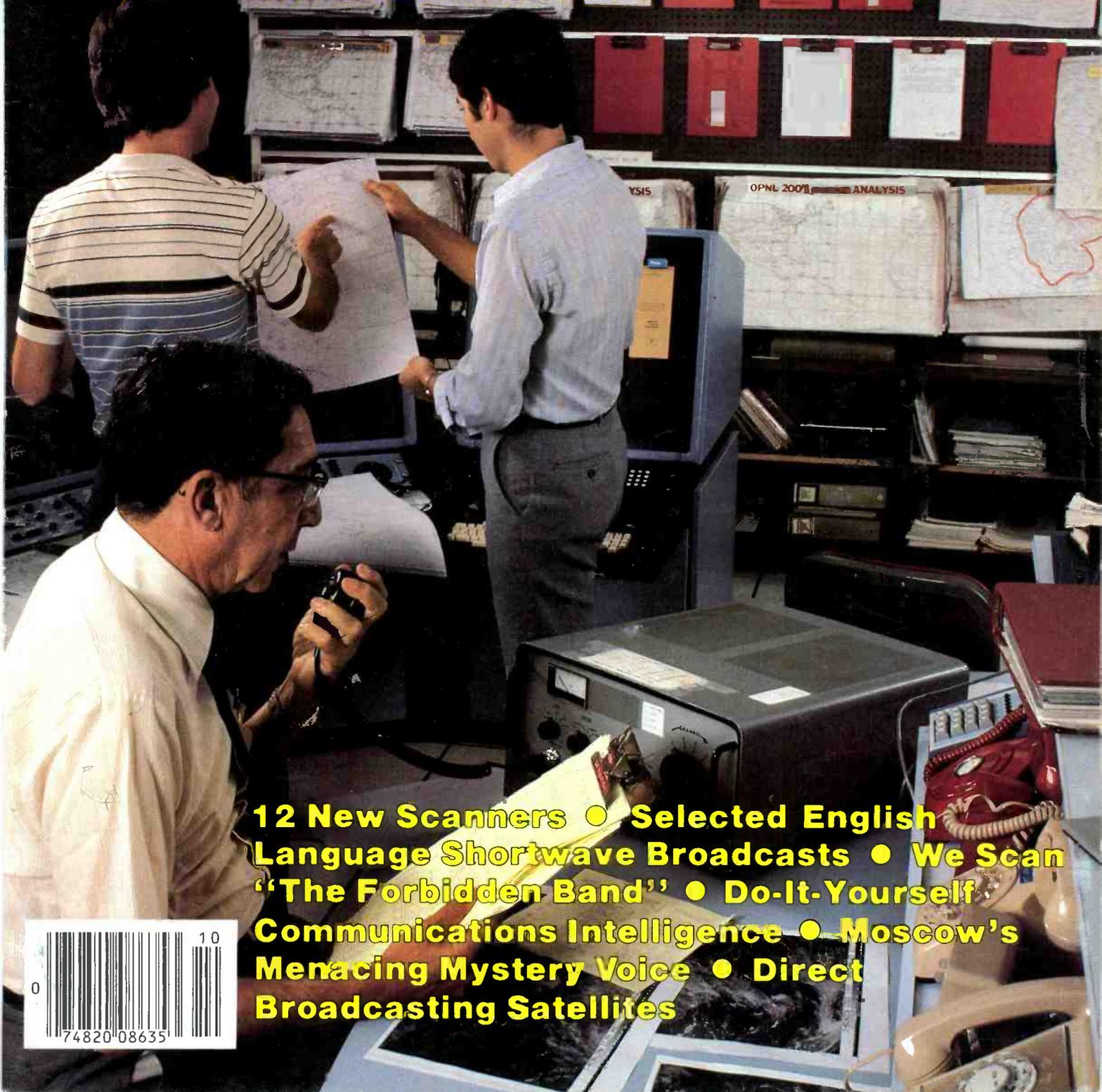


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OCTOBER 1983 \$1.75

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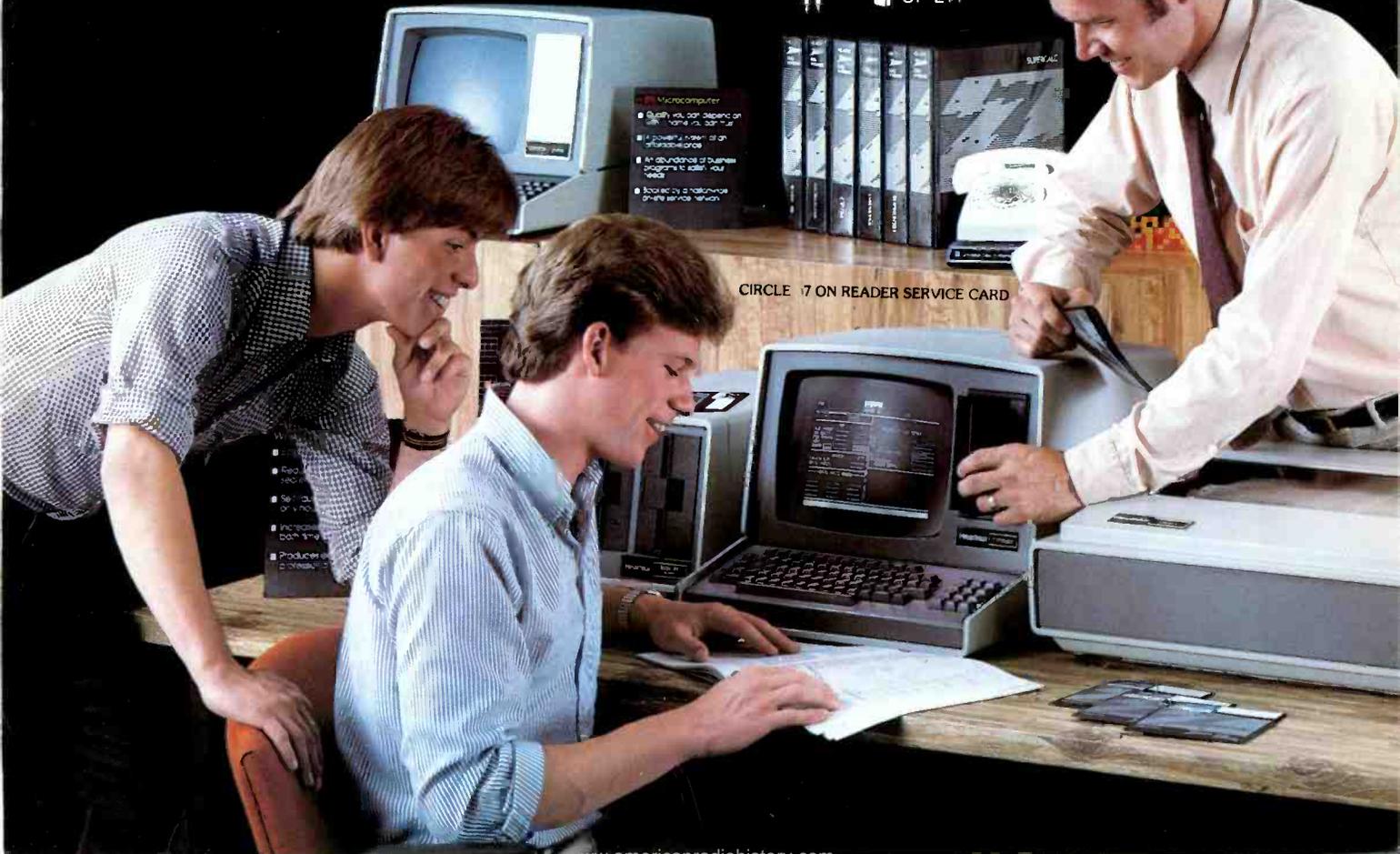
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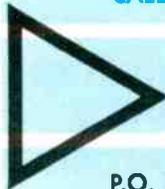
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CIRCLE 78 ON READER SERVICE CARD

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THE MONITORING MAGAZINE

EDITORIAL STAFF

Tom Kneitel, K2AES

Editor

Anita Hippius

Associate Editor**CONTRIBUTING EDITORS**

Gerry L. Dexter

Shortwave Broadcast

Joseph E. Jesson

RTTY Monitoring

R.L. Slattery

Survivalist Communications

Harry L. Helms, KR2H

Utility Communications

Darren Leno, WD0EWJ

Alternative Radio

Rick Maslau, KNY2GL

Special Assignments

Janice Lee

Radar Detectors

Chuck Gysi, N2DUP

Scanners

Mark Long, WA4LXC

Satellite TV

Gordon West, WB6NOA

Telephone Accessories**BUSINESS STAFF**

Richard A. Ross, K2MGA

Publisher

James Reilly

Associate Publisher

Herb Pressman

Advertising Manager

Arnold Sposato

Advertising Representative

Dorothy Kehrwieler

General Manager

Arlene Caggiano

Accounting

Cheryl Chomicki

Subscriber Services**PRODUCTION STAFF**

Elizabeth Ryan

Art Director

Dorothy Kehrwieler

Production Manager

Gail M. Schieber

Production Assistant

Pat Le Blanc

Phototypographer

Hal Keith

Technical Illustrator

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OCTOBER 1983**VOL. 2, NO.2**

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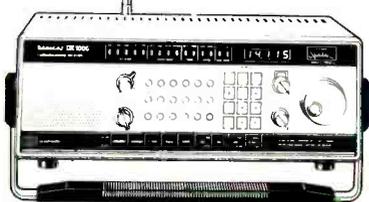
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CIRCLE 42 ON READER SERVICE CARD

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Low Power Broadcasting

A few issues back down the road I mentioned some thoughts I had on the possibilities of the FCC considering setting up some rules and regulations towards the establishment of legalized low power neighborhood broadcasting stations.

Many readers wrote to me about the concept. Several thought the idea as a poor one and others said it was basically good but nevertheless unworkable. Most who wrote said they liked the idea and hoped that the FCC might someday find a mechanism for bringing it into reality.

Reader Sam Eberhart of Nebraska reminded me that in the late 1920's there were scores of neighborhood low powered stations which had been authorized. Some of those stations ran as little as 5 or 10 watts on the AM broadcast band, while other powerhouse locals ran 15, 20, or 50 watts. A few stations Sam listed in his letter included:

KDLR Devils Lake, ND	1300 kHz	5 watts
KFGQ Boone, IA	1330 kHz	10 watts
KFJB Marshalltown, IA	1210 kHz	10 watts
WCAZ Carthage, IL	1220 kHz	50 watts
WCBM Baltimore, MD	1310 kHz	50 watts

Actually, Sam's list included many stations—all were listed in a 1926 roster called *Stevenson's Bulletin of Radio Broadcasting Stations*.

Sam's point is that this was obviously a feasible endeavor back in the good old days. It was apparently such a workable arrangement that even after radio "grew up" and the government no longer permitted such low power stations to exist, many such stations obtained authorization to continue their operations under standard high power rules. In fact, all of the mini-broadcasters listed above were in that category, and all are still in full operation at the same locations and with the same callsigns! WCBM is a 10,000 watt station today while the others listed operate with 250 and 1,000 watts. In actuality, dozens of the 1920's mini-broadcasters served such a valuable community service that they still continue in operation!

Chances are that, in their 5 to 50 watt days, these stations consisted of some homebrewed equipment located in the back room of a store or shop, or in someone's parlor or garage. In those days there were even licenses given out for low powered portable broadcasting stations (such as 50 watt station WKBY on 1363 kHz licensed to someone with the interesting name of Fernwood Quick).

The 1926 edition of *Stevenson's Bulletin* showed that radio broadcasting was truly in the hands of grass roots America and almost everybody had a license. Here's a random sampling of some of the typical licensees in those years:



Calling them "radio hooligans," the Soviet government has cracked down severely on unlicensed communicators.

KFAB Nebraska Buick Auto Co., Lincoln, NE
KFDD St. Michael's Cathedral, Boise, ID
KFDM Magnolia Pet Co., Beaumont, TX
KFH Hotel Lassen, Wichita, KS
KFLU San Benito Radio Club, San Benito, TX
KFOR David City Tire Co., David City, NE
KFVR Moonlight Ranch, Denver, CO
KFWB Warner Brothers Pictures,
Hollywood, CA
KGBZ Federal Live Stock Remedy Co.,
York, NE
KGCH Wayne Hospital, Wayne, NE
KGDE Jaren Drug Co., Barrett, MN
KMA May Seed & Nursery, Shenandoah, IA
KOIL Mona Motor Oil Co., Council Bluffs, IA
WASH Baxter Laundry & Cleaning Co.,
Grand Rapids, MI
WCFT Knights of Pythias, Tullahoma, TN
WEBJ Third Avenue Railroad Co.,
New York, NY
WFBR Maryland National Guard,
Baltimore, MD
WHAM Eastman School of Music,
Rochester, NY
WHBU Riviera Theatre, Anderson, IN
WJBC Hummer Furniture Co., La Salle, IL
WJBL Grishard Dry Goods Co., Decatur, IL
WKBA Arrow Battery Co., Chicago, IL
WKBQ Starlight Amusement Park,
New York, NY
WOAW Woodmen of The World, Omaha, NE
WOC Palmer School of Chiropractic,
Davenport, IA
WREO Reo Motor Car Co., Lansing, MI
WSAI U.S. Playing Card Co., Cincinnati, OH
WSKC World's Star Knitting Co., Bay City, MI

Astute broadcast listeners will quickly note that some of these stations are still in operation (even though with new owners). The 1926 broadcasting scene, however, contained innumerable schools, private companies, churches, organizations, and an unending assortment of individuals, all of whom had a reason to wish to have their say on the airwaves.

It's a shame that somewhere along the

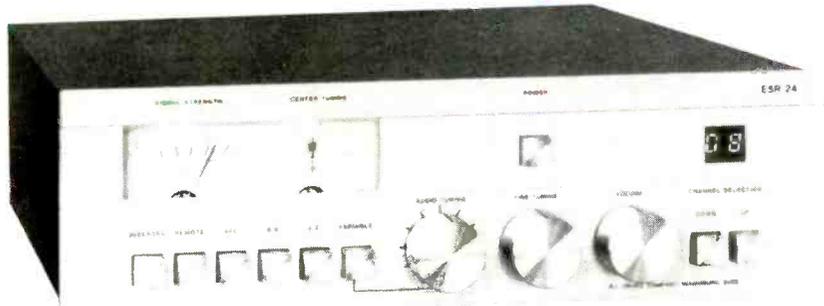
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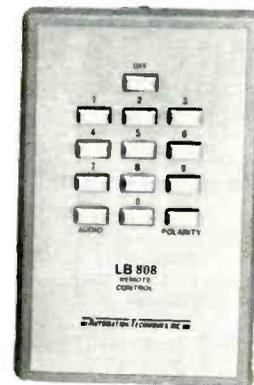
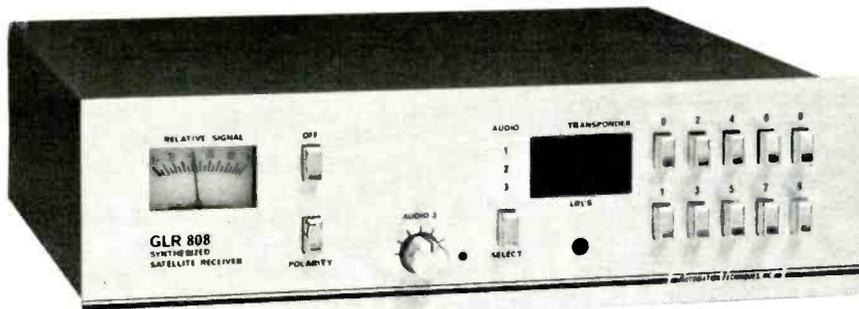


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CIRCLE 45 ON READER SERVICE CARD

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.

Pete Likes The Elite

I was tantalized by your passing mention of so-called "elite" or "insiders" closed/private membership monitoring groups (September "Beaming In" column). Why didn't you discuss these groups at length? You said very little about them except to note that they exist. Elucidate!

Peter Y. Greenfeig
Palm Springs, CA

Of those three groups specifically mentioned, I belong to only The Shortwave League. Other than the fact that Numero Uno and Fine Tuning have an annual get-together and are well thought-of by many hobbyists, I really don't know how much additional information I might pass along. They are both mentioned from time to time in the publications of several general membership clubs. The Shortwave League's members specialize in monitoring certain types of stations and frequencies in the HF and VHF bands. Members individually exchange information of mutual interest. For their own reasons, some members prefer to remain rather inconspicuous. Although it's not always the case, many members are or were professionally involved in some aspect of communications. Membership is limited in size and is strictly by invitation only. There isn't any annual convention and there are no dues. Those are the basics. — Editor

Unofficial Operations?

Your May issue's story on monitoring the VHF marine band really told the story well. I've been listening on those channels for years. I'd like to make one addition to the information presented in the feature and that is that Channel 10 (156.50) seems unofficially used as a broadcast auxiliary frequency. During the boating season, this frequency is used to broadcast live pickups from the boat PUMPKIN IV (WRA5732) that are intended for rebroadcast over station WMMM (1260 kHz), Westport, Connecticut.

Mervyn Alst
Bridgeport, CT

I'd say that it may be very unofficial. Nothing in the FCC regulations seems to permit VHF marine frequencies to be used for direct broadcast pickup. On the other hand, as many scanner enthusiasts have noted, there are many very unusual goings-on taking place on these frequencies, and some are quite "unofficial." — Editor

Seeing Red

Not long ago I was standing outside of a theatre in Los Angeles where there was a gathering of celebrities. I noticed that the vehicle that brought comedian Redd Foxx to the theatre was sporting several whip antennas and, since he's one of my all time favorites, I was hoping that I could find out what those antennas are for. Next time I'll show up with my scanner!

E.E. Cooper
Pasadena, CA

I can't vouch for what all of the antennas were for, but one of them was possibly for use on 462.075 MHz since Redd is licensed on that frequency under the callsign KXT409. — Editor

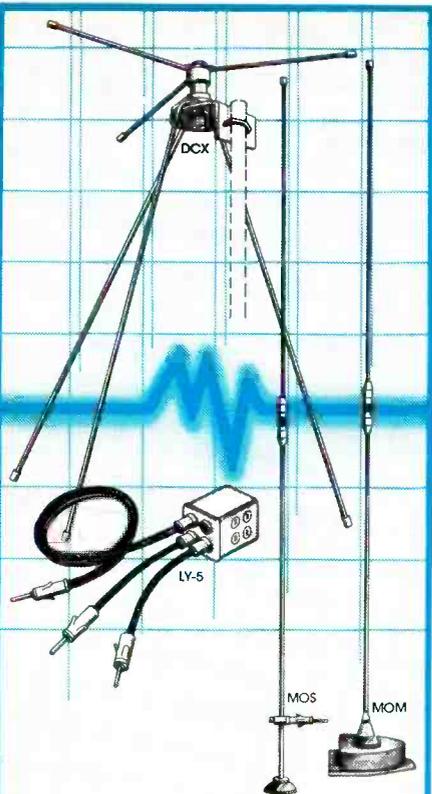


Must Have Been A Nice Rig

I couldn't help but notice in the drawing on page 18 of the June issue (the story on Rommel: The Desert Fox) a piece of radio gear much like the U.S. Navy's RAO series receivers manufactured during WWII by National Radio Company.

Dave Larson
Harlingen, TX

We didn't have the space in the June issue to describe what was taking place in the illustration. However, information released during 1944 by National Radio Co. related to Rommel's probable interest in radio. According to National Radio Co., a member of the U.S. State Department was stationed in Tunisia and used his National NC-100XA receiver (civilian version of the Navy RAO) to monitor the war news from around the world. When the Allies invaded North Africa and Rommel's forces retreated to Tunisia, the Allied personnel stationed there left in a hurry. The fellow from the State Department left behind his receiver and just about everything else he owned. During the German occupation of Tunisia, Rommel had moved into this fellow's house. The Germans eventually fled from Tunisia and the Allied personnel returned. When the State Department employee returned to his home he found that amongst the items which Rommel had taken with him was his treasured NC-100XA receiver! National Radio related this story in some of their ads during the 1940's. The illustration we ran was done by one of National Radio's artists during the 1940's and depicts Field Marshal Rommel supervising the removal of the receiver in question. — Editor



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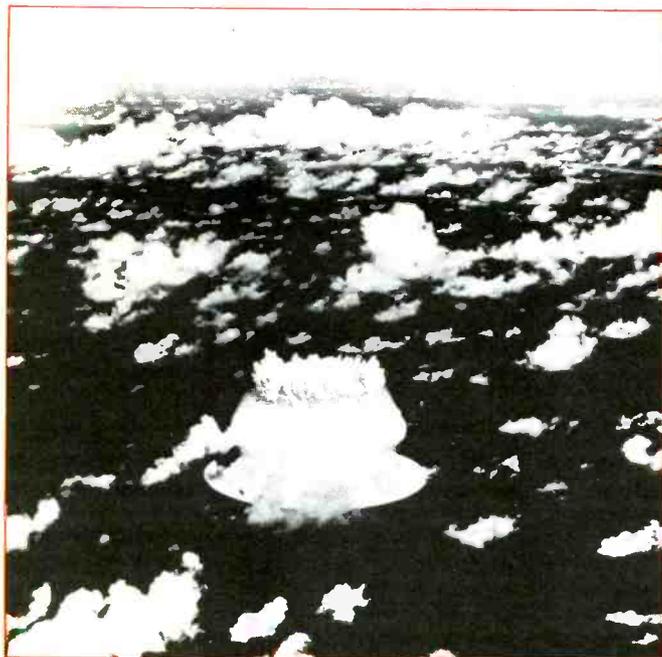
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It has long been known that concentrated microwave radiation has the potential for being used as a weapon. (U.S. Army photo)



Nuclear detonations, such as this one, release a devastating assortment of energy in addition to the physical force of the blast, including EMP, gamma, alpha, delta radiations. (U.S. Army photo)

Uncle Tommy's Handy Guide To The "Death Ray"

**The Death Ray May Finally Be Here!
Radio Waves Hold The Answer!**

BY TOM KNEITEL, K2AES, EDITOR

The Scientific City of Murania was decimated by a powerful energy beam weapon. The beautiful city simply melted away as if it were made of soft taffy. Buildings became distorted and began to sag, then they vanished along with all of the citizens of Murania. Ironically, the death ray which destroyed Murania was a very sophisticated radium-powered device which they had invented themselves. It had been turned against the Muranians by Gene Autry and his Junior Range Riders! That's how the death ray was depicted in the 1938 film called *The Phantom Empire*. Gene's Radio Ranch was made safe from the evil Muranians and their subterranean civilization.

Of course, the Muranians were neither the first nor the last ones to devise this weapon. Such death rays have shown up in hundreds of science fiction books and stories, feature and serial films, and TV programs. It seems to date back at least 70 years and has generally been regarded as the "ultimate weapon" and therefore has never ceased to intrigue the public.

The dreaded ray has appeared in high-budget films such as George Pal's *War of The Worlds* and the recently released *Su-*

perman 3. It's appeared in grade Z clunkers and likes of *The Lost Planet*, wherein another evil subterranean civilization had to be foiled in its plans to disintegrate those of us who occupy the planet's surface. The Three Stooges even found a way of getting some laughs out of the weapon, but James Bond had to endure endless travails in order to decommission one which was about to zap some of our major cities (he used Gene Autry's trick of turning it against its masters). Captain Kirk had these weapons to defend his starship Enterprise, and even carried a hand-held version called a *phaser*. More recently, the *Star Wars* series of films has depicted such weapons in their most graphic evolution yet seen.

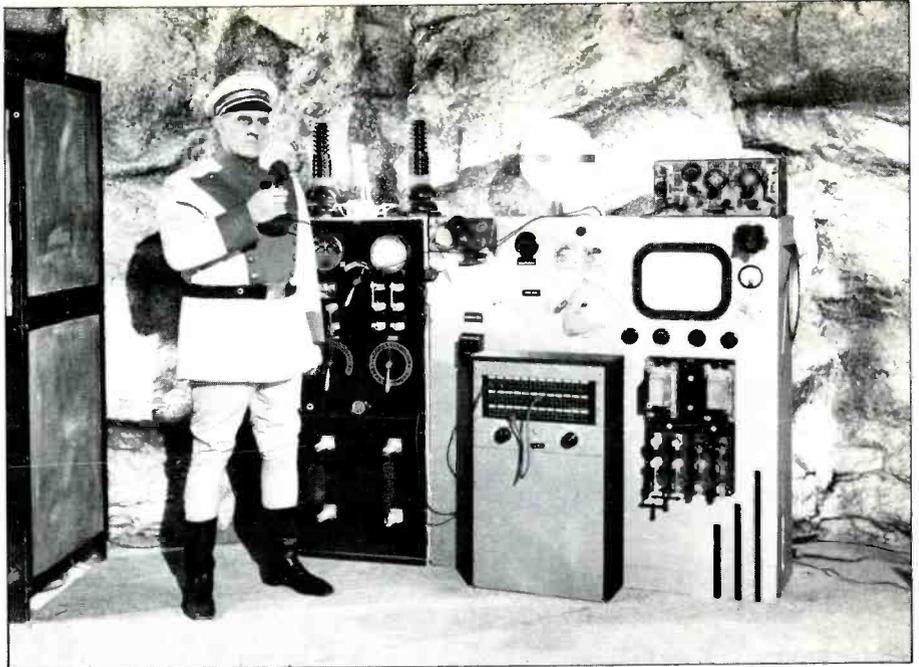
It's no secret that scientists always seem to eventually catch up with and even surpass the most fantastic predictions of science fiction writers. The airplane, submarine, space travel, robots, and radio once existed only within human imaginations. These evolved into missiles, satellites, color TV, single side-band, Viking landers, and thousands of other inventions which we hear of (or use) every day.

A mere 20 years ago we were still dreaming of a technology that would permit us to send a man to walk on the surface of the moon. Since that time we have accomplished that feat and the government has become so blasé about it that we aren't even doing it anymore! And now the President is talking about the development of "Star Wars weapons." That conjures up definite images of high energy beam weapons, the kind popularly known as "the death ray." Fact is, such weapons have been high priority items for military researchers for a long time and have been on the official list of the National Inventor's Council for years!

Twenty five years ago, Roy W. Johnson, head of the Advanced Research Projects Agency, told the Congressional Space Committee that the "ultimate" weapon of tomorrow might be a death ray that would make the hydrogen bomb obsolete. Referring to some of his agency's experimentation, America's research chief said, "... our work might lead to a death ray. That would be the weapon of tomorrow ... The (hydrogen) bomb today is considered the ultimate weapon, but I suspect that 20 years from now the bomb will be passe." He said that at a time when the highly touted ICBM was already operational!

What his experience had told him was that even the ICBM was merely an advanced version of a prehistoric weapon, the thrown stone. The thrown stone was the first ballistic missile and later weapons—cannon, rifle, pistol, machine gun, and even guided missiles—are really no more than efficient forms of the first missile. Even when an explosive warhead is added to a rocket, the only real change is to increase the weapon's area of destruction.

In a sense, "death ray" is a misnomer. It is a broad term describing a whole class of weapons, just as "gun" describes everything from a child's cap pistol to a UZI or a cannon capable of firing a shell with a nuclear war-



The death ray was prominently featured in all sorts of science fiction books and films. Here's what the machine looked like in the 1950's serial film *The Lost Planet, Conqueror of Space*.

head. As commonly used, "death ray" refers to a wide variety of weapons which project or radiate beams of various types of pure energy.

Several types of ray weapons might be conceived, such as rays which can sicken, stun, paralyze, or kill animal life. There are also "force" rays which can develop a push (or pull) against material objects, "disintegration" rays which might be used to destroy matter, and rays which could stun or jolt electronic apparatus to the point where it is inoperable.

Ray weapons could possibly be housed in small hand-held cases, could be deployed in artificial satellites, RPV's (Remotely Piloted Vehicles), or delivered in the form of familiar traditional weapons such as bombs, missiles, cannon shells, etc.

Frequency Sensitive

The human body generates and is sensitive to many different frequencies. In fact, even buildings and other objects of steel and concrete are frequency sensitive. This factor offers the potential for all sorts of weapons which can generate specific frequencies.

The human brain, for instance, generates delta waves (1 to 3 Hz) which are related to deep sleep. A weapon can be devised using delta waves to induce a sleeping state. Theta waves (4 to 7 Hz) affect the mood, alpha waves (8 to 12 Hz) relate to relaxation, and beta waves (13 to 22 Hz) come into play when we are concentrating our thoughts.

The fact, of course, is that extremely low frequency (ELF) radio signals have a definite effect upon people. That's why many people in areas of Wisconsin and Michigan have raised strong objections to the U.S. Navy installing its ELF (below 3 kHz) communications station in their backyards. This

was discussed in a previous issue of *POP-COMM* (May '83, page 4). This past May, the Associated Press carried a story revealing that the Soviets have been successful with behavior modification experiments using radio signals to "bombard" the brain and induce a state similar to one produced by tranquilizers. The experimental device they've invented is known as the Lida and has been tested in this country by the Jerry L. Pettis Veterans Hospital in Loma Linda, California.

The Lida's operating manual describes it as a "distant pulse apparatus," and apparently it's been in use by the Russians for more than 20 years. The concept, according to the Associated Press report, claims that "low frequency radio waves simulate the brain's own electromagnetic current and produce a trance-like state." Lida's actual operating frequency is 40 MHz, however the pulsed signals transmitted by the Lida duplicate frequencies to which the human brain is tuned.

During laboratory experiments, reports AP, a cat went into a trance-like state within two to three minutes after being exposed to Lida, and it remained oblivious to its surroundings for twenty minutes after the device was shut down. The AP story further speculates that the Russian "Woodpecker," known so well to shortwave monitors, may well be an experimental long-range mind-control device rather than the Over The Horizon (OTH) radar the Soviets claim it is.

Low frequency sound waves known as infrasound are also ripe for being put into use as beam-type weapons. If infrasound waves (peaking at about 7 Hz) are strong enough they can cause buildings to crumble and the internal organs of humans to cease functioning.

High frequency sound waves (superson-



Special protective clothing designed to protect our military personnel from intense heat and other forms of radiation has been designed. (U.S. Army photo)

ics) at about 20 kHz (similar to frequencies used in many burglar alarms) have caused persons to complain of painful ringing noises, nausea, and dizziness. This has military potentials.

Even the earth and its atmosphere is part of the frequency spectrum and therefore becomes prone to weapons based upon the use of resonant frequencies. The worldwide microseismic noise peak is 0.16 Hz. Auroral sounds possibly associated with magnetic disturbances have been noted at 1 to 16 Hz. There are also natural cavity oscillations which emanate from the space between surface of the earth and the ionosphere. Known about for at least 30 years now, these oscillations are the result of a phenomenon called the Schumann Resonance. A few simple calculations reveal that the distances between the various layers of the planet's ionosphere and its surface can be converted into wavelengths and thence into corresponding frequencies. For instance, the "D" layer (35 to 55 miles high) would create a cavity corresponding to frequencies between 3.4 and 5.3 kHz; the "E" layer (55 to 90 miles up) — 2 to 3.4 kHz; the "F" layer (90 to 150 miles high) — 1.2 to 2 kHz.

Moving up the frequency scale, during the 1950's, experimental laboratory monkeys were subjected to high level radio signals on a frequency of 388 MHz and were dramatically affected. They became disoriented, suffered collapse of the central nervous system—and died! Their brains were literally scrambled by this frequency! It was determined that the central nervous system of monkeys and humans is resonant to that frequency. Scott French, in his book *The Big Brother Game*, suggests that the Soviets were actually using transmitters on 388 MHz to induce headaches and other symptoms in American embassy personnel stationed in

Moscow (the media said that the Americans "were bombarded with microwaves which affected their health").

While 388 MHz would hardly be considered to be within the microwave spectrum, real microwaves have been suggested and tested by American as well as Soviet researchers. We are all familiar with the efficacy of low intensity microwaves since they are the basis for the microwave kitchen ovens we use. High powered 1 to 300 GHz microwaves (HPM) have this same ability to generate heat by affecting the molecular structure of target objects except on a far more dramatic scale than a kitchen oven might accomplish. This was known since the 1950's when a radar technician was killed as his internal organs were literally "cooked" after he accidentally stepped into the concentrated beam of a giant radar antenna.

Early experiments were conducted where extremely tight beams of HPM were used to ignite balls of steel scrapings over short distances. Obviously those experiments were found to be worthy of further exploration since, in September of 1958, the government warned pilots away from the Naval Research Laboratory at Stump Neck, MD. A giant microwave dish at the NRL was said to be sending out powerful electromagnetic impulses. Helicopter pilots who might attempt to hover over the antenna were singled out for particular warning, but airliners with routes transiting over the NRL were told to keep above a 3,000 foot altitude which had been set as a "danger zone."

Currently, it appears that HPM is viewed primarily as a weapon in its capacity to disrupt or knock out electronic devices and systems. A beam of HPM could accomplish this without the physical destruction (and harmful radioactive residue) of a similar hit with a nuclear weapon. Moreover, HPM devices

can be relatively small and portable, delivering their jolt without harm to those who use them. They could be used to disable communications equipment without killing the personnel using that equipment. The effect of such a device (using sufficient energy to knock out electronic gear) might be to cause temporary sterility—although HPM can also cause cataracts of the eyes.

Included in the wavelengths which can affect the human body in a negative manner are infra-red (heat) waves (4×10^6 to 8,000 Angstrom units wavelength), ultraviolet waves (4,000 to 136 Angstrom units), and X-Rays (1019 to 0.06 Angstrom units). An Angstrom unit is a measurement generally used when describing wavelengths just below, in, and above the visible light spectrum. One Angstrom unit equals one hundred millionth of a cm. (or 10^{-8} cm.) wavelength. A wavelength of 8,000 Angstrom units is 0.000,08 cm. in length and corresponds to a frequency of 375,000 GHz.

Weapons capable of generating certain strategic frequencies lying between ELF and X-Rays can be devised to produce physical and psychological changes in humans, affect plant life, and also disable, destroy, or render as useless buildings and equipment. It isn't beyond the realm of possibility that such weapons could also alter the weather or the ionosphere, the planet's magnetic fields, or even bring about geophysical changes to the planet itself!

Nuclear Fission By-Products

Gamma rays (1.4 Angstrom units and shorter) and alpha and beta particles are a secondary result from nuclear explosions. The thousands killed and injured by radiation from burns at Hiroshima and Nagasaki bear ample testimony to the potential effectiveness of such a weapon. However, the problem here is to produce such radiations in a weapon which doesn't require a massive explosion, and then focus those beams into a tight beam and direct it over great distances with accuracy. Highly efficient shielding against such beams would be necessary and without such shielding, the weapon would probably be more dangerous to the operators of the weapon than to the intended victims. Using laser beams to begin the chain reaction could solve this problem.

High energy atomic and sub-atomic particles formed into a particle beam (PB) could be a weapon with considerable potential. Such a beam would arrive at a target with the jolt of an express train, producing enormous shock and heat. This beam would consist of unbelievably minute particles of matter which move at close to the speed of light.

Such weapons might be deployed in satellites, although other PB weapons could be taken right into combat. One category of PB ray could fire out speck-sized "bullets" at a rate of millions per second and go through conventional armor like a hot knife through butter. The Soviets are hard at work on such weapons.

Experiments have been conducted by several nations in order to create anti-matter. Such matter is similar to conventional matter

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World Radio TV Handbook

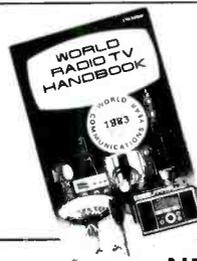
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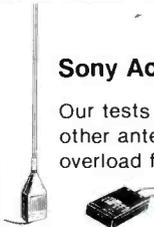
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but its atoms have a reversed electrical polarity—the atoms have a negative (rather than positive) nucleus and are surrounded with shells of positive electrons (positrons).

When anti-matter comes into contact with conventional matter, both are annihilated and converted into pure energy. A strong beam of anti-matter particles could disintegrate any object against which it is generated, including the toughest armor plate, concrete, lead, water, air, or even that old military standby, the sandbag.

There is a real possibility that a way will be found to create, harness, and direct powerful beams of anti-matter particles by devices similar to particle-accelerators—cyclotrons, bevatrons, and synchrotrons.

Laser Weapons

A sharply concentrated beam of highly intense light at a certain wavelength offers the potential for weapons which come under the category of High Energy Laser (HEL) devices. Such a beam or ray acts by searing a hole through its target. Based upon the amount of power used and the amount of heat resistance of the target, a wide variety of destruction is possible. A person hit by such a beam could end up with anything from a small wound (like a .22 calibre bullet wound) to a severed limb.

One of the problems with using HEL weapons is that they become increasingly ineffective when the beam has to pass through such things as clouds, air pollution, fog,

rain, dust, smoke, or smog. Even the atmosphere itself (minus clouds, smog, etc.) adversely affects the destructive powers of an HEL beam, causing it to lose its necessary sharp focus and diffusing its power. In fact, the beam is almost self defeating since the burning caused by the beam generates smoke—and that smoke reduces the ability of the HEL to continue to affect its target!

