 with national anthem, identification in Somali, Koran recitations in Arabic or Somali, identification at 0330 and into music. (Paszkievicz, WI)

South Africa The Radio Five service logged on 3.250 at 0409 to 0438 with rock music, advertisements for soft drinks, vitamins, motorcycles. (Cronkright, MI)

Sweden Radio Sweden International on 15.270 from 2304 with news in English, sports, *Weekday Monday*, folk and pop music from Scandanavia. (Paszkievicz, WI)

United States United Nations Radio (via VOA facilities) heard in English at 2115 on 15.120 with *Caribbean Echo*, talk about Palestine and the UN, The OAU, followed by identification and schedule announcement. (Paszkievicz, WI) WYFR says it is using 9.535, 11.830, 15.440, 21.525, and 21.615. (Merica, MD)

Uruguay Radio El Espectador, on 11.835 at 0026 with two man announcer team alternating with news, jingle, and station identification. Lost to the BBC when they signed on at 0029. (Konen, WI)

USSR Radio Moscow noted in their North American Service, in English from 2345 to 2358 on 11.790. (Pastrick, PA)

Venezuela Radio Nacional de Venezuela heard at 1104 on 9.570 in Spanish but with interference. (Nellman, CT)

A reminder that we seek your reports on what you're hearing, when and where. Be sure to include some detail, at least as to language used. It's not just your logs that are welcome either! Good, high contrast copies of your more interesting QSLs, photos of you and your shack with a rundown on your equipment (black and white or color shots) plus station schedules you've received, comments, questions, news, notes, and just about anything else! Let's have your input. Class participation is important.

And our thanks to: Sheryl Paszkievicz, Manitowoc, Wisconsin; Mark Konen, Milwaukee, Wisconsin; Bill Nellman, Norwich, Connecticut; Robert Pastrick, Baden, Pennsylvania; Lynn Merica, Millersville, Maryland; and Elmer J. Cronkright, Wyoming, Michigan.

We'll be back next month and we hope you'll join us in *The Listening Post*. Till then—good listening!

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BUY TWO—GET ONE FREE! You'll be glad to know that these albums are available in the mail for the low price of \$4.99 each (your choice of LP's, cassettes or 8-tracks)—better yet, buy any two records or tapes and you get a **third one of your choice absolutely FREE!** (All prices include postage and handling charges).

DO IT NOW. So you don't forget when the holiday crunch really hits, why not order right now! MERRY CHRISTMAS!



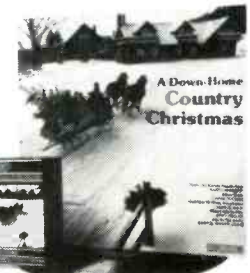
IT'S CHRISTMAS TIME! Andy Williams / The First Noel • Julie Andrews / It Came Upon The Midnight Clear • Brothers Four / God Rest Ye Merry Gentlemen • Barbra Streisand / Ave Maria • Mitch Miller / We Three Kings Of Orient Are • Anita Bryant / O Come All Ye Faithful • Johnny Mathis / What Child Is This • Patti Page / Santo Natale • Anthony Newley / Coventry Carol • Ray Conniff & The Singers / We Wish You A Merry Christmas

A COLLECTION OF CHRISTMAS FAVORITES Tony Bennett / My Favorite Things • Jim Nabors / Joy To The World • Barbra Streisand / The Christmas Song (Chestnuts Roasting On An Open Fire) • Mahalia Jackson / O Holy Night • Percy Faith & His Orchestra / Happy Holidays • Bing Crosby / God Rest You Merry Gentlemen • Jerry Vale / White Christmas • Ray Conniff Singers / Little Drummer Boy • Andre Kostelanetz / Sleigh Ride • Robert Goulet & Carol Lawrence / Angels We Have Heard On High



SILENT NIGHT... Julie Andrews / Silent Night, Holy Night • Andy Williams / Hark The Herald Angels Sing • Peter Nero / Trepak From *Nutcracker Suite* • Vikki Carr / It Came Upon The Midnight Clear • Percy Faith / Oh Tannenbaum • Johnny Mathis / Do You Hear What I Hear • Mahalia Jackson / Mary's Little Boy Child • Ray Conniff / Go Tell It On A Mountain • John Davidson / What Child Is This • New York Philharmonic / The Twelve Days Of Christmas

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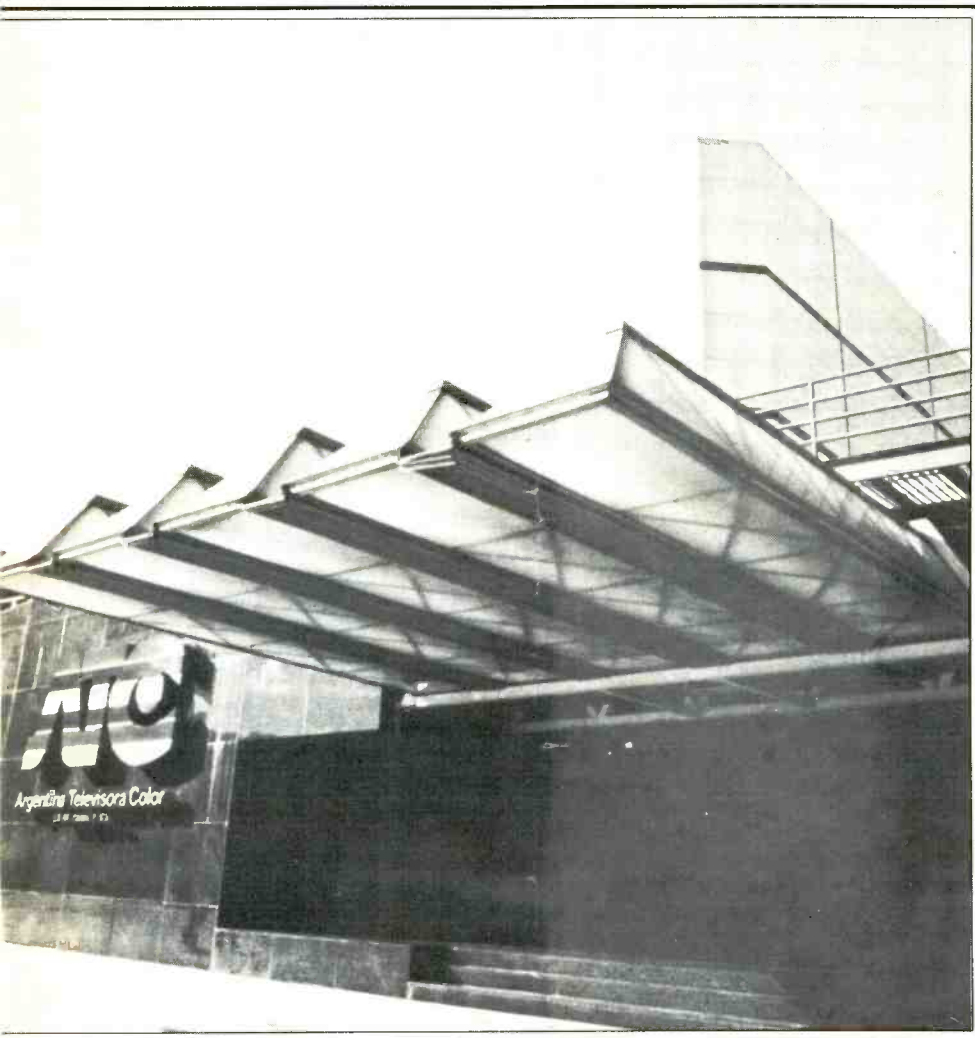
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“Liberty” And The Falklands Radio War

Argentina’s Sultry Propaganda Radio Personality



Exterior of Argentina Televisora Color studios.



Control room of Argentina Televisora Color, channel 7.



Exterior of ATC studios and Buenos Aires skyline.

BY DON JENSEN

“Hello, Tommy . . . I am Liberty!”

The voice was soft and throaty, honey-butter smooth and sexily intimate.

“You haven’t heard me before, have you, Tommy?”

Thousands of Tommys—Britain’s military Everyman—were at sea, headed south toward a place that the world had just learned to locate, the Falkland Islands.

For just 66 days in 1982, Liberty broadcast her blend of music and talk, nostalgia and impending death, soft-sell sex and Argentine chauvinism to British troops, before, during, and after the brief but bloody Falklands war.

Who was Liberty? To this day, the Argentine government remains mum. But now, for the first time anywhere, *POP’COMM* can now identify the mysterious lady known as Liberty.

“You are far away from the things you love,” the seductive voice purred that first night of April 22. “I shall accompany you throughout your trip. Now here’s something you’ll love to hear . . .”

From the loudspeaker came the familiar chimes of Big Ben.

But it wasn’t some South Atlantic-bound paratrooper or seaman who heard that initial broadcast. It was a 73-year-old businessman and ham radio operator, John Hurn, who tuned in the 16-meter-band shortwave signal quite by chance, thousands of miles away in London.

“I realized right away that I was on to something hot,” Hurn later explained. “So I recorded the program for 45 minutes.”

Hurn would deliver his tape to a surprised British Defense Ministry. He also would be credited with coining the nickname which quickly was picked up by the press—Argentine Annie.

Oldtimer Hurn recognized that Annie was a throwback to an earlier era, World War II, and its propaganda dollies, Tokyo Rose and Axis Sally.

Although there is no solid evidence that any member of this psychwar sorority ever accomplished her purpose—lowering the morale of opposing troops—each became a widely listened-to radio personality.

Before her short career ended, Liberty/Annie had also provoked Great Britain to

launch its own propaganda station called Radio Atlantico del Sur.

Like her predecessors, Liberty fascinated shortwave fans who tuned her daily programs on 17,740 kHz. Briefly, probably just on the first day, the transmissions also were aired on 25,680 kHz.

Her broadcasts were repeated four times a day, at 1800, 2000, 2200, and 2400 hours GMT/UCT. Most North American SWLs tuned the later transmissions. Each program ran 35 to 50 minutes, about half of which was devoted to music carefully selected to evoke nostalgia and homesickness.

"I am Liberty," she proclaimed in a later broadcast, "but I've told you that before. I am Liberty and my name is familiar amongst you boys. I am here to keep you company during your war. I am Liberty. This is your frequency and you know where to tune!"

Liberty touted the Argentine claim to the disputed islands and their dependencies, although she referred to the Falklands by their Spanish name, Las Malvinas.

"I am Argentine, just like the Malvinas, South Sandwich and South Georgian islands!"

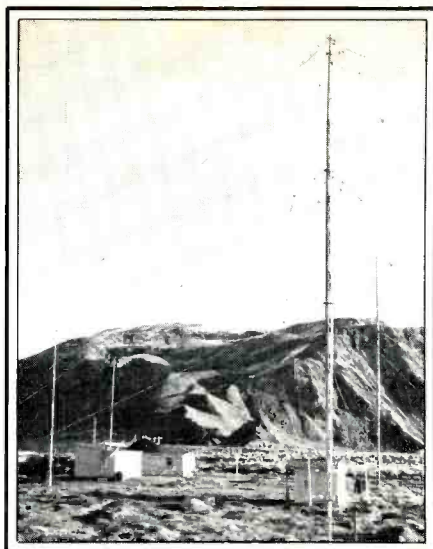
In one broadcast, she cited a visit to the islands by the Argentine head of state, contrasting it with the fact that the colonial outpost had never been visited by "a member of the British Crown."

Appealing to possible male chauvinists in her audience, Liberty teasingly reminded the British troops that they were being sent "far away from your dearly beloved land" by a government "run by a WOMAN!"

The dig at Prime Minister Margaret Thatcher conveniently snubbed Argentina's own recent feminine leaders, Evita and Isabel Peron.

There was a poetic quality to Liberty's silky delivery, and just a hint of hidden menace, a warning that possible death awaited her audience at the end of the voyage.

"We know where to find you," she noted in one closing announcement, "... in our sovereign islands of the South Atlantic, on the high seas, in this wide open sky over Malvinas ... where I am Liberty, the voice, the spirit, a country, a woman who proudly reminds you that the world listens when Argentina speaks!"



Receivers in the south Atlantic were given a choice of several interesting stations which beamed programs to them.

Each program ended as it began, with a haunting orchestral version of the Beatles' hit, *Yesterday*.

Signals were strong enough in the U.S. and Canada, though intelligibility left something to be desired. One listener in the United Kingdom referred to it as "tubby Argentine modulation," adding acidly and with considerable exaggeration that if any of Her Majesty's forces could closely follow the programming, "they deserve a diploma in speech therapy."

There was a "motorboating" hum on the frequency, which some listeners at first thought was deliberate jamming. Eventually, most concluded that it was an internal problem at the station, possibly a faulty microwave link between the studio and a remote transmitter site.

So where was the transmitter? Inside Argentina? Outside? SWL speculation ran rampant. Perhaps in Cuba, suggested some? One Canadian, with a straight face, interpreted an ambiguous remark by Liberty to mean she was broadcasting from Ottawa. A critic later observed that this improbable interpretation did result in the Canadian monitor being interviewed by a couple of his local TV stations.

David Crawford, a Florida SWL, persuaded a monitor at the FCC's Ft. Lauderdale facility to take direction finding bearings. From a slightly different angle, the federal monitoring post at Kingsville, Texas, did the same.

The conclusion was that the signal was coming from—surprise, surprise—Argentina! The bearings suggested a transmitter site in the Cordoba-Junin area, somewhat north and west of Buenos Aires.

Indirect confirmation came from the Argentine news agency, TELAM, which indicated in a dispatch that Liberty could not be heard in the Argentine capital itself, which suggested that the station was located rather close to Buenos Aires and the shortwave signal was skipping right over it.

Reports sent to the Argentine government eventually brought verification replies from a retired lieutenant colonel, Dr. Edgardo Bautista Matute Bravo, chief of the radio division of the Direccion General de Defensa Nacional. But Matute also ignored questions about the station's operations.

Finally, nearly a year later, POP'COMM was able to crack the mystery. Argentine broadcasting insiders confirmed that the station indeed broadcast from a secret transmitter at a military base in the northern part of that country.

Liberty's programs, however, were prepared and recorded at several medium wave stations in that nation's capital. One of those locations was the studio of LS1, Radio Municipal at 1551 Sarmiento Avenue in downtown Buenos Aires. The station, a government operation owned by the city of Buenos Aires, operates on 710 kHz. Its role in the Liberty broadcasts, though, was only to provide the facilities and technical support for the program recording.

As to the key question, who was Liberty, the same sources say the sexy shortwave voice was that of a bilingual television newscaster named Silvia Fernandez Barrio.

After her brief fling at being a Megahertz Mata Hari for her government, Silvia returned to TV. She again was seen on the Channel 7 newscasts of Argentina Televisora Color, but since has moved on to the Channel 9 outlet in Buenos Aires.

Less than a month after the Argentine

RADIO ATLANTICO DEL SUR

BRINGING TRUTH TO THE FRONT

SCHEDULE

AM 9700 KHz 0830 – 0930 GMT
PM 9710 KHz 2300 – 0200 GMT

THANK YOU FOR YOUR LETTER.

Radio Atlantico del Sur, PO Box 408, London, UK.

Certificado de Sintonia

Radiodifusora: "Liberty"
 Transmitiendo desde: Argentina
 Frecuencia de: 17,740 kclos., onda corta
 Potencia: vatlos
 Horas, fecha: 7:35 hasta 7:46 de la noche, hora argentina, 23 de abril de 1982.

Hemos comprobados sus detalles de recepcion, y confirmamos la emisora-sintonizada esta nuestra.

T. COL. DR. EDGARDO BAUTISTA MATUTE BRAVO
JEFE DE DIV. 'OM
DIRECCION GENERAL DE DEFENSA NACIONAL

Sello oficial

QSL from Argentina's "Liberty" station.

Radio Atlantico was the British government's attempt to keep their troops informed.

broadcasts began, Great Britain followed suit with its own military propaganda outlet on shortwave.

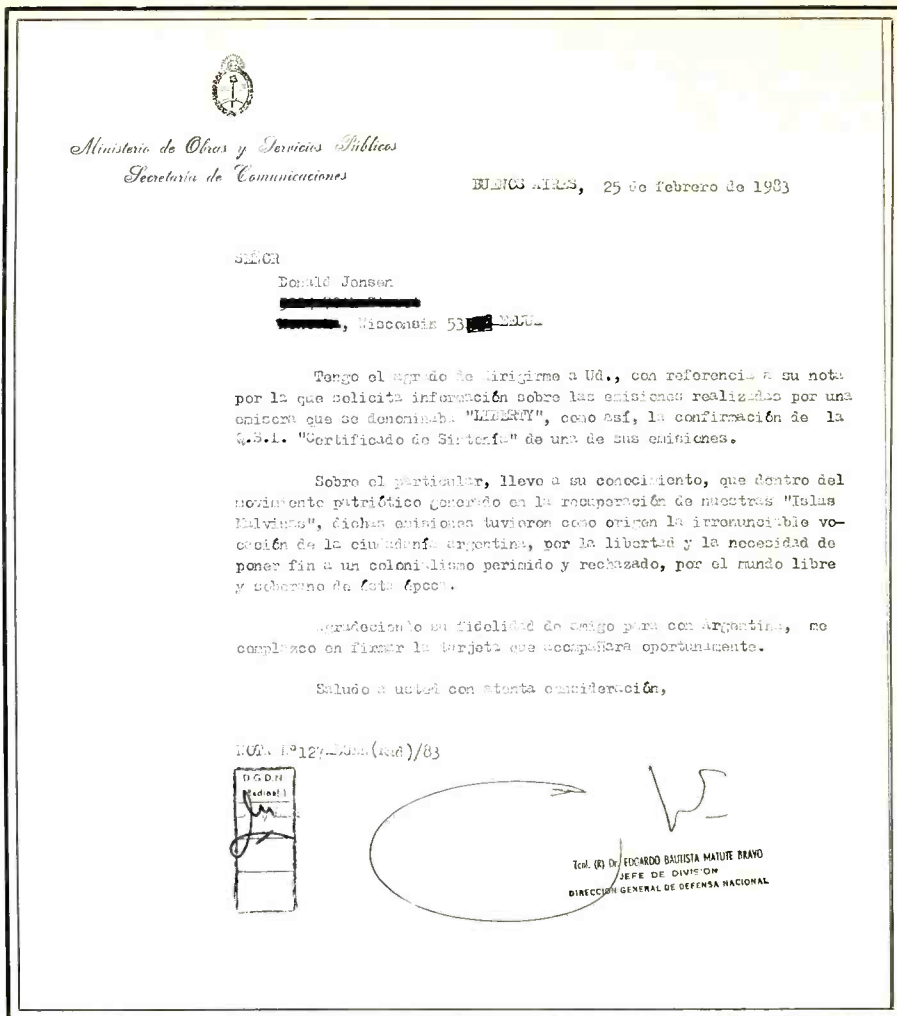
Radio Atlantico del Sur, the British Defense Ministry claimed, was neither a response to Liberty nor a propaganda station. Its purpose, a spokesman said, was to inform the Argentine garrison on the Falklands of events and world opinion, "giving them a better understanding than is currently available through wildly inaccurate Argentine reports."

