MONITORING TIMES

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A PERSONAL EYE IN SPACE

By Robert W. Popham

(Reprinted with permission from Weatherwise magazine, April 1984)

As children playing in the woods behind our house, we were told that we would never get lost if we knew that moss always grew on the north side of trees. In today's high tech world, all that's needed to orient oneself is to spot one of those dish shaped antennas that seem to be springing up in front yards, beside schools, and on top of office buildings—they all point in a southerly direction.

***DIRECT SATELLITE READOUTS** can be used educationally, commercially, or just for fun.*

But not all of them are used to receive home movies or educational programs. Some, like Dale Hauck's, are aimed at one of three geostationary weather satellites launched by the United States and placed over the equator 35,000 km out in space. An opthamologist in Pasadena, California, Dale has several hobbies, including copying WEFAX (Weather Facsimile) broadcasts from GOES-West which, together with GOES-East and GOES-Central, provide weather observations extending from as far west as Midway Island and New Caledonia in the Pacific to as far east as the western tip of Africa. Dale uses satellite images contained in these broadcasts to brief members of his 150-member flying club on weather conditions for weekend or vacation flying activities. And John Prigg, before his death in 1981, used to relay weather information received on his homemade satellite receiving equipment in Phoenix, Arizona via voice radio to merchant vessels and pleasure craft operating in the waters off the California coast.

While some weather satellite antennas are dish-shaped, others, like Aubrey Burton's in Richmond, Virginia, look like a pole with aluminum clothesline wire wrapped around it in large circles. He tracks polar satellites. Pictures of the March 1970 solar eclipse obtained on his homemade system, were published in the *Richmond Times Dispatch*.

In basements and back yards, office buildings and schools, on tropical Pacific islands, in the Antarctic and on the Greenland icecap, in more than 120 countries of the world, individuals, corporations, academic institutions, and civil and military agencies are copying data from weather satellites through an activity known as the satellite direct readout program. Well, not really a "program," which carries with it the connotation of a well-organized, funded effort with a support staff and all that. Perhaps a better term would be an "evolution." From a simple, but ingenious, effort to provide a few U.S. Weather Bureau stations with realtime weather satellite imagery in the early 1960s, satellite direct readout efforts have evolved into an activity in which more than 120 countries participate, at an estimated international investment of over $200 million in ground-receiving hardware and software.

Yet at the same time, high school students are winning college scholarships designing simple ground receiving stations, and home computers are being used to record and store pictures, color them, and even animate them to show the movement of weather systems across the country. Private and commercial pilots, farmers, fishermen, amateur weather observers, ham radio operators, TV stations, planetariums and museums, academic institutions, doctors, policemen, house painters, monks, Boy Scout explorer posts, power companies, petroleum companies—these are just a

***A HELICAL ANTENNA** for polar satellite Automatic Picture Transmission (APT) signal reception. Most are mounted on the ground; this one is on a tower.*

***THE REALITY**—Television broadcasts bring the latest satellite views of the world's weather to everyone's living room. This GOES East view of the world shows the weather patterns on August 29, 1980. Two hurricanes whirl in the Atlantic, while a third swirls across the Pacific. (NOAA Photo.)*

few of the individuals and organizations that are utilizing satellite direct readout services for fun or profit, education, or to reduce operating expenses, and in some cases, to save lives and property!

Direct Readout Sensors and Services

No less than 11 weather satellites are within constant range of, or pass over, various locations in the United States. Most are also within range of other countries in North, Central, and South America. The five geostationary satellites currently in operation include the U.S.-launched GOES-West, GOES-East, and GOES-Central, the European Space Agency's METEOSAT II, and Japan's Geostationary Meteorological Satellite (GMS), or Himawari (Sunflower). The United States also has two polar satellites in space—NOAA-7 and NOAA-8—while the Soviet Union has at least four Meteor weather satellites in orbit.

All of these satellites send stored information to a central command and data processing facility somewhere on earth. In addition, each has one or more systems on board to transmit data to local user terminals via direct readout. There are several different types of satellite direct readout systems or services, but in discussing direct readout services, we are only concerned with five, the acronyms or abbreviations for which are APT, HRPT, DSB, VISSR, and

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Grove To Speak At Dayton

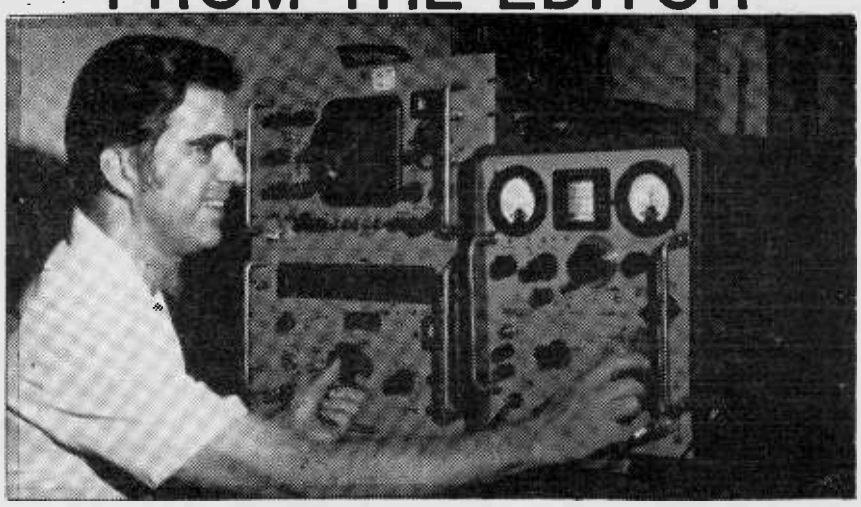
Bob Grove, editor of Monitoring Times and president of Grove Enterprises, has been invited once again to lead a seminar on listening at the Dayton Hamvention, the world's largest amateur radio "hamfest."

The annual event is expected to draw over 20,000 communications enthusiasts to Dayton, Ohio's Hara Arena during the April 27-28 weekend.

Hundreds of exhibitors and acres of electronic flea market space combine to produce a truly awesome spectacle for the radio enthusiast.

Come see us at booth #261 and #262.

FROM THE EDITOR



WANT TO DESIGN A PRODUCT?

From time to time we receive suggestions for new products. These are certainly welcome and we give them serious consideration. But there's more to offering a new item for sale than merely coming up with a good idea.

I keep an active--and very large--file on new prospects. My enthusiasm waxes and wanes with the phases of the moon, but I routinely review the list and cull out the not-so-good ideas, while paying closer attention to the more promising prospects.

This month I would like to share with intrepid experimenters and adventurous entrepreneurs a list of product suggestions which may find niches in the communications marketplace. I have to admit that I have reserved a few additional products for Grove Enterprises!

PLUG-IN ANTENNA FILTERS

Scanner listeners constantly complain of aircraft, amateur, FM/TV broadcast, National Weather Service, and mobile telephone interference. Small in-line filters plugged into the scanner antenna jack could trap out these unwanted signals.

LIGHTNING PROTECTOR:

While expensive gas-discharge arrestors are available for shortwave communications equipment, there is a strong market for similar low-cost devices for scanner monitors with outside antennas. Perhaps it could be combined with a line transient suppressor as well in one small box.

VHF/UHF CONVERTER FOR SHORTWAVE RECEIVERS:

With most general coverage receivers now being manufactured with FM and squelch functions, an add-on VHF/UHF frequency extension unit would be welcome. At this writing only Kenwood has such a unit, but it is dedicated to the R-2000.

UHF AERO BAND RECEIVER:

A simple, tuneable 225-400 MHz AM receiver, kit or wired, would find a niche among the utilities who don't have continuous coverage fields.

SCANNER TONE DECODER:

Those who depend upon scanners to alert them to specific calls would welcome a tone decoder/squelch add-on that would permit audio to be heard only when the proper selective call was received.

MICROWAVE DOWNCONTER:

There is considerable activity in the land microwave services and satellite services at 2-4 GHz; scanner and shortwave utility buffs would like to hear it.

NOISE BLANKER:

An add-on antenna gate or audio gate triggered by noise impulses would be welcomed by mobile radio users as well as electrical-interference-plagued home listeners.

VIDEODATA MONITOR:

And how about a video display for automatic readout of RTTY, Morse, facsimile, slow and fast scan TVI and ASCII mobile data?

TVI FILTER BALUN:

For amateurs and other transmitting services in the shortwave spectrum, why not introduce a balun transformer with built-in 30 MHz low pass filter?

2-30 MHz MINIRIG:

Hams, government agencies, survivalists and others concerned with eminently portable communications should look favorably on a tiny "spy" type SSB/CW transceiver, 2-30 MHz, 1-10 watts, universal power supply, built-in mike and key, earphone/speaker, reel-out antenna.