Plasma Beams

Plasma consists of a super-heated gas, so intensely hot that its atomic structure has resulted in the separation of its components into particles which become charged. Certain types of lightning, such as ball lightning, consist of plasma.

Artificial lightning produced by high voltage electricity has therefore been suggested as a possible ray-like weapon and attempts at creating such weapons go back a number of years. The idea is to create ball lightning which can be carefully aimed and fired. The effects of lightning on houses, trees, and even people is nothing new, but to attempt to artificially create lightning and use it as a weapon brings up questions of being able to harness it and direct it over sufficient range to a specific target. Such a weapon would need to generate pulses of plasma in a controlled manner. The fact that such pulses would travel far slower than those of other ray-like beams is a consideration, as is the problem of the plasma "grounding" (or

striking) on unwanted objects on the way to the desired target.

Solar Weapons

An obvious source of potentially destructive energy beams is the sun itself, and much has been done to harness this energy to amplify its rays on earth. At least 25 years ago the Army Quartermaster Corps at Natick, Massachusetts, put into use a large solar furnace. It concentrated the sun's rays sufficiently to produce temperatures up to 5,000°F. Most materials, including metals, cannot stand up under such extreme heat. Right now a functioning electrical power generating plant in the California desert is in operation—it utilizes the efforts of hundreds of large mirrors all concentrating the sun's rays on a central point to generate a high temperature to turn generators.

In early military experiments of solar energy, 355 adjustable mirrors reflected the sun's rays into a horizontal beam. Another set of 185 mirrors, called the "concentrator," converged the beam from the 355 mirrors on an area as small as four inches in diameter. This is a devastating concentration of solar energy!

Electromagnetic Pulse

Electromagnetic Pulse (EMP) has been in the news media for several years now. EMP consists of a sudden and intense burst of energy which spans a wide spectrum of frequencies, and results when a nuclear weap-

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Handy Reference Guide To Possible Frequencies & Wavelengths

Band	Remarks
0 to 3 kHz	ELF; can cause stress, hypertension, tumors, mental stress, altered growth levels.
0.16 Hz	Worldwide microseismic noise peak frequency; could possibly be used to cause geophysical disturbances.
1 to 3 Hz	Delta waves affect sleep.
1 to 16 Hz	Auroral signals from magnetic disturbances; could be generated to affect earth's magnetic force fields.
4 to 7 Hz	Theta waves affect mood.
7 Hz	Infrasound; at high levels can crumple buildings and cause human organs to cease functioning.
8 to 12 Hz	Alpha waves affect relaxation.
13 to 22 Hz	Beta waves affect concentration.
1.2 to 2 kHz	Resonant frequencies relating to ionospheric "F" layer and earth.
2 to 3.4 kHz	Resonant frequencies relating to ionospheric "E" layer and earth.
3.4 to 5.3 kHz	Resonant frequencies relating to ionospheric "D" layer and earth.
20 kHz	Supersonics; can cause headaches and nausea.
4 to 18+ MHz	Soviet OTH "Woodpecker." Mind control device?
40 MHz	Soviet "Lida" device; affects the mind as a tranquilizer.
388 MHz	A resonant frequency of the central nervous system. Soviets may have already used it to make American diplomats ill.
1 to 300 GHz	HPM; capable of affecting electronic equipment. Can also kill.
4-million A	Infra-red waves; raise temperatures in receiving body.
4,000 A	Ultraviolet waves; emitted by ionized gasses and very hot objects.
1019 A	X-Rays; emitted by sudden stoppage of fast moving electrons.
1.4 A	Gamma rays; from disintegration of atomic nuclei.
?	Psychic weapons.

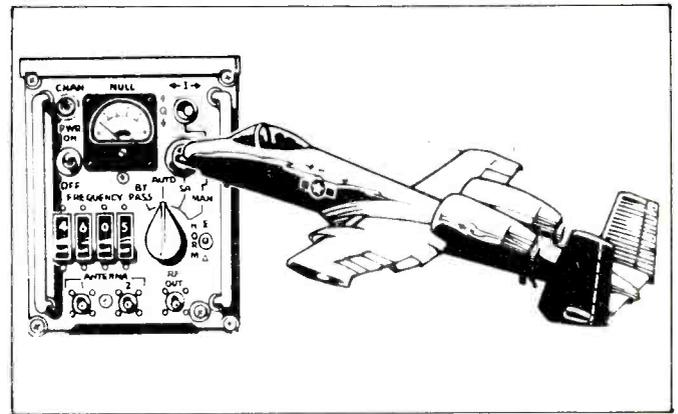
on is detonated. This is an immense force which cannot be directed or controlled in any practical manner. It effectively cripples all manner of electrical and electronics equipment, and so quickly that conventional fuses would probably not have sufficient time to protect equipment before it's too late. Such an energy surge can instantly wipe out electric generating stations, computers, radios, electronic ignition systems in vehicles, heart pacemakers, home appliances, quartz wrist watches, weapons guidance systems—just about everything which in any way uses electricity. Modern solid state devices, in fact, are far more susceptible to EMP destruction than older tube-type equipment (maybe that's why the Soviets rely so heavily on tube-type radio gear for their military aircraft and vehicles).

A nuclear weapon detonated a few hundred miles over the center of North America would do quite a job on electrical and electronic equipment between the Atlantic and

Pacific coasts, as far north as the Yukon, as far south as the Yucatan. EMP doesn't kill or injure people, but it renders useless the tools they have come to rely upon for comfort, convenience, and even survival.

On The Other Hand

Thusfar, there are still technological barriers standing in the way of turning many of these potential weapons into having a practical military application. Some are too cumbersome, others are easily able to be detected and destroyed by the enemy, some are potentially harmful to those who seek to use them. All are highly sophisticated and expensive, most are easily susceptible to malfunction. With the exception of a few, the ability to maintain a suitable source of power to operate the devices over a long period during combat conditions is a problem. And, of course, using such weapons also



depends upon our being able to protect ourselves from similar weapons which might be used against us by an enemy!

Whatever became of the death ray? It can be approached from so many different aspects that it's certainly closer than ever before, perhaps in some of the forms mentioned here, or maybe in other forms such as vibrations, magnetism, gravity, audible sound of intense loudness, or strobe lights. And the Soviets have been conducting serious experiments with psychic forces. As in the past, we are limited only by our imaginations. That could make present concepts of warfare and destruction seem mild by comparison to anything yet seen or conceived.

The President made his observation about creating "Star Wars weapons" in 1983, but science fiction writers said it first. Who could have put it better than one of the characters in the 1969 film *Colossus: The Forbin Project*, who commented, "Whatever can be conceived can be achieved."

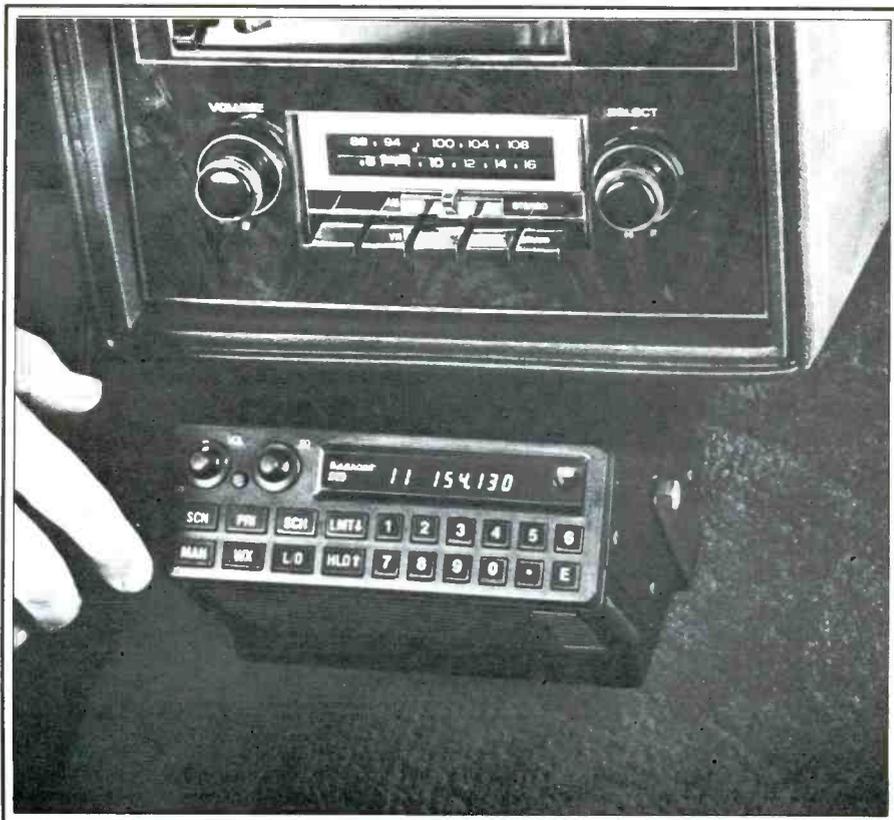


Regency's HX-650 hand-held scanner.



The Regency D-310 thirty channel programmable scanner.

Electra Bearcat 260 mobile scanner.



Scanner Bonanza!

12 New Scanners Make The Scene

BY RICK MASLAU, KNY2GL

It looks as though the coming holiday season will be merrier than usual for many scanner enthusiasts. That's because two major scanner manufacturers have unveiled a most exciting group of new entries into this rapidly expanding field. As far as anyone can recall, it's the largest number of scanner models ever brought out in one fell swoop and it's just in time for the holiday shopping season. Hooray!

Law enforcement officials, paraprofessional personnel, and scanner enthusiasts who enjoy doing their monitoring on the road, will be interested in a synthesized, programmable Bearcat® scanner designed specifically for mobile applications. The Bearcat 260 was designed with police cooperation. Its unique but practical shape and special two-position mounting bracket makes hump mounted or under dash installation easy in virtually any vehicle—or in the home or office, under cabinets or on shelves. Incorporated into its rugged, all metal case is a specially positioned speaker that delivers 3 watts of crisp, clear audio. Plus, the unit has been specially designed with a memory back-

up system that safeguards against memory loss during power outages and peaks.

Inside the car, the bright green fluorescent display clearly indicates frequency and channel, even in sunlight. The electro-luminescent keyboard backlights each key so every function is clearly visible, even in darkness. The dim control allows the lighting of the display and keyboard to be adjusted for viewing preference. The keys "chirp" to confirm each command.

Offering wide range frequency coverage from low band through the top of UHF, the new Bearcat 260 covers eight different bands and 16 channels. Included, are four public service bands (low, high, UHF and UHF-"T") for police, fire, business and transportation, 2 meter and 70-centimeter amateur, plus extended VHF and UHF range (138-144 MHz and 406-420 MHz). Each of these ranges are covered with exceptional sensitivity made possible by Electra's patented Track Tuning which peaks each transmission automatically.

In addition to its wide range frequency coverage, the new scanner offers many spe-

cial conveniences not found on most scanners. A priority channel is included to assure never missing important messages. At the touch of its "weather" key, it automatically locks on an active weather frequency. This means the user no longer needs to know or program weather frequencies into the scanner. The Bearcat 260 also features a "hold" key, plus manual up/down and automatic search, to zero-in on signals for maximum clarity. Other deluxe features include automatic lockout for bypassing channels not of current interest. Direct channel access enables the user to go directly to any channel, without stepping through other channels. Patented Scan Delay adds a two-second delay on desired channels to prevent missing transmissions when "calls" and "answers" are on the same frequency. The Bearcat 260 package includes a five element telescoping antenna for non-mobile use, external power supply and mounting bracket. It has a suggested retail price of \$399.95.

Electra is also bringing out a new, handheld, crystal scanner that has a special appeal to professionals and volunteers who



The Regency MX-3000 is a mobile scanner with 30 channels.



The HX-1000 is a hand-held programmable scanner from Regency.

need to keep track of police, fire, business emergency, and aircraft communications. This is the Bearcat 5-6, and it covers 5 bands and 6 channels, including VHF hi/lo, UHF/UHF-T, plus VHF aero, scanning these frequencies at 8 per second. The unit has sensitivity of 1 μ v. or less on all bands. Each UHF frequency is peaked automatically with high sensitivity made possible thanks to Electra's patented Track Tuning. The set's audio output is 300 mW to easily overcome background and room noise. Other features include Scan Delay (2 seconds), LED channel display, channel lockout switches, a belt clip, a rubber ducky antenna with a BNC connector. The Bearcat 5-6 operates from four AA batteries and there's even a warning light to give you advance notice that its batteries are getting low—a battery charger and AC adaptor is included in the Bearcat 5-6 package. Finally, the Bearcat 5-6 includes a wire antenna and an earphone. Suggested retail price is \$179.95.

Bearcat 151 is another new entry from Electra. Recognizing that many potential customers are intrigued by the excitement of

monitoring the public safety, marine, business, federal, and other scanner bands, Electra has made it easy for them to get started with an investment which doesn't require that they buy a top-of-the-line scanner. That's where the 10 channel Bearcat 151 programmable scanner comes in. The unit offers the features most often used in radio monitoring. For example, its bright fluorescent digital display shows channel and frequency number for quick ID. Keyboard programming permits the exploration of thousands of frequencies with pushbutton ease. The Bearcat 151 covers 8 different bands and 10 channels. The bands covered include VHF hi/lo, UHF/UHF-T, 2 meter and 70-cm. ham bands, and two extended range bands (138 to 144 MHz and the "forbidden band" at 406 to 420 MHz). Electra's patented Track Tuning covers all bands for maximum selectivity.

The Bearcat 151 also offers Scan Delay (2 seconds), channel lockouts, direct channel access, and simple operation. The suggested retail price is \$249.95.

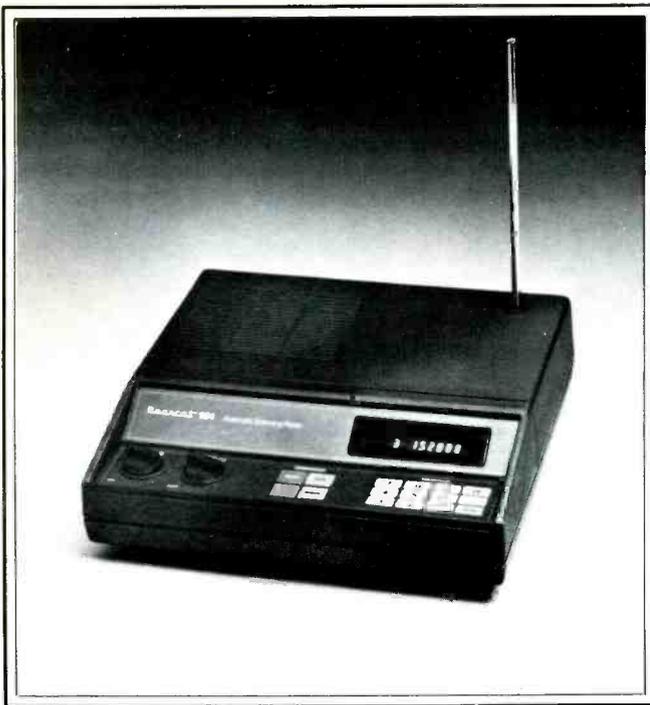
These units are available from all Electra

Bearcat dealers or you can check with Electra about them. This can be accomplished by circling number 119 on the reader service card or by writing directly to Electra Company, 300 East County Line Rd., Cumberland, IN 46229.

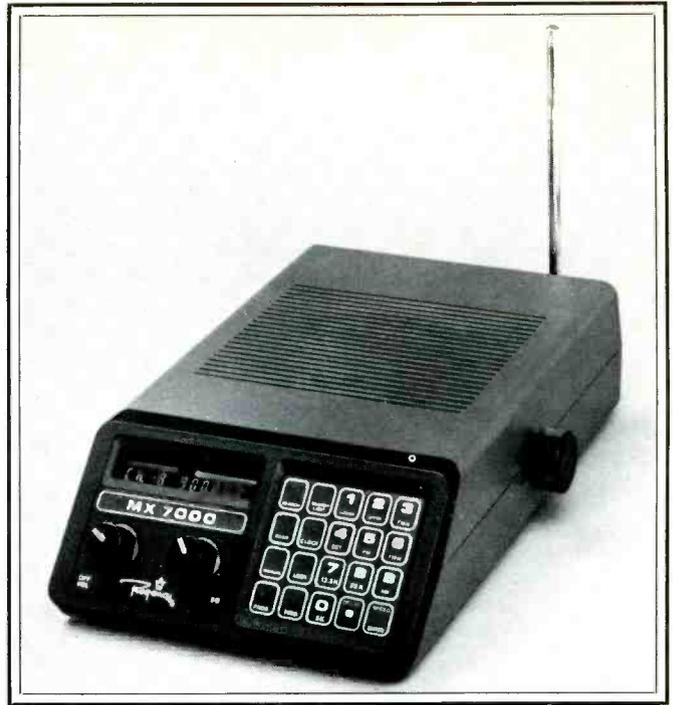
Regency Electronics has introduced an interesting new batch of scanners, leading off with the MX-7000, a 20 channel mobile scanner with a range extending up to 1250 MHz (1.25 GHz) in the microwave spectrum. It also covers CB, VHF/UHF audio, FM broadcast, civil and military aircraft bands, 800 MHz communications, cellular telephone, and (when connected to a printer or CRT) satellite weather pictures!

The MX-7000 has a computer controlled keyboard to allow the user to program up to 20 channels. Special features include search, clock, dual scanning rate, and scan/search signal delay. The MX-7000 has a telescoping antenna, a mobile mounting bracket, and an AC adaptor/charger. The unit's suggested retail price is \$599.

The Regency D-310 30 channel programmable scanner has a pressure sensitive



The 10 channel Electra Bearcat 151 programmable scanner.



The Regency MX-7000, a 20 channel mobile scanner.

keyboard which can be used to select from 15,000 frequencies in 6 bands. It features a search mode, non-volatile frequency memory, priority control, dual level display, channel lockouts, and it can operate from either AC or DC. Suggested retail price is \$249.95.

Regency's HX-650 hand-held scanner covers 5 bands including the 2 meter ham band. Regency claims this unit is the smallest hand-held scanner (measuring 2-3/4" wide, 5 1/2" high, 1" deep). It features channel lockout, step control, LED channel indicators, two antennas, and AC adaptor/charger. Suggested retail price is \$119.95.

The Regency MX-3000 is a mobile scanner covering 30 channels in 6 bands. Touch-pad keyboard provides access to the computer controlled circuits which enable full scan or search operation. The display is multi-function in nature and the unit has a priority channel feature, dual scan speeds,

scan/search delay, and a brightness switch. It is supplied with a mobile mounting bracket, swivel antenna, memory battery and AC adapter/charger. The MX-3000 carries a suggested retail price tag of \$299.95.

Regency has an entry in the field of programmable hand-held scanners. That would be their HX-1000 unit. The front-mounted sealed rubber keyboard allows the selection of 20 channels in 6 bands. A special feature is its side-lit liquid crystal display, which shows either channel number or frequency and display messages. Other features include search, priority, memory battery, scan/search delay, channel lockouts, and a rugged die-cast aluminum chassis. It is supplied with a battery charger, carrying case, belt clip, flexible antenna, and nicad battery pack. The price was not announced at press time.

The Regency HX-750 is a hand-held which includes coverage of the VHF aero

band as well as VHF hi/lo, 2 meter ham, UHF/UHF-T bands. Other features include channel lockouts on each of the 6 channels, step control, LED channel indicators. It is supplied with an adapter/charger and two antennas. Suggested retail price is \$169.95.

The model HX-3000 is a hand-held programmable featuring full scanning from 25 to 550 MHz. This unit is a keyboard-type unit and can be programmed for 20 channels. It features search with programmable frequency increments, digital display, and scan/search delay. Suggested retail price is \$449.95.

Regency has also announced the Z-10 ten channel programmable scanner covering 6 bands. The unit can search through any of its bands in addition to its coverage of specific programmed frequencies. No batteries are required for memory retention. Other features include streamlined design, wood grain cabinet, rubber keyboard, priority channel, AC/DC operation, dual scan speed, scan/search delay, and a brightness button. Suggested retail price is \$229.95.

The Regency Z-30 is a 30 channel scanner with a built-in alarm clock! This scanner is fully keyboard programmable and has search mode. No batteries are needed to retain its memory. A special feature is the quartz elapsed time clock with a 24 hour alarm. This unit has streamlined design, rubber keyboard, priority channel, dual scan speed, scan/search delay, brightness control, and AC/DC operation. Suggested retail price is \$269.95.

For further information on any of these Regency scanners, see your local Regency dealer, or you can circle number 120 on the reader service card. Regency may also be contacted directly at 7708 Records Street, Indianapolis, IN 46226-9989.

All information was extracted from manufacturers' literature.

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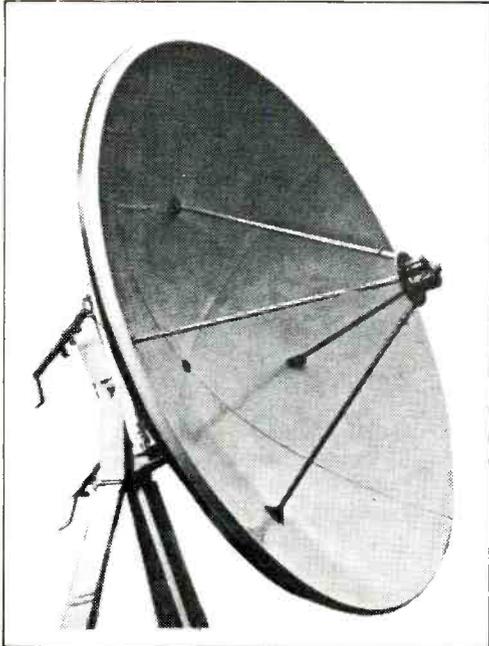
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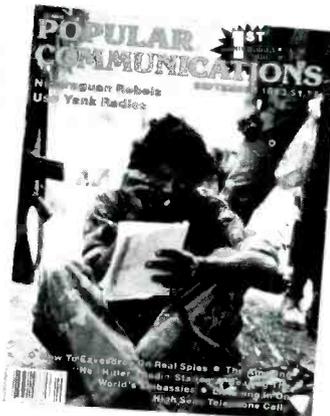
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Nazi Germany Propaganda Chief Josef Goebbels relied heavily upon radio broadcasts, but he wasn't happy about the mysterious radio voice from nowhere. (UPI photo)

Remembering

Ivan The Terrible Moscow's Menacing Mystery Voice – He Had The Nazis Climbing The Walls!

BY DON JENSEN

As in the rest of Berlin's Charlottenburg district, the windows of No. 8-14 Masurenallee were shuttered and dark, for on August 21, 1941, the threat of night-raiding Wellington bombers was uncomfortably real.

But inside Rundfunkhaus, headquarters of the Nazi radio network, the propaganda mill was grinding away. In a studio no larger than a phone booth, an announcer began the home-service news, aired nightly by Deutschlandsender, the powerful long wave station on 191 kHz.

There was plenty to report. Since the start of *Operation Barbarossa*—the invasion of Russia—two months earlier, nine million troops had been locked in a desperate struggle along the Eastern Front that stretched

from the Arctic to the Black Sea.

"The Red Army is retreating east of the Dnieper," gloated the announcer. Suddenly, the listeners in the Third Reich were startled to hear another voice cut in . . .

"Lies! Fairy tales!"

The German continued, "New victories have been won by the Wehrmacht!"

"In the grave!" added the mystery voice.

Thoroughly puzzled, the Deutschlandsender engineers, monitoring the off-the-air pickup, informed the announcer about what was happening. Gamely, while he then began to monitor the signal, the announcer tried to bull his way through the newscast. But each headline he read drew a caustic reply. Finally, the beaten newscaster gave up

and an engineer slapped on some recorded um-pah-pah's played by a beerhall band.

Radio jamming was nothing new. Rome had tried it during the Italo-Ethiopian campaign. The Nazis had resorted to jamming during the Polish and Albanian invasions in 1939. Both the Germans and the Russians had tried stepped tones and raucous buzzing to block each other's broadcasts.

But this was different. The mysterious broadcaster didn't try to cover over the Nazi newscasts with noise. He let the hapless Germans talk, then crushed them with scathing, often witty abuse. On August 24, he returned.

Announcer: "Here's the news."

Voice: "Here's the old liar again!"

Announcer: "German bombers went into action again last night."

Voice: "Have you got any left?"

"Fifteen Soviet planes were destroyed."

"But what about German losses?"

"And that ends the news."

"But the lying will continue tomorrow!"

Monitoring these exchanges in London, newsmen were intrigued by the unique counter-propaganda ploy. At first they dubbed the voice *Der Snag*, because of the way he snafued the Nazi network. But when British engineers pinpointed the transmitter's location in Russia, he was retagged *Ivan the Terrible*.

Ivan's lungpower, they learned, came from the 500 kw. long wave station RW-1 at Noginsk, 48 kilometers outside Moscow. It was built in the mid-1930's for Komintern, the international communist movement. It was the most powerful station in the world, a distinction it held until million-watt broadcasting became a reality more than three decades later.

Russian technicians had found a way to shift the station's frequency from 172 kHz and synchronize it perfectly with that of Deutschlandsender. Thus it was possible for the voice to cut in—minus heterodyne—when the Nazi announcers paused for breath.

Back in Berlin, Hitler's propaganda chief, Joseph Paul Goebbels, was fuming. And when Goebbels burned, things got hot for Heinrich Glasmeier, manager of Reichs Rundfunk Gesellschaft—the German Broadcasting Company.

Glasmeier ran what was generally conceded to be the most effective broadcasting organization around. From his Berlin studios, post office landlines carried the programs to an assortment of transmitters at Hamburg, Bremen, Cologne and, in the case of the key long wave station, the tiny village of Zeesen, just outside the capital. A humorless man, Glasmeier saw nothing funny in Ivan's remarks, particularly after being thoroughly chewed out by Goebbels, who told him to do something about it . . . or else!

He tried. The Deutschlandsender staff was told to speed up delivery. But Ivan was quicker. When announcers tried to slip in news items between records, Ivan was waiting. The frantic Nazis dropped news reports altogether and went to a non-stop music for-

mat. But, in the background, the chiding and sarcastic voice could still be heard. Even a wild cacophony of sound effects failed to stop him.

But the bedlam that engulfed 191 kHz was too much for the German burghers in the audience. Many, no doubt, heeded Deutschlandsender's desperate pleas to try other channels. But others simply switched off their radios in disgust.

Flushed with success, Ivan wasn't content with wrecking newscasts. Soon, he popped up in the middle of feature programs, even sports broadcasts. Through the fall of 1941, he harrassed Deutschlandsender. One evening, after forcing the station off the air, Ivan turned mimic. Sounding exactly like Der Fuhrer, he roared away . . . "I am the greatest man Germany has had for centuries, perhaps for a thousand years. But I'm not only the greatest German, I also have the greatest mouth in world history!"

Prompted by Ivan's effectiveness in disrupting German broadcasts, the Soviets turned the tactic on the Finnish Radio, the Axis station at Sofia, Bulgaria, and finally, on Hitler's junior partners, the Italians.

On October 13, 1941, an Anglo-American intelligence team in Cairo heard a ghost voice calling itself *La Voce del Popolo* interfering with Radio Roma's medium wave, home-service frequency. It berated Mussolini for selling out to Berlin.

Not long after, the Italian-speaking "Voce" jumped on Il Duce's pet announcer, Mario Appalius, calling him an "Italian ass!" Not one to take this insult in silence, Appalius shot back, "That's better than being a British citizen!"

Appalius, of course, had goofed. His tormentor wasn't British, but this error set off a chain reaction of mistaken identities that for a brief time threatened the European airwaves with chaos.

The Italians retaliated immediately with their own ghost voice. From a transmitter near Bolzano, he subjected the BBC home services on 391 and 449 meters to similar treatment. The British soon dubbed him *Harrassing Harry*.

Italy's secret kibitzer took swipes at Churchill, the aristocracy and even the British food ministry. At times the hubbub was so bad that listeners in the United Kingdom had to switch from the BBC frequencies to the home service military network station on 811 kHz. Generally, though, Britons found "Harry" amusing, and stayed tuned in.

His Majesty's government got uptight about it, however. The Italians had erred in blaming the British for the "Voce" interruptions. London compounded the confusion by assuming the Nazis were behind "Harry." Since Great Britain hadn't resorted to jamming German channels, it didn't seem quite cricket. Huffily, London threatened to equip RAF bombers with portable transmitters to air programming on Nazi frequencies during raids over the Continent.

It wasn't long before the mix-up was straightened out. "Harry's" real nationality was revealed to the British when a slip-up resulted in an internal studio comment, in per-

fect Italian, going out over the air.

Before long, Italian intelligence officers matched up *La Voce del Popolo* with some old recordings of an announcer—not the original Ivan by the way—who had broadcast for Moscow during the Spanish Civil War. Soon, "Harry" retired from the game and the British threat was forgotten. This left the field to Ivan, which was just as well, since he was head and shoulders above the competition.

Who was Ivan anyway? Officially, the Russians never said. But British and American intelligence pieced the mystery together and issued a secret joint report. Today, though it's no longer classified on this side of the Atlantic, the American copy of this report has disappeared, apparently misfiled among the mass of government archives. Hours of searching the Washington catacombs have failed to unearth it. And the British copy—under the Official Secrets Act—cannot be made public until 1991.

But careful digging has turned up enough information to give a pretty good idea about Ivan's identity. Actually, it seems there were two men behind the Russian scheme. The originator was a beetlebrowed old Bolshevik named Solomon Abraham Lozovsky, deputy director of the Soviet Information Bureau. While the multi-lingual Lozovsky sometimes took to the air himself, usually the voice was that of Ernst Fischer, a one-time Austrian journalist. Both were fascinating characters in their own rights.

Lozovsky, born Dridzo, was scarcely known outside Russian labor circles before WWII. Born in 1878, the son of a Hebrew teacher, he was working as a blacksmith's helper at age 11. A full-fledged revolutionary by 22, he adopted his protective pseudonym from the town of Lozovaya, where he toiled for the Communist Party.

Often imprisoned, he held the record for having escaped from jail more times than any other Communist of his era. Later, in the 1920's and 30's, he headed Profintern, the trade union international.

Just before the war, he became Vice Commissar for Foreign Affairs and the USSR's chief spokesman to the world. His handling of press conferences led Western newsmen to grudgingly respect him. "He doesn't tell nearly as much of the truth as we correspondents would wish," noted Quentin Reynolds, *Colliers* magazine's man in Moscow, "but so far none of us has caught the Vice Commissar in a lie."

Polished and suave despite his beginnings, the 63-year-old Lozovsky was considered a witty man. This characteristic was a key factor in Ivan's success. Throughout the war, he was closely linked to the USSR's broadcasting organization.

After WWII, he was caught in Stalin's murderous machinations, and during an anti-Semitic purge, was arrested in 1949 on trumped up charges. In August 1956, the editor of a New York Yiddish daily reported he'd learned of Lozovsky's rehabilitation—Sovietese for exoneration—by the post-Stalin regime. Officially it was, "so sorry, Sol!" But this apology didn't do Lozovsky

much good. He'd been shot seven years earlier.

On the other hand, Ernst Fischer, who must be considered the real voice of Ivan, fared better. Born July 3, 1899 in Komotau, now the steel center of Chomutov in northwestern Czechoslovakia, he was the son of a former general in the Austro-Hungarian army. He attended Graz University in Austria and served in the Imperial Austrian army in World War I.

At 21, he joined the Austrian Social Democrat Party and worked his way through the journalistic ranks to become editor of Vienna's *Arbeiter Zeitung*. A brief civil war between Austria's political parties in 1934 embittered him. The socialist became a Communist, joining the party in Czechoslovakia. He covered both Hitler's rise to power and the Spanish Civil War for various Russian journals. He moved to Moscow in 1938.

He was living comfortably in Moscow's Hotel Lux and working for the Russian radio in 1941. When Lozovsky concocted Ivan the Terrible, the German-speaking Fischer was tapped for the job. Later, Fischer's talents were used by a Moscow-based clandestine station, the Voice of Free Austria, which aimed its programs at Austrian troops in the German Army.

When the Red Army liberated Vienna in April 1945, Fischer and several fellow Communists were right behind, planning a takeover of Austria. Fischer briefly served as Minister of Education and Public Information in the Provisional government, but lost his job in the fall election. Later he was elected a deputy in the Austrian National Assembly, became foreign affairs spokesman for the Kommunistische Partei Oesterreichs, and twice bid unsuccessfully to become his nation's foreign minister.

From 1950, he aligned himself with more moderate Party elements in supporting co-existence with the West. After the Austrian Communists lost their last parliamentary seats in 1956, Fischer turned his attention to writing again, authoring literary works on Goethe and Kafka. The Czechoslovakian invasion in 1968 caused him to break with the Soviets and with his own party over their politics.

He retired completely from politics and lived quietly in Vienna at Rustenschacher Allee 28. On August 1, 1972, while visiting the Austrian village of Deutsch Feistritz, Ernst Fischer died of a heart attack. He was 73.

As for Ivan, his interruptions ended in 1941, except for two isolated incidents on March 29 and October 26 of 1942.

Why? Well, Moscow always knew that Ivan wasn't an effective jammer; he didn't actually block Deutschlandsender's frequency. His success lay in his ability to needle and goad the Nazis into overreacting. He made them appear ridiculous in the eyes of their countrymen and the world. But Ivan was a novelty, and in time, even his best act became a bore. He died of overexposure during the long Russian winter.

A headline attraction in his time, today *Ivan the Terrible*, the Moscow mystery voice, rates only a postscript in history.

“November Five Romeo, this is Echo One Sierra. Read you Lima Charlie.”

Cryptic messages such as that aren't strangers to anybody with a communications receiver who takes the trouble to tune frequencies other than shortwave broadcast or ham transmissions. They are no more far out than transmissions on scanner frequencies which say things such as “Angel will arrive at Coach House instead of Curbside.” Such traffic, usually monitored without benefit of traditional call signs such as might be assigned by the FCC is often baffling to the listener.

Such messages may come from business or industrial stations, spy stations, private ships or aircraft, military or civilian federal stations or just about anybody. The casual or uninitiated listener may shrug off the messages and keep right on tuning or scanning in order to locate something a bit more easily recognized. That's the easy way out and you may well be missing out on much of the fascination and excitement of owning communications receiving equipment. If you keep tuned to the frequencies which bring forth cryptic messages, you may well be able to identify the stations, not only determining who operates them but also where they are located and what they're talking about. The military does it all of the time; it's a part of electronic warfare called *Communications Intelligence*, usually known simply as COMINT. This not only includes those stations which happen to drift past your ears by accidental tuning, but those you may actually seek out on offbeat frequencies. Your research on all such frequencies could well reward you (and perhaps the monitoring fraternity in general) with useful new information; many listeners practically specialize in such efforts and have come upon some rather astonishing discoveries.