On the morning of May 19, the military informed the British Broadcasting Corporation that it was invoking Article 19 of the BBC's license, an obscure clause that gave it the absolute right to take over transmitting facilities in crisis situations. It was requisitioning one of the powerful shortwave relay transmitters on Ascension Island, some 3,500 miles north of the Falklands.

Officials at "Auntie Beeb" were unhappy about the turn of events. Two labor unions at the BBC protested the takeover as "gross interference in the independence and editorial freedom of the BBC!"

But at 2300 GMT/UCT that night, Radio Atlantico del Sur was on the air in Spanish on 9,710 kHz. Listeners first hear a series of three electronic chimes, a tuning signal, alternating with repeated announcements by a woman: "9-7-1, Radio Atlantico del Sur."

Programming ran for several hours, and a second daily broadcast was aired from 0815



This letter was received in response to an inquiry about "Liberty."

to 0945 GMT/UCT. Unlike Liberty/Annie, the British made no mystery of their station, even announcing a mailing address in London. And before long, SWLs were even getting an attractively printed QSL card in reply to their reception reports.

In an open society, the press had an easier time getting details than they had with Liberty. It was reported that Radio Atlantico del Sur was operated by the Royal Air Force's Operations, Electronic Warfare and Radio Division. It cost an estimated 10,00 to 20,000 pounds sterling to run the station each week, according to the newspapers. The announcers were said to all be employees of the Defense Ministry.

In Buenos Aires, Argentines scoffed at the programs, which in fact seemed rather amateurish. First of all, the Spanish was all wrong; the announcers spoke with Cambridge-Chilean accents.

The programming was a bit of everything, reported a U.S. correspondent in the Argentine capital. Some news reports were two days old. There was music, but with only three or four records each half hour, the station seemed heavy on talk. What purported to be messages from the homefolks to homesick Argentine soldiers in the Falklands—such as the memo from "Mama" to "Ernesto"—sounded phony.

The two male announcers on Radio Atlantico del Sur inexplicably seemed to be vy-

ing for the attention of their female co-host, Marianna Flores.

"Ah, Marianna, you look so beautiful tonight," oozed one of the announcers oily.

The musical selections ranged from aging pop tunes by the likes of Abba and Queen to even older tangos, more appropriate for G.I. Juan's parents back home than for an audience of young soldiers.

After British forces went ashore on the Falklands and the war got bloody, Radio Atlantico del Sur had some real news to report—the names, ranks, and serial numbers of Argentine prisoners-of-war captured at Goose Green.

With the capture of Port Stanley, the fighting ended. Radio Atlantico del Sur's job was done. The station signed off on June 15, never to return. It had been on the air for just 28 days.

Liberty, however, continued for nearly two more weeks. She made her "farewell" broadcast on June 21, in English and, for the very first time, Spanish. Still a tease, the sultry announcer specifically referred to the mysterious nature of her programs.

That last broadcast was repeated on successive days. Liberty's final transmission was on June 26, 1982.

Like her WWII sisters, Rose and Sally, Liberty faded into radio history. In a newfangled war, hers was an old-fashioned act. We may not hear her likes again.

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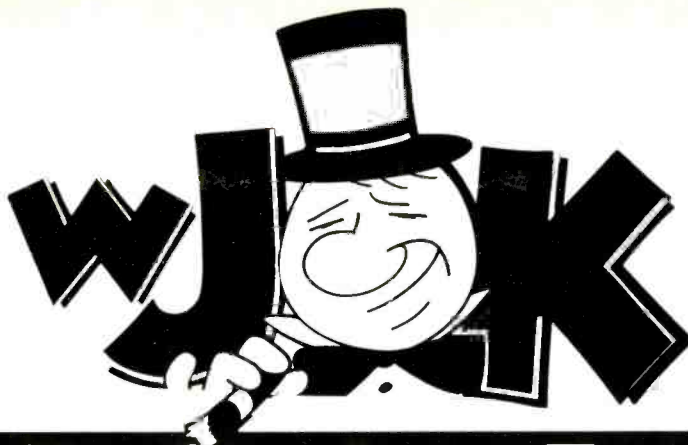
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WJOK: Radio Just For Laughs

BY HERMAN TIMBERG

Though there are many negative things in life, there is probably nothing that gets people as down as being stuck in a traffic jam on their way to work—unless it is being stuck in one on the way home. Well, some creative people in Washington, DC have come up with a way to make traffic jams, days at the park, or just a quiet evening at home more enjoyable. They've given large doses of laughter to anyone who tunes in 1150 AM WJOK radio.

WJOK is a radio station with one thing in mind—to make people laugh. They program comedy 24 hours a day and are proud to be the world's first all-comedy radio station. Well, not quite all comedy. The station also broadcasts hourly ABC News, local weather updates, rush hour traffic reports, and community service shows on Sunday mornings. But the primary part of the broadcasting day consists of jokes, sketches, parodies, comedy songs, and other comic-relief type material. The audience will be hearing some of the greatest comedians and comediennes in the world—Jack Benny, Bob Hope, George Burns, Bill Cosby, Bob & Ray, W.C. Fields, Woody Allen, Fanny Brice, Lily Tomlin, and just about any other funny person who comes to mind.

Although WJOK began airing on January 31 of this year, the idea of starting up a joke station is not a new one. Bob Cobbins, President and General Manager of WJOK, first got the idea for the comedy format in 1964, while he was in Manhattan on a business trip. He had spent 30 years selling advertising for various Washington stations, but was intrigued when a sales rep told him that the Telephone Company had just started a phone service called Dial-A-Joke. For a dime, anyone interested could call and hear a famous comic tell some jokes. Cobbins was amazed that anyone would spend a dime just to hear a joke, but was even more astonished when he learned that up to 40,000 New Yorkers alone called Dial-A-Joke every day. He figured that if people really wanted to laugh that badly, then jokes should be a radio format.

After trying to give the idea away to sta-

tions in the Washington area (no one was interested), he began gathering material on the chance that one day he would be involved with a comedy radio station.

For almost twenty years, Cobbins has been hunting record stores, nostalgia shops, flea markets, and garage sales, buying comedy recordings—the oldest dating back to an Edison cylinder of 1890. He is now the proud owner of a collection of more than 8,000 recorded routines. The station has also hired a "discographer" to locate old and unusual comedy recordings.

As a radio ad salesman, Cobbins never dreamed he would be able to buy a radio station, especially in the highly competitive and demanding Washington market. But ten years ago, a rock station lost its license and was forced off the air. Two years later, Cobbins and three partners, including Tom Reeder, the station's Vice President and program director, and Richard A. Bowis, head of WJOK's public affairs and promotion department, formed Barto Communications to compete against eight other groups for the 1150 AM frequency license. Though six years of hearings followed, Barto finally won the battle in 1980.

Next came the new battle of starting about the business of getting their comedy station on the air. By opening day, Barto Communications had invested about \$1 million in the station, partly due to extensive renovation of the vandalized studios of the previous station. More than \$300,000 was spent overhauling the studio and purchasing new broadcast equipment.

Naming the station was also part of the creation of the station. Cobbins original plan to name the station WLAF was squashed when he learned that a station in La Follette, Tennessee used those call letters. He settled for another choice, WJOK.

Along with the vintage collections taking part in creating the laughter, new broadcasting ground is being broken by the station by airing explicit comedy routines by performers such as Richard Pryor, George Carlin, and Eddie Murphy. Though some years ago a station could lose its license for airing sketches involving profane language, the

FCC has cut down its regulating of material that stations are allowed to play.

The only legal problems the station foresees could come from the Supreme Court's obscenity strictures. But since the language in question is meant only to make people laugh, and this material will be played only between 10 p.m. and 4 a.m., WJOK attorneys assume there will be no action against them. WJOK runs disclaimers all day advising people who object to these routines to avoid the late night programming.

Along with the careful selection of funny material, WJOK program personalities have been carefully selected as well. Though not comedians, they have the important qualities for their job—humor, creativity, and imagination. Armed with copy containing fast-paced puns and one-liners, they are there to provide continuity between the commercials and the routines they play. There is also listener involvement with ideas like the "worst joke of the day" contest.

Cobbins doesn't believe listeners are as loyal to WJOK as they are to all music stations, and he does not expect to take listeners away from their favorite music. He hopes the station will become a listener's second favorite station, since almost everyone enjoys laughing, but it is doubtful that anyone could laugh constantly. He views his station as the alternative, one to tune in when you need a lift or to help you enjoy lighter moments.

The listening pattern is probably similar to those of the all-news stations where people listen to a twenty minute news show, and tune in again periodically to check on new events.

But Cobbins admits that advertising sales will tell whether WJOK's all comedy format is a successful one. People tuning in is one good aspect, but of course the bottom line is still the financial picture. But WJOK is making its mark. Since an all-comedy format has never been attempted before, other stations are taking notice. Many are expressing interest in having WJOK syndicate its shows for airing. So, maybe someday soon, WJOK will be airing in your neighborhood, and the country will be chuckling in unison.

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Look Ma, No Hands

There has been a lot of interest in the hands-free (and license-free) FM 49 MHz transceivers mentioned here several times in the past. It seems that they have many survival applications and a number of readers have written to say that various law enforcement agencies are using the units too. Supposedly, law enforcement strike forces like the little transceivers for several reasons—they offer hands-free transceiving, they operate on off-beat frequencies not normally given attention by scanner owners, and they are short-ranged and can't be monitored by all and sundry. These reasons, of course, are exactly why survivalists like them too!

Among the units which weren't mentioned in previous coverage are those from RCD and Maxon.

The RCD unit is offered by a subsidiary of Regency Electronics and is known as the BRP-2. It has a 1/2 mile range, a belt clip, and operates from a standard 9 volt battery. The unit is voice-actuated and is designed specifically for high-noise applications. It has a neck microphone and a single headphone. RCD's address is 806 Custer Avenue, P.O. Box 1494, Norfolk, NE 68701.

Maxon Electronics (10723 Ambassador Drive Air World Center, Kansas City, MO 64153) has several license-free communicators. The Model 49-HR not only has an FM broadcast radio receiver, it also has a passenger intercom for two-way closed circuit communications for use in motorcycles, ultra-light aircraft, snowmobiles, etc. Operates on 4 "AA" batteries and is rated at 1/4 to 1/2 mile range.

The Maxon 49-HI is similar to the 49-HR but doesn't incorporate an FM broadcast radio. It operates from a single 9 volt battery.

Maxon's 49-S and 49-B are two other units with basically the same general features to the 49-HI, but with minor variations. The 49-B comes with a vinyl carrying case and a battery charger.

The channels which all 49 MHz license-free transceivers use are:

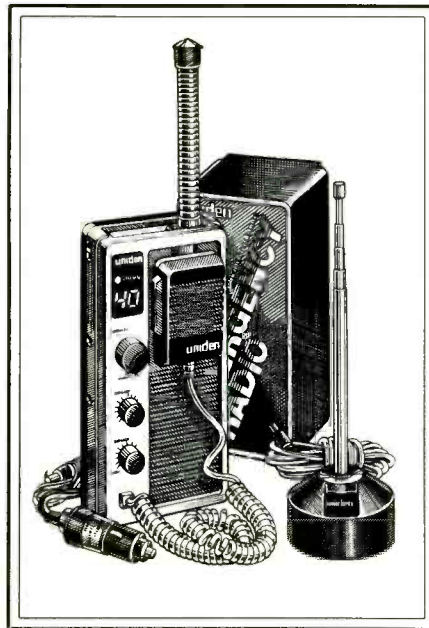
- Channel A 49.83 MHz
- Channel B 49.845 MHz
- Channel C 49.86 MHz
- Channel D 49.875 MHz
- Channel E 49.89 MHz

Most units can operate on only a single channel. If you have a scanner, it might be worth it to monitor these frequencies.

Another series of transceivers which we've previously discussed are the full-power (and now license-free) 27 MHz portable emergency transceivers which were pioneered by General Electric in the form of their well-known H.E.L.P. mobile unit.



RCD 49 MHz two-way unit.



Uniden's emergency 27 MHz communications unit.

Several readers asked why we didn't include the Uniden transceiver in our survey of these rigs; no reason in particular, except that it was an oversight.

Uniden Corp. of America (6345 Castleway Ct., Indianapolis, IN 46250) has a self-contained transceiver operating on all 40 27-MHz channels. It operates from any 12

volt vehicle electrical system and can also be operated from 9 "AA" batteries. A nice feature of this Uniden unit is that it has a separate microphone on a coiled cord which is different than most other transceivers in this category. Most similar units have a microphone which is built into the cabinet—the cabinet being, in effect, like a handset. The Uniden has a built-in antenna and also an outside-the-vehicle magnetic mount antenna. The suggested retail price is \$110, although we have seen the units offered for about \$90. Looks to be quite a versatile little transceiver, I'd say.

While I'm on the subject of magnetic mount antennas, I'd like to pass along a helpful hint. Although not normally mentioned in any of the literature supplied with mag antennas, it will be of some useful purpose to place a small piece of metal with magnetic properties on the antenna's base magnet. This can be no more than the lid of a tin can (with tape around the edges to keep from cutting your fingers while handling it). Forget about using lids from aluminum cans, they may not have magnetic properties! Leave the metal disc held in place there by the antenna base's magnet while the antenna isn't in use. This "keeper" (as it is called) will help the magnetic properties of the base remain at peak strength.

Nuke Warning

Readers have asked about radiation detection equipment. We've seen several nice



Maxon's 49-HR as described in the text.

units, and especially like the *Nukebuster* made by Solar Electronics, 156 Drakes Lane, Summertown, TN 38483. This unit detects nuclear radiation very effectively and has been a popular item with those persons who happen to be located in the vicinity of various nuclear power plants.

Along the lines of military surplus electronics, there's the CDV-710 Survey Meter (about \$70) and the PDR-63 Radiac set (about \$325 in good used condition). The PDR-63 runs on 4 AA batteries and detects Beta and Gamma radiation from background levels to 1000 r per hour. The CDV-742 dosimeter measures 0 to 200 r accumulative and sells for about \$15 in new condition. The military dosimeter, IM-147/PD measures 0 to 50 reontgens accumulative and sells in good used condition for about \$20.

One of the sources for mil surplus radiation detection gear is Khalsa Surplus and Supply, P.O. Box 716, Santa Cruz, NM 87567. Sometimes Fair Radio Sales (P.O. Box 1105, Lima, OH 45802) carries radiation detection equipment in their spectacular catalog (and their catalog is free).

Sideband Survival

For those who don't like the idea of having to take out a license to operate a survival communications system, the 49 MHz license-free units are ideal when it comes to short-range applications. For those requiring longer-range communications, it's now possible to operate 27 MHz systems without

FCC licenses thanks to the FCC's recent dropping of licensing requirements. This applies to AM and also longer-range single-sideband operations. In response to those who have been in a quandry about how this new aspect to 27 MHz operations changes things from the way they were before, actually (as far as the FCC is concerned) the main change is that it's no longer necessary to either be listed in the federal license computer or use an FCC-assigned callsign. Theoretically, the previously existing operating rules and regulations relating to 27 MHz communications systems remain in effect, although the FCC's present ability to enforce those rules now seems even more obscure than it was when they were licensing 27 MHz stations.

Stations using AM have long used usually silly "handles" to identify their stations and 27 MHz systems, but in recent years many serious users have backed away from that form of identification and used other forms of identification such as "unit numbers." Those operating single sideband systems were never into the use of "handles" as a means of identification and anybody showing up on a frequency and trying to use a "handle" was promptly and laughingly thrown off the frequency by other sideband operators. They've never allowed the traditional "goodbuddy" trappings and lingo on the frequencies used for sideband communications systems (as discussed last April in this column).

Sideband systems in this band are generally identified by identifications assigned by clubs and organizations. In the remote past there were scores of local groups, mostly short-lived and tenuous in nature, which operated for the convenience of area 27 MHz sideband operators. For a number of years now, however, most operators using sideband systems on 27 MHz have used a more efficient and standardized form of identification which did away with the confusion and temporary status of locally-assigned "sideband numbers." This has been by the use of standardized numbers representing affiliation with a national organization known as The SSB Network, a group which has been actively functioning since 1964.

