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EX310:	Voice Synthesizer	CALL
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FREE: ICOM options will be installed at no additional charge with purchase of NEW ICR71A.
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R71 (HP) High Performance. EEB has the reputation of excellence when it comes to R71A modifications. Many of our modifications are proprietary and not offered by any other source.
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LIST CALL

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CIRCLE 40 ON READER SERVICE CARD

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The *Regency* MX7000 scanner lets you monitor Military, Space Satellites, Government, Railroad, Justice Department, State Department, Fish & Game, Immigration, Marine, Police and Fire Departments, Broadcast Studio Transmitter Links, Aeronautical AM band, Aero Navigation, Paramedics, Amateur Radio, plus thousands of other radio frequencies most scanners can't pick up. The *Regency* MX7000 is the perfect scanner to receive the exciting 1.3 GHz. amateur radio band.

Regency® Z60-EA

List price $299.95/**CE price $179.95/SPECIAL**
8-Band, 60 Channel • No-crystal scanner
Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz.
The *Regency* Z60 covers all the public service bands plus aircraft and FM music for a total of eight bands. The Z60 also features an alarm clock and priority control as well as AC/DC operation. Order today.

Regency® Z45-EA

List price $259.95/**CE price $159.95/SPECIAL**
7-Band, 45 Channel • No-crystal scanner
Bands: 30-50, 118-136, 144-174, 440-512 MHz.
The *Regency* Z45 is very similar to the Z60 model listed above however it does not have the commercial FM broadcast band. The Z45, now at a special price from Communications Electronics.

Regency® RH250B-EA

List price $674.30/**CE price $329.95/SPECIAL**
10 Channel • 25 Watt Transceiver • Priority
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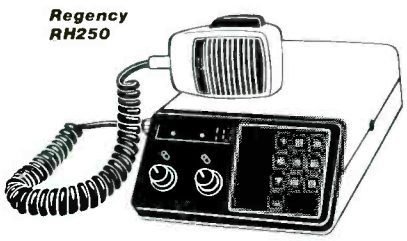
NEW! Bearcat® 50XL-EA

List price $199.95/**CE price $114.95/SPECIAL**
10-Band, 10 Channel • Handheld scanner
Bands: 29.7-54, 136-174, 406-512 MHz.
The Uniden Bearcat 50XL is an economical, hand-held scanner with 10 channels covering ten frequency bands. It features a keyboard lock switch to prevent accidental entry and more. Also order part # **BP50** which is a rechargeable battery pack for $14.95, a plug-in wall charger, part # **AD100** for $14.95, a carrying case part # **VC001** for $14.95 and also order optional cigarette lighter cable part # **PS001** for $14.95.



NEW! Scanner Frequency Listings

The new Fox scanner frequency directories will help you find all the action your scanner can listen to. These new listings include police, fire, ambulances & rescue squads, local government, private police agencies, hospitals, emergency medical channels, news media, forestry radio service, railroads, weather stations, radio common carriers, AT&T mobile telephone, utility companies, general mobile radio service, marine radio service, taxi cab companies, tow truck companies, trucking companies, business repeaters, business radio (simplex) federal government, funeral directors, veterinarians, buses, aircraft, space satellites, amateur radio, broadcasters and more. Fox frequency listings feature call letter cross reference as well as alphabetical listing by licensee name, police codes and signals. All Fox directories are $14.95 each plus $3.00 shipping. State of Alaska–**RL021-1**; State of Arizona–**RL025-1**; Baltimore, MD/Washington, DC–**RL024-1**; Buffalo, NY/Erie, PA–**RL009-2**; Chicago, IL–**RL014-1**; Cincinnati/Dayton, OH–**RL006-2**; Cleveland, OH–**RL017-1**; Columbus, OH–**RL003-2**; Dallas/Ft. Worth, TX–**RL013-1**; Denver/Colorado Springs, CO–**RL027-1**; Detroit, MI/Windsor, ON–**RL008-3**; Fort Wayne, IN/Lima, OH–**RL001-1**; Hawaii/Guam–**RL015-1**; Houston, TX–**RL023-1**; Indianapolis, IN–**RL022-1**; Kansas City, MO/KS–**RL011-2**; Long Island, NY–**RL026-1**; Los Angeles, CA–**RL016-1**; Louisville/Lexington, KY–**RL007-1**; Milwaukee, WI/Waukegan, IL–**RL021-1**; Minneapolis/St. Paul, MN–**RL010-2**; Nevada/E. Central CA–**RL028-1**; Oklahoma City/Lawton, OK–**RL005-2**; Orlando/Daytona Beach, FL–**RL012-1**; Pittsburgh, PA/Wheeling, WV–**RL029-1**; Rochester/Syracuse, NY–**RL020-1**; San Diego, CA–**RL018-1**; Tampa/St. Petersburg, FL–**RL004-2**; Toledo, OH–**RL002-3**. New editions are being added monthly. For an area not shown above call Fox at 800-543-7892. In Ohio call 800-621-2513.

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List price $349.95/**CE price $203.95/SPECIAL**
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Frequency range: 30-50, 118-174, 406-512 MHz.
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Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

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8-Band, 20 Channel • No-crystal scanner Automatic Weather • Search/Scan • AC/DC
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NEW! Bearcat® 145XL-EA

List price $179.95/**CE price $102.95/SPECIAL**
10 Band, 16 channel • AC/DC • Instant Weather
Frequency range: 29-54, 136-174, 420-512 MHz.
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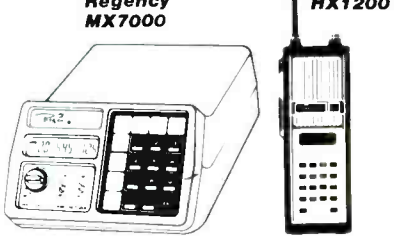
Test any scanner purchased from **Communications Electronics**™ for 31 days before you decide to keep it. If for any reason you are not completely satisfied, return it in original condition with all parts in 31 days, for a prompt refund (less shipping/handling charges and rebate credits).



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12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC
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The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½."

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Add $12.00 shipping per shortwave receiver.
Add $7.00 shipping per scanner and $3.00 per antenna.

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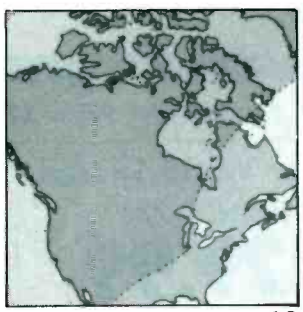
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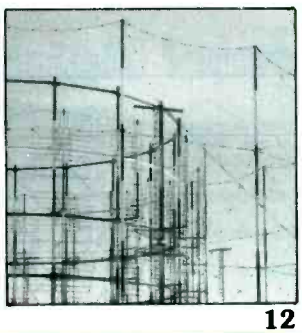
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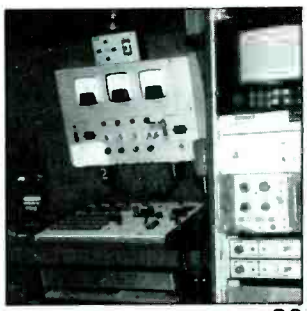
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FEATURES

This month's cover: *Tuning the remote broadcast pickup stations can add new dimensions to your scanning. Photo by Larry Mulvehill, WB2ZPI.*

DEPARTMENTS

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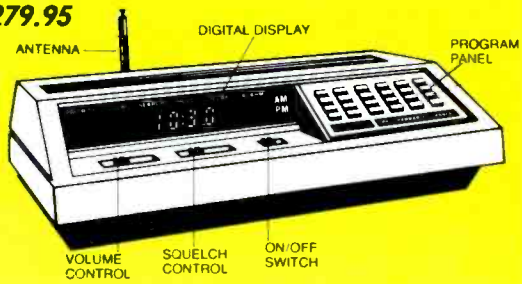

The Regency Z30 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, super heterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz. Size 10¾"Wx2-7/8"Hx8-3/8"D.

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RH-256B Transceiver, 16 channel 12 VDC 2-way Radio fully programmable in transmit and receive mode. Includes built-in CTCSS tones for encode/decode, time-out timer, scan delay, 25 watts transmit power, priority, plus more. Frequency spread as shipped 152-158 MHz. Package includes mobile mike, bracket, mobile antenna, and all cables and instructions for installation. ***Special package deal only:*** **$399.99** *(7.75 shipping)*

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CIRCLE 28 ON READER SERVICE CARD

BEAMING IN
AN EDITORIAL

BY TOM KNEITEL, K2AES

Wanted: New Faces!

I keep hearing lots of talk about how the number of newcomers into the ranks of the SWL and Ham Radio hobbies has been below what it should be. This is cause for alarm, and so it should be to anybody who has a commitment to communications. Without a sufficient number of newcomers the hobby will stagnate and eventually wither.

It's worth looking at some of the possible reasons why this turn of events is taking place since it seems to have taken so many folks by complete surprise. For instance, I'd like to include the various stages in the evolution of CB radio as integral parts of this scenario.

CB on 27 MHz began in the late 1950's, its frequency space created from the (relatively) little-used 11-meter Ham band, amidst much complaining from within Amateur Radio circles and predictions that nothing good would come of the new radio service that was being ensconced on those frequencies. This immediately established a definitely antagonistic relationship between the adherents of the two services.

Nevertheless, the smart money was riding on the concept that as soon as these people tired of their CB radios they'd be getting communications receivers and/or studying for Ham licenses. It didn't happen.

In the mid-to-late 1970's CB reached an enormous peak of popularity that will undoubtedly be included in all of the 1970's nostalgia films to come out of Tinseltown twenty years from now. While a certain number of CB operators did become SWL's and Hams, the majority of those who were into the service during its peak popularity period eventually became bored or annoyed with its *goodbuddy* image and ultimately turned off on everything and anything to do with the communications hobby. The FCC had, by then, lost all real ability to control the service or even exercise the ability to license the stations on the band, much to the perverse delight of many others who had predicted disaster right from the start.

A segment of the CB operators gravitated toward SSB operation since that group had avoided the use of CB handles and so-called trucker lingo. For the most part, these people were fighting a valiant battle to maintain some decorum within the service. When it seemed apparent that the *goodbuddies* were winning the battle, the SSB operators begged the FCC to establish mutually exclusive AM and SSB channels. Repeated petitions and requests were denied with neither reason nor explanation. This suffocated the enthusiasm of many SSB operators, forcing some to flee the edges of the authorized band and set up operations on unauthorized frequencies. That, of course, resulted in much scowling from the FCC and numerous others who had expected "the worst" all along.

I'm not attempting to justify or praise either the *goodbuddy* operators or those who fled the authorized channels for the bootleg frequencies. I am, however, trying to show how those who might have been a rich harvest of entrants into the SWL and Ham Radio hobby were given anything but an atmosphere of encouragement toward those ends, from those who might have tried to make them feel that they had a welcome oasis from chaos.

That's why an entire "generation" of potential SWL's and Hams was "lost." Still, many folks said, "Well, so what? In a few years there'll be some fresh recruits for our ranks." The problem was that the long-awaited next generation never really arrived. It was headed off at the pass and instantly converted into a swarming mass of computer buffs.

Sure, the communications hobby did manage to pluck a small number of people from this crowd, but mostly I think we can write them off the books as far as any hope for large numbers coming our way. It's a pity too; they're sharp and clever. Best of all, despite some rather blatantly illegal activities on the part of a small number of computerniks, they have never been regarded by the public with the same scorn as was directed at the relatively harmless CB *goodbuddies* and those who fled to unauthorized frequencies.

So let's assess what we've got to work with. For instance, it does look like CB popularity is again on the increase. If that's true, then let's hope that the CB operators don't repeat the same errors of their forebears, that the FCC doesn't reprise their own errors, and that members of our hobby can figure out how to get rid of our sour grapes attitude toward those operators.

What's this talk I hear from many quarters about there being almost as many VHF scanners in homes as there ever were CB radios? Can this be true? If so, lots of them are surely not owned by persons who could be counted as members of our hobby. Sure, scanner hobbyists are plentiful, but I haven't yet noticed them numbering into the CB-type digits. There should be some way of reaching these people and turning them into hobbyists by pointing out that they can do much more with a scanner than monitor their local police, fire department, animal shelter, or whatever.

Then there are retirees. As the median age of our population rises, a new flock of prospective converts to the communications hobbies is being created. It's as interesting and exciting as any avocation in the world, and just as suitable a retirement pastime as skiing, skydiving, or whitewater rafting. Other than those who have naturally "aged" in radio's ranks because they're been involved for many years, we have not yet attracted enough new recruits from those who have newly acquired leisure time.

As for youngsters, the educational system is geared toward creating an interest in computers. A proposal for the FCC to establish a non-licensed computer (packet radio) communications band between 52 and 54 MHz doesn't seem to have lit any sparks in Washington, nevetheless, it would be wonderful to think that radio could attract some of these people.

Those youngsters who aren't into computers seem to have their interests filled by TV. Unfortunately, much that is on TV serves to stifle the imagination rather than enhance it the way radio drama used to do. In pre-TV days, youngsters seeking adventure found that shortwave was the best way to go. Today those needs are filled by loads of flashy and colorful action programs that call for minimal passive participation by their audiences. Maybe a scanner or shortwave receiver would be a great birthday present for Little Horatio; and maybe for Grandpa, too!

There's still talk of allowing Novice Class Hams on the 6 and 10 meter Ham bands. If either or both bands ever gets approved, then that would certainly be very appealing to those who might be converted from the CB channels.

Hey, there are lots of candidates who would/could/should be getting interested in communications as a hobby, if only we knew how to get them involved. We know that they can be scared off, turned off, run off, or simply stolen away from under our noses by other technologies. What we *can't* do is just sit back and wait for these people to search us out.

We're going to have to realize that some form of active recruitment program is needed. Fine ARRL promos for Ham Radio have been showing up on TV screens and that's a step in the right direction. Now it's time for better monitoring clubs such as NASWA, SPEEDX, and ADXR to tell the world about hobby communications. The survival of the hobby depends upon new members entering our ranks in far greater numbers than are presently showing up, hat in hand. It's up to manufacturers, publications, clubs, dealers, and even individual communications users.

How about some ideas from our readers?

MAILBAG LETTERS TO THE EDITOR

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

Wild Talents

Being a devotee of the late Charles Fort and all things that might be classified as being "Fortean," I've been trying to locate information on any Ham radio networks devoted to discussions of the strange and unusual.

Stan Meyerson
Virginia Beach, VA

We've heard a few Ham networks that are rather strange and unusual, but they weren't dedicated to Fort. Maybe some of our readers have some information on such a network and will be kind enough to pass it along for mention here. In the meantime, you might try connecting with a computer bulletin board service called Fortnet. Operating out of Monterey, California, Fortnet is free (except for telephone toll charges) and features Forteana, parapsychological material, the occult, and sundry other far out topics. Fortnet's telephone number is (408) 646-8609. —Editor.

Is Something Missing?

Noting that most scanners cover the 2 meter ham band at 144 to 148 MHz, it seems strange that very few scanners will tune in the 6 meter ham band at 50 to 54 MHz. What with the DX reception potential far better on 6 meters than 2 meters, there isn't any good reason why the "low band" scanner tuning ends at 50 MHz instead of 54 MHz. Or is there a good reason?

Marty Creighton
Forest Hills, NY

I would venture a guess that the reason is while most 2 meter band communications are in FM mode, the majority of 6 meter band operators use SSB. Since scanners aren't designed to receive SSB mode, you'd never be able to copy those communications. It's a shame because when the 6 meter band is open for DX, it can be fascinating. —Editor

Exports Of Call

What's the big deal with the President Jackson transceiver? Many times when I tune across the CB channels the set is being discussed as if it were some sort of mysterious equipment from beyond time and space.

Fred Cooper
Brooklyn, NY

The President Jackson, along with sets such as the Galaxy 2100 and the Super Star 3900, is intended for export use only. Export transceivers usually cover all frequencies 26.060 through 28.320 MHz, run 40 watts PEP on SSB, between 25 and 40 watts on AM and FM, and have built in transmit/receive "sliders." Obviously they can't be used legally in the United States, nevertheless a few of them do seem to be available from various sources. They're in high demand, needless to say. —Editor

Is It Necessary?

Very often, while tuned to an AM or FM broadcaster, there's an announcement for the Emergency Broadcast System (EBS), followed by a minute or so of an annoying whistle or tone. This occurs so often I'm wondering if they think the tone generator is in constant danger of needing repairs and has to be tested without end, and why it has to be done over the airwaves. Exactly what are they testing, anyway (if it's more than the whistle machine)? What's the test all about, is it possible to fail this test, and has there ever been any time this system has been put to actual practical use?

E. J. O'Fallon
Alamogordo, NM

The EBS was started in 1964 as a replacement for a similar system called CONELRAD. In 1976, the EBS was enlarged from a federal-only operation to include state/local levels. The broadcasters participate on a voluntary basis.

The USA is sectioned into 590 EBS operational areas, each having a primary or key station. The FCC requires that all other stations in a given EBS area monitor the primary station. At such times as the primary station is advised by federal/state/local authorities to send out a test or broadcast, the activation tone is transmitted along with an announcement. If the information is relevant to the secondary stations, they will transmit it to their own audiences along with the tone signal.

The tone signal is used to activate ("demute") receivers that are constantly in "standby" status and are located at other broadcast stations. This permits the other stations to receive any emergency information sent out. The tone also serves as an attention getter for the public (as it seems to have gotten your attention).

In areas of the country subject to tornados, EBS receivers may also be located in hospitals, churches, schools, and police stations, as well as governmental offices.

The weekly tests aren't done to annoy listeners (although they probably serve that purpose, too), but are to keep personnel familiar with procedures and to check on the receiving as well as transmitting equipment. The fact is, if a (secondary) broadcasting station notices that a week has gone by without its EBS receiver being activated by a primary station, then it knows that something is wrong with its receiver.

The tone may seem very long to the casual listener, but it runs for only 20 to 25 seconds (it takes 8 to 12 seconds of the tone to activate an EBS receiver). The general public, of course, hears the entire test right from the start of the attention/de-muting tone.

During each of the past several years, the EBS has been used about 155 times to transmit actual (not-test) warnings relating to blizzards, hurricanes, toxic or noxious leaks, earthquakes, volcano eruptions, and other wide-area disasters affecting the public at large. —Editor

He's Out Of Bounds

In a club newsletter I came across instructions for programming a scanner to receive frequencies outside of its normal range. By special programming tricks you can get a scanner to operate well into the shortwave broadcast range. For instance, my Bearcat 250 can now receive frequencies as low as 15 MHz. I haven't yet heard anything on these frequencies and I'm wondering if I need a special antenna in addition to the VHF ground plane I presently use.

Howard Chen
Cupertino, CA

The only tricks here are the ones your scanner is playing on you. The fact that the LED's in your scanner's frequency readout can be forced to display far-out frequencies such as you mention doesn't mean that the RF circuits in the scanner are capable of actually receiving signals in those portions of the spectrum. Moreover, your scanner was designed to receive only FM signals and there is little use of FM below about 25 MHz. Scanner performance drops off substantially almost as soon as you depart from the edges of the bands the unit was intended to receive, so take certain reprogramming tricks with a few grains of sodium chloride. They are often created by well-meaning monitoring enthusiasts who are lacking an understanding of programmable scanners. I'm not, however, knocking all fancy programming techniques. Many scanners can be trick-programmed into receiving frequency increments not intended by the set's manufacturer. Some scanners tune the UHF band in 25 kHz "steps" and, unless tricked into doing so, won't normally scan frequencies that (for instance) lie between 450.275 and 450.30 MHz or similarly spaced channels. This, of course, doesn't require the scanner to function beyond the upper and lower frequency limits within which it was designed to operate, nor does it expect a scanner designed to receive only FM to function on frequencies where AM/SSB/CW/RTTY are the operating modes normally encountered. —Editor

America's First Silver Dollar

In Accordance with Its Established Policy, The Washington Mint Hereby Announces a Limited Release of 4,115 Silver Dollars from the period 1772-1821.

A recently rediscovered private cache of **4,115** historic Silver Dollars from our nation's colonial period has now been authenticated and certified.

The specifications for this special public sale are as follows:

Historical Data:

England ignored the colonists' requests for Silver coins, so the enterprising Americans turned to the Spanish Piece of Eight as a primary means of exchange. These legendary Silver Dollars (bearing the denomination 8 Reales) were struck at the famed Mexico City Mint, the first mint in the Americas, and then shipped to the 13 colonies.

The high precious metal content of these Silver coins made them an immediate favorite with the Americans, and they remained extremely popular *even after our nation began to mint its own currency*. Remarkably, these Silver Dollars continued to be a legal coin in the United States until 1857.

Coin Description:

The obverse of each coin bears the profile of Charles III, King of Spain, and the year in which it was minted. The reverse bears the crown and shield of the Spanish Empire, the 8 Reales denomination, and the Mexico City mintmark.

Each coin was minted between 1772-1821, and each measures 39.5mm in diameter (slightly larger than the U.S. Silver Dollar that it inspired).

Metal Content:

Each one of these Silver Dollars contains 27.67 grams (427 grains) of .900 Fine Silver.

Restrictions:

This special release of America's First Silver Dollar is restricted to private citizens only -- No dealer orders will be accepted. A limit of ten coins per order will be strictly enforced, and all orders are subject to acceptance by The Washington Mint.

Sale Prices:

Each Silver Dollar in this release is priced at $80.00 plus $2.50 for postage, handling, and insurance. (Total: $82.50)

Special Discounts:

The following discount prices apply for customers placing quantity orders:

Three Silver Dollars for $225.00 plus $5.00 (Total: $230.00)
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Order Instructions:

All mail orders *must* be accompanied by a check or money order for the full amount. Credit card customers are advised to place their orders by calling:

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(24 Hours a Day)

No lottery mechanisms will be utilized for this sale. Orders will be filled on a strict FIRST-COME, FIRST-SERVED basis according to the POSTMARK date of mail orders and the TIME AND DATE of telephone orders. The Washington Mint, one of America's foremost private mints, fully guarantees satisfaction with a 30-day, money-back policy. Certification of Authenticity will accompany each Silver Dollar in this release.

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Washington, DC 20009

"The Book" On Nuclear Plant Mishaps And Other Disasters

Recent events have reminded me how important it is for scanner owners to keep a "disaster book." Before we talk about what it is and how to go about setting one up, let me tell you why it's needed. In the Soviet Union there is a government policy against letting the public know what's going on. (If you doubt the government's intentions, just try bringing a scanner into that country!) Over here in North America there is a different type of censorship when disaster strikes. Usually, but not always, the censorship is unintentional. It's a type of paralysis brought on by confusion, lack of information, panic, and even ridiculous things like arguments over who should face the press. The bottom line is that when a true emergency hits, the paralysis censorship sets in. Conflicting speculation abounds, but the facts we need—facts that could even save a life—are often delayed for hours.

Enter the "disaster book." I first realized the significance of this type of book after a giant refinery explosion in the Chicago area. It was a big blast that leveled half of the refinery and even some nearby homes. Radio news reports speculated on everything from earthquakes to sonic booms. Finally, there was news that there was a "problem" at the refinery. The news media couldn't get more information, but a local scanner user quickly had a handle on how serious the "problem" was. He looked up the refinery in his disaster book and actually heard a trapped refinery worker call for help and described the fireball and heat. He heard the refinery fire crews calling that they couldn't get near the fireball, let alone begin to put it out or stop further explosions. It was time to evacuate!

Now this scanner owner had only listened to those frequencies a few times before. They weren't even programmed into his scanner. He listened just enough to make sure the frequency information he had received was correct and to get a flavor for the special slang used by the workers. Then he entered the information into his book. Nothing fancy mind you; just a loose-leaf school notebook with index tabs. The refinery was just one of nearly one hundred tabulated listings in his book that he rarely, if ever, listened to. But on that day he was one of the very few people who instantly and truly knew what was going on. It's a lesson for not only the scanner hobbyist, but the news media, too. Even the network stations didn't have the information to let them get the facts in those critical moments.

So how do you go about getting those obscure frequencies, the ones that aren't listed in the frequency directories, and none of your scanner friends seems to know? Well, the first place I'd start is with a friendly (hopefully!) visit to the person in charge of communications. Don't bother with others at the facility, be they workers or executives, because they probably don't even know what frequencies they are using. If you explain your interest in radio communications to the person in charge of their system, you might just get an answer. Certainly if you are a police officer, fireman, or other public safety official, you should have the *right* to *demand* that information! But, alas, it is often the case that they feel their frequency assignment is a private matter . . . even though it is, by law, public information that you can obtain by visiting the FCC and searching through their frequency allocation data banks. Probably the easiest way to get the information, however, is to get to know other local scanner enthusiasts. If there is a local club, jump at the chance to go to a meeting. That's where the real experts are and I guarantee you that somebody will know!

Start building your book and include every listing you can collect, no matter how remote you feel that the chance of an emergency there will be. You can never tell when the next big event will take place at the city dump or shopping center instead of the refinery! Spend a little time verifying the frequencies you collect and make some notations on any special lingo or codes you can figure out. Then record it in "the book" and forget it . . . until you need it!

How To Be A Frequency Detective

While we're on the subject of collecting obscure or hard-to-get frequencies, we've received some tips from the "MegaHertz Detectives" among us. One of the first places most of these detectives look at is the antennas used. On the surface, this seems to be an easy way to get to the general area of the frequency. The *higher* the frequency, the *shorter* a standard ¼-wave roof-top antenna. For instance, a 150 MHz frequency antenna would be about 18-inches long, while a 460 MHz frequency would be only 6½-inches. If all antennas were ¼-wave types, identifying general frequency ranges would be easy. But there is a myraid of other types of antennas out there. "Loaded" antennas with coils shorten antenna lengths. (A 70-inch "low band" antenna can be reduced to 30-inches or less with a loading coil). Gain antennas increase the size of the antenna. That 6½-inch ¼-wave VHF whip grows to something like 30-inches in the gain version. Sound confusing? Well, a good antenna catalog of professional mobile antennas can take some of the mystery out of it. Study the photos and dimensions of the various types and you'll begin to identify them when you see them on a vehicle. Once you have made an educated guess of the frequency, the "search" function on your scanners can zero in on the exact frequency.

There are still other ways to get that elusive frequency information. One scanner user I know carries a portable frequency counter with him. This battery-operated unit with digital display and antenna will read out the strongest frequency it is receiving. So, counter in hand, he simply hangs around when he sees one of their vehicles and waits for the driver to pick up the microphone. Presto! The frequency is no longer a secret . . . it's right there on the digital display.

If you're a "MegaHertz Detective" and have some tips, please write us. We'd like to pass them along to others through this column.

Some Observations From Dayton

In case you're not aware of it, the world's largest Ham radio convention is hosted each year by Dayton, Ohio. Tens of thousands of people from all over the U.S. and all over the world attend. Even if you're not a licensed amateur radio operator, this is a show you should try to attend just once. Outside in the flea market there were plenty of bargains on used scanners, antennas, and cables. Inside the exhibit hall it's an electronics toyland. Here we are just getting set up for 800-900 MHz scanning and on display at Dayton were 1.2 GHz (that's 1,200 MHz!) two-way hand-helds and mobile radios. There were also any number of fascinating demonstrations of various types of digital communications . . . the wave of the future. Not that amateur radio gear has a technological jump on our scanners. In fact, the scanning functions in the Ham equipment I've used is still terribly deficient. Scan speeds are very, very slow. And indispensible features like lockout are strangely missing. They've a ways to go to catch up to state-of-the-art scanning.

Another observation was that most of the Hams are "tuned in" to the Elecronic Communications Privacy Act issue. The news has really penetrated the ranks of the amateur radio community and there is a great deal of concern. Of course, many Hams are scanner enthusiasts and members of SCAN, too. But we all owe a "thank you" to the people at Westlink Radio, Westlink Report, W5YI Report, and other information services that got the word out.

It was fun to meet many of you in the midst of this electronic communications wonderland. We hope to see even more of you there next year!

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CIRCLE 67 ON READER SERVICE CARD

WHRI: Reaching Out

The Evolution Of A Shortwave Broadcast Station

BY GERRY L. DEXTER

Christmas Day was the day HCJB in Quito, Ecuador chose to begin what was to become today's huge and highly successful religious broadcasting effort on shortwave. That was in 1931. Fifty-four years later, another religious broadcaster also chose Christmas Day to officially begin life on the high frequency bands. HCJB came on the air with a tiny 250 watts when it first jumped into the ether. WHRI in Indiana started shortwave life with a hefty 100,000 watts.

World Harvest Radio is part of a large and far-reaching ministry—both broadcast and non-broadcast—operated by LeSea Broadcasting Incorporated. The name, LeSea, is a contraction of "Lester Sumrall Evangelistic Association." Its founder, Reverend Lester Sumrall, began his evangelistic work in 1932, traveling the world as a missionary.

In 1968 LeSea decided to take advantage of the opportunities for spreading the gospel that broadcasting offered and entered the radio missionary field with WHME-FM (103.1 MHz), a 3 kilowatt station in South Bend, Indiana.

That station, however, was only the first step on a trip that hasn't yet reached its conclusion. In 1972 WHMB-TV, Channel 40 in Indianapolis, signed on to serve the central Indiana area with gospel programming. LeSea followed that with the purchase of WHFT-TV, Channel 45 in Miami, which was later sold to Trinity Broadcasting. In 1978 Channel 46 in South Bend lit up with programming from WHME-TV, the video sister of WHME-FM.

LeSea Broadcasting's first priority is to bring the Christian gospel to as many people as possible. Their second priority is to teach God's word to the millions of people who might not have the opportunity otherwise.

The programming on the LeSea outlets is provided by LeSea itself, as well as by a number of other local and national ministries.

It isn't all religion, however. LeSea broadcasts programs that it says all Christian families can watch "without fear of embarrassment." To insure that dictum is maintained, there are rigorous standards applied to what is allowed on the air. Nothing is aired that could be considered obscene; there are no verbal attacks between denominations; no foul language; and no condoning of the occult or the use of alcohol or tobacco.

LeSea maintains two satellite uplink stations—one at South Bend, one in Indianapolis. They are used for daily feeds of Rev.

Dr. Sumrall during WHRI's first day on the air.

Lester Sumrall's Teaching Series (daily at 6:30 a.m. and 6:30 p.m. EST) and broadcast of "LeSea Live" Mondays, Tuesdays, Thursdays, and Fridays at 10 p.m. EST. "LeSea Live" is a one hour program of talk, interviews, and live call-ins and is fed on the PTL Satellite Network. The uplinks also carry specials; LeSea-affiliated churches with TVRO installations often view these on big screen TV. None of the satellite feeds are scrambled, nor will they be in the future.

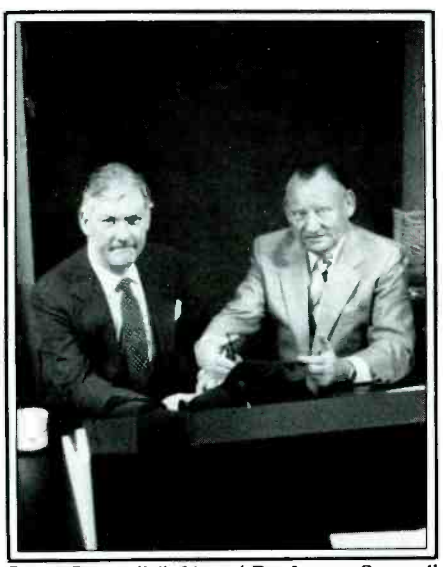
Over-the-air programming is only one part, albeit a large one, of the LeSea ministry. The group also sends TV programs and video tapes, as well as "tons" of gospel literature to overseas destinations. Facilities exist for making any American-produced television program technically compatible with any foreign video system.

LeSea also operates the World Harvest Bible College in South Bend. There are about 200 full and part-time students from the U.S. and overseas enrolled in the school. The ministry produces printed and taped cassette bible courses and both TV stations operate 24 hour a day "prayerlines." LeSea also publishes a full color magazine six times a year.

There's more. LeSea Tours conducts several overseas trips each year, including visits to the Holy Land, the Orient, and a cruise to the Bahamas. There are special conventions and seminars held several times annually. World Harvest Helps, another division, aids needy children. In all there are about 200 people directly involved in the LeSea operation.

WHRI announced in advance that regular broadcasting would begin on Christmas Day, and so it did. Considering the history of United States shortwave operations since the medium's rebirth here a few years ago, the on-schedule sign-on was a unique event, and perhaps indicative of how well organized this large ministry is.

For listeners in the Western Hemisphere, WHRI really took to the air on Christmas Eve. The switch was thrown at 7 p.m. Indiana time, which equals 0000 UTC on the 25th. Dedication services were aired live from the Christian Cathedral of Praise (the LeSea church) in South Bend, and beamed to audiences in Europe and South America.



Steve Sumrall (left) and Dr. Lester Sumrall during the WHRI ribbon-cutting.

WHRI's QSL card has already shown up in many collections.

Had you donated $500 to the WHRI shortwave effort, your name and favorite scripture would have been among those read on the occasion by Reverend Sumrall during the program. A $1,000 donation would, additionally, have gotten your name engraved on the door of the WHRI transmitter!

WHRI has a modern broadcast studio and a fully-equipped production studio that are part of the WHME radio and TV complex at 61300 South Ironwood Road in South Bend. The church, ministry offices, and college are at 530 East Ireland Road in South Bend.

Transmitting facilities for WHRI are near Nobelsville, which is about 115 miles south of South Bend and some eight miles northeast of Indianapolis.

A 100 kilowatt Harris SW-100A transmitter feeds two TCI model 527 log-periodic antennas on azimuths of 42 and 157 degrees. Effective radiated power from the antenna is "just over four million watts." One antenna is aimed at Jerusalem and covers eastern North America, all of Europe, Western Russia, Northern Africa and the Middle East. The second antenna looks at Buenos Aires and provides coverage of Central America, the Caribbean, and South America.

WHRI carries a variety of programs, including the well-known "Back To The Bible," the "Faith Seminar of the Air," and teaching programs by Rev. Sumrall. Others include "A Time To Live" and "Derin's Coffee Shop." WHRI is, of course, also the vehicle for a program particularly popular with shortwave listeners—Radio Earth, which is aired nightly at 0300, at least until Radio Earth opens its own facilities in Curacao.

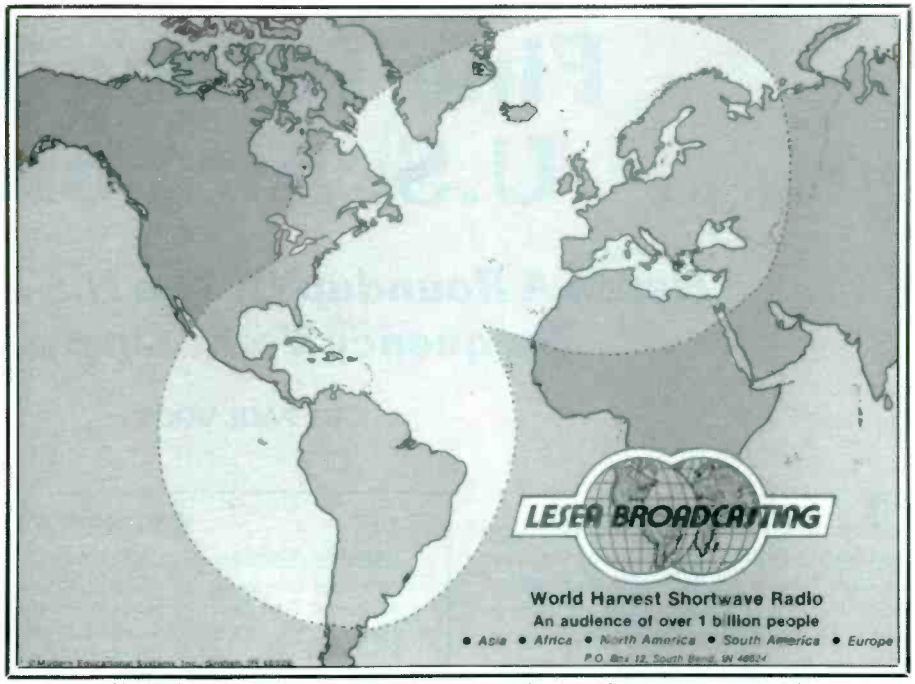
WHRI's current schedule, effective through early September, lines up this way:

UTC 0100—9.745 MHz
0300—7.400
0600—9.620
0800—7.355
1100—5.995
1300—11.790
1500—15.105
1800—15.310
2100—9.770
2300—11.775

Within a few months of its initial tests and official opening WHRI had logged in letters from listeners in 67 countries and 46 of the U.S. states. About 4,000 letters had arrived as of late March. WHRI verifies correct reception reports with an attractive QSL card. Reports should be sent to World Harvest Radio, P.O. Box 12, South Bend, IN 46624.

The LeSea organization expects to add to its broadcast portfolio soon. It is in the process of acquiring television stations in Honolulu; Tulsa, Oklahoma, and Kenosha, Wisconsin.

LeSea often uses the slogan 'we're reaching out," and considering all it has accomplished in broadcasting and its plans for the future, the phrase seems well chosen. Belated though it may be, here's a "welcome to the world of shortwave" extended to LeSea and WHRI from *POP'COMM* and its readers. We'll be listening! PC



WHRI's coverage includes a potential audience of one billion people!

Fine Tuning The U.S. Air Force

Here's A Roundup Of The U.S.A.F.'s High Frequency Voice Operations

BY PAUL VOGT

One thing's for certain; anybody who has taken the time to spin a tuning dial over the high frequency (HF) communications bands has come across USAF voice networks. They are pretty interesting communications, too. At least you can understand the messages that aren't deeply encrypted!

Fly along with the crew of a B-52 bomber on lonely patrol, or ride with the passengers on a VIP flight. Share the anticipation of arrival with the crew of a medical evacuation flight; even train (by shortwave proxy) with the pilot of an EF-111 *Electric Fox* electronic warfare aircraft. This is only a small portion of what you're liable to monitor on these frequencies.

While an in-depth examination of the structure and operations of the USAF would fill several books (and extend far beyond the scope of this frequency roundup), we do present capsulized data intended to provide a basic familiarity with some of the major areas of USAF monitoring.

Our listings consist of information on those frequencies most likely to produce activity; data is given about the primary uses of almost all frequencies listed. With the exception of some LSB mode transmissions used for VIP communications through the facilities at Andrews AFB, transmissions on these frequencies are virtually all in USB mode. Some clear/secure RTTY transmissions (850 Hz shift, 100 WPM) may also be observed.

Also, a guide is provided to help the listener identify many of the coded and tactical identifiers that appear on these frequencies. Note that many of the ground stations shown in our listing do not have their own transmitting facilities and are to be heard only via 'phone patch through the transmitting facilities of USAF ground stations that may be located as far away as hundreds or thousands of miles!

Here are salient points relating to our listings:

Civil Air Patrol: The CAP is a civilian auxiliary of the USAF, and on that basis their frequencies are given here. Among the main functions of the CAP are search and rescue operations. A highly detailed examination of the CAP's communications was contained in *POP'COMM* for June, 1984.

SOME CODED & TACTICAL IDENTIFIERS

Identifier/Callsign	Used by
Abnormal One Zero	Space & Missile Test Org. (SAMTEC), Vandenberg AFB, CA
Abnormal Two Zero	Space & Missile Test Org. (SAMTEC), Wheeler AFB, HI
Acrobat	Andrews Air Force Base, MD
Afkai 01 to 99	Tactical operations flight designators
Afkai (word) 01 to 99	89th Military Air Wing flight
Agar +2 digits	Designator for a type EC-135N aircraft
Airevac + digits	Air evacuation aircraft designator
Air Force 1	U.S. Presidential plane (President aboard)
Air Force 2	U.S. Vice-Presidential plane (V.P. aboard)
Air Force Rescue +digits	Designator for search & rescue aircraft
Air Rescue + digits	Designator for search & rescue aircraft
Alfa 6	Mil. Advisory Group, Venezuela (Call: YWA6)
American Eagle	Commando Escort unit designator
Aria +2 digits	Designator for a type EC-135N aircraft of the 4050th Test Wing, Wright-Patterson AFB, OH
Army 1	Any U.S. Army helicopter carrying Pres. of U.S.
Army 2	Any U.S. Army helicopter carrying V.P. of U.S.
Cape Radio	USAF Eastern Test Range, Cape Canaveral, FL
Capsule	Designator signifying a general message addressed to all aircraft of the Military Airlift Command
Charlie 20	Office of Defense Cooperation, Uruguay (Call: CXC20)
Copter +digits	Helicopter designator
Crown	White House Communications Agcy., Washington, DC
Delta 5	Military Advisory Group, Belize (Call: VPL1D5)
Denali	MAC, Alaskan Airlift Control Center, Elmendorf AFB
Discard	MAC, 22nd AF operations, Travis AFB, CA
Dropkick	SAC Headquarters, Offutt AFB, NE
Echo 21	Office of Defense Cooperation, Peru (Call: OAE21)
Edgy + digit(s)	AWACS aircraft of 552nd AWACS, Tinker AFB, OK
Electric	National Emergency Airborne Command Post
Executive 1	Commercial flight carrying President of U.S.
Executive 1 Foxtrot	Commercial flight carrying family of Pres., U.S.
Executive 2	Commercial flight carrying V.P. of U.S.
Executive 2 Foxtrot	Commercial flight carrying family of V.P., U.S.
Fast Charger	Air Force Joint Command (Europe)
Fertile	SAGE/NORAD Network Center, Ft. Lee, VA
Fireside 1	TAC Headquarters, Langley AFB, VA
Fireside 3	HQ 9th Air Force, Shaw AFB, SC
Fireside 4	Mountain Home AFB, ID
Fireside 5	HQ 12th Air Force, Bergstrom AFB, TX
Fivespot	Commando Escort unit designator
Fletcher	Commando Escort unit designator
Flynest	Nuclear & Chemical/Biological Warfare Disaster Team
Format	HQ 21st Air Force, McGuire AFB, NJ
Furious	MAC, S. American Airlift Control Center, Panama
Gold Coin	MacDill AFB, FL (Strike Control Command)
Golden	General net air/ground callsign used by aircraft wishing to contact any TAC ground station
Golf 3	Military Advisory Group, Guatemala (Call: TDMG3)
Goliath	NORAD, Duluth Int'l. Airport, MN
Gull	53rd Weather Recon Squadron, Keesler AFB, MS
Hilda	MAC Command Center, Scott AFB, IL
Hotel 54	Military Advisory Group, Haiti (Call: ACH54)
Jolly 01 to 99	Search/Rescue 'copter (not on mission)
Kilo Echo	Military Advisory Group, El Salvador (Call: YS1HUKE)
King 01 to 99	Search/Rescue aircraft (not on mission)
Lark	55th Weather Recon Squadron, McClellan AFB, CA
Letterman	Hickam AFB, HI (weather forecaster)
Mike 261	Office of Defense Cooperation, Paraguay (Call: ZPM261)
Night Hawk	Any USMC 'copter with President of U.S. aboard
Mac +digits	An aircraft of the Military Airlift Command
Mainsail	General net air/ground callsign used by aircraft wishing to contact any GCCS ground station

The EF-111 "Electric Fox" is in the USAF's fleet of electronic warfare aircraft. This is from the 366th TFW of Mountain Home AFB in Idaho. Its on-board equipment neutralizes SAM and anti-aircraft radars.