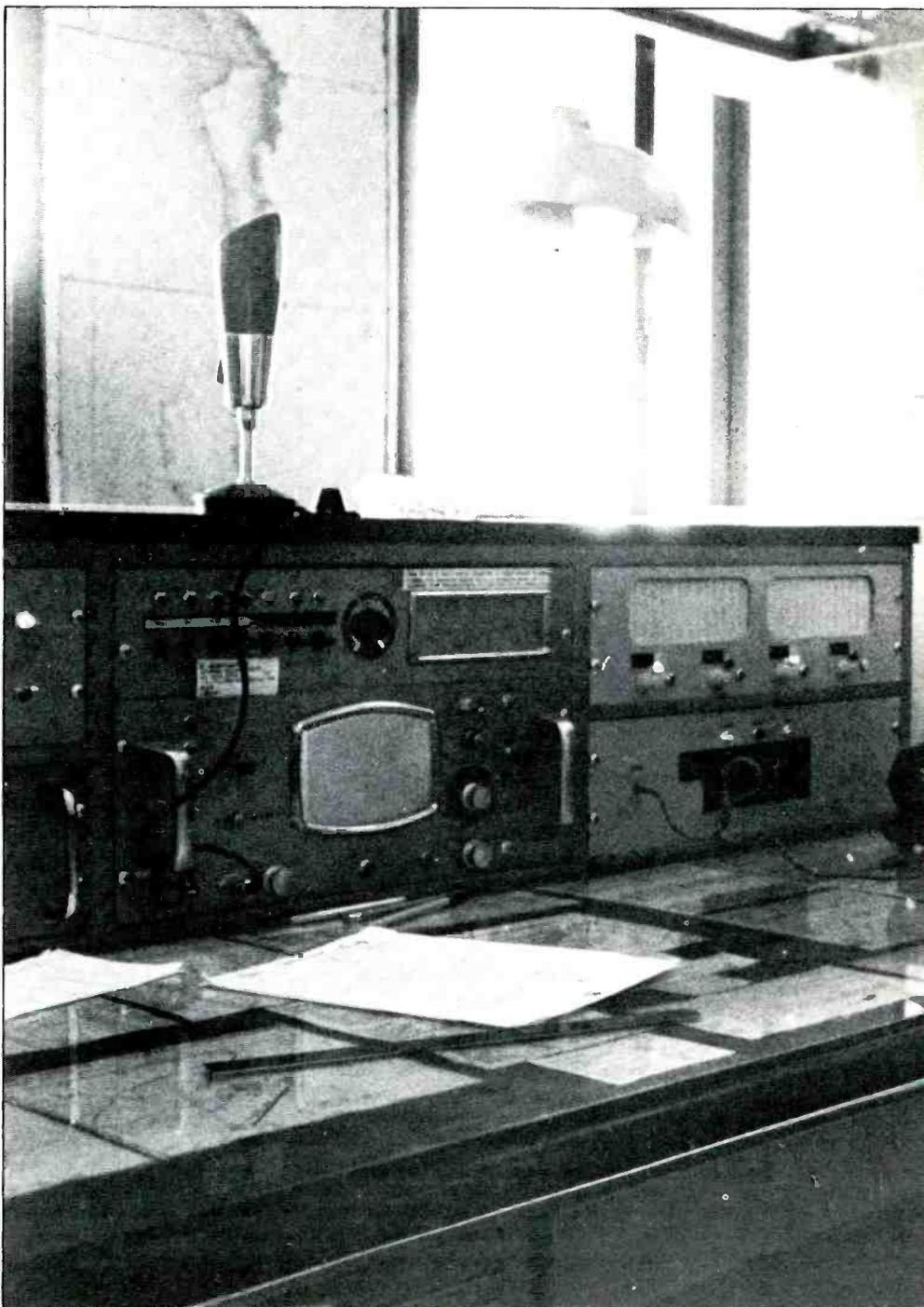
Here are some thoughts on getting started. They are presented in the hope of getting you rolling along the road to knowing more about what you're hearing as well as what you might be hearing. You'll find out that the tools of your trade not only include your receiving equipment but many other non-electronic means for COMINT operations. You'll be surprised at what you can assemble in the way of information with medium effort. If you put lots of effort into it you can (as others have done) unravel many mysteries. Right now, as you read this, many monitors are busily doing this—some monitoring spy “numbers” transmissions, other tuning military frequencies of many nations, still others monitoring VHF frequencies for “mystery” stations. You may know of some of these listeners—Helms, Gysi, Grove, Chinsky, Chabak, Kneitel, Pinto, Maslau, Ferrell and others. Here's hoping you can join their ranks.

First Things First

Never overlook any possible sources of information. Yes, your receiving gear is

COMINT – Communications Intelligence

Thoughts On Identifying “Mystery” Communications Stations



most important, but you must also use any publications which will aid you. Write letters to get information. Follow the information presented in club publications and *POP-COMM*. You may find that you get snippets of isolated information from here and there which you can eventually fit together to form a relatively complete composite picture.

Books which have been helpful in providing invaluable reference include *The Confidential Frequency List* (5th Edition) by Perry Ferrell, *How To Tune The Secret Shortwave Spectrum* by Harry Helms, and *The "Top Secret" Registry of U.S. Government Radio Frequencies* (5th Edition) by Tom Kneitel. Bob Grove's *Federal Frequency Directory* is also worthwhile but it is out of print.

Writing letters can produce interesting re-

sults in useful non-information. When the mysterious "KKN" type callsigns began appearing on shortwave bands years ago, nobody knew what they were. Tom Kneitel took the direct approach and wrote to the FCC asking for the name of the licensee. The FCC wrote back to say that they didn't license those stations but could handle any interference complaints about them. This confirmed that they were operated by the government; the ball went into play on further identifying them as such! And while the FCC refused to give out any additional information, publications of the International Telecommunications Union (ITU) in Switzerland gave their locations as Washington and overseas points. Monitoring by a number of persons who exchanged information on the operations of these stations enabled

listeners to assemble much information on them. Most listeners feel they are operated by the Dept. of State, while others insist that they are CIA stations.

Listen With Frequency

There are prime places to hear mystery stations. In the shortwave bands, these frequency ranges include those shown in Table 1. Those frequencies within the range of a scanner are shown in Table 2. Not that you won't find mystery transmissions on frequencies which don't show up in these Tables, but these are tried and proven areas. On scanner frequencies, most mysterious transmissions heard on band segments not shown in the Table will be from commercial or public safety agencies who carelessly forget to announce their callsigns; but stations operating within the bands will be military or civilian agencies of the government.

When listening, you may note that frequencies often come in closely packed clusters used by the same agency, such as the FBI which has many frequencies in the 163 and 167 MHz ranges. Frequencies you'll monitor around 38 MHz are usually from



Table 1

1600 to 1800 kHz	14335 to 14990 kHz
3400 to 3500 kHz	15010 to 15100 kHz
4000 to 4100 kHz	15600 to 17550 kHz
4438 to 4750 kHz	17900 to 18500 kHz
5060 to 5950 kHz	18900 to 19990 kHz
6525 to 7000 kHz	20900 to 21000 kHz
7300 to 8195 kHz	21450 to 21550 kHz
8815 to 9500 kHz	21850 to 22000 kHz
9775 to 10000 kHz	22855 to 24890 kHz
10000 to 11650 kHz	25010 to 25070 kHz
11975 to 12330 kHz	25110 to 26000 kHz
13360 to 13600 kHz	26175 to 26960 kHz
13800 to 14000 kHz	27410 to 28000 kHz

Although "spy" numbers stations might pop up anywhere in the shortwave spectrum, lots of mystery stations have been noted in the frequency ranges shown in Table 1. These include military and other federal networks, bootleg communications, smugglers, and various unknown stations.

Table 2

30.00 to 30.51 MHz
32.00 to 33.00 MHz
34.00 to 35.00 MHz
36.00 to 37.00 MHz
38.00 to 39.00 MHz
40.00 to 42.00 MHz
46.60 to 47.00 MHz
49.66 to 50.00 MHz
136.00 to 144.00 MHz
148.00 to 150.80 MHz
157.04 to 157.19 MHz
162.02 to 173.20 MHz
173.40 to 174.00 MHz

If your scanner has a search feature, try running through these frequencies to see if you can hear any mystery stations.

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CIRCLE 22 ON READER SERVICE CARD

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON 25, D. C.

March 8, 1960

ADDRESS ALL COMMUNICATIONS
TO THE SECRETARY

IN REPLY REFER TO:

6155R/LJ

Mr. Thomas S. Kneitel

Dear Sir:

This refers to your letter of February 23, 1960, requesting the identity of the United States Government Agency operating stations KKN43, KKN48 and KKN52.

The Commission is unable to furnish you with the identity of the assignees of the above stations. However, should your request concern harmful interference caused by these stations, please advise the Commission immediately of the call sign and frequency of the station receiving interference and specific dates and times interference has occurred, so that the matter may be referred to appropriate authorities.

Very truly yours,

Mary Jane Morris
Mary Jane Morris
Secretary

The first step in finding out more information about what you're hearing may involve writing a letter and asking some questions. This letter from the FCC tacitly confirms that several mystery stations were being operated by the government, a status which was open to some speculation at the time.

the U.S. Army. This is especially true of scanner frequencies, more so than on the bands below 26 MHz.

Don't be afraid to spend time with your receiver or scanner "sitting on" a frequency for several hours at a clip, or over a period of days or weeks.

Compile Data

As you listen, take notes of all information which will go into helping you to identify the station or network. A word here, a reference there, when collected over a period of time, will start to build into a well defined form. Listen for locations mentioned, the type of traffic sent, the operating procedures. Military stations may make reference to various military ranks which will form part of your information fund. Also pay attention to forms of identification used by the stations.

Tactical identifiers are used by many military stations instead of the types of callsigns such as might be issued by the FCC. While such tactical identifiers tend to change at periodic intervals, certain of them seem to remain in use over long periods of time and, in any event, the various military services retain certain patterns which help distinguish their stations.

Many Navy stations identify by letter/numeral/letter or numeral/letter/numeral

combinations such as "G-5-L," or "4-Y-2." Some of the older "codeword" USN tactical identifiers are still to be heard but they appear to be taking a back seat to the alpha-numeric ID's.

U.S. Air Force ground stations may identify with the name of their base, such as Eglin, Scott, or Andrews. Tactical identifiers commonly encountered on HF channels include *Raymond* (followed by a digit or two) and *Fireside* (followed by a single digit). Traffic which includes the words *Sky King* relates to USAF activities.

Army installations are often heard with coded ID's such as "Suitcase Control," "Hardship," "Barrelhead," or other similar ones. Interestingly, some stations just announce "Fort Ord Range," "Fort Irwin Range," etc.

Don't be fooled by all tactical military type ID's you hear. Florida area drug smugglers have recently started using FAA radar ID codes assigned to USCG Search/Rescue aircraft in an effort to avoid U.S. Customs radar picket aircraft!

Military stations are often easily identified by their highly structured communications protocol and use of certain words. Expressions such as "Lima Charlie" (loud and clear), "Uniform frequency" (UHF), and "Victor frequency" (VHF) are typically military. If you are tuned to a federal frequency and you've determined that what you're

hearing isn't military in nature, then the obvious deduction is that it must be a civilian agency. But which one?

FBI stations sometimes identify with three digits which relate to the final part of their call sign. The agents sometimes are referred to as "Signal" (followed by four digits). Various Treasury Department agencies (such as Secret Service, Alcohol Tobacco and Firearms, etc.) are prone to identifying their base stations by the name of the city in which the station is located. Agents are called by repeating their last name twice. After a while you can start to identify federal agencies by such patterns.

Secret Service stations utilize many coded identifications relating to persons, things, and locations. When Jimmy Carter was in office he was known as *Deacon* and his home in Georgia was called *Driftwood*; these are only two of several dozen types of codewords you might hear which peg a Secret Service station. *Angel* denotes Air Force 1 and it sometimes flies from *Acrobat* (Andrews AFB) or *Curbside* (Washington National Airport); *Cement Mixer* is the White House Situation Room, while *Fog Horn* is the State Department Security Division Communications Center. *Huntsman* is their surveillance helicopter and *Coach House* is Dulles Airport. Communications bearing these and other words are distinctive to that agency.

This is just a sampling to give you some idea of how various agencies can often be identified by the type of traffic they send.

You may wish to tape record a specific frequency under research so that you can review it at your leisure. You can even listen for background voices or inadvertent comments by the operators not intended for transmission. Sometimes the operator will say something to another person in the radio room, or answer a telephone, with the microphone keyed.

Information should be placed on file cards or entered into a home computer as it begins to accumulate. You will eventually see various patterns emerging which will let you zero in on the information you want—names and/or locations of stations in a network, schedules, groupings of frequencies. I once realized, by comparing tapes I had made, that stations on one former mystery frequency which had been "cracked" were actually identical to a network of mystery stations on a second frequency. On the second frequency, they used different identifications than on the first frequency and many of the operating procedures were different. But the tapes proved beyond any doubt that all stations in both networks were identical.

You can devote some time to tracking down additional frequencies known to be in use by some networks you hear. For instance, there is a tactical Navy network heard on 7893 kHz. Stations in this network have been noted switching to alternate frequencies, but what are those frequencies? This is a typical project you might wish to embark upon!

You'll find that certain portions of the

spectrum produce stations which interest you the most, such as the drug smugglers who operate at the high frequency ends of the 7 and 14 MHz ham bands. You may be intrigued by activity on the main North American Air Defense (NORAD) frequencies (14894 and 20855 kHz), or The USAF's Strategic Air Command operations on 6761 kHz or other channels. Maybe you'll like the many 162 to 174 MHz VHF networks.

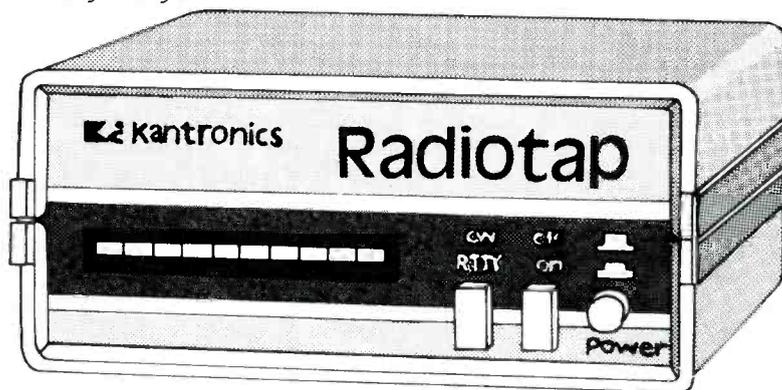
Whether you specialize or simply gather assorted bits of information with the hope that you'll eventually come up with some-

thing concrete, you'll find it an exciting challenge. It's like being a signal detective solving a mystery! As you gain experience, you'll develop your own techniques and, best of all, a certain amount of insight in knowing which are the most interesting stations to pursue. You may spend many weeks or months in carefully sorting and selecting data in order to achieve results. They'll be exciting months which will give you far more enjoyment than you would ever have by simply limiting your involvement in monitoring to only the easy-to-hear-and-identify stations.

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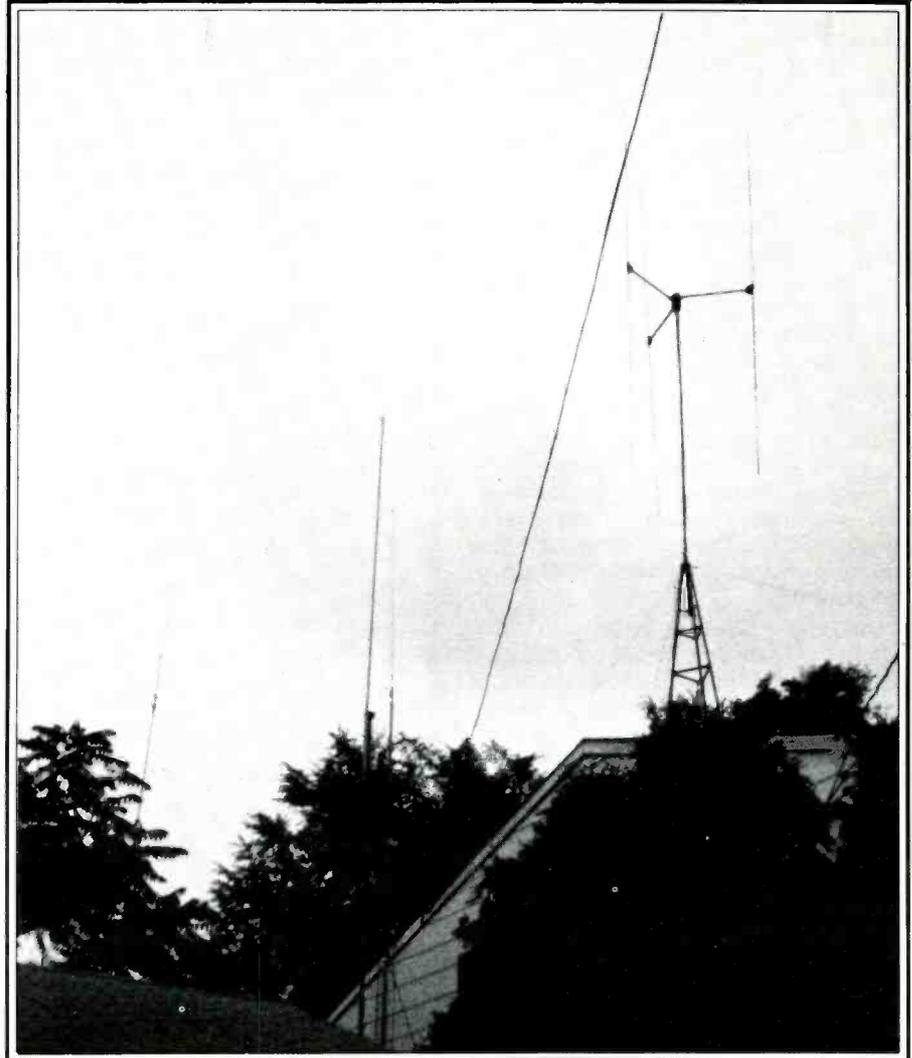
Fortunately, or unfortunately, antennas are a part of communications—fortunately, because the antenna system attached to communications equipment is what gives it the opportunity to reach out to and also receive other stations; unfortunately, because so many antenna systems aren't installed to give optimum results.

With apologies to Kraus, Orr, and others who have written many excellent books in an attempt to unravel the mysteries of the communications antenna, I have no intention (or ability) to give them a run for their money in this column. What I would like to do is pass along some random thoughts and observations on antennas based upon my experience with some of the installations I've come across.

For instance, many antenna systems don't seem to be installed with sufficient protection against wind and weather. What's the point of erecting an antenna that you hope will be of some value in an emergency if it can fall easy prey to the first healthy gust of wind that comes barreling across your location? If you've got anything more complex than a plain whip antenna in use at your base, then most likely it will require three or four guy wires to keep it safely aloft. And don't install any antenna where a gust of wind could send it toppling over into a tree, power line, telephone line, your shelter, or any vital equipment.

Antennas at a base station also require some form of lightning protection. This isn't a very complicated safety measure, and yet all too many installations don't include such protection. Why? Because most folks haven't seen the results of what lightning can do. Aside from its potentials for burning down the place should the antenna score a direct hit, it can easily burn out components in scanners and transceivers. If communications equipment isn't in use during an electrical storm, it's probably just as well to disconnect it from the antenna until the storm passes, even if the antenna is protected against lightning. Antenna lightning protection can consist of nothing more complicated than a grounding rod, a short length of heavy solid wire, and a lightning arrester. Commercially available arrestors for antenna systems can be found at most communications shops and can be connected right to the system's coaxial lead-in with a minimum of effort (and tools) in only a few minutes.

Another common antenna goof is to locate one transmitting antenna too close to another. It is seldom pointed out in the literature supplied with antennas that they will adversely interact with others unless they are given sufficient elbow room. I'd like to



Close placement of several antennas can bring about unique problems.

think that no two antennas would be mounted where they are closer than at least a quarter of a wavelength apart. This, of course, would make the actual distance dependent upon the frequency bands in use. As an example, an antenna for operation on or near 7 MHz (40 meter wavelength) could be affected by a VHF ground plane located within 10 meters (about 33 feet). The effect could be a distortion of the antenna's signal pattern.

An antenna for VHF transmission use is best separated with as much distance as possible from a scanner antenna if there is any possibility that the scanner will be used simultaneously with the transmitting facilities, and the transmitted frequency should be avoided by the scanner. Let's face it, no matter how hard you try to keep the transmissions out of a nearby scanner, they're going

to cause interference. However, interference isn't as bad as the destruction of the scanner. A good strong dose of RF from a transmitting antenna in close proximity to an antenna connected to a receiver picking up the critical frequency could easily damage the receiver.

Here's another observation. I've seen survivalist installations located deep in the recesses of some obscure and remote location. All sorts of effort has been taken to secure the camp and make it blend into the surrounding foliage, rocks, or whatever. So far, so good. The only problem is the beautiful and gleaming radio antenna poking up from the supposedly anonymous camp. It can be seen from the air and sometimes from the ground, shining out like a beacon to advertise the location of the installation which has otherwise been so carefully hidden.

COMPUTERS ARE CREATING JOBS FOR NRI-TRAINED PEOPLE.

Most people don't stop to think of this and that it could all be avoided by just spray painting the antenna, tower, or mast, and coaxial lead-in. A coat or two of flat black or olive drab will do wonders. Colors should be selected to blend in with the surrounding predominant color scheme—this could mean white in the winter if the installation is located in an area frequently covered with snow. The main precaution is to tape over any connections, connectors, and also hardware such as screws, bolts, nuts, and tuning adjustments before the painting.

Here's a way of improving the operation of vertical antennas, especially those used for VHF. Although it isn't always pointed out in manufacturer's literature, vertical antennas seem to like to work against some form of metallic support structure such as a mast. Experiences with Shakespeare Big Stick, Cushcraft Ringo Ranger, and other verticals made for operation between 27 and 160 MHz indicate that if mounted atop at least 20 feet of TV masting, they do a better job than if mounted on a chimney with straps or on a short roof tower.

What with the possibilities for antennas to be damaged or destroyed by severe weather (regardless of precautions you may take to protect them), it isn't imprudent or extravagant to make some plans for alternate or backup antennas, at least for receiving. That could mean having enough extra wire, cable, and insulators on hand to jury-rig at least a quickie dipole for HF operations. For VHF operation, a TV antenna can always be used in a pinch—even though it is directional, horizontally polarized, and has the incorrect impedance for the best match to a scanner or most other VHF gear. I wouldn't think it at all wise to try transmitting on such an antenna, but it will probably offer a scanner or VHF receiver enough signal pickup to be useful for reasonably strong signals. If a small balun can be obtained to convert the 300 ohm TV twin lead to even 72 ohms, you'll improve the input match to your scanner (which wants to work with a 52 ohm antenna match).

Another way of getting an emergency VHF antenna is to take a hacksaw to a 27 MHz antenna and cut it down to the proper element lengths. A generalized cutting for 150 to 160 MHz would require the vertical radiator of a 27 MHz ground plane down to 15 inches, and the ground radials to 26½ inches. You might even wish to buy an inexpensive 27 MHz ground plane, cut it down, and mount it or store it for emergency use.

One more thing while I'm rambling on about antenna thoughts. If I receive one more letter asking why fiberglass whips aren't as suitable for SSB communications as are steel whips, I'll freak out. I don't know where, when, why, or how such a preposterous story began circulating, but I've been hearing it for several years now. If an antenna "works," it will do so equally well for AM, CW, SSB, FM, or whatever. If it's no good for SSB, it will be likewise for use in any other transmission or receiving mode—and fiberglass whips work well!

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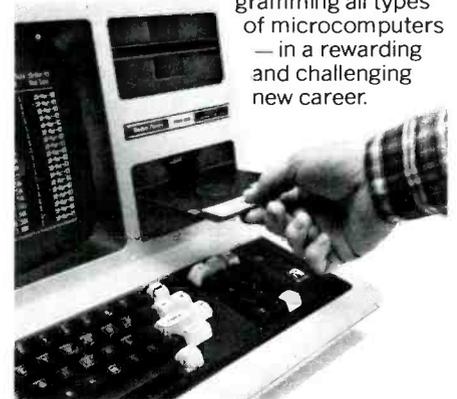
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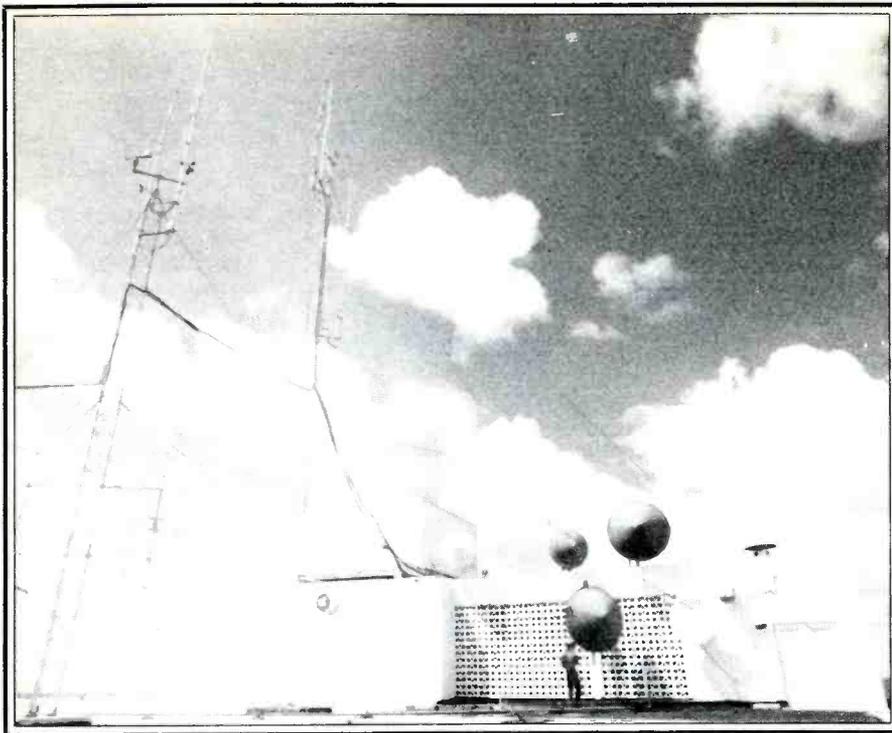
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76-103



Rooftop antenna system at the National Hurricane Center.

“Miami Monitor” Calling

**The National Hurricane Center
Is On The Air — But!** BY ALAN WARSHAW, KFL4LC

The NOAA National Hurricane Center is not especially interested in encouraging listeners unless they're tuned to the Center's VHF weather broadcasts on 162.55 MHz. As for their other operational frequencies, well the opinion at the NHC is “thanks, but no thanks.”

The NHC, located near Miami in Coral Gables, FL, is the nerve center and coordination point for information relating to hurricanes. Information from many locations and sources comes pouring into the NHC where it is placed in their computer for evaluation to determine the location, severity, and future track of hurricanes and those storms which have the potential for graduating into full-blown hurricanes.

Information is gathered from reports sent by commercial and military vessels at sea, from NOAA offices in the United States and overseas, from the weather forecasting services of other nations, and even from “hurricane hunter” aircraft which fly in and around the storm systems. Hurricane hunter aircraft are operated by the U.S. Air Force.

Some of this data is sent by landline circuits; other data is transmitted by HF, VHF, and UHF radio circuits using voice, CW,

RTTY, and FAX. At times when landline circuits fail due to the emergency conditions brought about by severe weather, back-up communications systems utilizing radio are pressed into service, for it is absolutely essential that the steady flow of data be maintained in order to effectively keep tabs on hurricanes. The NHC even uses amateur radio systems, manned by volunteer operators, when the going gets rough and the winds and rain batter their headquarters! Lives and property are at stake, and the NHC fully recognizes its job and the seriousness of its official hurricane progress reports and predictions. However, they don't want outsiders monitoring their information gathering communications circuits and refuse requests for information about their operating frequencies.

Every severe storm is by no means officially designated as a hurricane. In order to be classified as a hurricane by the NHC, the storm must meet certain specific parameters. For instance, the winds must be at least 74 knots per hour. In a hurricane, the stronger winds take the form of a circle (sometimes an oval) which could be 500 miles in diameter. Hurricanes located in lower latitudes tend to drift towards the

northwest or west at an average speed of 10 to 15 miles per hour, but by the time they come as far north as Florida they often veer towards the northeast and pick up forward speed. Therefore, the determination of which tropical storms are to be classified as hurricanes is critical since once such a definition is given to a storm it invokes all manner of complex emergency procedures which might otherwise not be commenced. Ships, aircraft, and various local governments located in the projected path of such a storm set into motion those predetermined measures which will offer maximum safety.

The problem is at what point to issue that most serious pronouncement, the one which says that a storm has become a hurricane. Many things are taken into account from a wide variety of sources. Some of the individual components of this barrage of data could include isolated or incomplete bits of information which, if taken alone, might seem to indicate that a hurricane exists—but when computer analyzed along with hundreds of other pieces of information would deny such a definition. Such isolated reports could include those caused by local weather conditions, by malfunctioning instruments, by misreading of instruments, data transmission problems, or any number of other factors.

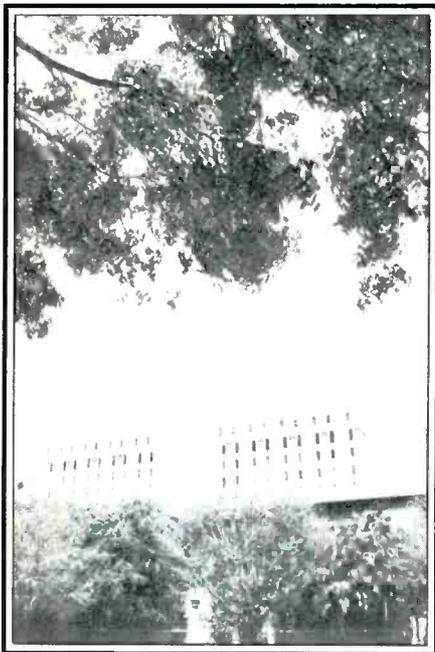
This is why NHC doesn't think it's a good idea for the public to monitor isolated bits of information being sent to their headquarters. They feel that such efforts on the part of the public could cause unqualified persons to use the unscreened, partial, or “raw” data to come to erroneous conclusions as to the status of the weather system before the NHC computer makes its decision based on *all* of the data being fed into it. It's a question of which is worse, erroneously deciding that a storm isn't a hurricane when, in actuality it is one—or vice versa!

NHC officials tell the story of a New Orleans TV station that was monitoring NOAA two-way communications with a hurricane hunter aircraft. Based upon something they overheard in those communications, the TV station's weather reporter announced that, even though the NHC had not made an official announcement as to a particular storm being upgraded to hurricane status, they had inside information that such an announcement would be made shortly. This caused considerable confusion as various emergency procedures began activating on the basis of the TV station's report. The NHC was, in fact, not getting ready to make such an announcement and never did upgrade the status of the tropical storm to that of a hurricane!

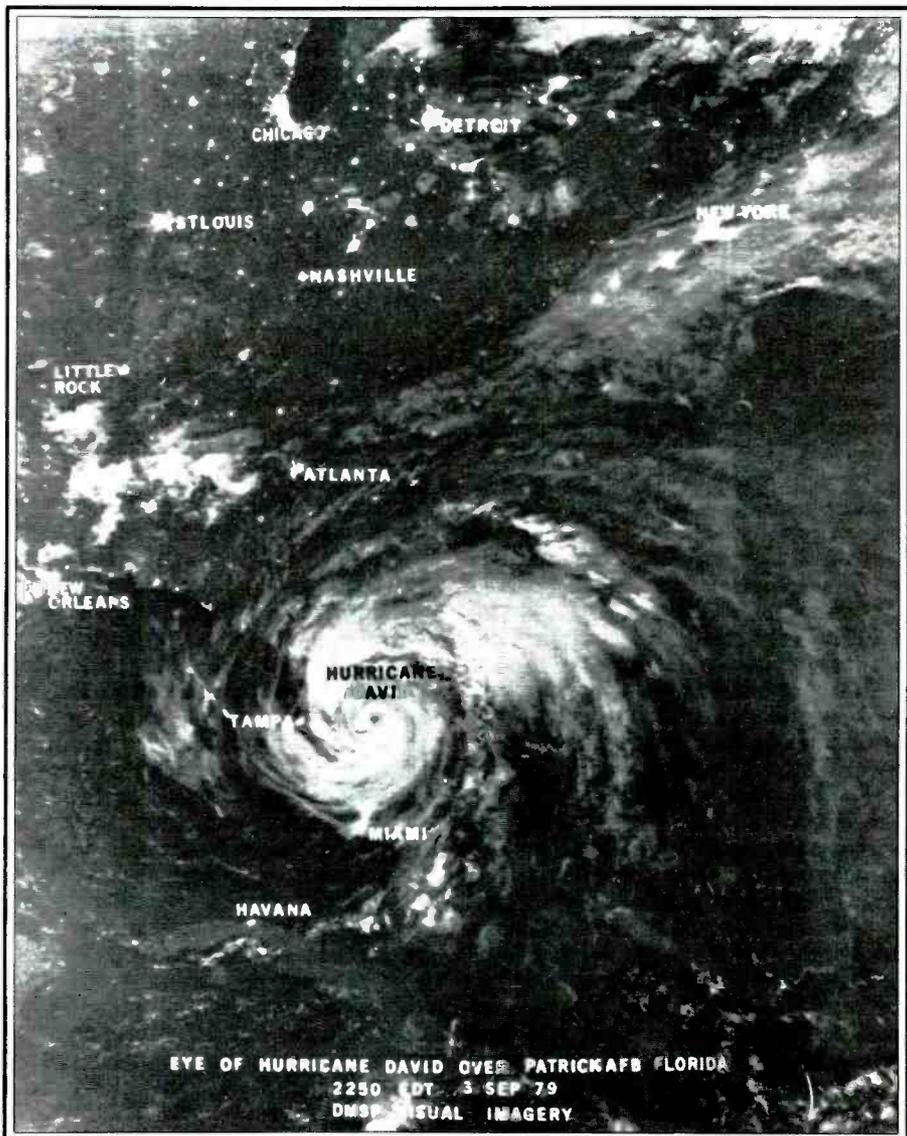
Of course, NHC's desires notwithstanding, monitors have long listened to these transmissions. Problems such as those which occurred at the New Orleans TV station have been extremely rare. The fact is that hurricane communications are exciting listening—just about as exciting as may be heard on any band! And the HF transmissions can be heard 'round the world. Those living along the Florida and Gulf of Mexico coastlines can also monitor the VHF and

The NHC feeds many hundreds of small scraps of data into its computer, and then decides if the information fits the requirements of a hurricane.

The National Hurricane Center is located in this building in Coral Gables, Florida.



Here's a satellite photo of Hurricane David (1979) as it moved up the East Coast of the U.S.



UHF transmissions of various information gathering and emergency systems operated in connection with the NHC.

One of the stations operated as a back-up by the NHC in the Miami area is KGD63, noted operating on 2777.5, 3364.5, 6977.5, and 9947.5 kHz. Additional information on KGD63 was given in the December '82 issue of *POP'COMM* (page 40).

The most frequently reported HF SSB station is KJY74, better known on the bands under its usual identification of "Miami Monitor." This station has been widely noted communicating with hurricane hunter aircraft on the following frequencies: 4669.5, 6646.5, 8963.5, 9021.5, 11397.5, 15015, 15048, and 17902.5 kHz. According to DX club publications and Perry Ferrell's *Confidential Frequency List*, other HF frequencies of NHC reported from time to time include: 4380.5, 4436, 6505.5, 6511, 8646, 8716, 8754, 8804, 13261.5, 17175, 17208.5, 17271.5, 22312.5, 22572.5, and 22703 kHz.

As for VHF/UHF operations, according to the latest edition of Tom Kneitel's "Top Secret" *Registry of U.S. Government Radio Frequencies*, the NHC utilizes the following frequencies: 122.925, 123.05, 162.075, 162.50, 165.435, 165.51, 166.075, 166.125, 169.025, and 304.8 MHz.

However, when monitoring any of these circuits, please keep in mind that just as one cannot decide what the completed building will look like by viewing the pile of individual bricks from which it is to be built, it is also impossible to draw any valid conclusions from isolated bits of data or speculative conversation you may overhear prior to official NHC announcements.



Although it's helpful to have a communications receiver for DXing, you can get surprisingly good results from just about any portable or home receiver which picks up the BCB.



Broadcast Band DX Techniques

Making The Most Of The 540 to 1600 kHz Band!

BY GERRY THOMAS

As Hurricane Frederic approached the Gulf Coast in the fall of 1979, residents in the path of the storm began their usual preparations—boarding windows, checking flashlights, stocking up on candles and canned goods, and installing fresh batteries in their radios. Before Frederic, few residents fully realized just how important a high quality AM radio could be in an emergency situation . . . by mid-evening *everyone* would know. As the winds reached 50 mph at 4:00 in the afternoon, those tuned to the local VHF National Weather Service station found themselves suddenly listening to only the manacng static generated by the approaching storm. KEC86 was the first station to fall victim to Frederic; others were soon to follow. The towers of WBSR-1450 kHz quickly collapsed under the power of the strengthening winds, then the cables feeding the transmitter of WCOA-1370 kHz snapped, leaving this Emergency Broadcast Station to operate on its low powered, back-up equipment. By 8:00 p.m., most of the city of Pensacola, Florida was without electricity *and* without a normally functioning radio station. Except for WCOA's emergency broadcasts, which were barely audible a few miles from its transmitter, most of the residents of this nor-

mally tranquil Gulf Coast town found themselves without local emergency and weather information.

Most residents, that is, except those who had AM radios capable of pulling the signals of distant stations out of the ever-increasing static. Those fortunate few were tuned primarily to WWL-870 kHz, New Orleans, a 50 kW "clear channel" station located 200 miles to the west. Throughout the night, WWL was literally a beacon in a stormy sea as it beamed its hurricane and emergency reports to the beleaguered citizens. Whether the broadcasts of WWL saved any lives isn't known, but the sound of a friendly voice reaching into the center of a swirling hell is a welcomed sound indeed.

Some weeks after Frederic, I learned that not only was WWL providing potentially life-saving information for the people caught in the midst of a hurricane's fury, but that listeners from as far away as Seattle, Washington were following the storm's progress on the New Orleans station. These individuals were not typical radio listeners, however, but rather members of a fraternity of radio devotees that is nearly as old as the medium itself. They are known as "broadcast band" (BCB) or "medium wave" DXers, a group of enthusiasts who specialize in listening to distant stations which broadcast on the standard AM, or medium wave, frequencies of 540 to 1600 kHz.