Those wishing more information on obtaining affiliation with this organization, which has been involved in preserving the integrity and usefulness of 27 MHz sideband operations for survivalists (and others too), can get information by sending a self-addressed stamped long (#10) envelope to the group. Their address is SSB Network, P.O. Box 908, Smithtown, NY 11787. We recommend this organization highly. Those writing for information and mentioning this column will receive (at no cost) a gift from the group in the form of their clever "Tricentennial Token," which is the world's first souvenir commemorating the 300th anniversary of the United States in the year 2076! Don't forget to ask for it, it's a classic!

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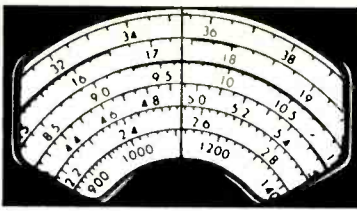
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COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

This month we get a look at the QSL card from OLB5, a Czechoslovakian time signal station operating on 3170 kHz with 5000 watts. The best time to try for this station in North America is during the evening hours. If you manage to hear them, send your reception report to Station OLB5, Astronomical Institute, Time Division, Budecska 6, Prague 2, Czechoslovakia. Our thanks to faithful reporter George Osier of New York for sharing his QSL with us!

Sometimes you may find a CW station (particularly if it is one of the "spy numbers" stations) using what are known as "cut numbers." This is a system in which letters of the alphabet are substituted for various numbers. This saves time when sending CW, since numbers are composed of more dits and dahs in the international Morse code. Here's a list of cut numbers noted used by many CW "numbers" stations:

- | | |
|-------|-------|
| 1 = A | 6 = 6 |
| 2 = U | 7 = B |
| 3 = V | 8 = D |
| 4 = 4 | 9 = N |
| 5 = E | 0 = T |

Other cut numbers systems are used, and we'd welcome reports on any systems you may run across.

Opportunity Knocks

How would you like a job getting paid to monitor the type of activity covered in this column each month? If so, the Central Intelligence Agency may be interested in you!

It's true! The CIA has recently been recruiting in magazines and at "hamfests" for (as one of their ads puts it) "... individuals with experience in communications systems maintenance, HF radio, Morse intercept, satellite communications, or radioteletype

operations." The general requirements for communicators and radio operators include previous experience as a radio operator or a general class amateur license; you should have a code speed of at least 12 words per minute and be able to type at least 30 words per minute. Other requirements include U.S. citizenship for you and your spouse, minimum of a high school diploma or equivalent, be able to pass a security check, and you must be available for extensive overseas service.

The starting salaries range from \$15,398 to \$18,215 depending upon experience and qualifications, with (as the CIA describes it) "... substantial overseas benefits." If you're interested, send your resume to Personnel Representative (HM), Dept. A, Room 821, P.O. Box 1925, Washington, DC 20013. (Your editor suggests answering only if you're really interested and not as a joke. Some of those people in Washington have no sense of humor.)

More on Embassy Communications

Speaking of Washington, your editor was recently there and happened to walk past the Soviet embassy. On the roof was a collection of HF/VHF/UHF antennas that would make any POP'COMM reader drool with envy! It's quite obvious that a great deal of radio communications flows in and out of the Soviet embassy in Washington, although you won't find any frequencies or call letters listed in any frequency guides.

Simply put, any embassy or consulate can have radio communications facilities. No license or other sanction from the host nation is required. And you don't have to live in or near Washington to be on top of such activi-

ties; many major cities have consulates (what might be termed "branch embassies") located in them. (A list of consulates in a given city can be found in the telephone yellow pages.) These consulates may also have radio communications facilities, particularly if they're part of the Soviet bloc. And New York area residents are well aware of the numerous U.N. missions in the area.

If you live near embassies or consulates, keep an ear out for unusual radio activity. In particular, be alert for local quality signals (no fading or atmospheric distortion, strong, constant signal levels) on the shortwave bands. If you have a portable shortwave receiver, you may be able to track down the source of the signals; if your receiver overloads outside a certain embassy, you can be fairly certain that the embassy's radio facilities are responsible for the signals! Efforts along these lines are already promising. For example, there is evidence that some numbers stations activity originates in the Washington area, particularly for the CW numbers stations. Give it a try, and report it to Communications Confidential!

Mystery CW Nets

Don Schimmel of Virginia has submitted several reports this month of some mysterious CW activity. Don has been tracking this activity since March 9 of this year. Traffic is sent in five-letter groups, with four special Morse characters noted (AA, IM, OE, and OT sent together as a single letter). Don has also noted "chatter" between transmissions, but it is enciphered in 18 character blocks. Don says these stations use standard "Q" signals and he has heard "73" and "88" used as well. Figure 1 shows a list of what

Frequency	Date	Time (GMT)	Calls	Frequency	Date	Time (GMT)	Calls
13439	3/9	0125	No call heard	7610	6/1	0103	"36 DE 28, TT DE 28"
6614	3/25	0059	"28 DE 83"	7610	6/3	2305	"36 DE 28"
7600	3/30	0106	"83 DE 28"	7486	6/3	2325	No call heard
7601	4/2	0331	"83 DE 28, 36 DE 28"	7607	6/5	0110	"36 DE 28"
6600	4/3	0228	No call heard	7607	6/6	0014	No call heard
7615	5/6	0017	"45 DE 28"	7607	6/7	0021	"36 DE 28"
7617	5/8	0125	"36 DE 28, 83 DE 28, 45 DE 28"	7732	6/7	0025	No call heard
7615	5/9	2327	"83 DE 28, 36 DE 28"	7607	6/7	2334	"36 DE 28, 45 DE 28, TT DE 28"
6642	5/9	2339	"45 DE 28"	7607	6/8	2230	No call heard
7613	5/10	2308	"45 DE 28, 36 DE 28"	7607	6/9	1815	No call heard
7486	5/17	2029	No call heard	7603	6/16	2236	"45 DE 28, 22 DE 28, 36 DE 28, 58 DE 28, TT DE 28"
7732	5/20	0010	No call heard	7611	6/19	2240	"45 DE 28, 36 DE 28, 83 DE 28, 55 DE 28"
7712	5/24	0016	"36 DE 28"	6612	6/19	2241	"28" called by unidentified station
7431	5/28	0059	No call heard	7631	6/21	2311	No call heard
7610	5/30	2200	"83 DE 28"				

Figure 1

Don has heard, detailing the frequency, date heard, time heard, and callsign(s) used:

Many thanks for this excellent bit of eavesdropping, Don. Notice how the activity appears to follow semi-regular patterns and how similar activity can pop up on multiple frequencies within the same time frame. Readers, be alert for this type of activity and report what you hear!

More On Spanish "Numbers" Stations

Recently, reader James Anderson of New Mexico monitored a four-digit Spanish numbers station on 11533 kHz at 0238 to 0321. He transcribed the message for us and we'll take a look at it this month.

Since the message is in Spanish, there are some Spanish words you'll need to know. "Mensaje" means "message," "repetir" means "repeat," "grupo" means "group," and "la fin" means "the end." And, as is usually the case, the announcer was female. Here is what James heard:

0238 "Mensaje mensaje mensaje 9999999 mensaje mensaje 9" (this was followed by rapid CW or RTTY).

0239 Pulses lasting approximately five-eighths of a second.

0300 "457 457 457 1234567890" repeated until 0310.

0310 Ten long pulses spaced approximately three seconds apart. Then the following was read: "Grupo 63. Grupo 63. 4614 2580 6627 3535 6906 6712 5552 2152 1041 4197 1622 5590 3340 8848 4190 2333 7098 3910 8217 3137 7323 1041 9805 5795 7555 9811 1122 8241 4265 0910 1704 9912 1357 6240 4357 1245 6595 4434 5063 7961 4837 6333 5577 3516 7143 4297 3746 5569 2447 8822 7238 4594 7553 2962 9195 9368 7488 5143 6822 8164 3453 8485 4178."

0316 "Repetir Grupo 63 Grupo 63" and then the entire set of four-digit groups was repeated.

0321 "La fin" followed by pulses of approximately five-eighths of a second.

Note that there are exactly 63 four-digit groups in "grupo 63." A key question is what the significance of "457" is. This could be either the "address" of the intended recipient of the message or (more likely) it could be the "key" to decoding the message. This message was almost certainly encoded using a system known as the "one-time pad" method.

However, much useful information about numbers stations can be gathered by careful observation of their frequencies, times, and patterns of operation. For example, it would be interesting to see how well numbers station activity correlates with "real world" activities, such as military activity in Latin America, ship movements, political unrest in certain countries, or even business/economic events in various countries. Doubtlessly, professional intelligence organizations are already engaged in this type of analysis.

We'd welcome further observations and



ICK-IUD—A double verification from Tripoli and Ethiopia, both in Africa. It's dated 1937.



VS2AK—A valued verification from the Malay States, circa 1938.



Reader George Osier of New York sent us this QSL he received from station OLB5 on 3170 kHz.

analysis along these lines from readers concerning numbers station activity, and our thanks again to James for sharing his catch with other POP'COMM readers. And if the organization responsible for the transmission James heard is reading this column (which is quite likely), why not write in and explain these transmissions for your fellow POP'COMM readers?

From the Mailbag

This past month, your editor received a letter from "HF Operator Banshee 5" of the "Shanachie Identification Group, HF Signals Division" commenting on a report of unidentified CW signals heard on 4100 kHz. "Banshee 5" reported that the five-letter CW groups heard on 4100 kHz are actually cut numbers as follows: A=1, U=2, W=3, M=4, I=5, R=6, G=7, D=8, N=9, and T=0. "Banshee 5" said the signals were "Secret communications (illicit)" but that the users and other frequencies were "non-releasable data." Many thanks for the letter, "Banshee 5," and we'd welcome your further comments on other times

in this column! (By the way, "Banshee 5" gave no return address, but the envelope was postmarked Fayetteville, NC—which is where the U.S. Army's Fort Bragg is located.)

Another letter this month came from K. Kumar of London, England. He passes along some frequencies used by British Airways for long distance operational control (LDOC). LDOC is used by airlines such as British Airways to communicate directly with their aircraft aloft. The very latest channels for British Airways are 5535, 8921, 10072, 13333, 17922, and 21946 kHz. All British Airways aircraft use the callsign "Speedbird." Many thanks for the info!

Keeping in Touch

For the very latest information on the types of activity covered here each month, it's essential that you belong to an established SWL club. For many months now we've been including loggings submitted by members of the American Shortwave Listeners Club (ASWLC). Their monthly bulletin, SWL, has an excellent column edited by Spence Naylor which includes the type of DX featured in this column. For a sample copy of SWL and membership information in ASWLC, send \$1.00 to ASWLC, 16182 Ballad Lane, Huntington Beach, CA 92649. Tell that POP'COMM and Communications Confidential sent you!

Featured Frequencies

Our sister publication, CQ, recently ran an article by Dave Ingram, K4TWJ, on shortwave listening. In it, Dave recounted some of the fascinating things you can hear outside the amateur bands. Among the frequencies Dave has found productive include 6522, 4125, 13560, and 27120 kHz (for undercover activities) and 8292 and 26865 kHz (for guerrilla activity). What can you hear on these channels? Give a listen and report the results to Communications Confidential.

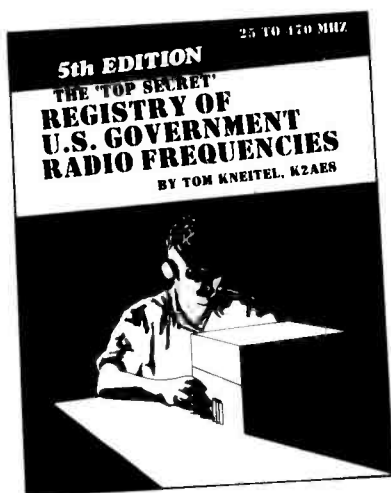
Listening Reports

Before getting to this month's listening reports, your editor has a favor to ask. While all reports are welcome, the sheer size this column is beginning to assume makes it very important that you submit reports in the form you see used in this column. That means you should include the call, location, and time in GMT (that's Eastern time plus five hours) for each logging. Your editor no longer has the time to look up correct locations or convert your local time to GMT.

It's also important to include enough information to make your report useful to others. A report like "English numbers station at 0000" is less than fully useful to readers of this column. At the minimum, we'd like to know the sex of the announcer and whether the numbers were read in four-digit, five-digit, or some other grouping scheme.

Follow these guidelines to make your reports more useful to your fellow POP'.

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COMM readers. Send your reports to: Harry Helms, P.O. Box 157, Rockefeller Center Station, New York, NY 10185.

Now to this month's reports.

278: HOC, Hillsboro, OR, CW beacon 0419. (Joe Woodlock, IL/ASWLC)

320: OM, Omaha, NE, CW beacon 0817. (Joe Woodlock, IL/ASWLC)

406: OK, Oklahoma City, OK, CW beacon 0834. (Joe Woodlock, IL/ASWLC)

530: NB, North Bay, ON, CW beacon 0245. (George Zeller, OH/ASWLC)

1615: OR, Ohura, New Zealand, CW beacon 1150. (Don Moman, AB/ASWLC)

3170: OLB5, Vinohrady, Czechoslovakia, time signals 0124. (George Osier, NY)

4394: Net of CW stations using calls such as FYX, YZQ, BJI, and BOF at 0102 and 0304. (Don Schimmel, VA)

4625: VEB2 time signal station, unknown location (but possibly Canada), 0112 with time signal pulses every two seconds. (George Osier, NY) Anyone have a clue as to where this one is located? (Editor)

4670: Four-digit Spanish numbers station with female announcer 0435. (Tom Lewandowski, NY)

5148: CW numbers station here 0200. Call-up was "UT AAA" repeated and then into five-letter groups consisting of the letters A, U, M, W, I, N, G, D, A, and T. These letters may be cut numbers, with the substitution being 1 = A, 2 = U, 3 = W, 4 = A, 5 = I, 6 = N, 7 = G, 8 = D, 9 = M, and O = T. Transmission stopped abruptly in the middle of a block 0208. (Kenneth Eichman, OH)

5733.4: Mystery CW marker transmission noted at 0400 consisting of the message "WP IWTUE UTUTET YQWUTEIU PEITIW PEIWT" followed by beacon-like repetition of the letter "Q" which was sent 30 times when the whole thing was repeated again. (Tom Kneitel, NY)

5810: Four-digit Spanish numbers station with female announcer 0208, parallel to 4670 kHz. (Thad Adamaszek, OH) If you're curious what a four-digit numbers station sounds like, tune to 5810 almost any evening. (Editor)

5920: "3/2" version of five-digit Spanish numbers station with female announcer 1102; pause between third and fourth digits of each five-digit block. (Dave Bush, OH) Welcome! (Editor)

6377: AME3 (possibly a Soviet tactical call-sign) calling UMA7 via CW marker transmission which included the information "13 RG" repeated 3 times. Heard at 0425. (Tom Kneitel, NY)

6470: DAM, Hamburg, West Germany, time signals 0003 but heavy RTTY QRM. (George Osier, NY)

6643: "FW2U DE 6NKP" passing five-digit groups in CW 2351. (Don Schimmel, VA)

6717: MTO, Rosyth Naval Radio, England, noted with CW marker at 0330. (Tom Kneitel, NY)

6830: "Seabreeze" working "Sport" in SSB 0036; military tactical traffic of some sort. (Thad Adamaszek, OH)

6925: KKN50, U.S. State Department Intelligence Service, Washington, DC, send-

ing "QRA" marker 0352. At 0400, a station identifying itself only as "AEA" came on frequency and began repeating its call. KKN50 increased its speed and finished transmission at 0403. It started back up again at 0407 when "AEA" was gone. (Brian Graham, NY)

6925: Five-digit number groups in Spanish read by a male in SSB at 0215; then into two-way traffic with a female; then female began to read Spanish numbers in five-digit groups, off at 0228. (Thad Adamaszek, OH) A very significant logging, Thad! It seems almost a certainty they were using amateur radio transceivers and further cements the link between numbers stations and mysterious two-way activity. (Editor)

6995: "78 de OAZBOR AA" repeated at 0338, then "GR22" and into a string of random digits. This was repeated three times until 0400, when the transmission ended in mid-message and "78 DE OAZBOR AA" was repeated until 0405. (Brian Graham, NY) An excellent report, Brian! (Editor)

7420-7423: Two-digit Spanish groups transmitted in SSB around 0200. (Don Schimmel, VA)

7608: "Victor Lima Bravo Two" repeated continuously 0053. (Don Schimmel, VA)

7660: CLN78 calling UCA in CW 0204; CLN78 is a Cuban station and UCA is Odesa Radio, USSR. (Don Schimmel, VA)

7882: Five-digit Spanish numbers station with female announcer 0325. (Lester Robison, NV)

8780: SAC "Skyking" broadcast in SSB 0420. (Lester Robison, NV)

8843: Five-digit Spanish numbers station with female announcer 0300; used SSB. (Lester Robison, NV) Excellent, Lester; Spanish numbers stations in SSB are rare. (Editor)

8876: Five-digit Spanish numbers station with female announcer 0500. (Lester Robison, NV)

8913: Five-digit Spanish numbers station with female announcer 0530. (Michael Harris, GA)

8917: Five-digit Spanish numbers station with female announcer 0207; groups read slowly—she sounds bored. (Thad Adamaszek, OH) You'd be bored too, Thad, if you had to read those numbers each month! (Editor)

9029: "Foxtrot" broadcast in SSB 0023, female announcer. (George Osier, NY)

9050: Five-digit German numbers station with female announcer 0200, transmission opened with a series of double beeps. (Thad Adamaszek, OH)

9050: Five-digit English numbers station with female announcer 0104, announcer had heavy accent. (Thad Adamaszek, OH) Compare these 9050 kHz items with the 9265 kHz items below. (Editor)