Marine 1	Any USMC 'copter with President of U.S. aboard
Marine 2	Any USMC 'copter with V.P. of U.S. aboard
Medevac	Evacuation aircraft having medical facilities
Mike Mike	Military Advisory Group, Honduras (Call: HR1MM)
Minuteman	Air National Guard Operations Center, Andrews AFB, MD
Oscar 225	Military Advisory Group, Colombia (Call: 5KO225)
Papa 67	Office of Defense Cooperation, Bolivia (Call: CPP67)
Papa 491	Military Advisory Group, Dominican Republic (Call: HIP491)
Pedro 01 to 99	Rescue craft assigned to a local base
Phantom	MAC, European Theater Airlift Control Center
Queen	Operations Center, Air Rescue, Eglin AFB, FL
Raymond 1	TAC Headquarters, Langley AFB, VA
Raymond 6	TAC, George AFB, CA
Raymond 7	27th/35th Tactical Fighter Wing, Cannon AFB, NM
Raymond 9	TAC, Dyess AFB, TX
Raymond 10	TAC, 1st Special Opns. Wing, Hurlburt Fld., FL
Raymond 11	TAC, Eglin AFB, FL
Raymond 12	TAC, England AFB, LA
Raymond 13	TAC, Homestead AFB, FL
Raymond 14	TAC, 49th Tactical Fighter Wing, Holloman AFB, NM
Raymond 15	TAC, 31st Tactical Fighter Wing, Homestead AFB, FL
Raymond 16	TAC, 1st Tactical Fighter Wing, Langley AFB, VA
Raymond 17	TAC, 347th Tactical Fighter Wing, Moody AFB, GA
Raymond 19	TAC, 56th Tactical Fighter Wing, MacDill AFB, FL
Raymond 21	TAC, 345th Tactical Fighter Wing, Myrtle Beach AFB, SC
Raymond 22	TAC, 57th/474th Tactical Fighter Wing, Nellis AFB, NV
Raymond 23	TAC, Pope AFB, NC
Raymond 24	TAC, 552nd AWACS, Tinker AFB, OK
Raymond 25	TAC, 4th Tactical Fighter Wing, Seymour Johnson AFB, NC
Raymond 26	TAC, 363rd Tactical Fighter Wing, Shaw AFB, SC
Raymond 27	TAC, 366th Tactical Fighter Wing & 662nd TACW, Mountain Home AFB, ID
Raymond 28	TAC, Bergstrom AFB, TX
Ringmaster	NORAD Headquarters, Cheyenne Mtn., WY
Sam +digits	Special Air Mission VIP aircraft (Mil. or Diplo.)
Sam 01	VIP aircraft carrying foreign head of state
Sam 26000	V.P. of U.S. aircraft (V.P. not aboard)
Sam 27000	Pres. of U.S. aircraft (Pres. not aboard)
Sam 31682	V.P. of U.S. aircraft (V.P. not aboard)
Sam 86971	U.S. Secretary of State aircraft
Sam 86972	U.S. National Security Advisor aircraft
Save 01 to 99	Rescue craft assigned to a local base
Sentry	AWACS aircraft from Tinker AFB, OK
Sierra 1	Military Advisory Group, Ecuador (Call: HCUS1)
Sierra Alfa	Military Advisory Group, Costa Rica (Call: TI2USA)
Skybird	General net air/ground callsign used by aircraft wishing to contact any SAC ground station
Skyking	General net ground/air callsign used by ground stations wishing to pass traffic to all nuclear forces and support groups
Spar	89th Military Airlift Wing VIP aircraft
Spar 01 to 99	Special Air Mission lower priority than SAM designator
Swan	54th Weather Recon Suadron, Andersen AFB, GU
Teal	815th Weather Recon Squadron, Keesler AFB, MS
Tonight	MAC, Pacific Airlift Control Center
U.S. Air Force +digits	Flights over foreign territories
Uniform 1	Office of Defense Cooperation, Chile (Call: CEF5U1)
Venus +digits	Sam aircraft, VIP's not aboard
3 letter word +3 digits	Student pilot on training mission
3 letter word +4 digits	Civil disturbance airlift (MAC/TAC)
6 letter word +1 digit	Combat crew training mission (TAC)
3-5 letter word +2 digits	SAC bomber or tanker
6-15 letter word (or 2 words)	SAC ground station

EMERGENCY ACTION MESSAGE (EAM) TRANSMISSION SCHEDULE
(Times in min. past each hour.)

03 min	Yokota AB, Japan
08 min	RAF Croughton, England
13 min	McClellan AFB, CA
18 min	Incirlik AB, Turkey
23 min	Andersen AFB, GU
28 min	Thule AB, Greenland
33 min	Hickam AFB, HI
38 min	Lajes Field, Azores
43 min	Elmendorf AFB, AK
48 min	Loring AFB, ME
53 min	Clark AFB, Philippines
58 min	MacDill AFB, FL

"CAPSULE" BROADCAST SCHEDULE
(Times in min. past each hour.)

00 min	RAF Croughton, England Hickam AFB, HI
05 min	Lajes Field, Azores Yokota AB, Japan
10 min	Incirlik AB, Turkey MacClellan AFB, CA
15 min	Ascension Aux. AF, S. Atlantic Elmendorf AFB, AK Thule AB, Greenland
20 min	Andersen AFB, GU MacDill AFB, FL
25 min	Albrook Field, Panama Clark AFB, Philippines
30 min	RAF Croughton, England Hickam AFB, HI
35 min	Lajes Field, Azores Yokota AB, Japan
40 min	Incirlik AB, Turkey MacClellan AFB, CA
45 min	Ascension Aux. AF, S. Atlantic Elmendorf AFB, AK Thule AB, Greenland
50 min	Andersen AFB, GU MacDillAFB, FL
55 min	Albrook Field, Panama Clark AFB, Philippines

Air Force Reserve: USAFR frequencies within the HF spectrum are not reported by monitors as often as other USAF channels. As with the frequencies used by the *Air National Guard*, maximum activity seems to be noted on weekends.

Strategic Air Command (SAC): The March and April (1986) issues of *POP'COMM* (in the Communications Confidential column by Mike Chabak) contained an exceptionally well stated in-depth discussion of SAC communications; your attention is directed toward that information. For completeness, the major SAC frequencies are shown in our listing.

The SAC, being one of the main components of the USAF, is very active in the communications bands—the command facilities being located both on the ground and from a fleet of aircraft command posts. Within the SAC's inventory are about 380 bombers (mostly B-52 variants); about 50 spy aircraft (RC-135, SR-71, U-2R and TR-1 types); about 30 airborne command posts (E-4B and EC-135 types), about 650 flying tankers (KC-135 types); plus more than 1,000 Minuteman I and II and Titan II ICBM's.

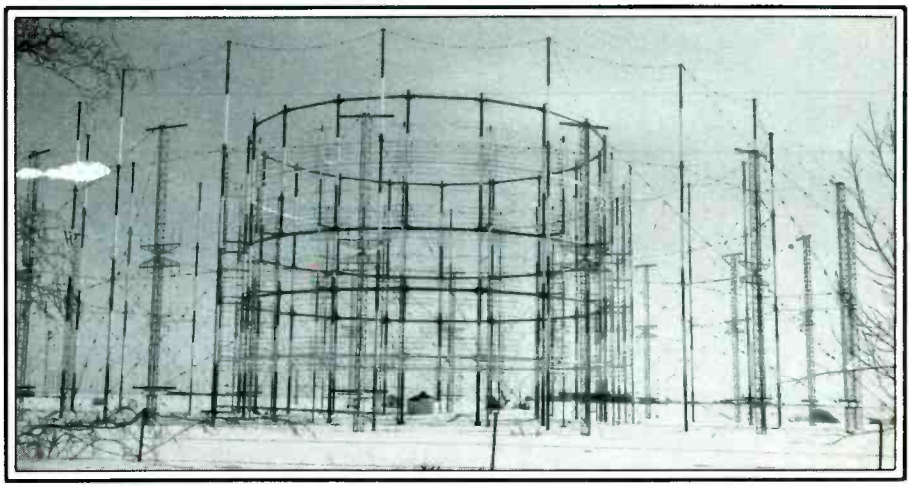
When tuned to SAC frequencies, two notable types of messages include the so-called *Skyking/Foxtrot* and *Emergency Action Message (EAM)*. These broadcasts, consisting of encrypted information, are sent out on a scheduled and unscheduled basis, as necessary; the EAMs are noted on the SAC frequencies as well as frequencies utilized by the USAF's Global Command Control System (GCCS). A chart indicating the times and transmitting points of scheduled EAM transmission is given here.

The contents of Skyking and EAM broadcasts probably contain information relating to the alert status affecting the nation's nuclear defense forces.

Tactical Air Command (TAC): The TAC is a major component of the USAF that offers fast-reaction air support for use overseas and for the defense of U.S. airspace.

Military Airlift Command (MAC): The MAC maintains a fleet numbering to nearly 1,000 aircraft. This consists of jet transports and turbo-prop freighters, plus wide-bodied aircraft, as well as helicopters.

Not concerned only with transportation matters, MAC units include the Air Rescue and Recovery Service providing search and rescue as well as weather recon functions.



A 172-ft. Wullenweber antenna, measuring 500 ft. across the center, plus a myriad of other SSB antennas installed at Elkhorn, Nebraska, for SAC communications.

Global Command Control System (GCCS): The GCCS provides air/ground HF communications between ground agencies and military aircraft of all service branches. It is used to pass command and control information. Military aircraft (and some non-military aircraft) of other nations may also operate within GCCS networks, according to "agreements and international protocols as appropriate."

For GCCS purposes, the world has been divided into 14 so-called Command Control Zones (CCZ's), with a GCCS station assigned to Command Control Station (CCS) responsibility within each zone. While each CCS is tasked with Command Control

USAF VOICE FREQUENCY ROUNDUP

kHz	Use
2371	Civil Air Patrol
2374	Civil Air Patrol
3032	TAC
3060	TAC
3067	GCCS Croughton AFB, England (2300-0500 GMT)
3081	GCCS Lajes Field, Azores (2100-1000 GMT)
3144	GCCS Hickam AFB, HI (0600-1700 GMT)
3503	S. American Mil. Assistance
4449	TAC
4457	USAF Reserve
4464.5	Civil Air Patrol
4467.5	Civil Air Patrol
4495	SAC ("Echo" freq.)
4504.5	Civil Air Patrol
4507.5	Civil Air Patrol
4582	Civil Air Patrol (Emergency freq.)
4585	Civil Air Patrol
4599.5	Civil Air Patrol
4602.5	Civil Air Patrol
4627	Civil Air Patrol
4630	Civil Air Patrol
4721	GCCS Andrews AFB, MD (2400-1200 GMT)
4725	SAC ("Victor" freq.)
4742	TAC
4746	GCCS Lajes Field, Azores (2100-1000 GMT) MacDill AFB, FL (0000-0900 GMT) McClellan AFB, CA (0400-1600 GMT)
4747	GCCS Yokota AB, Japan (1000-2100 GMT)
4760	Air National Guard
4809	SAC
4812	USAF Reserve
4872	SAGE/NORAD
5020	SAC
5026	SAC
5197	MAC
5297	NORAD
5303	SAC
5328	SAC
5479	SAC
5688	GCCS Loring AFB, ME (0900-2400 GMT) MacDill AFB, FL (0000-0900 GMT)
5700	SAC ("Bravo Quebec" freq.) & SAMTEC ops
5703	GCCS Zones 9/11/12/14 (nights) SAC, TAC, Air National Guard Croughton AB, England (2100-0800)
5710	GCCS Albrook Field, Panama (0200-1200 GMT)
5745	Air National Guard
5805	Air National Guard
5827	Air National Guard
6100	Air National Guard
6683	GCCS Albrook Field, Panama (0000-1400 GMT)
6708	SAGE/NORAD
6714	Air National Guard
6715	Rescue
6716	MAC
6727	GCCS Zones 6/7/9 (nites) SAC Scott AFB, IL (0200-1400)
6730	TAC
6738	GCCS Zones 5/10 (continuous) Zones 1/2/3/4/6/13/14 (nites) SAC Andersen AFB, GU (0700-2200 GMT) Clark AFB, Philippines (1200-2200 GMT) Elmendorf AFB, AK (continuous) Hickam AFB, HI (0400-1900 GMT) Incirlik AB, Turkey (continuous) McClellan AFB, CA (continuous) Thule AB, Greenland Yokota AB, Japan (0900-2400 GMT)
6750	GCCS Zones 11/12/14 (continuous) Croughton, England (continuous) Lajes Field, Azores (continuous) MacDill AFB, FL (0900-2400 GMT)
6753	GCCS Ascension Aux AFB, S. Atlantic (2000-0800 GMT)

kHz	Use
6756	GCCS
	Andrews AFB, MD (continuous)
6761	SAC ("Quebec" freq.)
6769	Air National Guard
6800	Air National Guard
6826	SAC
6890	Air National Guard
6895	Air National Guard
6940	Air National Guard
7330	SAC ("Xray" freq.)
7430	S. American Mil. Assistance
7460	Air National Guard
7635	Civil Air Patrol
7853	Air National Guard
7918.5	Civil Air Patrol
8101	SAC ("Alfa Papa" freq.)
8731	Air National Guard
8964	GCCS
	Hickam AFB, HI (continuous)
8967	GCCS
	Andersen AFB, GU (continuous)
	Lajes Field, Azores (continuous)
	Thule AB, Greenland
	Yokota AB, Japan (continuous)
8989	GCCS
	Elmendorf AFB, AK (continuous)
	Loring AFB, ME (continuous)
	MacDill AFB, FL (continuous)
	McClellan AFB, CA (continuous)
8993	GCCS Zones 1/8/13/14 (continuous)
	Albrook Fld., Panama (continuous)
	Ascension Aux. AFB, S. Atlantic (continuous)
	Clark AFB, Philippines (continuous)
	MacDill AFB, FL (continuous)
9011	GCCS Zones 9/11/12/14 (days)
	Croughton, Englans (0500-2300 GMT)
9014	GCCS Zones 6/7/9 (continuous)
	Loring AFB, ME (continuous)
	Scott AFB, IL (continuous)
9018	GCCS
	Andrews AFB, MD (continuous)
9023	NORAD
9027	SAC ("Romeo" freq.) & SAMTEC ops
9057	SAC ("Papa" freq.)
9129	Pacific area
9220	SAC
9723	NORAD
10344	SAC Pacific
10452	Commando Escort Network
10510	Commando Escort Network
10780	Space launch support
10802	GCSS Zones 1/13/14 (days)
10935	S. American Mil. Assistance
11118	SAC
11141	NORAD
11169	SAC Pacific
11176	GCCS Zones 9/11/12 /14 (continuous)
	Zones 1/13 (1300-0200 GMT)
	Albrook Fld., Panama (continuous)
	Andersen AFB, GU (continuous)
	Ascension Aux. AFB, S. Atlantic (1800-0200 GMT)
	Clark AFB, Phillipines (1500-0200 GMT)
	Croughton, England (continuous)
	Elmendorf AFB, AK (continuous)
	Incirlik AB, Turkey (continuous)
11179	GCCS
	Hickam AFB, HI (continuous)
	Loring AFB, ME (0100-0900 GMT)
	MacDill AFB, FL (0900-2400 GMT)
11182	GCCS Zones 6/7/9 (continuous)
	Scott AFB, IL (continuous)
11214	TAC
11220	SAC ("Bravo" freq.)
11226	GCCS
	Lajes Fld., Azores (0100-2100 GMT)
11236	GCCS
	Yokota AB, Japan (0900-2400 GMT)
11239	GCCS
	McClellan AFB, CA (continuous)
11243	SAC ("Alfa" freq.)
11246	GCCS
	MacDill AFB, FL (continuous)
11267	Coordination with USN
11408	SAC ("Yankee Quebec" freq.)
11440	Rescue
11441	NORAD
11494	SAC ("Lima" freq.)
12129	SAC Pacific area
13201	GCCS Zones 9/11/12/14 (days)
	Zones 5/10 (continuous)
	Andersen AFB, GU (continuous)
	Clark AFB, Philippines (continuous)
	Elmendorf AFB, AK (continuous)
	Hickam AFB, HI (1700-0600 GMT)
	Thule, Greenland
	Yokota AB, Japan (2100-1000 GMT)
13204	TAC
13211	SAC ("Bravo Whiskey" freq.)
13214	GCCS
	Croughton, England (0800-2100 GMT)
13215	GCCS
	Incirlik AB, Turkey (continuous)
13218	Space & Missile Test (SAMTEC) net
13241	SAC ("Sierra" freq.)
13244	GCCS Zones 8/9/11/12/13 (days)
	Ascension Aux. AFB, S. Atlantic (1000-1800 GMT)
	Lajes Fld., Azores (1000-2100 GMT)
	MacDill AFB, FL (0900-2400 GMT)
13247	GCCS
	Andrews AFB, MD (1200-2400 GMT)
13547	
13907	SAC ("Alfa Charlie" freq.)
13937	S. American Mil. Assistance
13950	S. American Mil. Assistance
14650	Air National Guard
14894	NORAD
14905	Civil Air Patrol
14955	SAC ("Charlie" freq.)
15015	GCCS Zones 11/12/14 (continuous)
	Zones 6/7/8/9/13 (days)
	Albrook Fld., Panana (1200-0200 GMT)
	Ascension Aux. AFB, S. Atlantic (0800-2000 GMT)
	Incirlik AB, Turkey (continuous)
	Scott AFB, IL (1400-0200 GMT)
15031	GCCS
	McClellan AFB, CA (1600-0400 GMT)
15035	SAC "Charlie Quenec" freq.)
15041	SAC ("Mike" freq.)
15091	TAC
15734	SAC Pacific area
15962	
16246	Tests
17248	Space & Missile Test (SAMTEC) net
17975	SAC ("Tango" freq.)
18002	GCCS Zones 1/2/3/4/5/6/7/9 (days)
	Andersen AFB, GU (2200-0700 GMT)
	Clark AFB, Phillipines (2200-1200 GMT)
	Hickam AFB, HI (1900-0400 GMT)
	Loring AFB, ME (0100-0900 GMT)
	McClellan AFB, CA (1600-0400)
	Yokota AB, Japan (0000-0900 GMT)
18019	GCCS
	Albrook Fld., Panama (1400-2400 GMT)
	MacDill AFB, FL (0900-2400)
18027	MAC
18049	SAC
18059	SAC Pacific area
18594	SAC ("Zulu" freq.)
20390	Space launch support
20631	SAC ("Whiskey" freq.)
20855	NORAD
20873	Civil Air Patrol
20885	S. American Mil. Assistance
20890	SAC ("Delta" freq.)
23206	TAC
23277	GCCS Zones 6/7/9 (days)
	Clark AFB, Phillipines (0200-1300 GMT)
23337	SAC ("Uniform" freq.)
26620	Civil Air Patrol
27870	SAC ("Delta Quebec" freq.)

Communications (C3) responsibility for their CCZ, any GCCS station will provide C3 to authorized users on request.

The GCCS station at Scott AFB is the continental U.S. (CONUS) master network control station (Zone 7) and has remote control of the HF equipment at the Loring, MacDill, and McClellan GCCS stations in order to provide communications throughout North America and adjacent waters. Similarly, GCCS at MacDill AFB (Zone 9) augments its own coverage with remote control of transmitters at Loring AFB. All GCCS stations offer direct phone patch and/or message relay service to major command posts, operations centers, etc., throughout the world.

The calling frequencies for each CCZ, along with the CCS and watch sked, can be found in the frequency chart accompanying this report. After making initial contact on a calling frequency, the ground station may advise the aircraft to switch to other frequencies.

EAM broadcasts are sent out over GCCS frequencies. CAPSULE broadcasts to all MAC aircraft are also transmitted on these channels.

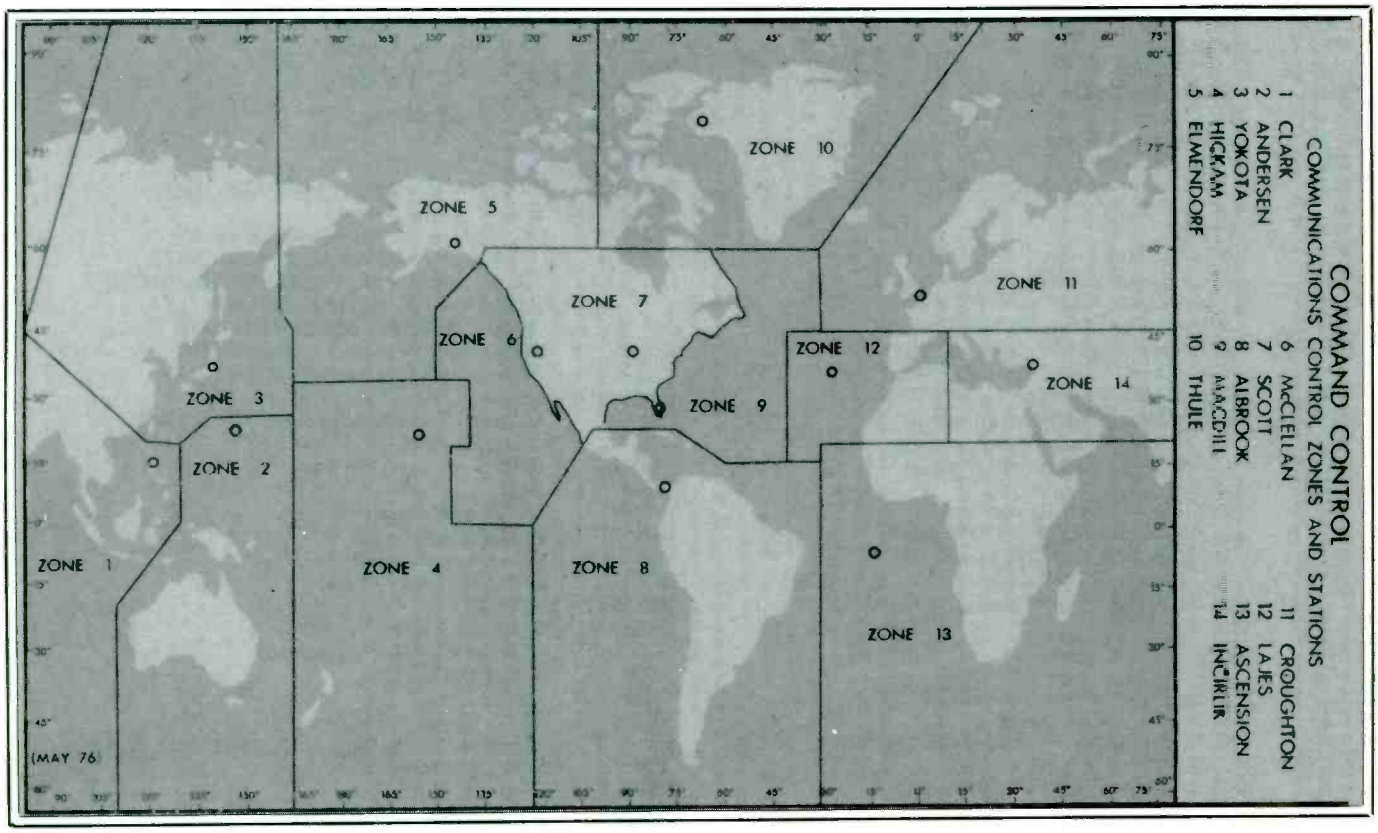
A map showing the 14 CCZ's applicable to the GCCS is given here.

Armed with this information, you should be able to get a handle on the many HF frequencies used for voice communications by the USAF.

One of the duties of the USAF's 89th Military Airlift Group is to maintain and fly this aircraft. It's often monitored as "Air Force 1."

A SAC B-52H (shown here with its braking parachute deployed while landing) sports pulse-doppler missile warning antennas on its tailfin.

The Command Control Zones of the USAF's Global Command Control System.

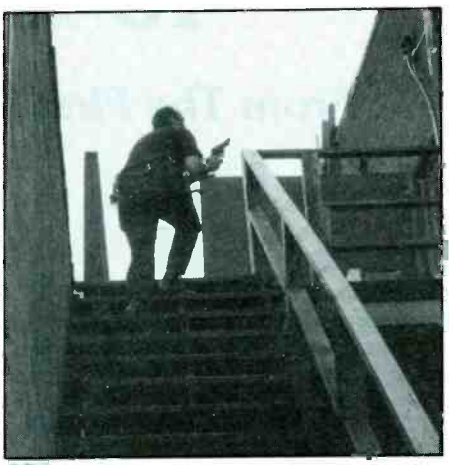


Police Officer Remains Cool After Being Wounded

Grants Pass, Oregon, is not the kind of place you would expect to see a shootout on a downtown street, buy that's what happened one April afternoon.

Grants Pass policeman Don Grow was passing by the Eagles Lodge when he noticed a heated argument between a man and woman and pulled into the parking lot where they were standing. As Grow began to get out of his car, the man pulled out a .357 Magnum revolver and shot the woman in the head and Grow in the abdomen, according to an account in the Grants Pass *Courier*. Grow fell back into his car and fired three shots through the windshield, missing the man, who ran into an alley.

Policeman Don Grow being lifted onto stretcher by fellow officers after being wounded. (Grants Pass Courier *photo by James W. Mitchell)*



After the shooting, fellow officers begin the search for the suspect. Here, Sgt. Frank Taus of the Josephine County Sheriff's Department approaches an open door with gun drawn. (Grants Pass Courier *photo by Wes Nelson)*

SCAN PUBLIC SERVICE AWARD

The bullet that hit the policeman was apparently deflected by the heavy leather belt used by officers to carry their gun and other police equipment.

Despite being wounded, Grow was able to call for help and officers from the three area police agencies were soon on the scene.

The suspect had fled into a nearby doll shop. Police Cpl. Harold Philbrick and officer Ray Tierce went inside the business and the man surrendered after a conversation with Philbrick. The woman in the incident, who turned out to be the suspect's wife, later died.

Grow underwent surgery after the shooting and was listed in satisfactory condition the morning after the shooting, according to the *Courier*. The 45-year-old police officer is reportedly popular with fellow policemen and with community residents. He's been with the Grants Pass Police Department for 15 years.

"So Don's going to make it? Hey, that's good news," said the employee of a nearby store. Other shoppers and store owners were pleased with the actions of the police in preventing what could have been a more serious tragedy.

Capt. Dave Jimenez of the Grants Pass Police Department said that Grow stayed alert and "did a real good job" handling the tense situation, according to the account of the incident in the *Courier*.

It is believed that the incident was the first time a Grants Pass police officer, and possibly any lawman in the county, had been shot in the line of duty.

For his coolness under pressure, Officer Don Grow will receive the SCAN Public Service. The award consists of a special commendation plaque and a $100 cash prize. For making the nomination, Emitt Jackson of Grants Pass will also receive a commendation plaque. SCAN

Best Equipped

Steve Harwood of Grand Rapids, Michigan, writes that he is into scanners "pretty heavy." He says that he has a satellite system and enjoys tuning into the audio bands transmitted with the television signals.

Steve uses a Bearcat 300 scanner, Bearcat H-2, Regency HX-1000, Regency HX-650, and Regency MX-5000. He also has a Realistic DX-302 receiver and a Robyn 520D, as well as a Zenith Transoceanic that was purchased as junk at a local flea market. This radio was built in 1951, but Steve says it works almost like new.

SCAN PHOTO CONTEST WINNERS

A computer system, complete with monitor, disc drive, and printer is also used in addition to a cassette recorder and television. Antennas in use include the Winegard H-1000 satellite system already mentioned, Hustler DCX antennas, Winegard FM antenna, Antenna Specialists "Big Stick," and a 65-foot longwire antenna for shortwave broadcasts.

Best Appearing

Our winner in this category this month is William F. Tupper of Ogdensburg, New York. This is the kind of equipment set-up that holds a lot of gear, but doesn't make the whole room look like the radio room on an aircraft carrier. (Of course, that's what some people want, but that's another story.)

Williams uses a Regency MX-5000 scanner, Bearcat 100, Realistic SSB/AM for REACT activities, and a Bearcat 220 that was not included in this photo. An MFJ Signal Enhancer II, Realistic audio mixer, Kenwood R-2000 with MFJ remote Active Antenna, and Grove mini-tuner are also used.

Thank you for your entry, William. We're sure that you will enjoy your new Nitelogger.

Winners of the SCAN Photo Contest receive the popular BMI Nitelogger voice-activated tape recorder controller. To enter the contest, send a sharp black and white photo and a complete description of your equipment to: SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558. SCAN

POP'COMM's

46-Issue Basic Index

From The First Issue (September of '82) To June '86!

BY WALTER B. LOGAN III, KFL4LF

It got to be too much of a good thing! *POP'COMM,* I mean. When I first began reading the magazine, it had just started publishing. As each new issue would appear, I'd carefully read it from cover-to-cover and mentally file away various snippets of information that I'd need in the future.

The story on DX'ing the "Middle East Powder Keg"? The feature on Dr. John ("Goat Glands") Brinkley's broadcasting stations in Kansas and Mexico? No problem, I could recall the exact issue containing these and many other items that had appeared. All I had to do was spend a few seconds thinking about the story I was seeking. This system worked for a surprisingly long time, but eventually so many issues had been published that I began to lose the ability to spot-locate specific articles I needed. Like many communications buffs, I found that I did frequently want to refer to past issues, but not being able to quickly locate them was a vexing as well as time-consuming problem.

My first approach was to use an office copier to reproduce the page in each issue containing the Table of Contents. That was a help for a while, but looking through a couple of dozen of those finally became a nuisance. Also, after reading *POP'COMM* for a while, one realizes that many of the things you might want to locate just don't show up in the Table of Contents!

The next stage in organizing my access to this super-supply of information was to create a basic index of features contained in the issues, generally excluding the contents of the regular monthly columns except in certain instances where they contained material that amplified items in previously published features. Category headings were created and items were dropped into one or more of these designations, as appropriate. I have found that this has served its purpose well, although I do see the advantages of a more highly detailed index.

Included here, for the use of those fellow *POP'COMM* fans who share my view that 40+ issues of the magazine comprise a huge reference library, I'm presenting here my basic index to all issues from the inauguration of the magazine in September of 1982 to the issue dated June of this year. This should suffice until I complete a more detailed index that I hope to offer upon completion.

For those who have not yet assembled a complete set of *POP'COMM*'s, this index will provide reasons to consider the advantages of obtaining the missing issues. Back issues are available at $2.50 each (specify which ones you want) from the Circulation Department, Popular Communications, 76 North Broadway, Hicksville, NY 11801. They advise that the supply of certain issues is beginning to run low since a number of readers have been assembling complete sets. In fact, the August '83 issue has totally sold-out and is now a genuine collectors' item! For those who seem inclined to put together as complete a set as possible, such a project might best be commenced (even piecemeal) at an early date (especially in regard to the 1982 and 1983 issues since the supplies of those are beginning to dwindle at a steady rate).

As an aside, I might note that as issues sell out and become collectors' items, the only way they can be obtained is from other collectors. If you've collected stamps, coins, *TV Guides,* or anything else, you know how they can appreciate in value when you attempt to make purchases from other collectors. I've paid more than I'd like to admit for certain issues of *Playboy* from the early years. On the other hand, I've already refused offers of $5 for my rare August '83 issue of *POP'COMM*!

To use the basic index here provided, the references for locating the features show the month and year of publication, followed by the page number. So, a reference to "10/85/7" means the issue of October, 1985, page 7.

Here's hoping that this will help you to find the information you're seeking in your back issues of *POP'COMM*. It's been of considerable use to me since I assembled the information.

Popular Communications
Index: September, '82 to June, '86

PC

Radio In Days Of Yore

Some Intrigue, Some History, An Arabian King And More

BY ALICE BRANNIGAN

Within the past year or so, CW monitors have noticed a coastal station signing WSC that has recently taken to the airwaves. To be sure, this latest use of the callsign WSC for a CW coastal telegraph station on the New Jersey shore carries only the external trimmings to connect it with the famous WSC of Tuckerton, New Jersey that communicated with ships at sea for half a century before closing down about four or five years ago.

An earlier WSC was a story in itself and harks back to an earlier station that was quite a piece of work. That original station, first operated under the callsign WGG by the Goldschmidt Wireless Telegraph Company when it began testing with station POZ (Nauen, Germany) in July of 1913, went into service to Germany in June of 1914.

There were several noteworthy matters relating to station WGG; first was that it went into full operation only ten days before Austria's Archduke Ferdinand was assassinated, an event that served as the pretext for the start of WWI. Secondly, all of the equipment at WGG (except for one item) was made by the Telefunken Company (of Germany), and there were those who felt that WGG's German owner, Dr. Goldschmidt, was merely fronting for the station's true owners, Telefunken, a company with close ties to the Kaiser's military establishment.

The most visible matter relating to WGG was its magnificent and gigantic transmission tower, reaching 860 feet toward the sky. The most invisible thing about WGG was the only piece of American made equipment at the station, a device called the Telegraphone. Made by the American Telegraphone Company of Springfield, Massachusetts, the Telegraphone was a magnetic (wire) tape recorder supposedly intended for office dictation. Only a few were ever produced, and most of those went to station WGG, the Imperial German Navy, and to another German-owned telegraph station, WSL in Sayville, New York.

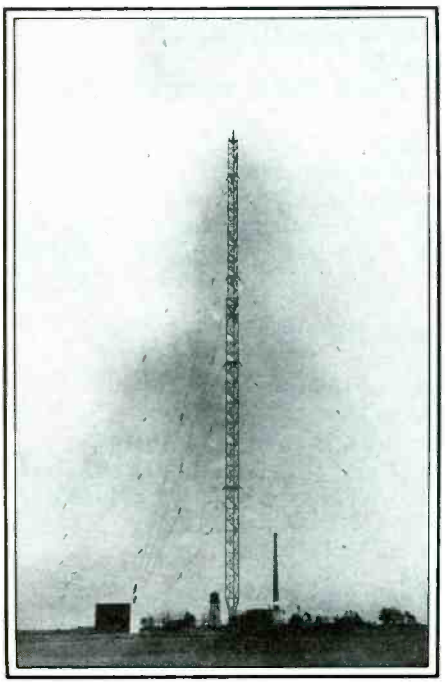
When the war broke out, the U.S. was a neutral nation. Our government quickly passed laws allowing only American citizens and companies to own wireless stations within our borders. That was immediate cause for the U.S. Navy to take over WGG and assign it a USN callsign (NWW, 32.6 kHz). During the confiscation of WGG, the Telegraphone was discovered in the station's equipment lineup.

The other German-owned station, WSL, was able to continue in operation due to a transfer of its license to a dummy American corporation. It was only after strange signals began coming from WSL that it was realized that the sounds were being generated by the Telegraphone. Encrypted CW was recorded and then transmitted at very high speed for the purposes of exchanging espionage traffic between German agents in the U.S. and their headquarters in Berlin.

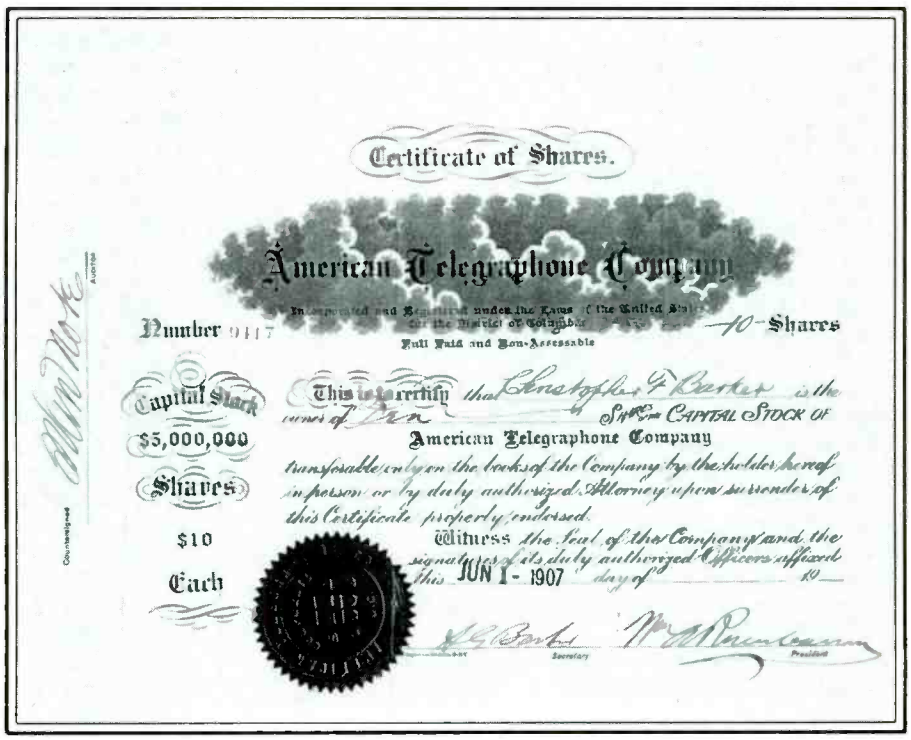
In later years, it was believed that this was the means used to pass information to the Germans that led to the sinking of the British passenger liner *RMS Lusitania* with the loss of 1,198 lives. The best guess is that American military monitoring stations had been able to intercept and decode the Telegraphone's signals because of the unit taken from WGG, and also because of the one that had been secretly installed and operated at the Navy's Arlington, Virginia station since 1912. A lengthy discussion of these events was given in the October, 1984, issue of *POP'COMM* ("Germany's High Power Spy Station—In The USA!").

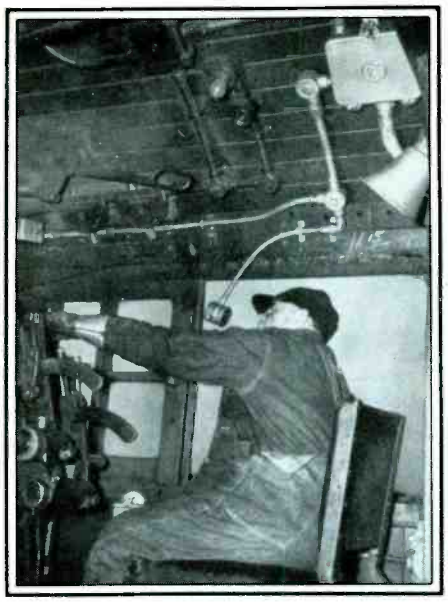
When the war ended, the Tuckerton station was returned to the air as WGG (19.9

In 1913, station WGG in Tuckerton, New Jersey had an antenna that was 860 ft. tall. It was also accused of having ulterior motives. That's when the U.S. Navy took over the station's operations.



A rare uncancelled 1907 stock certificate from the American Telegraphone Company, this nation's first manufacturer of electronics espionage equipment. One unit was installed at WGG; others were at WSL and NAA.





Early VHF installations in steam locomotives were plagued by a high (audio) noise level, soot, heat, cold, shock, and vibration. This 1945 coal burner represents a noble VHF experiment made by the NYCRR.

kHz) under the ownership of RCA. Within a few years the callsign was changed to WSC, and by 1930 the station was operating on frequencies between 111 and 22100 kHz.

We have a view of the Tuckerton station as it looked when it first went on the air just before the outbreak of the war. The station's imposing transmission tower was, by far, the tallest structure anybody in the area had ever seen. It became quite a well-known tourist attraction. We also present a copy of a very rare American Telegraphone (uncancelled) stock certificate dated June 1, 1907. This company was the first American manufacturer of electronic espionage equipment!

Never able to mass-market Telegraphones as competition to Edison's wax cylinder Dictaphones, American Telegraphone went through several reorganizations. The company was in debt and its only asset was its factory. ATC finally switched over to the manufacture of universal joints and got out of debt by the mid-1930's. In 1937 the factory was sold by court order and as of 1940 the assets of the bankrupt corporation consisted of $55,000 in cash (there were still 17,000 stockholders at that time). I don't know the final disposition of this company, but the matter probably remained in court for a sufficient number of years for expenses to whittle away most of its cash assets. For all I know, the stock may still have value; I could be an heiress!

Well Trained Communications

In the last issue of *POP'COMM* there was an excellent story about using a scanner to monitor steam powered excursion line railroads. That got me digging around to see what I could find regarding early use of two-way railroad communications during the era when steam locomotion was the usual method used to move our railroads.