ELT FALSE-ALARM:

Impact-activated emergency locator transmitters aboard aircraft are constantly being activated accidentally, resulting in long hours of frustrating search and rescue attempts, only to find an unoccupied Cessna sitting safely in a hangar. A simple 121.5/243 MHz detector with flashing light and audible beeper mounted on the unit or aircraft instrument panel would certainly help.

LOW COST TEST EQUIPMENT:

Whatever became of inexpensive oscilloscopes, RF and AF signal generators, dip meters and other useful gadgets? Is there room for a reintroduction?

POCKET METAL DETECTORS:

While beachcombers and treasure hunters endure gadgets the size of vacuum cleaners to find metallic flotsam, a truly pocketable metal locator would find a place in glove compartments (and pockets) of vacationers.

REMOTE MONITOR:

Wouldn't it be nice to be able to walk around the house or yard while still monitoring the radio? How about a simple wireless rebroadcaster that could plug into the external jack, relaying its intercepted transmissions to a pocket receiver?

If these are such good ideas, then why doesn't Grove do it? The research and development, product design, production, and marketing aspects of introducing a new product are extraordinarily expensive. One product alone which we are presently developing would cost us nearly a million dollars to properly introduce! Hard to believe--and terrifying--but true.

There is certainly room for the basement bomber, the weekend experimenter that has a good idea and wants to market it, but he is likely to be swallowed up by big-time advertisers with competitive products.

It would be insane for an American manufacturer to attempt to compete with ICOM, Yaesu, Kenwood, and similar off-shore manufacturers for their part of the market. We have witnessed the demise of Hammarlund, National, Hallicrafters, Johnson, Drake, Gonset, RME, Morrow, Knight, K-W Electronics, Collins amateur division, Harvey Wells, Globe, Clegg, and dozens of other quality brand names which used to pervade the amateur marketplace.

Nonetheless, there is still room for budding entrepreneurs with a combination of good product sense and good business sense.

REMEMBER! "S.A.S.E."

We at Monitoring Times constantly receive letters from readers which begin, "Please send me everything you have on..."

As much as we would like to help, we are not a public library service. Letters received with a Self-Addressed Stamped Envelope will be answered.

And as always, my telephone line is open for prepaid calls weekdays 1-5 pm Eastern (704-837-2216)..Bob

Viewpoint

In reply to a recent question in "Technical Topics" (February, 1985), you stated that the original Bearcat BC-210 cannot be programed to receive out of band signals.

I have an original BC-210 and I have been using it to receive out of band signals for years. The secret is to either add or subtract 21.6 MHz to the frequency you want to receive and program in that frequency. Of course this is only practical if the new frequency is in the operational bands of the BC-210. The sensitivity is reduced, but it does work.

Tom Blocker
Minot, ND

(We thank Tom for reminding readers about this "image reception" trick. To use it on your scanner, check the owner's manual to see what the intermediate frequency--I.F.--is. Double that number. Regency, Radio Shack, and FOX scanners typically use 10.7 MHz (doubled to 21.4), while Bearcats are generally 10.8 or 10.85 MHz (doubled to 21.6 or 21.7).

Depending upon the scanner's mixer scheme, you either add that 21 MHz figure or subtract it from the displayed frequency to receive the other frequency. This is why you may hear aircraft on the 155 MHz police band even though the signals are being transmitted 21 MHz lower in frequency...Ed.)

About that item in the January MT, "SCA Reception Made Easy," sounds like a good idea. One problem though: My ICOM R71A tunes down only to 98.5 kHz. This, of course, makes it impossible to use this receiver for listening on the 67 kHz subcarrier of FM broadcasts.

David Alpert
New York, NY

(Reader Alpert is right; this ICOM R71A won't tune low enough. But the NRD515, DX1000, and some modified general coverage transceivers will...Ed.)

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My mother language is Spanish, for that reason, I'm very careful when I read new technical words, colloquial words or just plain slang, in English written newspapers and magazines.

I do not pretend to criticize your writing style, but I'm really amused with the meaning of the word INTERCEPT as defined in MT. According to Webster's, "intercept" means: "1. To take or seize by the way, or before arrival at destination; to interrupt the course of; as, to intercept a letter. 2. To prevent; hinder. 3. To cut off communications with, a view of, etc." Thus I cannot understand what Mr. Schimmel means with, "I have selected several of this month's intercepts for some additional comments because the transmissions were quite unusual."

I'm confused, have you invented a device able to "intercept" electromagnetic waves? If so, you must go into the TEMPEST business, it is very profitable.

I have also seen the same word in old MT advertising and in some letters from your readers. This is very bad for young people reading MT. Orwell said, "Never use a long, unfamiliar word where a short familiar word will do." Gunning says, "Write to express not to impress." Strunk and White say, "Avoid fancy words." After all, those gentlemen know English much better than me. Isn't it?

Luis Suarez
Venezuela

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Recent additions to my library:

Codes, Ciphers and Computers: An Introduction to Information Security. By Bruce Bosworth. Hayden Book Company, Inc., 1982, 259 pp. $18.95. Cryptographic and cryptanalytic techniques, codes and ciphers, and how to use them for security against computer hackers et al. Also tells how to use a computer in BASIC provided for that application. Useful to readers of Havana Moon's column.

A Special Guide to Cruises Worldwide. PP 19-38 of the Sunday, February 10, 1985 Travel Section of the New York Times. Extensive diectory of ocean liners in the first two parts. Covers sailings from Feb. 11 to Nov. 30. Part two to be published October 20. Lists cruise ships worldwide, their owners, passenger capacity, weight, sailing dates, ports of call, fares and on-board attractions. Excellent reference for utes who monitor the high seas.

Robert Margolis
Skokie, IL

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George Greenwood

Monitoring Times is sad to report the death of George A. Greenwood, founder and president of the Radio Communications Society of the World. It was Mr. Greenwood's hope to provide a feeling of unity among influential members of the communications fraternity which contains names like Barry Goldwater (K7UGA).

It is our hope that others may follow Mr. Greenwood's example and encourage cooperation and friendship through radio.

Bob Grove,
Life member, RCSW

A Response To "Those BCB Harmonics"

In our February issue author Dave Beauvais presented an article containing a list of AM broadcast stations around the country he has recently monitored on frequencies other than those on which they are assigned. Beauvais went on to comment that one station had refused to acknowledge his requests for information.

We received a telephone call from J.B. Nelson, Program Director of WVFC (McConnellsburg, PA), at which time he said, "We are happy to acknowledge requests for information as we have done for many people over the past ten years. We have no record of writer Beauvais' statement that the station 'has refused to acknowledge repeated letters requesting more information'."

We would like to thank Mr. Nelson for his personal interest and have forwarded his comments to the writer along with the station's proper mailing address in case that was the weak link in this communications channel.

EYE IN SPACE cont'd

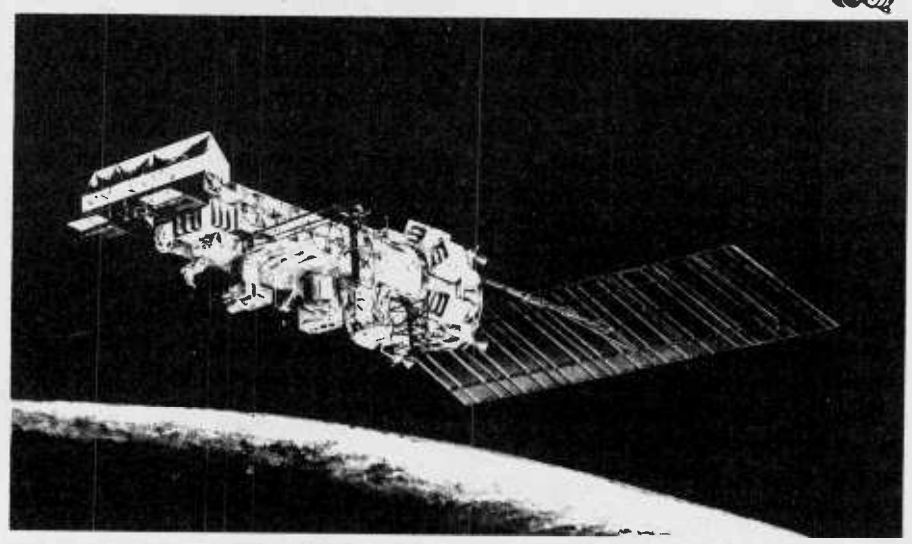
WEFAX. (Sometimes it's harder to remember all the acronyms and what they stand for than to build a ground station!)