9075: Five-digit Spanish numbers station with female announcer 0055. (Thad Adamaszek, OH) Four-digit Spanish numbers station with female announcer 0500. Transmission opened with three-digit group repeated three times, then digits from 0 to 9 were read. Then the three-digit group was repeated another three times, followed by a

high-pitched tone repeated ten times. Then "grupo 123" was announced, and four-digit groups began. (Michael Harris, GA)

9265: Five-digit English numbers station with female announcer 0307, announcer had strong accent. (Thad Adamaszek, OH)

9265: Five-digit German numbers station with female announcer 0100, opens with double beeps. (Thad Adamaszek, OH)

Anyone willing to venture odds that these two stations share the same transmitter site? (Editor)

9450: A four-digit German numbers station with female announcer has been heard on this channel in SSB during the 2100-0300 period at least once a night (sometimes more) since late April. Also heard on this frequency was a station transmitting coded traffic using only the letters A, N, D, R, U, W, I, G, M, T, F, H, and S. Each message consists of 50 five-letter blocks. These messages have been heard at 0000 and 0200. (Buzz Barden, MA) Excellent bit of listening and reporting! (Editor)

9970: "I" repeated continuously in CW 0300. (Dennis Rutowski, CT)

9975: Five-digit English numbers station with female announcer 0200, transmission opens with double beeps. (Thad Adamaszek, OH) Some of the German numbers stations reported this month also open with beeps. (Editor)

10015: Five-digit Spanish numbers station with female announcer 0222, off at 0240

with slow "final." (Thad Adamaszek, OH)

10460: Five-digit German numbers station with female announcer 0300, each group repeated. (Lester Robison, NV)

10500: Five-digit German numbers station with female announcer 0610-0620, in SSB. (Ernie Rice, OH) Welcome Ernie! Report often! (Editor) Similar station noted on 10501 kHz at 0345 in SSB. (Lester Robison, NV)

11269: SAC "Skyking" broadcast in SSB 0515. (Lester Robison, NV)

11282: Aeronautical Radio, Inc., Honolulu and San Francisco stations on this frequency working aircraft aloft 0254. (L. Jean Baker, IN)

11396: Aeronautical Radio, Inc., San Juan, PR, working aircraft aloft 2200. (L. Jean Baker, IN)

11530: Four-digit Spanish numbers station with female announcer 1425; at 1435 voice stopped and a "bumping" sound was heard until 1439, then carrier was cut. (Dan Nicholson, MO)

11544: Four-digit German numbers station with female announcer 0209. (Dennis Rutowski, CT)

11592: Four-digit Spanish numbers station with female announcer 0135. (Dennis Rutowski, CT)

12180: CW numbers station with five-letter coded groups similar to the station on 5148 kHz heard here at 1600-1608. (Kenneth Eichman, OH)

13395: Six-figure groups in blocks of five in CW 1828, and no calls were heard. (Don Schimmel, VA)

13496: "72 DE OA ZBO A AA" repeated 1146. (Don Schimmel, VA)

13775: Five-digit German numbers station with female announcer 0105; opened with flute music and phonetic letters. (Thad Adamaszek, OH)

13808: Three-digit Spanish numbers station with female announcer 0126, off at 0140. (Thad Adamaszek, OH)

14358: KWS78, American Embassy, Athens, Greece. Heard at 2300 with CW marker. (Tom Kneitel, NY)

14441: Four-figure groups sent at approximately four groups per minute in CW 1930. Numbers 4 and 6 sent normally; other numbers sent as A=1, U=2, V=3, E=5, B=7, D=8, N=9, and T=O. (Don Schimmel, VA)

14450: Five-letter CW groups sent in groups of six, approximately four groups per minute, noted several times in 1855-2135 period. (Don Schimmel, VA)

14818: Y7A60/Y7A73 running an "RY" marker on RTTY at 0225. Station is an Embassy operation in Berlin, East Germany. (Tom Kneitel, NY)

14848: TASS News in English via RTTY at 0215, also noted on 14899 kHz. Located in Moscow. (Tom Kneitel, NY)

Thanks again for the great support! See you next month!

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NEW AND EXCITING TELEPHONE TECHNOLOGY

Hard Wired Intercoms

Another step-saving device that operates similar to a cordless telephone is an intercom system. Intercoms need little explanation—they let you talk in a normal tone of voice to someone in the next room, the next office, or even the next building without having to shout. Intercoms work independent of the normal telephone system, relieving your telephone lines of idle chatter.

There are two basic intercom systems available today—ones that use dedicated wiring, and others that are “wireless.”

Hard Wired Intercoms

These intercom systems are the choice of most commercial businesses that demand multi-unit operation in a large building complex. The intercom itself is a modern looking speaker/mike device that fits in nicely on anyone’s desk. A sheath of wires about the diameter of a pencil feeds the intercom and ties it into other intercom systems throughout the building. The unit also requires connection to an AC source. These wires then join the main wiring harness, and this harness distributes each intercom station throughout the building complex. Depending on the type of intercom system, there may be as many as 50 stations on line.

Here are some of the benefits of a hard wired intercom system:

- Sparkling clarity
- Immediate access to any other station
- “Busy” mode for no interruption
- All station access for group calls
- Monitoring of a remote station (providing that station has authorized open-mike monitoring)

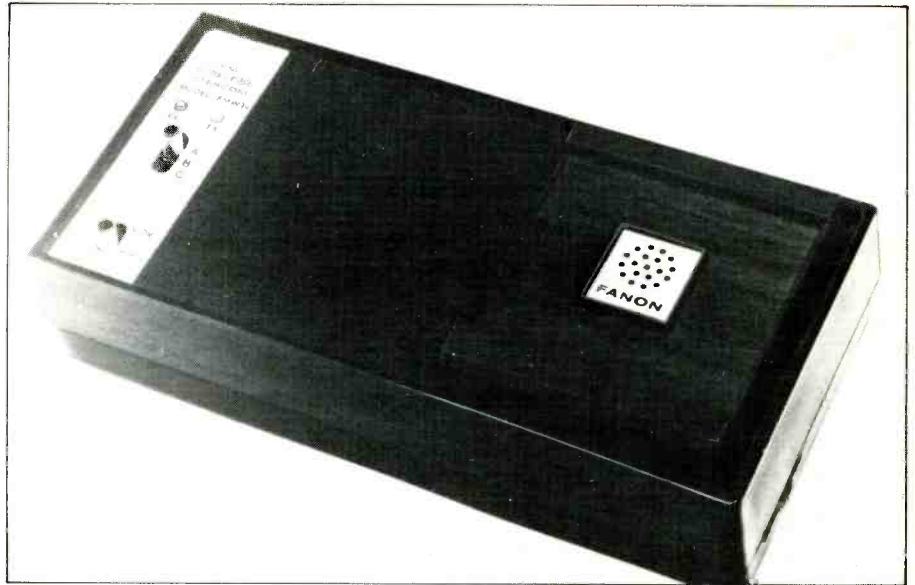
The hard-wired intercoms are also ideal in large office buildings because they can continue to function in a power blackout. Most feature built-in batteries for this type of an emergency.

The hard-wired intercom may also be used for paging when connected to a large paper amplifier. They can page out and then immediately listen for a response on the workmen’s floor.

Hard-wired intercom systems are available from approximately 10 leading manufacturers of intercoms. It is recommended that an intercom specialist review your needs in your workplace to suggest the right system. Several thousand dollars can be spent on an elaborate hard-wired intercom system.

“Wireless” Intercoms

By now, most of you have probably made up your mind that the hard-wired intercom system is much more elaborate than what



The Fanon wireless intercom.

you can really use around the home or in a small office facility. Alas, the wireless intercom is for you!

Wireless intercoms use your AC home and office wiring as the avenue to connect one set to another. Frequency Modulated (FM) signals are impressed over your household and office wiring. Each intercom station is a miniature FM transmitter and receiver on specific channels, shared with low powered Part 15 devices. Each intercom is allowed to feed back into the powerlines 100 microvolts on any frequency below 25 MHz when measured in accordance with the procedure in IEEE S213 FCC Part 15.75. Most intercoms can be found on a shortwave receiver just above the AM broadcast band (near 1700 kHz). In the AM mode on your shortwave receiver, slope detect the FM signal by tuning into each side of the signal envelope.

Channels And Stations

The beauty of these “wireless” intercoms is that you don’t need to spend hours running wires between each station. An intercom “station” is a complete unit that is capable of sending and receiving conversations. You can have many intercom stations on a single channel intercom system. It’s a “push to talk and release to listen” proposition when you operate these sets. Any one intercom talks to all others at the same time. The more stations you add, the more people that will get in on the conversations.

Another benefit from the multi-station single channel intercom system is that you never need to worry about someone eaves-

dropping in your office or in your room. Just as long as you don’t have your transmit bar pushed down, there is no way anyone can overhear what’s taking place in the room.

There are over 20 manufacturers of simple single channel multi-station intercoms. You can generally add as many stations as your system will accommodate. Just remember, everybody hears everything and only one person can talk at a time.

Multi-Channel Intercoms

There are also available two, three, and four channel wireless intercoms. These systems allow for your standard AC wiring to carry several different conversations simultaneously between different intercom units. Each conversation is on a different frequency, and sometimes frequencies near 180, 190, 220, and 250 kHz are used. These frequencies are spaced far enough apart that all systems may be operated simultaneously with four channel capabilities. You can also add up to six stations on each channel. Elaborate master stations can also make group calls over all four channels at the same time in case of an emergency, fire, etc.

Most wireless intercoms use FM for crystal clear listening and talking. Less expensive units use AM, which tends to be more noisy. Multi-channel frequency selection is accomplished through a phased locked loop (PLL) IC circuit. The more elaborate intercoms also feature touch controls rather than mechanical push-to-talk bars. A special key/lock allows you to continuously talk without having to hold the push-to-talk bar.

Wireless Drawbacks

There are some precautions to remember when considering a wireless intercom system. Since the signals travel along your AC wiring, there may be areas where the wiring is not common. If your large office building is not all on the same power line, or there is a power distribution center with an isolation transformer in the middle of the works, there is an outside chance that one intercom won't pick up another. You then need to, through trial and error, plug in the intercom in different locations to try and find compatible AC wiring. In most homes, this is rarely a problem. In fact, it's quite possible to stay in touch with neighbors next door and across the street providing you all share the same power lines.

All power lines are not noise free. Since your intercom is receiving weak signals off of the power lines, sometimes noisemakers like electric drills, hair dryers, computers, razors, and office calculators may interfere with a conversation. Although you shouldn't experience many problems around the house, you may find that certain wireless intercoms in an office and factory complex may be plagued with noises. Wireless intercoms are also not secure from shortwave eavesdroppers or next-office snoopers.

Another consideration on the "wireless" intercoms that use the AC wiring as the signal transmission line are cordless telephones. You may experience interference from a cordless telephone that shares the same talk-back frequency as your wireless intercom. You may wish to double-check that your system is compatible with a cordless telephone system.

Intercom systems can save valuable time in a business setting. Around home, intercoms are quite handy. Intercoms are fully solid state for years of reliable service. A pair on a single channel can be purchased for as little as \$65. If you are constantly yelling across the office floor to a buddy, or always having to search through a lot of rooms for someone you are looking for, consider an intercom system.

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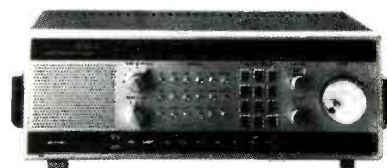


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CIRCLE 65 ON READER SERVICE CARD

Secret Radios Of The Dutch Underground

Hidden In Unusual Places, They Remained Hidden For Years!

BY ANSON MacFARLAND, KVA4EX

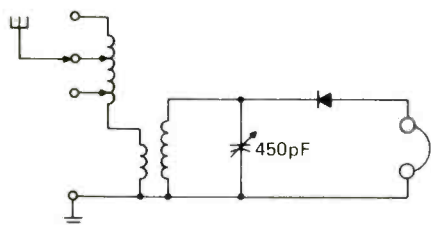


Figure 1. This set received English stations.

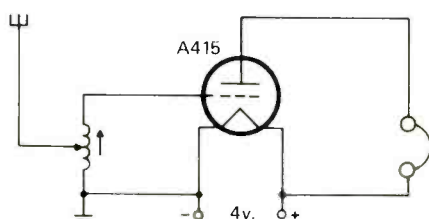


Figure 2. One tube radios were far more sensitive.

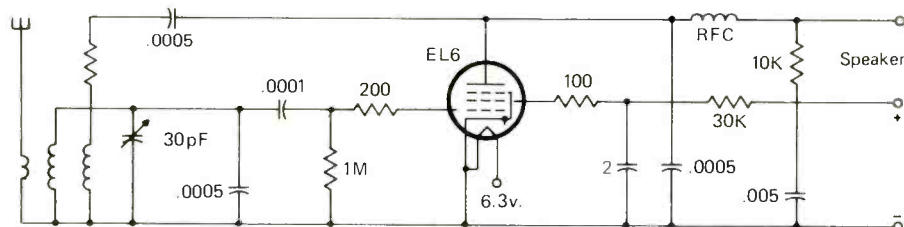


Figure 3. One of the early circuits.

As the Nazi war machine rolled through Europe, it left few nations untouched. One of the nations which was overrun in the hostilities was the Netherlands. Occupied from 1940, the Nazis faced the prospect of reducing the chances that the valiant members of the Dutch underground would be able to receive instructions for acts of sabotage. They also wanted to eliminate any abilities of the average citizens to hear any war news from Allied Forces stations. The way of doing this was to make it illegal for the Dutch to own radio equipment, backed up with an enforcement program which called for the equipment to be confiscated on sight. By the spring of 1942, radio listening had been driven deeply underground.

By a strange and almost bizarre coincidence, the task had been made less difficult by the prewar Dutch government! Before the Nazi invasion, the Dutch government (which owned all of the broadcasting stations in the nation) began imposing very high licensing fees upon owners of radio receivers. By 1936, Dutch radio listeners organized a revolt against those fees and many citizens disposed of their receivers as part of the protest. The protest movement swept the nation with anti-fee slogans being painted on walls and sidewalks. Another part of the protest included the formation of groups in which one member owned a radio receiver having 5 or more tubes (so it could tune

any of the European radio stations). The expensive fee was paid on the one receiver and each member of the group would have only a loudspeaker which was connected to that receiver. This made it possible for many people to enjoy radio at the relatively low cost of belonging to the receiving group. The membership fee was about 250 Guilden (about \$1) per month. As a result, Dutch citizens actually had fewer radio receivers amongst their numbers than persons elsewhere in Europe by the time the Nazis showed up in their nation.

When the Nazi occupation forces started confiscating all of the receivers they could locate, Dutch citizens set about constructing simple receivers to bring them news from the BBC and elsewhere in the free world. Members of the Dutch underground also required receivers.

One popular type of Dutch "underground" receiver was a simple crystal set which could be easily assembled by those lucky enough to have crystal. The set, shown in Fig. 1, could be constructed in a cigar box, complete with headset and tuning capacitor. When it was time to listen, the box could be opened, connected to an antenna and ground, and it was in operation. Weak reception was the main complaint, however the set was surprisingly selective.

Another early approach is shown in Fig. 2; it used an old battery tube. The plate volt-

age was taken from the A-battery and the results were much better than those obtained with a crystal detector. The coil was tuned with an iron-powder core only and no capacitor was used. Tuning was not very sharp, but this wasn't needed in the beginning because the Nazi jamming didn't get started in earnest until later in the war.

A better approach required a more complex circuit, such as the one shown in Fig. 3. It had a high- μ beam power pentode, connected as a feedback detector. It gave good speaker output and was sensitive enough to use an antenna of relatively short length. It was tuned by an iron-core coil and a fixed capacitor with trimmer for peaking. It was usually just left set at 200 kHz, which was the BBC's frequency.

The tube was an EL6, and the circuit worked very well. One problem was that it couldn't be hidden. Besides, it still needed an antenna and that meant that it might be seen.

Fig. 4 represents the next step in the evolution of underground receivers in Holland. It didn't need an external antenna. It used a triode-heptode which had three functions: RF amplifier, grid-leak detector, audio amplifier. The plate supply (43 volts) was obtained from the A-battery. The tube, a UCH21, operated from that heater voltage.

The coils were of the iron-core type, wound on a low-loss form with a core in the center. The set was tuned with a 500- μ f fixed capacitor and a 3 to 30 pf trimmer across it. The coils were shielded by pieces of copper sheet which were bent to fit. This set was also tuned to 200 kHz.

Tube, coils, resistors and capacitor, RF choke, and A-battery—the entire equipment was put into a wall telephone case (with the telephone parts removed). Fig. 5 shows one of these types of cabinets.

That was a most satisfactory way of concealing the set, and the loss of the telephone innards to the case was of little consequence to most people since the telephone system was mostly inoperative except for use by the German military command.

As an antenna, the operator's finger was usually sufficient while the former telephone lines invariably provided a good enough ground.

To operate the receiver, the telephone dial was rotated to a specific position and then you'd just pick up the handset and wait for Big Ben's chimes. Concealment often included tacking a piece of paper to the wall stating, "Pas op! Niet gebruiken Defect!" Translated it means, "Better pass this one by, take care, don't use it, it's defective."

These "radio telephones" were so cleverly disguised that they seemed unknown to the Nazis, even though they had become quite popular with the Dutch civilians. When the Allies began dropping out of the sky in 1944 to reclaim Holland, the Nazis tended to loot many homes during their retreat. Many were cleaned out right to the walls, except for the "defective" telephones—they had been overlooked!