I found that several early methods of communications with trains were tried, including VLF induction systems, high frequencies, and VHF-FM. The VHF-FM systems began to come into their own in the mid-1940's, just after WWII. Early experiments used low-band transceivers that had been originally designed for police use. The (30 to 50 MHz) low-band, with its coast-to-coast skip signals, was discarded in favor of frequencies above 150 MHz. By 1946, many railroads were using limited VHF communications in their railyards and elsewhere.

There were enormous problems involved with successfully operating two-way equipment in a steam locomotive. These included the power supply, drafts, soot, heat, cold, exposure, vibration, shock, and the copious amount of noise produced by the tracks and iron horse itself.

One of the very earliest users of railroad radio was the old New York Central RR which (in the 1940's) had about 12,000 miles of track. Our 1945 photo depicts a NYCRR engineman in a yard engine contacting the yardmaster at the classification yard in Selkirk, New York.

Operating on 158.79 MHz, this one engine was licensed for use at Selkirk; its callsign was WNKX, assigned for a transceiver made by the General Railway Signal Company. The yardmaster's callsign at Selkirk in 1945 was WNYP.

By 1950, the early experiments had proven so successful that railroad radio was a way of life. Selkirk's yardmaster had gotten a new callsign, (KEA901) and a new frequency (160.41 MHz), as well as permission to communicate with the NYCRR's 191 portable and mobile units operating on 8 different frequencies under the callsign KA2467. Quite a change!

The NYCRR eventually became the Penn-Central RR; then that was taken over (along with several other railroads) to form Conrail. Today, the yardmaster at Selkirk (Bethlehem Township) is still known as KEA901, but he's on 160.98 MHz. There are ten other VHF frequencies utilized by Conrail facilities at that same location, each under its own individual callsign!

But the NYCRR is long gone, and so is the era of the steam locomotive (except for a handful of tourist and excursion railroads). Railroad communications monitoring, however, is still a vital and fascinating part of the scanner communications scene!

The Sheik of Araby's Radio Station

As Alfonso Bedoya (and later, Al Collins) was heard to say, "I don't have to show you no stinkin' badges!" How true, when you've got the gold, you make the rules. That's the way it was, too, in Saudi Arabia during WWII when His Majesty, King Abdul Aziz ibn Abdul Rahman al Faisal al Saud (just plain Abdul Aziz al Saud to his many friends, or King Faisal to the news media) decided that it would be interesting to keep up with world technology by owning a radio station.

The King of Saudi Arabia didn't have to bother with lots of political falderal or bureaucratic paper-shuffling when he had one of these whims. In Saudi Arabia, there's no constitution and no parliament. The ruler (and his Council of Ministers) exercises complete authority within the structure of the nation's strict Islamic religious code.

Obviously there was no need to license the King's very own personal radio station; after all, who else but the ruler himself even owned a radio station at that time in Saudi Arabia? It would be the ruler himself who'd have to issue the license for himself. The license idea was quickly discarded as being too plebean and demeaning for royalty, as was the notion of having to identify such a radio station by a distinctive callsign. Frankly, when the station came on the air, King Faisal knew that there'd be little doubt as to whose station it was.

Oddly enough, there was one stumbling block to Faisal getting his very own radio station. Wahabi holy men (to whom even hymns are sarilegious) were certain that the entire contraption was no more than a way for Satan to speak to the world. They were opposed to the whole idea, and their opposition was sufficient to stall plans for the station. This obstacle was overcome with the promise that purifying Koran texts would be read over the station from time to time.

Then it occurred to someone that since there weren't any radio receivers in Saudi Arabia, there was not going to be any audience for the station. Nor would there be any other radio stations in Saudi Arabia for the King's station to communicate with. That was solved when His Majesty decided to construct two additional stations that could communicate with his personal station at his palace in Riyadh. These stations were in Jedda and La Mecque.

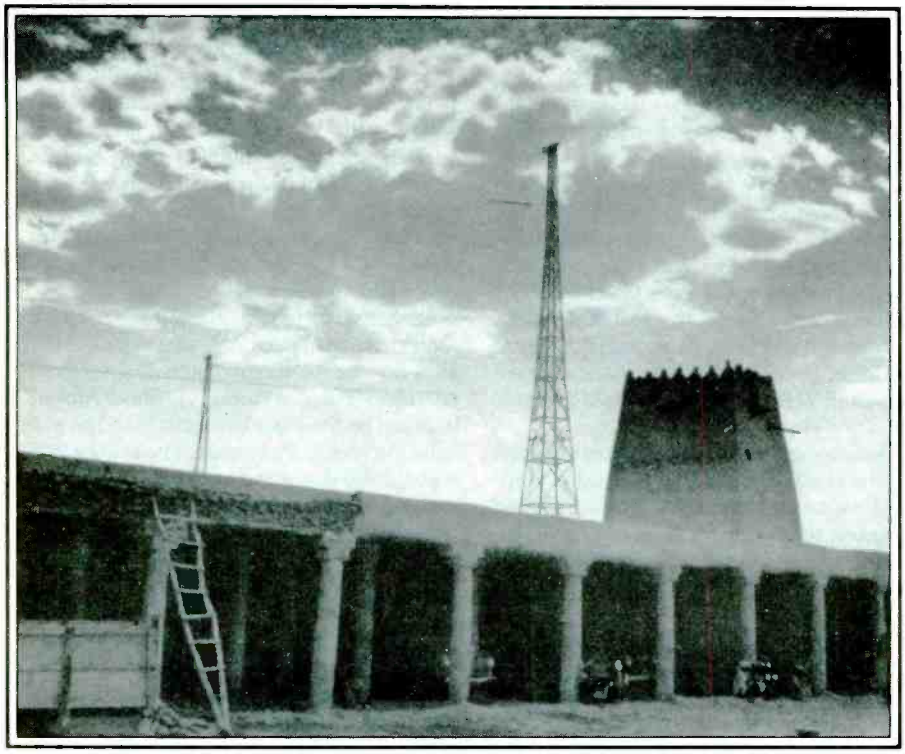
Operating in voice and CW, all three stations went into operation during WWII. Each had a 500 watt transmitter on 3500 kHz (the La Mecque station could also operate on 2667 kHz). Although these stations never had callsigns, they would later also be used to keep the king in contact with various oil fields and trucks, and with royal vehicles transporting the king's guests across the desert.

A bootleg network? You might define it as such, but you'd have to agree that this was one of the most unusual royal whims ever!

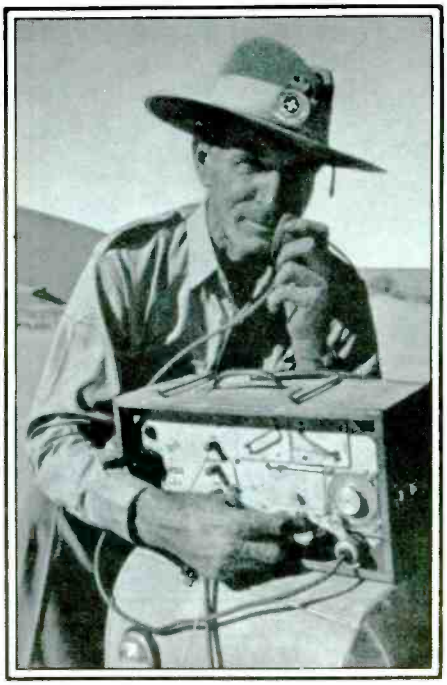
The 100% Dinkum

Readers of this section have asked for some coverage of public safety communications along the lines of the lonely RCMP station in the North West Territories that ran here last month. This time, let's take a look at the Australian outback's police communications as they looked almost 25 years ago.

In many areas of the outback (sparsely settled inland areas), the police travel great distances in Land Rover vehicles. This often takes them hundreds of miles from their base stations. Communications by VHF (such as



No callsign, no license, and no audience, but the king insisted upon owning his own radio station. After a few prayers, he got his way. But he had to build two other radio stations to talk to him!



This Australian police officer calls in from a remote area of Queensland.

would be used in urban or suburban areas) just don't have enough coverage under such conditions. As can be seen in the photo, the police officer has a rather bulky transceiver perched on the front fender of his Land Rover in order to periodically call his headquarters.

This type of procedure is common in many areas of Australia; this early 1960's scene shows one of the rugged-looking members of the Queensland Police. The transmitter can operate in AM-voice or CW mode. His base in Birdsville, station 8XR, had a 150 watt transmitter on 2020 kHz.

Lost And Found? Maybe!

A couple of months ago we had a mystery photo showing an early 1900's view of something described only as "Wireless Station At Sea Gate." I noted that Sea Gate is at the eastern side of the entrance of New York Harbor, but wasn't able to come up with an identification on this station. Readers were asked for help, and R.B. Mahler of Brooklyn offered an interesting thought. R.B. points out that in the book *Radio Station Treasury*, there's a station listed in Manhattan Beach that used the callsign DF in 1905. He notes that Manhattan Beach is the name of an area only a mile or two east of the Sea Gate section of Coney Island, Brooklyn, New York and that there's a real possibility that our mystery photo could be station DF.

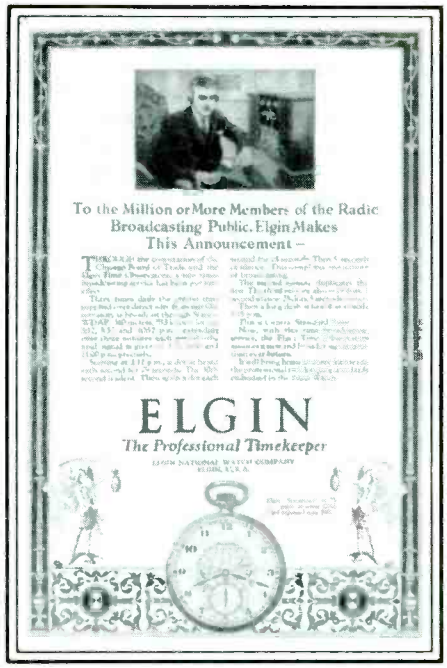
That was the best guess we received! In checking out station DF, I came across something that Ed Marriner (then W6BLZ, now W6XM) had written about this station in

This mystery postcard of an old time wireless station may have finally bee identified as station "DF." And guess whose grandpa may have designed the card!

the September '65 issue of *POP'COMM*'s sister publication, *CQ* magazine.

Marriner stated that in 1908-1909, station DF was established with a 2 kW spark transmitter at Manhattan Beach. This station was put on the air by Mr. R.H. Marriott, a wireless experimenter who was interested in long distance communications.

Station DF was to try to communicate with ships at sea that were using 1 kW spark transmitters. Cash bonuses were offered to ship operators who could copy DF at 100 miles distance, with a bigger bonus for 1000-mile DX. Records were kept relating to the time of day, the weather, the temperature of the operating room, etc., to see how such factors might affect DX range. He even found that some operators couldn't hear station DF



Mike Schulsinger sent us this 1924 ad touting an early time-signal broadcast from a long-lost station in Chicago – WDAP.

while they were smoking cigars! (Smoke Gets In Your Ears—wasn't that a song?)

Marriner, however, claimed that station DF used a directional antenna. The antenna in the view we ran looks to be a single heavily guyed vertical, and that would indicate an omnidirectional antenna in use by the station in our photograph. So, that still leaves it somewhat unsettled.

And here's a curious piece of trivia connected with the photo of this station. The view was from a postcard produced by the

Brooklyn Daily Eagle, a newspaper that existed in bygone days. *POP'COMM*'s Tom Kneitel dropped me a memo to point out that in 1908, his grandfather, the late cartoonist Max Fleischer (Betty Boop and Popeye animated cartoons) was 25 years old and was then the staff artist for the *Brooklyn Daily Eagle*, and could possibly have designed this postcard for the *Eagle*.

Time Out

In the days before stations WWV and CHU were giving out time announcements, it crossed someone's mind that radio would be a great way to give time checks. Michael A. Schulsinger of Springfield, Ohio (one of our regular correspondents) points out that he thinks he knows who might have been first with the concept.

Mike passed along an ad from an early 1924 magazine. This ad, from the Elgin National Watch Company, tells how radio owners could tune to 833 kHz where, three times daily (about 3:15, 6, and 11 p.m.) they could receive time signals through the cooperation of the Chicago Board of Trade and the Elgin Time Observatory.

The ad stated that the time pips were being broadcast over station WDAP, although no information about that station was offered. A check of our own records indicates that this station was owned by the Chicago Board of Trade (later by Midwest Radio Central, Inc.), and was located in Chicago's Drake Hotel.

A 1940's station operated by the U.S. Department of Agriculture on 3295 kHz. The transmitter ran a mere 25 watts.

WDAP wasn't what you'd call one of your more long lasting stations. It began broadcasting in about 1922; by 1925, the station (time pips and all) was history!

Snow Use

What better time than August to look in on the U.S. Department of Agriculture's Oregon Snow Survery station? The agency's base station in Medford, KBEI, was running 25 watts (AM modulation) on 3295 kHz back in the late 1940's when this photo was snapped.

The author strikes a pensive pose while awaiting the next POP'COMM *copy deadline.*

Communications were between Medford and various Sno-Cat vehicles in the boondocks taking snowfall readings. Chief operator at KBEI had the appropriate name of W.T. "Jack" Frost!

SCAN

Where Oh Where Do I Send . . .

There still is understandable confusion about what to send to SCAN and what to send to *Popular Communications*. Even we were confused at first, so don't feel alone! Here's a brief rundown you may want to save for reference.

Change of Address: If you're a SCAN member, your old mailing label and new address should be sent directly to: SCAN Address Change, P.O. Box 414, Western Springs, IL 60558. Sending it to *Popular Communications* will cause delays if you're a SCAN member. On the other hand, if you're *not* a SCAN member, address changes should go to *Popular Communications*.

Communications Shop Ads: These should go directly to: PC Communications Shop, 76 N. Broadway, Hicksville, NY 11801. Please, please type your ad or print very clearly.

Membership Renewal: Please send your SCAN membership renewal (which includes subscription to *Popular Communications*) only to SCAN, P.O. Box 414, Western Springs, IL 60558. *Popular Communications* subscribers who are not SCAN members should continue to send renewals to *Popular Communications*.

Photo Contest Entries: Send to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558.

Public Service Award Nominations: Send to SCAN Public Service Award, P.O. Box 414, Western Springs, IL 60558.

Co-Op Service Orders: Send to SCAN Co-Op Service, P.O. Box 414, Western Springs, IL 60558.

SCAN Insurance Claims: Send directly to Hartford Insurance using the address shown on the policy.

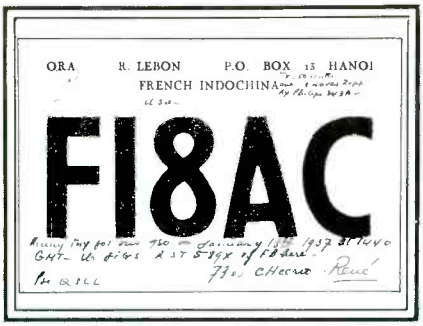
Comments and Suggestions: Always welcome at either *Popular Communications* or SCAN (or both!)

Historic Ham QSL's

The nation of French Indochina was the eventual name of an area of Southeast Asia conquered by France between 1858 and 1884. This colony was comprised of the protectorate of Cochin-China in the south and Annam and Tonkin in the north.

In 1940, Japan occupied these areas and established Bao Dai (emperor of Annam) as head of a puppet regime. In 1945, under the leadership of Ho Chi Minh, communist guerillas forced out Bao Dai. France sought to regain its control of the area and fought communist and nationalist forces between 1946 and 1954, ultimately being defeated at Dienbienphu in 1954. Bao Dai, in 1949 (with French support), had meanwhile formed the State of Vietnam. Ho Chi Minh gravitated toward an alliance with the PRC. In 1954, a cease fire accord was signed, creating two Vietnams, one in the north and one in the south. These few sentences are only a highly capsulized outline of a very complex series of dramatic historic events that led up to what came to be known as the Vietnam War.

Amateur operators in French Indochina traditionally used callsigns commencing with the French prefix FI8, and the *ARRL Countries List* in 1955 still listed FI8 as the prefix even though France's influence there had been virtually over after 1940, and was profoundly over after May of 1954.



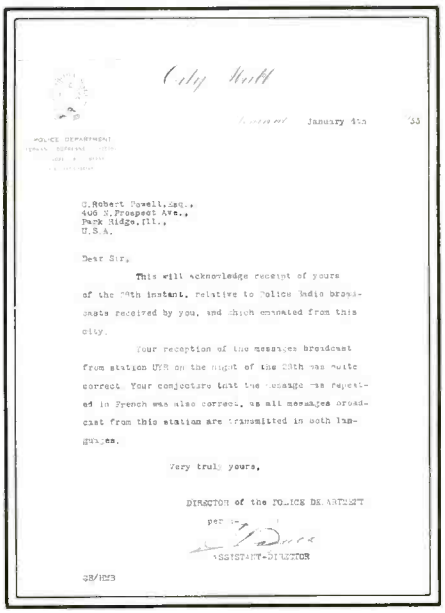
The bedraggled FI8 prefix continued in use for many years after it should have been retired, probably for lack of anything better to replace it during the continuing turmoil. In retrospect, however, the ARRL seemed to have second thoughts about counting contacts with FI8-prefixed stations toward League DX-operating awards. The current ARRL list notes that contacts with stations using FI8-type callsigns can't count for their awards if the communications took place after December 21, 1950.

Here's a QSL from one of the very earliest stations with an FI8 prefix, FI8AC, operated by René Lebon in Hanoi back in 1937. FI8AC's 50-watt signals made the trip to North America only three years before the fireworks began.

Where else could you read about Jack Frost and snow surveys in August?

An Odd Callsign

An early police station was obviously also one of the first users of what turned out to be a "tactical" (coded) identifier. That's the only way to describe station UYR (1712 kHz) of the Montreal, Quebec Police Department in 1932. The French/English language station (running 400 watts) even sent out a QSL letter in January of 1933 confirming its use of the oddball callsign from a block of calls that belonged to the USSR!


City Hall

January 4th 33

POLICE DEPARTMENT

G.Robert Powell,Esq.,
406 E.Prospect Ave.,
Park Ridge,Ill.,
U.S.A.

Dear Sir,

This will acknowledge receipt of yours of the 28th instant, relative to Police Radio broadcasts received by you, and which emanated from this city.

Your reception of the messages broadcast from station UYR on the night of the 28th was quite correct. Your conjecture that the message was repeated in French was also correct, as all messages broadcast from this station are transmitted in both languages.

Very truly yours,

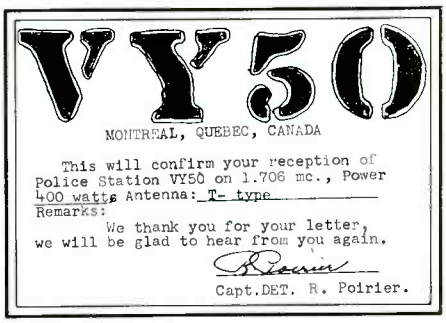
DIRECTOR of the POLICE DEPARTMENT

per

ASSISTANT-DIRECTOR

SB/HRB

Talk about esoteric callsigns! This letter confirms the use of the Soviet callsign "UYR" by the Montreal Police in the early 1930's. Eventually the callsign was changed to VYR to conform to the block assigned to Canada.


VY5O

MONTREAL, QUEBEC, CANADA

This will confirm your reception of Police Station VY5O on 1.706 mc., Power 400 watts Antenna: T- type
Remarks:
We thank you for your letter, we will be glad to hear from you again.

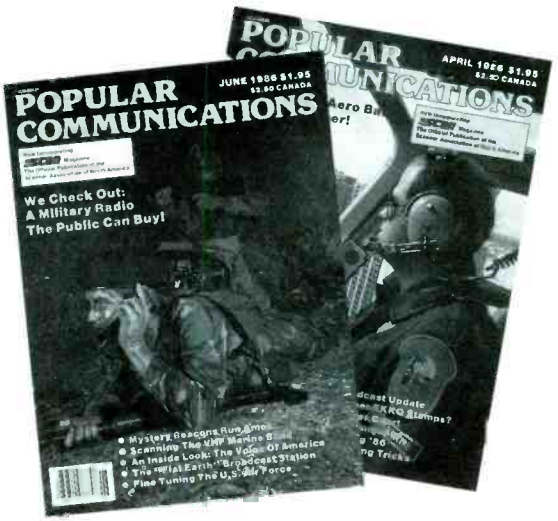
Capt.DET. R. Poirier.

In 1948, this prepared reply QSL was received from VY5O, the former UYR. (Courtesy Tom Kneitel)

By 1934, the Montreal Police saw the light and dropped the UYR for a similar (but more conformist) callsign, VYR. By the late 1940's the station had moved to 1706 kHz and become known under the callsign VY5O. But for a while there, it had a very strange handle. Wouldn't you agree?

Wish we had more space. Oh well, like the Four Freshmen used to say, *See You In September!* PC

To preserve your copies of



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Philadelphia, PA 19141

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City _____

State _____

Zip _____

Please allow approximately 4 weeks for delivery.

Studio control room director gives standby cue to a remote telecast unit. This systems uses a 450.85 MHz radio link.

A typical television remote telecast unit. It communicates with the studio on 450.55 MHz. Barrel-shaped objects on roof are used for microwave transmission of video.

Scanning Broadcast Remote Pickup Stations

There's Always Something New To Monitor On These Frequencies!

BY JOHN DOLIVE, N4DOR

Scanner operators are almost always people who love to know what's going on behind the scenes. And what more intriguing scenes to look behind than those of local radio and television broadcast stations and national broadcasting networks. Listening in on the behind-the-scenes activities of radio and television broadcast stations is easy if you know where to tune.

Broadcast stations are authorized to use frequencies in both the VHF and UHF spectrum for "remote pickup" (broadcasts originating from locations other than the studio) and technical coordination of such broadcasts.

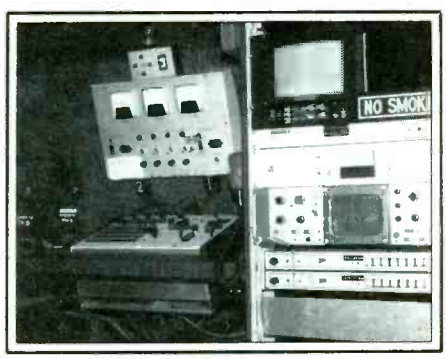
Frequencies used are 25.87 MHz to 26.47 MHz, 152.87 MHz to 153.35 MHz, 161.64 MHz to 161.76 MHz, 450.05 MHz to 450.925 MHz, and 455.05 MHz to 455.925 MHz. Tables 1 and 2 show the exact frequencies and how they are used.

These frequencies may be used to transmit actual broadcast material, such as entertainment or talk show programs, news reports, traffic reports, etc. for radio station broadcast. They are also used to coordinate remote broadcast activities, such as setting up live, microwave television pickups for news broadcast (Electronic News Gathering or ENG for short), cueing of reporters, announcers or camera personnel on location, and dispatching news crews to the scene of a late breaking news event.

Transmitted power levels range from 2.5 watts for small hand-held units to a maximum of 100 watts for mobile and fixed broadcast relay units.

In major metropolitan areas, most of the activity is likely to be found in the 450 MHz group of frequencies in which Automatic Relay Stations (repeaters) are licensed to frequency pairs.

In major metropolitan areas experiencing radio congestion, and in other cities where older equipment is still in use, 26 MHz frequencies are still in use for dispatch and even some types of remote pickup. Low power cueing systems and wireless microphones are sometimes found in this band. Propagation conditions at this frequency include "skip" during certain times of the year, and reception from hundreds or even thousands of miles away is possible.



Interior of television remote telecast unit. Note walkie-talkie type radios for use outside of truck.

Frequencies in the 174 MHz to 216 MHz range are also authorized for broadcast stations to use for low power applications, such

Table 1
Remote Pickup Broadcast Stations
Simplex Channels

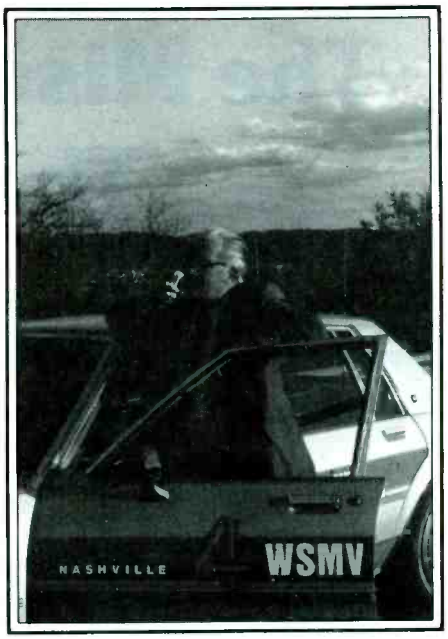
25.87	26.47
25.91	152.87
25.95	152.93
25.99	152.99
26.03	153.05
26.15	153.11
26.17	153.17
26.19	153.23
26.21	153.29
26.23	153.35
26.25	161.64
26.27	161.67
26.29	161.70
26.31	161.73
26.33	161.76
26.35	166.25
26.37	170.15
26.39	450.01
26.41	450.02
26.43	450.98
26.07	450.99
26.09	455.01
26.11	455.02
26.13	455.98
26.45	455.99

Table 1 shows remote pickup channels normally used in simplex operations.

Table 2
Automatic Relay Stations

Repeater Output	Mobiles
450.05	455.05
450.15	455.15
450.25	455.25
450.35	455.35
450.45	455.45
450.55	455.55
450.0875	455.0875
450.1125	455.1125
450.1875	455.1875
450.2125	455.2125
450.2875	455.2875
450.3175	455.3125
450.3875	455.3875
450.4125	455.4125
450.4875	455.4875
450.5125	456.5125
450.5875	455.5875
450.6125	455.6125
450.65	455.65
450.70	455.70
450.75	455.75
450.80	455.80
450.85	455.85

Table 2 shows frequencies authorized for repeater operation. Simplex may also be used on these frequencies with the repeater output frequency most commonly used for simplex operation.



Reporter files news stories on two-way radio transmitting on 455.85 MHz.

Studio camera operator enjoys unrestricted movement through use of wireless headset intercom system. Transmitter and receiver are attached to belt. Unit transmits on 215.2 MHz and receives on 189.20 MHz.

This wireless microphone transmits on 174.80 MHz. The transmitter attaches to the users belt and the tiny microphone clips on necktie or shirt collar.

Commuters hear traffic reports on their local radio and television stations from airplanes such as this one. Reports from this plane are relayed to the studio on 455.65 MHz.

as wireless microphones and wireless intercom and cueing devices. The range on these units is normally very limited, but if you are located near a broadcast studio or remote broadcast location, it is quite possible to listen to these transmissions.

There are even three frequencies authorized in the medium wave band for remote pick up use by broadcast stations. The frequencies are 1606 kHz, 1622 kHz, and 1646 kHz. These frequencies see very limited use and they will be eliminated from remote pickup use completely when the standard AM broadcast band is expanded from 1605 to 1705 kHz sometime in the 1990's. Any activity heard on these frequencies at present is likely to be in the AM mode.

All of these frequencies will provide very interesting monitoring fare. You'll hear the latest breaking developments on news stories as reporters on the scene advise producers at the studio of the latest details. Frequently, reports will be filed in advance via remote pickup and taped at the studio for later broadcast.

If you own a scanner capable of tuning the 900-950 MHz range, you can try receiving broadcast station aural studio/transmitter links (STLs). STLs are used to relay the main program from the studio to the transmitter location. These transmissions are wideband FM so your scanner must be capable of that mode in order to hear them. Also, at these frequencies, it is normal to use a small receiving dish, such as a microwave dish, instead of a quarter wave vertical, which would normally be used with a scanner. A yagi designed for the 450 MHz band might work if aimed properly at the transmitting antenna. The 15 frequencies used for STLs are 944.5, 945, 945.5, 946, 946.5, 947, 947.5, 948, 948.5, 949, 949.5, 950, 950.5, 951, and 951.5 MHz.

Take a listen to the behind-the-scenes activities of broadcast stations on the remote pickup frequencies. Many broadcast news organizations monitor the remote pickup frequencies of other broadcast stations to keep tabs on the competition. You are likely to find a permanent spot in your scanner's program for these channels. Be sure to have a television or broadcast band radio handy to listen to what the rest of the audience is hearing.

The Missing Scanner Band: They've Found It!

Do You Know Why Manufacturers Used To Ignore The 216 To 400 MHz Band? No Matter, Now (At Last) It's Been Discovered!

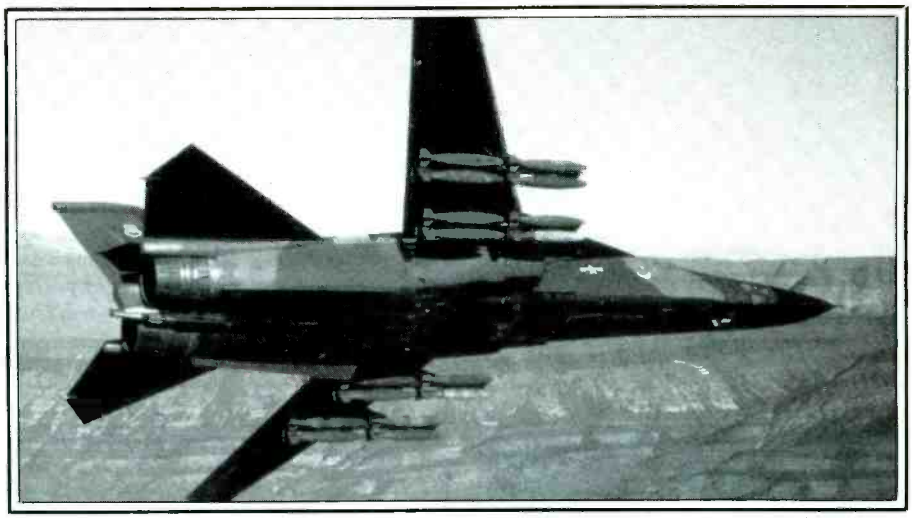
BY MARTIN STETT, KCA6TC

Scanner manufacturers can be peculiar at times. Many scanners include a digital clock but, for reasons unknown, they didn't go one step further and turn it into an automatic on/off timer. And, why isn't there even one single scanner that has a built-in cassette recorder with an automatic voice (VOX) relay for off-the-air taping of communications of interest?

For years, scanner manufacturers never included the 406 to 420 MHz UHF federal communications band. There used to be rumors that official or unofficial pressure from certain federal agencies was the reason why scanners skipped over these interesting frequencies. Then, with very little fanfare, the Realistic PRO-2002 scanner came out and dared to include 410 to 420 MHz—although why the 406 to 410 MHz frequencies were ignored remained a mystery. Then came the Bearcat 260 to offer the complete 406 to 420 MHz band. It was minor victory for scanner owners!

Maybe manufacturers hadn't realized that there were any worthwhile communications to monitor on the skipped-over frequencies, or they may have felt that scanner owners had already been given a sufficient amount of spectrum space to keep us well occupied. Or, could it be that there were design problems or that nobody had yet come up with the right "chip"? No matter. It does seem that the latest generation of programmable scanners has addressed the situation in a bold and sweeping manner, covering all frequencies between 25 or 30 MHz to well over 1,000 MHz. That includes coverage of FM and TV broadcasting, plus all sorts of communications bands, some on the list of those normally excluded from scanner coverage.

One of those frequency ranges that used to be counted amongst the missing ran from the high-frequency edge of TV Channel 13 (216 MHz) and the beginning of the radionavigation satellite band (399.9 MHz). Unlike the other assorted small bands and band segments that had been left out in the cold in bygone days (such as 136 to 144 MHz, 406 to 420 MHz, etc.), this was a major chunk of spectrum, almost 184 MHz-worth! That's more frequency space than covered in standard high-low VHF and UHF/UHF-T band scanners; almost twice as much, in fact! We're talking about a serious spectrum gap.



This USAF Tactical Air Command F-111 streaks over the bombing range at Nellis AFB in Nevada. Bombing and training run by the TAC requires UHF communications in the 225 to 400 MHz band. Now you can get scanner coverage of this band.

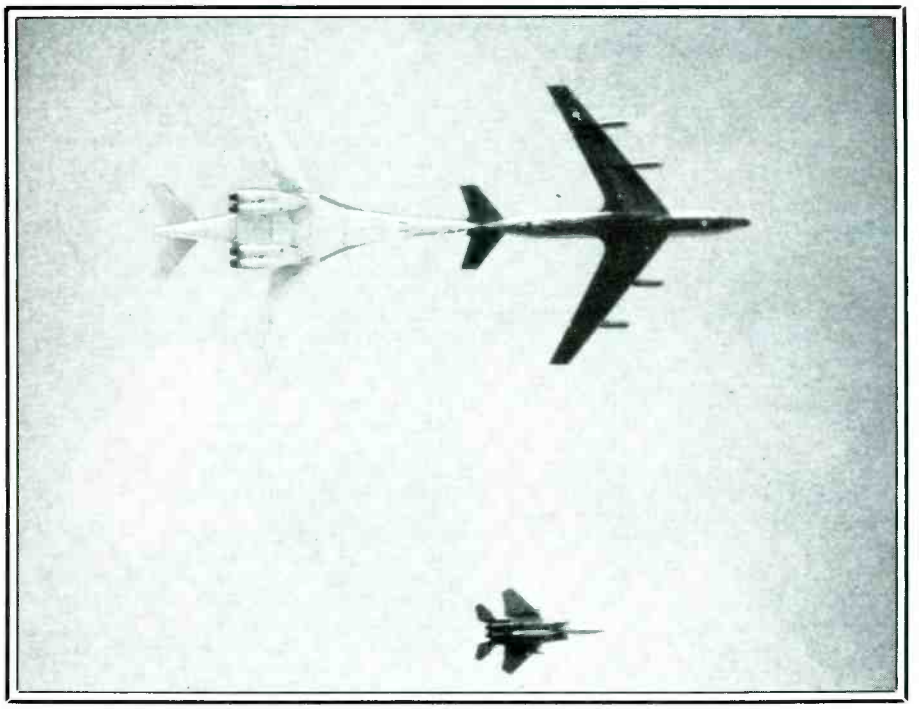
Some scanner owners were curious to know what they might be missing by not having these frequencies available. Others located converters that could run these frequencies into standard scanners, while another group scouted up (non-scanning) military surplus receivers that could tune in a portion of the band. Receivers such as the R-278 and R-1121/TRC-87 could cover most of these missing frequencies. Those who were able to monitor there were generally pleased with the results, finding that most of the band was occupied by military aviation stations and traffic.

But look at what's available in the commercial marketplace! ICOM has their exciting R-7000, Yaesu is here with the FRG-9600, while the JIL SX-400, and Regency MX-5000 and MX-7000 scanners all lead the vanguard with coverage of the previously neglected (or avoided) bands, including 216 to 399.9 MHz! Now that these frequencies are being covered in the newest generation of scanners, it's time to take a look at what they offer.

The Regency MX5500 scanner covers all frequencies between 25 MHz and 550 MHz. It is ideal for base station or mobile use.

The 216 To 220 MHz Band

The band of frequencies between 216.0125 MHz and 217.9875 MHz has been set aside for coastal stations operating in the Inland Waterways Communications System



The USAF's Strategic Air Command (SAC) relies heavily upon aerial refueling. Boeing KC-135 Stratotankers and McDonnell Douglas KC-10A Extender flying tankers coordinate these skilled operations by means of UHF communications.

(IWCS). Channelized frequencies (numbered from 101 to 180) are spaced at 25 kHz intervals. IWCS utilizes duplex (paired) frequencies with the ship stations operating 2 MHz above the coastal station frequencies. The ship frequencies occupy the 218.0125 to 219.9875 MHz band.

Voice (FM) and non-voice communications are authorized. Ship stations use 18 watts ERP (effective radiated power) and coast stations can run as much as 1 kW ERP (the maximum allowable ERP is determined by an individual station's proximity to a TV station on Channel 10 or 13).

The IWCS is described by the FCC as an "automated, integrated communication system" intended for use in the Gulf Intracoastal Waterway and the entire Mississippi River system (including all navigable tributaries of the Mississippi). Your author doesn't live close enough to these waterways to personally attest to the current activity status of the IWCS, and thusfar he hasn't noted any first-hand reports from other scanner users. Theoretically, these frequencies should be very busy in the central part of the nation.

The 216 to 220 MHz band is also used, to some extent, for telemetering purposes by federal and industrial stations. Some of the industrial stations that can (upon showing a need) be licensed by the FCC to use this band include those in the power utility, petroleum, forest products, special industrial, and telephone repair services. No voice transmissions are connected with these operations.

The 220 To 225 MHz Band

This is an Amateur Radio band that is gaining in use and popularity, being especially active in metropolitan areas where the 2 meter band (144 to 148 MHz) repeaters are starting to get too busy for the likes of some operators who yearn for a more laid-back place to chat.

Most communications here are in FM, and many repeaters are in use. Simplex (non-repeater) operation has been noted on 223.5 MHz. Generally, this band is where the 2 meter band was a number of years ago. It's a good place to listen—friendly and unhurried.

The 225 To 399.9 MHz Band

No doubt that the star performer of this portion of the UHF spectrum is the 225 to 399.9 MHz band. This is the stomping grounds for military communications on a grand scale, and with increased military readiness the frequencies here are more active then ever; these are primarily voice (AM mode) communications related to military aviation, with aircraft and ground stations in operation. In addition to aircraft on routine patrol missions, the frequencies turn up air traffic control messages, as well as communications relating to training and mid-air refueling activities. Air traffic control communications include control towers, ground control, approach and departure control, dispatchers, and most of the other services that you'd hear on the VHF aero band (118 to 136 MHz).

Most folks don't seem to realize that many FAA ground facilities (such as Flight Service Stations, Air Route Traffic Control Centers, control towers, etc.) operate in this band in addition to the VHF aero band, even at civil airports. For example, Los Angeles International Airport has two UHF control tower frequencies, a UHF ground control frequency, two UHF arrival and two UHF departure control frequencies. The FAA's Los Angeles

Some Activities 225 to 399.9 MHz

MHz	Used For
228.7	21st NORAD Region (Primary)
229.6	Army (Control Towers)
234.8	Offutt AFB, NE (Training)
235.1	Mather AFB, CA (Refueling)
236.6	Military (Control Towers-- USA/Canada)
238.2	Offutt AFB, NE (Training)
238.9	MacDill AFB, FL (Refueling)
	Milwaukee, WI (Air Reserve; Refueling)
239.8	USAF (Weather Information)
241.0	Army & Air National Guard
242.3	Eielson AFB, AK (Refueling)
243.0	Emergency/Distress
249.1	Military Satellites (Geostationary & Non-geostationary)
249.6	Military Satellites (Non-geostationary)
255.4	FAA Flight Service Stations
257.8	Military (Air Traffic Control)
259.4	Elmendorf AFB, AK (Refueling)
259.8	NASA Space Shuttle
262.3	Eglin AFB, FL (Mission Control)
263.6	Fallon NAS, NV (Bombing Range)
264.6	NORAD (Secondary)
264.9	Castle AFB, CA (Refueling)
	Grand Forks AFB, ND (Refueling)
	Griffiss AFB, NY (Refueling)
	Mtn. Home AFB, ID (Refueling)
266.5	Mather AFB, CA (Refueling)
	Ellsworth AFB, SD (Refueling)
	Plattsburg AFB, NY (Refueling)
	March AFB, CA (Refueling)
270.2	Charleston AFB, SC (Refueling)
272.1	Gila Bend USAF Aux., AZ (Bombing Range)
275.8	USAF (Ground Control)
276.1	Fairchild AFB, WA (Refueling)
	Holloman AFB, NM (Refueling)
	21st NORAD Region (Refueling)
279.8	Nellis AFB, NV (Refueling)
279.9	George AFB, CA (Central Coordinating Facility)
282.8	USCG Search/Rescue
283.9	N. Smithfield, RI (Air Guard; Refueling)
286.3	Wichita, KS (Air Reserve; Refueling)
289.7	K.I. Sawyer AFB, MI (Refueling)
	Pittsburgh, PA (Air Reserve; Refueling)
	Tucson, AZ (Air Guard; Refueling)
291.8	Tyndall AFB, FL (Bombing Range)
291.9	Loring AFB, ME (Refueling)
	Ill. National Guard (Refueling)
292.1	USAF Tactical Air Command
293.0	Robins AFB, GA (Refueling)
	Shaw AFB, SC (Refueling)
	Tyndall AFB, FL (Refueling)
294.6	White Sands Missile Range, NM
295.2	White Sands Missile Range, NM
295.8	Minot AFB, ND (Refueling)
	Luke AFB, AZ (Refueling)
	Knoxville, TN (Air Reserve; Refueling)
296.7	Buckley Air Guard Base, CO (Training)
297.3	Homestead AFB, FL (Refueling)
	Moody AFB, GA (Refueling)
298.6	Leemore NAS, CA (Training)
304.8	USAF/NOAA Hurricane Hunter Aircraft
305.7	USAF Tactical Air Command
311.0	USAF Strategic Air Command (Primary)
314.5	Caswell AFB, TX (Refueling)
	Rickenbacker ANGB, OH (Refueling)
321.0	USAF Strategic Air Command (Secondary)
322.8	Langley AFB, VA (Refueling)
322.8	Offutt AFB, NE (Refueling)
324.9838	NASA Satellites (Non-geostationary)
324.0	USN/NASA Satellites (Non-geostationary)
335.225 to 335.385	USN Satellites (Non-geostationary)
339.2	Ebbing ANG Base, AR (Refueling)
340.2	USN Air Traffic Control
340.8	USAF Military Airlift Command
342.2	USAF Strategic Air Command
342.5	USAF Weather Information
343.0	USAF Tactical Air Command
343.1	Beale AFB, CA (Refueling)
344.6	Military (Weather Information)
346.9	NORAD
349.4	USAF Tactical Air Command
	USAF Military Airlift Command
352.6	Salt Lake City, UT (Air Reserve; Refueling)
352.7	Dyess AFB, TX (Refueling)
	Grissom AFB, IN (Refueling)
	Davis-Monthan AFB, AZ (Refueling)
352.9	Eglin AFB, FL (Refueling)
	Cannon AFB, NM (Refueling)
	Pease AFB, NH (Refueling)
354.0	FAA Air Traffic Control
358.2	Camp Douglas, WI (Bombing Range)
360.045	ATS-6 Satellite
360.145	ATS-6 Satellite
360.2	USN Air Traffic Control
360.245	ATS-6 Satellite
361.7	Bergstrom AFB, TX (Refueling)
363.8	Military (Radar Approach Control)
364.2	NORAD
366.3	McChord AFB, WA (Refueling)
367.136	USN Satellite (Non-geostationary)
372.2	USAF (Dispatchers)
372.8	Military Airlift Command
375.2	USAF (Weather Information)
375.7	Altus AFB, OK (Refueling)
376.2	USAF Tactical Air Command
377.8	Nellis AFB, NV (Bombing Range)
378.2	Tinker AFB, OK (Refueling)
	Meridian NAS, MS (Refueling)
	Hurlburt USAF, FL (Refueling)
378.6	P 76-5 Satellite
381.1	Selfridge ANGB, MI (Training)
381.3	USAF Tactical Air Command
381.7	USCG
381.8	USCG
382.5	USAF Tactical Air Command
383.2	Offutt AFB, NE (Training)
383.9	USCG
384.7	Offutt AFB, NE (Training)
385.6	Scott AFB, IL (Refueling)
390.082	P 76-5 Satellite
390.9	USAF Military Airlift Command
396.2	Barksdale AFB, CA (Refueling)
398.5	Blytheville AFB, AR (Refueling)

ARTCC ("Los Angeles Center") operates on dozens of UHF frequencies in addition to its VHF aero band channels. This is typical across the nation.