The APT, or *Automatic Picture Transmission*, services are provided by polar orbiting weather satellites operated by both the United States and the Soviet Union. First tested on TIROS-8 in 1963, it is the oldest and still the most commonly used service today. On United States satellites, the APT service consists of a VHF signal containing low resolution visible and infrared images, transmitted continuously as the satellite orbits the earth. Records kept by NOAA's National Environmental Satellite, Data, and Information Service (NESDIS), the Commerce Department agency responsible for maintaining and operating the civil environmental remote sensing satellite program, indicate that there are at least 1000 APT stations in operation around the world, and probably many more.

With weather data from so many of its own satellites, NOAA does not receive or use APT data sent by the Soviet Meteor satellites, but there are many people that like to copy the images because the Soviets use slightly different spectral response channels. Dr. Grant Zehr of Bloomington, Illinois has been receiving and documenting data about the orbits, frequencies, and APT products sent from the Meteors, and provides this information upon request.

Technological breakthroughs in the late 1960s and early 70s led to development of a very high resolution radiometer, and in 1972, the *High Resolution Picture Transmission* (HRPT) service was introduced aboard NOAA-2. With this new system, the user could view detailed studies of cloud structure, ice in polar regions, ocean temperatures and snowpack accumulation in mountainous regions of the world.

Today, a multi-channel, continuous scanning Advanced Very High Resolution Radiometer provides HRPT data to about 80 direct readout stations. Most of them have been bought and are used by civil or military agencies, but some have been built by academic institutions. In 1975, the University of Dundee in Scotland constructed the first HRPT built by an academic institution, following their successful APT project. And the United Kingdom may well lay title to having the first "amateur"-built HRPT station. Mike Christieson, a radio ham in England, constructed one "just to see if I could do it."



ADVANCED TIROS-N POLAR-ORBITING ENVIRONMENTAL SATELLITE. NOAA-7 and NOAA-8 are the current operational satellites in this series. (RCA photo.)

EYE IN SPACE cont'd

The third NOAA satellite direct readout service is the *Direct Sounder Broadcast* (DSB) service, used to obtain vertical atmospheric temperatures and humidity profiles—a sort of reverse radiosonde. This system is less useful to many weather students. A great deal of computer knowledge is needed to process DSB data. There are only six stations in the world actually receiving and processing these data in real time to generate soundings. However, with increasing computer thru-put capabilities, higher memory capacities, and decreasing costs, it appears that atmospheric sounder data processing, for those who need it, will become quite affordable.

Polar satellites circle the earth approximately 14 times every 24 hours, coming within range of any given station twice during daylight, and twice at night. For this reason, there is a time gap between observations. Geostationary satellites, on the other hand, appear "fixed" in space relative to any given station (their orbital period is equal to the earth's rotation). These satellites operate on a fixed broadcast schedule. *A Visible-Infrared Spin Scan Radiometer* (VISSR) instrument, developed and tested on a NASA research satellite in 1974, is used on the GOES satellites to transmit high resolution visible and infrared digital data to earth 20 minutes out of each half hour. A WEFAX (*Weather Facsimile*) signal is sent in the remaining ten minutes. Then the cycle is repeated.

Most of the satellite images seen on network television weather programs are obtained from the GOES VISSR instruments; the color and annotation are added by the networks themselves. VISSR data received at NOAA's central data processing facilities near Washington, D.C. are used to create products such as the freeze-frost charts, sea surface temperature maps, and snow cover, sea, and lake ice charts used by special interest groups. In addition, these data are reformatted for transmission via landline to National Weather Service field service stations for weather analysis and forecasting purposes, and also processed for relay through GOES as part of the WEFAX service.

WEFAX Images

The WEFAX broadcast capability was first developed in 1966 aboard another NASA research satellite, and consisted of eight satellite images transmitted on VHF so as to be compatible with the APT ground receiving equipment. Today these transmissions are sent on S-band frequencies. There are nearly 100 individual products sent each day: (1) full earth disc infrared and visible images, obtained from the VISSR instruments every six hours, and sent as "sectors," or quadrants which, when pasted together, show the entire area of the earth viewed by the VISSR. This area extends from 55° north to 55° south of the equator, and about the same distance east and west of the satellite sub-point; (2) polar satellite mosaics of both the Northern and Southern Hemispheres; (3) National Weather Service charts, mostly 24-hour upper air prognoses, (4) plain language operational messages, and (5) orbital prediction data for polar satellites.

The European Space Agency's METEOSAT II and Japan's GMS also provide WEFAX services. As far as the U.S. is concerned, only Hawaii can receive GMS broadcasts, but METEOSAT broadcasts reach several states along the Atlantic seaboard. In France, GOES VISSR images are received and retransmitted via METEOSAT, as part of the WEFAX service offered through that satellite.

In Morristown, New Jersey, Lou Follett recently designed a low-cost, small antenna system to receive two channels of WEFAX data from this spacecraft. Imagine sitting at home looking at weather over Europe, Africa, and the Middle East in pictures less than three hours old. Obviously Lou also can receive WEFAX broadcasts from the U.S. GOES. In Holland, Luuke Lenting, another radio amateur, does the reverse—he copies WEFAX images of the U.S. and Canada, but he gets these photographs from METEOSAT.

HURRICANE—In Pass Christian, Mississippi, radio amateur Richard Oden received the APT photograph of dissipating Hurricane Frederic in August 1979. The storm clouds extend from the Gulf of Mexico to the lower Great Lakes (top of picture).

A WEFAX PICTURE from the European Space Agency's METEOSAT II, copied in Holland by Luuck Lenting (PA3AOA). The same pictures can be received in the eastern U.S. In WEFAX broadcasts from U.S. GOES spacecraft, an earth view is sent in four parts, or quadrants.

Sources of Information About Direct Satellite Readout

"Meteorological Satellites and the Amateur," Brown, J. O. G.: *Weather*, Vol. 7, No. 12, Royal Meteorological Society, December 1982

"Teachers Guide for Building and Operating Weather Satellite Ground Stations" Summers, J. and T. Gotwald, Chambersburg Area Senior High School; 1981; Educational Programs Branch, Office of Public Affairs, NASA Goddard Space Flight Center, Greenbelt, MD 20771

"The New Weather Satellite Handbook," Taggart, Dr. Ralph E.; 73 Publications, 80 Pine Street, Peterborough, NH 03458

"The Satellite Experimentor's Handbook," American Radio Relay League, 1984, Newington, CT 06111

"Worldview," (newsletter); Alvarez, R.; 2512 Arch Street, Tampa, FL 33607

"For the Amateur—Using the Home Computer as a Facsimile Receiver," Ryan, J.; *Weatherwise*, Vol. 36, December 1983

"An S-band Receiving System for Weather Satellites," Guido, E. and M. Righini, *QST*, August 1980

"Printing Pictures from 'Your' Weather Geostationary Satellite," Guido, E. and M. Righini, *QST*, April 1981

"Another Kind of Satellite . . .GOES *Satellite Digest*, Box 100858, Fort Lauderdale, FL 33310

TIROS-N Series Direct Readout Users Guide, March 1982, NOAA, U.S. Department of Commerce, National Earth Satellite Service

"The American Weather Observer" (newsletter); Steinke, S.; Association of American Weather Observers, Box 455, Belvidere, Illinois 61008

For further information about direct satellite readout, write to

Robert Popham, E/ER2
Satellite Progams Specialist
NOAA/NESDIS
Washington, D.C. 20233

Mr. Popham will also be glad to forward any questions and correspondence to observers mentioned in this article.

Using Satellite Direct Readout

What you can see or do with the (polar satellite) APT, HRPT, or (geostationary satellite) WEFAX and VISSR images depends on your purpose for looking at them, your interests, your training, and your experience.

No matter which satellite system produces a product, the first step is to orient it, to find out where it was taken, what area it covers. Obviously some knowledge of geography is necessary. In satellite images of North America, some easily recognized landmarks include the Great Lakes, Hudson's Bay, and the Rocky Mountains. Upon closer inspection, the Great Salt Lake and surrounding desert, the Mississippi Delta, and Long Island can be identified. Even in low resolution APT images, man-made features can be detected, even though they may be below the theoretical resolution of the system. In eastern Canada, for example, portions of the Canadian National Railroad can be identified in winter—the tracks have been cleared on either side for several hundred feet to help prevent fires, and when it snows, this area stands out in sharp contrast to the surrounding forests.

On islands far from the mainland, or aboard ship, or when large cloud masses obscure the land, another orientation technique has to be used—gridding. The infrared images sent via the GOES WEFAX and VISSR systems have five-degree latitude longitude lines superimposed. Polar satellite APT and HRPT data are not gridded, but techniques for creating a clear plastic overlay grid have been developed. At some stations, the grids are electronically implanted on the image as it is received.