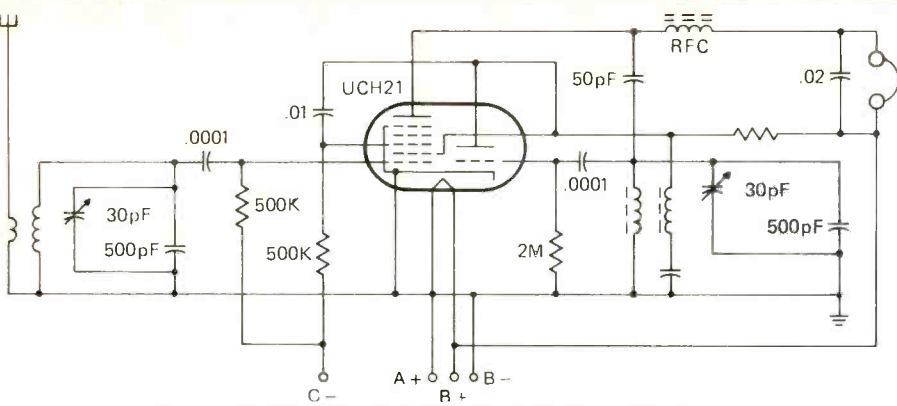


Figure 4. This set operated on a body antenna.



Figure 5. A real radiotelephone.

Another popular receiver is shown in Fig. 6. This was a common type of regenerative detector and gave very satisfactory results. The tube was a type similar to the American 6K7 or 6S7. Tuning was by an iron-core coil and a variable capacitor (L1, C1). The circuit regenerated by means of the tickler coil (L2) and was controlled by C2.

Two plug-in coils, made from old tube sockets, were available, one for 200 kHz (BBC) and one for 1,000 kHz (Dutch underground radio and later liberated Dutch

radio). The set was powered by external batteries and the receiver itself could be housed in a small wooden box. With this set coupled to a power amplifier it could drive a 5-inch speaker with excellent results.

I don't mean to give the impression that there were no commercially made receivers in operation, despite the fact that all which could be located were confiscated. One of the stories that came out of Holland at the end of the war concerned an RME-69 receiver. The RME-69 was an American set designed in the late 1930's for the ham radio service. In 1941, one of these receivers was placed at the disposal of the underground group known as Corps Regeerings Berichten Dienst (Government Communication Service). From 1941 to 1944 the receiver was used on a daily basis to copy signals from secret transmitters in England that had information and instructions for the Dutch underground.

In September of 1944, the receiver was sent to a farm in the area of Amersfoort to become part of a secret communications station. In March of 1945 the set was sent to Amsterdam and while enroute the Germans stopped the transport and opened the crate in which the set was packed. The Germans bought the story that the receiver was laboratory test equipment. After reaching its Amsterdam destination, the receiver was placed in daily 24-hour service at station "PAD," transmitting facility of the Corps Government Communication Service. In the five years the receiver was in use, it was so well cared for that it never required a single repair. And, by the way, it had been powered from batteries throughout that period.

I'd like to add that Dutch ham operators

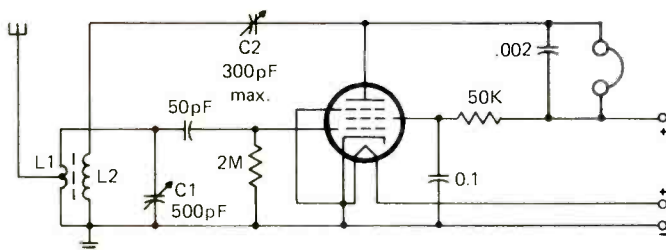


Figure 6. Another standard underground receiver.

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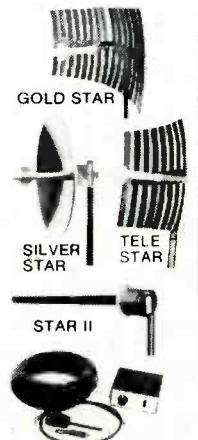
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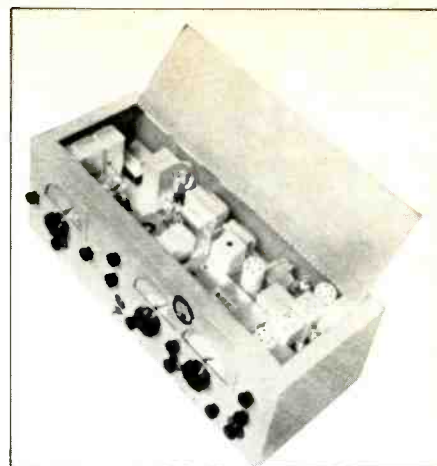
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received special attention from the Gestapo since they were constantly under suspicion of harboring or building contraband radio equipment. Many Dutch ham operators (such as PAØMO and PAØQQ, to name just two who happened to be well known on the air in prewar days) lost their lives. Other Dutch hams had all of their test equipment and construction tools taken away by the Gestapo—PAØAPX estimated the loss in electronic equipment and tools stolen from him to be about \$2,000 (that total also includes all of his household articles since they were taken away with the radio gear).

Of course the Dutch people weren't the only ones to have their freedom to listen to the radio taken away. For instance, the Brit-

ish Channel Islands (Jersey and Guernsey) were also occupied by the Nazi forces for five years. Again, radio equipment was confiscated and those found in illegal possession of same faced two years hard labor. Several months imprisonment were doled out to any person found to be distributing news or information obtained by radio. Nevertheless, at least 25% of the homes in Jersey had crystal sets hidden in shoes, clocks, match cases, pots and pans, seat cushions, dog houses, and books. Even though the German forces constantly searched for these sets, few were ever found.

The Dutch, the Channel Islanders, and others who found themselves faced with the spectre of losing their monitoring freedoms



The RME-69 was an American receiver which saw service in the Dutch underground.



Dutch underground radio station PAD as it looked in March of 1945.



After the war ended, a former member of the Dutch underground displayed the receiver he had hidden in a wooden card file box. It was used to copy instructions sent to him via radio from England.



appreciated all the more their ability to receive information to counter the propaganda fed to them regularly by their captors. It helped them to keep their morale intact through long years of anxiety, hunger, and privation.

Even today, in our own nation, we might always keep this in the back of our minds and view each and every regulation issued which restricts the free exchange of frequency data, or limits the reception of any radio signals (including SCA, satellites, use of mobile scanners, etc.) must be viewed with some trepidation. Can we forget what happened in the past?

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That's right, someone else can do all that ear-straining for you 24 hours a day. And every major city has at least a few organizations that do this all the time—the news media.

Reporters, editors, and photographers all need to know what is going on in the communities they cover. Thus, they may employ the use of several scanners in their newsrooms and company vehicles to keep tabs on crimes and major fires as they occur.

And when something newsworthy occurs, chances are a newspaper photographer will be contacted by his editor or a TV news crew will be alerted by their assignment desk—by radio. If you listen in on the frequencies used by the news media in your area, you'll probably know anything urgent as it occurs. Chances are that assigning editors will relay information as they hear it on the scanner to reporters and photographers. In addition, when news crews arrive on the scene, they will be relaying reports to their news desks. Rather than the mumbo-jumbo of codes and slang used by police officers and firefighters, you'll hear it straight from the news crews.

Recognizing the unique need for two-way radio by news organizations, the Federal Communications Commission allocates certain frequencies to broadcasters and newspapers. The accompanying chart indicates what frequencies you should check out for TV and radio news crews and newspapers in your area. Generally, radio and TV reporters can be heard on the 161, 450, and 455 MHz bands. Newspaper crews can be heard generally on the 173 MHz band and the two UHF frequencies allocated for relay press, 452.975 and 453.000 MHz.

Some newspapers and many TV stations will utilize more than one frequency for their operations and each channel usually will

have a dedicated purpose. For instance, a TV station might use one frequency for the assignment desk to keep in contact with reporters and film crews, another for engineering crews to coordinate the transmission of their film footage by microwave, and another for cuing reporters during live broadcasts. On a cuing channel, often you will hear the audio portion of the TV or radio station rebroadcast with the director or producer at the studio giving the reporter and film crew instructions such as moving the camera or that they have so much time left until the live broadcast begins. Other frequencies might be used for paging, couriers, and traffic helicopters.

In addition to the visible news media, other news gathering agencies also use two-way radio. Press cooperatives such as The Associated Press and United Press International use radio systems on news channels in several cities, and agencies such as traffic reporting services, photo agencies, TV news-film services, and magazines also might pop up on news channels.

Even with all of these radio systems employed by news-gathering agencies, you might have to listen elsewhere to get the real "scoop."

Because most TV stations and newspapers listen to each other's primary frequencies, it's a little tough to keep a scoop without everyone else knowing about it when you dispatch film crews and reporters. Thus, some TV stations may have a "private" radio system that is used infrequently enough to keep others from finding out the channel or what they are saying.

One of the easiest forms is to utilize mobile telephones, and many major TV stations do this. Because the mobile phone conversation can pop up on any one of perhaps a dozen-plus radio channels, and the channels are loaded with other idle and professional chatter day and night, it's impossible for competitive news agencies to eavesdrop on these conversations. But if you keep an occasional ear on the mobile phone channels, you might catch a news crew chasing down an exclusive story. Other private radio

systems might actually operate on business band rather than the news channels. It wouldn't be unusual to find a TV station utilizing a repeater in the 461-465 MHz range for occasional communications. Some TV stations also might just use a discrete simplex frequency in the 450 or 455 MHz band.

While many newspapers use the same frequency for both circulation and news photographers (in addition to hearing the photogs speeding off on an assignment, you'll hear how Mrs. Smith hasn't received her paper for the past two weeks), some may utilize a business band channel for delivery and leave the relay press channels open for their photographers and reporters. Listen around and you'll figure out which channel is being used for what.

In any event, if you loathe having to keep tuned in to 20, 50, or even 100 channels to keep up on what's going on, try the news media channels. You may not hear about the neighbor's bicycle being stolen off the back porch, but you'll know when the oil refinery is engulfed in flames or the mayor is suddenly taken to the hospital. You'll also get a better understanding of how newspapers, TV, and radio stations operate behind the scenes.

News Media Channels

25.87-26.47	Remote broadcast (TV and radio)
152.87	Film crews (frequency shared construction crews and farms)
152.90	Film crews (frequency shared construction crews and farms)
152.93	Film crews (frequency shared construction crews and farms)
152.96	Film crews (frequency shared construction crews and farms)
152.99	Film crews (frequency shared construction crews and farms)
153.02	Film crews (frequency shared construction crews and farms)
161.64-161.76	Remote broadcast (TV and radio)
166.25	Remote broadcast (used by fire departments within 150 miles of New York City.)
170.15	Remote broadcast (used by fire departments within 150 miles of New York City.)
173.225	Newspapers and film crews
173.275	Newspapers and film crews
173.325	Newspapers and film crews
173.375	Newspapers and film crews
450-450.99	Remote broadcast (TV and radio)
452.975	Newspapers
453.000	Newspapers
455-455.99	Remote broadcast (TV and radio)

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

It is apparent to me the urgent need for the SWL and ham to sample RTTY point to point transmissions without initially spending much money, preferably with a simple, low cost demodulator that is sufficiently flexible enough for various shifts and baud rates. This month, we will describe a straight-forward RTTY phase locked loop (PLL) demodulator that can be built for less than \$15. Of course, this demodulator is not designed to replace a commercial grade demodulator, but the design lends itself to gradually upgrade performance.

Phase locked loops have been around since the early 1930's and have been used for many applications in space telemetry. Of course, in the 1930's a great many tubes were required to implement a PLL design. Recently, the advantages of integration have reduced the entire system of phase comparator, VCO, and drivers to a single chip. The latest PLL integrated circuits are quite good when used for RTTY demodulation, assuming one adds an external audio filter. Other applications include single tone detection, stereo decoding, and frequency synthesis. In general, when the PLL is locked on the input RTTY signal and tracks the shifts in the input frequency (remember mark and space tones), the error voltage in the loop will convert the frequency shifts back to the binary logic pulses. The demodulator consists of an EXAR PLL set up to

convert audio FSK tones to binary (0 or +5V) signals.

This PLL design is perfect for the hobbyist who enjoys building and experimenting with "home brew" circuits. First of all, let's answer some basic questions about a PLL and demonstrate its effectiveness as an RTTY terminal unit.

The value of the lock-detect filter capacitor C_d is inversely proportional to the capture range. A .1m^f capacitor selected for C_d will work fine over the wide range of 170 Hz through 850 Hz shifts. Smaller values than .1m^f selected for C_d causes a form of "chatter" especially at 170 Hz shift. Larger values than .1m^f will simply delay the response time of the lock-detect output. Under noisy band conditions, this can be a useful condition due to the necessity for a stable, long term carrier in order to allow valid output data.

Setting up the XR2211 is quite easy. Any DC source from 5 V to 15 V may be connected as $V+$. A VTVM, LED, or oscilloscope (DC coupled) should be connected to the output (pin 7) to note a change in state from 0 to 1. There are several methods for setting the potentiometer adjustment Rx.

If a frequency counter is available, short pin 2 to pin 10 and measure f_0 at pin 3 with C_d disconnected. Then, adjust Rx to the frequency exactly between mark and space. The frequency between mark and space then becomes the switching point.

If a frequency counter is not available, use the FSK audio input (from receiver or external audio oscillator) to set the center frequency. This is accomplished by trial and error. Center the points of transition equidistant between mark and space while adjusting Rx and observe a stable voltage change on the output pin. For a 425 Hz shift, a transition on the output pin should occur around 2337 Hz.

What we have accomplished is to convert FSK audio tones into corresponding binary information.

A computer is now required to display this Baudot or ASCII information. Next month we will illustrate a technique for using a personal computer in conjunction with the demodulator.

The phase locked loop provides audio frequency selective tuning and filtering without any external inductors or transformers. Refer to figure 1 as the PLL operation is briefly explained. With no audio tone applied to the input (V_s), the output voltage (V_d) is equal to zero. The internal voltage controlled oscillator (VCO) operates at a set frequency (f_0) which is also known as the free-running frequency. If an input signal is applied to the system, the phase comparator compares the phase and frequency of the input signal with the VCO frequency and generates an error voltage. Since the output voltage changes as the input tone changes, a

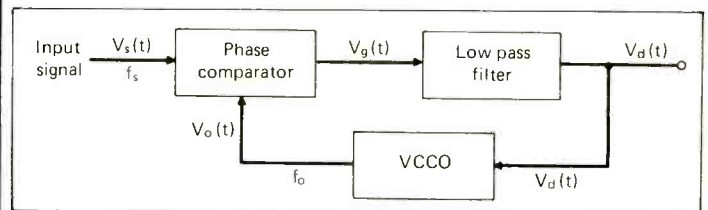


Figure 1

RTTY FSK Demodulation Desired

Mark	= 2125 Hz	2125 Hz	2125 Hz	2125 Hz
Space	= 2295 Hz	2550 Hz	2975 Hz	2725 Hz
Shift	= 170 Hz	425 Hz	850 Hz	600 Hz
Rate	= 45 baud	50 baud	50 baud	50 baud

Component Values

R_o	= 18 k	18 k	18 k	18 k
C_o	= .022 μ fd	.022 μ fd	.02 μ fd	.02 μ fd
R_1	= 260 k	110 k	60 k	81 k
C_1	= .005 μ fd	.005 μ fd	.005 μ fd	.005 μ fd
C_f	= .05 μ fd	.05 μ fd	.05 μ fd	.05 μ fd

Figure 3

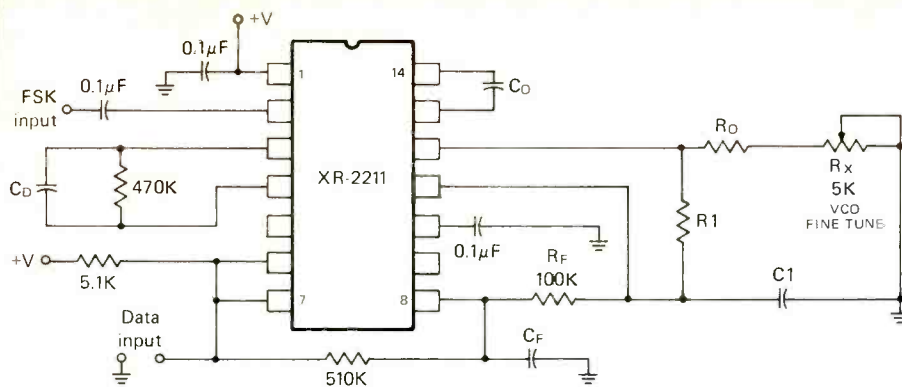


Figure 2

frequency shift keyed (FSK) detector, or demodulator, has been created. If the input frequency is close to the VCO center frequency, the internal feedback path will cause the PLL to lock, or synchronize, with the incoming signal.

The capture range of a PLL is the band of frequencies in the area of the VCO center frequency over which the PLL can acquire lock with an input signal. Once the input is locked to a particular audio frequency, the range of frequencies that will maintain lock is known as lock range. These terms "capture range" and "lock range" are important as one modifies this demodulator for experimentation. For example, a typical ham application will require a demodulator to translate 170 Hz shift tones that are very close to adjacent interfering RTTY signals. There-

fore, a key requirement in a PLL RTTY demodulator would require a narrow capture range in order to prevent "pulling" of the selected FSK signal by an adjacent FSK signal.