The Oldest Radio Listening Hobby

Back in the 1920's and 30's when commercial radio was just beginning and stations were few and far between, virtually everyone who owned a radio set was, by necessity, a "DXer." Stations like KDKA-Pittsburgh and WLW-Cincinnati sent their signals across America to families who had gathered closely around the set for an evening's entertainment. Today, with close to 5,000 stations licensed for operation on the AM band, it is no longer necessary to sit attentively in front of a radio listening to signals from hundreds of miles away. Unless, that is, you are one of the hundreds of BCB DXers who get that indescribable thrill associated with logging a small town station a thousand miles distant, or identifying a new Latin American station that has strangely appeared out of nowhere. Many DXers, too, use their radios and their knowledge to follow their favorite sports teams as they play in distant cities, or enjoy listening to the many late-night talk shows that fill the dial. Whatever the motivation, the BCB DXing hobby is alive and well after over 50 years and is manned by an enthusiastic army of followers who willingly share their time and know-how with all who show an interest. Because this is such a fascinating hobby (and because it can be quite useful in times of natural ca-



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BEARCAT® 300

List Price \$549.95

Scanner World Price \$335.99

50 Channel, 7 band, digital programmable, no crystal scanner, AM aircraft and public service band, AC/DC priority channel, search feature, plus more! Frequency range 32-50 FM, 117-136 AM, 144-174 FM, 421-512 MHz FM

BEARCAT® 151

List Price \$249.95

Scanner World Price \$154.99

10 Channel, 5 band, AC only, digital, programmable, no crystal base scanner. Frequency range: 30-50, 144-174, 440-512 MHz.

BEARCAT® 210XL

List Price \$349.95

Scanner World Price \$214.99

18 Channel, 6 Band, digital programmable, no crystal AC/DC scanner. Search feature, scan delay, lockout, plus much more! Frequency range: 32-50, 144-174, 421-512 MHz.

RCD LISTEN-IN

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Hand held, pocket sized, one channel portable professional FM Pager type receiver with 10 to 30 mile receiving range. Includes telescopic antenna, squelch & volume controls, and crystal. Uses standard 9 volt transistor battery (battery not included). Available in high, low, or UHF Band. Specify frequency needed when ordering. (Optional rubber antennas also available).

REGENCY® M-100

List Price \$319.95

Scanner World Price \$194.99

10 Channel, 5 band, digital programmable, no crystal, AC/DC scanner, mobile design, includes mobile mounting bracket. Priority, delay and much more. Optional mobile cord with cigarette lighter plug \$4.95 each. Frequency range: 30-50, 144-174, 440-512 MHz.

JIL SX-100

List Price \$269.99

Scanner World Price \$138.99

16 channel, 5 band, digital programmable, no crystal scanner. Frequency range 30-54 MHz, 140-174 MHz, 410-514 MHz. AC/DC for base or mobile use, fast-slow scan speed, variable scan delay, quartz digital clock, automatic search, dimensions 8 1/4" x 3 1/4" x 9 1/8" D. All of the above plus more for the low price of \$138.99.

JIL SX200 only \$269.99

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NOTICE

As new items become available in the future, we will add these to our monthly advertisements. If you would like information or prices on merchandise not released as yet by manufacturer, give us a call. For the past 15 years Scanner World has been the #1 Scanner Distributor with the largest on-hand inventory anywhere.

Super Special Package Sale!!

REGENCY H-604

Pocket Scanner

6 CHANNELS — 4 BANDS

VHF-Low 30 to 50 MHz
VHF-High 146 to 174 MHz
UHF 450 to 470 MHz
UHF-T 470 to 512 MHz
Small Size ... 3 3/4" W x 5 1/2" H x 1" D



Quality features included in the Regency H-604 are 6 channels - 4 band coverage, lockout switches, manual step switch, scanning speed of 15 channels per second, long lasting LED's, volume & squelch controls, AC adapter/charger jacks,

Scanner World's Special Package Deal Includes the Following:

- *Regency H-604 Pocket Scanner
- *MA 506 Carry Case
- *Set of 4 AAA Nickel Cadmium Batteries
- *6 Monitor Crystals (specify frequencies needed or we will include certificates for unknown frequencies)
- *Flexible Rubber Ducky Antenna
- *AC Adapter & Charger

Manufacturers Suggested List Price - \$245.55

Scanner World Package Price

\$109.99

WILSON WH-2510

List Price \$663.00

Scanner World Package Price \$479.99

CITI-COM Plus Transceiver, 2-way radio fully programmable in transmit or receive mode plus CTCSS, Private Line, Channel guard. No crystals to buy. 10 channels, high band (134 to 174 MHz) maximum frequency spread 6 MHz, transmit output 25 watts, priority, 10 channel scan, plus more. Comes with mobile microphone, mobile mounting bracket, mobile antenna, easy programming instructions, and cable assemblies for hookup. (UHF model available package price \$569.99)

BEARCAT® 100

List Price \$449.95

Scanner World Price \$279.99

Handheld digital programmable, no crystal portable scanner. 16 channels, search feature plus more! Frequency range: 30-50, 138-174, 406-512 MHz FM. Included in the package is a flexible rubber antenna, earphone, battery charger/AC adapter, 6 AA Ni-Cad rechargeable batteries and a heavy duty carry case. All for the low price of \$279.99.

FANON FCT-200

List Price \$249.95

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Cordless Telephone with 700 foot range.

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Whistler Remote Spectrum*	214.99
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Whistler Q1000*	169.99
Whistler Q1200*	116.99
Fox XK	84.99
Fox XK Remote	99.99
Superfox Vixen*	139.99
Superfox Remote*	189.99
Fox Super-Trucker*	229.99
Fox XKMR (Motorcycle)	119.99
Regency RS1	94.99
Regency RS2*	142.99
Regency RS3 Remote*	173.99

Above units marked with * are superheterodyne type

BEARCAT® 20/20 40 Channel Digital Scanner.....	275.99
BEARCAT® 200 16 Channel Digital Scanner.....	174.99
BEARCAT® 5 HLU AC Crystal Scanner.....	88.99
BEARCAT® Weather Alert BC-WA.....	39.99

BEARCAT 160

16 CHANNEL BASE SCANNER

(Looks the Same as BC150)

SPECIAL — \$159.99

REGENCY R1040 AC 10 Channel Programmable Base Scanner.....	128.99
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REGENCY E106 AC/DC 10 Channel HLU Crystal.....	114.99
REGENCY R106 AC/DC 10 Channel HLU Crystal.....	96.99
REGENCY D810 AC 50 Channel HLU and Air Digital.....	249.99
REGENCY D300 AC/DC 30 Channel HLU Digital.....	179.99
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FANON CAT-6 Carrying Case with Belt Clip.....	11.99
FANON AUC-3 Autolighter Adapter/Charger.....	12.99
FANON SCMA-6 Mobile Adapter/Charger/Amplifier for Slim Line 6 HLU.....	39.99
FANON PSK-6 Base Power Supply for SCMA-6.....	14.99
FBE Frequency Directory Eastern USA.....	10.99
FBW Frequency Directory Western USA.....	10.99
B-4 Set of 4 Triple AA Ni-Cad Batteries.....	8.99
B-6 Set of 4 Double AA Ni-Cad Batteries.....	7.99
A-20 Replacement Telescopic Antenna for Bearcat® Base Scanner.....	4.95

All Band Monitor Antennas

For added receiver gain, includes cable and connectors for scanning monitors.

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Trunk Mount Mobile Antenna.....	27.99
Mirror or Light Bar Mount Mobile Antenna.....	25.99
Gutter Clip Mobile Antenna.....	25.99
Hole Mount Mobile Antenna.....	22.99
Base Antenna with 50' Cable & Connectors.....	29.99

For Shipping, please add \$2.50 per antenna in Continental USA

Monitor Crystals—\$2.95 each

We stock thousands of crystals for all brands of scanners. Order by frequency number and brand of scanner. If crystal is out of stock, we will supply crystal certificate for prepaid delivery direct to you.

CIRCLE 44 ON READER SERVICE CARD



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Call (518) 436-9606 to place orders by phone or mail orders to **Scanner World**, 10 New Scotland Ave., Albany, NY 12208. Orders will be shipped same day received by United Parcel Service. **Scanner World** accepts VISA, MasterCard. C.O.D. shipments by United Parcel will be for cash or certified checks only. Mail orders with personal or business checks will be held 3 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All Shipments are F.O.B. **Scanner World** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase Orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax.

Shipping Charges

Add \$3.00 per scanner, \$2.50 per antenna and \$2.50 for all accessories ordered at same time. (Example: 1 scanner and 1 antenna has total shipping charge of \$5.50.) C.O.D. shipments will be charged an additional \$2.50 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, please ask for special shipping quote.

tastrophes!), you might be interested in a quick overview of some of the basic aspects of BCB DXing.

Getting Started

One of the appealing things about BCB DXing is the fact that you probably already own the only truly essential piece of equipment needed to get a taste of the hobby—a standard AM radio. Spend an evening tuning up and down the dial the next chance you get and see how many out of town stations you can hear. Stay with a few stations when they identify themselves at the top of the hour, and if you feel a little tickle of excitement when you hear “This is KDKA, Pittsburgh” or “You are tuned to Trans World Radio, broadcasting on 800 kHz from the island of Bonaire in the Netherlands Antilles,” you are a budding BCB DXer.

One item that will definitely make your life as a DXer more enjoyable is an up-to-date list of the stations that are currently operating in the United States and Canada. Table 1 contains a list of some of the more powerful U.S. stations that are heard in different parts of America and can serve as a starting point for your nighttime listening. This list, however, is doomed to rather rapid obsolescence because the Federal Communications Commission recently agreed to allow additional stations on the air on some of these previously protected “clear” channels. For this reason, new stations are appearing nearly every day and an up-to-the-minute log is a must if you become serious about the hobby. Perhaps the best reference in this regard is the *NRC Domestic Log*, published by the National Radio Club (an organization devoted exclusively to BCB DXing and which, incidentally, recently celebrated its 50th anniversary). This excellent publication is available from the publications center at P.O. Box 164, Mannsville, NY 13661. The *World Radio and Television Handbook* published by Billboard Publications contains AM, FM, and SW stations from around the world (but omits some of the lesser powered U.S. stations) and is available through POP/COMM.

Another reference work that can be quite useful when you are DXing is the *IRCA Almanac* published by the International Radio Club of America (another group of DXers who specialize in BCB DX). This handy book contains news, talk show, and sports networks’ affiliates, station slogans, articles on the hobby, and additional information useful to the BCB DXer. It can be ordered from the IRCA Goodie Factory, P.O. Box 17088, Seattle, WA 98107. Check with them on price and availability.

After you’ve spent some time exploring the AM band, the thought might cross your mind that perhaps the radio you’ve been using isn’t the best possible one for the job. There’s a good chance that you’re right. Unfortunately, many AM/FM radio manufacturers are placing primary emphasis these days on the FM sections of radios, adding a minimal AM section almost as an afterthought. Luckily, though, there are some very good, relatively inexpensive portables

KIRO

SEATTLE, WASHINGTON, U.S.A.

710 Kilohertz
(422.3 Meters)

50,000 Watts

This is a verification of the reception of

KIRO by _____ at _____

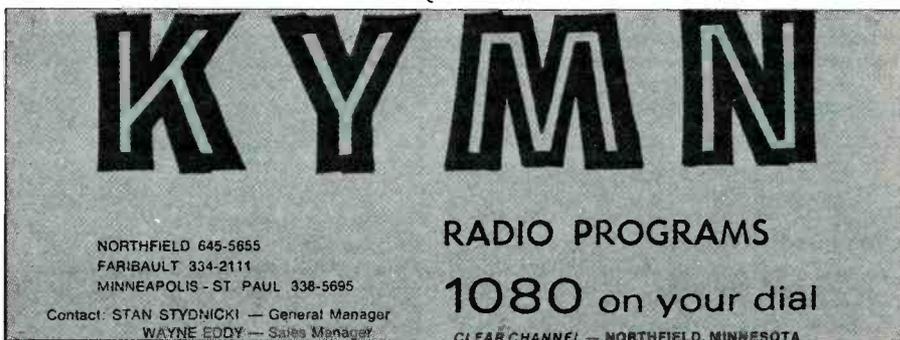
Date _____ Time _____

Signed _____

KIRO Newsradio 7

Affiliated with NBC & MBS

Many broadcast band (BCB) stations appreciate reports from listeners and respond to them with QSL cards.



While not actually a QSL card, this card from KYMN is a worthwhile souvenir for a hobbyist.

available that will enable you to hear hundreds of distant stations. Remember, though, it is definitely possible to begin BCB DXing with whatever radio you already own! Keep in mind that it is often possible for those who are technically minded to improve the performance of a radio with a few simple adjustments or modifications. If this is something you are interested in, the *IRCA Technical Manual* can be of immense help with its receiver modification details, antenna plans, as well as receiver reviews. It, too, is available from the IRCA Goodie Factory.

A Few Listening Tips

The best time to start listening for distant stations on the AM band is during the evening hours when the ionosphere is in a state which allows the reflection, or “skip,” of a station’s signal. Tuning the band during this time should result in your hearing several of the stations listed in Table 1. Concentrate on those stations closest to you and don’t expect to hear everything that is listed in the table.

Another excellent time to try to hear new stations, if only for a few minutes, is during sunrise and sunset. Many unusual stations are heard during these periods of ionospheric transition, especially those that are licensed to operate only during the daylight hours and are just beginning or ending their broadcast day.

As you are tuning the band, you might

hear high-pitched whistles between, or along with, the U.S. domestic stations. This will be especially likely to occur if you live within a few hundred miles of a coastline. Although these whistles could be caused by a fault in the radio itself, chances are they are the result of foreign stations operating on “split” frequencies and interacting with the domestic stations to produce a whistle or “heterodyne,” as it is called. Whereas most of North and Central America operates on frequencies that are multiples of 10 kHz (e.g., 540 kHz, 1060 kHz, etc.), some foreign countries maintain stations that are separated by 9 kHz (e.g., those in Europe, Asia, Africa, etc.) while others fall between the American domestic stations by 4 or 5 kHz. “Wait a minute!”, I can hear you saying to yourself, “This guy isn’t going to try to tell me that it’s possible to hear stations from Europe and Asia on my AM radio, is he?” Well, yes I am. When conditions are right, and if you know when and where to listen, it is possible to hear stations from Europe and Africa from the East Coast of North America, and parts of Asia and Australia from the West Coast. But this is really the domain of the dedicated BCB DXer and beyond the intent of this introductory article.

Logging transoceanic signals on the medium wave frequencies is restricted to certain times of the year and does require a certain amount of expertise, but as you are tuning the band you are likely to hear a number

THE INTERNATIONAL RADIO CLUB OF AMERICA

CLUB ADDRESSES
 Membership Dues, Address Changes, and Renewals
 P.O. Box 26254, San Francisco, CA 94126
 Bulletin Material, Sample Requests
 P.O. Box 21074, Seattle, WA 98111
 The IRCA Goodie Factory (Publications and Reprints)
 P.O. Box 17088, Seattle, WA 98107

MEMBERSHIP DUES
 \$16.50 First Class to the U.S.A., Canada, and Mexico. \$8.00 for trial membership (10 issues of DX Monitor and a New Member Packet) to the U.S.A., Canada, and Mexico. \$18.00 Surface Mail to the rest of the world. \$27.00 airmail to Central America, Colombia, Venezuela, and the Caribbean. \$30.00 to the rest of Latin America, Western Europe, North Africa, and the Middle East. \$34.00 to the rest of the world. Sample copies of DX Monitor cost 50 cents each or three International Reply Coupons. Make checks and money orders payable to IRCA. Persons living outside the U.S. should make dues payments by check or money order payable in U.S. funds.

The International Radio Club of America is a non-profit organization devoted to the hobby of hearing distant stations on the AM Broadcast Band (Medium Wave). IRCA is a member of ANARC, the Association of North American Radio Clubs.

Club Officers: President—Don Kaskey, 465 Burnett, Apt. 1, San Francisco, CA 94131. Secretary—Treasurer—Rick Segalas, Board of Directors—Phil Bytheway, Nick Hall-Patch, Ric Hsieh, Ernest Cooper, Jeff Jenson, Bruce Portzer, Nial Wolfish.

DX MONITOR, the official bulletin of the IRCA, is published 34 times per year, weekly from October to March, twice in September and April, and monthly from May to August. Unless otherwise noted, permission is granted to publish, broadcast, or otherwise reproduce any material appearing in DX Monitor. Reprints are available to IRCA and the original contributor. Opinions expressed in DX Monitor are those of the original contributors and do not necessarily reflect those of the IRCA. Its publishing staff, editors, or officers.

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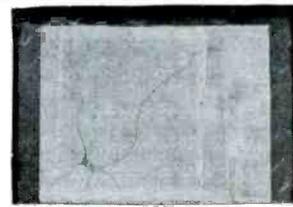
Perhaps the most valuable tip I can pass along to any fledgling BCB DXer, though, is to get in touch with one or both of the radio clubs that specialize in the hobby. The information they can provide is invaluable and, since both major clubs are strictly non-profit, solely volunteer organizations, the cost of their help is negligible. Both the International Radio Club of America (membership information: P.O. Box 21074, Seattle, WA 98111) and the National Radio Club (membership information: P.O. Box 118, Poquonock, CT 06064) publish over 30 issues a year of their club magazines which contain the latest in BCB DX information. A dollar to either club will bring a sample bulletin.

There are many other aspects to the hobby of BCB DXing which I haven't described but which provide hours of pleasure for the DXer. For example, like their shortwave counterparts, many BCB DXers collect QSLs, those cards or letters from radio stations which confirm a DXer's reception of the station. Others enjoy arranging and listening for the special DX tests that stations conduct for the benefit of the clubs (many of the chief engineers of stations are DXers themselves). Still others just enjoy tuning to a distant station, sitting back, and listening to programming that isn't available on their local stations. And, of course, the knowledge and equipment associated with the hobby can come in very handy when a hurricane is bearing down on you with its 150 mph winds and the last of your local stations has just disappeared. Best of DX.

The International Radio Club of America (IRCA) is one of several excellent clubs covering BCB reception.

of stations from the countries of Latin America. These are usually in Spanish (and a disproportionate number of them originate from Cuba), but others broadcast in English (e.g., Radio Belize-834 kHz, Cayman Islands-1555 kHz, and the Bahamas-1540 kHz, to name a few). Table 2 contains a very abbreviated list of some of the stronger Latin American and Caribbean stations presently being heard in the U.S. and can serve as an initial guide to DXing this part of the world.

Of course, you stand a better chance of hearing these if you live in the eastern part of the country, but most of them have been logged at one time or another by DXers throughout North America. A comprehensive compilation of the foreign stations (Europe, Africa, Asia, Australia, and Latin America) that have been heard in the U.S. in recent years is available in the form of the IRCA Foreign Log which is obtainable also from the Goodie Factory.

 <p>COMBAT "C" RATIONS Assorted meals including such favorites as beef slices and beans with frankfurter chunks. PC5-1007 Case of 12 meals \$58.75 PC5-1008 Individual Packets (our choice) \$5.95</p>	<p>ORDER TOLL FREE! 800-626-6171 KENTUCKY CUSTOMERS & CUSTOMER SERVICE CALL 502-351-1164 NO C.O.D.'S</p> <p>U.S. CAVALRY STORE INC. 1375 North Wilson Road Radcliff, KY 40160 SEND \$3.00 FOR A FULL COLOR, 100 PAGE CATALOG. FREE WITH YOUR ORDER! SHIPPING CHARGE \$3.75 FOR ANY SIZE ORDER.</p> <p>EASY TALK TRANSCIEVERS Lightweight voice activated/push-to-talk personal radio communicators. The PRC-1 is a waist pack with an attached headset. The PRC-2 is completely housed in the headset. Service area is 1/4 mile or approximately 400 meters. Uses 9 volt alkaline battery. Ideal for security, drug monitoring, surveying, coaching, hunting and all outdoor activities. Weighs only 9 oz. PC5-1324 PRC-1 \$59.95 PC5-1325 PRC-2 \$59.95</p> 	 <p>VIETNAM STYLE WATCH Olive drab plastic case and nylon watchband. Water resistant to 80 feet. 24 hour dial. TIMEX. One year factory warranty. PC5-1224 \$17.95</p>
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<p>JERRICAN POCKET LIGHTER Olive drab solid die cast metal model of the Jerrican. Standard pocket size. PC7-1399 \$7.50</p> 	<p>CAMOUFLAGE KNIFE SCABBARD Woodland camouflage printed on nylon webbing; Velcro flap. Holds one pocket knife. PC7-1248 \$4.95</p> 	<p>FIELD MAP CASE Clear acetate with full length zipper. Olive drab webbing. 24x34". PC7-1142 \$11.95</p> 
<p>DOG TAG KEY RING We emboss the information you specify on an official stainless military dog tag. If official tag desired, please supply exact information requested for the dog tag set or give us your own wording. PC1-1154 \$4.49</p> 		

CIRCLE 28 ON READER SERVICE CARD



Radio Inventors Stamps Issued

The U.S. Postal Service unveiled the design of the block of four 20-cent stamps honoring American inventors Charles Steinmetz, Edwin Armstrong, Nikola Tesla, and Philo T. Farnsworth.

The unveiling ceremony took place during an evening banquet on June 9, 1983 at the Brown Palace Hotel in Denver, celebrating the United States Activities Board Decennium. This event recognized the 10th anniversary of the professional activities of The Institute of Electrical and Electronics Engineers (IEEE). Walter T. Marable, Executive Director of the Research and Development Laboratories of the U.S. Postal Service, unveiled the design.

The IEEE will celebrate its centennial in 1984, having been established by the merger of the American Institute of Electrical Engineers (AIEE) and the Institute of Radio Engineers (IRE).

Charles Steinmetz served as President of the AIEE from 1901 to 1902, and, along with Nikola Tesla, appears in a mural at the Washington, D.C. office of the IEEE, which features 12 leading figures in the development of electrosience and technology.

The block of four American Inventors commemorative stamps were issued on September 21, at the U.S. Patent and Trademark Office in Arlington, Virginia. This office houses the National Inventors

Hall of Fame, which was initiated in 1973 with the induction of Thomas Edison. Three of the men depicted on the block of four American Inventors stamps have been inducted into the Inventors Hall of Fame—Tesla (1975), Steinmetz (1977), and Armstrong (1980).

Charles Proteus Steinmetz was born in Breslau, Germany, on April 9, 1865, and emigrated to America in 1889, finally settling in Schenectady, New York, in 1893. He pioneered research on the theories of alternating current and high-voltage power.

Edwin Howard Armstrong was born in New York City on December 18, 1890. His many inventions as an electrical engineer were so important that even today every radio and television makes use of one or more of his developments. His crowning achievement was the invention of wide-band frequency modulation in 1933, now commonly known as FM radio.

Nikola Tesla was born in 1857, at Smiljan Lika, Croatia (Austria-Hungary), and came to the United States in 1884. Of his more than 700 inventions, the most noteworthy was the induction motor.

Philo Taylor Farnsworth was born in Beaver, Utah, on August 19, 1906. With more than 300 inventions in television and related fields to his credit, he is most famous for the first all-electronic television transmission

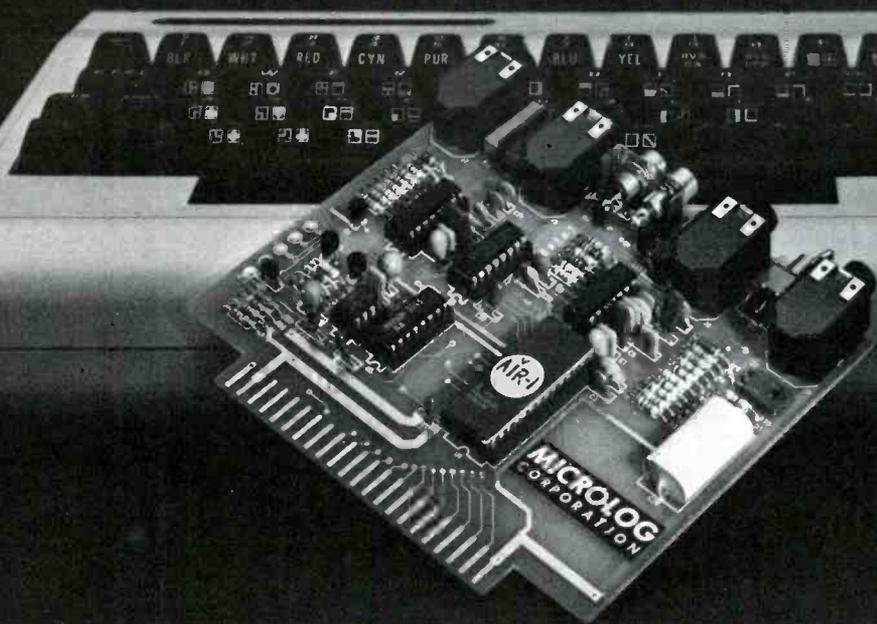
which was made in San Francisco, California, on September 7, 1927.

The horizontally oriented block of four stamps was designed by Dennis Lyall of Norwalk, Connecticut, who also designed the Joseph Priestley stamp issued this past April, and the Thomas H. Gallaudet stamp in the Great Americans Series to be issued June 10.

Each of the American Inventors stamps features a drawing of one of the inventors and a representation of one of his significant inventions or theories. To the right of the portrait on one of the upper two stamps in the block of four is depicted a graph with the words "Electrical Theories" above and "Charles Steinmetz" below. A frequency modulator with the words "Frequency Modulation" above and "Edwin Armstrong" below appears to the right of the portrait on the other upper stamp.

One of the two lower stamps depicts to the left of the portrait an induction motor with the words "Induction Motor" above and "Nikola Tesla" below, and the first television camera with the words "First Television Camera" above and "Philo T. Farnsworth" below is depicted to the left of the portrait on the other lower stamp. "USA" appears in the upper corner and "20c" in the lower corner of each stamp on the same side as the portrait.

Connect your computer to the air!



MICROLOG
AIR-1

The "AIRWAVES" that is, they're literally crackling with interesting things to listen to. Did you know that you can get local and overseas news a day ahead of your daily paper's publication? Weather stations, news services, ships and "HAM" radio operators all use the SHORT-WAVE radio bands daily for radio-teleprinter and Morse code communication. The Microlog AIR-1 plugs into your computer just like a "game cartridge." The single board AIR-1 contains both program in ROM AND radio interface circuit. All you need is a typical short-wave receiver, with CW capability (BFO). Connect your radio speaker and off you go . . . tuning in the world of digital communications. Instead of "COSMIC BLIVETTES" on your video screen, you'll be watching text readout from all sorts of stations around the world . . . free for the listening . . . a whole new use for your home computer . . . SHORT-WAVE DXing on RTTY and Morse. The manual lists some suggested times and frequencies, and your standard printer can provide a permanent record of copy. The AIR-1 will even tell you what Morse speed

you're copying and provide built-in send/receive code practice! For HAM radio use the AIR-1 will also send and receive RTTY/CW with AFSK/PTT and CW keying outputs. Convenient plug-in jacks make connection to your radio a snap. "On-Screen" tuning indicator and versatile program make it easy to use. The simple, one board design makes it inexpensive. And Microlog know how makes it best! If you've been looking for something to spice-up your computing, try the ultimate "peripheral" and connect your computer to the AIR-1.

The complete AIR-1 for the VIC-20 is \$199. ("64" soon) See it at your local dealer or call Microlog Corporation, 18713 Mooney Drive, Gaithersburg, Maryland 20879. TEL (301) 258-8400. TELEX 908153.

Note: VIC-20 is a trademark of Commodore Electronics, Ltd.

MICROLOG
INNOVATORS IN DIGITAL COMMUNICATION



What used to be hidden has now been revealed, thanks to newly designed scanners, such as this Bearcat 260, which covers the "forbidden band."

POP'COMM Scans: The Forbidden Band

**Monitor The U.S. State Department,
The U.S. Department Of Labor, And More!**

BY RICK MASLAU, KNY2GL

There's been considerable interest in what's going on in that most mysterious of scanner bands, 406 to 410 MHz. For a long time, you just couldn't seem to find a scanner that would operate there although, from a technical standpoint, there was no reason whatsoever why scanners couldn't be offered to cover these frequencies (which are reserved for use by federal agencies). Yes, some scanners did start their coverage of UHF federal frequencies at 410 MHz, but for some indefinite reason it wasn't easy to hear what was happening in the "forbidden band." Some said that the government either asked or demanded that scanner manufacturers avoid including these frequencies in their equipment; others said that the frequencies weren't included because it was decided that there wasn't sufficient activity there to bother with. Well, for whatever reason(s), monitoring the *forbidden band* meant innovation by those who wished to listen there. It can be done! It has been done! We now note that

some of the newer breed of Bearcat and Regency scanners actually include these frequencies! We thought it might be of interest to pass along some information on some of the agencies that operate in the forbidden band.

One agency, for instance, is the United States State Department. During the recent visit of the Queen of England and her party to the United States, west coast monitors reported considerable activity on State Department UHF frequencies. The fact is that the State Department has a number of security functions and their Bureau of Intelligence and research is a full member of the so-called "intelligence community." This Bureau coordinates programs of intelligence, research, and analysis for the State Department and "other agencies" (in their own words), and produces intelligence studies and current intelligence analyses essential to foreign policy determination and execution. According to an official govern-

ment description of this Bureau, "it maintains liaison with cultural and educational institutions and other Federal agencies on a wide range of matters relating to contractual and private foreign affairs research." You can read into that whatever you wish. In addition to some scanner frequency operations in the VHF bands, the State Department has a number of UHF *forbidden band* channels.

Another agency which uses forbidden band frequencies is the United States Department of Labor. This agency has a wide range of functions, including (to name but a few) promoting and developing the welfare of workers, administering more than 130 Federal labor laws, protecting workers' rights, and other similar tasks. The Department of Labor has an Office of The Inspector General, which is responsible for "providing comprehensive, independent, and objective audit, loss analysis and prevention and investigations programs to identify and report program deficiencies and improve the economy, efficiency, and effectiveness of operations." The OIG is also responsible for insuring employee and program integrity through prevention and detection of criminal activity, unethical conduct, and program fraud and abuse. The OIG, in fact, is an integral part of the Department of Justice Organized Crime Strike Force Program; in my local 'phone directory, the Organized Crime Strike Force is listed under the Department of Labor rather than the Department of Justice.

Listed here are some of the various "forbidden band" channels thought to be in use by these two particular agencies, along with their channels in other scanner bands.

Other agencies operating in the 406 to 410 MHz "forbidden band" include the Federal Aviation Administration, all military services, Bureau of Alcohol/Tobacco/Firearms, Postal Service, NASA, Border Patrol, GSA, the FBI, and others. The new 5th Edition of Tom Kneitel's "Top Secret" Registry of U.S. Government Radio Frequencies has a wealth of listings relating to federal communications systems in this band. If you're not yet scanning these frequencies, you're missing a lot.

As mentioned previously, new scanners cover this band (along with the regular public service bands). You can use a standard coverage scanner to tune in if you add a frequency converter designed for these frequencies; one is offered by Hamtronics, 65 Moul Rd., Hilton, NY 14468. It's also possible to purchase a standard scanner which has been retuned to cover these frequencies. Yet another approach is to use the frequency expansion techniques that have been developed which permit certain scanners to be programmed for operation beyond their normal design parameters. One company offering information on accomplishing this is Digicom, P.O. Box 1175, New York, NY 10009.

Aren't you curious about what's taking place in the "forbidden band"?



Hamtronics produces a line of converters which can be used with standard band scanners to receive this band.

Department Of State

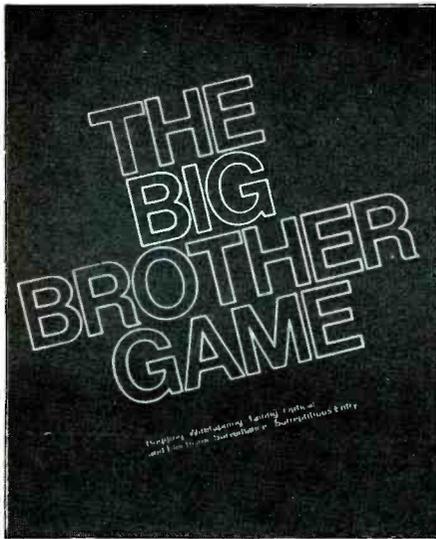
CA	Los Angeles	169.80	NY	New York	165.6125, 166.10, 170.575,
	Mt. Lukens	407.20, 409.625		Whiteface Mtn.	407.20, 408.10, 409.625, 409.70
	San Bernardino Mtn.	407.20, 409.625	PA	Philadelphia	407.20, 409.625
	San Francisco	407.20, 409.625	TN	Oak Ridge	41.61, 46.97
DC	Washington	166.6125, 168.225, 169.625,	TX	Dallas	407.20, 409.625
		169.80, 170.45, 407.20, 408.10,	US	all areas	32.25, 169.615, 169.625,
		409.165, 409.625, 409.70			407.20, 407.60, 408.10, 408.60,
FL	Miami	407.20, 409.625			409.625, 409.70
IL	Chicago	170.45, 407.20, 409.625	VA	Arlington	168.225
MA	Boston	407.20, 411.15		Tysons Corners	41.61, 408.10, 409.70

Department Of Labor

AZ	Phoenix	164.70, 406.20	MS	Crystal Springs	164.175
CA	Long Beach	406.20	MO	Kansas City	406.20
	Los Angeles	172.30, 406.20		St. Louis	406.20
	Sacramento	172.30	NV	Las Vegas	406.20
	San Bernardino	172.30		Reno	162.025, 162.6125
	San Diego	407.175, 408.025	NM	Albuquerque	408.025
	San Jose	408.025	NY	Buffalo	406.20
CO	Denver	406.20		Calicoon	406.225
DC	Washington	162.90, 163.75, 409.125		Cassadaga	408.025
FL	Gainesville	166.20		Liberty	409.025
	Jacksonville	406.20, 408.025		New York City	406.20
	Miami	406.20	NC	Kittrell	164.70
	Tampa	406.20	OH	Cincinnati	173.6125
GA	Atlanta	406.20		Cleveland	406.20
	Brunswick	408.025	OR	Astoria	162.225
IL	Chicago	406.20	PA	Philadelphia	406.20
	Wilmington	409.025	PR	San Juan	406.20
IN	Edinburg	409.025	TN	Knoxville	164.70
KY	Morganfield	162.225, 164.175, 164.70	TX	Dallas	406.20
LA	New Orleans	406.20		McKinney	163.00
	Shreveport	408.025, 413.025		San Marcos	164.70
MD	Baltimore	163.75	US	all areas	406.20
	Port Deposit	163.75	UT	Clearfield	164.70
MA	Boston	406.20	WA	Seattle	406.20
MI	Detroit	406.20, 408.025	WV	Triadelphia	168.35

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



The Big Brother Game

Playboy magazine's reviewer called *The Big Brother Game*, by Scott French, "A virtual encyclopedia on surveillance. Everything you've always wanted to know about spying . . ." They were talking about French's 237 page consumer guide to bugging, wiretapping, tailing, optical and electronic surveillance, and *black bag* jobs as practiced by professionals, amateurs, and even the government.

Whether you want to stop it, do it back, or simply understand the imaginative techniques involved, this large (8½ by 11 inch) book of do-it-yourself espionage shows you (in detail) just how it's done. Hundreds of photos, charts, graphs, diagrams, and schematics, illustrations, and simple instructions spell it out very clearly.

A partial listing of the contents of this unusual book: description/installation of bugging microphones/amplifiers and frequency equalizers; wireless surveillance techniques/equipment; receivers/transmitters; bug search/detection/countermeasure techniques/equipment; wiretap detection/scrambling and jamming; names/addresses of electronic surveillance equipment companies and also about 50 schematics of useful electronic surveillance equipment ranging from infinity transmitters to ultrasonic jammers and the exotic laser devices. Other topics explained include lockpicking, weaponry, optics, physical attack/defense, corporate espionage and lie detection, general detective techniques, getting into files, credit investigations.

The Big Brother Game is now available at \$13.95 plus \$1 shipping and handling (4th Class Book Rate mail). If First Class Mailing is desired, send \$13.95 plus \$3 for shipping

and handling to any address in USA/Canada/APO/FPO. Orders in other areas send \$13.95 for the book and \$4 shipping/handling. Order from CRB Research, P.O. Box 56, Commack, NY 11725.

RT-1100 New Product Release

DGM Electronics has just introduced the RT-1100 Receive Terminal for Baudot, ASCII, and Morse. The RT-1100 converts the audio from your receiver, decodes it, and displays the words on a video monitor



or TV set (using RF modulator). The RT-1100 incorporates an active filter demodulator with scope tuning outputs. It will copy 170, 425, 850 Hz shift RTTY signals at speeds of 60, 66, 75, 100 wpm on Baudot and 110 baud on ASCII. The unit will copy 6-60 wpm Morse signals using automatic or manual speed tracking. The RT-1100 has a parallel ASCII Printer output for hard copy. The video output provides 16 lines of 32 characters per line with 2 pages. The second page is stored in memory and can be recalled by using the page 1-2 switch on the front panel. The unit has a built-in 110 VAC power supply and is housed in an attractive 3" x 10" x 10" case with brushed, anodized front and rear panels. The cover is a grey wrinkle finish. The unit comes with a one year warranty on parts and labor.