Once the location of the pictures has been established, the next step is to examine them for content. Since the primary purpose of these satellites is to provide meteorological data, let's start there. Photographs of hurricanes are perhaps the most fascinating and awesome, conjuring up, as they do, visions of huge waves, and palm trees bent almost to the ground. To photograph such storms on sophisticated electronics equipment, using large dish-shaped 65-foot antennas, is a routine part of NESDIS operations; no major storm on

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earth has gone unobserved or undetected for more than a few hours since 1966, thanks to weather satellite observations. But imagine the excitement of a single individual capturing the majestic fury of such storms on film or screen inside his home from a satellite 850 km in space while that very storm is raging outside his door! A radio ham, Richard Oden, had such an experience when he acquired the APT image of the hurricane as it passed near his home in Pass Christian, Mississippi.

Satellite photographs reveal much more about the weather than just hurricanes. Cold fronts, warm fronts, low and high pressure centers, and squall lines, and in some instances, even the location of the jet stream can be easily identified by the type of clouds present in these photographs. (See the August 1981 issue of *Weatherwise* for a more detailed discussion of interpretation of satellite photographs.)

Individual Users

There are many individual applications of satellite direct readout transmissions, specifically in agriculture. The owner of a crop-dusting operation in Oil Trough, Arkansas uses WEFAX observations to complement local weather forecasts in planning flight activities. Locust control and weather modification experiments in Africa; designed to improve crop yield and reduce insect damage, rely heavily on satellite direct readout observations, as does the harvesting of sugar cane in Brazil, copra on the island of Tonga, and rafting of logs down river to the sea in French Guiana. In New York state, a landscaper uses satellite pictures to improve manpower utilization outdoors.

On the lighter side, amateur meteorologist Earl Bradley used APT and WEFAX images to provide back-up weather forecasting support for the Soaring Society of America's World Soaring Championships in Texas last July and August. And in Bakersfield, California, and in Ireland, where other soaring competitions are held, satellite direct readout by amateurs is being used for the same purpose.

Using Computers

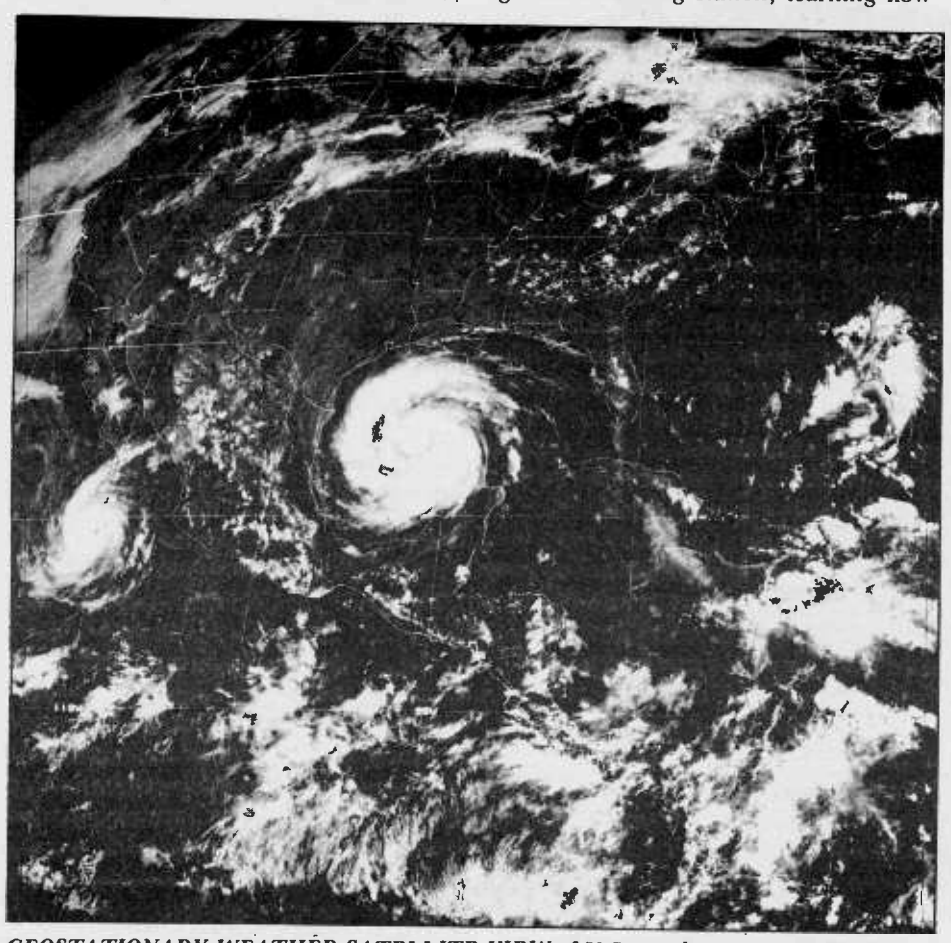
Years ago, computers and hand-held or desk-top calculators were used simply to determine azimuth and elevation angles for an antenna to track a polar orbiting satellite as it passed within range of a receiving station. Eventually, computers were used to drive the antennas automatically, Aubrey Burton, of Richmond, Virginia was undoubtedly among the first people to do it. Aubrey said he got tired of running out in the rain and cold weather to steer his antenna to track polar orbiting weather satellites across the sky, so he cleaned out his backyard tool shed, moved his satellite receiving station and small photo lab out there, and designed, built, and programmed his own computer system for automatically tracking these satellites. That was in 1970. Today, many individuals, schools, and businesses have designed complete unattended stations that are pre-programmed to track satellites, if necessary (geostationary satellites don't need to be tracked), and to turn on the receiving, display, or recording equipment at the appropriate moment.

Displaying satellite images on home computer screens is a relatively new technique developed by a few amateurs. We have already noted that Luuke Lenting in Holland reproduces METEOSAT pictures on his color computer and photographs the image. Joe Ryan, in his article "For the Amateur—Using the Home Computer as a Facsimile Receiver" (*Weatherwise*, Vol. 36, December 1983), described his uses of a TRS-80 color computer and facsimile interface to display polar orbiting satellite photographs received via direct readout, and GOES images and weather maps sent via radio-facsimile. He reproduces them, if desired, using a dot-matrix printer.

But even after designing their own ground receiving station, learning how to track polar orbiting spacecraft or copy geostationary satellite pictures, and displaying the readout on some type of computer, some station operators attempt to go even further. Some amateurs are attempting to acquire and store six-hourly WEFAX images on their home computers to produce time-lapse, color images of the weather as it moves across the continents and oceans.

And the APT images are also being used in a wide variety of ways. For example, students at a high school in Chambersburg, Pennsylvania, under the guidance of their science teacher, Joe Summers, are copying APT images and overlaying them with a .5 deg square grid map. For each picture acquired on a given day, a value is assigned to each grid block indicating the amount of cloudiness, if present. These values are entered into an Apple IIe computer. They can be averaged over a period of up to 30 days to show the presence or persistence of clouds in any one grid area, or correlated with rainfall, solar radiation, or other meteorological parameters. Students are not only learning and applying their knowledge of meteorology, but also electronics, computer programming, physics, and mathematics, among other studies.

At the North Mankato Vocational-Technical Institute in Mankato, Wisconsin, where students built their first APT station using the wringer motor from a Maytag washing machine to control the tracking antenna, Associate Professor Loren Johnson teaches electronics, including mini-processor and micro-computer equipment operations and programming. Like Grant Zehr, who volunteered to help NESDIS help others by collecting and distributing information about the Soviet Meteor satellites, Loren also has volunteered his services to help compile information on equipment and programs used to predict satellite orbits, control receiving equipment, and process satellite images. His current data base indicates that a wide variety of personal computers are being used in weather satellite related activities.



GEOSTATIONARY WEATHER SATELLITE VIEW of U.S. weather on August 8, 1980. Hurricane Allen completely covers the western Gulf of Mexico, while Hurricane Isis whirls off the west coast of Mexico. (NOAA photo)

Building a Direct Readout Station

As for building a satellite readout station, there is no such thing as "it can't be done" any more. Mr. J. O. G. Brown, in an article titled "Meteorological Satellites and the Amateur" (*Weather*, Vol. 7, No. 12, Royal Meteorological Society, December 1982) said it quite succinctly: "So far as the amateur is concerned, it is not always appreciated that pictures from many of these satellites can be obtained with quite basic equipment, and by careful shopping, at modest cost. Indeed the author has no formal qualifications in either electronics or meteorology, and has access to nothing more than the usual family budget. Yet with perseverance and some ingenuity, worthwhile results can readily be obtained. Salvaged computer boards and an abandoned yacht mast are essential parts of the author's machine!"

Articles describing the construction of APT stations have appeared in numerous popular magazines in several countries since 1965. In the late 60s, articles on WEFAX ground equipment construction also began to appear. But the acquisition of HRPT and VISSR data requires rather sophisticated hardware and software, and very little detailed information on the construction of such receiving stations is currently available.