The EXAR XR-2211 PPC is used as the heart of the RTTY demodulator—as this single integrated circuit is very temperature stable (earlier single chip PLL drifted considerably) and optimized for audio FSK design. It is low cost, approximately \$5.25 in single piece quantities, and readily available from your local electronics parts supplier. The fundamental demodulator circuit is shown in figure 2. Capacitor Co and resistors RO + RX sets the PLL center frequency which in turn is calculated by adding both the mark and space frequency together and dividing by 2. If the world press standard

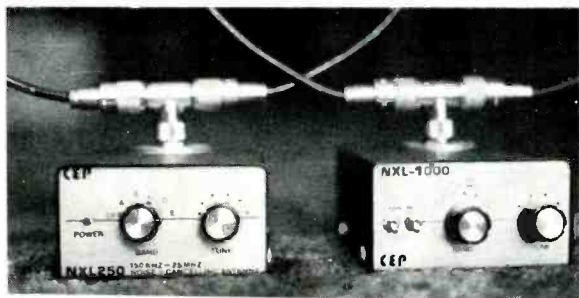
425 Hz shift is desired, the center frequency calculates out to 2337.5 Hz. Capacitor Co then becomes .02 µfd. Be sure to use a quality polystyrene capacitor for good temperature stability. Figure 3 outlines required components for Ro, Co, R1, C1 and Cf. First, decide which shift you are interested in and follow the component tables down to the actual listed resistive or capacitive components.

For ham use, select the first column which defines the components for 170 Hz shift. General RTTY reception of news agencies and weather entails selecting component values listed under 425 Hz and 850 Hz shift respectively. The FSK input connects to the receiver's audio output either from the speaker output or the audio line output depending on the individual receiver. Audio input levels to the EXAR PLL are not critical since the XR2211 IC has an internal amplitude limiter and good demodulation will result from a wide input voltage range of .01 volt to 3V rms. This is fortunate as a level or volume control is not required. Overall assembly is not critical, and a perfboard with point to point will be acceptable. The VCO fine tune potentiometer (RX) can be a single turn type mounted for easy access.

In order to minimize noise and false turn-on problems, the XR2211 offers an internal carrier-detect feature. Using this feature, the digital output (pin 7) is not enabled until there is a carrier within the detection band of the PLL and pin 6 output goes "high"—enabling the data output.

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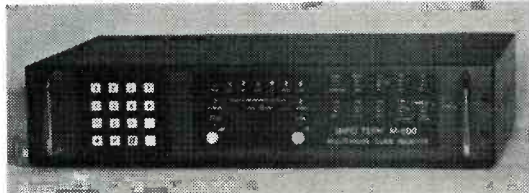
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Please send all reader inquiries directly.

An Army division or brigade commander has an urgent message that must reach a remote element of his command. Conventional methods of transmission such as the telephone are not available or secure enough at this time. How will the message likely be transmitted? In all probability, by secure FM radiotelephone or radioteletype. The operator who transmits the message is a product of the Radio Operator (MOS 05B) or Radio Teletype Operator (MOS 05C) Course at Fort Gordon, (Augusta) Georgia.

At any time during the year there are literally hundreds of young enlisted students attending these classes. The self-paced courses, a combination of hands-on training and classroom instruction, prepare students to operate either the AN/VRC-12 or AN/GRC-142 or 122 military comms rigs. Due to the common nature of some of the subjects taught in both classes, these students are not only members of the same unit, but also share the same academic and non-academic facilities. The major difference between the two courses is that the 05C student has the additional task of learning how to type and must become highly proficient in equipment associated with radioteletype operation.

According to instructor Joseph Plantamura, if the RTTY student is unable to meet the basic typing requirement for the course, typing classes will be included in the student's curriculum. He added, "Most of our soldiers, however, have basic typing skills prior to beginning class and a General Technical score of at least 100." (A test given to soldiers before enlistment, measuring their overall intelligence.) Additionally, many were either interested in some aspect of communications or were one-time CB operators or shortwave enthusiasts, although it's not a requirement. He emphasized, "Our classes can teach a student from scratch, if necessary."

A percentage of students from each course may be required to attend classes in International Morse Code which, if successfully completed, will qualify them for an award of the Additional Skill Identifier, A4. This is determined by administering an auditory perception test to each student on the first day of school. If a score of 100 or higher is attained, the student is considered to have

an aptitude for CW and is enrolled in this course. The battalion also provides training assistance to resident basic and advanced officer students as well as supporting the National Guard and Reserve component with in-house training and through mobile training teams. There is a vast difference in the length of the courses, 6.8 weeks for the radio operator and 13.2 for the teletype operator, plus the additional 4½ weeks for each specialty if the individual is selected to take the code course.

Both courses employ the self-paced method of instruction. Conceivably, a student could finish the course before or after the allotted time, depending on his or her ability to successfully meet the requirements. The combined courses are divided into six operating sections, with each lesson dealing with some portion of radiotelephone communications. After each of the six annexes, the student is required to take an end-of-annex test. If passed, he or she goes on to the next annex. If a portion of, or the complete end-of-annex test is not passed, the student is given remedial training and then given the opportunity to retake the complete test or those portions of the test that were missed.

The courses cover a wide range of subjects—from the phonetic alphabet to hands-on training both in and out of the classroom.

A student learns the intricacies of an AN/VRC-46.



They Pay You To Learn Communications Skills!

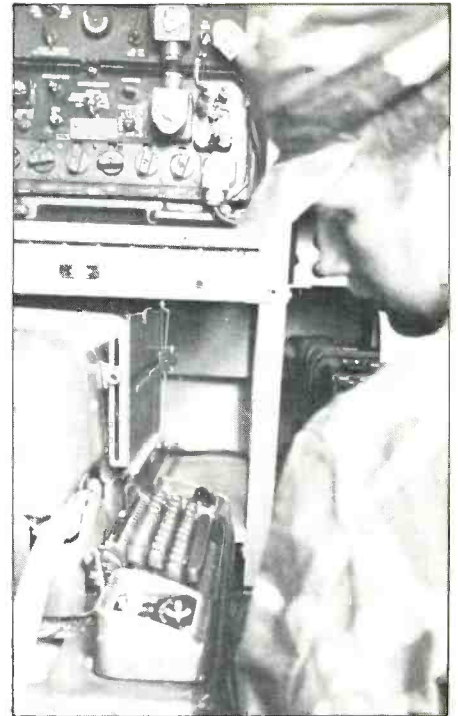
Best Way To Learn About Military Radio

BY HAROLD ORT, SGT. FIRST CLASS, U.S. ARMY





The mysteries of an AN/GRC-142 teletype station are revealed to this student.

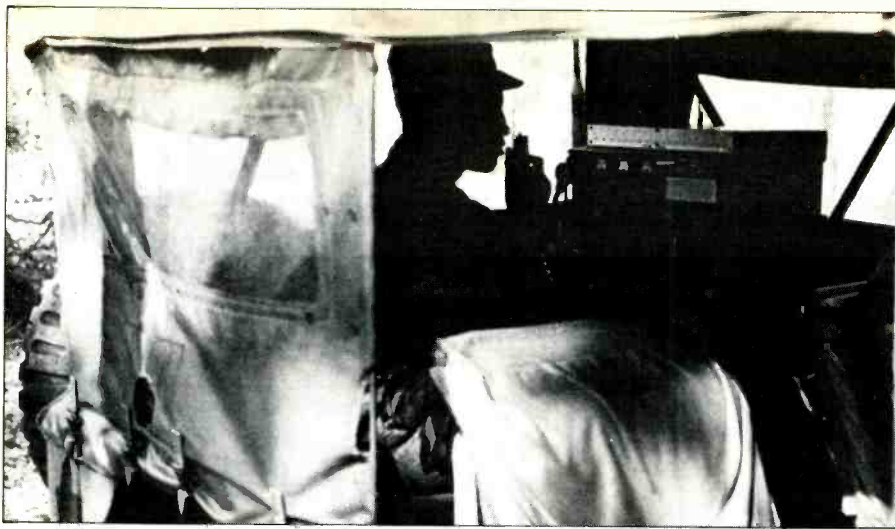


In one phase, students are required to erect and position antennas in an actual field situation. In addition to radio and radioteletype operating procedures, students learn operator maintenance and troubleshooting techniques. And operating radios isn't all they do. Each soldier must have a good working knowledge of AM and FM antennas, tactical power generating equipment and operation of cryptographic devices associated with the various radio systems, and a basic understanding of EW countermeasures.

In the final phases of training, students go through Skills Training and End-of-Course Comprehensive Testing. Skills Training is the application of those skills and knowledge acquired during the course in a simulated tactical field environment. This is where the operator brings the entire radio system together. During this phase, students actually perform as communicators. Additionally, they are required to wear their chemical masks and protective clothing for a specified period of time. They are also taught how to erect camouflage nets within the perimeter of the field communications sites that are enclosed by concertina wire to add realism and provide a measure of security.

Mr. Plantamura, who is primarily responsible for teaching the 05C course, is impressed with the quality of students enrolled in the courses. He noted that the dropout rate is less than 5% for both courses.

Classes normally begin at 7:25 a. m. and run until 4 p. m. Students are awakened at 4 a. m. and for an hour (beginning at 5 a. m.) they take part in organized physical training, followed by a hearty breakfast at 6 a. m. At the end of the day there's usually more training, including the spit and polish common to military life.



Actual "hands-on" use of two-way equipment in the field is a must. Here, an AN/VSC-2 is put through its paces.

"active duty" soldiers, they are full-fledged radio and radioteletype operators and have returned to their hometowns for monthly and annual "drills." Most students in the commo courses are normally assigned to Army outfits in Europe, usually Germany, in almost any type of unit from quartermaster to infantry to artillery. All receive a certificate of graduation at a formal ceremony.

The Army is constantly improving its commo courses and by the end of this year, the radio operator course will merge with a tactical wire operations specialty making a new skill known as Combat Signaler (31K), which incorporates the installation and operation of field telephone equipment into the radio operator course. The future may see the addition of a single channel satellite terminal class at the 05B course. Other plans include elimination of student training on FM commo gear (30-76 MHz) eventually utilizing only HF gear (2-30 MHz).

If a student has an interest in communications, a desire to travel and further his or her education, a career in Army communications might be worth considering. The unique and challenging training offered at Fort Gordon, when supplemented with additional communications and electronics courses, could easily land an experienced person an exciting career with companies like Bendix or Harris Corporation, and depending upon the location, he or she could earn from \$20,000 to \$40,000 working either for private industry or the government.

One radio operator student, Private James Barsch of Provo, Utah, entered the National Guard in February 1983 and began the 05B course on May 5, completing all required phases on May 26, ahead of schedule. He enthusiastically commented that he found the training challenging and stimulating. "Some of my friends back home are ham operators . . . I used to watch them talk around the world," he added. "Now I know what it's all about." He admits that the most difficult part of the radio operator course was

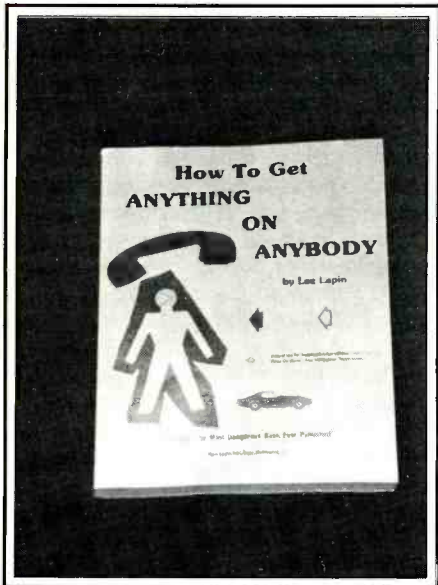
using proper voice procedures. Eighteen year-old Army Reserve Private Joseph Brown, from Mt. Morris, Michigan, agrees. He said, "It's a different language, but more precise with definite standards that must be followed in order to be understood." An ex-CBer, his typing speed is up to 30 wpm. Brown chose the 05C course "because it's something you can't learn anywhere else." He continued, "After looking at all the recruiting brochures I knew it was what I wanted to do." While Barsch and Brown are not

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CIRCLE 28 ON READER SERVICE CARD

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



How To Get Anything On Anybody

The new book called *How To Get Anything On Anybody*, by Lee Lapin, is a giant consumer's guide to the latest surveillance equipment and techniques. Actual comparison tests on the latest exotic eavesdropping gear; how to save 30 to 500% on many items! Tests of 11 devices which hear through walls, overseas sources for items not sold in the U.S.! The book tells about improvising surveillance gear; modifying common objects into surveillance devices (mics, transmitters, VOXs, spike mics, carrier current bugs, etc.). Improving and souping-up commercial electronic surveillance gear, 11 undetectable bugs; passive snooping; plus the most exotic bug in the world, three cheap super systems that outperform \$3,000 "packages."

The book also reveals how to organize and run an intelligence campaign against any target, how to beat a lie detector (CIA reports plus author's own tests), setting up a stakeout, tracing persons who are in hiding, obtaining unlisted telephone numbers and other Telco "inside" info. Methods for tailing and ditching tails. Information is given on lock picking, safes, running motor vehicle checks, obtaining birth/death/credit records, securing tape recorded information so no one else can listen in, voice scramblers, anti-surveillance devices, constructing the ultimate intelligence storage system.

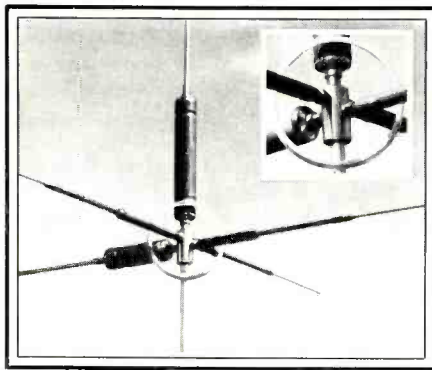
Lapin then discusses the secret CIA chemical that lets you read through envelopes without a trace (and where to buy it for \$1). Four experts tell how they would plant a bug. Also listed are 100+ sources for surveillance and investigative hardware.

This book doesn't fool around. Its text, photos, and illustrations make it a complete A-to-Z handbook on virtually all phases of undercover operations. In fact, Peter Lauffer (of *NBC News*, Washington DC) dubbed the book "possibly the most dangerous book ever published."

Lapin's previous book was banned altogether by the British Government and Lapin claims it earned him threats from both the FBI and the U.S. Attorney General (it even caused him to be shot at). This new Lapin book runs a thick 268 pages (almost 1½ lbs. in weight) and is a MUST for law enforcement agencies, private detectives, members of the intelligence community, and all persons interested in learning about the techniques and hardware used in amateur/professional/government intelligence gathering and surveillance operations.

How To Get Anything On Anybody is now available for \$29.95, plus \$3 for First Class Mailing (or plus \$1 for 4th Class Book Rate Mailing which is slower than First Class). Mailing rates apply only to USA/Canada/APO/FPO. You can order it from CRB Research, P.O. Box 56, Commack, NY 11725.

There seems to be something to outrage just about everybody in this new book!



JL Industries X-Panda Five

This one to five band coupler is aluminum hub precision machined with five steel $\frac{3}{8}$ x 24 rust-proof hi-tensile carbide studs, and makes a Hustler or Hy-Gain (or the equivalent) antenna into a five band mobile with the appropriate coils added. When the X-Panda is installed with the proper resonators, you can change bands without stopping your vehicle. Each resonator tuned to the desired frequency eliminates the need for an antenna tuner. Adding the X-Panda adapter to the antenna with the appropriate resonators and added ground planes will make an antenna system for apartments and condominiums. It can also be used to make multi-band antenna systems for RV's.

For more information, contact JL Industries, P.O. Box 030413, Ft. Lauderdale, FL 33303, or circle number 102 on the reader service card.



Low-Band Mobile Radios

Low-band mobile models are now available as part of the new SYN-TECH™ frequency-synthesized line of two-way FM radios introduced by Midland LMR, a division of Midland International Corporation.

Operating in the frequency range 29-54 MHz, the new models are programmable for up to 36 Tx and Rx frequencies, and can be modified for up to 80-channel programmable operation. The radios are field-programmable and the stored program can be erased and quickly reprogrammed as required. Time-out timing and busy channel lock-out are also field-programmable/reprogrammable, as are the tone-coded squelch and two types of channel scanning options. New programmable functions recently added to the Midland SYN-TECH line include variable scan rates and tone-coded squelch scanning.

RF power output of the low-band SYN-TECH mobiles is continuously variable from 25 to 50 watts. Receiver sensitivity is 25uV (SINAD); selectivity is -90dB. Standard frequency stability is 5 ppm, with 2.5 or 2.0 ppm optional.

Dash-mount models are just 2½" high, 7¼" wide, and 11" long, with a built-in front-firing speaker. Trunk-mount units are the same size as the under-dash models and feature one of the smallest control heads presently available (2" x 3½" x 3⅞"). Ribbon-type cable and connectors simplify installation.

In addition to the new low-band mobiles, Midland's SYN-TECH line now includes medium-power mobile and base station units in international low-band VHF (66-88 MHz), high-band, and UHF models. Phase two of the SYN-TECH introduction, consisting of high-power mobiles and base stations, repeaters, and 800 MHz models, is expected to be completed during 1983.

For more information, circle number 107 on the reader service card.

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE



Attorney Wins Fight Over Speeding Ticket

Not counting 10 hours of his own time, for which he would charge a client \$65 per hour, Peter M. Suwak of Washington, PA spent \$770 to defend himself against an \$80 VASCAR PLUS speeding citation.

Washington police charged Suwak with traveling 44 mph in a 25 mph zone.

Suwak contended, first in magistrates' court and in an appeal to Common Pleas Court, that the city used VASCAR PLUS without having passed an ordinance authorizing its use. Such an ordinance has since been passed by city council.

Judge Samuel L. Rodgers ruled in Suwak's favor, but not because VASCAR PLUS is illegal or unreliable or that the city failed to authorize its use. He ruled that the 25 mph zone was illegal. The legal speed limit as established by the Pennsylvania Department of Transportation and approved by a 1947 city ordinance, is 35 mph.

"If a street is improperly posted, then the speed limit is 55 mph in the eyes of the law. That's my legal opinion," Suwak said. "If they put up speed signs, then at that moment, it is a 35 mph limit."