There are also UHF frequencies set aside for emergencies and for search and rescue operations. Federal enforcement agencies have also been noted utilizing this band. For instance, aircraft looking for smugglers in the Miami (Florida) area have been monitored on 353.9 MHz.

Perhaps the most exotic application of this band has been in connection with military and NASA space programs and also its use by radio astronomers. The frequencies between 322.0 and 328.6 MHz have been of particular interest to radio astronomers, while 240 to 328.6 MHz, as well as 335.4 to 399.9 MHz, can turn up all sorts of artificial satellites.

Among the most highly publicized functions of the band include NASA's use of 296.8 and 259.7 MHz for Space Shuttle communications. Low powered (1-watt) transceivers operating on 279.0 MHz are installed in the suits designed for activities outside the Space Shuttle. When this program goes back into full gear, these frequencies will surely be retained.

Military communications satellites (and their associated ground stations) in this band generally use complex secure operating modes that you won't be able to comprehend (or possibly even detect) on a scanner. Some seem to transmit what sounds like a plain "open" carrier that are interesting to try for with a scanner. Of course, you'd have to be within the signal coverage area of the satellite to hear anything. Remember, too, that many satellites do not transmit continuously and transmit for brief periods upon command from a ground station.

The sub-band between 328.6 and 335.4

Selected Canadian UHF Aero

Abbotsford BC	295.0 (Control Tower)
Brandon MAN	248.3 (Control Tower)
Charlottetown PEI	236.6 (Control Tower)
Chatham NB	307.4 (Rescue)
	344.6 (Weather Information)
Comox BC	236.6/358.1 (Control Tower)
Fredericton NB	295.0 (Flight Service)
	236.6 (Control Tower)
Greenwood NS	308.6 (Operations)
	344.6 (Weather Information)
Halifax Int'l NS	346.6 (Control Tower)
	225.2/363.8 (Arrival Control)
Lethbridge ALTA	236.6 (Control Tower)
London ONT	321.3 (Flight Service)
Moncton NB	236.6 (Control Tower)
	270.8/290.6/294.5/368.5 (Center)
Montreal PQ	226.0/227.2/229.2/245.0 (Center)
(Dorval)	267.1 (Control Tower)
(St. Hubert)	352.5 (Control Tower)
Moose Jaw SASK	227.6/342.9 (Terminal Control)
North Bay ONT	360.4 (Military Operations)
	228.2/236.6/257.2 (Control Tower)
Ottawa ONT	247.0/278.5 (Terminal Control)
	236.6/341.3 (Control Tower)
Portage MAN	358.4 (Terminal Control)
	236.6/384.7 (Control Tower)
	344.6 (Weather Information)
Quebec City PQ	322.8 (Arrival/Departure Cntrl.)
	236.6 (Control Tower)
Regina SASK	279.8 (Arrival/Departure Cntl.)
St. Jean PQ	356.8 (Control Tower)
Sault Ste. Marie, ONT	236.6 (Control Tower)
Shearwater NS	308.8 (Military Operations)
	340.2/360.2 (Control Tower)
	344.6 (Weather Information)
Sudbury ONT	233.8 (Control Tower)
Summerside PEI	308.8 (Military Operations)
	236.6/294.7/325.9 (Cntrl. Twr.)
Thunder Bay, ONT	363.8 (Arrival/Departure Cntrl.)
	236.6 (Control Tower)
Toronto ONT	227.3/236.8/254.9/260.9 (Center)
(Pearson)	253.1 (VFR Advisory Svc.)
	236.6 (Control Tower)
Trenton ONT	324.3 (Terminal Control)
	268.0 (Base Operations)
	344.6 (Weather Information)
	236.6 (Control Tower)
Val-D'Or PQ	236.6 (Control Tower)
Vancouver BC	352.7/363.8 (Arrival/Departure Cntrl.)
	226.5/236.6 (Control Tower)
Victoria BC	239.6 (Control Tower)
Windsor ONT	236.6 (Control Tower)
Winnipeg MAN	225.2/232.3/266.3/283.4 (Center)
(International)	356.6/363.8 (Arrival/Departure Cntrl.)
	308.8 (Military Operations)
	325.9 (Radar Assist)
	236.6 (Control Tower)
	341.3 (VFR Advisory Svc.)

MHz is used by glide-slope navigational transmitters located at many military and civil airports. These are one-way, non-voice signals that probably won't sound like anything of interest to you. In fact, they are actually just that—of no interest at all!

A sample frequency listing of just some of the things that are taking place between 225 and 400 MHz is given in the chart that accompanies this report. This is only a fraction of what there is to hear.

Monitoring Tips

As for an antenna, you'll probably find that a good VHF high-band or UHF antenna will do a fine job in this band, with receiving distances roughly approximating what you'd expect to hear on the VHF aero band. In-flight aircraft (especially those at high altitudes) will be copied at great distances from your station and ground stations to perhaps 20 or 30 miles (depending upon many variables). Omnidirectional base station antennas intended for use in the 220 or 420 MHz Amateur Radio bands will do a fine job here, too. For satellite reception, you'll want to investigate the use of a steerable satellite antenna designed for Amateur Radio use in the 420 MHz band.

In all cases, reception will be improved by the use of a receive preamplifier designed for boosting signals in this range. Hamtronics, for one, makes an excellent UHF preamplifier.

For a meat 'n' taters no-frills approach to an antenna for this band, you might consider getting a basic inexpensive ground plane antenna (such as an Antenna Specialists MON-3 or ASP-7A) and trimming it for maximum performance between 225 and 399.9 MHz. Cut it for 312 MHz (the center of the band) by making the vertical radiator 7.5 inches, with each of the 4 horizontal (or drooping) elements 13 inches in length. Cutting is easily accomplished in a few minutes with a hacksaw and a burst of energy.

A highly detailed listing of 225 to 399.9 MHz communications facilities is contained in the 5th Edition of the *Top Secret Registry of U.S. Government Radio Frequencies*. This is available from many scanner dealers, or it may be ordered at $14.95 per copy (plus $1 Book Rate postage to addresses in U.S.A./Canada/APO/FPO) from CRB Research, P.O. Box 56, Commack, NY 11725.

If you have one of the newer scanners, you now know how to put these frequencies to use for you. If you don't yet have one of the latest-generation scanners, try visually scanning our frequency sampler chart and see what you're missing out on. You'll probably come to the conclusion that the time to ignore these frequencies has ended for you, just as it has ended for the manufacturers. Might as well hear as much as you can; isn't that what it's all about?

Now, if we can only get them to add that built-in cassette recorder! PC

The USAF's Computer Communications

AISD Supports The C-17

BY LOLA HOBBS,
AISD OFFICE OF PUBLIC AFFAIRS

An Airlift Information Systems Division office, dedicated to serving the information systems needs of the C-17 aircraft, now serves Military Airlift Command.

The Embedded Computer Resources Division within the deputy chief of staff for Programs was formed in late October to provide support and expertise on mission critical computer resources for MAC's new C-17 aircraft. An initial capability of 12 planes is expected to be in operation in 1992.

Computer systems on aircraft have become so complex that a pool of expertise was needed to address computer issues and take a critical look at the software support and systems required.

The staff consists of five members formerly assigned within the Headquarters AISD Plans and Requirements, Automation Support, and Logistics offices. The division is dedicated to the development of embedded computer systems hardware and software support for the C-17.

Embedded computers are microprocessor systems that form a part of a larger system whose purpose is not primarily computational. Such systems may range from a single microcomputer to a network of computers and may or may not be manually programmable. The C-17 is expected to have more than 90 microprocessors.

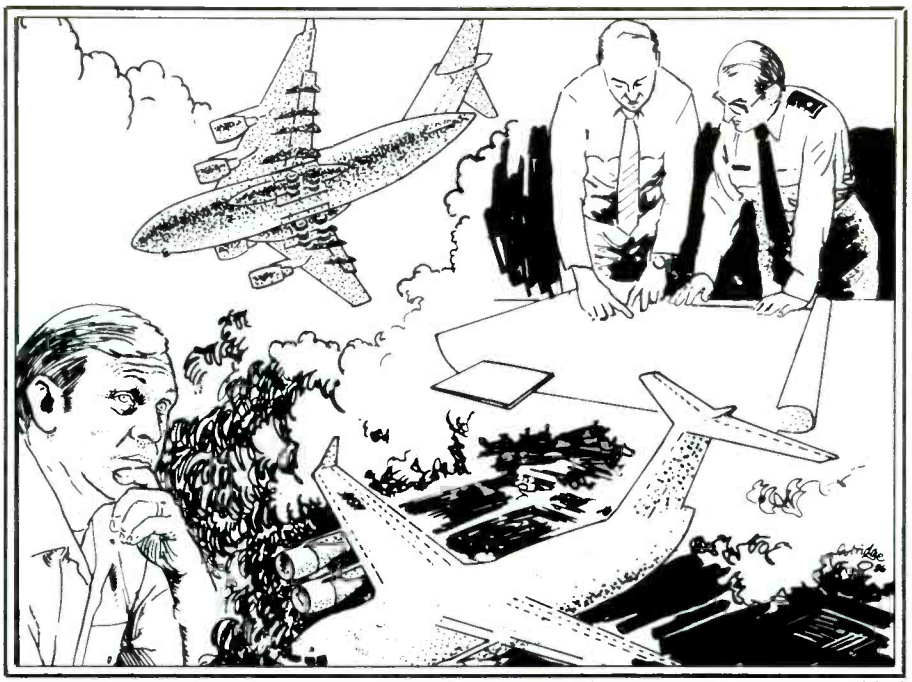
According to Maj. Larry W. Wessels, chief of the USAF's AISD division, "Embedded computer resources is a new era, a new field, and a lot of our initial effort has been a self education process."

The C-17 embedded computer resource systems are comprised of four subsystems: the mission computer, the electronic flight control computer, and the communications and navigation computers.

The mission computer subsystem controls the overall aircraft mission profile.

The electronic flight control subsystem uses external avionics sensors to direct the autopilot, flight director, and automatic throttle. It also provides inputs to the mission computer.

The communications control computer contains the high frequency coupler; HF, VHF, and UHF transceivers, the communication/navigational control panel, and the central aural warning system.



The Embedded Computer Resources Division makes plans for the mission critical embedded computer systems for the C-17. (U.S. Air Force art by Capt. Milford A, Gutridge)

The navigation subsystem provides navigational data to flight instruments for displays, and to the electronic flight control system computer for lateral, vertical, and throttle-speed automatic control. This subsystem will make the C-17 the first cargo aircraft with an electronic heads-up display system, considered essential for short field landings, accurate touchdowns, and low altitude parachute extraction system operations.

Cathode ray tube displays will provide increased reliability and will be easier to maintain and repair. In addition, CRT displays will enable the new aircraft to fly with a crew of two pilots, as opposed to today's transport planes that require a navigator and flight engineer. The CRTs will display the functions accomplished by these other crew positions.

Other C-17 embedded computer systems are the anti-skid braking system, the onboard gas generation system, and the engine control system. These are examples of microprocessor controlled systems with their software embedded.

Some systems are common to other aircraft in the Air Force inventory and, if practical, will be used. However, experience has shown that software support for these systems can take up to a year to be developed. On certain mission critical systems, this support needs to be identified from the start.

After coordination with personnel from MAC Plans, the new AISD office developed a plan identifying the necessary software and hardware required on the new aircraft.

In addition to the planning, the AISD personnel review each computer configuration item test plan, test procedure, and test report.

They represent MAC as primary members of the Computer Resource Working Group, and participate in the preliminary design

reviews, technical interchange meetings, and critical design reviews chaired by the Aeronautical Systems Division of Air Force Systems Command.

According to Major Wessels, "We have identified problems encountered during development of other aircraft. We can avoid these same problems on the C-17 and conversely, things we learn developing the C-17 may be used on other major command aircraft."

Major Wessels' office is working closely with Air Force Logistics Command to develop the procedures to manage the software and hardware support that will be required for the new aircraft computer systems. They also work closely with Air Training Command to develop the necessary training that will be required for support crews.

Members of the office are also working on plans to develop embedded computer systems hardware and software support for the new Air Force One aircraft.

Said Major Wessels, "The whole area of information systems is evolving so rapidly—we have to be careful that what we develop is the most up-to-date capability available when the aircraft start flying."

AISD is an intermediate headquarters of the Air Force Communications Command. It provides command and control communications, data processing functions, weather and base communications, and air traffic control services to Military Airlift Command bases around the world. PC

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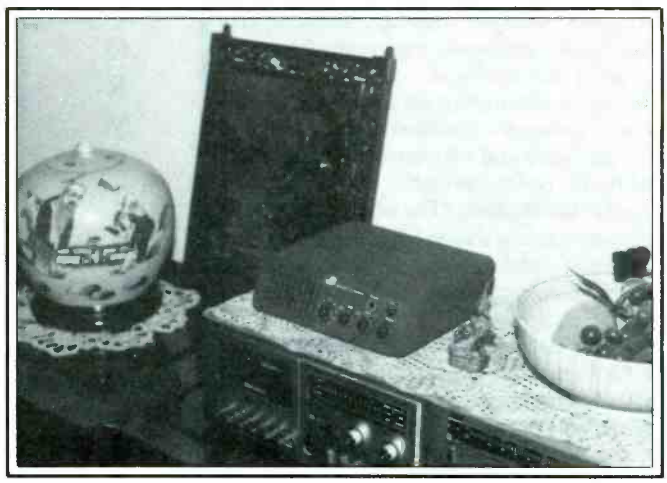
PRODUCT SPOTLIGHT

LINIPLEX

A New Concept For Hi-Fi Shortwave Reception

The LINIPLEX F1 HF receiver.

You can see how small it is.



Most shortwave enthusiasts would consider the latest synthesized communications receiver to be the ultimate for reception of high frequency broadcast stations. That's conjecture! It really depends on whether the listener wants overseas entertainment in quantity or quality.

For the ardent DXer intent on sifting out and logging a maximum number of stations, a synthesized comms receiver is obviously ideal. What's the argument, then, you might ask? Well, a percentage of shortwave listeners are not DX fanatics. They simply want to obtain the best possible reception of a particular station or service. There are plenty of examples: an off-duty crew on an oil rig in the South China Sea who want to spend the evening listening to music, the news, or a ball game from home; a migrant family who keeps in touch with the homeland by listening to the shortwave service of their country or origin; an island community who want to rebroadcast a mainland service over their local AM or FM station. It's these types of situations that highlight the limitations of communications receivers when used for AM.

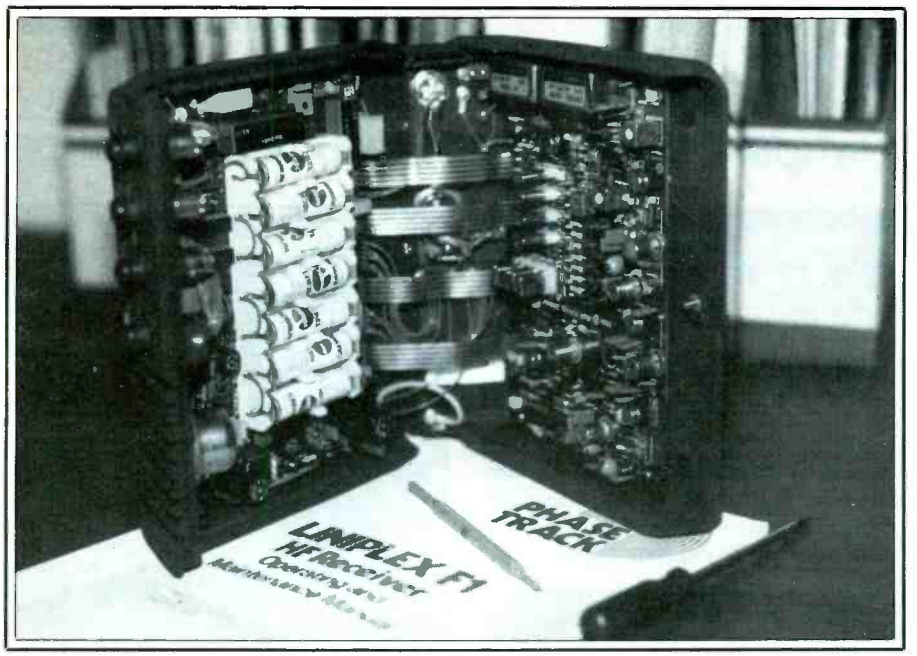
Shortwave broadcast stations transmit AM of a similar quality to your local mediumwave AM stations. The higher audio frequencies are perhaps limited a little more because shortwave stations are stacked in at every 5 kHz across the dial, as compared to 10 kHz for mediumwave stations in North and South America. (It's 9 kHz for the rest of the world.) The low audio frequencies go right down to 50 Hz, but how much of all this can we hear from a good communications receiver? Less than half, due to the audio response being tailored to cut all lows beneath 300 Hz and highs above 2500 Hz. Is it any wonder that speech is muffled and music isn't music. No fault of the receiver, which was designed that way to provide optimum speech performance in HF-SSB communications networks, not AM broadcasting. Some receivers do have a wider filter fitted for the AM mode, but the low frequency cutoff remains, along with several other problems relating to difficulties associated with AM reception.

An AM signal can also be called a double sideband (DSB) signal, with identical information transmitted on the upper and lower sides of the carrier. Fine, until the signal gets bounced around the earth and ends up at the AM detector in your receiver. By this time and because the two sidebands and carrier are different frequencies, they may have taken slightly different routes from the transmitting site to your antenna, arriving just a little out of time and phase. The receiver's detector happily processes this mess to produce the distorted audio output that we have all come to accept as the best to be expected from a shortwave signal. Wrong—not all of us.

Art Collins and a few other people set the trend some 30 years ago with the development of SSB, where only one sideband is used, thus eliminating the problem of the other sideband and carrier arriving out of phase. While SSB has been adopted as the standard for all commercial HF communications, it is only very recently that any shortwave broadcast stations (Radio Japan and the BBC) have been game to run up the cost of change with pilot schemes and test transmissions. It will probably be another 10 years before a significant number of shortwave broadcasters provide this alternate mode. What do we do in the meantime?

LINIPLEX is the catchy new name for a process called synchronous demodulation. It gives a new lift to AM reception on the HF frequencies. The LINIPLEX F1 HF Broadcast Receiver is manufactured by Phase Track Limited and marketed by Philip Collins & Associates of Sydney, Australia. Many features of this new receiver are worth noting, but one which cannot be adequately described is the crispness and clarity of both speech and music that comes out of this little box. Listening first on a conventional comms receiver and then on LINIPLEX is almost as dramatic as switching from AM to FM on your portable radio. To achieve these results, Phase Track has come up with some pretty fancy circuits, including specially developed thick film techniques.

To get technical for just a while, the F1 features a high fidelity synchronous demodulator with very low audio distortion, even in the presence of fading. When the receiver is first turned on, or is switched to another channel, the audio output to the speaker is muted while a unique fly-wheel carrier recovery system automatically synchronizes with the new signal being received. After a



Here's a look into the inner workings.

few seconds, the mute opens to allow you to hear the station, locked on and with no distortion. Another surprise—SSB techniques are used in the F1 for reception of AM. A front panel switch allows selection of USB/DSB/LSB with the receiver being normally used in the DSB mode for optimum performance. In the event of adjacent channel interference, it is possible to select and use one sideband with only a very slight drop in performance, but without the interference. The receiver has a very high dynamic range with extremely low second and third order distortion, eliminating the common effect in many comms receivers where many stations appear on top of each other.

Nine frequencies is all you can tune on this receiver, with plug-in crystals and a 9-position switch on the front panel. This is certainly the limiting feature of the F1, but the manufacturers have put forward some highly convincing arguments for this approach. Synthesizers are out when it comes to SSB reception with audio outputs down to 50 Hz. They generate high phase noise or jitter, which in most comms receivers is present but masked by the audio cut-off below 300 Hz. Another problem is microphony, where the loudspeaker of the receiver starts shaking up the synthesizer and the whole lot takes off with a growl. Crystals are the most practical way of overcoming these difficulties as well as meeting the primary design requirement for a receiver to listen to a limited number of selected programs or stations. Crystals are plug-in and easily changed without the need of test equipment.

The LINIPLEX F1 is constructed in a small but rugged cast aluminum case, which also acts as an excellent enclosure for the front panel speaker. Rechargeable NiCad batteries with a life of about ten hours are contained within the receiver and an in-line adaptor/charger is supplied for operation on 90-265 volts, 50-60 Hz mains. A rear mounted DIN socket provides a low level audio output for direct connection to a tape recorder or hi-fi system. Also available as an option is a balanced 600 ohms output to enable the receiver to be used to send programs over land-lines for rebroadcasting. Providing an antenna for the F1 is not much of a problem, as the receiver is fitted with a switched 300/1500 ohms balanced input that suits about anything in the way of an antenna from a metal window frame to a dipole. Changing crystals is as easy as plugging them in and twiddling a trimmer with the neat tool supplied until you hear music, the receiver's auto-tracking doing the rest. It's all covered, complete with schematics, in the operating and maintenance manual sent out with every receiver.

Impressed? You should be, particularly if you want to sit back and enjoy a little hi-fi from your favorite shortwave service. The LINIPLEX F1 with accessories and nine frequencies of your choice fitted costs $1265 including air postage to any address in the world. With only one channel crystal fitted, the price is $1145; crystals are $15 each.

For further information contact Philip Collins & Associates, P.O. Box 295 Artarmon, NSW 2064, Australia, or phone Marc Robinson, Intel + 612 412 2797, Telex AA 20149, Cable LINIPLEX SYDNEY. PC

LINIPLEX F1 Receiver Specifications

Frequency range: 2-26.5 MHz.
Channels: 9 switched.
Frequencies: Supplied to customer's choice.
Modes: AM (using SSB techniques and USB/DSB/LSB selection).
Intermodulation: 2nd order intercept +43 dBm (typical).
3rd order intercept + 13 dBm.
Sensitivity: 1.5 μV (in 50 ohms) for 10 dB S+N/N(SSB).
AM passband: 50-3400Hz, −3dB.
AM stopband: −40dB at 5.0 kHz.
−60dB at 6.5 kHz.
Sideband discrimination: better than 35 dB, 300-3400 Hz.
Spurious responses: not more than −60 dB.
Non-linear distortion: not more than 1% (100% modulation, −40 dBm input).
Ultimate S/N: Not more than 53 dB (flat weighted, relative to. 100% modulation, 50-5000 Hz at audio out).
Audio outputs: 250 mW into internal loudspeaker with less than 1% distortion.
Headphone output on 3.5 mm front panel socket.
200 mV via 10K ohms to rear DIN socket.
Optional balanced 600 ohms line to rear DIN socket.
Power requirements: Supplied with internal rechargeable NiCad batteries giving 10 hours operation and in-line 90-265 volts, 50/60 Hz mains adaptor/charger.
Antenna input: Balanced 300 and 1500 ohms input, surge protected with a ceramic gas discharge tube.
Optional 50 and 200 ohms inputs available to order.
Construction: Rugged cast aluminum case with internal loudspeaker.
Size & weight: 193×63×203 mm (approximately 7½″×2½″×8″) 1.85 kg (less than 4 lbs.)
Operation & Maintenance: A detailed manual is supplied with every receiver.

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

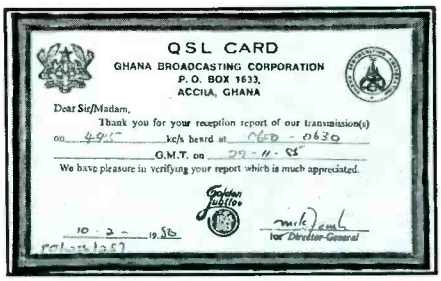
If you are browsing the bands one of these nights and Radio Beijing suddenly rattles your eardrums at strengths vastly greater than used to be the case, it doesn't mean that reception conditions have suddenly taken a quantum jump, or that you've stumbled upon the long lost secret of the perfect receiving antenna. What it does mean is that you are really picking up French Guiana. The mutual relay agreement between China and France was supposed to take effect in mid-April. Beijing will relay RFI programs for six hours per day, and Radio Beijing's services to the western hemisphere will air over the French Guiana relay of RFI.

This relay business is great for providing much-improved reception, but it does tend to make things confusing. We get a lot of reports from people who report reception of the Netherlands, West Germany, England, Taiwan, and many others even though the transmissions are actually coming from one of the increasing number of relay stations spotted around the globe. It's a good idea to be a little suspicious of such stations, particularly when signals are exceptionally strong and/or is beamed to your listening area. Chances are that, under those conditions, you aren't hearing what you think you're hearing.

And it's going to get more complicated in the future. As we noted in a previous column, Spain is putting up a relay station in Costa Rica and once that's on you'll have to decide whether you're hearing Spain, Costa Rica or the *other* REE relay in the Canary Islands! Spain's Costa Rica transmitters will also carry programming from Radio Costa Rica International. There are also reports that Radio Canada and Radio Japan may do a switcheroo as well.

Maybe one of these day's we'll put together a guidesheet on how to figure out what you really have—a broadcast from the horse's mouth or a middleman.

The Radio Earth Saga added still another chapter with the news that well-known radio personality Jeff White, who was the inspiration behind the formation of Radio Earth, has resigned his position. We couldn't get hold of Jeff for comment, but word is that he wants to devote more time to the new Dominican Republic station, Radio Discovery —The Voice of the Caribbean. Radio Discovery has been on the air periodically since early March. It's approximate schedule is 0100 to 0300 on a frequency somewhere above 6200; try 6215, 6220, 6245, or 6290. In the daytime it's on from around 1800 on 15045, where it was heard here recently with signal strengths varying from very strong to zero and with distorted modulation. If you catch'em, the address for reports is P.O. Box 25454, Tampa, FL 33622.


QSL CARD
GHANA BROADCASTING CORPORATION
P. O. BOX 1633,
ACCIA, GHANA

Dear Sir/Madam,
Thank you for your reception report of our transmission(s)
on 4915 kc/s heard at 0600 - 0630
G.M.T. on 29 - 11 - 85
We have pleasure in verifying your report which is much appreciated.

10 - 2 - 1986

This Ghana Broadcasting Corporation QSL showed up in the mailbox of Walt Witkowski, Port Ewen, New York.

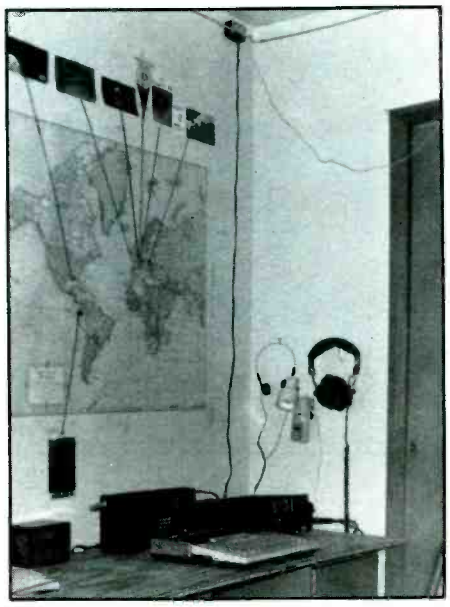
James and Aaron Rakes take a break from listening in Lexington, Kentucky. James is the one with the beard.

The new 500 kilowatt transmitter of Radiodiffusion Television Ivoirienne is active currently from 1800 to 1900 on 11.920 (sometimes 11.940). Any DX'er who's had his or her frustrations with Abidjan's highly erratic verification policies should get a report off on his new transmitter presto. Address is B.P. V191, Abidjan 01, Ivory Coast.

The new Australian Northern Territories stations are being heard far better and more widely than we believed would be the case. Try VLA8 at Allice Springs on 2310 at 1930-2230 and 0730-1430, and 4835 at 2230-0730. VL8K at Katherine is on 2485 from 1930 to 2230 and 0730-1430, and 5025 from 2230 to 0730. Best chance occurs between 1000-1200. Still to come is VL8T at Tennant Creek on 2325 and 4910, presumably with a schedule similar to the other two. Reports can be sent to G.P.O. 9994, Darwin, Northern Territory 5794, Australia.

The Voice of the Islamic Republic of Iran has been trying out an English language broadcast from 1115 to 1215 on 7215, 11790, and 15084. Iran is reportedly still in the process of installing several new 500 kilowatt transmitters.

And Radio Monte Carlo, an FM outlet in the Principality of Monaco, was being relayed by someone on 9795 for a couple of weeks, but has now disappeared. Broadcasts were in French and Arabic, with some English as well, and ran to 2100. Let's hope it shows up again.



Karl Witsman tunes the bands from this shack in Oakwood, Illinois.

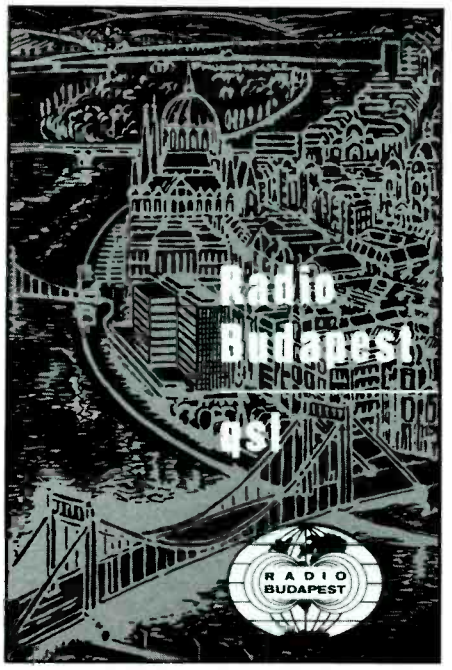
In The Mailbag

Gary Bledsoe of Anchorage, Alaska says that many of the loggings he submitted this month were made during a 12 hour "DX party" with fellow Alaskan and fellow Listening Post reporter Dave Twiggs. They managed to log 41 countries during the session.

Francis Krizanek checks in from on board the *USS Coral Sea*, serving in the Mediterranean. He says his schedule keeps him very busy (especially of late, we'll wager!) so he doesn't find a lot of time to listen. When he does, it's with a Yaesu FRG-7700 and a 50 foot wire strung between two tie points, about 60 feet above the water line. Francis says the interference from various sources on the ship "is terrible."

Joshua Stanfield of Omaha writes to say that he has fixed on the ID of the station he misidentified earlier on "7465" and 9960. The mysterious Radio Caiman, of course. We haven't seen any other reports of them on 7465 though, Josh. It's 7470.

QSL'ing questions come in from Allen R. Linville of Edmonton, Alberta—questions such as how long does it take for replies from Radio France International? Rather long, sometimes. They've been spotty recently, occasionally answering with just a program schedule and pennant. Allen also wants to know about replies from the Voice of Nicaragua. Well, those have been virtually nonexistent for a year or more. The station says



A recent QSL from Radio Budapest. This station celebrated 60 years on the air during 1985!

Rev. Floyd Fisher of Holmes, New York, is a returning SWL.

it's short of money. Allen notes there's "a growing deficit in my countries logged vs. countries confirmed columns in my logbook." I won't succumb to the temptation to recommend my book *Secrets Of Successful QSL'ing* here.

James R. Coyle is thanked by R. Dennis Gibbs in Fairfax, Virginia for Coyle's comments about interference caused by those touch-to-turn-on capacitance lamps. Dennis had been having serious interference problems and reader Coyle's remarks helped him solve the problem. Dennis notes that it's not enough to have the lights turned off, they have to be unplugged. So who says technology is making so much progress? We had a pair of these in the shack some 30 years ago and never had a problem!

Don Bear in Burlington, Kentucky, would like to send in logging reports, but isn't sure how. Simple. Logs should be listed by country, including the station name, time in UTC, and some program details. Leave some space between each item so we can cut and sort, and tag your last name and state abbreviation after each one. Send them to the Listening Post, *POP'COMM*, 76 North Broadway, Hicksville, NY 11801. Incidentally, we still have two or three people each month who forget to add their names and state after each item. That makes things a lot tougher. If reports are really heavy or time is pressing, these sometimes just don't make it into the listings.

It seems that every month we welcome some new folks who were SWL's years ago and have come home again. This month it's Reverend Floyd Fisher of Holmes, New York, just retired. He's been WA2MPO for many years. Also welcome to Patrick McKrell of Rohnert Park, California, who was active about ten years ago and now, is so again.

Let us have your loggings, good copies of QSLs, shack photos, news clippings, questions, comments—anything you think would be of interest; your letters are always very welcome! And, as you can tell from this month's letters, they very often help out other readers.

Listening Reports

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

ALASKA- KNLS, Anchor Point at 0800 w/"Swingin' Years" on 9540 (Rutowski, Philippines).

ALBANIA- R. Tirana in EE on 9760 at 0142-0157 (Lyster, BC).

ANTIGUA- Deutsche Welle relay in SS on 11785 at 0230 (Witsman, IL).

ARGENTINA- RAE in EE w/good sigs at 0130 on 9690 (Carman, ALTA), 9690//11710 w/EE s/on (Lyster, BC).

ASCENSION ISLAND- BBC relay on 15390 at 2130 w/"Calling the Falklands" (McKrell, CA).

AUSTRALIA- ABC/Alice Springs on 2310 at 1102 w/rock DJ, WX & time sigs (Sgrulletta, NY).

ABC/Darwin, 6840 (tentative) at 0002 w/EE nx, very weak (Bledsoe, AK).

ABC/Brisbane, 4920 at 0954 w/"Music Magazine" (Lyster, BC); 0708 w/nx (Shute, FL); 1350 w/telephone call-in show (Lyster, BC); 9660 at 0950 w/classical mx (Bledsoe, AK).

ABC/Melbourne, 6150 at 1302 s/off (Bledsoe, AK); 0915 w/call-in show (Lyster, BC).

ABC/Lyndhurst, 9680 at 1100 w/ABC National News (Bledsoe, AK).

ABC/Perth, 15425 at 0552 w/wx400 relay races (Bledsoe, AK).

R. Australia, 5995 at 0800 in Papua New Guinea Service (McKrell, CA); 1310 w/nx (Northrup, MI); 6060//6080//9580 w/mx at 1115 (Sherry, MA); 7215 at 1130 "World of Pop Ballads" (Cobb, ME); 9580 at 1618 w/"Talkback" (Loftus, OR); 1510 w/nx & commentary (Cole, CO); 0903 w/Australian nx then "Talkbock" (Loftus, OR); 9720 at 2245 to 2300 s/off (Cole, CO); 9770 to 1300 s/off (Cobb, ME); 17795 heavily QRM'ed at 2159, also on 15160/15320 (Lyster, BC); 0051 w/mx (Linville, ALTA).

AUSTRIA- R. Austria International, 6155 at 0330 in EE but heavy QRM (McKrell, CA).

BELGIUM- BRT on 15590 at 1320 in presumed Flemish (Northrup, MI).

BRAZIL- R. Gaucha, 11915 at 0207 w/OM announcer & ID "Radio Gaucha, Porto Alegre, Rio Grande do Sol, Brazil" (Sgrulletta, NY).

R. Bare, Manaus, 4895 in PP 0112 to 0202 s/off; jazz, instrumentals, ID, jingles (Paszkiewicz, WI).

R. Nacional de Rio de Janeiro, 9705 at 0221, 2 OM's & a YL talking in PP. R. Nacional & Radiobras ID's; off 0231 (Sgrulletta, NY).

R. Clube do Para, Belem, 4885 at 0230 in PP, all Brazilian pop & ballads w/2 short ID's (Cobb, ME).

R. Cultura do Sao Saulo, 17815 at 1830 in PP w/mellow pop; very weak, many fadeouts (Cobb, ME).

R. Nacional Amazonas, 11780 at 2230 in SS (are you sure it was SS?-- Ed.); again at 0110 (Witsman, IL).

Radiobras, 11745 in EE w/local pops at 0200 (Lyster, BC).

BULGARIA- R. Sofia, 9700 in EE at 2315 (Sherry, ME); 11720 at 1620 in presumed Bulgarian (un-ID reporter).

CANADA- CHU time station, Ottawa, 3330//7335 at 0411 w/FF & EE time announcements (Lyster, BC).

Radio Canada International, 9510 at 1300 w/nx & commentary (Cole, CO); 9755 at 0100 w/nx (Sherry, MA); at 2305 (Carman, ALTA); 15260 at 1910 in African Service (Loftus, OR); 15325 at 1935 w/"SWL Digest" (Cole, CO); 1900 w/news & "Listener's Corner" (Loftus, OR); 15325//17820 at 1646 w/EE to Europe (Lyster, BC).

CENTRAL AFRICAN REPUBLIC- R. Centrafricaine (tentative) on 5034.4 at 0458 in FF w/African choral mx (Shute, FL).

CHAD- Radiodiffusion Nationale Tchadienne, 4904 in FF at 0532 (Shute, FL).

CHILE- R. Nacional in SS on 15140 w/nx at 2200 (Linville, ALTA); SS pops at 1310 (Northrup, MI).

CHINA- R. Beijing, 9730 at 1430 in EE (Cole, CO); 9820/11685 at 0037, 11970 at 0046, 9680 at 0102 (Lyster, BC); 15100 at 2300 in SS (Linville, ALTA).

CLANDESTINE- R. Truth (anti-Zimbabwe), tentative at 0440 in EE w/mention of So African Communist Party, "Flashdance" mx ur 0453 then off at 0500 (Sgrulletta, NY).

R. Caiman (anti-Castro) w/pop tunes, commentary in SS tpo 0245 s/off on 7470; great signal (Carman, ALTA); 9960 at 1237 in SS (Carman, ALTA).

R. Nejet-e-Iran (anti-Khomeni), 9027 in presumed Farsi at 0430, nx 0500 (Sgrulletta, NY).

R. Venceremos (anti-El Salvador), 3727 at 0211 in SS (Lingenfield, PA).

COLOMBIA- Caracol Neiva, 4945 at 0300 w/many ID's, SS talk about Guatemala (Sgrulletta).

R. Sutatenza, Bogota, 5095 in SS at 0400 (Henry, MA).

COSTA RICA- R. Impacto, 6150 w/pops, SS announcer at 0400 (Lyster, BC); 1130 w/mellow SS pops, ID after every song (Cobb, ME).

TIFC on 5055 at 0429, in SS (Lyster, BC).

R. Reloj, 4832 at 0507, apparent nx (McDonough, PA).

CUBA- R. Havana, 6060 at 0529 in SS w/QRM from France/6055 & WYFR/Taiwan on 6065 (Lyster, BC); 9525 on 0600 OM & YL w/world nx in (Loftus, OR).

R. Rebelde, 5025 at 0440 nx & lively mx. S/off abruptly at 0509 (McKrell, CA).

USSR Mayak relay, 4765 in Russian at 0440 (Carman, ALTA).

DENMARK- R. Denmark, 11785 w/1730 s/on, program in Danish (McKrell, CA).

DOMINICAN REPUBLIC- R. Clarin, 11699.6 at 1130 w/mostly SS pops, 1 ID break in SS & frequency announcement; transmitter drifts slightly (Cobb, ME).

EAST GERMANY- R. Berlin International, 9620 in FF at 2100 (Henry, MA).

ECUADOR- R. Quito, 4920 w/classical mx & SS commentary at 0430 (Carman, ALTA).

R. Rio Amazonas, Macuma, 4870 in SS at 0338. Conclusion of religious program, frequency sked & off 0405 (Shute, FL); 0150 fanfare, ID, mention of Pastaza (Sgrulletta, NY).

R. Catolica Nacional, Quito, 5055 at 1057 in SS w/lengthy s/on; "Desde la ciudad de Quito..." adress, telehone, etc. QRM from presumed TIFC (Shute, FL).

HCJB, 6205 at 0550 w/religious program (McDonough, PA); 15115 at 0113 w/"Passport" (Loftus, OR); 1313 here & on 17890 (Northrup, MI).

ENGLAND- BBC, 5965 at 1312 w/"24 Hours," 5975 at 0025, 9510 at 1305 (Northrup, MI); Nx at 1200 on 5965//9815 at 2330 (Sherry, MA); 9915 at 2300 (Calman, ALTA).

EGYPT- R. Cairo, 9805 ot 2200 (Henry, MA); 12050 at 1750 in AA (Linville, ALTA); 2000 in AA (McDonough, PA).

FINLAND- R. Finland International in EE at 1420 on 15400 (Shute, FL).