Separate from the popular magazines are the often-referenced publications, "Teachers Guide for Building and Operating Weather Satellite Ground Stations" by J. Summers and T. Gotwald, and Professor Ralph Taggart's "The New Weather Satellite Handbook." Most recently, the American Radio Relay League in Newington, Connecticut, has published their first edition of "The Satellite Experimentor's Handbook" which covers a variety of topics related to both weather, TV, and other types of satellite reception.

Both amateurs and professional alike may be interested in learning about two new amateur newsletters. "Worldview," started by Raul Alvarez in Tampa, Florida, in December 1983, is primarily concerned with amateur construction and operation of low cost satellite receiving equipment. Steven Steinke publishes "The American Weather Observer," aimed at stimulating an exchange of information among amateur meteorologists, including information about weather satellites.

Information exchange is really the first step in learning how to acquire satellite direct readout transmissions, and how to interpret them. Dale Hauck, Aubrey Burton, Mike Christieson, others mentioned in this article, and many more like them discovered quite by accident that satellite ground receiving stations could be built by anyone with the time, interest, and a little technological know-how. Many amateur and professional meteorologists have not been aware that satellite data are so readily accessible.

Until you have actually held a satellite picture in your hands, it is difficult to believe how much information it contains, or to appreciate the excitement and satisfaction of someone who has built their own station and figuratively reached out in space to view the earth in its entirety.

The potential is almost unlimited and there are many who are willing to help newcomers in the field. Satellites can indeed provide a "personal eye in space."

WEATHER SATELLITE CONFERENCE
April 15-19 (See March MT)
For further information and registration fees contact: Robert W. Popham, NOAA Co-chairman, ISDBSUC, NOAA/NESDIS, Washington, DC 20233 (301)763-7289.

TELEVISION DX

by Patrick O'Connor

It's a warm Saturday afternoon, and you've pulled a nice, cold brew from the refrigerator. Your plan is to settle down in front of the television and watch a baseball game. But when you turn on the set, the ball game isn't there--there's a bunch of lines running through the picture, different voices come and go and when the picture IS clear, it isn't the ball game.

If you're a baseball fan, you switch off the set in disgust and go tune in the game on a radio. But if you're a DX'er, you recognize the symptoms and settle down for some good TV DX!

Reception of television is normally 'line-of-sight'; that is, a straight line between transmitter and receiving antenna with a maximum range of around 100 miles. Certain conditions, however, can greatly increase the distance of reception. Let's take a look at the 'how' and 'why' of television DX.

Television occupies three separate bands of frequencies: VHF (Very High Frequency) - low (channels 2-6) 55-88 MHz; VHF-high (channels 7-13) 175-216 MHz; and UHF (Ultra High Frequency) (channels 14-83) 471-890 MHz. These separate bands can be affected by several types of propagational disturbances.

SPORADIC-E SKIP (Es): The "E" layer in the ionosphere, about 68 miles above the surface of the Earth, is normally transparent to high-frequency signals. On occasion, patches of this layer become ionized, causing television signals to reflect off this layer and back to the surface. This normally affects channels 2-6, and is quite rare above channel 7. This mode can result in very clear reception, although signals can drop out suddenly if the maximum usable frequency (MUF) of the ionized patch changes.

Sometimes these patches remain almost stationary, providing near-continuous reception from one area; other times they scoot right along, bringing in signals from one station after another. Normal range for this phenomenon is between 500 and 1500 miles. It occurs in the spring and early summer, and increases and decreases with the sunspot count.

TROPOSPHERIC DUCTING ("Tropo"): Unlike Es, Tropo is directly related to the weather. It is most frequently caused when a frontal system of markedly different temperature passes you; the signals may be 'ducted' along the front. Mostly, it affects UHF signals rather than VHF. Also unlike Es, tropo is terrain-affected; where Es bounces over mountainous terrain, tropo is blocked by them.

Since tropo can best be considered an extension of ground wave, any signal normally blocked by terrain won't be brought in via tropo. Tropo is high-quality DX; signals of local quality may be watched for hours with little trouble.

F2 SKIP: Similar to Es is F2 skip; higher in the ionosphere, it reflects signals farther. The maximum range is about 2200 miles, which can make transoceanic reception possible. There is a catch; however, most foreign television transmitters incompatible with American receivers.

If you don't have a foreign television set, your best bet is an audio receiver. Even with the proper video signal from F2 reception is usually 'smeary', making video identification almost impossible.

METEOR SCATTER (MS): When a meteor blazes through the sky, it leaves in its wake a trail of ionized particles. Don't expect to watch an entire program; reception via MS lasts for just a few seconds! This method is a good way to catch test patterns from distant stations in the early morning.

AURORAL PROPAGATION: The aurora borealis, caused by an influx of solar-generated charged particles into the upper atmosphere, can reflect television signals. To receive these reflected signals, your antenna should be pointed at the aurora, not the transmitting station. Video reception is usually weak and fluttery, but the audio is usually understandable.

OTHER METHODS: There are several ways that television signals may be propagated, but they are quite unusual. For instance, signals may bounce off a passing aircraft, be reflected by the ionized trail of a bolt of lightning, or even bounce off the moon (least likely!).

To successfully DX television signals, you will need a good black-and-white set. Color sets should be avoided, as the sensitivity is normally better on a good monochrome set. Also, with the exception of tropo, DX signals rarely have complete color signals along with the other information.

Next, you will need a good outside antenna. While it is possible to receive strong DX signals with indoor 'rabbit ears', an outside antenna will help pick up weaker signals. A parabolic 'dish' is best for UHF DX; a Yagi-type will suffice for VHF. A rotor is essential to help you 'zero in' on the signal. Separate antennas for UHF/VHF are preferred; the combined types simply don't have the gain to help 'sniff out' the weaker signals.

WHEN DO YOU LOOK FOR TV DX? That depends on the type of propagation involved. Es, F2 and auroral are sunspot dependent. F2 will disappear with the sunspots; Es is scarcer with the lower sunspot count but will still occur. Auroral DX also depends on a higher sunspot count; but any time you can see an aurora, give auroral DX a try. Auroral propagation is mainly a nighttime phenomenon; F2 and Es are daytime. On some occasions Es can occur around the clock.

Tropo can be predicted by keeping up with weather reports; when a frontal system is in the vicinity, there's a chance for tropo reception.

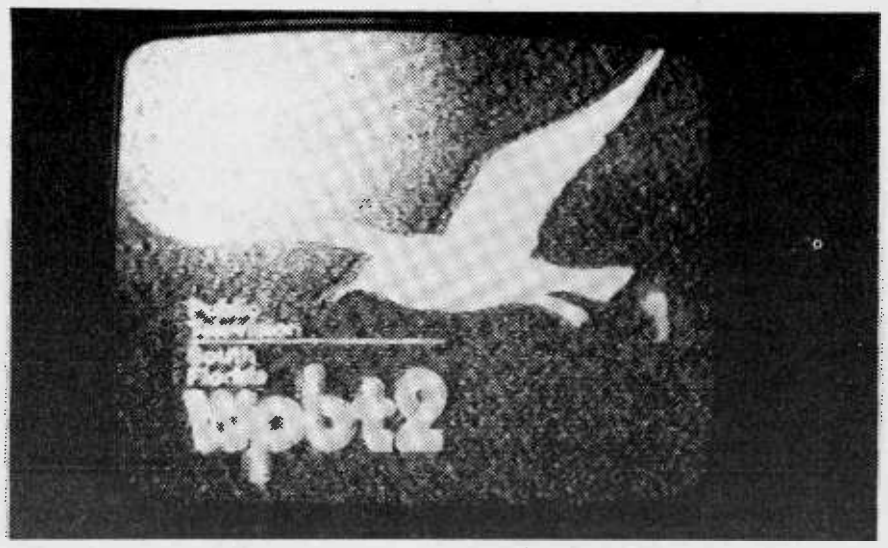
MS is the most predictable. Check an almanac for the times of meteor showers. Among the best in terms of numbers are the Quadrantid (Jan. 3-5); Perseid (Aug. 10-14); and Gemenid (Dec. 12-14). Since most showers occur after midnight, that is the best time to DX for test patterns.

After watching some DX, you might wonder if TV stations will QSL reports. Most stations will verify correct reports; some, in fact, have their own QSL cards! The usual form of verification, however, is a letter. Of course, there are some stations that won't verify at all.

What constitutes a good report? First, be sure to report in the station's time if it's in a different zone from yours. Include a title of the show seen if known. Be sure to get the time & content of LOCAL advertisers in particular; these are excellent report material. Include the station's identification and a description of the ID method used.