For more information, contact DGM Electronics, Inc., 787 Briar Lane, Beloit, WI 53511.

Regency Introduces Radar Detector

Regency Electronics, Inc., announced the introduction of the RS Two, the company's first radar detector.

The RS Two is a superheterodyne dual band XK radar detector that operates on both the new moving and hand-held "gun" radar systems. Two self-contained specially tuned die-cast horn antennas are employed to receive the radar signals. The unit has a three selection warning mode system for lamp, buzzer, or both.



Other features include sensitivity control to adjust range for highway or city driving, a compact, non-glare case, and mounting hardware for dashboard, windshield, or sunvisor mounting.

Suggested retail price has been set at \$199.95. Additional information can be obtained from Regency Electronics, 7707 Records St., Indianapolis, IN 46226, or circle 111 on the reader service card.



Portable Telephone Scrambler

The new Viking International TS 102 portable telephone scrambler makes communication between a pair or more of users completely private.

In use, the regular telephone's handset is placed into the TS 102, the user speaks into the handset attached to the TS 102. The two-way conversation is now completely scrambled in both directions. Any unauthorized listener will hear only gibberish.

The TS 102 has a choice of 25 codes, is easily portable (fits in a briefcase), and is powered by a standard 9V transistor battery.

A new adjustable acoustic coupler accepts every known telephone handset.

Dimensions: 3½" x 4½" x 11"

Weight: 4 lbs.

Price: \$910 Pair

For more information, contact Viking International, P.O. Box 632, Newhall, CA 91322, or circle number 12 on the reader service card.

Give the gift of music.



SPECIAL HOLIDAY DISCOUNT

\$4.99 EACH INCLUDES POSTAGE & HANDLING

BUY 2 GET 1 FREE
ONLY \$9.98 FOR ANY THREE!

CBS RECORDS SPECIAL PRODUCTS PRESENTS...
THE WORLD'S GREATEST CHRISTMAS CAROLS & SONGS IN THEIR MOST MEMORABLE PERFORMANCES
ON 6 DAZZLING NEW ALBUMS (8-Tracks or Cassettes, if you prefer)

FROM FROSTY THE SNOWMAN TO BARBRA STREISAND Choose from this array of beautiful Christmas music to brighten your holiday celebrations—this year, and for year after year to come.

Check the lists of songs, singers and orchestras. Here truly is the variety and quality to satisfy every holiday mood and occasion—from the quiet beauty of silent nights...to the ting-a-ling of jingle bells...to the moving reverence of *Ave Maria* (performed here by Barbra Streisand in a way that makes this one song worth the price of the whole album).

GIVE THE GIFT OF CHRISTMAS MUSIC! Who on your gift list wouldn't love to receive one or more of these albums as a gift

from you? What an easy way to send your greetings to friends and neighbors...to "service" people...to anyone deserving of a "thank you and season's greetings."

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!



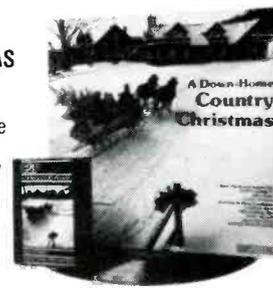
IT'S CHRISTMAS TIME! Andy Williams / The First Noel • Julie Andrews / It Came Upon The Midnight Clear • Brothers Four / God Rest Ye Merry Gentlemen • Barbra Streisand / Ave Maria • Mitch Miller / We Three Kings Of Orient Are • Anita Bryant / O Come All Ye Faithful • Johnny Mathis / What Child Is This • Patti Page / Santo Natale • Anthony Newley / Coventry Carol • Ray Coniff & 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 Coniff 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 Coniff / Go Tell It On A Mountain • John Davidson / What Child Is This • New York Philharmonic / The Twelve Days Of Christmas

A DOWN-HOME COUNTRY CHRISTMAS Ray Price / Jingle Bells • Johnny Cash / The Spirit of Christmas • Jim Nabors / O Come All Ye Faithful • Jimmy Dean / Have Yourself A Merry Little Christmas • Lynn Anderson / Soon It Will Be Christmas Day • Marty Robbins / Hark! The Herald Angels Sing • Tanya Tucker / Silver Bells • Charlie Rich / God Rest Ye Merry Gentlemen • Jody Miller / What Child Is This • Chuck Wagon Gang / Joy To The World



HAVE YOURSELF A MERRY LITTLE CHRISTMAS! Johnny Mathis / Winter Wonderland • Doris Day / Have Yourself A Merry Little Christmas • Carol Burnett / The Christmas Song • Jim Nabors / Christmas Eve In My Home Town • Andre Kostelanetz / We Wish You A Merry Christmas • Bing Crosby / The White World Of Winter • Patti Page / Jingle Bells • Robert Goulet / Let It Snow! Let It Snow! Let It Snow! • Julie Andrews / Amid The Bleak Midwinter • Tony Bennett / Santa Claus Is Comin' To Town

WE WISH YOU A COUNTRY CHRISTMAS! Tammy Wynette / White Christmas • Jim Nabors / O Holy Night • Lynn Anderson / Frosty The Snowman • Carl Smith / Silent Night, Holy Night • Jimmy Dean / It Came Upon A Midnight Clear • Tammy Wynette / Away In A Manger • Marty Robbins / O Little Town Of Bethlehem • Jim Nabors / Go Tell It On The Mountain • George Morgan / Blue Snowfall • Ray Price / The Lord's Prayer



MAIL TO: CSP CHRISTMAS OFFER, P.O. BOX 36309-G CINN., OHIO 45236

QUAN. LP

QUAN. 8-T

QUAN. CAS.

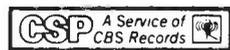
Please allow 4 to 6 weeks for delivery.

- IT'S CHRISTMAS TIME
- SILENT NIGHT...
- HAVE YOURSELF A MERRY LITTLE CHRISTMAS
- A COLLECTION OF CHRISTMAS FAVORITES
- A DOWN-HOME COUNTRY CHRISTMAS
- WE WISH YOU A COUNTRY CHRISTMAS

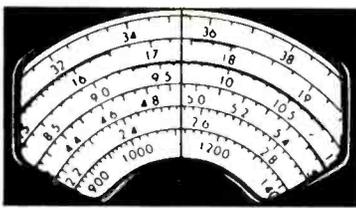
discontinued

I enclose a check (or M.O.) in the amount of \$_____ payable to "CSP" to cover the cost of _____ items (\$4.99 each or any 3 for \$9.98 or all 6 for \$19.96) I understand that there will be NO additional charges for postage or handling.

NAME _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____



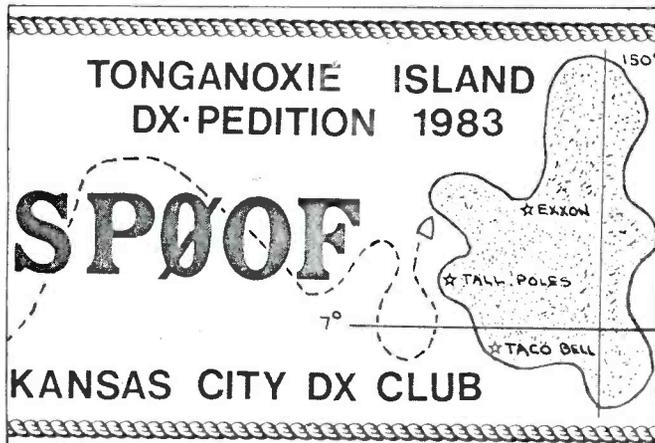
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COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS



Two very different QSLs bearing call signs with the prefix "SPØ." "SPØØF" is a souvenir joke QSL card sent out by the Kansas City DX Club. Of course the call sign SPØØF spells the word spooof. The QSL SPØVHF is a real card and is from a rare experimental station in Warsaw. (Both cards courtesy Tom Kneitel)

Recently, a reader wrote about some "funny" CW signals he was receiving. It seems that in the middle of a message in the international Morse code, some strange "characters" would suddenly pop up. What was going on?

It's nothing terribly mysterious. It's just that the international Morse code includes characters not found in the English alphabet. If the text of a CW transmission is in a foreign language, the following characters (and their sounds) may be encountered:

- ä didahdidah
- á didahdahdidah
- ch dahdahdahdah
- é dididahdidit
- ñ dahdahdidahdah
- ö dahdahdahdit
- ü dididahdah

What Transmits Where?

Most radio stations operate according to various international agreements. (Of course, many of the stations we cover here each month don't!) Among other things, these agreements have divided the radio spectrum up into ranges that are set aside for specific purposes. These frequency allocations are a valuable bit of information for the DXer. For example, if you're interested in eavesdropping on ship-to-shore communications, it doesn't make much sense to tune in a frequency range set aside for aeronautical communications. A knowledge of which stations are supposed to be operating where is also a valuable tool when looking

for extralegal/espionage activity. You can quickly tell whether a transmission "belongs" in a certain frequency range. The following is a table of international frequency allocations from 10 to 30000 kHz:

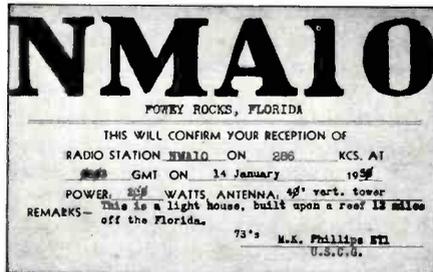
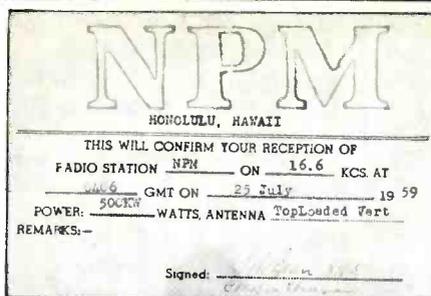
kHz	Use
10-20	Radio navigation
20-60	Fixed stations
60	Standard frequency stations
60-90	Fixed stations
90-110	Radio navigation
110-160	Fixed stations and maritime radio navigation
160-200	Fixed stations
200-285	Aeronautical beacons
285-325	Maritime beacons
325-405	Aeronautical beacons
405-415	Miscellaneous beacons
415-490	Maritime
490-510	Distress and emergency communications
510-540	Miscellaneous beacons and government
540-1600	Broadcasting
1600-1705	Radio navigation and miscellaneous
1705-1800	Radio navigation and disaster services
1800-2000	Amateur radio
2000-2107	Maritime
2107-2170	Miscellaneous services
2170-2194	Distress and emergency communications
2194-2495	Aeronautical, maritime, and fixed stations
2495-2500	Standard time and frequency stations
2500-2850	Aeronautical, maritime, and fixed stations
2850-3155	Aeronautical
3155-3200	Maritime and fixed stations
3200-3400	Tropical broadcasting
3400-3500	Aeronautical
3500-4000	Amateur radio
4000-4063	Aeronautical, miscellaneous, and fixed stations
4063-4438	Maritime
4438-4650	Aeronautical and fixed stations
4650-4750	Aeronautical
4750-4995	Tropical broadcasting
4995-5005	Standard time and frequency
5005-5050	Tropical broadcasting
5050-5450	Aeronautical and fixed stations
5450-5730	Aeronautical
5730-5950	Fixed stations
5950-6200	International broadcasting
6200-6525	Maritime
6525-6765	Aeronautical
6765-7000	Fixed stations
7000-7100	Amateur radio
7100-7300	Amateur radio and international broadcasting
7300-8195	Fixed stations
8195-8815	Maritime
8815-9040	Aeronautical
9040-9500	Fixed stations
9500-9775	International broadcasting
9775-9995	Fixed stations
9995-10005	Standard time and frequency
10005-10100	Aeronautical
10100-11175	Fixed stations
11175-11400	Aeronautical
11400-11700	Fixed stations
11700-11975	International broadcasting
11975-12330	Fixed stations
12330-12689	Maritime
12689-13107.5	Facsimile
13107.5-13200	Maritime
13200-13360	Aeronautical
13360-14000	Industrial and scientific and fixed stations

14000-14350	Amateur radio
14350-14990	Fixed stations
14990-15010	Standard time and frequency
15010-15100	Aeronautical
15100-15450	International broadcasting
15450-16460	Fixed stations
16460-17360	Maritime
17360-17780	Fixed stations
17780-17900	International broadcasting
17900-18030	Aeronautical
18030-19995	Fixed stations
19995-20005	Standard time and frequency
20005-21000	Fixed stations
21000-21450	Amateur radio
21450-21750	International broadcasting
21750-21850	Fixed stations
21850-22000	Aeronautical
22000-22720	Maritime
22720-23200	Fixed stations
23200-23350	Aeronautical
23350-24490	Fixed stations
24490-25010	Standard time and frequency
25010-25330	Industrial and special services
25330-25600	Government
25600-26100	International broadcasting
26100-28000	Government and miscellaneous services
28000-29700	Amateur radio
29700-30000	Miscellaneous services

In late 1980, the nations of the world met in what was known as the World Administrative Radio Conference (WARC). WARC concluded with several agreements to re-allocate various parts of the radio spectrum over the next few years. Some of the changes that will be phased in during the next few years include:

9500-9900	International broadcasting
9900-9995	Fixed stations
10100-10150	Amateur radio
11400-11650	Fixed stations
11650-12050	International broadcasting
12050-12230	Fixed stations
12230-12330	Maritime and fixed stations
13360-13600	Fixed stations
13600-13800	International broadcasting
13800-14000	Fixed stations
15100-15600	International broadcasting
15600-16360	Fixed stations
16360-17410	Maritime and fixed stations
17410-17550	Fixed stations
17550-17900	International broadcasting
18030-18068	Fixed stations
18068-18168	Fixed and amateur radio
18168-18780	Fixed stations
18780-18900	Maritime and fixed stations
18900-19680	Fixed stations
19680-19800	Maritime and fixed stations
19800-19990	Fixed stations
21450-21850	International broadcasting
21850-21870	Fixed stations
22000-22855	Maritime
22855-23200	Fixed stations
23350-24890	Fixed stations
24890-24990	Amateur radio
25070-25210	Maritime
25210-25550	Fixed stations
25550-25670	Radio astronomy
25670-26100	International broadcasting
26100-26175	Maritime

As you can see, the big winners at WARC were international broadcasting and amateur radio. Fixed station services lost the largest slices of frequency space. This was mainly due to the fact that much of the fixed station traffic once carried on shortwave now goes by communications satellites.



Since many fixed stations will be leaving shortwave for good during the next few years, now is the time to hear (and hopefully QSL!) such stations before they're only memories.

QSLing The Armed Forces

Stations operated by the various branches of the U.S. military are among the most commonly heard utility outlets. However, most DXers are missing QSLs from them. This shouldn't be the case, since many Navy, Coast Guard, and Air Force stations are excellent verifiers—if you know where to send the report! To help you out, this month we'll give a list of U.S. military station addresses, both stateside and foreign. Some of these stations even have their own QSL cards! However, in most cases it's wise to include your own prepared QSL card with your report. Your reports should be addressed to the attention of the chief radio officer at each station.

Stateside Stations

- AFA:** U.S. Air Force, Communications Group, Andrews AFB, MD 20331.
- AFC4:** USAF, Communications Station, Westover AFB, MA 01022.
- AFD31:** USAF, Communications Station, Wright-Patterson AFB, OH 45433.
- AFE8:** USAF, Chief Radio Officer, MacDill AFB, FL 33608.
- AFE70:** USAF, Eastern Test Range, Patrick AFB, FL 32925.
- AFF13:** USAF, Chief Radio Officer, Barksdale AFB, LA 71110.
- AFF24:** USAF, Communications Squadron, Kelley AFB, TX 78241.
- AFG4:** USAF, Chief Radio Officer, Offutt AFB, NE 68113.
- AFH9:** USAF, Chief Radio Officer, March AFB, CA 92508.
- AFI:** USAF, Communications Squadron, McClellan AFB, CA 95652.
- AGD:** USAF, Chief Radio Officer, Vandenburg AFB, CA 93437.
- AKA:** USAF, 1931 Communications Group, APO Seattle, WA 98742.

- NAM:** U.S. Naval Communications Facility, Norfolk Naval Base, Norfolk, VA 23511.
 - NAR:** USN Communications Station, Key West Naval Base, Key West, FL 33040.
 - NAS:** USN Communications Station, Naval Air Station, Pensacola, FL 32508.
 - NCR:** USN Communications Station, Cape May Naval Base, Cape May, NJ 08087.
 - NEL:** USN Communications Station, Naval Air Station, Lakehurst, NJ 08733.
 - NGP:** USN Communications Station, Naval Air Station, Corpus Christi, TX 78419.
 - NGZ:** USN Communications Station, Alameda Naval Air Station, Alameda, CA 94501.
 - NHD:** USN Communications Station, Naval Air Station, Nantucket, MA 02554.
 - NHK:** USN Communications Station, Naval Air Station, Patuxent Naval Air Station, MD 20670.
 - NIP:** USN Communications Station, U.S. Naval Station, Jacksonville, FL 32212.
 - NMC:** U.S. Coast Guard, Chief Radio Officer, Box 560, Point Reyes, CA 94956.
 - NMF:** USCG, 1240 S. River St., Marshfield, MA 02050.
 - NPL:** USN Communications Station, San Diego Naval Base, San Diego, CA 92130.
 - NPM:** USN Communications Facility, Chief Radio Officer, FPO San Francisco, CA 96612.
 - NSS:** USN Communications Service, Officer in Charge, Annapolis, MD 21402.
- ### Overseas Stations
- AFJ:** USAF, Kindley AFB, APO New York, NY 09560.
 - AHF:** USAF, Albrook AFB, APO New York, NY 09825.
 - AIC:** USAF Communications Facility, Clark AFB, APO San Francisco, CA 96274.
 - AID:** USAF, Kadena AFB, APO San Francisco, CA 96239.
 - AIE:** USAF, Andersen AFB, APO San Francisco, CA 96634.
 - AIF:** USAF, Base Communications Facility, Fuchu Air Station, APO San Francisco, CA 96525.
 - AJA:** USAF, Chief Communications Officer, APO New York, NY 09633.
 - AJF:** USAF, Chief Radio Officer, Rhein Main Air Base, D-600 Frankfurt, West Germany.
 - AJG32:** USAF, Chief Radio Officer, USAF-Iraklion, APO New York, NY 09219.
 - CNL:** USN, USNAVCOMSTA-Kenitra, FPO New York, NY 09544.
 - CUW:** USAF, Officer in Charge, Lajes Field, APO New York, NY 09406.
 - NAW:** USN Communications Station, Guantanamo Bay, Box 12, FPO New York, NY 09593.
 - NBA:** USN Radio Station, Balboa-Canal Zone, Box 5007, FPO New York, NY 09593.
 - NDT:** USN Communications Facility, USN—Yokosuka, Yokosuka, Japan.
 - NGD:** USN Radio Station, Antarctic Support Facility, FPO New York, NY 09501.

NKW: USN Communications Facility, Chief Radio Officer, FPO San Francisco, CA 96601.

NWU: USN Communications Facility, U.S. Naval Air Facility-Bermuda, FPO New York, NY 09560.

NPN: USN Communications Facility, U.S. Naval Base-Guam, FPO San Francisco, CA 96656.

NPO: U.S. Naval Radio Station, Chief Communications Officer, FPO San Francisco, CA 96656.

NRK: USN Communications Station, Chief Communications Officer, Box 47, FPO New York, NY 09571.

XPH: USAF, Chief Communications Officer, USAF-Thule, APO New York, NY 09023.

However, you may not always be able to QSL military stations, even if your report is correct, sent to the proper address, and includes a prepared card. This is because there is an apparent policy against verifying certain types of transmissions, particularly of a sensitive nature, and at times directives are issued to prohibit verification of any reports. However, it should be possible to eventually verify any military station through repeated reports.

Featured Frequencies

Listening to Soviet satellites and manned space missions is a popular activity for many European listeners but has never caught on to the same extent in the United States. This is surprising, since most Soviet spacecraft can be easily heard on conventional communications receivers. Most Soviet spacecraft, whether manned or unmanned, have at least one beacon or telemetry frequency near 20 MHz. Among the most common frequencies are 19946, 19954, 19995, and 20008 kHz. Telemetry signals sound like a mixture of clicks and chirps, while other signals will be similar to the Morse code. Remember that if you hear a signal that's really coming from space, the frequency of the signal will steadily drop because of the phenomenon known as Doppler shift. If the signal you hear remains steady in frequency, it's coming from a terrestrial station.

Several federal "mystery" stations are often monitored on 7880 kHz. Among them are KAE92, Billings, MT; KAE94, Huron, SD; KAE95, Bismarck, ND; KAE96, Jamestown, ND; and KAE93, Watertown, SD. While we know their call signs and locations, we don't know which agency operates these stations or what their purpose is! But listen to 7880 kHz and report what you hear to Communications Confidential!

Listening Reports

Here are this month's listening reports. All frequencies are in kHz and all times are in GMT (that's Eastern standard time plus five hours). We'd like to see your reports here; submit them in the format you see here and be sure all times are in GMT. Be sure to include as much detail as you can; for example, if you report a numbers station, tell whether the digits were in three, four, or five

digit blocks. Send your reports to Harry Helms, P.O. Box 157, Rockefeller Center Station, New York, NY 10185.

4048: Five digit Spanish numbers station with female announcer 0546. (Mike Goetsch, MD)

4057: Five digit Spanish numbers station with female announcer 0504; was in SSB. (Paul Adamaszek, NY)

4525: Y3S, Nauen, East Germany, time signals 0033. (George Osier, NY)

4560: Open carrier noted here from 2300 to 0302 tune out. (George Osier, NY) George is not only a prolific reporter, but apparently very patient as well! (Editor)

4670: Four digit Spanish numbers station with female announcer beginning transmission at 0250 with carrier and rapid bursts of CW. This was followed by what sounded like footsteps (although they weren't). At 0300, woman said "438" in Spanish three times, followed by a count of 1 to 10 in Spanish. At 0310 there were ten pulses at one second intervals. The woman then said "grupo 146" and the four digit groups were read. In the background was a high-pitched whine. (George Osier, NY)

4670: "Victor Lima Bravo Two" repeated by woman 0150. (Mike Goetsch, OH)

4770: Five digit German numbers station with female announcer 0415; station was directly atop the Voice of Nigeria station on this frequency. Station was of the "3/2" variety; each block consists of five digits but there is a pause between the second and third digits in each block. (George Osier, NY) This was the first frequency on which the "3/2" stations were reported and seems to be your best bet for hearing one. (Editor)

5599: Gander Aeradio, Gander, Newfoundland, working Yugoslav Airlines flight 517 in SSB 0109. (George Osier, NY) This is a very busy channel for trans-Atlantic flights. (Editor)

5641: Shannon Aeradio, Shannon, Ireland, aviation weather in SSB 0123. (George Osier, NY)

5812: Four digit Spanish numbers station with female announcer 0415. (Paul Adamaszek, NY) This frequency is by far the busiest channel for four digit Spanish stations. (Editor)

5960: This channel is used by the U.S. Coast Guard for communication with aircraft operating out of New Orleans and Miami; traffic is in SSB. (Alan Sorenson, MS)

6215: Traffic between barges on Illinois River in SSB 1856. Base stations take check-ins and reports of numbers of barges in two or to be picked up. (Dan Nicholson, MD)

6600: "North America 51-Dave" working "Delta Tango Cerritos" in SSB 0100-0130. General ragchewing just like hams and both were using modified ham transceivers (ICOM 720A and Kenwood TS-430S. At 0115, they shifted frequency to 8315 kHz and continued their contact. 6600 kHz is a very active frequency for bootleggers. (W.J. Clarkson, NY) Similar operations also noted on 13560 kHz.

6762: "Foxtrot" message to SAC bombers aloft 0301 in SSB, female announcer, used

the identification of "Atomic." (George Osier, NY) Other SAC stations using such calls as "Spacegun," "Intergalactic," and "Roadmap" in SSB 0332-0400. (Joe Wosik, IL)

6840: Four digit CW numbers stations can be heard around 0325 almost daily. (Mike Goetsch, OH)

7835: Three digit Spanish numbers station with female announcer 0425. (Mike Goetsch, OH)

8425: "Sierra Michael November Two" repeated continuously by woman at 0242. (Mike Goetsch, OH)

8915: Several ships reporting to a man named "Alan" around 0100 in SSB; each report was a series of numbers and traffic breaks into a series of numbers between reports. No identification given. (Alan Sorenson, MS) Any clues readers? (Editor)

8925: At 2343, "Charlie India Oscar" repeated by woman, then interference from an SSB transmission in a foreign language. When the interference stopped, the female was reading code blocks made up of the international phonetic alphabet. At 0000, both stations were gone. At 0210, a five digit Spanish numbers station came on frequency with a female announcer; there were loud single and double "beep" tones interfering. At 0217, there was a dialog in Spanish between two males in SSB. (J.R. Hollis, WV) Several DXers, including your editor, have noted two-way radio traffic on or near frequencies used by various numbers stations. (Editor)

9041: Five digit German numbers station with female announcer in SSB 2330, transmission opened with a tone that sounded like a video game, then "Hotel Kilo" repeated four times before the number groups were also repeated, off at 2347. (George Osier, NY)

9075: Four digit Spanish numbers station with female announcer 0233. (Paul Adamaszek, NY) Similar station heard at 2311-2330. (George Osier, NY)

9265: Five digit German numbers station with female announcer 0202. (Mike Goetsch, OH)

9370: Musical tone sequence, sounding like a video game, repeated 1305. At 1311, there was rapid CW with a high-pitched whine in background. (George Osier, NY)

9450: Four digit German numbers station with female announcer 0507. (Mike Goetsch, OH)

10246: Five digit Spanish numbers station with female announcer 0433. (Mike Goetsch, OH)

11518: Five digit Spanish numbers station with female announcer 0306. (Mike Goetsch, OH)

11532: Four digit Spanish numbers station with female announcer 0217-0329; also signing on at 0100 with a count of 1 to 10 in Spanish, then "769" repeated three times and a count of 1 to 10 repeated before start of four digit groups. (Dan Nicholson, MO)

17928: Aircraft phone patches in SSB at 1847; patches were run through Houston. One call was made to the U.S. Coast Guard. (Dan Nicholson, MO)

DESERT FOX UPDATE



BY DAVE BEAUVAIS, KB1F

If you've been losing sleep trying to crack the mystery of the "fluke" propagation that carried Rommel's 27 MHz tactical transmissions to the eager ears of U.S. Army monitors in New England during World War II (*POP'COMM* "Outfoxed by Shortwave," June 83 issue), you can rest easier. Since the article went to press, a great deal of new light has been shed on the subject from a most unlikely source—ongoing satellite and manned orbital studies of the ionosphere in the equatorial region.

This research has already led to some genuinely new and startling conclusions about the behavior of VHF propagation in the equatorial zones. (Signals of 27 MHz are close enough to the low edge of the VHF spectrum, which formally begins at 30 MHz, to share many of VHF's propagation characteristics, including a nominal restriction to line-of-sight usefulness during times of low solar activity.)

As recently as four or five years ago, the "Desert Fox" affair would have been consid-

ered fit matter for a *Twilight Zone* episode. But John Brannigan, a British radio engineer interviewed recently on Radio Netherlands' *Media Network* program, informs us that beacon-signal studies conducted through the American P-76 research satellite, and photo reconnaissance carried out by Russian manned space labs, have opened new horizons of understanding on the subject of equatorial radio propagation. Some data collected as recently as a year ago has radically altered the tenets of classical propagation science.

In brief: these new space studies prove the existence of several previously unknown modes of equatorial radio propagation. The activity is centered around two belts, or zones of disturbance, which extend 15 degrees north and south of the equator.

According to Brannigan, these zones of ionospheric disturbance actually occur north and south of the earth's magnetic equator, which happens to coincide with the geographical equator over Africa. Soviet

space lab photography over these equatorial zones has revealed the characteristic 6300-Angstrom red fluorescence which is associated with auroral display at the north and south geomagnetic poles.

"I'm not sure I'd dare have said it a year ago," concedes Brannigan, but he now stands convinced that an equatorial aurora exists, and that the zones of disturbance surrounding the equator are responsible for several distinct phenomena which affect radio signals entering the ionosphere beneath these zones.

Long-distance VHF propagation has been noted in the region, even at times when the normal F-layer would not support extremely high MUFs (maximum usable frequencies) of 100 MHz or more. According to *Media Network* host Jonathan Marks, "Letters from listeners in Mauritius to *Media Network* have pointed out that in 1981, you could hear Dubai (United Arab Emirates) FM radio in Mauritius (an island in the Indian Ocean), some 3000 miles away."

These reports are most interesting from the point of view of the "Rommel phenomenon," if we look at a global map. Both Libya (the site of Rommel's transmissions) and the United Arab Emirates (the site of these long-distance FM transmissions) lie exactly along the 15 degree zone of disturbance which extends north of the geomagnetic equator. The signals from Rommel's tank corps, in fact, probably originated directly underneath the zone!

Propagation in a north/south transverse across the zone seems to have occurred both in the Dubai-Mauritius link, and in the Libya-New England link. The transverse is, of course, much more oblique in the Libya-New England link, with the received signal reaching an area which may have resembled the narrow end of a tight "bow-tie" directional pattern. This could account for the skittishness of the received signals, and the fact that reception was possible only along a narrow stretch of seacoast.

It's also true that signals propagating over a large body of water—such as the Indian or the Atlantic Ocean—experience minimal absorption losses, while dissipating quickly over land. This phenomenon is well known to VHF repeater users who reside in coastal areas.

In fact, radio amateurs in New England who use the 28 MHz band have long observed a similar fluke of north/south propagation. Even at those times of the year (or of the sunspot cycle) when the F-layer of the ionosphere is not dense enough to support any European activity, strong signals from both South America and South Africa are frequently noted on an otherwise "dead" band, especially during late afternoon and early evening hours.

This phenomenon has a current case in point: as the MUF declines and long-distance signals wane, you can presently hear Radio RSA from Johannesburg, South Africa, as well as the Voice of America relay in Monrovia, Liberia, laying down strong but fluttery signals on the 26 MHz shortwave band. The flutter, says Brannigan, is a sign of transequatorial aurora—a newly-discovered phenomenon, but one which has clearly operated without recognition for as long as radio propagation has occurred.

It would be interesting, of course, to know whether the signals recorded in Scituate in 1942 exhibited this characteristic flutter, as well as the times of peak reception. Nevertheless, the regularity with which the signals appeared on an almost daily basis, viewed in light of the current daily appearance of shortwave broadcasts from Africa on 26 MHz (no matter what the condition of the F-layer), should let us stamp this mystery "SOLVED!" Now it can be told: propagation across the 15 degree belt of equatorial disturbance, on an oblique north/south transverse from Africa to New England, was the downfall of the Desert Fox.

One final, personal note: in 1976 and 1977, operating with just 10 watts of AM and an eight foot indoor hunk of hookup wire dangling over the bench for an antenna, I enjoyed two-way contact with a succes-



sion of Soviet "novice" hams in the Black Sea region, on 29.1 MHz—QSL'd too! One was a Soviet youngster; I was his very first DX Contact, and was he ever excited! Moments like this make ham radio worthwhile.

Anyone who thinks a medium-powered, tank radio with a whip antenna couldn't make the same crossing at 27 MHz obviously doesn't know how protean and magical these frequencies can be!



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PIRATES DEN

BY DARREN LENO, WDØEWJ

FOCUS ON FREE RADIO BROADCASTING

Welcome to The Pirates Den, POP-COMM's new monthly feature. In this column, we will be taking a look at the North American pirate radio scene, Central American clandestine broadcasting operations, European "Free Radio" stations, and miscellaneous mysterious transmissions. We will be covering the entire underground radio spectrum. You are invited to participate in The Pirates Den by writing and telling me what underground stations you have recently heard. I welcome your tips, ideas, questions, and anything else you may wish to send along. Good quality copies of pirate QSLs, pennants, and stickers are welcome. I hope we'll be seeing your name in the credits section soon. You can write me through this address: The Pirates Den c/o Popular Communications, 76 North Broadway, Hicksville, NY 11801. I plan on responding to your letters if you enclose a self addressed stamped envelope. Now, lets see what's happening on the bands.

The 7350 to 7430 kHz range continues to be the hot spot for pirate activity. The best times to watch for these stations is throughout the evening hours of Friday and Saturday, 0100 to 0700 GMT. Here are some stations that have been heard recently in this "pirate band."

Munchkin Radio was noted at 0300 GMT on 7430 kHz. This station, like several other pirates, programs satirical commercials and comedy skits. The operator of the station calls himself "The Wizard." Transmissions are infrequent and last about a half hour.

Nylon Radio was noted on 7425 kHz at 0530 GMT. No one seems to know much about this station, first heard back in March. They program rock music and comedy.

Radio Clandestine continues to be very active. For at least the last year or so, they have been on the air every month. Recently, Grant Lochmiller in Iowa heard this station on 7375 kHz after 0330. You will hardly ever hear Radio Clandestine on the same frequency at the same time as a previous transmission. They have been heard on 6105 kHz, 9590 kHz, even 11860 kHz. Times vary as greatly as the frequency; anywhere from as early as 1600 GMT to as late as 0630. No telling where or when this station will pop up. But, judging from their many past performances, the 7350-7430 kHz pirate band is the place to keep checking. When heard, you will likely be impressed with the quality of their signal, good modulation, and very original programming.

WRFH, Radio Free Harlem, has been heard after 0430 on 7355 kHz. Listener Artie Bigley in Texas, quoted WRFH as saying "This is WRFH . . . with an input power of 15,000 watts as unauthorized by the FCC." I would be quite skeptical as to the accuracy



David Markwick of East Sussex, England, sends these promo stickers from Dutch medium wave stations.

of their power claims, but listeners did report fair to good reception of WRFH around the country.

The Crystal Ship is another very active and interesting operation. It is run by three individuals, "The Poet," "The Radical," and "The Unknown Soldier." There are several other people who help produce the taped segments of their programs. This station overcame very severe technical problems and returned to the air earlier this year after a three month absence with quality program-

ming and a quality signal. TCS has been very active lately on 7425 kHz, usually after 0300 GMT. They have been one of the easiest pirates for SWLs to hear because of their relatively constant and predictable schedule. Programming consists of commentary on current events, interesting and often original poetry, and music by such rock groups as Blue Oyster Cult, The Who, and The Doors. In fact, they named their station after a song by The Doors. Listen for their interim signal consisting of a ship's horn blowing and a crowd chanting, "We want the world and we want it now!"

WRAM is a recent development. According to Tom Brennan of Indiana, this station was heard on 7430 kHz from 0400 to 1000 GMT (12 a.m. to 6 a.m. EDT). That's one of the longest and latest broadcasts I've ever heard of! WRAM was playing rock music and taking phone calls which were relayed to the station via 27 MHz radio. Hopefully, I'll have more to tell about WRAM in the months ahead.

There have also been a couple of new SSB pirate broadcasters active in the 7350-7430 kHz band.

Radio Amity has been heard on several different frequencies in this range. Their transmissions are usually in LSB, although I have heard them on USB. Favorite operating times seem to be after 0400 GMT. They were playing music by The Moody Blues and relaying a local FM station when Kirk Baxter of Kansas heard them.

Radio USA appeared on LSB about the same time that Radio Amity showed up. The announcer, "Mr. Blue Sky" (named after a song by the group ELO), has a very distinctive voice which lends an interesting atmosphere to this station. They program comedy and late 60's early 70's rock music. In a telephone interview with Mr. Blue Sky recently, he told me that Radio USA is not "anti-establishment" as many pirates are assumed to be. He says the purpose of Radio USA is to create among the citizens of the U.S. a positive feeling toward their country by discussing its good points, and reminding us that things could always be worse. Radio USA is a fun station to hear, and they will QSL your reception reports or answer your letter for three 20¢ stamps to: Radio USA, PO Box 4948, Arcata, CA 95521-3048.

Many new pirates have been cropping up recently, and here is another one Artie Bigley of Texas logged on 7435 kHz at 0000 GMT. They call themselves Coral Reefer Radio and ended a transmission on LSB with "You have been listening to the Independent Voice of the Caribbean . . . This station now leaves the air until 9:00 p.m. EST tomorrow on 7435 kHz." They solicited QSL reports through a well known DXer

and several publications (including *POP'COMM*) obviously as a joke.

Of course, not all stations operate in the 7350 kHz pirate band. One of these stations operates on a frequency of 8074 kHz. They call themselves KHO, the "Voice of the People" and are yet another relatively new station. Favorite broadcasting times are usually in the early evening hours. They have been noted as early as 2100 GMT and as late as 0300 GMT. Music consists of 70's rock and talk. According to Robert Horvitz of Rhode Island, the men who run this station are all into radio and electronics as a hobby. One of the DJs is getting on the job experience and is a student of radio broadcasting. Robert talked to KHO when they called him on the telephone after receiving his reception report in the mail. He asked if they were worried about the FCC finding them. They calmly replied, "No, the FCC doesn't have the money to hunt down (pirate) operations like ours." Not a very healthy attitude, I'm afraid.