FRANCE- R. France International, 17620//17795 at 1624 in EE (Shute, FL); in FF at 1930 on 21685 (Linville, ALTA).

GABON- Africa #1, 15475 at 2040 in FF, reggae mx (McDonough, PA); 0204 w/American & African hits (Sgrulletta, NY).

GHANA- BGC on 4915 at 2243 in EE w/mx & nx (McDonough, PA).

GREECE- V. of Greece, 7430 nx in EE ot 0130 (Carman, ALTA); EE & Greek, 0130-0150 (McKrell, CA); 0347 w/EE nx to N. America (Lingenfield, PA); 9935 at 0130 s/on & frequency announcement (Lyster, BC).

GUATEMALA- TGNA R. Cultural, 3300 at 0325, religious program in EE (Cole, CO).

HONDURAS- HRVC, La Voz Evongelica, 4820 at 0401 in SS (Lyster, BC).

HONG KONG- R. Hong Kong, 3940 at 1055-1105 in EE w/tone, ID by OM every 30 seconds, 6 pips at 1100. This during the alternate years South China Sea Race (Paszkiewicz, WI). Next opportunity: Mar/Apr '88!-- Ed.

INDIA- All India R., 9545 at 1454-1500 w/ID, nx, frequency info & "goodbye from New Delhi" before s/off (Cole, CO).

INDONESIA- V. of Indonesia, 11790 at 1640 in possible AA, nx, ID, anthem (Cole, CO); 1500-1600 in EE (McKrell, CA).

RRI Ujung Padang, 4719 at 1028 in Indonesian, local mx (Bledsoe, AK).

IRAN- VOIRI, 15084.1 at 0720 in FF, then un-ID language at 1730 (Bledsoe, AK).

IRAQ- R. Baghdad, 6050, faint w/EE nx at 0430 (Henry, MA); 9565 poor in EE w/AA mx at 0400 (Carman, ALTA); 17770 at 0816 w/AA mx program (Bledsoe, AK).

ISRAEL- Kol Israel, 5885 at 0120 w/mx program, address is P.O. Box 1082, Jerusalem. On 7410 at 0000 w/events in Israel (Sherry, MA); 7410 in EE at 0100; 7465 at 0330 in Hebrew, 12080 at 2020 in EE (Linville, ALTA); 9435 at 0107 in EE (Lyster, BC); FF at 2050, into RR at 2100. On 12080 in FF at 2030 (Henry, MA).

ITALY- RAI on 15385 with birdcall IS, Italian to Latin America (McKrell, CA).

JAPAN- Far East Neywork, 15260 at 0227 w/typical AFRTS programming (Bledsoe, AK).

NSB, tentative, on 9760 at 0115 in Japanese (Bledsoe, AK).

R. Japan, 5990 in EE at 1721 (Lyster, BC); 15195 in EE at 0200 (Carman, ALTA); 0130 in JJ w/ID in EE (Loftus, OR); 15420 at 0055 s/on (Linville, ALTA).

KAMPUCHEA- V. of the Kampuchean People, 9695 at 0010 w/nx, comment, s/off 0015 (Rutowski, Philippines).

KIRGHIZ SSR- R. Moscow World Service, 15420 at 0148 in EE. Transmitter site listed as Frunze (Paszkiewicz, WI).

KUWAIT- R. Kuwait, 15345 at 0350 w/religious readings (Bledsoe, AK).

LEBANON- V. of Lebanon, 6549 kHz, very weak, in EE at 0100 (Linville, ALTA).

LIBERIA- VOA relay, 17870 at 1910 in EE w/service to Africa (Cobb, ME).

LUXEMBOURG- RTL on 6090 at 2357 in EE w/nx, contests, paps, DJ was Tony Bluitt (Paszkiewicz, WI); 15350 in FF w/Europop mx at 1621 (Shute, FL).

MALAYSIA- R. Malaysia, 7160 at 1135 w/news & commentary (Rutowski, Philippines); Kuching (Sarawak) 4950 at 1110 in EE, rx program & nx at 1130 (Laftus, OR).

MALTA- R. Mediterranean, 6110, international nx in EE at 2300 (Henry, MA).

MEXICO- XEWW La Voz de la America Latina, 9515 at 1250, Mexican mx, talks, ID by OM at 1300 (Cole, CO).

MONACO- Trans World R., 11950 at 1610 w/folk mx, ID in EE. Wiped out by Cuba on 1628 (Cole, CO).

NEPAL- R. Nepal (tentative) on 5005 at 1310 in presumed Nepali; chanting, announcements by OM & YL. No ID's (Cole, CO).

NETHERLANDS ANTILLES- R. Netherlands relay,6020 at 1110-1125 in EE (Cobb, ME); 9715 at 051 w/"Shortwave Feedback" (Loftus, OR); 15560 at 2200 in Dutch (McDounough, PA); 21685 in EE at 1830 (Linville, ALTA).

NEW CALEDONIA- R. Noumea, 7170 at 0708 w/jazz program, FF talks (Bledsoe, AK).

NEW ZEALAND- R. New Zealand, 15150 at 1831 w/news. Heavy QRM (Linville, ALTA); 17705.7 at 0151 w/cricket match (Bledsoe, AK).

NICARAGUA- R. Sandino, 6162 in SS at 0922; a move from 6200 (Lingenfield, PA).

V. of Nicaragua, 6015 at 0515 w/Latin American nx & mx in EE (Loftus, OR); 0100 in EE, also at 0500 but bad QRM from WYFR around 0550 (Linville, ALTA); 1130 in SS (Cobb, ME).

NORTH KOREA- R. Pyongyang, 13650 at 2300-2350 in EE; N. American service (McKrell, CA).

NORTHERN MARINAS- KYOI Saipan, DJ in JJ w/American pops on 9665 at 1630 (Linville, ALTA; 1645 rock & pops, EE ID's. Heavy QRM (Loftus,OR).

KFBS on 15220 at 2200 s/on in EE, inta Indonesian (McKrell, CA).

NORWAY- R. Norway International, 15305 at 1617 in EE (Sundays only-- Ed); good signals (Shute, FL).

PAPUA NEW GUINEA- NBC Port Moresby, 4890 w/nx & mx in EE at 1230 (Carman, ALTA); 1320-1400 w/country-western, anthem at 1359 & s/off 1400 (Cole, CO); 0942 w/country-western, local mx at 1000 after ID (Bledsoe, AK).

R. North Solomons, Kieta, 3325 at 1020 w/rx & island mx (Bledsoe, AK).

PERU- R. Echo, Iquitos, 5010 at 0144 in SS w/frequent mentions of "Radio Echa," OM & YL alternating announcers, ute station QRM (Shute, FL).

PHILIPPINES- FEBC, 15445 at 2345 w/"Pacific Suntise" program & s/off at 0001 (Bledsoe, AK).

PORTUGAL- R. Portugal, 6095 w/music & PP at 0000, EE at 0040 (Henry, MA); 0035-0055 w/folk mx, ID (Cobb, ME).

ROMANIA- R. Bucharest, 11940 at 0552 w/pops mx, EE announcement "African Service of Radio Bucharest" (Bledsoe, AK).

SAUDI ARABIA- BSKSA on 9530 at 2045 in AA (Henry, MA); 15245 in AA at 0400 (Bledsoe, AK).

SINGAPORE- R. Singapore's Radio 1 service, 11940 at 1500 to 1605 s/off w/nx, events, ads, contemporary mx (McKrell, CA).

BBC relay, 15436 at 0010 w/world nx & "Radio Newsreel" (Bledsoe, AK).

SOLOMON ISLANDS- SIBC, 5020 at 1032 w/chanting, rx mx (Bledsoe, AK); 9545 at 0630 local nx in Pidgin, mx (Loftus, OR).

SOUTH AFRICA (REP. OF)- Capital Radio, Transkei, 3930 at 0405 "AM 604" (Northrup, MI).

Radio RSA, 7270 at 0409 in EE (Lyster, BC); 9615 at 0215 w/good signal till wiped out by noise at 0243 (Witsman, IL); 0200 in EE //5980 & 6010 (McKrell, CA); 0200 w/"South Africa Today" (Linville, ALTA).

SOUTH KOREA- R. Korea, 9570 at 0900 in SS under heavy QRM (Loftus, OR); 15575 in EE at 0210 (McKrell, CA).

SPAIN- REE, 9630 at 0000 in EE, "Panorama" pgm at 0030 (McKrell, CA); 0501 w/nx (Shute, FL); 17845 in SS at 1320 (Northrup, MI).

SUDAN- Omdurman R., 5039 at 0415 in AA but no positive ID (McDonough, PA).

SWEDEN- R. Sweden International, 1418 on 15345 w/"Weekday" pgm, T-shirt offer, "50 Years of Swedish Jazz" (Shute, FL); 11785 in Swedish at 1700, fair level (McKrell, CA).

SWITZERLAND- Swiss R. International, 9885 w/the "Two Bobs" at 2100 (Henry, MA).

SYRIA- R. Damascus on 7455 in AA w/"Radio Damask" ID at 2130 (Henry, MA); 9670 at 2030 in EE w/nx updates, literature review (Krizanek, Mediterranean); 12085 in EE at 2139 (Linville, ALTA).

TAHITI- R. Tahiti, 9749 at 0520 w/blues songs in FF (Shute, FL); 15170.1 at 0245 w/rock & YL announcer in FF (Bledsoe, AK).

THAILAND- R. Thailand, 9655 at 1205 w/world nx in "In Perspective" (Rutowski, Philippines).

TURKEY- V. of Turkey, 7215 at 2100 in EE w/nx, mx, commentary (Krizanek, Mediterranean); 2200 w/ID in FF: "Ici la vaix du Turquie" (Henry, MA); 9560 at 2300 w/"Last Week in Turkey" (Sherry, MA).

UNITED ARAB EMIRATES- UAE Radio, Dubai, 11955 in EE w/listeners' reception reports, nx 1600-1645 (McKrell, CA); 1520 in EE w/pgm about Islam (Linville, ALTA); 17750 at 0739 in AA (Bledsoe, AK).

V. of the UAE, Abu Dhabi, 9655 at 2040 in AA (Lingenfield, PA).

UNITED STATES- WHRI, 5995 at 1130-1145 in EE, ID's, requests for reports (Cobb, ME); 7400 w/Radio Earth 0340-0401 (Lyster, BC); 0347-0400 (Cole, CO); 15105 w/gaspel mx at 1555 (Linville, ALTA).

WYFR in PP at 1900 an 21525 (Linville, ALTA).

WRNO, 6185 at 0425 w/"National Rock Test" (Loftus, OR); 7355 to 0400 s/off, worldwide dedication shgow (McKrell, CA); 9655 from 1800 w/rock (Lyster, BC); 9715 w/0000 s/off (Carman, ALTA).

V. of America, 6155 at 0230 to 0300 s/off (Carman, ALTA); 9455 at 0030 (Northrup, MI); 21545 at 1700 w/phone-in talk pgm //15410/15580/-15600/17640/17830/17865 (Carman, ALTA).

R. Marti, 11930 w/SS commentary, Latin mx at 1530 (Carman, ALTA); 11815 at 1700 (Lyster, BC).

WINB, 15185 at 2212 in EE. Am just outside their groundwave coverage so was weak (Lingenfield, PA); 2030 w/rx pgm (McDonough, PA).

KCBI on 11735 w/DX pgm at 1800 (Carman, ALTA); 11790 at 1915, slogan "Natianal Radio of Texas" (Witsman, IL).

AFRTS on 15355 at 0200 w/news, 15345 at 1730 w/talks on drugs (Corman, ALTA).

USSR- R. Moscow (via Havana), 6000 at 0230 w/"Moscow Mailbag" containing very funny jokes & puns I've never before heard from Moscow. In talking about taurism: "You must go to Moscow" and "You can't do better than to write us a letter." After much laughing, the announcer exclaimed, "I must be under the influence of Western commercialism!" (Carman, ALTA); Alsa 7115 in EE at 0130, 7135 at 0300; 15425 at 0130 w/"Home in the USSR" (Carman, ALTA); 7165 at 0300 w/nx (Northrup, MI); 9620 in African service at 2045, 9470 at 2049 in EE (Krizanek, Mediterranean).

Radiostansiya Rodina, 11860 at 0000 in RR (Bledsoe, AK).

R. Mayak (tentative), 7320 at 0452 in RR (Luyster, BC).

Vladivostok on 5015 in RR w/drama or play at 0830 (McKrell, CA).

VATICAN- Vatican R., 6185 at 0600 s/on after WRNO s/off. Poor, in EE, no copy by 0610 (McKrell, CA); 15120 at 0846, church bells & rx announcements (Bledsoe, AK).

VENEZUELA- R. Mundial Bolivar, 4770 at 0950 in SS w/mx, many ID's in SS (Loftus, OR).

R. Rumbos, 9660 at 0327 w/rhumba mx, ID, nx in SS (Bledsoe, AK).

Ecas del Torbes, 4980 in SS at 0200 (Carman, ALTA).

La V. de Carabobo, 4780 at 1015 in SS (Loftus, OR).

YVTO time station, 6100 at 0604 w/ID & time in SS (Lyster, BC). Time station reports should really be sent to the Communications Confidential column as these are usually classified as ute stations-- Ed.

R. Mara, 3275 at 0115 in SS, talks, ads, pops, address (Cobb, ME).

VIETNAM- V. of Vietnam, 9840 at 1008 w/world nx (Rutowski, Philippines).

WEST GERMANY- RIAS, Berlin, 6005 at 2315-2345 in GG w/live vocals, time checks, ID & nx at 2330. Rechecked frequency at 0015 to hear BBC s/on (Paszkiewicz, WI).

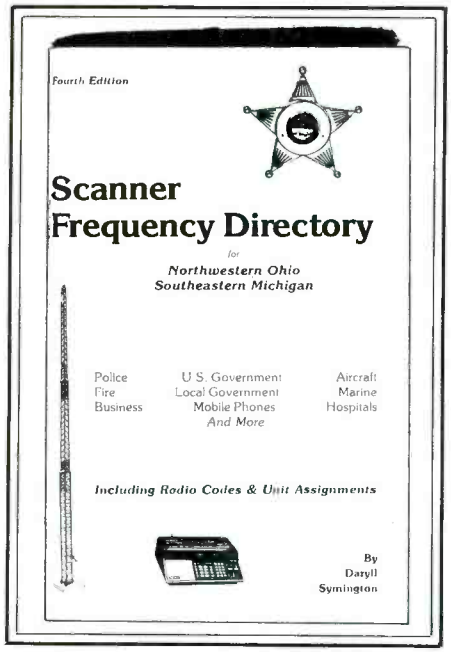
Deutsche Welle, 6185 w/DX club at 0400 (Carman, ALTA); 9505 at 0937 in EE (Lyster, BC); 9640 at 0335 (Northrup, MI); 9735 in EE to Africa at 1540 to 1550 s/off (Lyster, BC).

Time to pull off the headphones and say "thank you" to: Mark A. Northrup, Ann Arbor, MI; Sheryl Paszkiewicz, Manitowoc, WI; Michael Loftus, Springfield, OR; Dennis Rutowski, Philippines; Darrell Lingenfield, Chambersburg, PA; Gary L. Bledsoe, Anchorage, AK; Michelle Shute, Pensacola, FL; Garth Carman, Alberta, Canada; Laurie Henry, Provincetown, MA; Karl R. Witsman, Oakwood, IL; Patrick McKrell, Rohnert Park, CA; Allen R. Linville, Edmonton, Alberta, Canada; Thomas J. Sherry, East Long Meadows, PA; Pat McDonough, Pittsburgh, PA; Francis Krizanek, *USS Coral Sea*, Mediterranean; John Sgrulletta, Mahopac, NY; S. Lyster, Keremeos, British Columbia, Canada; Jackie Cole, Denver, CO; and Kenneth A. Cobb, Portland, ME.

'Til next month, good listening! **PC**

BOOKS YOU'LL LIKE!

BY R.L. SLATTERY



Regional Scanner Directory

Daryll Symington (N8EBR) has produced an updated 4th Edition of his popular *Scanner Frequency Directory for Northwestern Ohio and Southeastern Michigan*. This is a 91-page, 5½" × 8½" book that covers police, fire, business, hospitals, marine, and other services operating between 30 and 821 MHz.

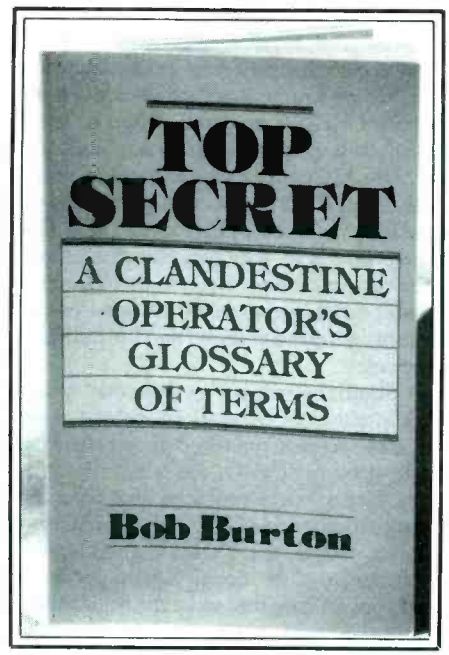
The latest edition shows 400 new frequencies and about 125 callsign changes that went into effect since the previous edition was issued. Radio codes are included for a number of major agencies such as Toledo, OHP, Buckeye Sheriff, Defiance County Sheriff, etc. Unit assignments are also included for more than 20 police, sheriff, and fire agencies within the directory's coverage. And, of course, there are plenty of frequencies and callsigns throughout the publication.

Daryll's done a fine job with this updated edition. We think you'll agree that it's a worthwhile monitoring aid for scanner enthusiasts in the covered areas of Ohio and Michigan.

The *Scanner Frequency Directory* is available from Daryll at Midwest Software Services, P.O. Box 399, Holland, OH 43528. The price is $7.95.

The Words Of Big Brother

Did you know that when an important message is coded with a certain word, it can reach CIA HQ from any point in the world in less than seven minutes? Do you know what the expression "room circuit" means in connection to crypto-operations? What is a "prearranged message code," or a "Cosmic Top Secret"? Explain the espionage terms ELINT, ELSUR, ELSEC, and HUMINT.



What is a "Dial X" communications system? Why would a "manipulative communications deception" be used? Why do espionage agents fear the "Pucker Factor"? Author Bob Burton has taken these and more than 800 other terms used in international espionage and assembled them all in a revealing 127-page book called *Top Secret: A Clandestine Operator's Glossary of Terms*.

Now available to the public for the first time, this A-to-Z encyclopedia of the professional jargon used by operatives, federal agents, electronics surveillance/warfare personnel, and spies contains an enormous amount of information, with a detailed explanation of each term.

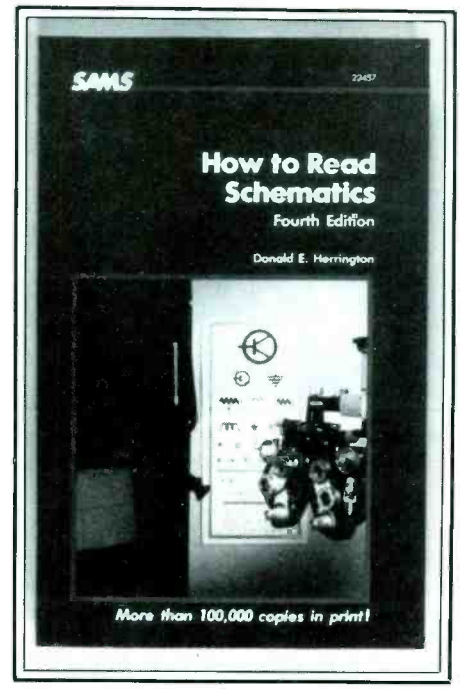
The book has all of the traditional terminology plus the very latest hi-tech terms; not just relative to the CIA, but those terms used for unconventional warfare, special operations, codes/ciphers, security, and the intelligence community in general.

Burton's book contains a fascinating "Foreward" written by the former acting chief of CIA operations in Latin America. At the rear of the book are charts and appendices relating to international espionage gathering and agencies, including information on security classifications in many nations of the world.

Such a comprehensive guide couldn't have come along at a better time, when there are daily disclosures of spy scandals, when world communications frequencies are wall-to-wall with strategic messages that comprise tomorrow's news headlines, and while spy fiction and nonfiction is flooding the bookstores.

If you're a communications monitor, you'll be especially interested in learning about things like "back channel" communications, used by the CIA at world embassies when a message has to bypass normally used State Department frequencies.

This enlightening book is available from CRB Research, P.O. Box 56, Commack, NY 11725. The price is $10.95 per copy, plus $1 for 4th Class Book Rate postage/handling to addresses in the USA/Canada/APO/FPO. It's a book you'll refer to very often in the months to come as world tensions continue to heighten. Every intelligence service around the world should make this book must reading for their operatives!



How To Read Schematics

Howard W. Sams & Co. has released the fourth edition of *How to Read Schematics*. This new edition has been revised and expanded to include the latest electronic developments. Included are logic diagrams and flowcharts.

Beginning with a general discussion of electronic diagrams, the book systematically covers the components of a circuit: printed capacitors, transformers, electron tubes, resistors, and more.

This expanded fourth edition of *How to Read Schematics* is 272 pages, softbound, and retails for $14.95.

Author Donald E. Herrington has 33 years of experience in Sams' technical book division. His experience aids in the presentation of electronic circuit diagrams—for the beginner, hobbyist, or technician.

Howard W. Sams & Co. is an Indianapolis-based publisher whose books are available through bookstores, computer retailers, electronic distributors, or directly from Howard W. Sams & Co., 4300 W. 62nd St., Indianapolis, IN 46268. PC

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

Grounding Tips That Protect Satellite Systems From Lightning

Satellite owners should be prepared to protect TVRO antennas and electronics from lightning, suggests Gil Hodges, Director of TVRO Engineering at Pico Products, Home Satellite Division, in Liverpool, New York.

As with any antenna system, grounding should be employed to protect equipment from lightning.

Hodges says a lightning strike directly on or near an ungrounded satellite system can considerably damage all the components in the system—even the television set. He adds that high voltage electricity from lightning can enter a TVRO system through the outside TVRO electronics to the inside TVRO receiver and antenna positioner via cable that connects the antenna with the television set. Power surges through power lines serving the residence are another source of danger.

Pico offers the following tips for satellite dealers and system owners on properly grounding a satellite system:

1. Avoid installing the TVRO antenna on the roof of a building or in an open field. Aluminum and steel antennas attract lightning during an electrical storm. Always try to place the antenna on the ground near other structures. The tallest of these structures should have a lightning rod to attract lightning and safely ground lightning away from the antenna.

2. Ground a satelite antenna by connecting it with #10 copper wire from the grounding block to the structure water supply pipe or to an eight foot copper jacket rod driven into the ground near the antenna. Grounding rods that comply with the National Electrical Code are available from most electrical equipment distributors.

3. Use a GRB-AR arrestor ground block to buffer electrical power surges and remove high voltage from coaxial cable center conductors. GRB-AR arrestors should be used with *all* microprocessor based receivers.

4. Use #10 copper wire and either Pico's GRB-1 or GRB-2 copper grounding clamps to attach the LNA, motor drive, and discharge unit with the antenna and home electrical grounding system. A grounded metal conduit can be used to enclose the cable connecting the antenna and the in-home electronics.

5. Equip the satellite receiver and actuator with either three-wire grounding power inputs or two-wire polarized power inputs to safely ground TVRO electronic components. Use a "surge protector" between the electrical outlets and TVRO electronic components, VCRs, and TV sets to buffer electrical surges that occur when lightning strikes power lines that serve the household.

6. In the event of extremely severe electrical storms, Hodges suggests playing it safe by unplugging all electrical components and appliances.

Pico carries a full line of satellite grounding devices. For more information, contact Pico Products, Inc., Home Satellite Division, 103 Commerce Blvd., Liverpool, NY 13088; or call toll free 1-800-336-3363.

Block Conversion Stereo Satellite Receiver

Regency Electronics, Inc. announced the introduction of their first block conversion stereo satellite receiver, model SR3500.

The SR3500 uses a block down converter instead of the usual single conversion type. The block system insures a clean, crisp picture and allows the user to install a multiple receiver system. In addition, the new Regency unit can receive stereo broadcasts in either the discrete or matrix modes.

Other SR3500 features include signal strength and tuning meters, built-in Chaparral Polarotor I control, Channel 2 or 3 modulator, and a contemporary design with simulated woodgrain cabinet. An A/B switch, compatible with the Regency SR5000 block system, is also available for dual feed installations.

List price for the Regency SR3500, including block down converter, has been set at $559.95. An optional wired remote control is available. For additional information, contact Regency Electronics, 7707 Records St., Indianapolis, IN 46226.

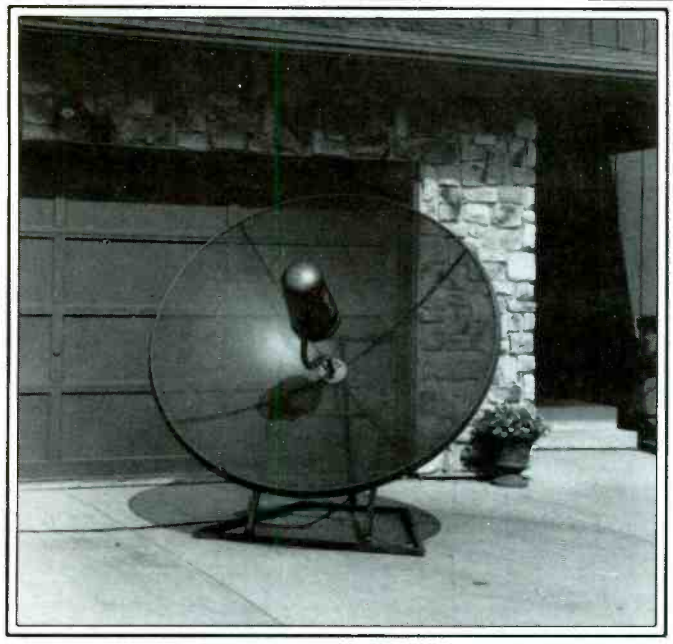
Complete Portable Satellite Television Receiving System

Winegard Company has introduced a complete, portable home satellite TV receiving system that can be assembled by a consumer in less than an hour—for under $1,000.

The Mini-Ceptor™ Satellite Antenna System, designated RR-646, features a block conversion receiver with a 6-ft. antenna on a portable mount. Consumers can carry the system out of the store in three cartons. According to Bob Fleming, Winegard's vice president of marketing, the new Mini-Ceptor system offers a high quality satellite receiving system that does not require a professional to install, meets most zoning requirements, and can be set up and taken down at will. Fleming says that installation is a four-step procedure requiring only two wrenches.

"While the system will certainly appeal to the price-conscious buyer," said Fleming, "it is a system that gives any consumer quick access to satellite TV. It can be set up in the

Regency has recently introduced some nifty satellite receiving equipment.



Winegard offers this portable satellite TV system.

135-138 MHz SATELLITES MONITORED BY NASA SPACEFLIGHT TRACKING AND DATA NETWORK

MHz	Name	Period	Inclination
135.56	GOES-3	1436 min	2.0
136.38	GOES-1	1436 min	7.1
	GOES-2	1436 min	3.2
	GOES-3	1436 min	2.0
136.46	ATS-1	1435 min	11.7
136.74	EXPLORER 27	108 min	41.2
136.77	NOAA-6	101 min	98.5
	NOAA-7	102 min	99.1
	NOAA-8	101 min	98.7
	NOAA-9	102 min	98.9
136.86	IUE	1436 min	29.6
137.19	GOES-3	1436 min	2.0
137.35	ATS-1	1435 min	11.7
137.77	NOAA-7	102 min	99.1
	NOAA-8	101 min	98.7
	NOAA-9	101 min	98.9
137.86	LANDSAT-2	103 min	99.0

(All transmit only upon ground command.)

backyard, deck, patio, and even used by renters or other temporary residents."

Since it is a low-cost system and requries no professional installation, the Mini-Ceptor system will also appeal to many dealers as a quick sell through item with a direct profit made in the sale.

The Mini-Ceptor System RR-646 includes a powder coated 6-ft. perforated aluminum dish antenna; and RF-90 block conversion receiver with tunable audio for satellite radio reception, satellite format selection, polarity control, LED signal strength bar, AFC, and switchable modulator. All the electronics, including the feed, LNB, and polarotor come with the system and are factory pre-assembled with a weather cover. System cabling is also included. One 60-ft. length of properly terminated cable is designed for connecting the antenna to the receiver, and a second cable connects the receiver to the television set.

The Winegard Mini-Ceptor System RR-646 has a suggested retail price of $995. For additional information, contact Winegard Co., 3000 Kirkwood Street, Burlington, IA 52601. PC

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

BY ROBERT MARGOLIS

Recommended reference books for your maritime library, part 2: *Lloyd's Register of Shipping* (3 Vols.); *Soviet Naval Developments* by Norman Polmar; *The Soviet Navy Today* by Capt. John E. Moore; *Russian Sea Power* by David Fairhall; *World Atlas of Shipping* (combining an atlas with several articles about the sea and shipping), edited by W. D. Ewart and H. Fullard; *Encyclopedia of the Modern Royal Navy* by Paul Beaver; *Jane's Merchant Shipping Review* edited by A. J. Ambrose (a yearly publication begun in 1983); *Warships of the U.S. Navy* by Samuel L. Morison and John S. Rowe; and the *Almanac of Seapower, 1985*, by The Navy League of the United States. All have either ship data or useful information about the maritime industry. They were added to this editor's bookshelves after the first list was printed in the June *POP'COMM*.

Starting this month, a new feature will be occassionally tacked onto this column. Called "Ship Directory," it contains the names of ships and their call signs. This directory will list only those ships that have been monitored by your fellow hobbyists, either by voice, CW, or RTTY, and is being presented as an inexpensive alternative to those sources that contain such information in hard-to-handle tomes. Start saving this directory series and you'll soon have hundreds of listings to work from. Those of you owning computers and data base software may want to type in these lists and have your computer sort the directory with the call signs listed in alphabetical order as opposed to the list published here that has the ships in alphabetical order.

Has anyone logged teletype traffic bouncing off satellites? There are lots of goodies to be found 22,500 miles above Earth. All you need, besides your present equipment, are a satellite dish antenna, a down converter, a TVRO receiver, and a stable FM receiver in the 65-85 MHz range. Detailed information about satellite RTTY can be found in several books at ham shops or retail book stores.

Two readers inquired if I would use baudot instead of words-per-minute RTTY rates in the loggings section. Let's put it to a vote. If a simple majority of you prefer to see baudot used, then it will be done so beginning in a few months. Send your ballots via letter or postal card to me c/o Popular Communications, 76 N. Broadway, Hicksville, NY 11801. Do it right now, since you have the address right in front of you. Would you like the RTTY shift or speed listed first? Please include that info, too.

Another reader asked if I would print the loggings in a logbook-like format. The decision for that rests not with me but with *POP'COMM* editor Tom Kneitel. He's in charge of the magazine's format. Write to him. If he gets enough reader input to warrant the change, I'm sure he'll let me know about it.

In last March's *POP'COMM*, I asked for help in identifying some ships' names seen in traffic monitored on 4356.5. The ships were First Lt. Alex Bonnyman (WMFZ), Pfc. James Anderson (WJXG), Pfc. William B. Baugh (KRPW), and Pvt. Harry Fisher. Replies came from Terry Steinford of Florida and Marc Bartolomeo of Texas.

Both say those ships are Maritime Prepositioning Ships and are named after Medal of Honor recipients. Originally built for the Danish Maersk Line, these cargo ships are owned by private commercial shipping companies and are under a long-term charter as support to the Navy and Marine Corps. They have no hull numbers. These vessels have a crew of 50 civilians and 17 Naval personnel, and carry part of the U.S. Marine Amphibious Brigades military supplies and vehicles.

Ribbons of teletype tape to both for their research. The publications they used for reference were later editions than mine. Thanks, guys!

Jerry Brumm of Illinois asks about all the V's and K's he sees when a RTTY station is idling. Actually, Jerry, the station is not sending anything when idling. If your demodulator is set to the same RTTY shift, speed, and polarity as the transmitting station, you should see only the LED's flickering on your set. The cursor should remain stationary on your monitor with no letters appearing on the screen. Any deviation from the correct RTTY setting will cause the V's and K's to appear.

Time now for the August summary of the RTTY column loggings:

RTTY Loggings

139.5: Foxes & test counts, 0800, 120/60N. Ran for more than 40 hours but never a single ID. Who/what? (Bob Margolis, IL).

183: Same test tape as above, same RTTY setting, noted 1000 to 1040 UTC (Margolis, IL).

3195.8: Un-ID WX station w/Middle East data at 1836, 425/66N (M/Sgt. David Freed, U.S. Army, Frankfurt, FRG). My records show this as Prague Meteo in Czechoslovakia-- Ed.

3376: OLN2, Prague, Czechoslovakia, calling LZU33, 425/66R at 0144 (Alice Brannigan, MA).

4012.7: NNN0ZIF, a USN MARS station sending tfc to NNN0VPJ, 170/100R at 0010 (Daryll Symington, OH).

4175: UVAU, the Soviet research vessel BOROVICHI, w/telegrams & a 5L "kriptogramma" to Leningrad Radio. Vessel belongs to the USSR Baltic Shipping Co. & is used for spacecraft & satellite tracking. Is manned by civilians & contains labs. It's much like our own land-based space tracking stations (Margolis, IL).

4275.3: "KS42," a/k/a Keystone 42, Mailbox 64 of the Pennsylvania Wing of the CAP. Sending tech stuff in 40-column width (via computer) at 1605, 170/60R (Margolis, IL).

Ship Callsign Directory

WZJG	American Astronaut
GCSC	British Success
VSBD9	Cape Race
HOKL	Carnivale
PDKA	Christina
HO5919	DB Champian
HCZR	Esmeraldas
ELBE6	Fairfield Venture
BOTL	Fengyan
ELZX	Flammulina
GBSD	Fort Toronto
DPBC	Genova
VRAG	Grey Fighter
EHSY	Guridi
DHMP	Helias
UPLO	Lensovet
PFZQ	Mighty Servant
WTEO	USC&GS Oceanographer
WJBC	Overseas Ohia
HO6579	Pacific Ocean
5BQL	Panorama
SVLW	Procyon
PGWH	Producer
DHTP	Sao Paulo
WGWF	Sea Land Innovator
KHRH	Sea Land Developer
ELBY	Shannon Venture
ZCSV	Snow Flower
DFCG	Sonne
DVUM	Southern Jay
ZGPK	Stena Carrier
PHTQ	Super Servant
J4QP	Taurus
H3QY	Tolteca
SYDS	World Protector

U.S. Coast Guard Cutters

NODY	Acacia WLB-406
NMFN	Anvil WLIC-2647
NBTC	Aquidneck WPB-1309
NODG	Basswood WLB-388
NBKE	Bayberry WLI-65400
NRUS	Biscayne Bay WTGB-104
NODI	Blackhaw WLB-390
NODD	Bluebell WLI-313
NODK	Bramble WLB-392
NRPX	Buttonwood WLB-306

4353: VCS, Canadian CG, Halifax, w/FEC WX & other nautical info at 0300 (Darrell Lingenfield III, PA).

4483.2: Hamburg Meteo, FRG, calling CQ & sending freq list w/RYRY at 1721, 425/66R (Freed, FRG).

4532.7: JMI, Tokyo Meteo, Japan, coded WX at 1030, 770/66R (Fred Hetherington, FL).

4574.5: NMO, USCG, Honolulu, HI, w/unclassified tfc at 0655 & 1230, 170/100R (Margolis, IL).

5022.2: Foxes & test counts, no ID's though, at 2319, 120/60R. Also noted on 5022.7, 5023.2, 5023.5, 5023.9. Different than stations on 139.5, 183 & 5125.4 kHz (Margolis, IL).

5028.6: ONY27, NATO, Rouveroy, Belgium, w/foxes & ID tape at 0122, 850/66N (Tom Brailey, MI).

5092.7: FDY, French Air Force, Orleans, France, w/tfc to various AF units at 0214, ARQ (Margolis, IL).

5125.4: Same tape & RTTY setting as 139.5 kHz but this was 3 days later when the other one was off the air. Next day noted again with powerhouse signal at 1650 (Margolis, IL).

5170.6: Un-ID aero station w/aero tfc in FF, WX forecasts at 2335, 425/66N (Margolis, IL).

5320: NIK, USCG Ice Patrol, Boston, MA, w/Ice Bulletin & iceberg data, FEC made, 0022 (Margolis, IL).

6257: Telexes in Serbo-Croat from PJDU, DINTEL, to Rijeka, Yugoslavia, ARQ at 0248 (Margolis, IL).

6260: ERET, the Soviet hydrometeorological research vessel GEORGIY USHAKOV. Telegrams to Odessa Radio (vessel's home port). Ship located in the Far East. In ARQ at 0255 (Margolis).

6330: CFH, Halifax, NS, at 1255, 850/100R giving sked as cantinuous an 122.5, 6330, 10536, 13510; from 2200 to 1000 on 4721 (Tom Kneitel, NY).

14568.8: Y7A58, MFA East Berlin, GDR, w/RYRY at 1255, 425/66N (Margolis, IL).
14574.2: MAP Rabat, Morocco w/nx in EE at 1242, 425/66R (Margolis, IL).
14605.8: Y7K30, MFA East Berlin, GDR, w/RYRY at 1256, 425/66N (Margolis, IL).
14619: Nx in GG from Y7A59, MFA East Berlin, GDR at 1258, 425/66N (Margolis, IL).
14630.8: FF nx from ANSA, Rome, Italy, Was 550/66N at 1405 (Margolis, IL). Same station w/EE nx at 1502 (Gittens, Barbados).
14632: TANJUG, Belgrade, Yugoslavia, w/nx in EE at 1333, 425/66R (Margolis, IL).
14640: CLN477, PTT Havana, Cuba at 1912, 425/66N to ITT New York. Sending RYRY & foxes tape backwards for a while before they got around to correcting it (Williams, CO). Just because they can roll good cigars it doesn't mean that they can't have problems with a balky RTTY machine!-- Ed.
14672: MKD, RAF Akrotiri, Cyprus w/foxes & RYIRYI, 170/66R at 1330 (Margolis, IL).
14672.8: AGERPRESS nx BC in EE from Bucharest, Romania, 425/66R at 1259 (Margolis, IL).
14690.1: Nx in AA from RIC73, APN Moscow, USSR, 425/132R at 1424 (Margolis, IL).
14740: WAR, U.S. Army MARS, Washington, DC w/tfc at 1618, 600/60R (Williams, CO). Is it just a coincidence that Mars was the Roman god of war? Hmmmm-- Ed.
14785.3: ATP65, INFOIND, New Delhi, India, nx in EE at 1457, 475/66N (Margolis, IN).
14882.4: IINA Rome, Italy, w/nx in EE at 1323, 425/66N at 1457 (Margolis, IL).
14901: TASS nx in EE from Havana at 1800, 425/66R (Alpert, NY).
14937.5: TTL, ASECNA, N'djamena, Chad, w/coded aviation WX at 1253, 425/66N (Margolis).
15502: INTERPOL HQ in Paris w/police bulletins at 1200, FEC mode (Hetherington, FL).
15670: MTI Budapest, Hungary, w/SS nx, 425/66N at 1624 (Williams, CO; Lingenfield, PA).
15682: Many 5L messages sent 2118 to 2134, 425/66R (Margolis, IL).
15724: Nx in EE from ANSA, Rome, Italy, 425/66N at 1540 (Hetherington, FL).
15845: Nx in AA from MENA, Cairo, Egypt, 300/66R at 1632 (Williams, CO).
16134: MAP Rabat, Morocco, w/nx in FF, 425/66R at 1530 (Margolis, IL).
16137: PTT Havana, Cuba, w/RYRY to ITT WorldComm in (Brentwood) NY, 850/100R at 1650. Test tape showed a lot of garbage (Jerry Brumm, IL). Jerry, if you'll change your RTTY shift setting to 425 Hz, you'll probably be able to obtain a better copy of this station. Although it's true that your location isn't the best for SW reception, this shift (which is what the Cubans use) should cure at least some of your problems-- Ed.
16194: NBA, USN Balboa, Panama, w/naval tfc in EE & SS to OBC of the Peruvian Navy, 850/100N at 1430 (Navory, VA).
16348: TASS Havana, Cuba, w/EE nx at 1923, 425/66R (Kneitel, NY).
16397.5: DIPLO Paris, France, w/nx in SS, FF & Portuguese at 1548. Also w/AFP dispatches in FF. Was 425/66N (Margolis, IL).
16462: Un-ID station using callsign of YBU with 5F & 5L messages at 2200, 425/66R (Rich Knowles, IL).
16663: UQIH, a Soviet research ship called MIKHAIL LOMONOSOV operated for the USSR Academy of Science by the Ukraine Institute of Oceanology, w/telegrams to UNM2 in Klaipeda. Was 170/66N at 2137. This civilian staffed ship has 16 labs & carries its own helicopter. (Margolis, IL).
16703.5: An Iraqui stern trawler fish factory ship, the KEFAL, w/Telexes to Baghdad via Sevastopol Radio (USSR). Noted at 1605, 170/66N (Margolis, IL).
17038: URL2, Sevastopol Radio, USSR, w/tfc list at 0800, 170/66N (Palmberger, FRG).
17223: LGX3, Rogaland Radio, Norway w/FEC nx BC in Norwegian at 1730 (Palmberger, FRG).
18221:MAP nx in EE at 1326, 425/66R (Margolis).
18265.2:MAP nx in EE at 1320, 425/66R (Margolis).
18704: CXR, Montevideo Naval Radio, Uruguay, w/foxes at 1430, 850/100R (Kirk, CT).
19229: DFZG w/RYRY & tfc to DBPB & DBPL. Was 860/100R at 1500 (Kirk, CT). Possibly o Yugoslav embassy somewhere-- Ed.
19747: Coded WX tfc from Dakar Meteo, Senegal at 1650, 425/66N (Williams, CO).
20078: Nx in SS from DIPLO Paris at 1617. Was 425/66N & a very poor signal (Lingenfield, PA). Wait another year & reception should be much better-- Ed.
20610: Diplo tfc from MFA, New Delhi, India to the Indian embassy at Hanoi, Vietnam. Was 850/66R at 0844 (Palmberger, FRG).
20786: MAP Rabat, Morocco, w/nx in FF at 1700, 425/66R (Brailey, MI).