In arguing his case before Rodgers, Suwak charged that the city used VASCAR PLUS to raise revenues from traffic citations, a contention that he repeated recently in an interview.

"I still maintain that the city used it to raise funds and the illegal signs that they posted supports my case," he said.

Suwak said his appeal expenses included "\$240 for a VASCAR expert to school me in its use, \$30 for a PennDOT witness and \$400 for legal representation at the hearing and legal research. That doesn't include my

time. I charge \$65 an hour and I know I spent at least 10 hours fighting this.

Policeman Tickets Officer

Police officer Dexter Whitmire of Wailuku, HI believes in giving a ticket to anyone who does 89 mph in a 35 mph zone—including fellow officer Kevin Kahailii who is now \$100 poorer.

Both officers were recently on duty when Kahailii sped past Whitmire on his way to a local police station on the island of Maui. Whitmire followed him and wrote him a speeding ticket.

Kahailii claimed he was chasing a speeding car at the time of the incident, but Whitmire said he didn't see another car nor did he see blue warning lights flashing or hear a siren.

The ticketed officer was found guilty in District Court, fined \$100 and docked six points on his driving record. He also faces possible disciplinary action.

Court: Defendant Must Prove Inaccuracy Of Radar Devices

A Vermont Supreme Court ruling will make it tougher for drivers to argue their way out of speeding tickets by contesting the accuracy of radar devices.

The high court recently ruled that a defendant must prove that inaccuracies in radar specifically apply to the case at hand.

Nancy Murry-Miller had contested a speeding conviction, saying external factors may have caused the radar device to malfunction.

She argued the lower court had not proven "beyond a reasonable doubt" that the radar was accurate when she was clocked at driving 61 mph in a 50 mph zone.

The high court upheld the District Court conviction, saying the burden of proof is not on the state to show the accuracy of the radar system.

"The primary fallacy in defendant's position lies in her argument that once she presented evidence of potential external factors . . . which might cause an otherwise accurate radar device to malfunction, the state had the burden to show that such malfunction did not occur," the ruling said.

"This is not a correct statement of the law nor of the state's obligation in these cases."

The Supreme Court said the defendant had a limited knowledge of how radar systems work.

"The defendant conceded that she is not a radar expert. In the absence of such appropriate qualifications, the mere recitation by her of possible problems held little if any necessary evidentiary value," the ruling said.

Her husband, who holds a degree in electrical engineering, may have been more aware of how the system works, but his testimony still had limited value, the court ruled.

CHP Chief: All Cars Need Fuzzbusters®

Every motorist should have a Fuzzbuster® to detect police radar because, contrary to their purpose, the devices "would slow people down," says the new chief of the California Highway Patrol.

"I wish every car had one," CHP Commissioner James E. Smith said with a mischievous smile. "We ought to make it a requirement."

Smith said the devices actually deter speeding because they cannot pinpoint where the police radar is located. The wider the sensor's radius, the better, he said.

"It would slow people down for miles around. I can't think of any way that we could have a patrol car that would do that much good," Smith said. "I'm all in favor of it."

Smith, a 25 year veteran of the CHP who worked his way up through the ranks, took over the department two months ago.

Smith said his top priority as patrol chief is to maintain the CHP's reputation for efficiency and "build upon it." He said Craig was "the best administrator the department ever had."

Smith said he will take a different approach from his predecessors on the issue of using radar against speeders.

Noting the Legislature has repeatedly refused to authorize state-financed radar for the CHP in the past dozen years, Smith said he won't lobby the lawmakers for radar because he sees no change in their attitude.

Instead, Smith will seek to expand an experimental program in which local governments buy radar equipment for use by the patrol in their communities on special "problem" roads such as in the school zones and on winding roadways.

"We will use it only when conventional enforcement isn't practical," he said.

Radar Foe Nailed Again!

Senator Joe Neal, D-Las Vegas, who has tried unsuccessfully to abolish use of radar speed guns to catch motorists, has fallen victim to the electronic device again.

Records in justice court recently showed that Neal was found guilty of speeding north of Carson City. He was caught going 50 mph in a 35 mph zone.

He pleaded innocent and went to trial May 11. The radar gun was then subpoenaed into court in an attempt to show its unreliability, but acting Justice of the Peace John Ray didn't buy Neal's argument. Neal was found guilty and fined \$30.

Neal paid the fine and told court officials he would appeal the conviction to district court.

In previous sessions of the Legislature, Neal attempted to abolish use of the radar guns. This session he introduced a bill, SB9, on January 18, which sought to change the law by saying the readings on these electronic devices were presumed to be unreliable. The bill was defeated February 17 by a 6-15 vote on the floor.

Speeding Tickets Skyrocket in Georgia

The number of speeding tickets handed out by Gwinnett county police officers has increased three-fold since a six-man traffic task force hit the road last December.

The police department wants another six officers added to the task force and the Board of Commissioners voted recently to apply for a U.S. Office of Highway Safety grant which would double the number of officers on the traffic task force.

The task force and request for additional men has become engulfed in controversy, however, because of statements made by Commission Chairman Charles Ashworth which suggested that the Police Department might use the extra men to operate a "speed trap." Ashworth was the lone dissenter in the vote to apply for more officers for the task force.

Angered by Ashworth's comments, Police Chief John W. Crunkleton asked that the Georgia State Patrol and the county grand jury investigate whether his department is operating a speed trap. The grand jury is waiting for the results from the state patrol before deciding what, if any, action should be taken.

From December 1982 through April 1983, Gwinnett County police handed out 4,724 speeding tickets, compared to 1,533 from December 1981 through April 1982, an increase of more than 200 percent.

In April 1983 alone, more speeding tickets were given out than in the first three months of 1982 combined.

However, a speed trap is not defined by the number of tickets written, according to the state patrol. Nothing in state law specifically mentions speed traps, but the state patrol has the power to revoke a county's

radar permit if it can be proven that the radar is being used for purposes other than "promotion of the public health, welfare and safety . . ."

This would include using radar to increase the amount of revenue coming into government coffers.

Woman Who Warned Others Of Speed Trap Wins Case

Debbie Utsey of James Island, South Carolina, was fined \$30 after she flashed her headlights to warn oncoming traffic of a speed trap. But now she has her money back and the state attorney general's office is pondering her arrest.

In the meantime, Charleston County police say they won't issue any more tickets to those caught flashing lights to warn of radar.

Mrs. Utsey, 31, was fined by Chief Charleston Magistrate William Simmons after her arrest. But in a recent retrial, she was found innocent by Magistrate Walter Jennings. He said there's no law on the books preventing motorists from flashing lights to warn of radar.

He returned the \$30 and removed the points from Mrs. Utsey's license.

Simmons has asked the state attorney general's office for an opinion on speed trap warnings.

It's being researched right now. The research is still going on," Mark Dillard of the attorney general's office said.

Janice Lee is the editor of Monday, A. M., the newsletter of Electroret, Inc.

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PIRATES DEN

BY DARREN LENO, WDØEWJ

FOCUS ON FREE RADIO BROADCASTING

Pirate activity has been on the increase during the last several months. Your chances for actually hearing these stations are good if you're willing to give up a night on the town any given weekend evening to stay home and listen to the radio. In all honesty, you may have to give up more than one weekend evening before you catch one of these stations, but that's the price you pay. Those who persevere will enjoy the most interesting radio listening.

The two most active range of frequencies used by pirates that you should keep an eye on are 7350-7430 kHz, and 6200-6300 kHz. Generally, these are the most active areas for unlicensed broadcast activity, but definitely not the only ones. You never know when or where some pirates will show up. For example, Radio Clandestine will sometimes surprise everyone by popping up on the frequencies of legal broadcasters, like Radio Canada Int'l and WRNO, right after they sign off for the evening.

Here are loggings of several new pirate "Free Radio" stations that have been heard.

KBIR was noted by Thad Adamaszek of Ohio on 3240 kHz from 00:44 to 01:42 UTC. Thad describes the musical format of this station as easy listening, and he heard a man identify the station as, "This is KBIR, clear channel soundtrack music."

Radio Lock was heard on 7425 kHz from 04:11 to 04:45 UTC. Kirk Baxter of Kansas said he noticed the operators were having problems with the audio of their transmission. One of the operators of KBIR came on the air and announced, "Hope you're enjoying the show—it's making me sick!" Judging from that honest declaration and reports from listeners who noticed quite a bit of belching, perhaps somebody was sick.

Radio Paradise Int'l was heard on 7300 kHz from 05:30 to 06:01 UTC. I don't have too much information on this new station yet, but Johnny Denham of Alabama managed to copy their address. Anyone hearing Radio Paradise Int'l can send reports to the station in care of the following address: PO Box 982, Battle Creek, MI 49016-0982.

WILD was heard on 6230 kHz at 01:30 until sign off at 02:03 UTC. Scott McClellan of Michigan reports hearing "some really strange electronic music" during this test transmission. WILD said to watch this band for future transmissions.

Readers in the Milwaukee, Wisconsin area can listen for FM pirate WTPS on 104.5 MHz. According to an article in the *Milwaukee Sentinel*, WTPS transmits to listeners with a tenth of a watt. This station apparently came about after WMSE, a legal radio station at the Milwaukee School of Engineering, started to add pop, soul, and heavy metal music to its music format. A few of the WMSE people became disgruntled, appar-



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WMR sends these souvenir stickers to its listeners.

ently feeling that Milwaukee needed a strictly new music station. Thus WTPS was born.

WTPS programs groups such as "Three Teens Kill Four" and "The The" into their new music format. Duane Dudek, writer for the *Milwaukee Sentinel*, says, "WTPS is a reaction to the stagnancy of the music played on commercial radio. I hope they thrive."

Although WTPS is admittedly a hobby operation, the operators hope to change that. The staff is hoping to talk a cable company into picking up the station. By the way, I should mention that "TPS" stands for "The Pirate Station."

Another FM station that's being talked about these days is Jolly Roger Radio in Bloomington, Indiana. They were previously notorious for a time broadcasting on AM, FM, and SW. Finally, after many years of broadcasting, the station was raided and shut down by the FCC in 1980. That "bust" made national news. The operators were fined \$750 for their activities, but that doesn't seem to have had an effect on the crew. Earlier this year, Jolly Roger Radio once again took to the air waves. They operate on FM, but the chief operator, The Flying Dutchman, told me during a telephone conversation that JRR may attempt an SW transmission before too long.

The general attitude of the Bloomington community has been one of great acceptance, I'm told. Most of the people in the Bloomington area know about the station, and apparently, large numbers of them tune to JRR's frequency in the early evenings to see if the station is on. Transmissions have been almost nightly since they began many months ago. I am told JRR sometimes broadcasts for days on end, especially during the weekends.

What can one expect to hear on JRR? You just never know; they feature everything from Irish folk music to Iranian satire, thus providing the community with a true alternative in radio listening.

JRR also provides the community with access to the radio. Listeners can voice their opinions on virtually any topic by writing the station, or even call JRR on its own telephone line and possibly be put on the air. The Dutchman says he is seriously consider-

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ing listing JRR in the telephone directory.

JRR is definitely not a secret. Why has this station been allowed to go on broadcasting for such a long time? It's hard to say. Because JRR was closed once before, it should be quite obvious to the FCC exactly who is behind the station. There is absolutely no doubt that they could come into Bloomington right now and shut the station down. As to why they don't, it could be because of all of the attention and (dare I say) *sympathy* the local media generated toward JRR after their first bust. Now that JRR is even more of a part of the Bloomington community than before, it's hard to estimate exactly what kind of response we would see from the public. I don't doubt that if JRR continues to broadcast as it has these last several months, the station will eventually be shut down again. However, from my conversations with the Flying Dutchman, I have my doubts as to how permanent a second closer by the FCC would prove to be. The 1980 bust doesn't appear to have had the effect on JRR that it was intended to. I'll try to keep you posted on events surrounding Jolly Roger Radio.

In New York City, KPRC Pirate Radio Central continues its activities on 1620 kHz during weekend evening hours. They raised some eyebrows during a recent transmission when they signed off of the air with a tape of barking dogs. This isn't so fantastic in itself, but some of the veteran pirate DXers were wondering if this wasn't a clue to the puzzle of the mysterious Voice of the Purple Pumpkin. VOPP has roots that go back to the

1960's. The station appears infrequently, and then disappears for months, sometimes years, before it is heard again. Several months ago, when the station was again active, many listeners (including myself) heard the Purple Pumpkin sign off with a similar tape of barking dogs. I'm not saying that KPRC is the Purple Pumpkin, but the temptation to let you in on a little "underground gossip" was too much. With any illegal activity, it is sometimes very difficult to separate fact from fiction; pirate radio is no exception.

Also on the East Coast, WDX, a station that claims to be transmitting from a boat with a 200 foot wire antenna, made one of their rare appearances on 1620 kHz recently. WDX was taking phone calls from listeners through a telephone loopline that presented the operators with some difficulty when Bill Martin of Delaware logged them.

The Voice of To-morrow was one of the more interesting operations to hit the short-wave bands in quite a while. The station was widely heard by listeners all over the country. Their claim to two thousand watts of power may or may not be an exaggeration, but many listeners reported very good, if not exceptional, reception of this station, which claims to have studios in Providence, Rhode Island and transmitters in Baltimore, Maryland. Their six scheduled broadcasts were advertised by the mail. Several DXers, myself included, received VOT postcards with advanced notice of their transmissions.

In spite of all the catering to the DX community, VOT seems to have made few friends. The reaction I have received from people who heard this station is generally one of disappointment, contempt, and even hostility. Why? The Voice of To-morrow's programming, although very professional, was critically editorializing against various racial and ethnic groups. I have never seen a shortwave pirate that has created as much a negative reaction from the public as this one. Possibly, more on this station next month.

Radio Dublin in Ireland continues to be active and widely heard in the United States on 6910 kHz. Remember to listen for them in the evening hours, weekdays.

World Music Radio, possibly relayed by Radio Dublin, was heard on 6910 kHz, from 02:07 to 02:25 UTC by Terry Provance in Ohio. WMR announced a mailing address of PO Box 4078, Amsterdam, Holland.

Well, that'll do it for this month's edition of The Pirates Den. Remember, you are more than welcome to participate in this column. Any material you would like to submit for publication, including loggings, QSL cards, trivia, or if you have questions, comments, criticism (constructive criticism, that is), you are more than welcome to send them along to me through this address; The Pirates Den, c/o Popular Communications, 76 North Broadway, Hicksville, NY 11801.

Special thanks this month to Paul Royce of Wisconsin for his contributions to this column including the WTPS story, and to the members of A*C*E for all their support. Until next month, good DX!

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FCC ACTIONS AFFECTING COMMUNICATIONS

Bulletin On Biological Effects And Hazards Of Radiofrequency Radiation

The FCC's Office of Science and Technology has issued a revised and updated version of OST Bulletin No. 56 that discusses biological effects and potential hazards of radiofrequency (RF) radiation. The new second edition, dated June 1983, includes additional information on standards for RF exposure and incorporates suggestions made since publication of the original bulletin in July 1982. Additional references have also been added for further reading.

As with the original bulletin, the new version includes:

- definitions of RF and microwave radiation and information on uses of RF energy
- discussions of biological effects and hazards of RF radiation
- information on the safety of specific products and operations that generate RF radiation
- discussions of RF safety standards
- information on federal agencies that have interest or responsibility for controlling RF emissions and exposure
- references for further information

Copies of OST Bulletin No. 56 (Second Edition) can be obtained from the FCC Consumer Assistance Office, Washington, DC 20554. Telephone: (202) 632-7000.

Aviation Frequencies Available For Airport Ground Communications

The FCC has made two aviation frequencies available for communications between aircraft on the ramp area of an airport and aviation service organizations. This action is intended to satisfy the need for direct communications between a general aviation aircraft on the airport ramp and mobile units such as fuel trucks, vans used to shuttle passengers to distant aircraft, repair and support personnel and the like. In addition to improving the efficiency and convenience of servicing aircraft at many airports, the availability of these frequencies will reduce the use of the airport unicom station for the relay of message traffic relating to aircraft servicing requirements. This should help reduce the congestion on unicom frequencies at many airports, especially general aviation airports which have no control tower.

The two frequencies provided for airport ground communications are 122.775 MHz and 122.850 MHz. However, the frequency 122.850 MHz will be assigned only on a secondary noninterference basis to multistation operations.

Airport operators and all aviation service

organizations located at an airport are eligible to be licensees of aeronautical utility mobile stations operating on the frequency 122.775 or 122.850 MHz. An "aviation service organization" is any entity which maintains facilities at an airport for one or more of the following activities: (1) aircraft fueling, (2) aircraft, passenger and/or freight services such as parking, baggage, and cargo handling, (3) maintenance and/or sales of aircraft or aircraft equipment, and (4) aircraft rental, air taxi service, and/or flight instruction.

To apply for license to operate an aeronautical utility mobile station on the frequency 122.775 or 122.850 MHz, an applicant must file an FCC Form 406. These forms may be obtained from FCC Headquarters in Washington, DC or any of the FCC's Field Offices.

UHF-TV Channel 69 Interference To Land Mobile Technical Memorandum Available

The Office of Science and Technology issued a Technical Memorandum (FCC/OST TM-83-5) entitled "WVEU Channel 69 Atlanta: An Engineering Solution to the Land Mobile Interference Problem."

The interference problem is examined in two parts: (1) the specific WVEU problem in Atlanta, and (2) the general problem inherent in all cities when Channel 69 will be used. Both problems are addressed individually in the report.

WVEU-TV, operating on frequencies between 800 and 806 MHz, interferes with land mobile licensees using the lowest frequencies of the 806-866 MHz band. The technical memorandum suggests present licensees using LMC 40 (Land Mobile Channel 40, 806.9875 MHz) and lower relocate to LMC 332-LMC 400 (814.2875-815.9875 MHz) which are interference free. Future licensing commencing at LMC 400 and working downward is suggested to avoid interference problems in small and medium markets.