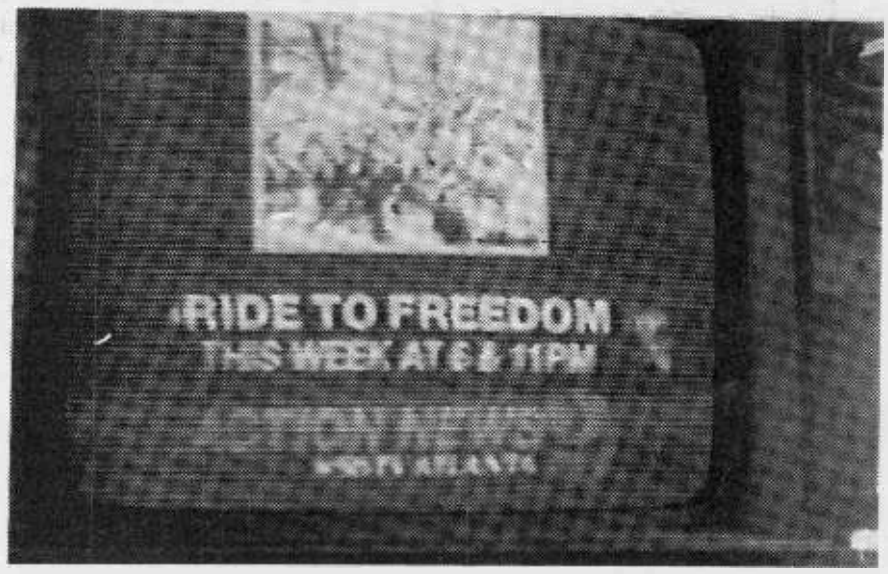
The main idea is to get as much detail as possible How well was the signal received? Were there any interfering stations? On occasion, you may have the peculiar situation of audio from one station and video from another. Don't be afraid to report both--receiving, identifying & verifying two separate stations at the same time is a fine accomplishment in ANY DX speciality! Finally, be courteous with your request for verification, and include return postage (in IRC's if foreign)!!

Addresses of stations are relatively easy to come by; most local libraries have telephone directories for larger cities. Broadcasting Yearbook also has addresses, as do various city directories. As a last resort, you can call the station and politely request the mailing address. Most will respond positively.



WPBT-TV, channel 2, Miami, FL, PBS. Identification slide.

WSB-TV, channel 2, Atlanta, GA, CBS, ID/news promo slide.



DOCUMENTING YOUR CATCH

Even if you don't collect QSL cards, you can keep a permanent record of your DX. If you have a VCR, you can keep a tape of your DX receptions. If you don't have such equipment, you can still keep a permanent record by photographing your DX.

To properly photograph a television screen, you will need a camera with variable shutter speed, and fairly high-speed film (ASA 400 is good). Try to get the television screen to fill up the camera's field without losing focus. Adjust the shutter speed for a speed of about 1/25th of a second; a speed faster than 1/30th of a second will result in a partial frame as it takes that amount of time to write a full image on the screen.

Don't use a flash; it will wipe out the image you want to photograph. Your best bet is to get pictures of ID slides or stationary images such as newspeople sitting at a desk. The pictures accompanying this article were taken with a shutter speed of 1/25th of a second using an old 'range-finder' type 35mm camera with ASA 400 black and white film.

TV DX is fun--give it a try--you might be surprised at what you see!

All photos show sporadic-E skip (Es) reception in southwest New Hampshire during July, 1981.

AVIATION RADIO IN LABRADOR – CIRCA 1947

PART II

(The conclusion of author Huneault's nostalgic recollections as a radio operator in the Canadian bush.)

by Bert Huneault

SANTA CLAUS OVER ASHUANIPI

On Christmas eve, one of our operators with a good sense of humor decided to indulge in a little Christmas spirit. Although we had no reason to communicate with Montreal (over 600 miles away) in our normal work, this chap (Bernie) decided to call Montreal and send a position report to Air Traffic Control (ATC) on that special occasion. His 11:15 p.m. call went something like this:

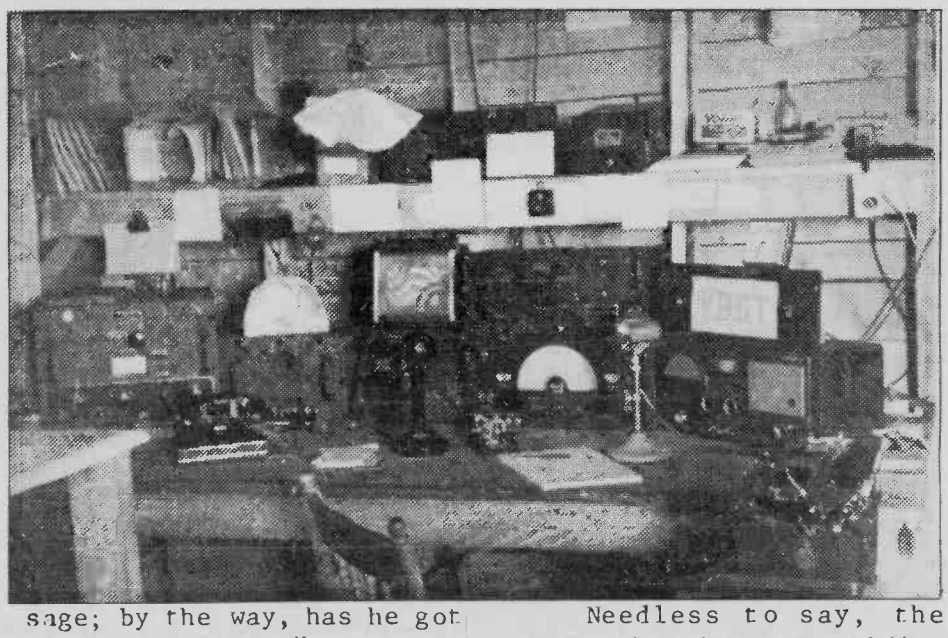
- "Montreal from Ashuanipi. Over."

- "Ashuanipi from Montreal, go ahead."

- "Montreal from Ashuanipi, please advise ATC that Santa Claus is over Ashuanipi at 2315, cruising at 5000 feet, on top of the overcast, and estimating Montreal on the hour. Over."

Not hesitating a single moment, and without a hint of a smile in his voice, the Montreal operator replied:

- "Ashuanipi from Montreal, Roger on your message; by the way, has he got his bag with him?"



Radio shack at Knob Lake Airport, before the construction of a new control tower. On the far left is a LF receiver; receiver with the large half-moon dial is a Marconi general coverage receiver. At the right is a Hallicrafters S-40 shortwave receiver.

Needless to say, the whole circuit went wild!... There were whistles, laughs, and catcalls on the air from just about every station in the circuit, from Knob Lake all the way down to Montreal! It was one of those light-hearted moments that helped us to preserve our sanity up there in the Canadian bush.

DIRECT CONNECTION WITH THE DEVIL?

One afternoon, while I was on duty at Knob Lake Airport, I had switched on our powerful low-frequency radiobeacon at the request of one of our pilots who was homing-in during bad weather. Whenever that big brute of a transmitter was on, the whole radio shack was filled with RF energy. Everything in the place was "hot"... We'd even draw RF sparks off the metal tuning knobs and toggle switches of our receivers whenever we touched them! Those were temporary conditions we had to live with while a permanent transmitter building was under construction near the end of the runway.

While I was seated at the operator's desk, facing away from the door, I became aware that someone had entered the building and closed the door. Not hearing any conversation, I turned around to discovered that it was a middle-aged Indian who was by now sitting on a chair beside the door. He had simply come in out of the blue and just there, staring at me and the radio equipment.

A number of these Montagnais Indians used to hunt and trap mink, beaver, and other fur bearing animals in the region, so his presence wasn't that unusual; but I didn't know what he wanted in the radio shack.

I said "Hi!" to him,

but got no reaction. I tried a few more words in English, but got nowhere. So I switched to French, but with the same negative results. He didn't even smile -- he just sat there with his arms folded and stared at me.

I then tried the few Indian words and expressions I knew; mind you, my knowledge of the Montagnais dialect was hardly fluent, but I thought I'd at least get some kind of response. But I figure wrong... I still wasn't getting through to him.

I considered this a personal challenge and I remember saying to myself, "I'm going to get a reaction out of him if it's the last thing I do!" Electronics came to my rescue.

Sitting on the operator's desk was a large neon bulb of the same shape and size as a regular 60-watt light bulb. Remembering that the room was full of RF, I took the bulb in my hand, walked over to the Indian who was still sitting by the door, held the bulb right in front of his face, and said: "Look!...Regardez!."

I then walked over to the wall near the transmitter; there, a hand saw was hanging on a nail and I knew the blade would be "hot" with RF. I simply touched the base of the neon bulb to the blade of the saw,---the bulb glowed with a bright orange color! I looked at our friend.