6356.3: GZO, Hong Kong (British Royal Navy), calling MTT (alro of RN), w/RYRY & foxes at 1025, 850/100R (Hetherington, FL).

6372: FKS, un-ID w/FF callsign w/RYRY at 0913, 425/66R (Wolfgang Palmberger, Weilheim, FRG). A big willkomm to Wolfgang!

6402.3: CLJ, a Cuban coastal station, at 1722 w/relay of telegrams in Russian from USSR to Soviet ships (Margolis, IL).

7303: AFB4FK & AFB4FP in contact at 2030, 170/60N (Michael Walker, TX). These are USAF Region 4 MARS stations-- Ed.

7396: RPFN, Monsanto Naval Radio, Portugal, w/foxes & tfc to RPTI, Ponta Delgada Naval Radio, Azores, 0334 in 850/66R (Walker, TX).

7406: CML5, PTT Havana, Cuba, w/RYRY at 2318, 425/100R (Walker, TX).

7478.3: USIA nx in FF from Monrovia, Liberia, 0225425/100R (Walker, TX).

7695.4: CNA, Taipei, Taiwan, w/nx about Asia in EE at 1005, 850/66R (Guy Atlins, WA).

7755: ITT WorldComm, New York (actually Brentwood), NY) w/foxes at 0010, 850/66N (David Alpert, NY).

7820.6: MKK, RAF, London, w/foxes, RYI's & mermaids test tape at 1007 via TDM (Time Division Multiplex) (Hetherington, FL). Fred's got one of those new M-6000 units that receives TDM mode. We can expect to see a lot more of these exotic loggings in the future-- Ed.

7890.1: Coded WX from ROQ3, Novorssisk Metea, USSR at 0232, 425/66N (Margolis, IL).

7954.9: Dyn nx in SS from Buenos Aires, Argentina at 0230, 850/66N (Margolis, IL).

7960: MKD, RAF, Akrotiri, Cyprus, w/faxes & RYIRYI at 2003, 425/66N (Brailey, MI).

8020.2: KCNA, Pyongyang, N. Korea, beaming nx in EE to N. Africa at 1910, 475/66N. Was // to 12175.2, 300/66N (Atkins, WA).

8024.6: Nx in FF from AFB, Paris, France, at 0034, 425/66N (Brailey, MI).

8031.9: AFRTS BC of UPI sports nx at 1330, 85/66R in FDM mode (Hetherington, FL).

8344: UPUI, the Soviet research vessel PROFESOR VIZE. Operated by USSR Hydrometeorological Service, Leningrad, w/wx obs to RNO, Soviet Antarctic Meteo Center, Moscow, at 0123, 170/66N (Margolis, IL).

8344.5: GUYD, the British tanker LEPETA on its way to Port Said, Egypt, & working GKE4 (Margolis, IL).

8354.5: Soviet vessel IVAN FEDOROV w/grams at 0444, 170/66R. Any details? (Jim Hartung, MD). Sure! Callsign UEJB; it's a fish factory vessel out of Kaliningrad, which was probably the destination of the grams-- Ed.

8457.1: NMA, USCG Miami, FL, w/marine wx 'cast to a Cutter w/callsign NYOS. Was 170/100R at 1325 (Margolis, IL).

8707: WLO, Mobile, AL, w/wx & tfc list to ships at 2226, ARQ (Walker, TX).

9070: 6VU, Dakar Meteo, Senegal, w/RYRY test tape at 0511, 425/66R (Jim Navary, VA).

9127: NMC, USCG San Francisco, CA, w/tfc in the clear at 0330, 425/100R (Navary, VA).

9136: TJK, ASECNA, Douala, Cameroon, w/RYRY at 0231, 425/66N (Brailey, MI).

9210: CLN281, Havana, Cuba, w/RYRY & foxes at 1324, 425/66R (Kneitel, NY).

9216: 5UA, ASECNA, Naimey, Niger, w/RYRY at 2113, 850/66R (Margolis, IL).

9402: ANSA, Rome, Italy, w/RYRY at 1857, 425/66N (Brailey, MI).

9797.1: AGERPRESS nx in FF from Bucharest, Romania, 1059 in 548/66R (Hetherington, FL).

10503: R9R training T7T, F6F, C4C & S4S in how to operate RTTY. Noted at 1758, 120/100N. All their machines were in the "sync position." Seemed more like a class in Typing 101 than anything else! (Margolis, IL).

10580: KCNA, Pyongyang, N. Korea, w/nx in EE at 1015, 600/66N (Hetherington, FL).

10740: APN nx in EE from the USSR, 425/132R at 1235 (Kneitel, NY).

10805: NA nx in SS from Buenos Aires, Argentina at 0046, 425/66R (Brailey, MI).

11249: 5KM, Bogata Naval Radio, Colombia, w/RYRY at 1246, 425/100R (Kneitel, NY). Logged at 1333 w/RYRY & SGSG; calling NBA at 1339; SS tfc at 1408, 425/100R (Margolis, IL).

11459: Y7A54/Y7A59, MFA in East Berlin, GDR, w/RYRY at 425/66N at 1929; into CW at 1930. Correct callsign for this freq is Y7A49. Also logged on 8008 kHz at 1440 UTC (Kneitel, NY).

11497: SOL349, PAP Warsaw, Poland, w/RYRY & QRA tape at 1415, 425/66R (Margolis, IL).

11635.5: STK, Khartoum Aero, Sudan w/coded WX at 2151, 425/66R (Margolis, IL).

11676.5: TJK, ASECNA, Douala, Cameroon, w/RYRY, 425/66R at 2145 (Margolis, IL).

12187.7: 5UA, ASECNA, Naimey, Niger, in TDM mode w/wx to Dakar Meteo, Senegal on Channel A at 0000; when an Channel B the transmission was WX to Libreville Meteo (Hetherington, FL).

12315: RWV57, TASS Moscow, USSR, EE nx at 1332, 425/66R (Kneitel, NY).

12492: GBBA, the SEA PRINCESS, a British passenger liner w/Telex to GBVC, a British passenger/cargo vessel. Was sent via WNU in ARQ mode at 1947 (Margolis, IL).

12493.5: A8AU, the Liberian chemical carrier JUSTINE, w/Telex to Baltimore via WLO, ARQ at 1935 (Hartung, MD).

12497: ELEI6, the ORANGE BLOSSOM, sailing inder the Liberian flag, in ARQ at 2020 (Hartung, MD).

12501.5: 7KXZ, the cargo ship PACIFIC STAR w/Telex to Japan via WCC, ARQ at 1915 (Navary).

12509: URRN, the Soviet ship KARELIIA in FEC to UAT (Moscow) at 1906 (Margolis, IL).

12682.5: LGB, Ragaland Radio, Norway, w/tfc list at 1902, followed by Norsk Radio Presse nx in Norwegian, ARQ (Margolis, IL).

12843: The Dutch Navy at Gaeree Island, Holland, w/RYRY at 1654, 850/100R (Carol Kirk, CT).

12896: RFLICF calling FUF & FFJ at 1349; 850/100R (Kirk, CT). RFLICF is a FF military unit at Fort de France, Martinique-- Ed.

13084.5: NMO, USCG Honolulu, HI, w/CQ tape & "hydropac" data for Japan, FEC mode, 2145 (Margolis, IL).

13366.5: 5YD9, Nairobi Aeradia, Kenya, coded WX BC at 1941, <425/66N (Kneitel, NY).

13372.3: NBA, USN Balboa, Panama w/RYRY & SGSG tape at 1744, 850/100R (Margolis)

13400: LZG3, BTA Sofia, Bulgaria w/EE nx at 1339, 525/66R (Kneitel, NY).

13482.3: DPA Hamburg, FRG, w/nx in EE about secret heroin refineries in Burma. Was 500/66N at 1543 (Margolis, IL).

13520: INTERPOL in Athens, Greece, w/list of wanted persons. Sent to INTERPOL HQ in Paris ARQ at 1615 (Margolis, IL).

13540: TELAM, Buenos Aires, Argentina, w/nx in SS at 1540, 850/66R (Frankie Gittens, Secretary of the Caribbean Shortwave Listeners Club, Barbados). Must be a new time/freq for TELAM-- Ed.

13580: Nx in EE from KCNA, Pyongyang, N. Korea, 2143, 425/66R (Margolis, IL).

13615: ZEN62, AFP Hong Kang w/RYRY, 425/66R at 1000 followed by FF nx (Hetherington).

13647.5: CETEKA, Prague, Czechoslovakia, w/RYRY & RY RY tape; ID's in EE, SS, FF at 1539, 425/66N; nx in FF at 1545 (Margolis).

13649.8: FDY, French Air Force, Orleans, France, w/RYRY & "brick" tape at 1606, 425/66R (Margolis, IL).

13653.4: MENA nx in FF from Cairo at 1610; 475/66R (Margolis, IL).

13785.1: SON278, PAP Warsaw, Poland, nx in EE at 1500, 425/66R (Margolis, IL).

13791.5: SON279B, PAP Warsaw, Poland w/nx in Polish, FEC mode at 1508 (Margolis, IL).

13955: Telexes in Polish & 5F tfc from a Polish embassy at 1337, 250/100N (Williams, CO). P6Z calling Z4D & then sending encryption, was 375/100R (Kirk, CT).

14419: KUN94 w/foxes at 2021, 800/100N. Where from? (Williams, CO). Probably KUNA, Safat, Kuwait, after it ended a nx BC. Doubt if it was anything else-- Ed.

14421.8: Nx in AA from KUNA, Safat, Kuwait at 1252, 425/66R (Margolis, IL).

14510: TASS Moscow, USSR w/EE nx //14489.8 at 1246, 425/66R (Margolis, IL).

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

Radar Detectors Again Legal In Vermont

When he got his radar detector back, Lumper Vega was sure the system still worked. About a month ago Vega was stopped by Officer Penny Kuzmeskus of the Windhall, Vermont, police department. Kuzmeskus gave him a ticket and took his radar detector as evidence. Vega was charged with violating regulation T-13VSA3014—use of a radio receiving device in a vehicle.

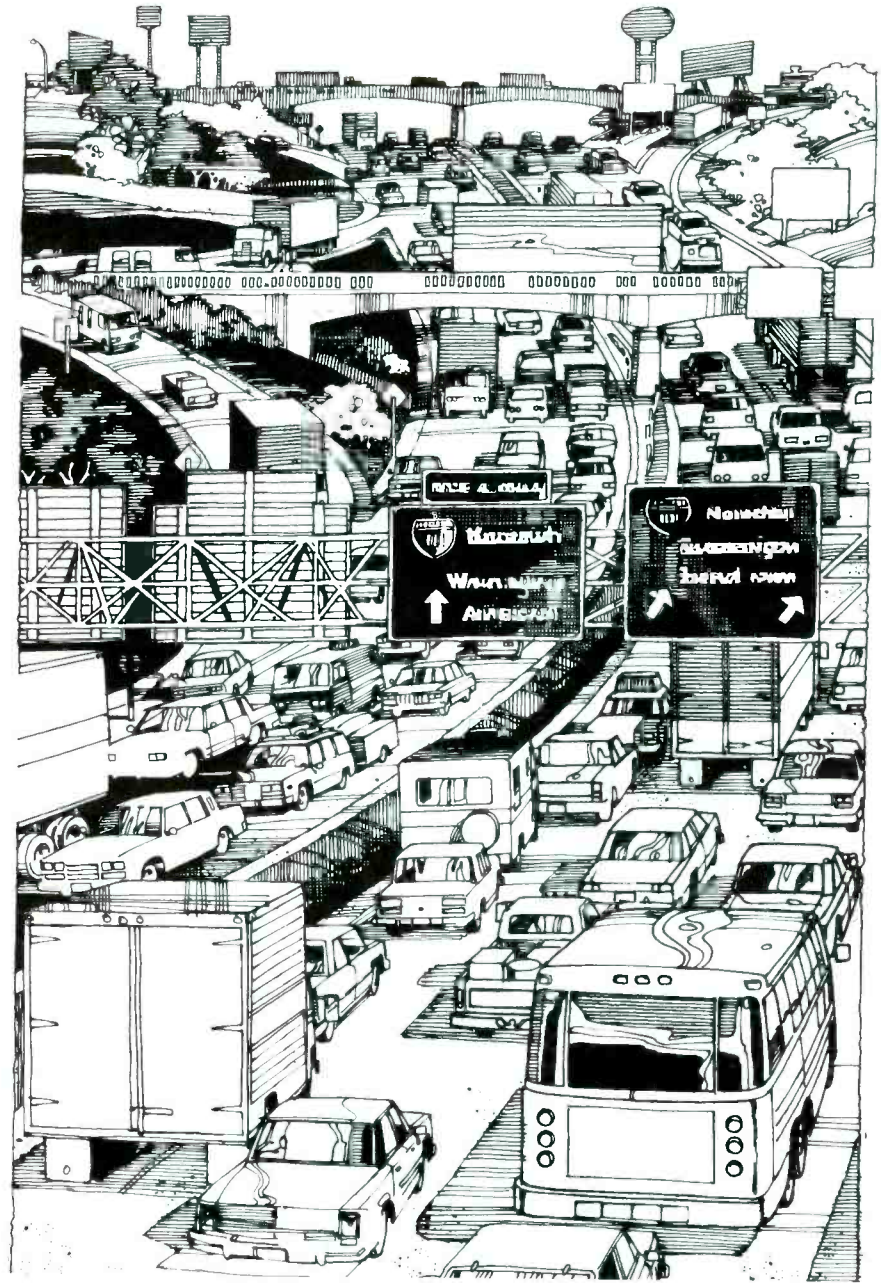
On April 7, 1986, Vega and his lawyer, Patricia R. Barr of Bennington, received a dismissal from Judge Paul Hudson. After reviewing information about the case, Hudson stated that he failed to find probable cause for the arrest. Shortly thereafter, Vega and his radar detector were reunited.

Judge Hudson's ruling is in line with court decisions in four other states: Indiana, Kentucky, Michigan, and New York. These states have tried to apply bans on police scanners to radar detectors. All these attempts have proven to be futile.

I, speaking as president of the Radio Association Defending Airwave Rights, Inc., believe that it is a matter of intent. Bans on using police scanners in vehicles are intended to prevent lawbreakers from eavesdropping on police and also to prevent them from jamming police broadcasts.

Similar to an auto's AM/FM radio, radar detectors are simply radio receivers tuned to traffic radar. Detectors do not affect traffic radar any more than a radio alters a radio station's signal. Police scanner bans cannot be applied to radar detectors that are not tuned to police radio. Police communications are transmitted on different frequencies than traffic radar.

Thanks to RADAR's support, Mr. Vega's constitutional rights have been restored . . . radar detectors are once again legal in Vermont!



Pennsylvania Judge Ousts VASCAR Speed Device

Police in Westmoreland County won't be using VASCAR (Visual Average Speed Computer and Recorder) to stop speeders in the immediate future, thanks to a recent common pleas court ruling.

VASCAR has grown increasingly popular among municipal police since the courts ruled they could not use either the Excessive Speed Preventor (ESP) or radar to document speeding offenses.

Now Westmoreland County Common Pleas Court Judge Daniel Ackerman says the VASCAR is improper for use by municipal police departments.

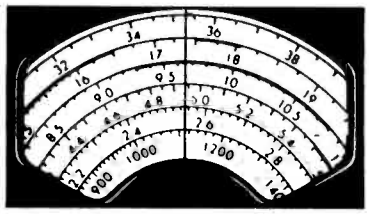
Although Ackerman's ruling has no immediate effect on VASCAR cases outside of Westmoreland, it effectively puts a clamp on its use in the county. Westmoreland County Assistant District Attorney Terry Faye, who is asking Ackerman to reconsider his ruling, is advising police departments to put away their VASCAR machines, pending appeals.

The VASCAR system consists of a machine that times and calculates the speed of cars passing through a marked zone. A police officer must turn VASCAR on when a car enters the zone and then turn it off when it leaves it.

Ackerman ruled that VASCAR falls into the same category as radar and ESP. Both of those speed detecting devices are considered electronic devices and are reserved for use by state police only.

The whole argument could be moot if legislation that has passed the House and is pending in the Senate is approved. The legislation would amend the motor vehicle code to provide for the use of electronic devices by municipal police. PC

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



COMMUNICATIONS CONFIDENTIAL

BY DON SCHIMMEL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

Another nice note was received from Peter Thompson in England and he sent in two addresses for verification of reception reports. The first is for the Russian time signal station RWM: State Committee of Standards of the Council of Ministers of the USSR, 9 Leninsky Prospect, 117049 Moscow, USSR.

Peter furnished copies of the Russian and English responses he received relating to his RWM monitoring report.

Peter also informed us "The main British coast station is Portishead Radio which uses the callsign GKA, etc. I cannot comment on their willingness to verify, but the address is: "British Telecom Radio Station, Worston Lane, Highbridge, Somerset TA9 3JY, Great Britain.

Reader Allen Linville of Edmonton in Alberta, Canada has given us his loggings of six CW Beacons for Edmonton Air Base: 201 "X", 267 "XD", 294 "F", 309 "E", 339 "ZU" and 378 "G". All frequencies in kHz.

John Tow, Alabama, forwarded an impressive listing of 200 longwave beacon intercepts. All the more impressive is the fact that he collected these signals in just eight days of monitoring! In checking his loggings against the past five months of published selections, there were relatively few dupes. A tip of the hat to John Tow. Because of the length of the material, it is more practical to present it in a list rather than incorporate it into the other loggings.

John Tow's 8-Day LF Loggings:

kHz	ID	Location
201	CE	Crestview, FL
206	QI	Yarmouth, NS
209	RNC	McMinnville, TN
	HOE	Homerville, GA
212	HQL	Sylva, NC
	YYM	Cowley, ALTA
219	LS	Ft. Benning, GA
221	HYE	Ft. Rucker, AL
	HM	Hamilton, ONT
	BJT	Athens, GA
224	BH	Birmingham, AL (Voice WX BC)
227	AB	Albany, GA
	XI	Killaloe, ONT
	LCE	LaCeiba, Honduras
228	BCZ	Butler, AL
230	CPP	Cole Spring, AL (USB)
	QB	Ste-Foy, QUE
	UGN	Giron, Cuba
233	QN	Nakina, ONT
	HEM	Sparta, TN
236	RZT	Chillicothe, OH
239	VO	Val d'Or, QUE
242	LKG	Americus, GA
	AH	Ash, ONT
	MMI	Athens, TN
243	3X	Cluff Lake, SASK
245	YZE	Gore Bay, ONT
	JYL	Sylvania, GA
248	FRT	Spartanburg, SC (w/voice)
251	UPK	Dublin, GA
252	LQV	Penington Gap, VA
	SMS	Sumter, SC
254	FPY	Perry, FL
257	YXR	Earlton, ONT
	SQT	Melbourne, FL
260	BNL	Barnwell, SC
263	FIO	Paducah, KY
266	BR	Atlanta, GA (w/voice)
268	S7	Hanover, ONT
269	GN	Gainesville, FL
270	HHP	Port Au Prince, Haiti
	OAX	Oaxaca, Mexico
272	UVR	Varadero, Cuba
273	ZV	Sept Isles, QUE
276	TWT	Sturgis, KY
278	NM	Matagmi, QUE
281	SGK	Knoxville, TN (w/voice)
283	UZG	Zaragoza, Cuba
	PT	Pelee I., ONT

If any of our readers can read the Russian language, they can probably get a lot out of this QSL.

-3-

ГОСУДАРСТВЕННЫЙ КОМИТЕТ СССР
ПО СТАНДАРТАМ
USSR STATE COMMITTEE FOR STANDARDS

Господину Петеру Томпсону

Великобритания

Уважаемый господин П.Томпсон,

Мы благодарим Вас за ваше сообщение о приёме эталонных сигналов радиостанции РВМ, Москва и подтверждаем действительность работы этой радиостанции в указанное Вами время.

В приложении высылаем Вам бюллетень В 06/1984, в котором Вы найдете всю необходимую информацию о передачах эталонных сигналов частоты и времени через радиостанции Государственной службы времени и частоты СССР.

Приложение: Бюллетень В 06/1984

С уважением,

Е.Л.Наер
и.о.начальника Управления
внешних сношений

For those of our readers who can't read Russian, here is a trans – lation of the QSL letter.

-2-

Mr. Peter Thompson

Great Britain

Dear Mr. P.Thompson,

We thank you for your reception report of the signals broadcast by the RWM radio station, Moscow.

We confirm that the RWM station actually radiated signals at the time you indicated in your report.

Enclosed we are sending you the bulletin B 06 1984 in which you will find all the necessary information about standard frequency and time signals emissions by radio stations of the National Time and Frequency Service of the USSR.

Sincerely yours,

E.L.Naer
Chief, Foreign
Relations Department.

Enclosure: Bulletin B 06/1984.

284	SCD	Sylacauga, AL
	URA	Roxtan, QUE
	TMA	Tifton, GA
286	GD	Goaderich, ONT
	DE	Dry Tortuga Light Station, FL
290	MC	Macon, GA
	TZ	Gibraltar Pt., ONT
292	MIQ	Maiquetia, Venezuela
294	J	Jupiter Inlet, FL
295	RHC	Riohacha, Colombia
296	ARF	Albertville, AL
	UBO	Batabano, Cuba
298	S	Charleston Light Station, SC
304	BN	Nashville, TN (w/voice)
	Z	Aransas Pass Light Station, TX
306	R	St. Johns Light Station, FL
308	YJH	Hudson Heights, QUE
310	H	Egmont Key Light Station, FL
313	Z	Cape Canaveral, FL
315	USR	Simon Reyes, Cuba
317	TB	Tybee Light Station, GA
320	W	Cape San Blas, FL
323	OUK	Calhoun, GA
	UWP	Argentia, NFLD
326	PKZ	Pensacola, FL (w/voice)
	VV	Wiarton, ONT
329	CH	Charleston AFB, SC (w/voice)
	YHN	Hornepayne, ONT
	RVN	Rogersville, TN
331	LAN	San Salvador, El Salvador
335	UQC	Stirling, ONT
	AWS	Columbus, GA
336	MCZ	Williamston, NC
338	GGY	Clanton, AL
	ZEM	East Main, QUE
341	CQN	Chattanooga, TN
344	ZIY	Grand Cayman, W.I. (w/voice)
	POJ	Selma, AL
348	UHA	Havana, Cuba
349	GW	Greenwood, MS
350	CWH	Huntsville, AL
351	YKQ	Fort Rupert, QUE
353	JUK	Brunswick, GA
	UHG	Holguin, Cuba
354	MKS	Monck's Corner, SC
355	CS	Columbus, GA
356	ME	Meridian, MS
357	IM	Asheville, NC
359	PRN	Greenville, AL
360	PN	Anticosti I., QUE
362	TC	Tuscaloosa, AL
	SB	Sudbury, ONT
	FZG	Fitzgerald, GA
365	CKK	Miami, FL
	FKV	Gainesville, GA (w/voice)
366	YMW	Maniwaki, QUE
368	BEQ	Bessemer, AL
	L	Toronto, ONT
369	CXU	Camilla, GA
370	UCM	Camaguey, Cuba (w/voice)
372	VDI	Vidalia, GA
	CQD	Erie, PA
375	GZS	Pulaski, TN
376	ZIN	Great Inagua, Bahamas
379	BRA	Ashville, NC
382	ALX	Alexander City, AL
	UPA	Punta Alegre, Cuba
385	AUC	Arauca, Colombia
	EMR	Augusta, GA (w/voice)
388	OYD	Floyd, GA (USB)
391	OO	Oshawa, ONT
394	RO	Birmingham, AL
	YB	North Bay, ONT
397	NVA	Neiva, Colombia
398	G	Windsor, ONT
400	BGA	Bucaramanga, Colombia
	UWI	Dalton, GA
402	USJ	San Julian, Cuba
404	YSL	St. Leonard, N B
405	YXL	Sioux Lookout, ONT
407	IBU	Statesboro, GA
	LET	Leticia, Colombia
	H	Montreal, QUE
412	UNG	Nueva Gerona, Cuba
413	TAM	Tampico, Mexico
414	DWY	Gadsden, AL
	BC	Baie Comeau, QUE
417	EVP	New Smyrna Beach, FL
419	UEW	Lawrenceville, GA
420	CEK	Crete, NE
	OWC	Douglas, GA
423	SIF	Reidsville, NC
	AU	Auburn, AL
	OC	Ocala, FL
424	RVJ	Reidsville, GA
429	JNM	Monroe, GA
432	MHP	Metter, GA
435	IIY	Washington, GA (w/voice)
485	RBX	Comoyuga, Honduras
516	LOF	USAF, AK
521	DWH	Houston, TX
524	UOC	Iowa City, IA
	AJG	Mt. Carmel, IL
	HEH	Newark, OH

Gary Bledsoe of Anchorage, Alaska listens at the setup.

A note from Gary Bledsoe in Anchorage, Alaska indicated he had heard 78 "ute" countries in his five months in Alaska. An accompanying photo shows his set-up and he mentioned he is now using an R-2000 receiver with a 40-foot longwire and an MFJ-1020 as a preamp.

During this reporting period, George Osier, New York, sent in over 100 loggings. George informed us that he will shut-down for a bit while he is trading in his old receiver for a new NRD-515.

A letter from Tom Borawski, Pennsylvania, offered an identification of the activity reported by Paul LeVinus, New York, which was described in the January 1986 *POP'COMM* column. The frequency was 4020 kHz; LSB and the stations used FLL callsigns. Tom said he believes this is a MARS activity as the abbreviated callsigns are typical of MARS operations after the net is established.

Here is an intriguing musical transmission passed to us by RTTY Editor Bob Margolis. The musical marker was intercepted on 19158 kHz on USB at 1630 and consisted of 10 notes in 2 phrases of 5 notes each. See the musical notation illustration:

A great big thank you to those readers who sent in items relating to the tragic *Challenger* accident. It was just not possible to include all of the material in this column as the volume was considerable. I do want to express appreciation in particular to the following contributors (see box). NOTE: All activity was USB.

G. Bledsoe in Alaska had some rather unique intercepts all made in the region of 5000 kHz. He first heard JJY Tokyo Standard Frequency/Time Station in CW at 2009 with time pips followed by callsign. At the same time he heard WWV (Ft. Collins, CO), WWVH (Hawaii), BPM (Shanghai), and BSF (Chung-Li, Taiwan) each with their respective time pips and callsigns. A few minutes later he picked up RID (Irkutsk, USSR) on 5004.5 kHz at 2019. It is not often that propagation is such that these multiple transmissions can be heard at the same time.

Alberto Flotile, New York, provided some interesting background information relating to an item supplied by McEwan, New York, which appeared in the March 1986 column. The item pertained to transmissions on 8968 kHz with Aircraft 4994 in communication with LOCKHEED FLIGHT. The conversation went thusly: "over the reservoir, doing ground proximity work . . . back in later." Alberto advised seeing a special report on WPIX-TV, Channel 11, NYC, which described numerous recent sightings of UFO's in the Stewart AFB (near Newburgh, NY) area. Some of the sightings were of a UFO hovering over a reservoir.

I regret I must discontinue direct mail answering of individual letters. The volume of questions has reached such enormous proportions that I simply can't find the time necessary to adequately answer these letters. Questions deemed to be of general interest to readers will still be carried here in the column, however.

Intercepts

2384: 77URY calling 77WTT in CW at 0313, automatic tape (Ross, Ontario). Possibly additional Spanish naval activity-- Ed.

2598: VAU, Yarmouth, NS, in USB at 0221 w/WX at Canadian locations (Ross, ONT).

2709: GG/YL in AM-mode at 0615 w/5F grpups. "Ende" at 0621 (Borawski, PA).

2716: NBA, USN CommSta, Panama in USB at 1200 giving bouy positions to various vessels (Holscher, GA).

3170: OLB5, Prague, Czechoslovakia in CW at 0226 w/time signals, 1 per second (Osier, NY).

3186: KWS78, U.S. Dept. of State, Athens, Greece w/CW call tape at 0342 (Brannigan, MA).

Borawski, PA	6517—CG Cutter Dallas 9006—SAM 500, Andrews AFB
Holscher, Ga & Foley, VA	5680—CG C/Dallas, USS Simpson, Navy Star 247, Navy Rescue 322, CG A/C 1710, A/C 1424, Cape Leader. Some tfc on 5696 & other freqs mentioned during above were: 8984, 11201, 6518.8, 3023, 2702 kHz & UHF Freq 282.8 MHz.
Kokinda, OH	6708—Cape Rdo, USS Independence. QSY'd to 2622.
Gervik, MI & Bennett, FL	4376—Cape Leader, CG C/Dallas, Bear, Harry Lane, Mayport, Pt. Roberts, Dauntless, USS Simpson, Sampson, Guam, Underwood, Navy Patrol Boat 778. Alternate Freq 3130.
Durst, WI	5680—Cape Leader, CG C/Dallas. Sent us a very fine tape of transmissions concerning the debris search efforts.

3320: CIP25 working CIP22 in USB at 0328 in EE (Ross, ONT). Possibly Canadian military-- Ed.

4037: GG/YL in USB at 0530 w/5F groups (Borawski, PA).

4044: SS/YL in AM-mode at 0530 w/5F groups (Borawski, PA).

4063: WMLG, vessel AMERICAN OHIO to KMI/San Francisco in USB at 0421 (Symington, OH).

4131.2: GBUC, the new cruise ship CANBERRA in USB at 0313 w/phone patch to WOM/Miami (Symington, OH).

4310: MTI, Plymouth Radio, England in CW w/VVV at 0215 (Lingenfield, PA).

4316: VVV CQ DE XUD X3X8 (Cambodian alloc.); very odd sounding CW at 1714-- sort of "boink-boink" & weak. Time pips also on top of signal, fading out under RTTY at 1721 (Hall, WA).

4321: 9VT, Singapore in CW at 1650 w/CQ (Hall, WA).

4324: LIMEADE 10 to LIMEADE 11 in USB at 1630. Tfc about radio procedures (Hall, WA).

4335: JCK, Kobe, Japan in CW at 1622 w/CQ (Hall, WA).

4348: JCS, Choshi, Japan in CW at 1618 w/CQ (Hall, WA).

4449: CW beacon signals at 0037. First heard a U, then changed to H, then back to U (Vendetti, NJ).

4455: Un-ID station in MCW-mode at 0420 w/5F groups (cut #'s) w/message: A U V 4 E 6 B D N T (Borawski, PA).

4767: CCS, Santiago Naval Radio, Chile in CW at 0547 w/VVV marker (Osier, NY).

4901: Un-ID MCW-mode station at 0410 w/5F groups. The 0 cut as letter T. S/off w/BT BT 408 408 408 62 26 00000 (Borawski, PA).

5080: ZVN3, Belem Aeradio, Brazil in CW at 0142 w/VVV marker (Osier, NY).

5335: Two American stations w/standard callsigns in CW at 1634. Don't know why they were on this out-of-band freq. (Margolis, IL).

5658: Addis Ababa Tower, Ethiopia in USB to various aircraft in USB at 2310 (Vendetti, NJ).

5696: Cape Cod Air & CommSta Boston working RESCUE 2115 during a mission. USCGC VIGILANT relaying tfc in USB at 1346 (Navary, VA).

5752: KRH267, U.S. Dept. of Energy, Savannah River Plant, SC in USB at 2246. Also KRF266 in Cheltenham, MD in USB w/radio check & comms to KRH267 at 2246. Returned to Digital mode at 2250 (Lingenfield, PA).

5895: MCW station at 0300 w/5F groups (0 cut as letter T) (Borawski, PA).

6218.6: Vessels ARGOSY VOYAGER & ARGOSY SAILOR on inland waterway in USB at 0306 (Ross, ONT).

6220: SS/YL w/5F groups in AM-mode at 0338 (Navary, VA).

6383: TBA6, Ankara Naval Radio, Turkey in CW w/VVV at 0302 (Lingenfield, PA).

6390.9: IDQ/2/3/6, Rome Naval Radio, Italy w/CW calltape ot 2219 (Bledsoe, AK).

6445: SXB, Patras, Greece in CW w/calltape at 2316 (Lingenfield, PA).

6470: SXA, Spata Attikis, Greece in CW w/VVV at 2310 (Lingenfield, PA).

6470.6: UVD, Madigon, USSR in CW at 0601 w/tfc list (Bledsoe, AK).

6490: JOS, Nagasaki, Japan in CW at 1726 w/CQ tape (Hall, WA).

6676: Sydney Volmet, Australia, w/WX in USB at 1003 (Navary, VA).

6738: XPH, Thule AFB, Greenland in USB at 0014 to Alert Radio w/phone patch about injured person (Symington, OH).

6761: SKYBIRD working aircraft REINDEER in USB at 0209. A USAF freq. (Navary, VA).

7383: GG/YL in USB/CW at 0200 w/5F groups. Started with "N" beacon in CW at 0200 followed by GG/YL giving #'s at 0205. "Ende" at 0209 followed by new message (Borawski, PA).

7700: PCW2, Dutch Embassy, Jerusalem, Israel in CW at 0042 w/calltape (Vendetti, NJ).

8216.7: ELQO, tanker AMOCO BRISBANE in USB at 2205 to WOO/New York w/phone patch (Symington, OH).

8288: GBCG, liner PACIFIC PRINCESS in USB at 0300 to WOM/Miami w/phone patch (Symington, OH).

8291: WGW, San Juan, PR in USB at 2331 to tug SAMPSON. Also noted WPE in Jacksonville, FL working same vessel here (Ross, ONT).

8437.4: 7TA6, Algiers, Algeria in CW w/CQ at 0703 (Bledsoe, AK).

8441: SS/OM w/4F groups in USB at 0011 (Vendetti).

8445: 9PA (Zaire alloc.) in CW at 0500 w/tfc list to one ship, LZRG (ship BALKAN), & QSK to 364. Hand sent w/chirpy note (Borawski, PA).

8458: LSA2/3/4, Boca, Argentino in CW at 0149 w/VVV (Bledsoe, AK).

8468: CUL8, Lisbon, Portugal in CW at 0248 w/calltape (Osier, NY).

8478: CBV, Valparaiso, Chile in CW at 0336 w/CQ marker (Ross, ONT).

8509: CCM, Magallenes Naval Rodio, Chile in CW at 0225 w/calltape (Osier, NY).

8566: VJJ, Charleville, Qld., Australia in CW at 0800 w/CQ tape carrying a lengthy #'s message (Hall, WA).

8632: XSW, Kaohsiung, Taiwan in CW at 2242 w/CW marker (Lingenfield, PA).

8656: XFU, Veracruz, Mexico in CW at 2231 w/CQ marker (Lingenfield, PA).

8690.2: TFA, Reykjavik, Iceland in CW at 1950 w/CQ marker (Bledsoe, AK).

8711: UAH, Tallinn, Estonian SSR in CW at 0728 w/calltape (Bledsoe, AK).

8765.4: USCG Portsmouth, VA w/WX for N. Atlantic area in USB at 1600 (Morley, ONT).

8993: MacDill AFB, FL w/TEAL 10 & MANDY 40 in USB at 1620 w/phone patches to MAC command posts (Holscher, GA).

9932: Un-ID station w/5F groups in CW at 2110 (Navary, VA).

10009: KBU6, Collins Radio net station in CW at 0800 to an aircraft on flight test. Portion copied said "Missed it next pass but keep TV set two rigs TST2 go to reconx of bother 8AZZ time VN4 bye KNS KBU6" (Hall, WA).

11775: SIERRA 65 working ECHO 15 in USB at at 0730, talking about setting up modem, then data signals (Navary, VA).

12130: Y7A52, MFA E. Berlin, GDR to Y7B23 (their embassy in Moscow) w/crypto tfc in CW at 1800 (Hall, WA).

12208: Two SS/OM's in LSB at 0012 exchanging coded groups w/phonetic letters (Vendetti, NJ).

12453.4: GOOB, freighter DART AMERICA in contact with GOOF, freighter DART ATLANTIC in USB at 1300. Skippers discussing impending transfer of 1 or both ships to new owners & wondering if they'd still have jobs the following week! (Kneitel, NY).

12661: UMV, Murmansk, USSR in CW at 1910 sending BK over & over, mentioned the ship KARANA II (Osier, NY).

12664.5: FUM, Papeete Naval Radio, Tahiti in CW at 0425 w/VVV (Vendetti, NJ).

12695: CNP, Casablanca, Morocco in CW at 1436 w/CW marker (Osier, NY).

12710.2: XSZ, Dalian, China in CW w/CQ at 0008 (Bledsoe, AK).

12756: YQI2, Constanta, Rumania in CW at 1414 w/calltape (Osier, NY).

12780.5: D3E51/61/81, Luanda, Angola in CW at 1029 w/CW marker. This is tough to hear in Alaska (Bledsoe, AK). But look at all of the other exotic DX you get a clear shot at!-- Ed.

12860: 5AT, Tripoli, Libya in CW at 1502 w/VVV (Osier, NY).

12880: XSG68/67, Shanghai, PRC w/CQ in CW at 2330 (Hall, WA).

12938: SPE61, Szczecin, Poland in CW at 1510 w/tfc (Osier, NY).

12939: LZW5, Varna, Bulgaria in CW at 1617 w/calltape (Osier, NY).

12949: UFB, Odessa, Ukranian SSR in CW at 1746 w/CQ tape (Osier, NY).

12974: IQX, Trieste, Italy in CW at 1518 w/VVV (Osier, NY).

12983.3: XSF, Lianyungang, PRC in CW at 0056 w/VVV (Bledsoe, AK).

13065: 6YI, Kingston, Jamaica in CW at 1915 w/CQ marker (Lingenfield, PA).

13113.2: USCG CommSta Portsmouth, VA to USCGC GLACIER in USB at 1800 (Navary, VA).

13215.5: FUX, St. Denis Naval Radio, Reunion in CW at 2020 w/VVV (Vendetti, NJ).

13440: NAVY 49676 (aircraft) to Andrews AFB in LSB at 2145. This aircraft is a P-3 assigned to Chief, Naval Operations (Symington, OH).

14445: CIW202, Canadian Forces MARS-type station at 1606 in USB to VXV9 (Symington, OH).

15085: GG/YL in AM-mode at 1611 w/3/2F groups (Osier, NY).

16518.9: "Ship First Light"(?) in USB at 1817 w/telephone traffic (Navary, VA).

16875: JKB, Tokyo, Japan in CW at 0118 w/CQ in into tfc for a ship (Hall, WA).

16958.8: HML, Pyongyang, N. Korea in CW at 2327 w/CQ (Bledsoe, AK).

17174: CLS, Havana (Industria Pesquera) in CW at 1927 w/calltape (Osier, NY).

18437: Station in ISB at 0017 w/very strong time pips, then long silence, 2 long tones, back into time pips (Hall, WA).

28174: WPD, Tampa, FL w/calltape in CW at 1657 (Vendetti, NJ). A harmonic or an image of some lower frequency-- Ed.

PC

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

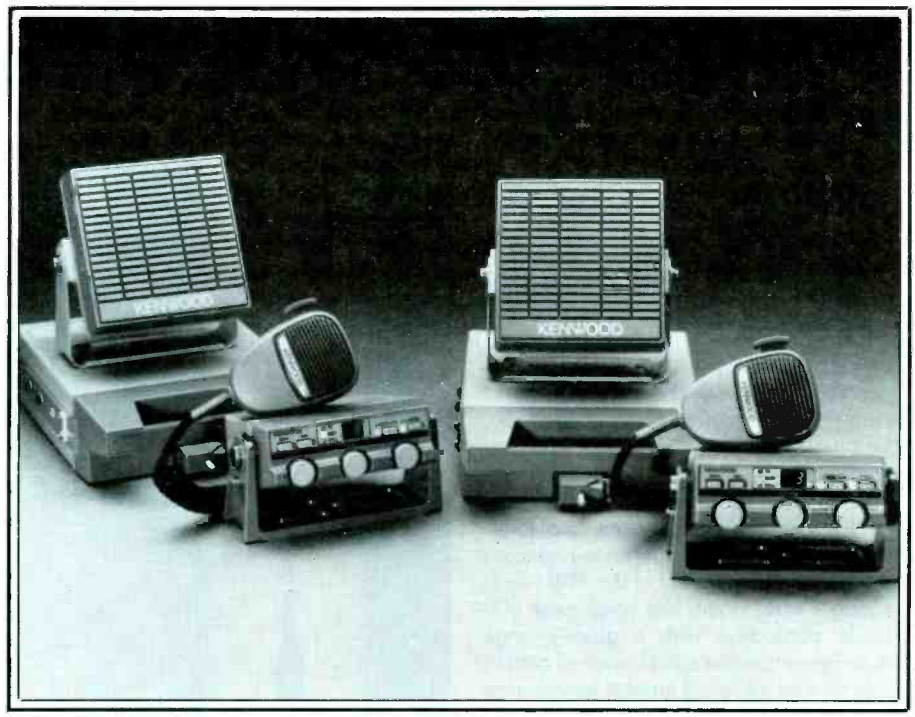
New IC-28A And IC-28H 2-Meter Mobiles

ICOM announces the IC-28A 25-watt and IC-28H 45-watt packet compatible 2-meter rigs with all the features you need for carefree mobile operation.