Radio North Star International is another station on a lonely oddball frequency. Listen for them on 13785 kHz. Times vary greatly. They'll pop on for an hour or two any time between 1530 and 0400 GMT. Although they are on the air frequently, RNS is still a difficult station to catch. They are known for fine audio and their easy rock mixed with oldies format of music. If you're lucky enough to hear this station, QSLs are obtained for a reception report and a few 20¢ stamps to: Radio North Star International, PO Box 982, Battle Creek, MI 49016-0982.

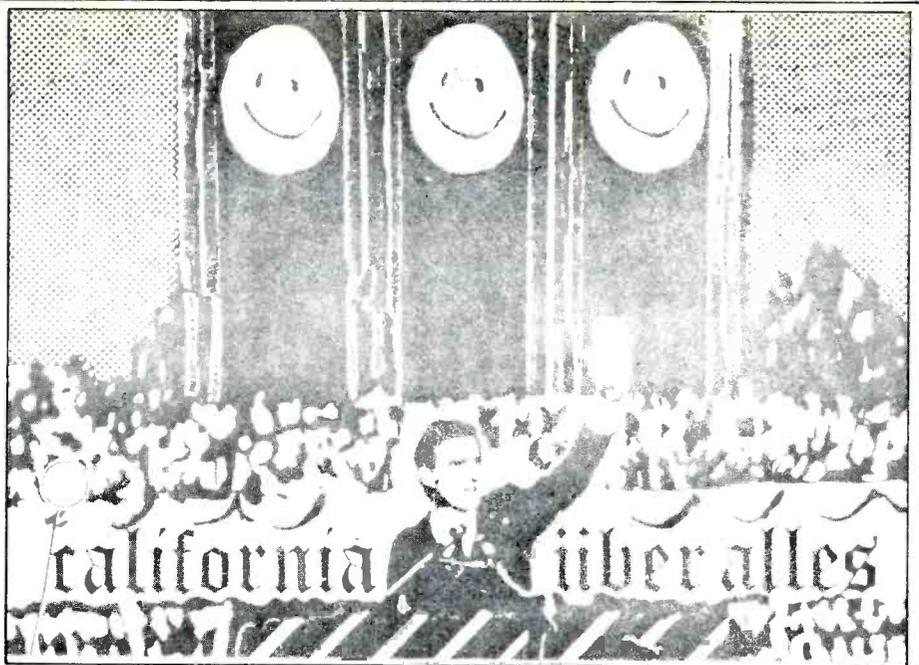
KQSB is an interesting operation that, like Radio Clandestine, can appear just about anywhere. They have been on 6279 kHz and 15025 kHz, but seem to be most active in the 7350 kHz pirate band. From past loggings, 0400 seems to be a popular time to broadcast, although they have been known to be on much earlier than that. KQSB can be contacted through the same address as North Star.

Over in Europe, the 6200-6300 frequency range is bustling with activity. Podney Sixe of England reports hearing:

Radio 49 Int'l	6243 kHz	0845 GMT
Radio 48	6290 kHz	0950 GMT
Radio Atlantis-SW	6225 kHz	1100 GMT
Radio Xanadu	6300 kHz	1200 GMT

One of the most widely heard Euro-pirates in the United States is Radio Dublin, an Irish "private" broadcaster that has been active in Dublin since 1966 on the medium wave band. Listeners in North America can listen for Radio Dublin's shortwave outlet on 6910 kHz. Best times to tune are the evening hours, after 0300 GMT. They are on every night and with a little patience, you should be able to pull this one in.

Medium wave pirate activity has been dominated on the East Coast of the United States by the New York City area station, KPRC-Pirate Radio Central. This station has been noted for its professional sound and current event commentary. "Pirate Joe" has definite opinions on U.S. involvement in Central America, Reaganomics,



Here is a QSL from a station you'll hear when and where you least expect them. Radio Free San Francisco is a rare and interesting catch.

and nuclear weapons. Check for them weekend nights after 0400 on 1616 kHz. Usually, you'll have a chance to call the station and give your opinion on the topic of discussion. Reception reports for QSLs should be sent with a few first class stamps to: KPRC, PO Box 747, Exeter, NH 03433.

PRN-Pirate Radio New England is another NYC station to watch for. Listen on 1615 kHz weekend evenings. Listener Herb Shatz in New York describes the people at PRN as "very friendly folks." Like many other NYC pirates, PRN will often open the phone lines for listeners to call in.

Rebel Music Radio is a newcomer to the NYC pirate scene on medium wave. Broadcasting on 1620 kHz after 0430 GMT, listener Frank Decker in New York reports RMR playing "highly political music." Songs such as "Open Your Eyes," "War Crimes," and "Better Decide Which Side You're On" are commonly heard.

WART-the Voice of the North East, one of the most widely heard and popular of the NYC pirates, has decided to close its doors. The official story that the station released is that WART's operator, the Crystal Goblin, had to move from Southern New Jersey to Tennessee for a change in occupations. This means that WART is permanently off the air. However, this station may return to the airwaves from its new location as WDOA at any time.

Over the last several months, *POP'COMM* readers have been introduced to a couple of radio clubs specializing in the field of pirate radio, only to be disappointed in discovering that these clubs had ceased operation. I'd like to tell you about another club, and I guarantee you that it will be there when you write. The Association of Clandestine Radio Enthusiasts has been around for more than a year, and it is even an associ-

ate member of the Association of North American Radio Clubs. A*C*E publishes a monthly bulletin that contains pages of up to date loggings of pirates, clandestines, unidentified and mystery stations, and several pages devoted to the stealthy Spy-Numbers stations each month. There is also news from Europe, feature articles, a "Media Scan," and sometimes technical articles. If you're a clandestine DXer, I would recommend A*C*E to you. You can send an SASE for more information. Write: A*C*E PO Box 452, Moorhead, MN 56560.

As you can see, there is plenty of underground activity on the airwaves today. We hope you are enjoying *POP'COMMS* coverage of this interesting and important part of radio broadcasting. Unfortunately, some individuals feel that by reporting to you the activities of these stations, we are promoting and encouraging pirate radio. Such is not the case. I am here only as a reporter. I neither condemn nor condone these broadcasters. If, after you've read this column, you are overcome with reckless abandon and feel the urge to run right out and start a pirate station, please remember the possible consequences—which include jail sentences, heavy monetary fines, confiscation of equipment, and loss of all FCC licenses. Nevertheless, such stations are out there, and as long as these broadcasters are a part of the total shortwave and medium wave picture, we feel you deserve to be informed as to what they are doing. I'm sure many of you are going to want to respond to this and I will appreciate your comments being sent to my address, previously given in this article.

Until next month, I wish you much success with your convert radio listening and I hope you will tune in again next month as we continue to explore the underground radio world.

Fall 1983 Selected English Language Broadcasts

BY GERRY L. DEXTER

Note: This list was accurate at the time of compilation. Hundreds of English language broadcasts are to be found on shortwave every day. This is a representative sampling and not intended as a complete reference. Some stations listed will have only part of their broadcasts in English during a given hour. Others will start, for example, on the half hour. These are indicated by (30), (15), or (45) indicating the starting time in minutes past the hour. Other stations will run their English segments into the next hour (or even for several hours straight). These are not always carried over to the next hour in our listings. Times are GMT. In some cases, added frequencies may be in use.

Time	Country	Frequencies	
0000	Albania	7.065, 7.120, 9.750	
	China	15.120, 17.855	
	Ecuador (30)	15.155, 15.175, 9.745	
	Israel	7.410, 9.815, 11.655	
	East Germany	9.620	
	Bulgaria	9.700	
	Spain	9.630, 11.880	
	Belgium	9.880	
	Australia	21.680	
	England	6.175	
	Lithuanian SSR	9.685	
	0100	Hungary	9.585, 9.835, 11.910, 12.000, 15.220
Israel		7.410, 9.815, 11.655	
Italy		9.575, 11.800	
Switzerland (45)		6.135, 9.725, 11.715, 15.305	
Vatican		6.015, 9.605, 11.845	
Canada		5.960	
West Germany		6.040, 9.545	
Argentina		11.710	
New Zealand		17.705	
Japan		17.825, 21.610	
Czechoslovakia		7.345	
Greece		9.865	
Nicaragua		5.950	
Brazil		15.290	
Cuba	9.525, 9.550, 11.930		
0200	Brazil	15.290, 17.830	
	Egypt	9.475, 12.000	
	South Korea	9.640, 11.810, 15.585	
	Roumania	9.510, 9.570, 11.940	
	Sweden (30)	11.705, 15.420	
	South Africa	5.980, 9.615, 11.730	
	Taiwan	11.740	
	New Zealand	17.705	
	Netherlands	6.165, 9.590	
	Lebanon	9.545	
	Canada	5.960, 9.755	
	Cuba	9.525	
	Armenian SSR	17.870	
	Argentina	11.710, 15.345	
Poland	9.525, 11.815		
0300	China	15.120, 17.680	
	Portugal	6.025, 11.925	
	Belize	3.285	
	Costa Rica	5.055	
	Japan	17.725	
	Namibia	3.270	
	Austria	9.545	
West Germany	9.560		
	Greece	9.865	
	New Zealand	15.485	
	Honduras	4.820	
	Ecuador	9.745	
	Turkey	11.740	
	Kenya	4.915	
	Taiwan	17.800	
	0400	Roumania	9.510, 9.570, 11.940
		Tanzania	9.750
Austria		9.655	
Switzerland (30)		9.730, 11.965	
Italy		15.330	
Zambia		4.910	
Lesotho		4.800	
Botswana		4.845	
Argentina		11.710, 15.345	
Swaziland (30)		3.200, 7.285	
0500		Israel	9.815, 12.025, 15.105, 15.585
	South Korea	7.275, 11.810, 11.820, 15.575	
	Portugal (30)	6.075, 9.575	
	Ireland	6.910	
	Nigeria	4.770, 4.990, 7.255, 15.185	
	Australia	9.710, 15.160, 15.425	
	Saipan	15.190	
	New Zealand	15.485, 17.705	
England	9.510		
0600	Sierra Leone	5.980	
	Ecuador	9.745, 11.910	
	Ghana	3.366	
	Liberia	3.255	
	Poland	9.675	
0700	Switzerland	9.560	
	Solomon Islands	5.020, 9.545	
	Guam	11.840	
	Netherlands	9.770	
	Australia	15.115, 15.425	
	Monaco	9.495	
	Liberia	11.830	
Philippines	9.580		
0800	Indonesia	11.790, 15.150	
	Canada	6.070	
	Australia	9.680	
	Cook Islands	11.760	
	Guyana	5.950	
	Philippines	11.890	
	Japan	11.750	
	Guam	15.240	
0900	Hungary (30)	9.835, 11.910, 15.160	
	Papua New Guinea	4.890	
	Guyana	5.950	
	Japan	9.505, 11.875, 15.325	
	Oman	9.735, 11.890	
	Hungary	9.835, 11.910, 15.160	
	South Korea	5.975	
1000	Falkland Islands	3.958	
	Singapore	11.940	
	Australia	21.720	

	New Zealand	11.960		Ethiopia	9.585
	India	17.387		Greece	9.685
	South Korea	9.570			
1100	Finland	15.400, 17.800	2000	Israel	11.655, 13.745, 15.485, 15.585, 17.630
	South Korea	9.570, 15.575		Cuba	11.840, 11.960
	North Korea	9.977		Norway	11.870 (Sunday)
	Sri Lanka	11.835		Spain	15.375
	Poland	11.840		Netherlands	21.685
	England	11.775		Algeria	9.685, 15.160, 17.745
				Kuwait	11.675
1200	China	15.180, 15.520		Saudi Arabia	11.855
	Ecuador	15.115, 17.890		Poland	9.675
	Mongolia	12.070	2100	Iraq	9.745
	Bangladesh	15.280		India	11.620
	Finland	17.800		Cuba	17.780
	Austria	21.615		Egypt	9.805
	Australia	5.995, 9.580		Spain	11.760, 15.375
	Papua New Guinea	15.485		Ecuador	15.295, 21.475
1300	Finland	15.400		Malta	9.515
	Switzerland (15)	21.570		East Germany	9.620
	Malaysia	7.180	2200	Grenada	15.045
	Japan	9.505		Angola	9.535
	South Korea	9.750		Bulgaria	9.560, 9.700
	Vietnam	10.040, 15.010		Libya	11.815
	India	11.620, 11.810		Argentina	15.345
	Philippines	15.440		Iraq	9.745
1400	Finland	15.400, 17.800	2300	Sweden	11.705, 15.270
	Sweden	17.790		China	17.855, 17.885
	Australia	9.640, 9.710		Japan	15.300, 17.775
	Singapore	11.940		Cuba	17.690
	Canada	11.955, 15.240		Ukrainian SSR	11.790, 12.070
	Belgium	17.610, 21.815		Luxembourg	6.090, 15.350
	Uzbek SSR	9.715, 11.785, 15.460		Turkey	9.560, 11.740
	Philippines	9.580		Haiti	9.770, 11.835
	Cameroon	9.745		North Korea	9.745, 15.220
1500	Indonesia	11.790, 15.150			
	Guam	9.505			
	Australia	9.610			
	Canada	9.625, 11.720, 11.955			
	Nigeria	15.120			
	Yugoslavia	15.240			
	China	11.900			
	Japan	9.505			
	Seychelles	11.895			
	Nepal	9.590			
1600	South Korea	9.870, 11.830			
	France	17.720, 21.620			
	Canada	17.820			
	United Arab Emirates	15.300, 15.320, 21.655			
	Pakistan	17.640			
	Norway	21.730 (Sunday)			
	Portugal	21.490			
1700	India	11.620			
	Roumania	17.825			
	Tanzania	9.750			
	Cuba	17.710			
	Uganda	15.320			
	Saudi Arabia	11.855			
1800	Israel	11.610, 13.725, 17.585			
	Kuwait	11.675			
	Italy	21.560			
	Bulgaria	15.110			
	Ukrainian SSR	9.560, 11.880			
	Brazil	15.125			
1900	Kuwait	11.675			
	Spain	11.760, 15.375			
	West Germany	15.150			
	Afghanistan	11.755, 15.077			
	Vatican	9.645			
	Yugoslavia	9.620			
	Canada	11.825, 15.325, 17.875			

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SCANNER SCENE

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

A scanner installed in your car is prone to theft. The only way to keep the thieves away is to fool any potential crook.

There are many ways to disguise the scanner you use in your car. Remember when CB radio was in its heyday in the mid-1970's and CB rigs disappeared from beneath dashboards faster than they were installed? Well, CBers fought back with all kinds of protection ranging from truckers rigging up guns to blow away potential thieves to motorists simply removing the radio when they parked the car.

The first place one must look in trying to outsmart criminals is the antenna: How else would the crook know there is a radio in the car? Many scanner antennas look like CB and professional two-way radio antennas and the thief may not even know the radio sitting on the transmission hump is a scanner; all he or she knows is that it can be pawned off.

So the first place to start in disguising your scanner is its antenna. The simplest solution is not to have an external scanner antenna. The easiest method is to take the lead coming off your AM-FM antenna—whether it is cowl mounted or the windshield type—and plug it into a "Y" adapter for car radio antenna systems that is available at most electronics stores. From there, plug one end of the "Y" connector into either the car radio or the scanner and then run a jumper cable to the other radio from the "Y" adapter. You now have both radios running off the same antenna. However, the reception may not be good enough for you for the scanner. Or perhaps, the scanner interferes with the car radio with "blips" when it is scanning. If most of your scanner listening is to repeater stations within the given geographic location that you are usually in, this system should work quite satisfactorily for you.

If you'd like to use the same type of system, but with a little more punch for picking up stations farther away, Antenna Specialists' MON-63 all-band scanner antenna coupler will do the job. You plug the cable from the car radio antenna into the coupler and the coupler feeds to the scanner and the car radio.

One other method would be to do what undercover detectives do: install a disguise antenna. Two-way radio antennas would give away an undercover operation, thus unmarked police cars usually have two-way radio antennas that look like standard AM-FM antennas. You could get an Antenna Specialists two-way disguise antenna custom-cut for the frequency range you usually listen to, but the cost might be prohibitive. Antenna Specialists also manufactures a CB/AM-FM disguise antenna that I have found worked the best for a disguise operation. At one time, I had one of the A/S dis-



Antenna Specialists' MON-63 electronic coupler.

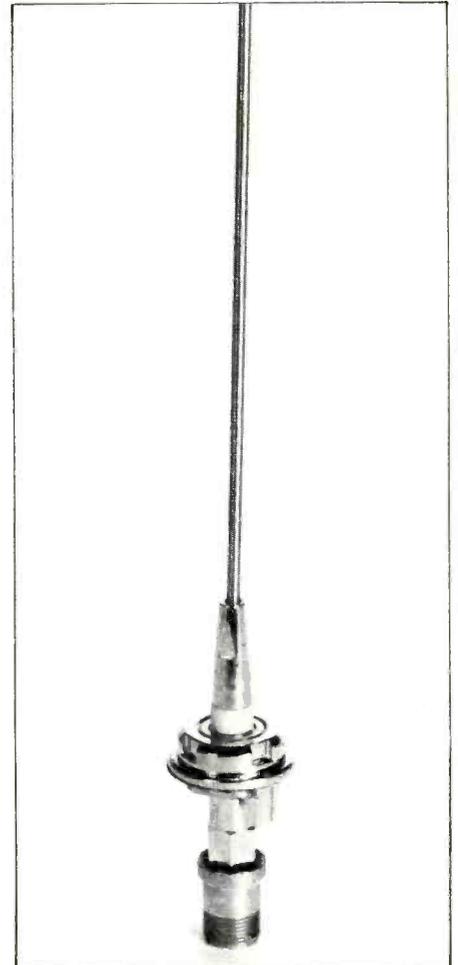
guise CB cowl-mount antennas and had the CB rig plugged into the one end and the scanner plugged into the AM-FM cable. The antenna worked quite well on low band and it was not uncommon to hear high-band base stations up to 100 miles away. However, operation on UHF was not as good.

Another possibility would be to use an antenna that can be removed. Magnetic and gutter-mount antennas come in a variety of mounts and specifications. The antenna can be quickly removed for security. If you listen predominately to high band, a 2-meter magnetic mount amateur radio antenna will work fine and they can be obtained new for as little as \$12.

One last thought to disguise an antenna would be to do what some police departments do to hide a quarter-wave high-band or UHF antenna. The antenna can be mounted in the rear deck in the back window of the car. The cable would feed into the trunk and to the bottom of the antenna as it is mounted on the rear deck. The antenna sits inside the car away from general view and will work well locally.

Now that we have the antenna hidden, how about the scanner itself? If you have a pocket scanner, you can just toss it under the seat when you leave the car. Larger scanners either need to be hidden or removed from the car when it is parked. Today's cars don't leave much room to hide anything, let alone mount a radio under the dashboard.

The best bet is to mount the scanner on a stereo mount. These slide mounts, which become popular with CB radios and 8-track players, allow the user to remove the radio



The M-265 mobile antenna from Antenna Specialists.



Gutter clamp mount ASC-236 featured by Antenna Specialists.

from the car with a minimum amount of effort. The mount allows instant connections of power, speakers, etc. It is best, however, to make direct connection of the coaxial cable to the radio to eliminate any signal loss that can result from running it through the slide mount. The slide mounts usually come equipped with locks for added security when you leave the radio in the car.

Even with all of these precautions, they mean nothing if proper safeguards are not instituted. Lock your car at all times (it doesn't take a thief long to rip out a radio), consider alarm systems, and last but not least, record the serial number of your radio gear in case it should be stolen. That way, if it is recovered by police, the serial number is your proof the radio is yours.

Mailbag

Steve Biczak of Wayne, New Jersey, writes in to find out the best way for him to monitor the Garden State Parkway patrol units, which recently switched over to 800 MHz. He said he was considering purchasing an 800-MHz pager for \$385 to monitor the frequency.

Steve said that it would not be practical for him to purchase a converter to monitor the channel because the bulk of what he listens to is on UHF, where the converter would output on. First of all, \$385 is a lot to spend to listen to one channel. Second, you'll have to hit the reset button and hold it down every time you want to listen in. It doesn't sound like much fun to me.

If you have \$385 to spend, why not first buy the 800-MHz converter and see whether or not you can hear the repeater station where you live. That way, you're only out \$80 if you are too far away from the repeater. If it works and it would tie up other channels you are listening to, then go out and buy another programmable scanner. Because many programmable scanners sell for less than \$200 now, you can listen in on the parkway and a whole lot more for about \$100 less than the cost of the pager. (Note: The Garden State Parkway now operates on 851.3375, 852.1625, 852.7375, and 853.8625 MHz.)

Charles Sowders of Middletown, Indi-

ana, writes in to say that he is having trouble finding a shop to service his Unimetrics-Dura Scan 4 UHF receiver. If anyone knows of a radio shop that will service scanners on a mail-order basis, please write in and let us know and we'll pass the word along to Charles.

For Scanner Frequencies

There are some new scanner directories worth mentioning.

Mobile Radio Resources (2661 Carol Drive, San Jose, CA 95125) has published an excellent catalog of frequencies in use in the Northern California area, including the Bay Area. Not only are all local, county, and state channels listed with channel identifiers, but PL frequencies also are listed for many of the users. This is perhaps the first scanner directory to list PL frequencies and is invaluable to the advanced listener.

Most scanner owners appear to find federal government communications to be fascinating. The standard reference source for information on where to listen for federal

government communications has recently been updated; that would be the giant (weighs almost a full pound) new 5th Edition of *The "Top Secret" Registry of U.S. Government Radio Frequencies*, by Tom Kneitel. Covering everything from the FBI and CIA to the National Park Service, the military services to the Secret Service, and everything in between, the new 5th Edition is a thick 168 page book, and those are large (POP'COMM sized) pages! Loads of really interesting and useful information is tightly packed into this book and nothing else even remotely duplicates what it offers. The new 5th Edition of this book is available at many communications shops or may be ordered by mail directly from its publisher, CRB Research, P.O. Box 56, Commack, NY 11725. The book is \$14.95 (postpaid by Book Rate Mail); add \$2 if you want it sent by First Class Mail to U.S., Canada, or APO/FPO addresses. Add \$3 postage for mailing to addresses in other areas. This is certainly a "must have" category reference book for every scanner user!

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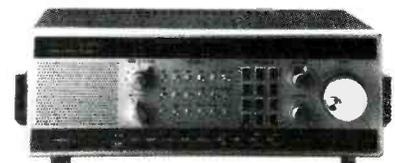
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CIRCLE 38 ON READER SERVICE CARD

NEW AND EXCITING TELEPHONE TECHNOLOGY

The Phone Year

I have great news for those of you into telephones—this is the year of the phone! Take a look at these phenomenal statistics:

- Cordless telephones have doubled in sales since last year. Over two million cordless sets are expected to be sold this year.
- Telephone sets and the sales of actual telephone apparatus are up 44 percent this year over last year. It is expected that eight million units will be sold this year.
- Telephone answering machines will be sold to the tune of over one and one-quarter million units this year.
- Radio Shack is opening up Radio Shack phone centers.
- More homes than ever are adding a second telephone number for the kids or the computer!

All of this vigorous marketing of private telephone equipment means super savings for us, the users. Everyone is going all out to produce more innovative telephones and telephone devices than ever before.

Early statistics indicate that Americans throughout the country still prefer the regular looking telephone when they buy their own private equipment. Only 15 percent are venturing out to buy specialty or novelty telephones, such as the Duck phone (it quacks instead of rings), the bozo phone, the beer can phone, and the very popular E.T. phone.

"Our most popular telephone is the new U.S. Tron \$15 phone with everything in the handset. We can't get enough of these units to satisfy the demand," comments Bob Shultz, owner of a telephone sales store in Orange County, California. This little device simply plugs into any telephone jack and works like a charm. How can you beat that for \$15?

Many of you wrote us regarding the more sophisticated telephone systems—the ones that do more than just provide you with access to the outside world.

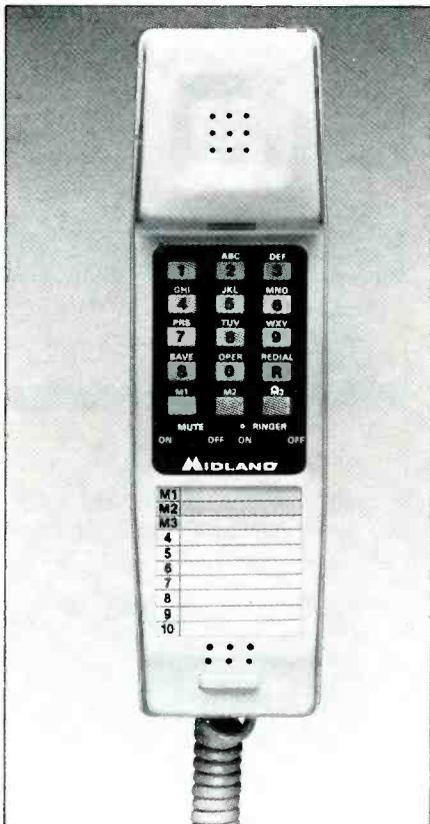
Take for instance the Moog "Phone Controller™." We tested one of these add-on devices and couldn't believe what we had at our fingertips:

- Thirty number memory
- Programmable redial
- Tone or pulse dialing
- Automatic stop watch
- Clock
- Hold button
- Built-in speaker for group listening

The list goes on, but we are still in the process of discovering more features about this little plastic marvel. We were interested to see how fast the unit integrates with the regular phone system. Nothing to it! It simply



The Demon Dialer stores up to 176 numbers and each number can be up to 32 digits long. Quite a machine!



Telephones, like this one from Midland, abound—and for under \$25.

plugs into your regular phone jack. After everything is connected up, a well-detailed instruction manual gives you everything you need to know about how to program the numbers and how to make it work for you. There's even a secret button that keeps unauthorized users from ringing up the numbers on your phone list while you're away! You've gotta try it to appreciate it.

Several phone companies wrote in, indi-

cating that they had more memory capabilities in their equipment than I mentioned in a previous article for a competitor. Indeed so; there are now telephone dialers that will store up to 200 phone numbers, including those seemingly endless extra-long ones for the extended dialing networks.

If you're looking for dialers, be certain to double-check that they can hold the quantity of numbers necessary to completely dial each phone number. Some "bargain brand" dialers can memorize only the standard set of 11 numbers. However, if you use some of those new low-cost extended dialing services, it may require up to 17 numbers! Better dialers will hold all of these numbers for each phone number programmed.

Zoom Telephonics

"You obviously don't know about our Demon dialer, which has many features that far surpass the dialers in your past articles. Our Demon 176T stores up to 176 numbers, and any number can be up to 32 digits long," comments Frank Manning, President of Zoom Telephonics in Boston, Massachusetts. You have probably seen many pictures of their "Demon" automatic dialer, and from what I have seen, it's quite a machine. It will even continue to doggedly attempt contact with busy numbers for up to two hours until it finally gets through! Or, if someone is not answering their phone, the Demon dialer will call every 10 minutes for up to 10 hours, letting you know when they come home and answer the phone! I am always amused at their ads—they show their dialer in a tantalizing clear Lucite enclosure, but note that the regular dialer sold to the public comes in an opaque enclosure. Why not give the public what they want as a see-through telephone dialer and quit tempting them with something beautiful that they can't have? After all, there are several sellers of clear see-through telephone equipment that folks really go crazy over!

One of the most comprehensive catalogs of telephone and telephone add-ons is from the Sharper Image®, 406 Jackson Street, San Francisco, CA 94111. Request their catalogue "Phone Book™." This exquisitely produced wish-book is in full color, and features the latest in exotic and useful telephone gadgetry.

Sounds Strange!

All of this new technology is not without a few problems. You may find that your new telephone picks up some strange sounds. Maybe the CBer next door or the ham radio



No more ringing with this attachment.

operator down the street begins to creep into your conversation. Some of the less expensive telephone devices have only minimum shielding and little or no circuits to trap out stray RF signals from these radio operators. Calling your local phone company may do no more than bring about a special RF trap at the incoming phone line box on the side of your house. If the interference is coming in on your own equipment, you are probably out of luck. You may wish to write the manufacturer, but many claim that it's the other guy's fault, and suggest that you tell him to stop transmitting over your telephone gear. Approaching an amateur radio operator or a CB radio operator with this in mind will only result in someone laughing in your face.

Repair Problems?

If your phone accessory equipment goes out, it's going to take more than a call to 611 to bring a repairman. You will probably need to take the gear back to where you bought it. Make sure you only buy from reputable phone dealers that provide service on their equipment if it should fail. Although there really isn't very much that can go wrong with your telephone setups, still make plans in the event they may need repair. Thanks to the hard working equipment that Ma Bell used to supply to us, plus their fantastic repair service, I'm afraid that we have become spoiled into thinking that all telephones are totally infallible.

Long Distance/Short Temper

On a separate subject, I wonder why long distance telephone calls these days are so especially lousy? You would think with all of the expensive newfangled satellites and microwave circuits, a simple coast-to-coast call should be as natural sounding as calling next door. Rarely do I get a long distance call that sounds even remotely like a local call. Usually there is an agonizing one second gap in when I talk, and when they talk, and then we both interrupt. This one second gap is no fault of the home telephone apparatus—but rather in the circuits between the caller and the callee. We usually spend half the time interrupting and uninterupting each other, waiting for the other person to talk, and then waiting for the delay, and then both talking at the same time, only to repeat everything that we just said. It appears that today's long distance telephone call is going back to the

old days of first you talk, then I talk, saying "over" at the appropriate time. These calls also contain voice echoes. Wow! I would appreciate if some kindly long distance expert would tell me what in (or out of) the world is going wrong with simple duplex long distance circuits! They sounded better ten years ago than they do now.

Finally on to cordless telephones. Manufacturers were definitely not pleased with my comments here last June regarding the probable dropping of cordless phone prices when new frequencies come out. They carefully avoided any mention about the real problem of congestion on the present five channels. In fact, no one made any mention at all of the over-crowding situation. It's as if they didn't even know it was there. For those of you with a cordless phone, how many times have you heard your phone ring, only to discover it was the sound of your next door neighbor's phone being dialed? I routinely hear three or four different conversations at the same time on my phone—thanks to a telephone sale at the local phone supermarket down the street. Everybody on the block is on Channel A. This makes for some juicy listening late at night!

The FCC is proposing 10 new duplex channels in the 46.6 to 47.0 MHz and 49.6 to 50.0 MHz region. Cordless telephone manufacturers were quick to respond to their notice of proposed rulemaking No. 83-325.

"We urge the Commission to adopt this proposal without further amendment," comments Electra Company. AT&T called the FCC proposals "clearly in the public interest." Mura, a leader in cordless telephones, said it supports the FCC proposals in general but feels that we need 26 more channels, not just 10.

Have you ever wondered as to whether or not someone might make a telephone call over your gear from the next house down? General Telephone and Electronics has that same worry, too. "Cordless phones should include a security device or mechanism to assure that only authorized users will be al-

lowed to access the base station." Not a bad idea. Better cordless telephones today already have this feature built in, generally found on phones that sell for more than \$150. If your instruction book calls for a setting of several dip switches between the handset and the base unit, you have a selectable security device. Read over your literature and you will probably find that several high-quality phones have some sort of system intended to lock out unauthorized users. Most cordless telephones cannot be accessed when the companion handset is actually hung up in the charger.

Uniden, definitely a giant in the cordless telephone industry, points out to the Commission that there is indeed a problem on the present five channels by indicating "without further interim or permanent relief, cordless phone users will once again face the same problems of frequency congestion that currently exist." . . . "Frequency congestion that currently exists" . . . need we say more?

When the new channels hit, the present cordless phones on the existing five channels will go like hot cakes despite what any manufacturer or retailer may now admit.

Many of the manufacturers who returned comments to the FCC proposal of 10 new channels echoed Mura, that there is a need for more than only 10 channels to give relief from cordless telephone interference. By 1990, it is expected that one out of every four households will have a cordless phone system. Maybe we'll get back to the old party line system and everyone will have to wait until the channel is clear before initiating a phone call! Or maybe you'll have to ask for a "break" from "channel master" like they used to do on CB!

This is the year of the phone, most certainly. This new technology has few drawbacks and a bucketful of benefits. Even the crowded cordless telephone channels can still hold a few more million users. Just be sure and buy your phone from a supplier that will allow you to swap channels in case your neighbor is on the same frequency.

I'll keep you up to date on the latest in phone news.

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CIRCLE 86 ON READER SERVICE CARD

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

After displaying RTTY on the video monitor for a period of time, it soon becomes desirable to have hard copy output. One wishes to spend more time reading or pondering over a displayed item without losing a potentially interesting topic following this. Most terminal units with video output will simply scroll the display, moving the top-most line off the screen and finally losing each line successively. Keeping this fact in mind, saving data for future retrieval can be done by storing the data on an audio cassette, disk memory, or hardcopy.

Using an audio cassette is the lowest cost approach since the direct receiver audio output is tape recorded. Mark and space tones are 2125 Hz to 2975 Hz—well within a low cost tape recorder passband. A simple audio switch can be used to select an audio demodulator input from either the HF receiver or tape output. Since many of the prime news RTTY signals are transmitted during the morning hours, a tape recorder with a built-in timer can be a boon for saving RTTY data. Of course, as we have discussed in last month's column, be aware of the slight frequency drift due to the receiver's stability or a change in the transmitter's frequency. Drift can significantly add to the bit error rate (BER) as exact tuning is quite important in receiving correct copy.

Using disk memory requires a computer system connected to the output of the demodulator and the resultant RTTY data is then displayed and selectively stored on disk. Calling at will from disk storage, the received text may be displayed at a future time. Of course, if one does not own a suitable, low noise (minimum RFI/EMI) microcomputer, this approach is more expensive than using a timer and tape recorder combination.

Selecting a printer becomes an important part for building a complete RTTY listening post. The selection of a printer requires knowledge of your demodulator's output capability. For example, certain low cost demodulators completely lack any printer output. HAL telereader demodulators offer a converted parallel printer output while Info-Tech has a RS232C compatible serial printer output. Quality demodulators offer internal Baudot or Morse code input conversion to ASCII output. Standard printer input data is normally ASCII at a specified baud rate (serial) or strobed parallel data.

Usually, lowest cost printers offer parallel input capability and serial compatibility requires additional PC boards/components with resultant higher prices. On the positive side, a serial interface is usually straightforward to connect and wire due to a simple three wire cable requirement as opposed to a nine wire plus cable requirement for par-

AFTER THREE WEEKS OF THE LOWEST SOLAR ACTIVITY IN FIVE YEARS, THE SOLAR FLUX IS RISING SLIGHTLY AGAIN.

IT REACHED 113 ON THE 17TH AND SHOULD GO SOMEWHAT HIGHER BEFORE TURNING DOWN AGAIN IN A FEW DAYS. GEOMAGNETIC ACTIVITY WAS LOWER AS THIS BULLETIN WAS ISSUED, SO SOMEWHAT BETTER CONDITIONS AND SLIGHTLY HIGHER MUF CAN BE EXPECTED ABOUT APRIL 20.

Printout of part of a WIAW RTTY broad cast. This was made on a dot matrix printer.

allel printers. HAL telereaders will print out an entire page—buffered by internal memory—if requested to do so at the touch of a pushbutton. This is very nice as one reviews screen text and decides to print out a page from the video display. This video page then becomes mirrored into printed text.

InfoTech offers adjustable RS232C data rates by changing an internal switch position. For example, ASCII output data rates can be varied from 110 baud to 300 baud by changing a DIP Switch setting. Keep in mind that any Baudot, ASCII, or Morse code will end up as a fixed (once the internal switch is selected) ASCII baud rate. This certainly simplifies selecting a printer since no changes are required on the printer. Important features such as ease of printer selection are often overlooked when purchasing a demodulator or terminal unit (TU).

Basically, there are two categories of printers—complete character impact or dot matrix. A droplet or vector print scheme is also used on expensive and exotic ink jet printers but certainly not in the RTTY preferred category. This is because printing speed is not a primary concern with 45, 50, or 75 band RTTY transmissions. Anyway, the most popular type of printer available is the dot matrix variety. This popularity is due to its low cost, high speed (over a full character printer), and character cell (font) capability.

Characters are created by firing certain print "needles" at a sequenced timing rate. The numeric character 1 is created by firing all vertical needles at a single time period and then not firing any print needles during the complete character time (or position). Matrix print models are available, which can print standard, embossed, bold, or custom characters. Legibility can be improved by using boldface and expanded font control with a dot matrix printer. Vertical needles produce vertical fixed dots and the expanded format is created by changing the print timing. Expanded or bold font is controlled

by internal microcomputers and is transparent to the user. The user simply selects the required mode and the printer responds.