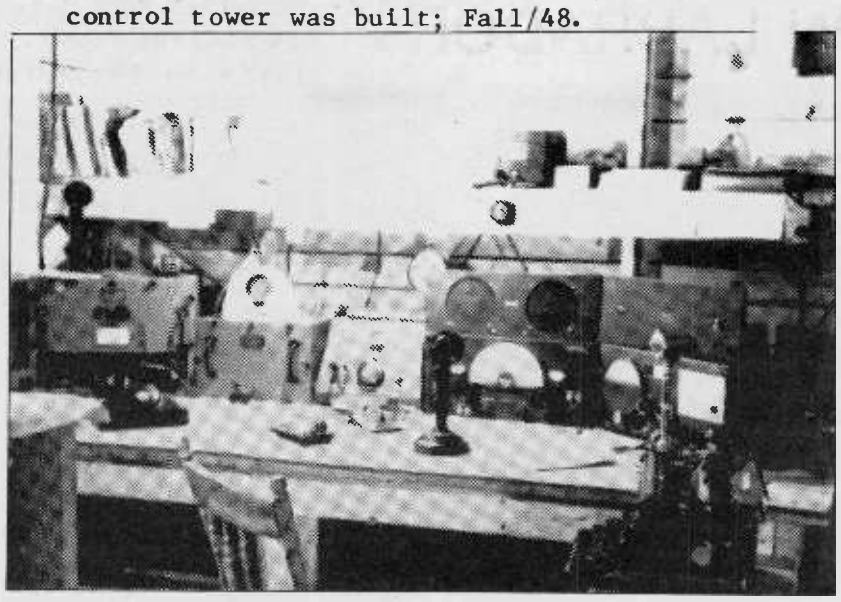
Success at last! The guy was grinning from ear to ear; he then got up and walked out the door without saying a word. I never saw him again. I wondered if that poor fellow though I had a direct connection with the devil himself!

CHERRY RED VACUUM TUBE PLATES

Subsequently, the transmitter building was safely located about 2500 feet away from the radio operator's station in a new control tower. The transmitters were remotely controlled by telephone line. The operator I was about to replace drove me to the new transmitter site to show me around.

When we walked into the building I saw a huge new transmitter and immediately spotted three large vacuum tubes whose plates were glowing a bright cherry red! Instinctively, I rushed to the transmitter and pushed the red button labelled "OFF." The operator shouted at me, "What the heck do you think you're doing? This is our radio beacon, and we've got an aircraft coming in!"

Radio shack at Knob Lake Airport, before the control tower was built; Fall/48.



He switched the powerful transmitter back on, and calmly expained that it was normal for those type-833A tubes to glow red like that. A fan blowing cold air on these three parallel-connected power amplifier tubes prevented them from melting. That was my introduction to kilowatts of RF power!

NORTHERN LIGHTS GALORE

During 1947-49, a new peak in solar activity was recorded. Being in the auroral zone of sub-Arctic Canada during this intense maximum in the 11-year sunspot cycle was an experience not soon to be forgotten. Not only did Mother Nature frequently put on fantastic displays of Northern Lights -- awe-inspiring spectacles of colored rays, arches and fast-moving lights in the sky -- but those sunspots and solar flares played havoc with shortwave communications.

Sudden ionospheric disturbances often resulted in complete radio blackouts for up to four consecutive days! It was an eerie feeling, tuning across the whole shortwave and broadcast band spectrum and not hearing any signals at all. It was as if the world had come to an end and we were the only ones left! We didn't mind the disruptions too much; we knew they were only temporary and the spectacular shows in the nighttime skies were well worth the inconvenience.

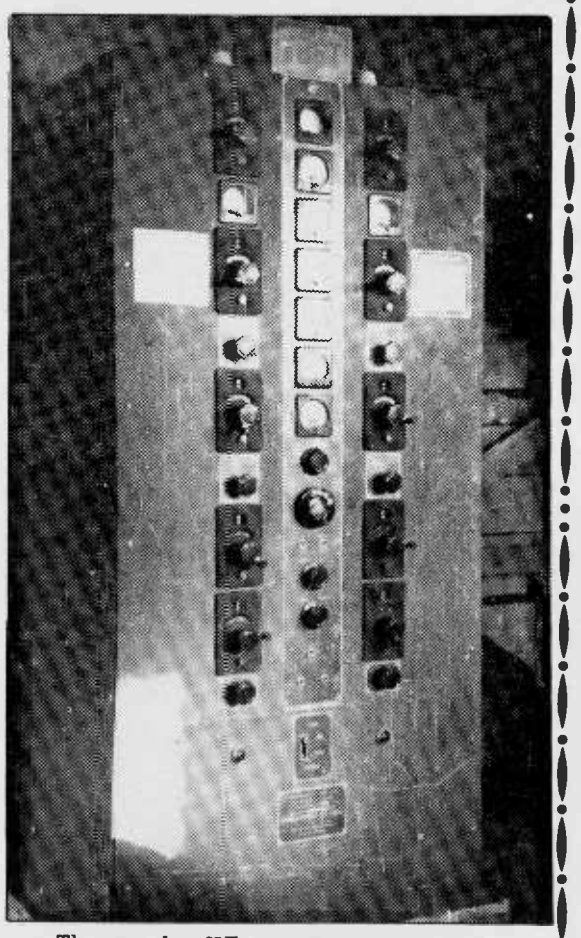
Because of the frequency of these magnetic storms our ability to supply the outside world with hourly weather reports was severely hampered. We got around the problem by installing remote keying facilities in our radiobeacon transmitter, and we instructed Seven Islands Radio to listen for our weather reports on our LF beacon frequency (in the 200 kHz band) during HF radio blackouts. Sure enough, with brute-force RF power, our LF ground wave c.w. signals made it through most of the time-- weak and noisy, but readable.

During that time I became very interested in the shortwave propagation forecast charts, tables, maps, and monograms available from the Central Radio Propagation Laboratory in the U.S.A. The CRPL operated time and frequency standards radio station WWV which was then located in Washington, DC.

In return for their generous offer of technical literature and monthly forecast charts, the CRPL people asked me to supply them with weekly reception reports of WWV signals from our QTH in the auroral zone. I've been a radio wave propagation buff ever since.

AN IDEAL SPOT FOR HAM RADIO

After over a year in the bush I realized that amatuer radio would really come in handy for keeping in



The main HF transmitter at Knob Lake Airport. The two-channel RCA Model AT-3 CW/phone XMTR was formerly used by the Royal Canadian Air Force.

AVIATION RADIO cont'd

touch with the outside world. Since I was already the holder of a commercial operator's certificate, the Canadian license was granted on request. I became VE2SH in Knob Lake, Quebec; when I operated in Ashuanipi, Labrador, I used the call letters VE2SH/VO6.

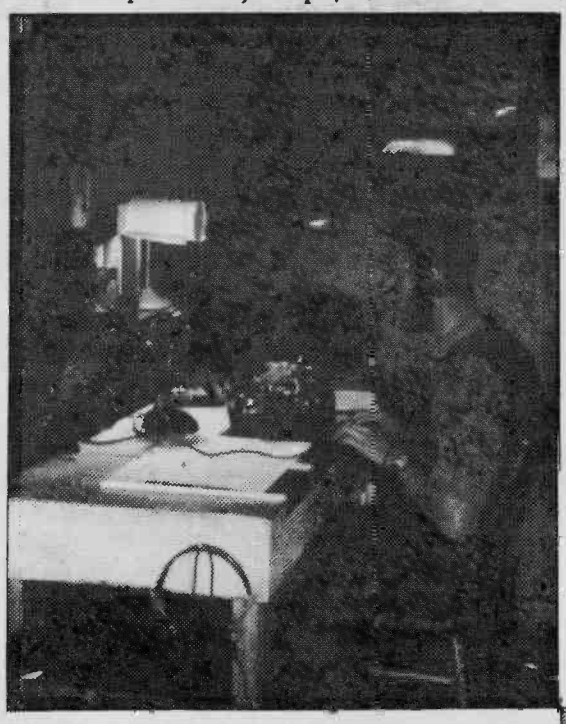
I built a c.w. transmitter and ordered a Hammarlund HQ-129X receiver through the company. I was soon on the air and had a ball! My mother's sisters lived in a suburb of Detroit, Michigan, and I established a regular schedule with a ham operator in the Motor City. I used to call him every Monday evening on 40 meters c.w. and give him the latest news from Ashuanipi or Knob Lake; he would then phone my aunts and pass the news along, and then get back to me with the latest news from them.

My parents lived in Montreal. One evening, on my father's birthday, I thought I'd surprise my Dad and send him birthday greetings via ham radio. I called "CQ Montreal" for quite a while on 40 meters c.w., but got no answer until a ham operator in St. Hyacinthe, Quebec (a city 35 miles east of Montreal), responded to my call and volunteered to relay my traffic to Montreal on 80 meters.