The features include: Compact size, measures 5¼"D x 5½"W x 2"H (IC-28H is 7¼"D); large LCD readout with automatic dimmer circuit to reduce brightness; wideband coverage, it performs from 138-174 MHz, specifications guaranteed from 144.00-148 MHz, ideal for MARS and CAP operation; 21 memory channels; scanning—scan the entire band or the memory channels from the provided HM-12 mic; easy to operate—only 11 front panel controls.

There are a wide range of options available as well: IC-HM14 DTMF mic, PS-45 13.8V 8A power supply, UT-29 tone squelch unit, SP-10 external speaker, HM-16 speaker mic and HS-15/HS-15SB flexible boom mic and PTT switchbox.

For more information, contact ICOM America, Inc., Suite 307, 2380 - 116th Avenue NE, Bellevue, WA 98004.



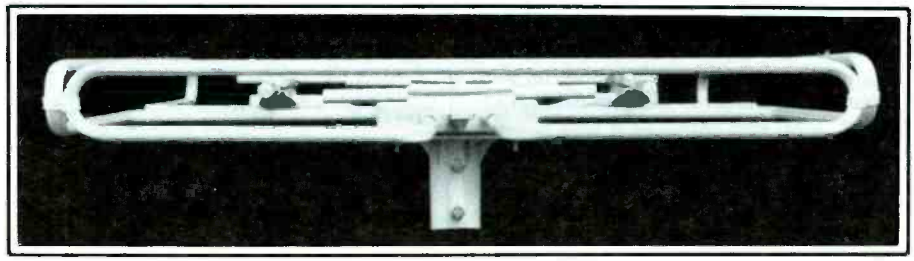
Remote Mount TK-702R VHF Synthesized FM Two-Way Radio

Compact in size, the Kenwood TK-702R VHF Synthesized FM Two-Way Radio provides the user with a remote control head that includes a molded multi-position mounting bracket and controls for monitor, auxiliary, volume, power and channel select. Designed for the 150-174 MHz bands, the basic TK-702R has a 12 MHz transmit and receive channel frequency spread. It outputs 50 watts of RF power and can handle up to 32 (simplex) or 16 (half-duplex) synthesized channels. An orange color two digit LED channel indicator, built-in time out timer, and a heavy duty 3-watt external speaker come standard.

An optional microprocessor-controlled scan model provides channel scan or channel scan with priority. Users can select the priority channel via the channel selector knob or the priority channel may be fixed. The scan model provides a switch and a visible indicator that allows the user to delete or add channels to the channel scan sequence.

The TK-702R comes equipped with many of the important characteristics found in the Trio-Kenwood line of mobile radios, such as die-cast construction; high-impact molded case cover; glass-epoxy circuit boards; rugged microphone; and a Temperature Compensated Crystal Oscillator (TCXO) that provides for frequency accuracy and stability.

Various microphones and tone signalling boards are all offered as options. The TK-702R carries a one-year warranty on parts and labor. For further details on the unit, contact Donald L. Phipps, Marketing Manager, Trio-Kenwood Communications, 1111 West Walnut Street, Compton, California 90220.



360 Degree Omnidirectional TV/FM Antenna System

A popular long-range VHF/UHF/FM television antenna, the new and updated Dantronics-360 is a complete television reception system covering all channels between 2 to 80 (40 MHz-840 MHz) and features the new low noise HF-100 hybrid VHF/UHF wideband preamplifier with 22 dB gain. The preamplifier is an "in-line" amplifier, connected outside the antenna for maximum gain with minimum noise, replaceable if defective.

This new antenna system has two important features that enhance its performance in the marine environment. First, it is a 360 degree omnidirectional antenna. This feature eliminates the need for a motor to turn a directional antenna, normally an item with a high failure rate because of the harsh marine environment. The second feature is a high gain preamplifier, which enables TV-reception up to distances of 100 miles. Normal marine antenna systems offer TV reception to distances of 30-45 miles maximum. There are seven different antenna system configurations to fit a wide range of installations. Power requirements are 12-24 vdc. or 110 vac. (220vac optional).

The DAN-360 antenna system is very compact, measuring 25" x 25" x 2.75" and the weight of the antenna element and preamplifier is only 4.5 lbs.

For additional information, including a descriptive brochure, write: Dantronics Comp., P.O. Box 204, Boca Raton, Florida 33429-0204. PC

BETTER SIGNALS

ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

BY ED NOLL, W3FQJ

MW Loaded Long Longwire

The MW 86/87 DX months are on the horizon, and it's time to plan a new miracle wire for the upcoming season. A *long* longwire, if you have the space, offers some new excitement to your early morning, late afternoon, and late night listening. Amazing is the directivity of such a wire on the MW band as compared to an antenna of the same electrical length on the HF bands. Furthermore, if you wish the back pick-up of the long longwire to drop back substantially, all you need do is terminate the far end with a resistive load to ground.

In the March '86 issue this column presented a comparison between two longwires. One was cut to a quarter wavelength at the high-frequency end of the MW band; the longer one, down the band near 800 kHz. In conjuction with a quick-change switch-operation the significance of cutting such a wire an electrical quarter wavelength for the portion of the band you wish to favor was demonstrated. Also, the longer wire was more directive toward the west than the shorter one, and westerly signals were received with less nighttime hash on them. Our story picks up again at this point.

In the previous test the longer wire was not quite so directive at the low-frequency end of the MW band. Directivity was improved by adding 60 feet to the longer wire. The new length of 360 feet corresponds to a quarter wavelength in the 650 kHz region. Long-to-short wire S-unit difference for this new length is shown in the first column of Table 1. You can compare it with figures given in the early article. Improvement was modest at the low-frequency end of the band.

A next step was to try a resistive termination on the far end of the longer wire. The end of wire was dropped down to a terminal, bolted to the last PVC pipe (Figure 2). Three 750-ohm resistors were paralleled and connected between antenna end and a

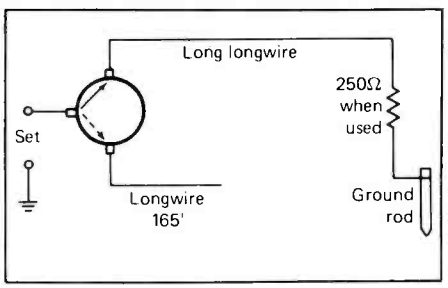


Figure 1: *Longwire antenna comparison set-up.*

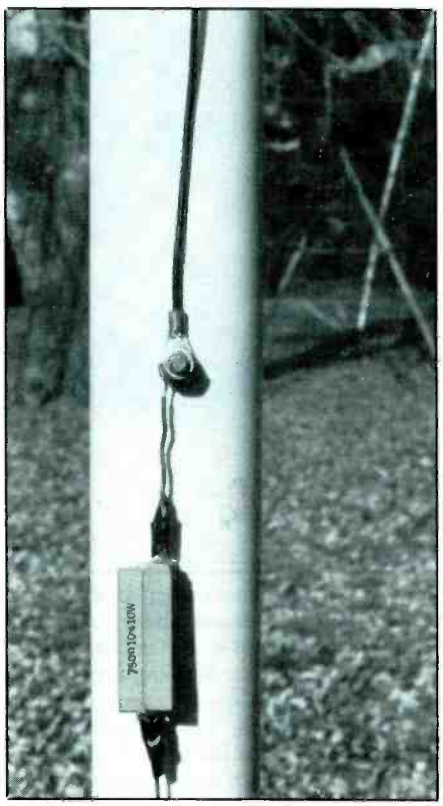


Figure 2: *Attachment of terminating resistors as described in the text.*

Figure 3: *Ground rod for terminated long longwire.*

Direction	Call	Freq kHz	No-T	Yes	No-T	Yes
N	WARM	590	+6	+7	−6	+1
E	WNBC	660	+6	+7	+1	+1½
S	WIP	610	+14	+14	+1	+5
W	WHP	580	+8	+10	+5	+8
N	WEY	810	+2	+2	−1	−4
E	WTTM	920	+1	−½	+1	−5
S	WPEN	950	−2	−1	+1	−1
W	WEEU	850	+3	+3½	+4	+6
N	WGPA	1100	−6	−7	+1	−3
E	WINS	1010	−2	−2	+1	−4½
S	KYW	1060	−5	−8	+6	+1
W	WHYL	960	+2	+1	+3	+6
N	WKAP	1320	−7	−7	−6	−6
E	WBUD	1260	−3	−4	−½	−9
S	WHAT	1340	−6	−4	0	−5
W	WHUM	1240	−1½	−½	+5	+7
N	WEST	1400	−4	−6	−8	−9
E	WBCB	1490	−1	−1	−1	−4
S	WDAS	1480	−4	−6	−2½	−2½
W	WLAN	1390	+2	+5	+6	+7

Readings are S-unit difference between longwire and 165' reference.

Table 1: *Longwire S-unit comparison.*

4 foot ground rod driven into the ground (Figure 3). Results are shown in the second column of Table 1.

It must be stressed that S-unit comparisons often read true and positive but, at other times, they may only offer clues to what is going on because of the disguised influence of variables. For example, another station on the same frequency, even a weak one, can spoil your results. This is an obvious problem because you can hear that station. Some adjacent channel spillover or a malfunctioning transmitter quite removed from the test frequency can ride up your S-meter and you may not be particularly aware of it. More noise pick up on one antenna can fool you when checking low-level signals. At night, when the band is heavy with strong signals, overload is possible and you may just as well forget about many S-unit comparisons. However, at night you can listen and by switching antennas, the results become quite obvious. In fact, it is the day measurements in combination with the night listening that tells the complete story.

Results with the far end terminated improved directivity modestly over the mid-frequency section of the band. Again listening results were better than figures suggest. At any rate the added length and termination was a definite improvement toward the west. In addition, the ability to switch between two antennas of different characteristics was a help in IDing two stations on the same frequency.

Enter The Long Longwire

The next step was an additional jump in length to 585 feet, which is just about as far as I can go at the moment with the present set-up. Quarter wavelength frequency was lowered to near 400 kHz. Good directivity is evidenced over the entire band as indicated by the higher ratio of westerly pick up along with some declines in the north and south directions. The results suggest real directivity begins when the length of a long longwire is longer than an electrical quarter wavelength at the very low-frequency end of the band.

A most pronounced improvement took place when the long longwire was terminated. Take a look at the final column with the westward pick up jumping and almost every other direction falling off. Now you begin to see some Beverage characteristics. In fact, the use of a termination may be the way of introducing some Beverage-like performance when you are hampered in just how far you can stretch out your antenna.

Antenna was supported about ten foot above ground by PVC pipes and was reasonably straight except where I had to make some dipsy doodles to bring the wire into the radio room. Can you find some space to do some long longwire DXing? Even insulated wire laid along the ground will do it for you. Search the Hamfests and flea markets for some long hunks of wire. Let me know how well you do. By the way, the extra performance offered by the terminated long longwire helps me enjoy WSM Grand Old Opry a couple S-units better.

Results

The results are presented in the form of a comparison between the termnated 585′ long longwire and the 165′ long unterminated longwire. The latter itself is a very fine antenna and is cut to a quarter wavelength at the high-frequency end of the MW band. Results were gathered from four days of sporadic listening at sunrise, sunset, and early evening up to 10 p.m.

Early morning listening on a few of the western clear-channel frequencies gave the first inkling to the superior performance of the long longwire or (L) antenna as compared to the shorter (S) antenna.

There was Nashville WSM on 650 kHz, the two Chicago stations on 670 and 720, WLW 700, WJR 760, WHAS 840, KDKA 1020, WWWE 1100, and WCKY 1530 all coming through very well. Switching over to the (S) antenna always resulted in a weaker signal on each station and, in the case of WCKY, no signal at all. At high noon all stations were still there on the (L) antenna, quite weak but they could be identified, except for WCKY. Not one of the stations could be heard on the (S) antenna. Nighttime listening was equally impressive on the clears and pseudo clears. Total count was 29 westerly stations. All came through in good shape on the (L) antenna. Most times they were as strong as locals and you could enjoy the programming fully most of the time. The (S) signals were notably weaker and greatly affected by the usual nighttime background hash and spillover from adjacent channel strong locals.

There were a number of impressive crossovers. You would hear a same-frequency different station as you switched between the two antennas. On occasion the two stations were at almost identical levels with no trace of opposite signals. Most notable were the clean separations between WCCO/WNYC on 830, KRLD/WTIC on 1080, WLAC/WMRE on 1510, and KXEL/WPTR on 1540. One that was amazing was CKLW/Bonaire on 600. There was practically no background noise on either signal for just about one-half hour.

Tuning the regionals was equally rewarding, demonstrating the westerly pickup clearly in the form of 14 crossovers and 24 stations (plus four more on the clears) I never heard before. Two of the new ID's was a WAKR/WQQW crossover on 1590.

Of special satisfaction to me was the reception of a number of central and western Pennsylvania stations for the first time in Latrobe, Bedford, Altoona, Hanover, Canonsburg, Everett, a couple of low-power Pittsburgh stations, and Ephrata. The latter station is only 50-60 miles from here, but it was heard on the (L) antenna despite the presence of nearby WSSJ Camden on the same frequency. A long longwire is an exciting antenna and switchable antennas add to the enjoyment of MW DXing.

ON THE LINE

BY JULIAN MACASSEY, N6ARE

NEW AND EXCITING TELEPHONE TECHNOLOGY

What's New?

The large telephone companies and manufacturers have had some years to adjust to deregulation and divestiture in the telephone industry. It is worthwhile to look at what is happening and see if the projected fortunes have been made. More interesting is what is happening to the consumer. The consumer has probably not adjusted. He is just as confused as he was 50 years ago.

When deregulation was on the horizon, the expensive chart generators on Wall Street went bananas. Looking at the breakup of AT&T, the largest company in the world, they saw nothing but money for all. Some shady individuals, possibly too crooked to sell used cars, got into "telephones." Most of these overnight *experts* could hardly read a phone bill, let alone understand the largest machine ever built by man.

Despite the piles of gold foreseen by the experts and the tales of increased prices and lowered service from the doomsayers, things haven't changed much. The U.S. still has the best phone service in the world. No one has really taken over from AT&T and the Regional Bell Operating Companies (RBOCs).

Many of the large manufacturers that hoped to clean up have not. Some large companies have not seen things go their way. ITT spent hundreds of millions of dollars converting their System 12 Digital Central Office to U.S. standards. At the beginning of the year, ITT decided to get out of the business and laid off hundreds of people. AT&T, meanwhile, has laid off over 25,000 people.

The public has found out that $10 phones don't work. Overseas manufacturers have found the U.S. market tough going. It may be a free market, but the consumers are finding out that what they want is service, not cheap prices. For service, people will pay. Foreign manufacturers have been used to a monopoly market where it takes three years or more to get a phone installed. The U.S. market is fast-moving and free. The key to winning the U.S. market is service. Fancy features are not as important as instant dial tone and circuits you can hear on.

At the moment the large phone companies of the world are completely enamored with something called ISDN, which stands for Intergrated Standard Data Network. Some wags have suggested this stands for "I Still Don't Need It," "I Still Don't Know," and "Innovations Subscribers Don't Need."

ISDN is, without doubt, the most hyped thing ever to come to the telecommunications industry. It is promoted by the CCITT (Committe Consultif International Telegraphe et Telephone—International Telephone and Telegraph Consultative Committee). The originators of the ISDN idea were the Germans, which explains why Siemens is one of the major movers in the field.

The purpose of ISDN is to provide wide band digital voice and data services to subscribers down a regular phone line. The basic ISDN service will provide channels 64 kilobits wide. Per line, the maximum bandwidth will be 1.544 Megabytes. It will require a modem at both the subscriber and central office end. No ISDN promoter has been able to issue an assurance that such wide bandwidths will work on all or most subscriber lines as currently installed. This service is aimed at less than five percent of telephone subscribers, yet manufacturers are spending billions chasing after this very small segment of the market. The "market" is "large" phone users. When asking the mover and shakers of ISDN just how ISDN will help the small business subscriber or home subscriber, they laugh. It seems they don't care about the small fry.

The sad news is that most phone lines go to single line subscribers such as homes and small business. The amazing statistic of phone use is that 95% of American businesses have 15 employees or less and 75% have ten or less.

Any telephone engineer who understands the phone network will tell you that most lines are single lines terminated with a single phone and most businesses use two lines and six phones. This is an enormous market, millions of individuals. Harder to think about than the Fortune 500. What people forget as they chase after the business of the Fortune 500 is that there are only 500 of them. Somehow, millions of subscribers who in total provide most of the phone companies' income are ignored while salesmen chase a few companies that provide a small part of it. The phone network was designed and built to allow all of these small people to talk to each other. They always have and always will provide the major profits to the phone companies. They are also better bill payers than the big corporations.

Right now, what are the phone companies and manufacturers doing for the majority of their customers? Nothing!

One of the amusing facts of ISDN is that the German phone company, Deutche BundesPost, who started all this, will not allow their customers to provide their own equipment and claim that having more than one telephone set working on a line at one time is "technically impossible." Yet, they think their customers will have use for wideband digital equipment.

Hopefully, the U.S. phone companies will come to their senses and take care of the remaining 95% of their customers. What do all those millions of customers want? Better service, easier to read phone bills, information services, and wider distribution of custom calling services.

Central offices are nowadays just large computers; with a little effort from the phone company and a little expense to subscribers the consumer could make use of all this computer power. Besides the current custom calling services such as call forwarding and speed dialing, new services could be offered. A subscriber should be able to dial a number and set up an "alarm call" where the phone would ring back at a predetermined time to remind the subscriber of appointments or provide a wake up call for that 3 a.m. flight.

Why not let owners of personal computers have access to the telephone company computers so that they can call information and make their own searches for telephone numbers? How about being able to call in by phone or computer and get an instant update on call charges and services? Many subscribers would like to know the status of their bill during the month. The phone company could provide this. Using a computer terminal and credit card number, a subscriber could examine a bill and pay it at the same time. The hardware to provide these services is in place, but it seems the imagination isn't.

For those few who wish to use wideband data services, video, and multi-channel voice, there is a system already developed; it's called . . . satellites.

The technology is in place; some coordination and consolidation is needed. Any customer should be able to purchase a satellite terminal and point it at a satellite and get going. There are many advantages to doing it this way.

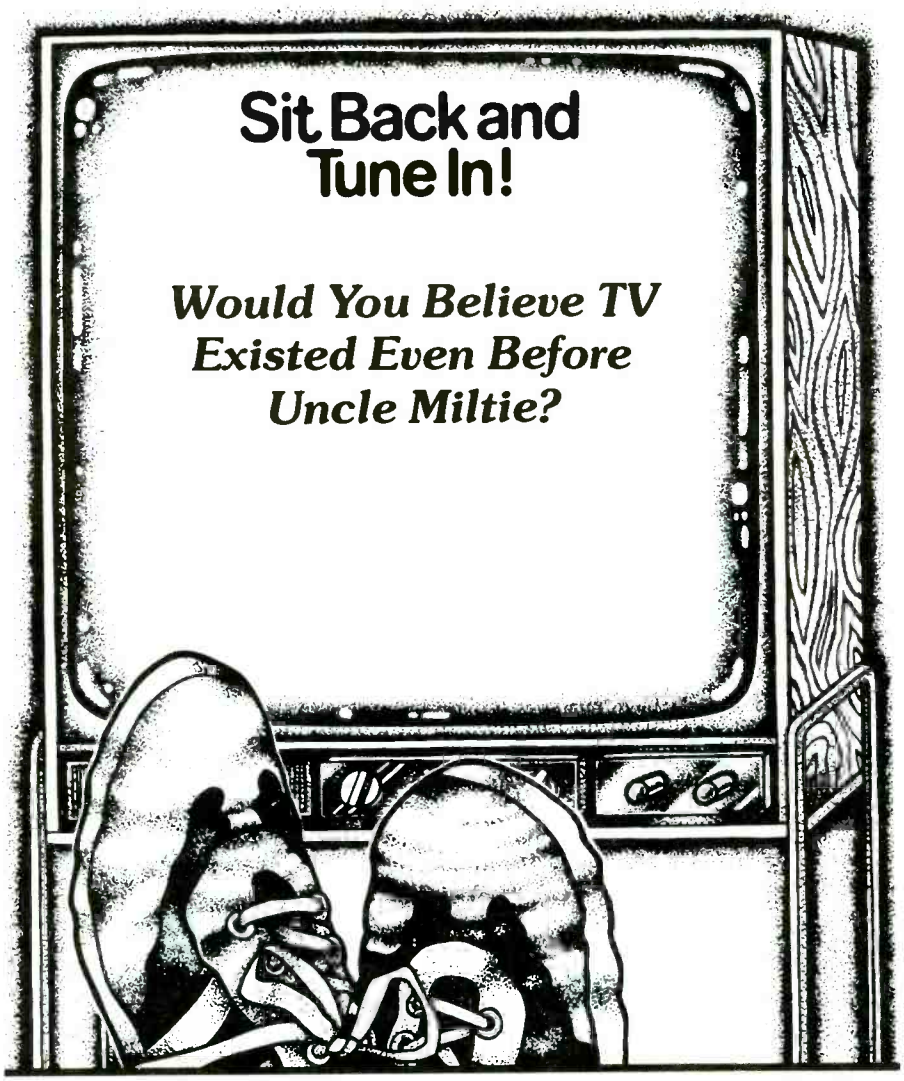
The first advantage is that only the users pay. Why should someone pay to have his local phone company go into wide band digital so his neighbor can use it. Another advantage is that it will work anywhere, even in the most remote areas that may not

have phone service. The biggest advantage is that the switching technology would be done at the customers terminal, not in large buildings downtown.

We have satellites and we have a system called "packet switching." With packet switching, data, voice, or video is broken up into "packets." Each packet or small burst of data has a digital address on it. The address contains the originator and receivers ID. A packet will make it to the destination and be decoded. Many users can be on the channel at the same time and will only decode those packets addressed to them. When a subscriber is neither receiving or sending data, his terminal is quiet. By entering an "address," any subscriber to a satellite packet service could connect up to any other subscriber, just like dialing a phone number.

Pardon the pun, but all this is not pie-in-the-sky. The technology is in use today. Many companies are using packet switching for data. Many companies are renting satellite transponders for data. All that is needed is for someone to put it together and offer the system to subscribers.

Think of it, a worldwide solution to wide band data and video services that could be available within months, not years as is proposed by the ISDN fans. PC



The First Few Days Of American Commercial Television

BY PETER HUNN

This little TV history is designed to assist those who have long demanded answers to important television questions like: How come there's no Channel 1? And, weren't TV programs much, much better in the old days?

During the summer of 1941, the FCC yielded to pleadings from experimental television station owners and authorized commercial TV broadcasting. Undoubtedly, the audio-video transmitting enthusiasts had been requesting such permission for so long that they were caught off-guard by the government's sudden okay. Out of the 22 or so U.S. TV stations then in some form of operation, only one, WNBT (now WNBC-TV) in New York City, was ready to accommodate commercial sponsors.

WNBT, the National Broadcasting Company's station, was given dial positioning preeminence in that it transmitted on Channel 1. The folks at Channel 1 were all set for their entry into the early days of commercial telecasting. An NBC-TV staffer got the ball rolling by coining the profitably mnemonic WNBT slogan, **W**hy **N**ot **B**uy **T**ime, and the advertising revenues began flowing—or at least trickling—in.

The Bulova Watch Company kicked off video commercialization, sponsoring one minute time checks prior to a few of the first commercial television shows. Bulova then sent NBC-TV a check for $12. Sunoco, Procter & Gamble, and Lever Brothers each paid $100 to sponsor programs ranging from *Lowell Thomas and the News,* to *Truth* or *Consequences,* and *Uncle Jim's Question Bee*. NBC accountants soon discovered that those advertising rates brought their broadcasting firm a grand total of $312. True this is not a staggering sum, but considering that TV was still very much a novelty, this represented a start. Actually, NBC might have augmented its revenues by competing with the enterprising New York City telescope salesman who was positioned on 42nd Street selling glimpses of WNBT's top of the Empire State Building television antenna for a nickel per look.

If you're wondering who was looking at TV back in that radio dominated age, there were no overnight Nielsen ratings to satisfy such a query. But, NBC conducted a survey showing the presence of some 4,500 TV's in New York metropolitan area homes, and 600 more sets in nearby taverns and eating places. When one assumes that each television home and bar could squeeze at least 15 viewers in front of its TV set, WNBT could estimate an audience of, say, 90,000.

In order to cultivate this number, NBC-TV officials decided to distribute what was termed "the first piece of major television consumer promotion." This new concept consisted of a window poster that tavern and restaurant owners could display in their establishments promoting prize fights televised from Brooklyn.

And, the National Broadcasting Company's television division did not stop there. It soon proudly announced that a clothing manufacturer had agreed to sponsor an interesting WNBT weather report program during which there would also be a visual presentation of the advertiser's popular wrinkle-proof necktie.

Meanwhile, the Federal Communications Commission presented WNBT with a problem that required ironing out. The FCC had changed its mind about certain frequency allocations, giving Channel 1's space to pioneer FM broadcasters, and telling NBC to move WNBT, lock, stock, and Empire State Building antenna, up to Channel 4.

Where were the other major networks while all of these initial commercial TV events were contributing to American history? Well, ABC had not yet been founded (that would occur in 1943 when the government would require NBC to sell off one of its radio networks), and the CBS eye and ear station, WCBW (now WCBS-TV), was still testing —airing station identifications and images of paintings, prints, and art objects from the Metropolitan Museum of Art.

Finally, for the benefit of you who may feel that all of today's television programming tends to look the same, making it difficult to distinguish between one program and the next, sympathize with the early CBS-TV engineers who were frantically trying to tune in their company's television outlet (one of only two transmitting at the time). There was a bit of adjusting, some touching of the dials. At last, there came sighs of relief when a clear image appeared on the tiny screen. The technicians began watching, and everything seemed fine . . . until the CBS-TV engineers realized that they had tuned to the NBC station. PC

Peter Hunn is a broadcast historian, and founder of FM radio station WHRC-FM in the Adirondack mountain region of New York.

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BROADCAST TOPIX

BY MARK MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Much activity has gone on in the past few months concerning stereo, both AM and FM. Tests have started on WGBH using the new FMX system I spoke of a while back. The Chicago and San Francisco areas may also be able to try their ears out on FMX if the Boston tests go well. FMX is a system that allows the 20 dB penality of FM stereo (vs. mono) to be recovered. Not only that, but it is possible to achieve up to 90 dB signal to noise ratio using the FMX system developed by CBS.

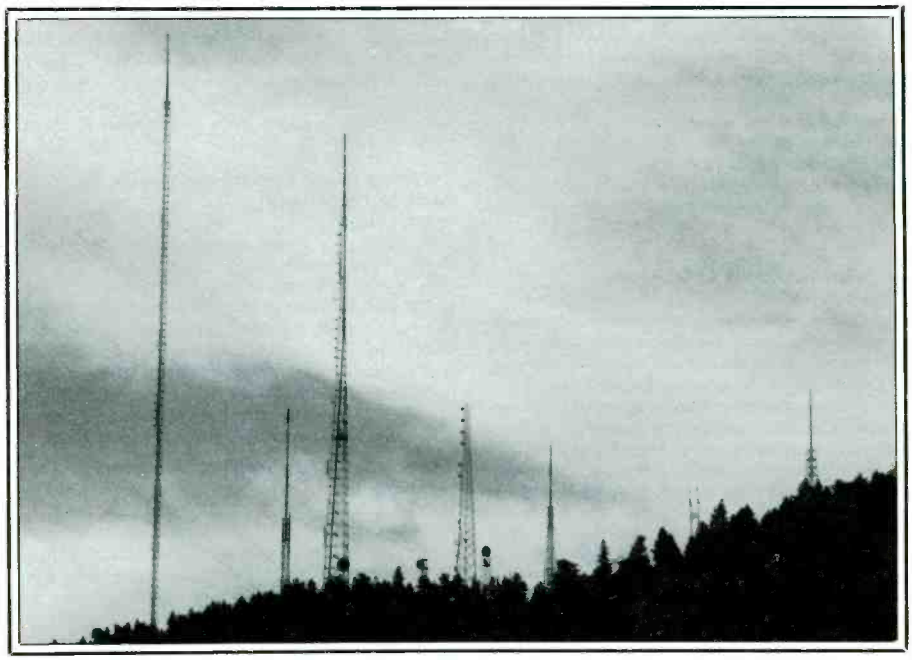
Hopefully, by the end of the year, there may be some consumer receivers available to receive FMX. Existing receivers are not affected by the addition of FMX to the stereo signal, but FMX equipped receivers will benefit from a receiving area four times greater than the existing coverage area and without increasing the power output of the station.

The reason for picking WGBH and WFMT is obvious. These stations are such sticklers for quality that any change in the station will be readily noticed by the audience. Also, the stations do not use excessive amounts of audio processing, which can hide certain noises that want to be heard when testing a new system such as FMX.

Leonard Kahn of Kahn-Hazeltine Systems has filed a protest with the FCC requesting all C-Quam stereo systems be removed from the air. He alleges the C-Quam system does not fall within FCC rules for bandwidth requirements. This may have been resolved by the time you read this, so stay tuned next month. Even so, C-Quam has added 63 new AM stereo stations in the past few months, two at the expense of Kahn and five conversions from the defunct Harris system. The new stations are listed elsewhere. That brings the AM stereo count to 280 for C-Quam, 98 Harris systems left, Kahn has 77 operating, and the PMX system shows 6 stations, for a grand total of 461 stations or about 10% of the total AM stations, according to my count. If you want the entire current list of AM stereo stations in the U.S., send me $2.50 and I will return you postpaid a nice little seven page, 4″ × 10″ pamphlet listing all the U.S. stations.

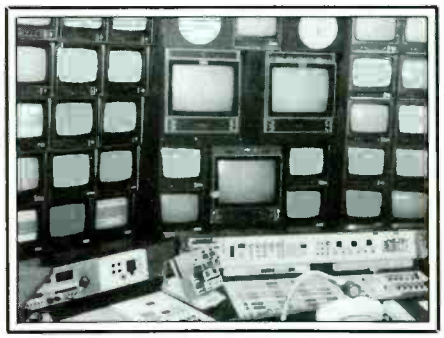
On my bench a Fijitsu-Ten ETR auto sound system was successfully converted to AM stereo with a module from Motorola and "The Secret" from Kahn-Hazeltine. This allows reception of both AM stereo systems in my car. Not only could I have automatic switching of the radio to AM stereo, but I was able to add a switch that would allow me to force the radio into the stereo mode for long-distant stereo weak signals. Unfortunately, when the system was reinstalled into the mini-van, the Kahn part of the system would not function properly and I did not have enough time before leaving on vacation to repair it. However, the C-Quam did work well and the majority of the stations I heard were pleasing, with one in particular—WCXR AM/FM in Washington—which simulcasts programming on both stations. I was able to A/B (compare) the stereo AM against the stereo FM. The AM station is 5 kW on 730 kHz, so they have pretty good coverage. Besides enjoying the programming, the AM stereo actually sounded better than the FM stereo! To compare, I switched back and forth many, many times while driving through Washington. No one wants to believe this because everyone is of the opinion AM cannot possibly sound better than FM—that is, except those who have heard AM stereo on a good high-fidelity AM receiver. The other Washington C-Quam station, WMZQ, sounded just as good. By comparison, all three Baltimore AM stereo stations of both systems did not sound very good while I was running comparison listening tests. To be fair, however, the same can be said of several area FM stations.

Another point of view on AM stereo comes from Steve Coletti, who is able to monitor the big guns of New York. He says WNBC has always had a "horrendous" sound (I can't agree), but they sounded good in the early days of stereo. He also says they are now EQ-ing their sound like they did when they were mono and have stopped announcing "stereo," as has WPAT. Steve says WPAT has always sounded good and had an incred-



Denver's Lookout Moutain with a multitude of media. (Photo by Pat Griffith)

You're standing beside the audio control operator at Channel 11 in Baltimore. Through his window can be seen the video operations. (Photo by Mark Manucy)



This is the video control room. (Photo by Mark Manucy)

ible sound when they started using stereo. WNEW, he continues, has a big band format and doesn't need stereo. Listen to CJSB on 540 kHz and see how they are doing big-band in stereo . . . sounds great! Richard also sent a list of SCA operations in the Big Apple, which I'll try to list next month.

The new generation of AM decoders or detectors, which are just hitting the market, make a world of difference in the way AM radio sounds. There is no comparison between these new detectors and the old diode, which must be in about 99.9% of all AM radios. There are several new detectors, the most famous one being the synchronous detector, which, by the way, is not new but certainly should be in any new hi-fi AM radio, stereo or not. I am one of those AM nuts that will listen to AM even though there is a raging thunderstorm just about to blow the voice coil out of the speaker. During my vacation, in consideration of those riding in the car with me, I could not operate my "new AM detector" at the volume level normally enjoyed, so I had to wait until last night when a business

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
WZYQ	Frederick, MD	820	5/1	DA-2
WADU	Norco, LA	830	5/.75	DA-N
KIXI	Mercer Island, WA	880	50/10	DA-2
WNBG	Waynesboro, TN	930	.47/0	O
KAGI	Grants Pass, OR	930	5/1.5	DA-N
WCCS	Homer City, PA	1160	5/0	O
KIOT	Barstow, CA	1310	5/.5	DA-2
KLBS	Los Banos, CA	1310	5/5	DA-2
WKEA	Scottsboro, AL	1330	5/.5	DA-N
FM				
WCBN	Ann Arbor, MI	88.3	.2	177′
KUAR	Little Rock, AR	89.1	73.5	272′
WHFR	Dearborn, MI	89.3	.268	60′
KVRH-FM	Salida, CO	92.1	3	-912′
KPQX	Havre, MT	92.5	95.7	1790′
KSUE-FM	Susanville, CA	92.7	100	1155′
WCCR	Clarion, PA	92.7	3	279′
KLSI	Kansas City, MO	93.3	100	1056′
KDUC	Barstow, CA	94.3	.35	745′
WCVU	Naples, FL	94.5	100	1012′
WJAX-FM	Jacksonville, FL	95.1	100	984′
KNIF	Gilmer, TX	95.3	1.0	574′
WKML	Lumberton, NC	95.7	100	1054′
WSKS	Hamilton, OH	96.5	19.5	810′
WVLI	Buena Vista, CA	96.7	3	155′
WSEY	Sauk City, WI	96.7	.74	665′
WKOV-FM	Wellston, OH	96.7	1.75	430′
WONA-FM	Winona, MS	96.7	3	328′
KTCZ-FM	Minneapolis, MN	97.1	100	236′
WCKA	Sutton, WV	97.1	25	193′
WMLQ	Rogers City, MI	97.7	2.08	396′
KCTT-FM	Yellville, AR	97.7	3	328′
KLZS	Wichita, KS	97.9	100	1036′
WERV	Rotterdam, NY	98.3	3	328′
WILI-FM	Willimantic, CT	98.3	1.25	525′
WOZN	Key West, FL	98.7	100	453′
WQIK-FM	Jacksonville, FL	99.1	100	984′
WQTR	Whiteville, NC	99.1	100	981′
KLPW-FM	Union, MO	101.7	1.32	489′
WCXL	Vero Beach, FL	101.7	1.39	465′
WCFI	Daytona Beach, FL	101.9	100	1610′
WTKS	Bethesda, MD	102.3	1.35	480′
KWNR	Liberal, KS	102.7	100	513′
KEZS-FM	Cape Girardeau, MO	102.9	100	982′
WFUR-FM	Grand Rapids, MI	102.9	50	500′
KEZP	Canadian, TX	103.1	.83	575′
KZYR	Avon, CO	103.1	N/C	459′
WTCM-FM	Traverse City, MI	103.5	100	990′
WDEB-FM	Jamestown, TN	103.9	1.6	450′
WKKY	Moss Point, MS	104.9	3	328′
KHUG-FM	Phonenix, OR	105.1	51.7	544′
KSLE	Seminole, OK	105.5	3	298′
WYZB	Mary Esther, FL	105.5	3	328′
KZFN	Moscow, ID	106.1	100	961′
KBER	Spanish Fork, UT	106.3	7.94	2709′
WWJM	New Lexington, OH	106.3	3	328′
WCRJ-FM	Jacksonville, FL	107.3	100	984′
KFFM	Yakima, WA	107.3	100	1500′
WQLC	Poplarville, MS	107.9	92	1460′
KMGW	Anoka, MN	107.9	100	1089′

KEY: D = Daytime N = Nighttime DA = Directional Antenna DA1 = Same Pattern Day & Night DA2 = Different Pattern/Power Day/Night O = Omni Antenna Day and/or Night § = Special Operation or Critical Hours N/C = No Change

Call Letter Changes

Location	Old	New
AM Stations		
Wasilla, AK	new	KCBR
Fort Smith, AR	KYYN	KZZE
Thousand Palms, CA	new	KPSL
Detla, CO	KDTA	KPLG
Vernon, CT	WRTT	WCTF
Hamden, CT	WSCR	WNNR
Haines City, FL	WTHN	WLVF
Ormond Beach, FL	WDAT	WELE
Jacksonville, FL	WAPE	WJAX
Brandon, FL	new	WJCZ
Dunedin, FL	WVTY	WLVU
Jacksonville, FL	WJAX	WRXJ
Hopkinsville, KY	WKOA	WYKH
Pittsburg, KY	WKPJ	WMAK
Garyville, LA	WKQT	WCKW
Towson, MD	WTOW	WFEL
Grand Rapids, MI	WXQT	WKTH
Ridgeland, MS	WYAI	WLRM
Cape Girardeau, MO	KEWI	KKPE
Las Vegas, NV	KBKK	KVEG
Las Vegas, NV	KVEG	KFMS
Camp Le Jeune, NC	WJIK	WBQZ
Chardon, OH	WBKC	WCDN
Painesville, OH	WQLS	WBKC
Tulsa, OK	KELI	KVLT
Greer, SC	WEAB	WPJM
Bolivar, TN	WQKZ	WBOL
Adamsville, TN	WPJM	WLXG
Diboll, TX	KIPR	KAFX
Del Rio, TX	KDLK	KLKE
El Paso, TX	KKMJ	KEZB
Norkolk, VA	WNOR	WKLR
Lynchburg, VA	WHRQ	WJJS
Richmond, VA	WEET	WANI
Dishman, WA	KSPO	KEYF
Grafton, WV	WKGA	WTBZ
FM Stations		
Phoenix, AZ	KONC	KAMJ
Russellville, AR	new	KMTC
Fort Smith, AR	KZZE	KZZE-FM
El Dorado, AR	KCAJ	KIXK
Carsbad, CA	KKOS-FM	KKOS
Pueblo, CO	new	KRYT
Shelton, CT	new	WRXC
Jacksonville, FL	WJAX-FM	WAPE-FM
Safety Harbor, FL	WXCR	WJQI
Deland, FL	WELE-FM	WOCL
Titusville, FL	WAJX	WSCF
Athens, GA	new	WCAG
Tifton, GA	new	WPLH
Fort Valley, GA	WHGW	WJTG
Jacksonville, IL	WYOB	WJVO
Indianapolis, IN	WNAP	WWAG
Monticello, IN	WLZR	WKJM
Bluffton, IN	WCRD	WBGT
Des Moines, IA	KMGK	KOSN
Des Moines, IA	KOSN	KKXI
Dubuque, IA	KIYX	KQKX
Wichita, KS	new	KCEV-FM
Hopkinsville, KY	WKOA-FM	WZZF-FM
Garyville, LA	WCKW	WCKW-FM
Caribou, ME	new	WCXU
Camden, ME	WESK	WMFT
Frederick, MD	WFXM	WJTM
Sault St. MArie, MI	WLXX	WYSS
Muskegon Hts, MI	WABM	WQWQ
Forsyth, MT	KXXE	KIKC-FM
Kimball, NE	KMDE	KDOT
North Platte, NE	KODY-FM	KSRZ-FM
Las Vegas, NV	KFMS	KFMS-FM
Rochester, NH	WXKZ	WCYT
Gallup, NM	KOVO	KKOR
Santa Fe, NM	new	KJIB
Buffalo, NY	WGR-FM	WRLT
Whiteville, NC	WQTR	WZFX
Caldwell, OH	new	WNQV
Toledo, OH	WKLR	WKKO
Mc Alester, OK	new	KZBX
Owasso, OK	KVLT	KVLT-FM
Salem, OR	KSKD	KXYQ
Bradford, PA	new	WBRR
Mechanicsburg, PA	WTPA-FM	WTPA
Dillon, SC	WDSC-FM	WZNS
Elizabethton, TN	WUSJ	WUSJ-FM
Diboll, TX	KIPR-FM	KAFX-FM
Lubbock, TX	KFYO-FM	KZII-FM
San Angelo, TX	KGLB	KELI
Houston, TX	KLEF	KJQI
San Antonio, TX	KXZL	KZEP
Del Rio, TX	KLKE	KDLK
El Paso, TX	KEZB	KEZB-FM
Houston, TX	KLEF	KJYY
Lynchburg, VA	WJJS-FM	WXYU
Yakima, WA	new	KYWB
Cheney, WA	KEYF	KEYF-FM
Grafton, WV	WTBZ	WTBZ-FM
Morgantown, WV	WCLG-FM	WMGG
Milwaukee, WI	WZUU-FM	WOMN
Milwaukee, WI	WZUU-FM	WBGK
Buffalo, NY	KLGN	KLGT

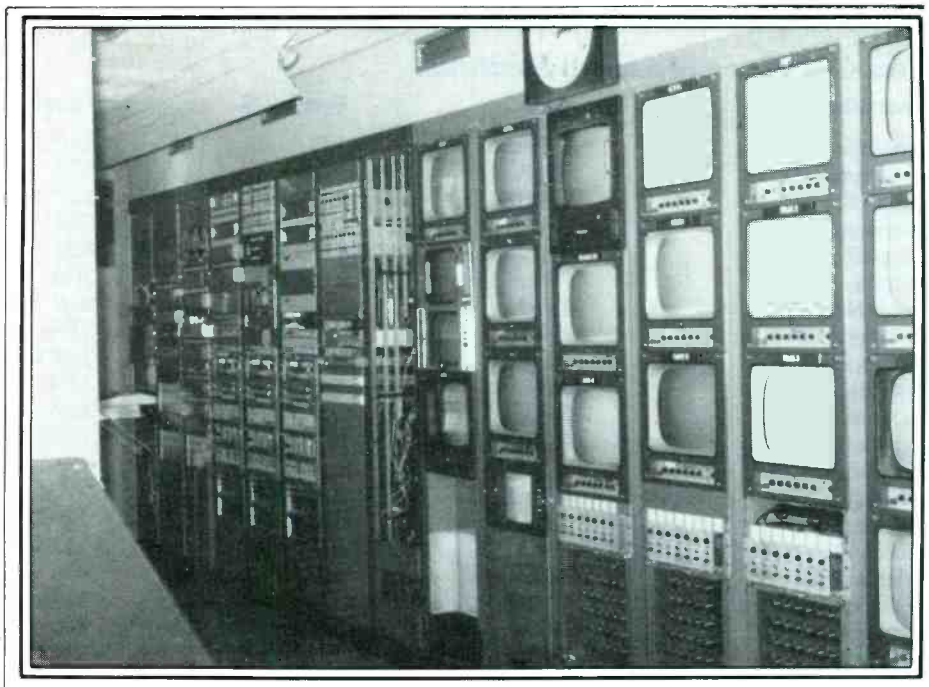
trip took me to Elkton. I was able to spend a couple of hours with thunderstorm and all listening to some of my favorite haunts. The Kahn stereo decoder does work, it just doesn't lock up on the station as quickly as it should. WQXR was in good form last night, as was WWKB (WKBW), which is C-Quam. Even through the fades and static, this new synchronous detector made AM radio pleasant to my ears as never before. WHAS was great, WCBM sounded good. I don't listen to talk radio since I get enough of that through my normal work week. I spent most of my time with KB.