Professional quality printing is accomplished by a fully formed or daisywheel printer. A daisywheel printer gets its name from the physical similarity to a daisy flower due to 96 or more spokes arranged in a radial fashion. Each spoke has a complete metal character and an embossed metal character strikes the ribbon when struck with the electromechanical hammer. The entire 96 character ASCII set is represented by each "spoke" of the wheel. Daisy-wheel printers lack the flexibility and the speed of the dot matrix type but the perceived quality of the daisywheel copy is excellent. Typical formed character printers range from 12 characters per second to 55 characters per second (CPS) at a cost of \$600 to 2,500. Dot matrix printers offer printing rates of 50 to 200 CPS at \$250 to \$600.

Knowing that speed is not critical for RTTY, the choice ends up being one of quality vs cost. If your budget allows a daisywheel printer, this is ideal. New low cost daisywheel printers, such as the JUKI model 6100 letter quality printer, have a retail price of around \$700 and a speed of 18 CPS. One of my favorite dot matrix printers is the Epson MX80 and the Teletype model 43—the Epson due to its price/performance characteristics and the Teletype model 43 for its reliability. Epson started out with the TX80 printer five years ago. Since then, Epson added the TX series, MX series, and the FX/RX series in response to the growing requirements of personal computer users. Between the sophisticated FP series and the low cost RP Series, Epson offers fully upward compatibility.

Normally seven or nine needle print heads were used to print alphanumeric characters with one pass of the print head. High resolution displays coupled with a need for high quality print creates a need for an increased number of print needles. The

new Epson FX-80 is approximately the same price as the older MX series—160 CPS vs 80 CS. The FX series uses a paper feed mechanism similar to the MX series.

One of the benefits of a dot matrix printer is the unique character sets that may be used. For example, experiments in printing CYRILLIC (Russian) text are possible with a dot matrix printer, microcomputer, and HF RTTY setup. If you would like to experiment with unique character fonts, select a dot matrix printer which allows redefining a character set (character generator) by specifying one byte codes. Prices have been dropping rapidly on dot matrix printers recently with the introduction of the Epson RX-80 printer and other \$250-\$500 dot matrix printers. We will continue to see a price erosion in printer prices which benefits all of the RTTY digital communications hobbyists.

Two passes of a dot matrix will create the equivalent of a higher resolution 18 needle character font but at half the print rate. A brief history of Teletype is interesting. Teletype was founded in 1907 (by the initial name of Markrum) in order to manufacture

a device that would print out telegraph signals, replacing the human who wrote down Morse dots and dashes. In the roaring 20's, the name was changed to Teletype after a merger of Kleinschmidt Electric and Markrum took place. In 1930, AT&T bought Teletype and it became a wholly owned subsidiary of Western Electric (AT&T manufacturing arm). Teletype actually manufactures most of the custom integrated circuits, including microprocessors in house.

This Skokie (Illinois) company uses reliable ceramic IC's and rugged print heads in the model 43. Newer models will print at a rate of 300 lines per minute.

Harold Van Dover mentions a very useful bulletin broadcast from the ARRL station WIAW. The basic information on late breaking ham news is included but most importantly (SS) a propagation forecast bulletin is transmitted. Listen 0100, 0400, and 2200 GMT daily and at 1500 GMT weekdays. Frequencies are 3625, 7095, 14095, 21095, and 28095 kHz. RTTY bulletins are sent at 60 and 67 wpm (170 Hz shift) and also on ASCII.

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RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE



Arkansas Police Facing New Radar Standards

A new state law may put thousands of law enforcement officers out of the radar gun business in Arkansas.

Until March, any certified law enforcement officer in the state could use a radar gun, and legally arrest speeders.

The bill was signed by Governor Bill Clinton on March 22, 1983 and became law the next day. It not only limits the use of the radar guns to full-time, certified law enforcement officers, but also requires all affected officers to take a 40-hour training course and obtain a certificate.

Harold Zook, administrator of the State Law Enforcement Standards Commission, which certifies law enforcement officers, said he would estimate the number of small town law enforcement officers using radar in the thousands. But he said he had no way to determine that accurately, since any law enforcement officer who is certified as a part-time or full-time officer could issue a radar ticket, before the law was signed.

Until the 1983 Legislature changed aspects of the State Enforcement Standards Law, many small Arkansas towns would hire part-time law enforcement officers, working less than 40 hours a week, and the cities would be required to give them only 40 hours of training to be certified.

However, part-time law enforcement officers now are ineligible to use radar guns. To be a full-time law enforcement officer and use a radar gun, under the new law, a person must have more than 300 hours of training plus the 40-hour course in the proper use of the radar gun and meet other standards set by the state.

To the best of his knowledge, Zook said, most officers outside the state's larger police departments have not been trained in the use of the radar gun.

Zook also said that according to the new law, police officers were not given a grace period in which to comply. Apparently, any traffic tickets based on radar detection since that time must be made only by the officers who have completed the training.

All state patrolmen have completed the radar training along with some of the larger police departments such as Little Rock and North Little Rock.

Speeding? Not I, Says Other "Half" Of Driver

New Jersey State police have twice handed out speeding tickets to a motorist in Morristown who drives from the passenger seat at speeds up to 90 mph and claims to have a split personality.

"He was originally stopped in Chesterfield Township and was clocked going 90 mph," trooper R. Gilbert said recently.

Ohio Judge Questions K-55's Predecessor

Recently, Ohio State Troopers in the Defiance, Ohio area traded their K-55 radars for older MR-7's.

They may wish they had waited!

The legal conflict which led to the trade—a local court ruling that the K-55 may be inaccurate when used in a moving patrol car—has widened. Defiance Municipal Judge Anthony DeJute, the decision's author, is questioning the K-55's predecessor.

Within the last few weeks, DeJute dismissed speeding cases based on MR-7 readings taken by Ohio Highway Patrol Troopers.

Declaring that "there has never been a test case on the MR-7 in this court," he said it is "going to be considered not dependable" unless an officer also clocks a defendant with his speedometer or "the speed is so great that it is readily observable."

The city's prosecutors promise an appeal. The local Patrol commander counters with a statement linking speed to highway deaths.

But what they see as a confrontation between court and cops, DeJute considers only a natural extension of the original K-55 case.

The whole flap arose last May, when Ohio's third appellate court ruled on a speed case originating in Auglaize County. The appeals justices said the K-55's reliability had never been proven to them. They refused to take judicial notice of it in the absence of evidence.

After a three-day trial in February, he

ruled on April 14th that the K-55 is reliable when used in a stationary cruiser or with supporting evidence. But its reading alone in a moving cruiser, he said, is not good enough.

For now, it looks like DeJute will find defendants innocent when they plead no contest to MR-7 arrests, just as he initially did with the K-55. He will continue to do so until the city appeals or finds an MR-7 test case.

Some questions have been raised about the propriety of DeJute advising defendants to plead no contest in MR-7 cases. He shrugs off such doubts.

"In all fairness, the pleas have to be explained to the defendant." Though it might be technically incorrect, "I consider it more proper to advise a defendant of the result of his 'no contest' plea than to allow him to plead guilty out of ignorance."

He denies that he is handicapping police—"They still have their visual observations, their speedometers"—or seeking a confrontation. Instead, he considers it a matter of judicial duty.

"I don't want to come off as a maverick judge who says 'The hell with the third district court.' But as I interpret the facts, I have a duty to determine if this MR-7 is reliable or not."

To do that, it will "have to be proven reliable to me through the same process" as the K-55. That promises to be an expense, if nothing else. Proving—to DeJute, at least—that the K-55 isn't reliable cost more than \$5,100.

"The trooper stopped him and he was sitting in the passenger seat and he said he had a split personality," Gilbert said. "He said the other guy was driving."

The trooper gave the man, identified as Mario Maldonado of Philadelphia, two tickets and had the car impounded because Maldonado allegedly was driving without a license.

But Maldonado got the car, a Pontiac Firebird, back and was stopped again after allegedly whizzing up the New Jersey Turnpike at nearly 80 mph.

"We don't know how he got his car back. By the time the trooper caught up to him he was already out of the car," Gilbert said.

Wisconsin Computers Can Clock Your Speed

The Wisconsin Court of Appeals recently upheld the use by police of VASCAR time-distance computers to clock speeders.

The Appeals Court rejected a challenge to the device raised in an Ozaukee County speeding case.

Similar unsuccessful challenges have been raised by lawyers in speeding cases involving radar.

In the Ozaukee County case, Howard M. Frankenthal, of DePere, sought to bar from evidence the VASCAR reading upon which a speeding ticket was issued to him by the State Patrol on the ground that the state had not shown that the device was accurate.

The Appeals Court upheld Ozaukee County Circuit Judge Warren A. Grady, who allowed the VASCAR reading to be used. Frankenthal was found guilty after a jury trial.

The device was presumed to be accurate, and it was up to the defense to prove otherwise, the Appeals Court said.

VASCAR, which has been used in Wisconsin by the State Patrol for at least 11 years, stands for "Visual Average Speed Computer and Recorder."

The operator uses the device to record the time it takes a car to travel a measured distance; the car's speed is then computed by the device.

Amateur Lawyer Wins 24th Case

A grizzled, self-styled "lawyer" specializing in radar speedtraps won his 24th court case recently and he's never seen the inside of a law school.

Phillip M. Bowler Sr. of Burlington, VT, landlord, race-car enthusiast, and amateur lawyer, hauled the Vermont Criminal Justice Training Council into court to get public records pertaining to police officer radar certification the council had refused to provide.

After an hour-long hearing before Superior Judge David Jenkins in Chittenden Superior Court, Bowler, 45, got what he was after.

He was given the names of state and Chittenden County police who have been certified by the council, the names of the certified teachers at the police academy, and the syl-

labus used by the council to instruct police in using radar machines.

He based his request on Vermont's law governing access to public documents. Before going into court, Bowler was confident about his chances for success.

Bowler, 6 feet tall with a long salt-and-pepper beard and equally long hair, believes the information vital to a "data base" he is building in support of his case against the increasing use of radar speed-sensing devices by police.

He claims both that police using the devices are inadequately trained and that the machines are not always capable of measuring the speed of an oncoming car.

He says the four hours of training required for certification in Vermont are but a drop in the bucket when compared to the 40 hours recommended by the National Highway Traffic Safety Administration.

Bowler, who gives free assistance to defendants who have been issued speeding tickets, says he has been on the winning side of 24 court cases involving the police use of radar.

He said he has only lost one case. "And that was a jury trial," he adds.

"When I say I helped these people, I told them what I did in my case," he says of a case he argued for himself several years ago after being stopped for speeding.

"I tell them they can go through the court system themselves and that there is a pretty high probability of winning."

So pleased is he with his track-record in court, he is considering undertaking the four-year law study clerkship required of those who have not attended law school and want to be lawyers.

"The use of radar is the biggest abuse of police power in Vermont I have ever seen," he says. "Officers are going out and picking up motorists all the time."

Bowler, who has advanced degrees in Business Administration and speaks three languages, would not be without a radar detector in his automobile.

He says he has spent more than 600 hours of his own time researching radar devices and court cases in Vermont and elsewhere. It seems clear from his determination that he plans at least 600 more before he is through.

Voided Ticket Costs Driver \$6,000 In Fees

So what's a clean driving record worth, anyway?

Not \$6,000, Robert Langford says.

The price of innocence—or proving it—can be too costly, Langford has learned.

Langford had his day in court recently and won, but the victory for his driving record carried a \$6,000 tag in legal fees. Admitting guilt would have only cost him \$150.

On April 28, 1981, Langford was returning from a dinner engagement with three women in his car when he was pulled over by a Jackson, MO police officer and charged with traveling 55 mph in a 40 mph zone on Highway 61.

"I honestly wasn't speeding," Langford said.

He took the case to court and was fined \$150 but appealed on the grounds that there was no evidence the radar gun wielded by Lt. Lary Koenig was accurate.

The Mississippi Court of Appeals in St. Louis agreed.

In retrospect, Langford advises others to let economics outweigh principles.

More Texas Speedtraps

Spelndora and Patton Village are tiny towns, but it's a cinch to find them. Just head north on U.S. 59 and pull over when everybody's brake lights start flashing.

The 55 mph speed limit means just what it says in both cities. The welcome wagons here have a cherry on top and an unforgiving radar gun inside.

"Everybody seems to hate us," said H.L. Patton, the man for whom Patton Village was named. "They talk about us in every filling station from Lufkin to Corpus Christi."

"All of our police cars are in plain view. So we're no speed trap," Patton Village Mayor Pro Tem Wilson B. Holder said. "All we are doing is enforcing the law."

But there is more to the story than that. In both Patton Village and Splendora, the police chief takes the place of the tax assessor-collector. Neither town has raised a dime through property taxes, but each takes in thousands of dollars in traffic fines every year.

In Splendora, for example, 85 percent of the \$315,000 general fund will be underwritten by heavy-footed visitors this year. Paton Village projects a \$240,000 budget, with 76 percent coming from the highway.

Splendora Mayor Lucas said highway patrols are the only answer in a humble town where residents can't afford to pay their own policemen. "So many people are unemployed everywhere, they just can't pay," he said. "If we could get our income from sales taxes or something else, we would."

"There are lots of elderly people here with fixed incomes and large tracts of land," said Splendora Alderwoman Hazel McCracken. "Traffic fines are not the best way to raise money, I grant you, but taxing the citizens would be too much of a burden."

We Can Always Count On Wisconsin!

Wisconsin State Senator Daniel O. Theno introduced Senate Bill 204 (co-sponsored by Ulichny and Gilson) to prohibit the use and sale of radar detectors.

According to the bill, the presence of a radar detecting device in a motor vehicle would constitute prima facie evidence of a violation. The penalty would be a forfeiture of not less than \$10, not more than \$200.

Again, any help to kill this legislation would be greatly appreciated. Please address your letters to the following: Senator Carl Otte—Chairman, Transportation Committee, State Capitol, Madison, WI 53702.

INSIDE THE WORLD OF TVRO EARTH STATIONS

Direct Broadcast Satellites – The Not So Distant Wave Of The Future

In the July issue of *Popular Communications*, we took a look at the new generation of Ku-Band satellites planned for launch within the next three years. Although these birds will operate in the 11.7 to 12.2 GHz band designated for the Fixed Satellite Service, they will be technologically capable of supplying interim DBS services throughout North America until the high powered DBS satellites are ready to fly toward the latter half of the decade. Last year, United Satellite Communications Incorporated (USCI) announced their intentions to become an early DBS operator by using a Canadian Ku-Band bird. Within the last few weeks, two additional companies have made public their plans for the launch of interim DBS services during the next year.

Why is the FCC allowing DBS services to sprout up in the 11.7 to 12.2 GHz band, when these frequencies were allocated for a Fixed Satellite Service at the 1979 World Administrative Regional Conference (WARC)? At a recent international satellite television symposium held in southern California, FCC Commissioner Henry Rivera said that the use of these lower frequencies would be an efficient use of the available spectrum and would bring direct-to-home satellite TV services to the American public much sooner than originally anticipated. A footnote to the 1979 WARC agreement does permit fixed and broadcast satellites to share this portion of the spectrum.

The initial announcement by the FCC that it would allow the use of the 11.7 to 12.2 GHz satellites for interim DBS services brought screams of protest from the companies that had invested in the lengthy licensing process required for operating in the 12.2 to 12.7 GHz DBS band. COMSAT—the U.S. signatory to the International Telecommunications Satellite Organization (INTELSAT)—and her DBS subsidiary, the Satellite Television Corporation (STC), were incensed over the matter and sought to block the interim DBS efforts through petitions to the FCC and litigation in the courts. However, now that it looks unlikely that these interim DBS efforts can be blocked, STC has announced plans of its own to counter with an early service of its own.

Although the possibilities of using geostationary satellites for the direct broadcasting of programming into the home was first envisioned by pioneer Arthur C. Clarke in 1945, it only recently became technologically possible and economically feasible to implement it. Through the experimentation conducted by today's C-Band satellites and because of the major cost reductions achieved in the manu-



This model ESR-120 12 GHz all-polarization antenna is made by Seavey Engineering Association, Inc.

facturing of microwave electronics, DBS hardware has become a reality. DBS is a perfect illustration of ephemeralization—a basic principle of high-tech guru Buckminster Fuller. As technology evolves, it will be possible to have greatly expanded production from ever decreasing amounts of raw materials and power sources. A single DBS satellite can now replace an entire network of hundreds of affiliate stations around the country which retransmit programs received from network TV broadcasters.

STC was the first corporation to propose to the FCC the idea of using satellites for direct broadcasting into the home back in 1980. Last year, STC and eight other applicants were given the go ahead for the implementation of DBS services in the 12.2 to 12.7 GHz DBS band. STC's original plans called for the construction of a series of high powered satellites to be launched starting in 1986. These satellites are now being manufactured by RCA Astroelectronics. When completed, STC plans to co-locate two DBS satellites per orbital location. With each bird transmitting three channels, it will be possible for STC's subscribers to receive a total of six channels from either the eastern or western orbital position.

However, STC has been forced into initiating an interim DBS service by the manu-

vers of USCI and IAST. USCI announced in late 1982 their plans to use a Canadian satellite for a medium powered DBS service to begin in late 1983. This service is to be supplied by the Canadian satellite ANIK-C2, which has been leased under an FCC/Telesat agreement until additional American Ku-band birds are up and flying by the end of 1984. At that time, USCI's services will transfer to an American owned GSTAR satellite.

USCI's end-run of the entire regulative process that had been tackled by all other DBS proponents put this infant industry in a dither. Although STC was the first company in the world to propose a DBS service, it could very well see USCI grab a large share of the potential market long before STC's birds would be ready to fly. In order to counteract this, STC has decided to move ahead with an interim DBS service of its own, using one of COMSAT's own satellites.

Satellite Television Corporation has announced plans to offer 6 channels of DBS TV programming throughout the northeastern region of the U.S. starting in October, 1984. Utilizing a fully-encoded and addressable scrambling system, STC will offer a smorgasbord of movies, sporting events, news, special entertainment events, and pay-per-view programs. STC will be using 6 transponders on the SBS-4 satellite, which will be launched in August, 1984. Although the SBS (Satellite Business System) birds were not originally intended for the direct broadcast of television signals, they are capable of delivering a medium power signal into sections of the country.

Initial coverage of STC's interim 11.7 to 12.2 GHz DBS service will be bordered roughly by Norfolk, Virginia; Burlington, Vermont; and Pittsburgh, Pennsylvania. Those locations which lie only marginally beyond these boundaries will still be able to receive their services, albeit with a four foot or larger antenna.

COMSAT has ordered the modification of the SBS-4 beam pattern to allow an even more powerful footprint pattern than supplied by the earlier SBS satellites. This modification will allow STC to use two foot diameter dishes for all DBS earth stations within the primary coverage area. STC's total earth station package will be compatible with those DBS birds on line for 1986, so no upgrading of the equipment will be necessary in the near future. To achieve compatibility, STC's receivers and LNAs must be broadbanded enough to tune into not only the 11.7 to 12.2 GHz frequencies that are available starting in 1984, but also the 12.2 to

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The new HBO ground communications station at Hauppauge, New York under construction last summer. (Photo by Tony Earll, KNY2AE)

12.7 GHz DBS band which will be used by the true DBS birds of the late 1980's. If the hardware is produced as it is now envisioned, the only modification necessary following the transfer of the service in 1986 will be the realignment of each terminal's dish antenna to the new orbital location of the satellite.

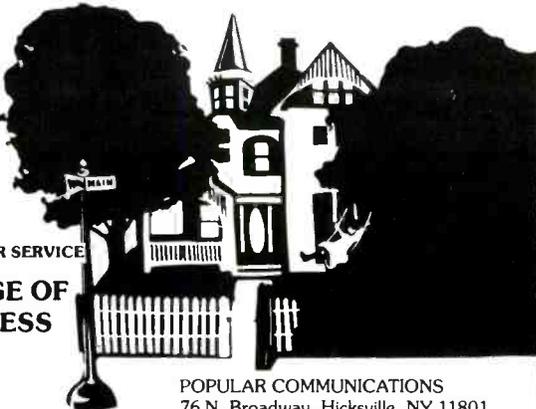
STC's announcement came hard on the heels of a similar declaration by Inter-American Satellite Television Network (IAST). IAST has leased five transponders on the Satellite Business Systems SBS-3 bird already in geostationary orbit. IAST will begin uplinking their DBS service via SBS uplink facilities in Los Angeles starting this fall.

IAST is a joint venture with News Satellite Television Ltd., a British company owned by publishing magnate Rupert Murdoch. William Kommers, President of IAST, has indicated that his company's service will offer television distribution to subscribers primarily in thinly populated areas of the low 48 states where television services are not available and not likely to be available in the near future.

"Satellite television distribution is an exciting new opportunity for delivering high quality programming to non-cabled U.S. households." While more than 80 million American homes have televisions, only 55 million homes are equipped with cable. Many of the remaining 25 million homes without cable are in rural areas that are unlikely to ever be wired because of the high costs involved.

IAST's five channel service will include at least one movie channel and a menu of news, entertainment, and cultural programming such as is commonly available to cable subscribers. Transmissions will be scrambled and will be available only to subscribers who purchase or lease dish antennas and decoding equipment. Financing for IAST's DBS venture is primarily being provided by Rupert Murdoch, the Australian businessman who already holds interest in the *New York Post*, the *Boston Herald*, the *San Antonio Express-News*, the *Times of London*, and television stations in Australia.

Earlier this year, IAST spent several weeks conducting tests via SBS-3 satellite



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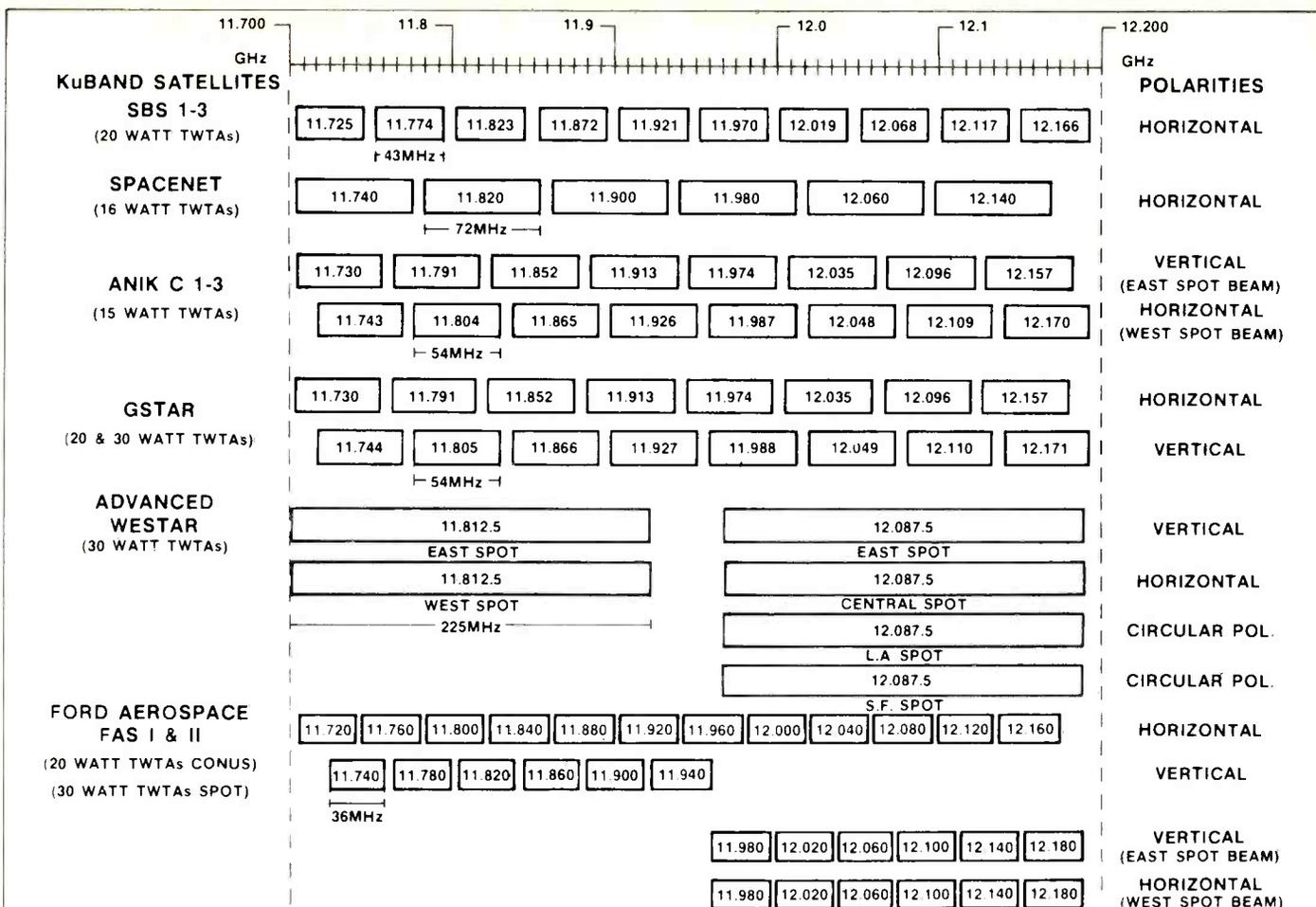
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And how do these developments affect the booming activity on C-Band for private terminals in the 8- 10 foot range? With over 70 channels of television programming readily available and no subscription payment system in hand, C-Band satellite earth stations remain a highly attractive product. Scrambling for all but a handful of channels remains unlikely in the foreseeable future. Even the new DBS services will begin by tapping existing cable programming for use on their 12 GHz systems. Many consumers will not opt for DBS when C-Band reception is much more attractive. Still many consumers will welcome the 2-4 foot dish sizes which will open up urban installations which have limited space for an earth station installation.

However, one major advantage that K-Band satellite transmissions will have over their C-Band counterparts is that K-Band signals will not be subject to terrestrial microwave interference in urban areas. Unlike their C-Band counterparts, which must share frequency space with microwave services for the telephone company, airports,

and the military, K-Band satellites will have little competition from earth based K-Band microwave services. Rain attenuation will be a factor in areas which experience high rainfall levels, since K-Band signal strength is much more affected than C-Band signals currently are.

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. Price: \$9.95 plus \$1.00 for shipping and handling.

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FCC ACTIONS AFFECTING COMMUNICATIONS

Authorize Frequencies For Wildlife Tracking In The Forestry Conservation Radio Service

The FCC amended Part 90 of the rules to allow the use of Forestry-Conservation Radio Service frequency bands for wildlife tracking telemetry.

This proceeding was initiated in response to a petition for rulemaking filed by the State of Oregon Department of Forestry (Oregon). Oregon is presently using Forestry-Conservation Radio Service frequencies under a Part 5, Experimental (Research) authorization which requires that the license be renewed every two years. In its petition, Oregon requested that it be allowed to use the same frequencies under a Forestry-Conservation Radio Service authorization, where renewals are required every five years. Oregon stated that the longer license term would reduce the paperwork and administrative efforts of both the licensee and the Commission.

In allowing the authorization of frequencies for wildlife tracking telemetry in the Forestry-Conservation Radio Service, the Commission adopted a procedure which requires licensees to notify the Commission of the number of transmitters in use for wildlife telemetry, by frequency, on their application for renewal of their base/mobile radio system authorization. Separate licenses for wildlife tracking transmitters on Forestry-Conservation Radio Service frequencies will no longer be required.

Private Local Distribution Services Authorized At 2.5 GHz And In 21.2-23.6 GHz

The FCC affirmed an earlier decision to allow licensees in the Private Radio Services to deliver products to their customers.

On May 7, 1981, the Commission amended its rules to permit licensees in the Private Operational-Fixed Microwave Radio Service (OFS) to operate private local distribution services to deliver their products and services to customers. The new rules allowed OFS licensees to distribute to consumers such products as motion pictures and music or services such as computerized information using three channels in the 2.5 GHz band for point-to-multipoint transmissions and using the OFS bands above 13 GHz for point-to-point transmissions.

In response to this action, the FCC received approximately 1,400 applications proposing to establish systems in the 2.5-2.69 GHz band. Most of the applicants applying for the three OFS channels desired to use the frequencies to distribute motion pictures and other video entertainment material to their customers.

The Commission also received two petitions for reconsideration, one filed by Cablecom Corporation and the other by the Central Committee on Telecommunications of the American Petroleum Institute.

When it adopted the original report in this proceeding, the Commission said, it concluded that video entertainment distribution on a point-to-multipoint basis should be limited to the three OFS channels at 2.5 GHz.

In the decision on reconsideration, the Commission said that it did not believe the bands at 13.2-13.25 GHz and 18.36-19.04 GHz should be made available at this time for video entertainment distribution services since this spectrum is already under consideration as a likely alternative for accommodating the OFS licensees who will be displaced from the 12.2-12.7 GHz by the Direct Broadcast Satellite service (DBS).

However, the Commission said, congestion was not a problem in the 21.2-23.6 GHz band, where many more entertainment systems could be accommodated than at 2.5 GHz. The FCC could also allow multiple channels per applicant if a requirement for more than one channel could be shown. After considering this matter, there appeared to be merit in modifying the earlier decision by designating the 21.2-23.6 GHz band and higher OFS bands as the appropriate locus for the operation of these private service systems that would deliver video entertainment products to their customers.

Accordingly, the Commission imposed a two year prohibition on distribution of video entertainment material on the three OFS channels at 2.5 GHz. In the meantime, it will act on applications in the Private Microwave Service which request the use of frequencies below 21.2 GHz and do not involve the delivery of video entertainment directly to customers or to the ultimate customer delivery system.

Additional Frequencies Proposed For Emergency Services In Wartime

The FCC proposed making additional Amateur Radio Service frequencies available to the Radio Amateur Civil Emergency Service (RACES) when the president's war emergency powers have been invoked.

RACES is conducted by amateur radio operators who provide emergency radio-communications to local, regional, or state civil defense organizations. Ordinarily, RACES shares Amateur Radio Service frequencies. During a war, the Amateur service could be completely suspended and the frequencies reassigned to the government. RACES, however, would continue on some of the Amateur frequencies now shared.

On behalf of the Defense Department, the National Telecommunications and Informa-

tion Administration requested more frequencies for RACES under war emergency conditions. The Federal Emergency Management Agency (which would manage RACES during a declared national emergency) supported the request.

Besides the additional frequencies, the Commission also proposed some related changes in the operational rules governing RACES.

Amateur Radio Service Rules Streamlined, Clarified

The FCC has streamlined and modified some of its Amateur Radio Service rules to delete unnecessary rules, make editorial modifications of rules for clarification, amend rules to relieve a restriction or codify a provision of the Communications Act.

Due to the nature of these amendments, the notice and public procedure requirements of the Administrative Procedure Act may be dispensed with.

The changes include:

- Deleting Section 97.32 (f) which prohibits the renewal of Interim Amateur Permits, since renewals may be justified in circumstances where there is an extraordinary delay in the issuance of permanent amateur operator and station licenses;
- Revising Sections 97.13(c) and 97.13(d) to correct an omission in order that amateur operator license renewal applicants may submit a photocopy of their license in place of the original;
- Deleting Section 97.69(a) (3) and revising Sections 97.61(e), 97.69(a) (2) and 97.69(b) (3) to rectify certain unintentional inconsistencies in the recent FCC authorization of use of the digital code "AMTOR" on Amateur Radio Service frequencies below 50 MHz;
- Revising Section 97.99 to delete the reference to the obsolete Form 452-C;
- Revising Section 97.173(d) to change an incorrect reference;
- Adding a new paragraph to Section 97.81 which codifies into the rules the existing requirements of the Communications Act that specify that the Commission has the authority to inspect all radio installations subject to the provisions of any Act, treaty, or convention; binding on the United States; and
- Revising Section 97.84 to allow station identification for amateur stations to be made by video when specific transmission standards are used, or, under some circumstances, by using certain common digital codes. This will relieve a number of burdens amateur operators have faced when required to identify "packet radio" transmissions, television transmissions where audio cannot be practically transmitted on the same operating frequen-

cies, and transmissions where international third party traffic is exchanged and identification of the station being communicated with is required.

Log Requirements For Amateur Radio Service Eliminated

The Commission eliminated routine station log requirements for the Amateur Radio Service and made several related changes in FCC rules.

The Commission said the changes would eliminate most of the record-keeping burden previously placed on amateur operators. It estimated that the 413,000 licensed amateurs would save more than 300,000 hours annually. The 7,000 to 9,000 amateur operators of repeater stations who ordinarily tape record their third party messages to satisfy the logging requirements will be relieved of that substantial burden and expense.

There is no official need for a record of routine station activities. It noted that it rarely used the information recorded in amateur logs, preferring to rely instead on data collected by monitoring. The FCC on its own initiative proposed the rulemaking in October 1982.

The rule changes permitted amateur licensees to keep the few records which the FCC will continue to require in any form that can be made readily available to the agency. Those records primarily concern repeater and auxiliary operation and operation by remote control.

The Commission removed a number of implied operational requirements from the logging rules and placed them in the amateur rule sections to which they apply. It also authorized the Engineer-in-Charge of FCC field facilities to require specific individual station licensees to maintain a record of their station operations for enforcement purposes.

Nothing in the rule changes, the FCC noted, would prevent an amateur licensee from maintaining a station log or including in it any information the licensee chose to keep.

Unnecessary Record-Keeping Requirements Eliminated In Maritime Services

The Commission amended Parts 81 and 83 of its rules to eliminate unnecessary reporting, record-keeping, and retention requirements in the Maritime Services.

In Part 81, the Commission deleted the necessity to maintain logs and certain documentation for all maritime stations, other than public coast stations, since these records are seldom, if ever, utilized for any regulatory purpose. In addition, the requirement to have on hand Parts 81 and 83 has been eliminated for these stations, as well as for Alaska-public fixed stations.

Furthermore, the Commission deleted notification requirements concerning certain changes in station location, emergency operations, discontinuance of station operations (other than public coast stations), and

the cooperative use of limited coast station facilities.

In Part 83 (Stations on Shipboard in the Maritime Services), the Commission eliminated the requirement for ships to maintain radio logs and specified documentation, except where based on requirements contained in treaties or statutes.

The changes also made it unnecessary for recreational boaters to keep a radio station log and have Part 83 available. Specified documentation relating to radar, emergency position indicating radiobeacons and auto alarms were deleted; and a number of log, documentation, and notification requirements pertaining to compulsory radio-equipped ships, as well as survival craft stations and on-board stations have been rewritten and simplified.

Reconsideration Of Establishment Of Direct Broadcast Service Denied

The FCC has denied the petition of the County of Los Angeles for reconsideration of the Commission's 1982 order that established initial rules and policies for the Direct Broadcast Satellite (DBS) service. The petition was filed by George Y. Tice, Director of Communications for the county, and was limited to issues related to the allocation of the 12.2-12.7 GHz band for satellite to earth transmissions in the DBS service.

LA County, a microwave fixed service user of the 12 GHz spectrum that may be required to move its operations to another band as a consequence of the allocation of the 12 GHz to DBS, contended that:

- The Commission allocated the 12.2-12.7 GHz band for DBS use without giving adequate consideration to the needs of fixed service users of the band;
- The associated terrestrial proceeding to accommodate the needs of existing 12 GHz fixed service licensees, outlined in the DBS order, would not protect adequately the needs of these licensees; and
- The FCC did not establish a procedure in the DBS order to compensate adequately fixed service licensees that must move from the 12.2-12.7 GHz band.

It was noted that LA County implicitly requested that the 12 GHz spectrum allocation be suspended pending full Commission consideration of the needs of fixed service users, and explicitly requested that it be suspended pending the conclusion of the 1983 Region 2 Administrative Radio Conference (RARC-83). At that conference, the United States and other regional administrations will adopt procedures for sharing of the 12 GHz spectrum for direct satellite broadcasting services within Region 2. LA County also requested that the terrestrial proceeding be structured to allow public comment on the spectrum allocation issue after RARC-83.

Allocation of the 12 GHz band for DBS use was made against the background of international and domestic spectrum allocation and planning and reflected not only careful consideration of all the facts and ar-

guments put before it, but also a commitment to mitigate as much as possible any dislocation the decision might engender.

The Commission found the 12 GHz band was the only frequency band available both internationally and domestically that would allow initiation of the service in the foreseeable future, and, unfortunately, that DBS and most existing terrestrial uses of the band were incompatible.

There was no reason to suspend the FCC's allocation decision until after RARC-83 since the only possible outcome of that meeting relevant to the domestic allocation decision is that the full 500 MHz of spectrum would be made available for DBS in Region 2. The only pertinent domestic consequence of this, it noted, would be to decrease the number of existing fixed service users that might have to move from the 12 GHz band.

The Commission concluded that LA County raised no new facts or arguments that would require modification of the Commission's DBS decision.

Additional Frequencies For Repeaters In 10 Meter Band Proposed

The Commission has asked for comments on its proposal to make additional Amateur Radio Service frequencies available for repeater operation in the 10 meter band (28.0-29.7 MHz).

It noted that expanding the available frequencies to 29.0-29.7 MHz would permit amateur radio operators to increase the number of channels for repeater operations.

The Commission pointed out that it is interested in receiving information on the need for repeater subband expansion, its impact on existing and future repeater and non-repeater operation and whether that impact would be acceptable to the amateur community.