In the largest markets where all land mobile channels must be used, and there is a Channel 69 television allocation, even the most troublesome land mobile channels can be used if the mobile and base transmitting frequencies are transposed.

A limited number of copies of the Technical Memorandum are available from the Office of Public Affairs, Telephone (202) 632-7000, Room 207, 1919 M Street, N.W., Washington, DC 20554.

Copies may be purchased from Downtown Copy Center, 1114 21st Street, N.W., Washington, DC 20037; Telephone (202) 452-1422. For further information about

the Technical Memorandum, contact Don Precure at (202) 653-8170.

Marine Radio Operators Issued Fines

Four operators/owners of vessels engaged in shrimping activities in the coastal waters of Louisiana were issued Notices of Apparent Liability for Monetary Forfeiture, Richard Smith, Chief, Field Operations Bureau of the Federal Communications Commission announced. James Berrie, Engineer in Charge of the Commission's Grand Island Monitoring Station notified Leon Smith and Ronnie Benner, Palacios, Texas, Arthur Smith Corporation of Houston, Texas, and Herbert Lacombe of Deweyville, Texas, of apparent liabilities ranging from \$600 to \$1,000.

"The stations were observed operating on unauthorized marine radio channels which caused interference to police radio communications in the City of Lafayette, Louisiana," Smith said. He also added, "These actions are a part of the Bureau's continuing enforcement efforts against abusers of Public Safety and Marine Radio frequencies in the Louisiana waterways and on the Gulf of Mexico. Misuse of frequencies cannot be tolerated and violators will receive large monetary forfeitures." Operators were cautioned that the frequency 156.15 MHz (VHF Marine Channel 3) is not to be used along U.S. Coastal waters.

According to Smith, "Operators are creating a hazardous situation by causing interference to safety communications, and they must refrain from these activities." Smith added, "There are marine channels available to these operators to conduct communications." They are:

Distress and Emergency	Channel 16
Calling	Channel 16
Intership Safety	Channel 6
U.S. Coast Guard	Channel 22
Navigation (Bridge to Bridge)	Channel 13
Navigation Bridge to Bridge in New Orleans only	Channel 67

Forest Product Sharing Of Frequencies With Power And Petroleum Services

The FCC terminated a rulemaking proceeding begun in 1981 without adopting proposed rules which would have given eligible licensees in the Forest Products Radio Service in certain northwestern and southeastern states access on a coequal, coordinated basis to lightly loaded low band frequencies assigned to the Power and Petroleum Radio Services.

The Commission said that to alleviate frequency shortages in the Forest Products

Service it would consider instead specific requests by eligible users in that service for waiver of the rules (Part 90) to enable them to share frequencies outside their assigned spectrum.

The rulemaking proposed placing 36 frequencies in a pool to which Forest Products eligibles would have had access in northern California, Oregon, and Washington and 19 frequencies in southeastern states.

Organizations of eligible users in the Power and Petroleum Services opposed the proposal, chiefly because of the interference that results from the "skip" phenomenon occurring in the low band. Forest Industries Telecommunications, representing forest products industry users, questioned whether its members would benefit from the proposal, on grounds that the plan did not take account of growing demand for mobile communications in the Petroleum Service.

The FCC said it would not adopt the proposed rule change, since it would not resolve the shortage. It said it would consider waiver requests to share Power and Petroleum Services frequencies and those allocated to other services. Waiver requests, it said, must demonstrate that no Forest Products Radio Service frequency in the band is available in an area of operation, that there is spectrum available in the area in another service, that the potential use of the frequency has been coordinated with that service and that shared use is feasible on a coordinated basis minimizing the potential for skip interference.

Maritime Search And Rescue Operations By Governmental Entities

The FCC is seeking comments on its proposed amendments to Parts 2, 81, and 83 of its rules which would facilitate maritime search and rescue operations by governmental entities.

The Commonwealth of Virginia petitioned the Commission to permit the operation of ship radio stations on land for purposes of search and rescue. The petitioner has over 300 "trailerred" vessels, that is, rescue boats that are carried on trailers behind state cars or trucks. These vehicle-trailer-boat combinations are operated extensively as a "shore patrol" to respond to marine search and rescue calls.

Currently, the shore patrol may not communicate directly with a vessel until the rescue boat is launched. This creates a problem whenever the shore patrol, still on land, is closer to the distress scene and is better equipped to respond to an incident than a waterborne craft farther away.

To meet its needs and those of other local governments in similar circumstances, the Commonwealth requested that radio transmissions concerning search and rescue operations be permitted from vessels before they are launched.

Recognizing that the proposed rules would cause more communications from ship radio stations on land, a situation it has sought to minimize for many years, the FCC

proposed to limit the use of ship radio stations on land to governmental entities managing search and rescue programs.

The FCC proposed allowing use of the following Marine VHF intership frequencies: Channel 6 (Intership Safety), Channel 16 (Distress, Safety and Calling), Channel 17 (State Control), and Channel 22 (Liaison, U.S. Coast Guard). It proposed limiting power for VHF operation to 25 watts, and said VHF Channels 17 and 22 could be used for search and rescue training exercises, while use of Channel 22 would be limited to communications with the Coast Guard.

Marine VHF Channel 88 For Public Correspondence In Puget Sound Area?

The Commission proposed to make marine VHF Channel 88 available for public correspondence use in Puget Sound and surrounding waters within 75 miles of the U.S./Canadian border.

The action parallels previously taken action for the Great Lakes and St. Lawrence Seaway. The Commission also proposed to prohibit further use of Channel 88A for commercial intership use in the Puget Sound area. There are 10 other frequencies which would remain available for commercial use.

In the same rulemaking the Commission proposed to clarify the eligibility requirements for Limited Coast and Marine Utility stations and to delete its requirement that single sideband transmitters be capable of operating in the A3A mode.

The Channel 88A restriction was proposed at the request of the North Pacific Marine Radio Council. The Council transmitted a letter from the British Columbia Telephone Company which said U.S. ships using Channel 88A for commercial ship-to-ship communications were causing harmful interference to its public correspondence (radiotelephone service between ships and land).

Channel 88 is a duplex channel comprised of the ship station frequency 157.425 MHz and the coast station frequency 162.025. In the U.S. the ship station frequency is used in the simplex mode for ships to communicate with each other and with planes engaged in fish-spotting operations. When the frequency 157.425 is used alone, it is often referred to as Channel 88A.

In response to numerous requests by companies servicing radio equipment on noncommercial vessels that they be included specifically among eligible licensees of Limited Coast and Marine Utility stations, the Commission proposed to revise the eligibility list to include those users.

The Commission proposed to relieve manufacturers and purchasers of the unnecessary burden and additional cost of its type acceptance requirement that single sideband transmitters have capability of voice, reduced carrier operation (A3A mode), which retains and uses a small amount of the

carrier frequency to activate a signal light during transmission. It noted that the need for that capability is reportedly nonexistent among marine users.

Manufacturers have requested removal of the A3A emission requirement from the rules (Parts 81 and 83), the FCC noted. The proposed rule change would not preclude use of A3A emission or manufacture of equipment with that capability.

Identification For Radiolocation Service Stations Operating Below 3400 kHz Deleted

The Commission deleted the identification requirement for Radiolocation Service stations operating below 3400 kHz. These stations are presently required to transmit their assigned callsigns at the beginning and end of each transmission.

The amendment of Part 90 of the rules resulted from a petition by Offshore Navigation, Inc., which argued that the identification requirement served no real purpose and should be deleted. All radiolocation stations would then have to identify only upon specific instruction from the FCC.

The Commission noted that because of the long duration of radiolocation transmissions, identification occurs so infrequently as to be of little or no value. If interference results from the operation of a radiolocation station, neither the affected parties nor the Commission can wait for the transmission of a callsign. The interference must be resolved by other means.

In eliminating the identification requirement, the FCC pointed out it still would retain identification requirements for spread spectrum systems and its general authority to require identification of any radiolocation system when deemed necessary.

New "Short Form" Renewal In The Private Land Mobile And General Mobile Radio Services

The Commission has amended Parts 1, 90, and 95 of its rules by adopting a new "short form" renewal, FCC Form 574-R, for Private Land Mobile and General Mobile Radio Services (GMRS) licenses.

Currently, licensees in the Private Land Mobile Radio Service and the GMRS are required to submit FCC Form 405-A (Applications for Renewal of Radio Station License) requesting the renewal of their station license. Many licensees fail to complete it for a timely station renewal requiring them either to apply for reinstatement of their license or to submit a new application for radio station authorization.

The Commission is introducing FCC Form 574-R in order to avoid the inadvertent expiration of licenses and to reduce the paperwork burden on the public.

Sixty to ninety days before the expiration of a station license in the Private Land Mobile and GMRS, the Commission will mail to

the licensee a computer-generated FCC Form 574-R. This notification will serve as a pre-completed renewal application which the licensee need only review, correct as necessary, sign, date, and return to the Commission.

The Commission said that implementation of the new short form will be accomplished in stages, to be announced by the Commission by Public Notice. It said that licensees must continue to use Form 405-A if the licensee has not received the computer-generated short form 574-A within 60 days of license expiration.

American Airlines And ARINC To Transmit Digital Messages On 131.55 MHz

The Commission waived its rules to permit American Airlines, Inc. and Aeronautical Radio, Inc. (ARINC) to transmit domestic digital airline administrative messages on 131.55 MHz, on a secondary basis.

(Airline administrative messages are defined as those communications relating to on-board provisioning and inventory, passenger travel arrangements, coordination with airline ground services for passengers, and passenger data for on-board services.)

ARINC is the licensee of the vast majority of the more than 2500 aeronautical enroute stations throughout the U.S. and provides enroute service to all aircraft operators, including foreign airlines, business entities, and private individuals, who make cooperative arrangements. It noted that a waiver of Section 87.291 of the rules would permit more efficient and economical use of its digital communications system which is now being implemented. It added that since most of this equipment is now in place, a valuable communications service could be provided without further investment in hardware. Such messages would be carried only to and from aircraft and an aircraft's operating agency.

In granting the waiver, the Commission noted the following conditions:

- Administrative messages shall be transmitted on a secondary, noninterference basis to operational control communications as defined in Section 87.291;

- These messages shall be transmitted only by digital techniques on 131.55 MHz; and,

- These messages shall be transmitted only to and from an aircraft and the aircraft operating agency; public correspondence is not permitted.

In addition, the Commission said the waiver could be terminated at its discretion if the need for such action arises.

Codification Of General Mobile Radio Service Rules

The Commission has adopted updated and codified rules for the General Mobile Radio Service (Part 95, Subpart A).

The GMRS is a land mobile Personal Radio Service using UHF bands and available to the general public for personal or business communications. FCC rules governing the service have remained virtually unchanged since 1958. In the intervening years, technological advances have made many of the rules obsolete, and new systems have been licensed under policy decisions and staff interpretations of broadly drawn rules.

The Commission noted that, with the continued growth of GMRS systems, some of its licensing procedures have become unwieldy and that a number of the existing rules are partially or wholly inapplicable to current technology. More than 2,200 new GMRS licenses were issued in 1982, and over 600 licenses were modified. The FCC issued a rulemaking notice April 2, 1982, proposing to update the rules and incorporate current policies and interpretations.

The new rules are organized into five major divisions, according to particular needs: general provisions (for all interested persons), considerations when planning a GMRS system (for system designers), applying for a GMRS license (for applicants), managing a GMRS system (for licensees),

and operating a GMRS station (for station operators).

The Commission retained its "system" concept in the codified rules. A system, in GMRS licensing usage, is composed of at least one station operator and at least one mobile station. Various types of land stations (base stations, mobile relay stations, voice-only paging receivers) may be part of a system.

The FCC noted that systems provide a convenient way to minimize the number of licenses issued for stations and to bring an array of otherwise separately licensed facilities under the umbrella of a single system licensee. As established in the rules, a system does not require a base station, does not limit a base station to communications with mobile stations in the same system and does not prohibit interlicensee communications or relegate them to secondary status.

To encourage sharing of the limited frequencies, the rules prohibited a base or mobile relay station in one system within 40 miles (64.4 kilometers) of a base or mobile relay station in another system under the same licensee.

The Commission retained rules providing for authorization of a second channel or channel pair in a GMRS system upon satisfactory showing. The rules retained restrictions on fixed stations in or near large urban areas (defined as areas with 200,000 or more population, by the 1980 census) and on operation of control stations in large urban areas.

The rules required station identification by a station's assigned callsign or its system callsign. Every unit was required to identify, except that a mobile relay station need not identify if it automatically retransmits the signal of another station which identifies properly.

Prohibition of communications between base stations was retained, as was a general prohibition of transient communication—transmission by one licensee to another via a third licensee's mobile relay station—with only verbal permission of the third licensee. Interconnection to the public telephone network was prohibited, though remote control of a transmitter by wireline control link was permitted.

Simplex, duplex, and combination simplex-duplex systems were authorized. (A proposed prohibition of cross-channel communications was not adopted.) Rules were retained permitting cross-service communications with stations in other radio services except with amateur, foreign, and unlicensed stations. Certain specific one-way types of communications were prohibited, for example, tone-only paging, public address use, broadcasting and continuous undirected transmission.

The new rules recognized both current types of sharing: nonprofit cooperative shared use and multiple licensing. In the case of multiple licensed transmitters, the rules required all licensees to have access to the transmitting equipment, but the licensees may designate one of their number to have primary access responsibility.

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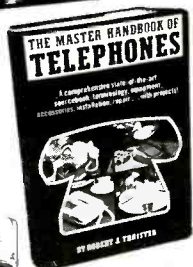
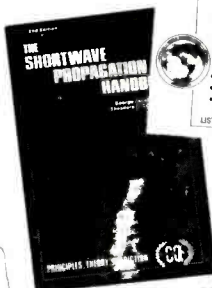
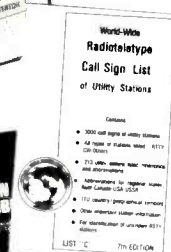
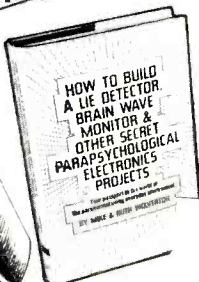
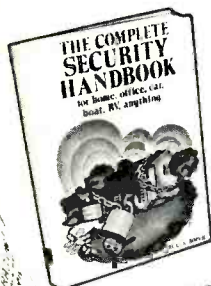
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Beaming In (from page 4)

cision nut and bolt from the orbiter and they'd have the \$500,000 needed to hire the best damned staff of gag men available.

I can just see the NASA Planning Department. In one room, engineers are running data through a computer to establish the

correct velocity and angle for launching a satellite from the orbiter. Next door, other engineers are sitting there with a bunch of tiles and a tube of Krazy Glue figuring out how to get the orbiter's covering to stay in place. In yet another room, hidden deep beneath the main complex, there are five gag writers working against a launch deadline. Crumpled papers litter the floor. A blue haze

of stale cigar smoke hangs heavily in the air.

"I got it, Charlie! We open the mission with the music from Laurel and Hardy, then one astronaut says to the other 'Here's another fine mess you've gotten me into! Then . . .'"

"Naw, forget it Harry. It's too close to the schtick we used in the second *Columbia* mission. Suppose we have the guy open with, 'Boy, do I feel spaced out today' . . ."

"Great, then Houston comes back at him with, 'How spaced out are you?'"

"Yeah, then the astronaut goes into a wild Uncle Miltie walk, right in mid-air with his ankles bent outwards!"

"That's it Manny! Then the astronaut says 'I'm so spaced out I can't even sense the gravity of the situation!'"

"Fine, then we cut to this crazy looking jack in the box. It suddenly pops open and a big banner drops out reading "Looks like the main computer is overheating again!"

"Nix on that. *Jack In The Box* restaurants are thinking about buying 50 commercial spots during the flight and they might not like it."

If NASA doesn't want to go the whole route with a staff of writers, at the very least they should hire Henny Youngman to sit at Mission Control to pick up on any comedy openings which might present themselves during the mission. Let's face it, even "I just flew in from Edwards Air Force Base and, boy, are my arms tired" has got to be an improvement over the Waltons.

I really don't think its absolutely necessary for NASA to look like buffoons. Not necessary for it to appear to the world that this important program is anything less than deadly serious. It serves no constructive purpose for this one major vestige of our once thriving space program to come across as a joke and those responsible for it to appear to be a pack of clowns. Those overseas nations that carefully watch the various technological developments of both the United States and the USSR cannot help but compare the Space Shuttle with the Soviet manned space program. By monitoring the communications of both programs, it's probable that they've come to the conclusion that the United States is the one with the happy-go-lucky cowboys in orbit. This is not an especially great image for this vital program or the United States.

What became of that crisp, professional communications style used by pioneers Glenn, Grissom, Shepard, Carpenter, Schirra, Borman, and the others? They didn't feel the need to make attempts at continual entertainment while they were inspiring awe and pointing the way towards the frontiers of space.

The only thing worse than listening to the inane Space Shuttle babblings is the pondering of what may be in store when they get results from SETI programs in progress.

"I got it, Charlie! When we answer them let's say, 'Give me your wrist and let me check your pulsar.'"

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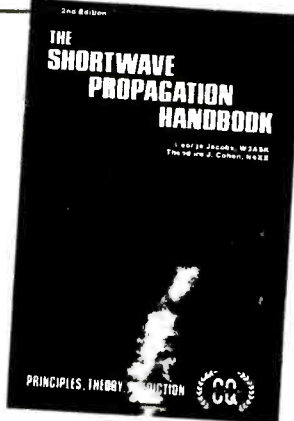
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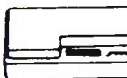


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