I had a very interesting conversation with Christopher Kissel last week, who is another AM supporter. Hope to hear more about new AM detectors from him in the months ahead.

On the same day in April I received a letter from Australia and New Zealand. The mail brings several letters each month from "down under," but two in a day was a bit unusual. Brian Withers would like to swap tapes of different radio stations in North America for some of the ones he has of the land down under. Write to him: Brian Withers, P.O. Box 871, Hamilton, 2000, New Zealand. By the way, he prefers something other than Top 40 music!

Antennas

Antennas are always a popular topic. Jack Rubin asked a question or two about antennas and he is interested in a mono-directional antenna trimmed from soup to nuts! Well, Jack, we're working on it. Uni-directional antennas, as they are commonly called, are easily constructed for higher frequency bands (nuts area) say, from 10 MHz and up. These are generally yagi type antennas and are set up for a small frequency range of a few MegaHertz. Log periodic antennas cover a wide range of frequencies, but tend to be rather expensive if bought commercially. They are also quite large and can be built for just about any range of frequencies. The low end of the frequency spectrum (soup) generally has to rely on the famous loop antenna,



This is part of what the master control operator sees over the top of his console.

which by itself is bi-directional (two). It can be made uni-directional, but is not normally operated that way. The basic loop plans I have available for the broadcast band could be modified for uni-directional operation, which is something we will discuss in the future, Jack. If you want loop plans, they are as follows: Box loops made from RG-59, a two foot loop and a four foot loop are $5.50. Ferrite loop (shielded) with built-in preamp is $7.50. A preamp plan that can be used with any loop is $2.50. If you have an ICOM R-70 or 71 and want to increase the sensitivity of the broadcast band, the modification instructions are $2.50.

Everyone has been reading about de-regulation of radio and TV by the FCC. Ernie Baird sent me a clipping from *The Edmonton Sun* written by Dave Billington in which he describes the efforts of the new Canadian chief, Andre Bureau, to start some de-regulation of Canadian radio and TV. He wants to lift restrictions on the number of stations for starters and loosen the reign on commercial time, also. So, in addition to many new U.S. stations, there will also be many new Canadian stations. Sharpen those filters, folks! Ernie also asked if his old SX-62 could be converted to receive AM stereo. That's another one of my projects, Ernie, and although it is theoretically possible to use older radios with AM stereo decoders, a lot of them have inherent problems that the decoders cannot tolerate and produce a usable stereo output. I have an SX-62 that I am rebuilding, and I have a AM stereo decoder, that I plan to try and use with the SX-62. Stay tuned for the results. Of course it will be necessary to use an outboard stereo amplifier since it would be hard to have another amp similar to the 6V6's in the SX-62.

A letter from Jim R. Hall, editor of the IRC of America, East, asked me to mention that he is interested in hearing from any MW DX'ers who do worldwide DX'ing, especially Pan American type. Write to: James R. Hall, 240 Byron Road, Pittsburgh, PA 15237.

Richard Sachs sends an update of my old stomping ground—Brevard County, Florida.

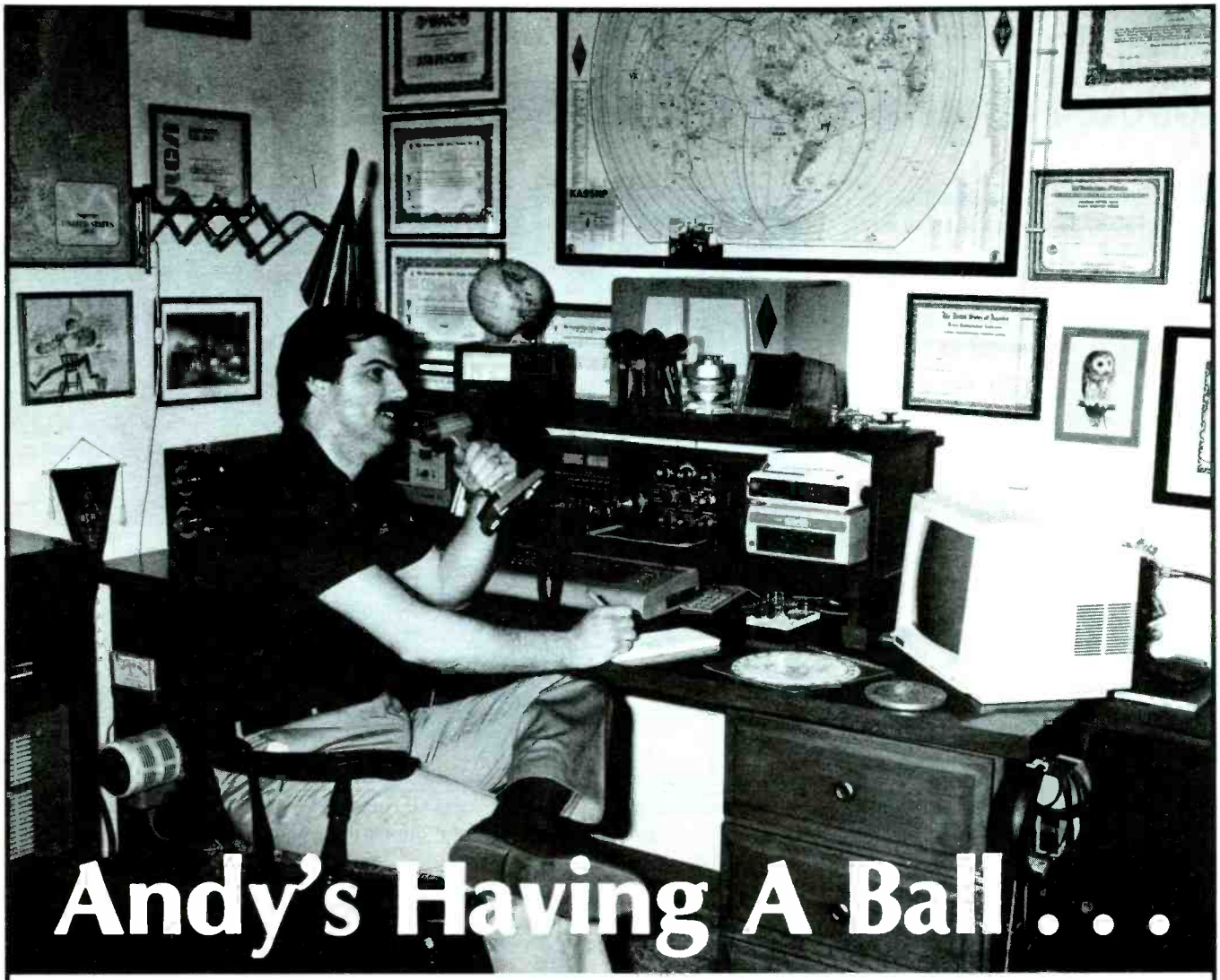
Radio in central Florida is taking on a new face as many stations try to identify with the Orlando area to cash in on the growth caused by Disney (among others). Here's what's happening, Richard: a new 1600 foot tower was built west of the St. Johns River near Cocoa by the owners of WRKT and WCKS. WCKS was originally WXBR way back when. WRKT changed their call letters to WSSP, "Whisper-104," and they now cover half the state of Florida. They are at the tippy top of the tower and rate the billing of the tallest structure in Florida. WCKS changed call letters to WSTF, "Star 101," as well as city of license to Orlando. Their coverage is essentially the same as WSSP, but seems to be a little less according to my measurements. Another station in Deland, which is just north of Orlando, has recently increased their tower height and will also be attempting to catch part of the Orlando market. WKKO, which operates on 860 kHz, took the call letters shed by WCKS to become CK-86, probably hoping to pick up on the audience ID with WCKS (FM) previously. And the owners of WWBC in Cocoa have recently been granted a new full time license on 760 kHz. A little side note, Richard: when WRKT became full time on 1300 kHz back in 1960, I moved the station from Cocoa Beach to Cocoa—built the thing from the ground up! But that's another story and not for here.

That's it for this month, so remember to mail something to me! The address is P.O. Box 5624, Baltimore, MD 21210. PC

New C-Quam AM Stereo Stations

Location	Call	Pwr D/N	Freq.
Fort Payne, AL	WFPA	1/1	1400
Fort Payne, AL	WQRX	1/0	870
Huntsville, AL	WBHP	1/1	1230
Anchorage, AK	KHAR	5/5	590
Flagstaff, AZ	KCLS	5/.5	600
Sedona, AZ	KAZM	5/.25	780
Fort Smith, AR	KFSA	1/.5	950
Monterey, CA	*KNRY	1/1	1240
Palm Springs, CA	KCMJ	1/.5	1010
Pasadena, CA	#KWKW	5/1	1300
Sacramento, CA	KGNR	5/1	1320
Denver, CO	KLSC	50/.5	1090
Hartford, CT	WDRC	5/5	1360
Wilmington, DE	WDEL	5/5	1150
Ft. Myers, FL	WDCQ	10/1	1200
Milton, FL	WEBY	5/0	1330
Orlando, FL	WMMA	50/5	990
Pensacola, FL	WBSR	1/1	1450
Albany, GA	WJAZ	5/0	960
Athens, GA	WGAU	1/1	1340
Savannah, GA	WWSA	5/5	1290
Pocatello, ID	KWIK	1/1	1240
Elmhurst, IL	WKDC	.25/0	1530
Ft. Wayne, IN	WEZR	1/1	1450
Des Moines, IA	*KSO	5/5	1460
Madisonville, KY	WFMW	.5/0	730
Leesville, LA	KLLA	1/0	1570
Pineville, LA	KKLC	.5/0	1110
W. Yarmouth, MA	WOCB	1/1	1240
Hibbing, MN	WKKQ	5/0	1060
Biloxi, MS	WVMI	1/0	570
Greenville, MS	WDDT	1/0	900
Laurel, MS	WQIS	5/0	1260
Pascagoula, MS	WJKX	.5/0	1460
Kansas City, MO	*WDAF	5/5	610
Springfield, MO	KTTS	1/1	1400
Henderson, NV	KVEG	5/5	1410
Asbury Park, NJ	WJLK	1/.25	1310
Albemarle, NC	WZKY	.25/0	1580
Asheville, NC	WWNC	5/5	570
Goldsboro, NC	WGDR	5/1	1150
Lima, OH	WCIT	.25/0	940
Oklahoma City, OK	WKY	5/5	930
Chester, PA	WQIQ	1/1	1590
Muncy, PA	WKDJ	-/-	1190
Pittsburgh, PA	KDKA	50/50	1020
Reading, PA	WEEU	1/1	850
Pawtucket, RI	WICE	1/.5	550
Columbia, SC	*WIS	5/5	560
Cowan, TN	WZYK	1/0	1440
Sparta, TN	WTZK	.25/0	860
Amarillo, TX	KQTY	1/1	1490
Brownsville, TX	KBOR	1/1	1600
Dallas, TX	KPBC	1/0	1040
Houston, TX	#KLAT	5/5	1010
Midland, TX	KCRS	5/1	550
San Angelo, TX	KQSA	1/0	1260
San Antonio, TX	*KSJL	50/0	760
Salt Lake City, UT	KUTR	1/0	860
Fond Du Lac, WI	KFIZ	1/1	1450
Milwaukee, WI	WOKY	5/1	920
Laramie, WY	KOJO	10/1	1210

* = Previous Harris operation.
# = Previous Kahn operation.



and you can too!

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

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

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

For information on becoming a Ham operator
circle number 110 on the reader service card or write to:

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

This space donated by this publication in cooperation with the American Radio Relay League.

SCANNER SCENE

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

BY CHUCK GYSI, N2DUP

Are you prepared for an emergency?

If a five-alarm fire ripped through an industrial section of your town, would you be able to tune in all the channels that might be used?

If a plane crashed into a residential development nearby, would you be able to hear all the action?

If an explosion rocked the downtown section of your community, if a major snowstorm inundated your state, or if an oil refinery blew up, would you be able to keep up with all of the activity on your scanner?

Now's the time to think about it!

We all have frequencies we listen to on a regular basis. By tuning them in every day, we are able to keep up with what's going on in a particular town or within a particular agency or business. Most radio communications are of a routine nature. But what happens when the dispatcher's voice starts cracking and all havoc breaks loose? Would you be able to keep in touch with *everything* that might be going on?

Within each town or designated region, there is usually someone in charge of preparing for emergency situations in terms of large-scale disasters. This falls under the auspices of emergency management, formerly known as emergency preparedness and Civil Defense. These people keep up to date on possible problem situations in their towns and constantly update information that would allow the town to respond to and mitigate large-scale disasters in an efficient and organized manner.

What's the point here? If you want to hear everything that might be going on during *any* type of disaster, now is the time to assess your needs *before* it happens. If you draw up lists of frequencies that would need to be monitored for various situations now, you won't waste valuable time later and miss important radio calls.

One of the first steps you'd undertake would be one of the first steps an emergency management planner would take in developing and emergency management plan for his or her town: hazard analysis. In developing a hazard analysis, make up a list of possible disasters that could occur in your town or area. If freight trains run through your downtown, a derailment could occur. If a chemical plant operates in your community, all kinds of toxic accidents could occur. Does your area have big snowstorms that keep residents homebound for several days at a time? Can tornadoes touch down? Do commercial airliners fly over your community on a regular basis? These are just a few of the various emergency situations for which you might want to prepare your monitoring post.

Some scanners, such as this Bearcat 200, offer direct access to weather channels, which would be helpful during a weather emergency.

Other emergency situations might include: avalanche, earthquakes, floods, hurricanes and tropical storms, landslides, seismic sea waves, volcanoes, wildfires, nuclear or conventional attacks (let's hope not on this one!), civil disorders such as riots, dam failure, transportation of hazardous materials (along highways, rail lines, pipelines, rivers and port areas), incidents at nuclear reactors, extended power failure, subsidence (depressions, cracks, and sinkholes), etc.

Once you identify the various emergencies that could occur in your town, then identify what agencies or businesses might be involved with such a disaster. For instance, if a tanker truck loaded with gasoline overturned on your main street, you would want to monitor the local police and fire departments as they dealt with operations on the scene. Other frequencies that might come alive during such a situation would be the rescue squad; auxiliary police and fire police services that might be assisting; specialized wrecker crews that might be righting the overturned truck and its trailer with air bags; local, county, and state health and environmental agencies that might be monitoring the gasoline's possible spillage into a nearby stream; cleanup crews that might be contracted by the tanker's owners to sop up the spilled gasoline; the tanker driver's company frequency, if one is used; the news media; and emergency management units, of course. You might even think of other possible frequencies for your own town, depending on local situations.

In a larger-scale emergency, dozens of radio channels might spring into active status. If a plane crashed into a neighborhood, not only would emergency services such as police, fire, and rescue be pressed into service, operations such as the American National Red Cross, Amateur Radio operators, emergency management teams, municipal departments, federal agencies such as air crash investigators and coroner's office units, would be on the air. In addition, airline company officials, news media, power utilities, insurance company adjusters and wreckers might be using two-way radios. Draw up a list of frequencies indicating which channels known agencies and businesses would use in various types of emergencies. Also, jot down where to search for other frequencies that might be used, though you don't know what they are at present.

Other things you might want to consider in your emergency listening planning is how you will be monitoring radio traffic. If you lose commercial electric power in your home during a widespread emergency, base station scanners are worthless. Pocket scanners operating on nicd batteries would be needed if power was lost. Always make

sure your pocket scanner is fully charged in case such an emergency should occur. It even pays to have a spare nicd battery sitting in the charger at all times, too. Another alternative would be to use generators or to operate your radios in your car while mobile (state laws allowing, of course).

If you plan to monitor in the field, either with hand-helds or mobile units, make sure your source of fuel would be adequate: Do you have a full tank of gasoline in your car or do you have fuel available for generators you might use? You might also want to consider portable antenna towers if you are going to monitor at a stationary place in the field. Portable towers are easy to make and can be as makeshift as you want them to be. A couple of 2-by-4s with bolts holding them together and a piece of plumbing pipe at the top will adequately hold a base station monitoring antenna 8 to 24 feet in the air if righted against your vehicle. A long length of PVC pipe would also do the job in a pinch. Once, I even used a camera tripod with the antenna attached to the top of it and set it all on the roof of my car. Your mobile antenna would probably prove adequate, especially if you listened from a hilltop.

Scanner Bust

I received a very interesting letter from Todd Scheidler, who works for the circulation sales department of the *Las Vegas* (Nevada) *Review-Journal*, and has a tale of horror about how he had some unwelcome visitors because of his monitoring hobby. I'll just let him tell his story:

"I work for a local newspaper and often try to help out some friends who are reporters with news tips and frequency information. Well, that's what I did Feb. 19 with someone who works for the same newspaper I work at. The city editor said they would pass on the information to the person covering Vice President George Bush's visit to Las Vegas.

"I was home sick on Feb. 20, the day Bush visited Las Vegas. In the early part of the afternoon, someone knocked on my door. When I opened it, I found two Metro SWAT officers with guns drawn asking me who I was. They threw me against the wall and searched me and my house. They looked through all my notes, books and magazines relating to scanners. They then called ID and took photos of all my magazines, notes, scanner and cassette player. They also took away all notes, lists and papers regarding the visit, Secret Service, White House or any person the Secret Service would protect.

"While they were here, they asked me to explain how the scanner worked, what types of calls I heard and all kinds of questions on descrambling (I have no descrambling equipment) of police and other frequencies. They also had me play a tape that was in my recorder for them. It had some federal agency radio traffic on it.

"When they left, they only took notes, lists and some papers and frequency registries. They left all my equipment and tapes alone. They did leave one more thing, though: two plainsclothes officers to keep an eye on my house until the Vice President left town.

"One special note: The SWAT officers became very polite when I called a reporter friend at a TV station in town and he verified to them who I was an that I was listening to the scanner for them. My newspaper, a TV station and a National Public Radio station all did a story on this incident, but no one would give me back my stuff. Boy, are scanners fun!"

A government spokesman would not confirm or deny the reported investigation, saying that his agency does not comment on investigations involving the protection of public officials, according to the *Las Vegas Review-Journal*.

Like I said, this is a scary situation that sounds as if it was initiated by some clunkheads who know nothing about radio. Just be aware that it DOES happen!

Write To Us

We'd like to hear from you. We hope you don't have stories as scary as Todd Scheidler's, but we welcome your comments, questions and frequency lists, in addition to photos of your listening post, mobile installation or two-way radio units. Write to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. PC

EMERGENCY
COMMUNICATIONS FOR SURVIVAL

BY GORDON WEST, WB6NOA

Pinpointing Positions

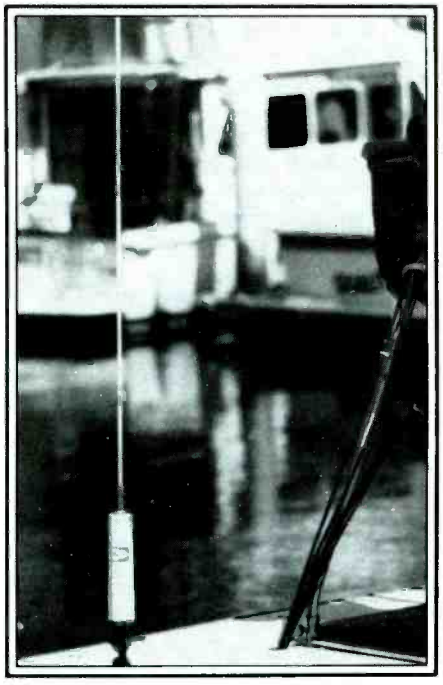
You can cash in on inexpensive Loran receiving equipment during the navigation revolution going on right now. Imagine picking up an inexpensive Loran-C receiver that could lead you back in the wilderness to a previously stored waypoint within 25 feet of the actual position recorded earlier! This equipment is now available, but first let's take a brief look at where we are going with a national navigational plan.

Loran stands for long-range aid to navigation. It was designed primarily to provide very accurate navigation to mariners on the east coast, west coast, Great Lakes, Canada, and Alaska. There is excellent Loran coverage in the Mediterranean, North Atlantic, Hawaii, and in the ocean areas of Japan. There is also excellent Loran coverage for almost all of the United States except for a narrow corridor in the midwest. This means that hikers, backpackers, and skiers could use Loran for navigation, too. The same thing is true for airline pilots; many commercial and private pilots rely on Loran as an excellent source of navigation.

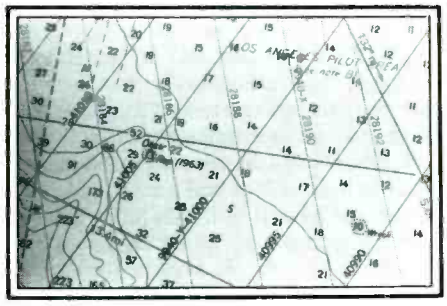
A Loran receiver times the difference in arriving signals between known Loran transmitters. The receiver measures the time difference (TD) between signals sent from a master station and secondary slave station. This time difference is measured in microseconds—millionths of a second.

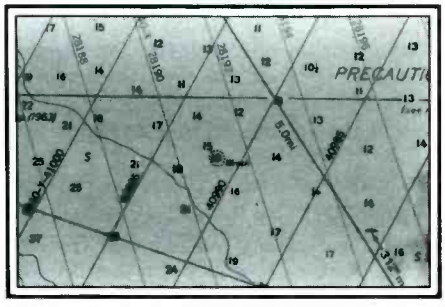
Since radio waves travel near the speed of light, a microsecond of time difference is very meaningful to a Loran readout. The time difference between the master signal and the signal from secondary station X gives one line of position. The time difference between the signals from a master station and secondary station Y gives us one more line of position. The crossing point of the two lines of position is the resultant position fix. Additional secondary stations that provide additional lines of position can further increase the reliability and accuracy of the fix.

Position fixing on land and sea through the use of Loran is called "hyperbolic navigation" because the plotted lines representing given time differences between a master and one of its secondary stations are hyperbolic rather than straight. Based on the fairly constant velocity of Loran signals over water and certain land masses, Loran time differences have been printed on marine charts. For land use, where most of you will use this equipment for emergency communication measures, the Loran will also compute the latitude and longitude of your exact position so that you might transfer it onto local topographical or local automobile-type maps that list local latitude and longitude coordinates.



Loran antennas are small in size.





These charts indicate the Loran lines of position.

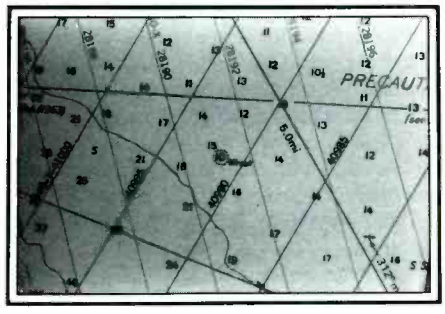


Chart lines may not always be accurate.

For emergency communicators taking part in wilderness search and rescue efforts, Loran is an important tool because of its accuracy in repeatability. Most modern Loran sets offer 99 memory positions to store electronic waypoints. For instance, you would store your base camp location as waypoint #1. As you hiked along a fire break with your communications equipment, you would store additional waypoints in the additional memory channels as you reach forks in the road. Along the way, if you found evidence of the person or object you were searching for, you could store this precise position in an additional waypoint.

Now it's nighttime and you need to retrack your steps back home. Simply follow the instructions of the Loran set to back-track to each waypoint. The Loran will even give you the bearing to the next waypoint, as well as its distance in nautical miles. As long as you have a compass and watch the Loran equipment, it will faithfully lead you back to your base camp.

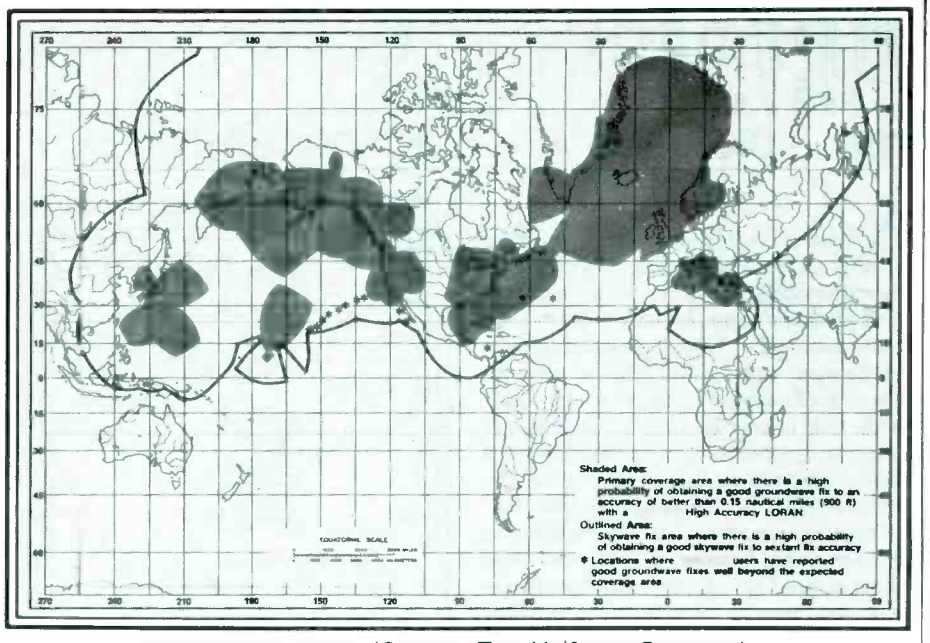
Mariners use this in setting their fishing lines or lobster traps. Without any signposts out on the ocean or lakes, Loran becomes an invaluable tool to retrace their course back to each and every location where they put down a line or trap. Mariners have been using Loran for years with great accuracy.

The accuracy of Loran is affected by foliage, local weather conditions, mountain ranges, and other terrestrial masses that influence radio signals transmitted via ground waves at 100 kHz. If you are outside of local ground wave coverage, such as in the central United States, you could also use your Loran set with less accuracy, but good accuracy, with skywaves that are slightly less accurate than ground waves.

Good ground wave position finding using latitude and longitude is within one-half mile of your actual location. If a marine chart with Loran TD's printed on it extends into your particular area of concern, you might find position accuracy better than one-quarter mile. However, repeatability of waypoints is the beauty of Loran, many times repeatability is within *25 feet* of each and every waypoint you store, providing you don't try to come back one-half year later when the trees have all lost their leaves. (Leaves slow down incoming Loran signals, so a change of sea-

The SI-TEX/KODEN Model 787 Loran C receiver can come in handy.

Raytheon's RAYNAV-550 Loran C Navigator.



Loran converage chart. (Courtesy Tremble/Loran Company)

sons may mean a shift in waypoints by up to 100 feet in a constant direction.)

Most of today's modern receivers feature liquid crystal displays and ultra low current drain receivers that could easily be powered off of eight flashlight batteries for up to three days of constant use. Some Loran sets even have rechargeable batteries built-in for several days of no-charge operation.

The Loran antenna is half as short as a CB stainless steel whip, and it screws into a 6-inch tube that contains the preamplifier. Small coax cables interconnect the antenna assembly with the Loran set. This makes the entire package portable, and ideal for field communications use.

The Loran receiver may also give you features such as audible beeping when you have arrived at a certain waypoint. It will also give you an audible alarm if you should stray more than a few hundred feet off the track to the next waypoint. Again, this extra good waypoint accuracy and all these features depend on a good healthy Loran signal, which is easily attained except for a gap down in the central United States.

The price of Loran-C receivers has been dropping for the last five years because of overproduction of Loran receivers by foreign makers. Loran-C equipment first priced out about $1,500—then $1,000, then $800, and you can now find multi-memory/waypoint Loran receivers for as low as $400.

You can also expect Loran prices to continue to creep lower and lower, thanks to the Defense Department that has unveiled a new navigational plan that takes effect in about ten years. Slowly replacing the Loran system will be the new Global Positioning System (GPS). When this system is completed, it will give us 3-D navigation with pinpoint accuracy within 25 feet of an unknown position. Repeatability will be down to several yards. It will give you your altitude, too. All of this information will be beamed down on microwave frequencies by orbiting satellites. If this system seems farfetched, would you believe that it's presently operational in 2-D with fixes as close as 50 feet? That's true; some of the satellites are already up there and the $20,000 equipment is doing a fine job for those who have opted to invest in it now.

We also have the Transit Satellite System that mariners use for very accurate position finding throughout the world, but the Transit System gives precise position fixes only every one and one-half hours depending on your location. It's also quite expensive—roughly $2,000.

This is why Loran equipment makes for a good investment if you live in an area of good Loran coverage. The Loran system will be maintained all the way through the year 2000, even though more sophisticated satellite systems are now being phased in.

Want a catalogue of various types of Loran equipment offered to mariners at a substantial discount? Write for my free fact book on "marine navigational systems," plus a catalogue of discounted Loran equipment from Skipper Marine Electronics, 3170 Commercial Avenue, Northbrook, Illinois 60062; ATT: Larry Sklar. You can also see live Loran equipment turned on and operating at a local marine electronics dealership.

You may also want to write for the free *Loran-C Users Handbook* from the U.S. Coast Guard, (E-WAN-2), Washington, DC 20590.

Good navigating with Loran, whether you're on the sea, or backpacking with your radio equipment out in the wilderness. PC

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

BY EDWARD TEACH

Another 30 days have been X'ed off the calendar, 30 days in which activity on the pirate scene again seemed to be less evident.

It is probably natural to charge off this apparent lessened activity to operator fears of Big Brother and his crackdown on unlicensed radio broadcasting. A major factor within *that* is probably the FCC press releases citing cities in which pirate activity is under investigation. But there may be other, less obvious elements involved here, too.

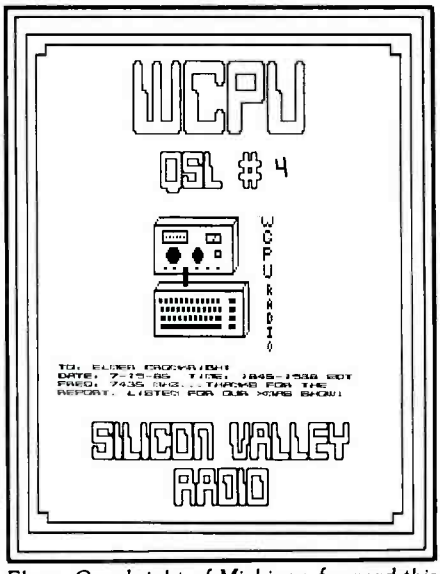
The poorer reception conditions over the past few years (thanks to a sunspot level sliding toward its 11 year minimum) may have less people tuning the shortwave bands and thus fewer pirate loggings being reported. Pirate broadcasters may, in addition, be reacting to FCC citation thumping not so much by ceasing activity altogether but by restricting their broadcasts, simply transmitting less often or for briefer periods than they did before, thus reducing chances of being heard—by us or the FCC. Finally, the general atmosphere created by FCC pronouncements and crackdowns may be generating an attitude that "there's no activity anyway, so why bother tuning for them." If activity is indeed down, then the real answer is probably a combination of all of the above.

The answer to more pirate loggings then becomes a matter of the listener doing more patrolling of the pirate bands. Don't assume there's nothing on just because that seems the "in" thing to believe these days. Patrol the prime pirate bands, especially 7.300 to 7.500, on a regular basis. If you have the time, I'd recommend making a survey of these frequencies every half hour during late afternoons and evenings, especially on the weekends.

I hope you'll advise me about what you are hearing because that's the kind of information that will help other readers increase their pirate loggings. If you operate a pirate station, or have in the past, I'd like to hear from you with information about your station—with a station photo or sample QSL, too. So, whether you're a monitor or an operator, let's have your pirate news so this column can better tell the pirate broadcasting story.

Across The Dial

Laser 558 Kal Hunsaker in Arizona passes along an advertisement he spotted in the British magazine *Melody Maker*. The ad advises of an Admiralty Court Sale of the Laser's ship, *The Communicator*. Among the items listed were two 25 kW transmitters, two fully equipped production studios, a "TV room," and assorted other equipment. The deadline for bids was April 8, so we can assume that *The Communicator* has a new owner now.

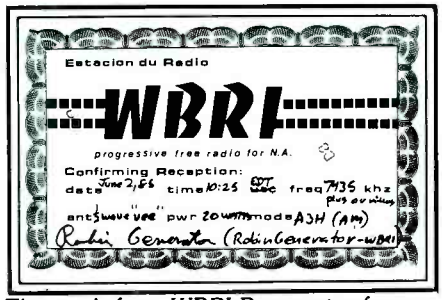


Elmer Cronkright of Michigan forward this QSL from WCPU-Silicon Valley Radio.

WHOT was heard in late March by Larry Vogt in New York. The station was on 1,629 kHz from 0620 to 0730 and featured lots of oldies. Phone calls were invited to (718) 946-9748. Larry says the station told him they were using 50 watts and would QSL to anyone who called them.

WLRK was the first pirate log for Hank Rogers in Pennsylvania. The station was noted twice in mid-December on 99.7 FM and was also calling itself "K-100" and "the Wyoming Valley's only hot hits radio station." Hank hasn't been able to make a third log on this one, so perhaps they've closed.

Pig Boy Radio Logged on March 15 on 7.439 by Lance A. Peterson in New York state, the broadcast was heard on single sideband and monitored from 0204 to 0251, with poor audio. The address for reports was given as P.O. Box 982, Battle Creek, MI 49016. The station is presented by "Pig Boy Enterprises" and personalities include The Messenger and The Soldier (who is the engineer). Features included "Health Tips on Sex," "Sex Over Forty," and "Marxism For The Beginner." The interval signal at sign off was "Old MacDonald Had A Farm." Lance says he wishes more pirates would state their frequency and operational mode on the air.



This one's from WBRI-Progressive free radio for North America. (Elmer Cronkright)

Radio Nova International A QSL and data sheet on this station was sent in by Mace Twiggs in Minnesota (she also sent a lot of other goodies which will appear in future columns). Radio Nova International slogans itself as "shortwave music radio" and says its purpose is "to give shortwave listeners around the world a bit of good music, some free radio chat and a lot of fun." Broadcasts have emphasized rock classics and reggae. RNI's first broadcast was on December 9, 1984 over Great Britain's Radio Apollo. The staff includes Monty Python, Sgt. Pepper (who operates a sister station, Capital Radio One), and Dr. Banzai "the samurai disc jockey." As of last summer, RNI was planning to relay broadcasts from Radio Apollo, Free Radio Service Holland, and Canzoni Radio. Anyone know if RNI is active?

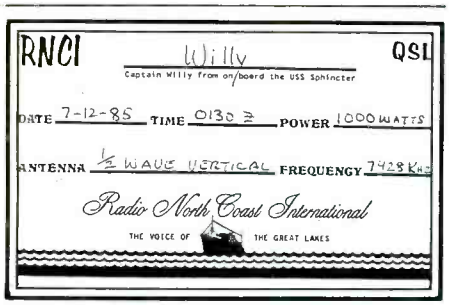
KROK was heard by Mace Twiggs on 11 January on 7.436 from 2239 to 2310 playing oldies and testing two different antennas. Reports should go to P.O. Box 245, Moorehead, MN 56560.

Radio Deadman heard January 19 from 2110 to 2141 on 7.426 with poor strength, playing music, comedy, and fake commercials. (Twiggs, MN).

KNBS was logged by Twiggs on 19 and 20 January around 0000 on 7.436 with rock music and fake public service announcements. ID as "Cannibis 41, KNBS the station of the California Marajuana Cooperative."

CJRR ID'ing as Jolly Roger Radio and giving an address of P.O. Box 2602, New Westminster, BC V3L 5L2, Canada, was monitored by Charles McKee, who lives in New Westminster. The station took a music request from someone in Galveston, Texas, so it was obviously getting out quite well. Music consisted of oldies from the 60's and 70's, as well as comedy songs. Heard from 0740 to 0901 sign off on 7.420. This was Chuck's first pirate (he's only been DX'ing a few months).

KHO advises that they were expecting to be back on the air in late March or early April, after what they term as "long FCC harassment." Broadcasts are planned on 40 or 80 meters using 500 watts and a mobile set-up. The most likely time to tune for this one is 2200 on Saturdays. Reception reports are welcome and will be answered. The address is KHO Pirate Radio, P.O. Box 15326, Philadelphia, PA.



Radio North Star International was heard by many pirate hunters last year. (QSL courtesy of Elmer Cronkright)

WMTV was heard on 2 March from 0522 to 0630 sign off on 7.423. Address given between each record was P.O. Box 1945, Del Ray Beach, FL 33444. Gary L. Townsend of Indiana logged this one.

One reporter asks if it's more likely you'll hear a pirate closer to your own location than a more distant one. The answer is yes. But that doesn't mean you can't hear pirates at a considerable distance from the transmitter. It is common to log pirates from half a continent away and some lucky DX'ers have even managed to add a few European pirates to their logs. Radio Dublin International on 6.910 is often heard in much of North America, given the right conditions.

Don't forget to let me have your loggings and any other pirate-related information you run across. Keep up your pirate pursuits and I'll be back with more next month. PC

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Advertising Rates: SCAN members and *POP'COMM* subscribers are entitled to one FREE 30-word, non-commercial classified ad per year. Enclose subscription name label with ad copy. For those people not in the previously mentioned groups, non-commercial ads are 30 cents per word, including abbreviations and addresses; minimum charge $6.00 per issue. Ads from firms offering commercial products or services are $1.00 per word; minimum charge $20.00 per issue. Leading key words set in all caps at no additional charge. All ads must be prepaid in full at time of insertion; a 5% discount is offered for prepaid 6 time insertions. All ads must be typewritten double spaced.
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The All OHIO SCANNER CLUB will have it's second annual summer meeting and picnic on Sunday, August 17, 1986 in Columbus, Ohio. All SCAN area members are invited to attend. If interested, please send a SASE to: Dave Marshall, 50 Villa Rd., Springfield, OH 45503-1036 for further details.

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FOR SALE: Radio Shack DX-302 shortwave receiver, good condition, 6 yrs. old, asking $175; Radio Shack DX-360 portable shortwave receiver, excellent condition, 1 yr. old, asking $50; JIL Sx-200 scanner, very good condition, 3 yrs. old, asking $135; MFJ Enterprises Active Antenna Model MFJ 1020, 6 yrs. old, asking $40. All equipment in original boxes with manuals. Robert C. Bishop, 2783 Shelburne Ln., Beavercreek, OH 45430, (513) 429-5144.

ARMY RADIOS: CPRC-26 Infantry Manpack Radio, compact, transmits-receives 46-54 MHz FM, with battery box, antenna, crystal: $17.50 apiece, $32.50/pair. PRC-510 Backpack Radio (Canadian version of PRC-10), transmits-receives 38-55 MHz FM continuous tuning, with battery box, antenna: $34.50 apiece, $67.50/pair. Add $4.50/unit shipping. 45 day replacement guarantee. Baytronics, Dept. PC, Box 591, Sandusky, OH 44870.

COMPLETE ANTENNA DIMENSION TABLES for shortwave broadcast stations. Band-by-band and multi-band dimensions for longwires, dipoles, verticals, slopers and a simple beam, standard and metric. Simple drawings so you can't go wrong. U.S. and Canada $2 and SASE. Foreign, U.S. $3.50 for surface mail. SLOPER ANTENNAS for shortwave broadcast reception. New designs and excellent performance. Complete dimensions for single band and multi-band types. Simple drawings so you can't go wrong. U.S. and Canada $2 SASE. Foreign, U.S. $3.50 for surface mail. LANDMOBILE AND MARINE RADIO TECHNICAL HANDBOOK. The 1985 classic book of two-way radio fundamentals and practice. Study for certification or knowledge with this 575 page mammoth at $24.95 plus $2 p.h. Foreign, U.S. $29 by surface mail. If you like, send SASE long for outline. All publications from Ed Noll, P.O. Box 75, Chalfont, PA 18914.

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Bearcat 220, $125.00; Grove Scanverter UHF Aero, $40.00; MFJ-1224 RTTY-CW Interface. C-64 & Vic-20 software & cables, $65.00. Jon VanAllen, WB7OWL, 2872 W. 7140 So., West Jordan, UT 84084.

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