Omnidirectional Antenna Use Proposed With 450-470 MHz Fixed Stations

The Commission has proposed to permit use of omnidirectional antennas with operational-fixed stations operating in the 450-470 MHz band and communicating with at least three receiving stations separated by 160 degrees or more of azimuth.

The proposed use would be on a secondary, noninterference basis to land mobile operations and would apply to all users eligible for UHF operational-fixed assignments.

The FCC acted in response to a petition by the Central Committee on Telecommunications of the American Petroleum Institute, which argued that use of omnidirectional antennas would enable its members to conduct routine telemetry "polling" of drilling site stations by a master station using only one frequency pair, a more efficient use of spectrum than at present.

The location of drilling rigs, onshore and offshore, is determined by the shape of an oil or gas field, and wells frequently are lo-

cated in a circular or nonlinear arrangement. Present rules requiring directional antennas for each fixed link require a separate system and frequency pair for communication with each well.

The Commission said needs for fixed systems, particularly those handling data, have increased substantially since the allocation of frequencies in 1968 and many fixed systems are located in offshore or remote areas lacking common carrier service. To use wideband microwave for links in such systems is costly, it said, and wasteful of spectrum, because of the narrow bandwidths required. Interference cases resulting from fixed station operations have been minimal and generally have been resolved expeditiously, it noted.

New Experimental Stations

The FCC took the following actions:

KM2XLE, General Electric Radio Services Corp., Lynchburg, Virginia. Experimental research station to operate on 861.2625, 862.2625, and 865.2625 MHz to research intermodulation problems either cable or antenna related as well as reliable problems stemming from installation situations or other system incompatibilities.

KM2XLR, Integrated Data Systems, Inc., Eastern Coastal waters, Gulf of Mexico and Western Coastal waters. Experimental research station to operate on discrete frequencies in 152, 157, 456, and 460 MHz

bands to provide a viable radio link to transfer seismic data from barge ship to mother-ship within 1-2 mile away.

KM2XLS, General Electric Company, Utica, New York. Experimental developmental station to operate on 9300-9600 MHz and 17250-17700 MHz bands to test feasibility of an all weather radar.

KM2XLT, University of Illinois, Urbana, Illinois. Experimental research station to operate on 40.92 MHz as required by contract with U.S. Govt.

KM2XLW, Motorola, Inc., Chicago, Illinois. Experimental developmental station to operate on 869.9875 MHz to conduct field strength surveys & propagation studies needed to design a wide area communication system involving the two-way transmission between hand-held portables and distant transmitter sites.

KM2XLX, Motorola, Inc., Chicago, Illinois. Experimental developmental station to operate on 869.9875 MHz to conduct field strength surveys and propagation studies needed to design a wide area communication system involving two-way transmission between hand-held portables and distant transmitter sites.

KM2XLY, Kokusai Electric Company of America, Montrose, California. Experimental developmental station to operate on 821, 822, 823, 824, and 825.7125 MHz to conduct research and experimentation needed to develop new products which will provide improved trunking technology.

KM2XLZ, Timex Clock Company, Middlebury, Connecticut area. Experimental developmental station to operate on 217.15 MHz to develop a remote fire alarm activation detector.

KM2XMA, Houston Lighting and Power Company, Houston, Texas. Experimental research station to operate on 952.3625 and 928.3625 MHz to simulate an actual operating supervisory control and data acquisition (SCADA) system via radio rather than telephone circuit.

KE2XMO, Gulf Radiotelephone and Electronics, Inc. Pasadena, Texas. Experimental developmental station to operate on 1636.5-1645.0 MHz to demonstrate the usefulness of the INMARSAT Satellite to members of the petrochemical industries.

KB2XSK, Hewlett-Packard Company, Waltham, Massachusetts. Experimental research station to operate on various discrete frequencies between 433.075 and 469.5625 MHz to develop equipment being exported to other countries.

KM2XLQ, Digital Paging Systems, Inc., Within Continental U.S., and Alaska and Hawaii. Experimental developmental station to operate on 151.625 MHz to demonstrate equipment to potential customers.

KM2XMB, Wulfsberg Electronics, Inc., Overland Park, Kansas. Experimental developmental station to operate on 454.675, 454.725, 459.675, and 459.725 MHz to develop airborne radiotelephone system to allow for automating call placement process.

KM2XMC, King Radio Corp., Lawrence, Kansas. Experimental developmental sta-

tion to operate on various discrete frequencies between 30.70 and 861.9875 MHz to develop product line equipment.

KM2XMD, Westinghouse Communication Services, Inc., Sunnyvale, California. Experimental developmental station to operate on 10650 MHz to field test a SYNAPZ Business Local Distribution System.

KM2XME, Westinghouse Communication Services, Inc. Experimental station on 10650 MHz to field test a SYNAPZ Business Local Distribution System.

Applications For 800 MHz Private Land Mobile Frequencies In Detroit And Cleveland

On February 23, 1983, the Commission re-opened the filing window for 806-866 MHz private land mobile applications in the Detroit, Michigan and Cleveland, Ohio areas (See Public Notice No. 2582.) Applications were accepted from March 15 until April 15, 1983. The Commission stated that after April 15, 1983, it would no longer accept applications in these areas until another Public Notice was released indicating that applications would again be accepted.

This Public Notice again re-opens the filing period in the Detroit and Cleveland areas for the three non-Commercial pools of frequencies at 800 MHz (Business, Industrial/Land Transportation, and Public Safety/Special Emergency). In the Commercial pool (SMRS Category), new applications will not be accepted in Detroit and Cleveland because they already have applications on file for more channels than are available in that pool.

As noted in an earlier Public Notice, the submission of technical protection demonstrations is no longer necessary in Detroit and Cleveland because of the reassignment of the Canadian television stations that previously required protection. Effective today, therefore, applications in these two areas will be processed in accordance with the general procedures for all other areas of the country (See Public Notice No. 3526, released April 11, 1983.) All applications should be submitted to the Private Radio Bureau's Licensing Division in Gettysburg, Pennsylvania 17325. Applications will be stamped with the date they are received in Gettysburg. It is the date of actual receipt in the Gettysburg office that will control. Applications will not be time stamped.

Applications will be processed on a first received, first processed basis. All applications filed on the same date for an area will be considered together. If there are sufficient channels available to grant all applications filed on the same date for an area, they will all be granted. If there are not sufficient channels available to grant all applications filed on the same date for an area, the applications filed on that date will vie for the remaining available channels by comparative hearing or lottery, and all applications which were filed after that date for that area will be dismissed.

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CIRCLE 71 ON READER SERVICE CARD

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

One often finds that countries in the news aren't all that easy to hear on shortwave. Radio Lebanon is one current example. The Falkland Islands were a virtual impossibility during that crisis.

Up until a couple of years ago Israel was in that category, at least to some degree. Certainly the Voice of Israel was no Falkland Islands Broadcasting Service, but for ease in hearing it was no BBC or Deutsche Welle either.

With the addition of a couple of more powerful transmitters a few years ago, and, more recently, an expansion of broadcast hours, Kol Israel has moved up a few rungs on the ladder of accessibility.

The Voice of Israel is a direct descendant of The Voice of Palestine, the station operated by the British Mandate government between 1922 and 1948.

Once the movement for independence got underway in earnest, so did clandestine broadcasting in the form of the Voice of the Haganah, the underground station of the Jewish Independence Movement. A number of employees of the Voice of Palestine left that station and provided their services to the clandestine broadcaster.

With the arrival of independence in 1948, the two stations were combined to form the Israel Broadcasting Service which at first operated as part of the Ministry of the Interior and later under the office of the Prime Minister. Up until the mid-1950's, the shortwave service was known as The Voice of Zion.

In 1965 the station became an independent public operation, free of government interference.

The Israel Broadcasting Authority operates the transmitting facilities and the point-to-point services while Kol Israel (The Voice of Israel) provides any of the programming services.

In addition to shortwave, Kol Israel operates four program services. Program "A" on medium wave frequencies is in Hebrew and languages used by immigrants to Israel; Program "B" is a commercial service also aired on shortwave; Program "C" is a commercial, popular and light music service on medium wave; and Program "D" is an all-Arabic service aired on both medium and shortwave.

Kol Israel's shortwave services are aired over one 20 kilowatt, five 45 kilowatt, three 75 kilowatt, one 100 kilowatt, one 150 kilowatt, and four 300 kilowatt transmitters. Transmissions are beamed to Europe, the Mid East, South and East Asia, Australia and New Zealand, North, South, and West Africa, Western Europe, and the Americas in English, Hebrew, French, Spanish, Portuguese, Russian, and several less widely used languages.



kol israel

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**D-82 shortwave
programme
schedule**

7 Nov 82 - 6 Mar 83



The Voice of Israel sends program schedules to interested listeners four times a year.

Programming includes everything from news to a consumer magazine to tourist information, pop music, commentaries, a DX show, press review, lessons in Hebrew, phone-in program, and many more.

The latest English language schedule for the Voice of Israel looks like this: from 0000 to 0028 to 7.410, 9.815, 11.655; 0100 to 0128 on those same frequencies; 0200 to 0228 on 9.815, 11.655, and 12.025; 0500 to 0515 on 9.815, 12.025, 15.105, 15.485, 15.585, 17.685, 21.495, and 21.710; 1100 to 1130 on 11.610, 13.475, 15.485, 15.585, 15.605, 17.630, 17.685, and 21.495; 1800 to 1815 on 11.610, 13.725, and 17.585; 2000 to 2030 on 9.009, 11.655, 13.745, 15.485, 15.585, 17.630, 17.685, and 17.815; and 2230 to 2300 on 9.815, 11.655, 13.745, 15.200, 15.485, 15.585, 17.685, and 17.815. Frequencies are subject to change at any time, of course.

Reports on reception of Kol Israel can be sent to The Voice of Israel, P.O. Box 1082, Jerusalem 91010, Israel. Program schedules are also available from this address.

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No. 127

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BROADCAST SECRETARY

Mark Konen treasures this QSL from the Falkland Islands Broadcasting Station at Port Stanley.



One of the many attractive QSL cards issued by Radio Japan.

In The Mail

POP'COMM can take a bow for getting Geoff Davis of Columbus, Ohio back into DXing. Geoff is now using a Kenwood R-600 receiver and an MFJ-1020 active antenna which he says works well in his apartment. Geoff's main interest is in the tropical bands, especially the African stations. He hopes to see an article on African DXing. We can report that an "African Safari" is something we're going to present down the line somewhere.

Robert King of Austin, Minnesota also just recently got back into DXing, although his first go at it was back in 1971.

Joe Wright of Jamaica Plain, Massachusetts, is currently using a Radio Shack SX-190 and hopes to add an active antenna to his equipment.

School teacher Philip D. Reefer of Sacramento, California has been a DXer for some



Voice of Israel's map QSL card.

23 years and has quite a line-up of equipment, including a Hallicrafters SX-100, ICOM R70, and Panasonic RF4900. Philip also finds the tropical bands to be favorite hunting grounds.

A ten year DXing veteran is Victor Barz of Battle Creek, Michigan who uses a Kenwood R-1000 and would like to make improvements in his antenna system. He has plenty of space in which to experiment. Like receivers, we can't make specific recommendations on antennas either but there are some useful books on the subject, including the *ARRL Antenna Book*, published by the American Radio Relay League and the *ABC's of Antennas*, published by Howard W. Sams. Both should be available in the larger ham radio stores.

Jeffery M. Padell of East Walpole, Massachusetts is just a few months into DXing, using a G.E. World Monitor 2990 portable receiver. He's also looking to make improvements in the antenna department.

Quite a number of loggings this month, so let's get right to them and find out what's on. Remember, all times are in GMT.

Australia ABC Radio Two and Three on 9.660 from Brisbane heard around 0700 and 3AR from Melbourne noted on 9.680 after WYFR signs off at 0800. (Davis, OH)

Botswana Radio Botswana noted from 0353 sign on on 4.848 with cowbells and cow mooing interval signal, choral version of the national anthem, man and woman with sign on announcements followed by a music program. (Konen, WI)

Canada The private station CFCN at Calgary was logged on 6.030 with English and a Top 40 format at 0804. (Konen, WI) CFRX on 6.070 noted from 1400 to 1430 with its one kilowatt transmitter. (Maus, PA)



Philip D. Reefer of Sacramento, California has a right to be proud of his listening post.

Cameroon Radio Cameroon at Yaounde heard at 2316 on 4.850 in French, and at 2105 on 9.745 with regional news in English followed by station identification. (Konen, WI) Yaounde on 9.745 noted from 2105 to 2125. (Wright, PA) Radio Garoua, Garoua on 5.010 heard at 0402 in French with local music. (Konen, WI) Radio Bertoua, Bertoua, 4.750 found at 0500 with music and news in French. (Reefer, CA)

China Radio Beijing's latest schedule to North America is from 0000 to 0200 on 17.855 and 15.120; 0200 to 0300 on 15.120 and 1200 to 1300 on 15.520 and 15.180. To the West Coast from 0300 to 0400 on 17.855, 17.680, and 15.120 and 0400 to 0500 on 17.680 and 15.120. (Thomas J. McKeon, IN) Radio Beijing heard at 2325 in Spanish on 17.885. (Dementiuk, VA) What was presumed to be the PLA-2 program from Fuzhou on 4.380 noted at 1030 with man and woman in Chinese, Chinese folk music. Radio Beijing noted in English at 1220 on 11.900 with identification and "China Anthology" program. (Konen, WI)

Clandestine Radio Ignacio Agramonte, part of the La Voz del Cuba Independiente y Democratica network, noted on 5.105 at 0315 in Spanish. (Dementiuk, VA) The Anti-Nicaraguan Radio Quince de Septiembre heard on variable 6.510 at 0336 and possibly jammed. (Dementiuk, VA) Heard

on 5.565 and 7.000 to 0630 with occasional jamming. (Davis, OH)

Colombia Radio Cinco at Villavicencio observed on 5.040 at 0315 in Spanish with Latin American vocals and many identification announcements. (Konen, WI) Radiodifusora Nacional on 9.635 at 1111 with music and Spanish announcements. (Dementiuk, VA)

Cook Islands Radio Cook Islands on 11.760 heard at 0705 with Radio Australia news relay and then local and popular music. (Konen, WI)

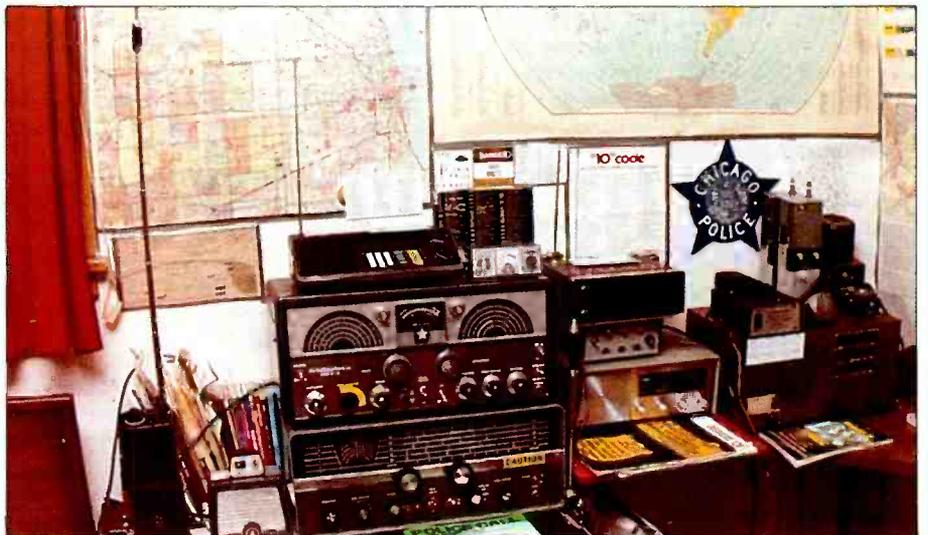
Cuba Radio Havana Cuba is on in English to North America from 2050 to 2140 on 17.850 and 11.725; from 0100 to 0450 on 11.930; 0100 to 0600 on 17.735; 0330 to 0600 on 11.760 and 0630 to 0800 on 11.880. (station)

Dominican Republic Radio Clarin on 11.700 heard at 0017 with a music program in Spanish up to the start of the La Voz del CID program at 0136. (Dementiuk, VA) Radio Clarin now airs "The World," a program produced and presented by Radio Earth International which has studios in Curacao, Netherlands Antillies. The program is on Monday through Saturday at 0330 to 0430, in English with news, features, and interviews. Shortwave listener



Here's Robert King of Austin, Minnesota in his multi-receiver shack.

Monitoring station of Jack Svetlik of Illinois. Several scanners and communications receivers are in use.



Jeff White, formerly active in the Association of North American Radio Clubs, is the prime mover behind Radio Earth. (Editor)

Ecuador Radio Federacion at Sucua on 4.960 heard with easy listening music to sign off in Spanish at 0511. (Konen, WI) Radio Zaracay, Santo Domingo, on 3.395 with Ecuadorian Music, Spanish announcements under strong interference from a utility station. (Reefer, CA)

Equatorial Guinea Radio Nacional de Guinea Equatorial at Malabo heard on 6.250 at 0513 with Spanish pop tunes and man announcer in Spanish. (Konen, WI)

Ethiopia The Voice of Revolutionary Ethiopia logged through heavy interference at 0329 on 7.110 with national anthem, identification, news in Amharic. (Konen, WI)

Falkland Islands Falkland Islands Broadcasting Service heard on 3.958 at 0926 to 1008 with popular music and news at 1000. (Brossell, WI)

Finland Radio Finland can be tuned in English to North America from 1100 to 1125 and 1200 to 1225 on 17.800 and 15.400; 1300 to 1325 on 15.400 and 1400 to 1425 on both frequencies again. On Sundays the broadcast runs from 1230 to 1445 on both channels. (station)

France Radio France International noted at sign on at 2159 on 9.790 with announcement in French by a man. (Konen, WI) RFI on 17.620 at 1605 with "Paris Calling Africa" in English. (Paskiewicz, WI)

Gabon Africa Number One from Moyabi heard on 4.810 with sign on at 0500. (Davis, OH) Radiodiffusion Television Gabonaise from Libreville noted on 4.777 at 0500 with "high life" music, vernacular languages. (Reefer, CA)

Greece The Voice of Greece found on 11.645 at 2341 with news in English. (Dementiuk, VA)

Guyana Guyana Broadcasting Corporation at Georgetown heard on 5.950 at 0905 with religious announcements and frequent mentions of Demerara and Georgetown. (Konen, WI)

Indonesia The Voice of Indonesia using 11.790 at 1358 with an identification in English and then into Arabic programming. (Paskiewicz, WI)

Iran Voice of the Islamic Republic of Iran heard on 9.022 at 0225 in Farsi with revolutionary music, Koran recitations. In parallel to the 15.084 outlet. (Konen, WI)

Ireland Radio Dublin, the pirate station, found on 6.910 from 0226 to 0430 with lighter popular music and a phone-in program. (Konen, WI) Heard at 0440 with mostly rock and roll. (Dementiuk, VA)

Israel The Voice of Israel noted at 0156 sign on on 11.655. "This is Israel," then national anthem and sign on announcement, news read by a woman. (Konen, WI)

Ivory Coast Radiodiffusion Ivoirienne from Abidjan on 7.215 at 0500 in French with soul and African music at very good strength. (Davis, OH)

Kiribati Radio Kiribati on 16.432.9 (single sideband) from 0538 to 0704 with local music, announcements, BBC news at 0600,



POP'COMM reporter Geoff Davis, Columbus, Ohio logs a new one.



This Radio Netherlands QSL belonging to Robert King shows W. Ch. J.M. Van Lanschot, Chairman of the station's Board of Governors, placing a commemorative stone to mark the beginning of construction at the new Flevo transmitter site.

local news at 0611, and music from 0630. (Konen, WI) Sign on time is 0528. (Editor)

Lesotho Radio Lesotho, 4.800 heard from 0400 to 0500 with music and news in vernaculars. Strong but interference from a South American station. (Reefer, CA)

Liberia The Liberian Broadcasting Service noted on 6.090 from 0600 to 0630 with music and vernacular announcements, heavy interference. (Reefer, CA) 6.090 at 0700 including a "Police Report" program. (Davis, OH)

Libya Radio Jamahiriyah heard on 11.816 at 2225 with commentary and a news bulletin on the half hour. (Wright, MA) Here at 2236 with tape running too fast, dead air at 2246, man in regular speed Arabic at 2252. (Dementiuk, VA)

Luxembourg Radio Luxembourg on 15.350 from 1800 to 1900 in French with rock tunes. (Davis, OH)

Mali Radiodiffusion du Mali, from Bamako, on 4.785 with regional music and French announcements at 0630. (Reefer, CA)

Malta International Christian Radio, a program over the DW Malta relay facilities, heard on 9.515 at 2030 with English identification and a request for reception reports. (Konen, WI)

Mauritania Radiodiffusion National, Nouakchott on 4.845 heard with chanting, music, and French announcements from 0500 sign on. (Davis, OH)

Mexico Su Pantera at Merida, logged on 6.105 from 0440 to 0500 sign off with U.S. pop and disco, panther snarls. (Konen, WI)

Mongolia Radio Ulan Bator heard in English at 1210 on 12.070 but with QRM from Russian "woodpecker." (Konen, WI)

Morocco The Voice of America relay, possibly from Morocco found on 15.595 at 0455 ending "Music of Yesterday" and "Breakfast Show" starting at 0500. (Dementiuk, VA)

Mozambique Radio Mozambique from Maputo on 11.817.9 at 0435 in Portuguese with taped interviews during a news program, then local music. (Konen, WI)

Namibia Southwest Africa Broadcasting Corporation heard on 3.295 from 0428 to 0500 with music and announcements in Afrikaans and English. (Brossell, WI)

New Caledonia FR3 at Noumea heard on 7.170 at 0854 in French. (Konen, WI)

New Zealand Radio New Zealand on 11.960 noted at 0730 with weather for Wellington, and 40's music. (Konen, WI)

Nigeria Radio Nigeria at Kaduna on 4.770 and from Lagos on 4.990 heard in English at 0500. (Davis, OH)

Nicaragua La Voz de Nicaragua, the government station at Managua, heard at 1630 on 11.714.3 with identification, music, and interference from Canada on 11.720. (Konen, WI) On 5.950 at 0408 with an English mailbag program and music. (Paskiewicz, WI) 5.950 variable at 0020 with long-winded speech in Spanish. (Dementiuk, VA)

Pakistan Radio Pakistan observed on 17.840 at 0230 with English to Southeast Asia and slow-speed news. Other listed frequencies were not heard at this hour. Noted on 13.608.9 from the Islamabad transmitter at 1710 to 1730 with Turkish program to 1730 sign off. (Konen, WI)

Papua New Guinea Radio North Solomons at Bougainville on 3.322.5 at 1053 with local music, woman and man announcers in Pidgin English. (Konen, WI) Radio New Ireland on 3.905 heard at 1130 with local music, and occasional rock, announcements in English. (Reefer, CA)

Paraguay Radio Nacional heard at 0230 on 9.735 with high speed play-by-play football announcer. Good signal. (Konen, WI)

Peru Radio America, Lima on 6009.5 at 1020 with a live music program. Radio Atlandida at Iquitos on 4.790 heard at 0403 with echo identification and other announcements, time check, and Latin American popular music. (Konen, WI)

Poland Radio Polonia in English at 0205 on 11.815 with news, identification, and commentary. (Konen, WI)

Qatar The Qatar Broadcasting Service found on 17.910 at 1703 with Arabic talk, music to abrupt sign off at 1730 after station identification. (Paskiewicz, WI)

Roumania Radio Bucharest heard on 11.830 at 0210 with news in English followed by "Radio Newsreel." (Konen, WI) We assume that "newsreel" wasn't the BBC version! (Editor)

Saipan KYOI at 1027 on 11.900, at 1716 on 9.670. Rock and roll with various identification announcements in English and Japanese. (Dementiuk, VA)

Senegal ORTS, Dakar, on 4.890 at 0600 to 0800, mostly with talks in French. (Davis, OH)

Seychelles Far East Broadcasting Association (FEBA) on 15.200 at 0426 with man giving news of Africa. "Youth Focus" program at 0431. (Dementiuk, VA)

Sierra Leone Sierra Leone Broadcasting Service noted and logged in English at 2302 on 5.980 with disc jockey program. (Konen, WI)

Solomon Islands Solomon Islands Broadcasting Corporation from 0829 to 1026 on 5.020 with U.S. music, English news, and local music, at 0730 on 9.545 with news and music. (Konen, WI)

Spain Radio Exterior de Espana heard on 11.860 at 0410 with news in English at very strong level. (Dementiuk, VA)

Swaziland Trans World Radio Manzini, on 3.200 at 0317 with religious program in an unknown language. (Konen, WI) On 4.760 at 0356 with English ID alternating with interval signal. German language program at 0400 and sign off at 0429. (Dementiuk, VA)

Sweden Radio Sweden International is scheduled to North America in English at 0230 on 15.420 and 11.705; at 1400 on 17.790 and 17.845; and at 2300 on 15.270 and 11.705. (station)

Switzerland Swiss Radio International on 15.305 at 0145 with world news in English. (Dementiuk, VA)

Taiwan If you want to hear English to North America from the Broadcasting Corporation of China (Voice of Free China), but hear it direct rather than via the WYFR relay, try 0100 on 11.825, 0200 on 15.345, 0300 on 11.825 and 15.345, and 0350 on 17.800. (Rempala, IL)

Tanzania Radio Tanzania noted in Swahili with talks and local music at 0307 on 5.050. (Konen, WI)

Thailand Radio Thailand tentatively logged on 11.905 from 1230 to 1315 with classical music program, anthem and woman in unknown language at 1300. (Konen, WI)

Togo Radiodiffusion TV Togolaise on 5.047 at 0537 with music program and man speaking in French. (Konen, WI) At 0538 in French with identification at 0600. (Dementiuk, VA)

Tunisia Radiodiffusion Television Tunisienne noted on 7.225 from 0540 to past 0600 with excellent signal strength. All in Arabic with talks, music, and recitations. (Brossell, WI)

Tunisia Radiodiffusion Television Tunisienne noted on 7.225 from 0540 to past 0600 with excellent signal strength. All in Arabic with talks, music, and recitations. (Brossell, WI)

Unidentified 15.350 "WLKN" at 0036 in French with rock and roll. (Dementiuk, VA) Believe the "WLKN" has been mentioned in the hobby press in connection with Radio Luxembourg but we've been unable to locate the reference. Sounds like Radio Luxembourg. (Editor) 5.025 an unidentified African station at 0500. (Reefer, CA)

This is the Benin regional station at Parakou. (Editor)

USSR Radio Moscow's North American service schedule: to the East Coast from 2200 to 0000 on 17.760, 17.700, 15.420, 15.240, 15.100, 12.060, 12.050, 11.790, 11.780, 11.770, 11.750, 11.730, 9.760, 9.720 (from 2300), 9.610, and 9.530. From 0000 to 0300 on essentially the same frequencies with the addition of 7.150. To the West Coast from 0300 to 0400 on 17.790, 17.760, 15.420, 15.240, 15.180, 15.110, 12.050, 12.030, and 11.710. From 0400 to 0600 on 17.790, 15.240 (to 0500), 15.180, 12.050, 12.030, 11.870, 11.750, 11.710, 9.650, 9.580. And from 0600 to 0700 on 15.180, 12.050, 11.870, 11.750, 11.710, 9.650, and 9.580. Some of these frequencies are added or dropped on September 4. Also many of the frequencies Radio Moscow quotes are actually 5 kHz low, i.e. 7.150 is likely to be 7.155, 9.580 likely to be 9.585 and so on.

Radio Moscow World Service via listed Alma Ata, Kazkah, on 11.770 at 1128 in English with Russian music, news at 1200. Via listed Ashkhabad on 15.540 from 1559 to 1630 in English. (Konen, WI)

Radio Tashkent's overseas English schedule is from 1200 to 1230 and 1400 to 1430 on 15.460, 11.785, 9.715, 9.650, and 5.950. (McKeon, IN) Heard on 11.785 at 1205 in English with news, commentary, and identification. (Konen, WI)

Vanuatu Radio Vanuatu noted with news in Pidgin English at 0803, standard English at 0814, identification in French and Pidgin at 0831. Noted on both 3.945 and 7.260 at this hour with the latter having the better quality. (Konen, WI)

Venezuela Radio Juventud, Barquisimeto, on 4.900 at 0255 with songs and

identification at 0300. Radio Mundial Bolivar, Ciudad Bolivar, on 4.770 at 0200 with Latin songs. (Dementiuk, VA) Radio Tachira at San Cristobal heard on 4.830 at 1045 in Spanish with Latin American ballads. (Konen, WI)

West Germany The Voice of Germany is scheduled in English to North America from 0100 to 0150 on 15.105, 11.865, 9.590, 9.565, 9.545, 6.145, 6.085, and 6.040. From 0500 to 0550 to the West Coast on 11.905, 11.705, 9.690, 9.545, and 5.960. (station)

Zaire La Voix du Zaire noted on 15.245 from 2110 to 2204 with talks in French and African music. (Brossell, WI)

Zambia The Zambia Broadcasting Service logged at 0415 on 4.910 with local African music, man announcer, and military band music. (Konen, WI)

Remember that another word for shortwave is "change." Times, frequencies, interference, and propagation are all factors which contribute to the always changing line-up on the shortwave bands. Thus we cannot guarantee 100% accuracy for listed schedules or loggings.

Our thanks to: Geoff Davis, Columbus, Ohio; Joe Wright, Jamaica Plain, Massachusetts; Kenneth M. Maus, Wyomissing, Pennsylvania; Philip D. Reefer, Sacramento, California; Roman Dementiuk, Newport News, Virginia; Sheryl Paskiewicz, Manitowoc, Wisconsin; Larry Rempala, Lisle, Illinois; Thomas J. McKeon, Indianapolis, Indiana; Robert Brossell, Pewaukee, Wisconsin; and Mark Konen, Milwaukee, Wisconsin.

This is your column, so your loggings, your questions, your comments, your QSLs, and shack photos are always welcome. Let's hear from you! Until next month, good listening.

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line low power AM rules were killed and broadcasting was, to a great extent, removed from the realm of the private individual and the small commercial establishment. These days there are some non-commercial educational FM channels allocated for low power use by schools, churches, and others, but the financial investment in placing such a station on the air—to say nothing of the technical standards which must be maintained—are beyond the means of most who would like to broadcast for one reason or another. The current regulations which permit schools and churches to operate on low power FM make it virtually impossible for individuals or small companies to get on the air as in earlier days.

Sam Eberhart says that maybe folks still need to have the opportunity to broadcast; possibly that's why various pirate stations have continued to operate despite the lack of a license. It certainly would create an interesting rainbow of ideas and programs if the FCC again would throw open several AM frequencies for low powered neighborhood broadcasting enterprises. What with the 1610 to 1620 kHz band virtually dormant except for occasional pirate broadcasters, it might be a good place for the FCC to permit amateur broadcasters running 1 to 5 watts with limited antennas.

Unpopular Communications

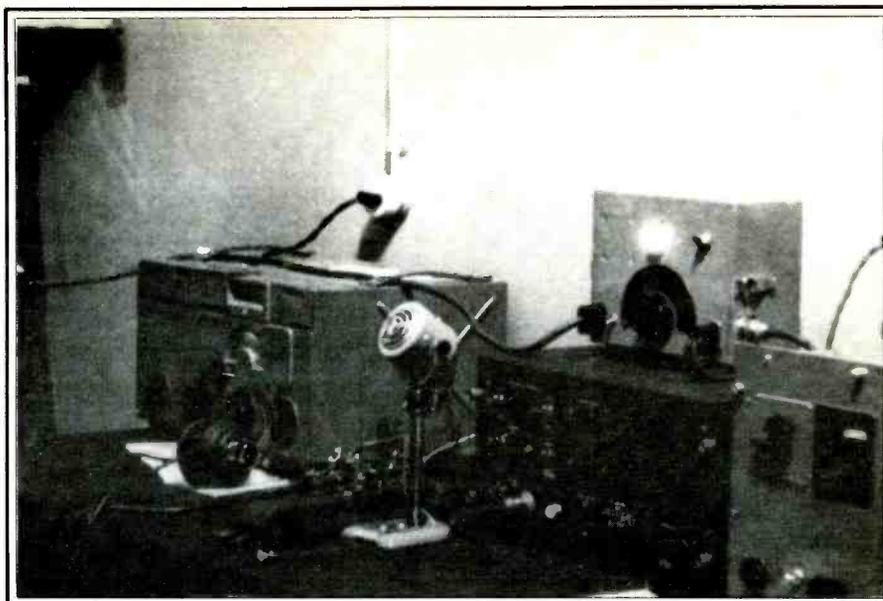
Speaking of people wanting to chatter over the radio even if they don't have licenses, I've been hearing all sorts of reports about communications bootleggers in the Soviet Union (and several other Eastern bloc nations). While in North America such stations are dubbed "bootleggers," "pirates," or something similar, in Russia they are given the rather harsh title of "radio hooligans." In North America there has traditionally been a certain romantic mystique given to at least some pirate station operations. In the Soviet Union, such communications are definitely most unpopular and are dealt with accordingly.

The CIA's Joint Publications Research Service USSR Report on Political and Sociological Affairs #1296 had a translation of a story on this which appeared in a 1982 issue of the Soviet publication *Sovetskaya Rossiya*. Author V. Lukin, in his article entitled "Jamming the Distress Signal," described the apprehension of a *radio hooligan* as follows:

"The spot of light on the screen of the radio direction finder looks like a star—a bright point in the center and sharp green rays shooting off in all directions. The lever of the closer scan clicks. As if drawn together by a magnet, the rays line up in a single direction—that is where the transmitter is operating.

"—We have it,—said Aleksandr Terent'yev, the commander of an operations group of amateur radio operators.

"This is not the first hour that we have



This station, located in Poland, was known under several IDs and various frequencies but has not been heard in several months.

been hunting for the transmitter. The radio hooligan with the code name of *Nominal* came onto the air at 11:00 in the evening, and now it is already getting light.

"The Central Radio Control vehicle is racing through the empty streets. The little star on the screen flares up and dies down, and the rather gruff voice of *Nominal* is clearly audible in the earphones. He is calling *Nakal*.

"—Who was that?—I ask Terent'yev.

"—That one is also in the field,—Aleksandr explains.—Soon we shall get after *Nakal* also. The Black Sea fishermen are already complaining about him—he operates on a frequency which has been assigned for distress signals.

"This is the second year that a specialized detachment for the struggle against radio hooligans has been operating at the Moscow Sports and Technical Radio Club. The amateur radio operators go out evenings to maintain order in the air. And not without results—the city has been almost completely freed of radio hooligans now, *Nominal* is the last.

"—These people are hindering the development of radio sports,—says the amateur radio operator and participant in our raid, S.V. Golubev.—Usually there are very doubtful types, without any notion of morality, and sometimes they are simply criminal elements. How many times, when they are caught on the air on a working frequency, have the operators of official stations warned them: *Your transmissions are interfering with railroad and Aeroflot dispatchers, and you are subjecting people's lives to danger. Vacate the frequency immediately!* And in reply—abuse . . .

"Leaving the car on the street, and equipped with pocket locators and flashlights, we enter a cozy Moscow courtyard. The antenna has to be found.

"This time the violator's self-confidence helped. Thinking that no one could hear

him, he cried out to his friend: I want to rehang the antenna; it is sticking out right in view, on the corner of the building . . .

"The district policeman, M.I. Grishin, to whom we turned for help, was perplexed:—Apartment 54? Strange. The tenant is an engineer, an elderly man and quite a respectable one.

"Indeed, *Nominal's* appearance somehow did not jibe with the idea of a hooligan—a short baldish man, outwardly innocuous, and even timid. If not for the transmitter on the desk, one could have thought we had made an error. Not a trace was left of the bravado with which *Nominal* broadcast on the air; the violator was fined, the radio transmitter was confiscated, and it was promised that a copy of the protocol would be sent to his job.

"And so, Moscow's air is clean. However, while they are able to call violators in the capital to order, Moscow's radio operators are not able to clean the airwaves everywhere in the country. This requires the creation of protection services in every oblast. Only then will hooligans stop their far from innocent sailing on the airwaves."

As far as I know, that's only the first-person, eyewitness report to emerge from the USSR about the catching of one of these stations. A number of persons in various countries have actually received QSL cards and letters from the radio hooligans. In particular, an operator named Slava, who used the return address Rublevskoya Sh. 87-1-61. Moscow 121467, was practically operating out in the open and worked countless stations on amateur bands, the HF maritime bands, CB channels, and wherever else he could get someone to chat with him. He hasn't been heard from in more than a year. I guess Comrade Lukin and his strike force must have caught up with him. For all I know, *Nominal* may have been one of the many identifications he was prone to using. Slava is (or was) an engineer.

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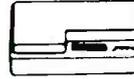
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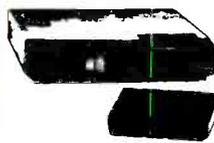
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