After giving him the birthday message and my father's address and phone number, I assumed that within a few minutes my parents' phone would ring and Dad would get a surprise. Little did I know that he would not receive the birthday greetings until several days later; and when he did finally get the message it was by mail from Kansas City, Missouri!

It turned out that the band had changed rapidly that evening and the ham operator in St. Hyacinthe could not raise Montreal. He then passed the message to

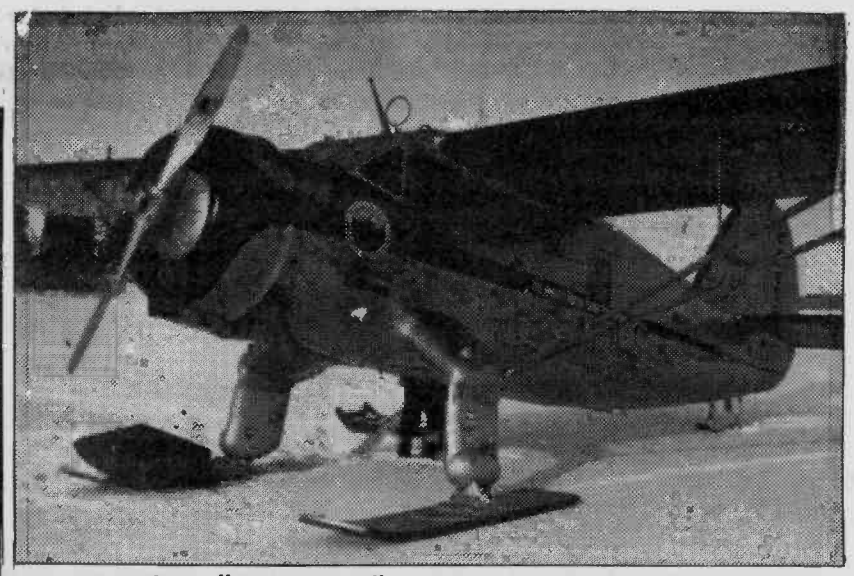
Author copying CW message on special"weather" typewriter, at Ashuanipi Lake, Sept/49.



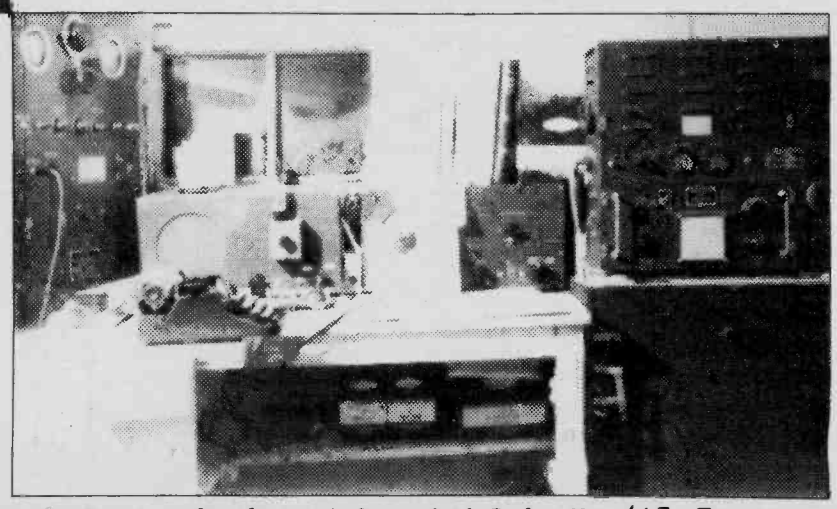
an operator in Kansas City for long-distance relay to Montreal, but that guy got stuck with the message as propagation conditions changed again. So, in desperation, he dropped the message in the mail. Oh, the pleasures of HF radio!

Being in World Zone number 2, I was a very popular fellow at DX contest time! That zone encompassed northern Canada, and there were very few active ham operators up there. I once took part in one of these DX contests and the experience was fantastic. With my VO6 callsign I was in unbelievable demand. Dozens of c.w. stations would call me simultaneously. After sorting out a single callsign from the mess, I'd exchange numbers with that ham.

During the brief exchange the frequency would be very quiet, but as soon as I'd end the QSO with di-dah-di-dah-dit, all heck would break loose and I'd be swamped with dozens of calls again! This went on and on... They didn't let me QRT until well into the night! So found out what it is like to be DX--- I'll never forget that experience!



Popular "Norseman" bush plane at Ashuanipi Lake, Feb/48. HF antenna wire was strung from the mast (above the cockpit) to the tail. DF loop antenna may also be seen.In addition, a long trailing antenna wire could be released from the tail for better HF signals, and winched back in before landing.



Radio shack at Ashuanipi Lake Nov/47. Transmitter on the left is Marconi TR-200. Receiver behind typewriter is fix-tuned LFR-6. Transmitter at the right is a BC-191-E which was used as a LF radiobeacon.

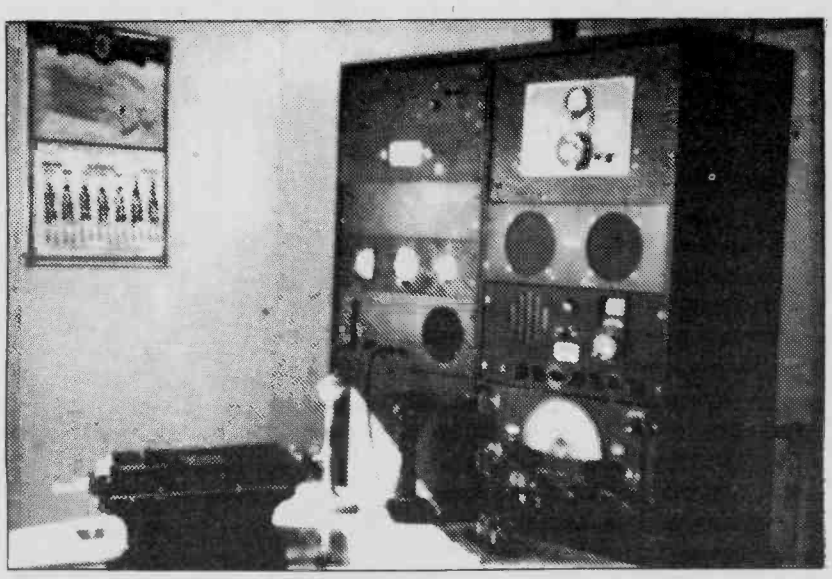
BASEBALL GAMES ON VHF RADIO

Our company pilots had one thing in common: come October, they were all interested in the World Series. However, the World Series games were broadcast on shortwave by the Armed Forces Radio Service (AFRS), and we could pick up these broadcasts very well on our spare HF receivers.

When our DC-3 pilots had to fly the usual supply run from Mont Joli (on the south shore of the St. Lawrence River to Seven Islands and then via Ashuanipi to Knob Lake (each of the three legs was about 150 miles long) during the baseball games, they had no way of hearing the AFRS broadcasts because their HF aircraft receivers did not cover the international shortwave broadcast bands. That's when we company radio operators came to the rescue!

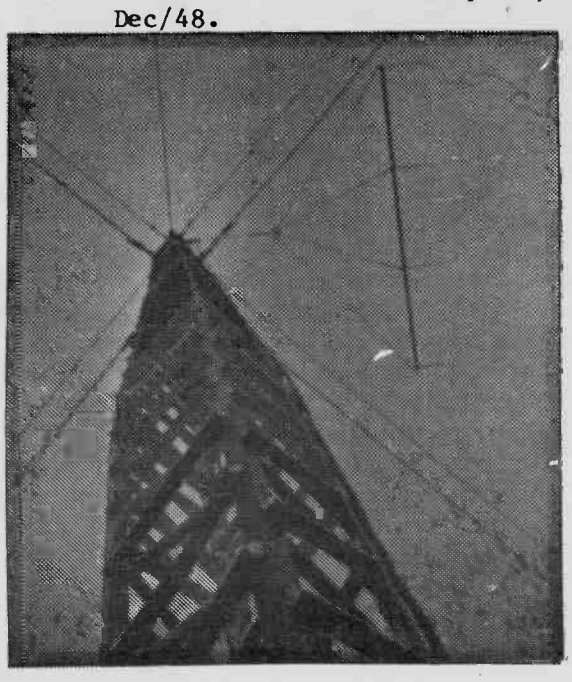
By that time we had VHF aircraft band equipment (W.W.II surplus transceivers) to complement our HF gear, so we all agreed to relay the World Series games to our pilots via VHF radio. We did this by placing our VHF microphones in front of our HF receiver loudspeakers. Our pilots got excellent reception, never missing a play during their three-hour flights. From the altitude at which they cruised, as soon as they'd fly out of VHF range from one of our stations, they'd come within range of our next one!

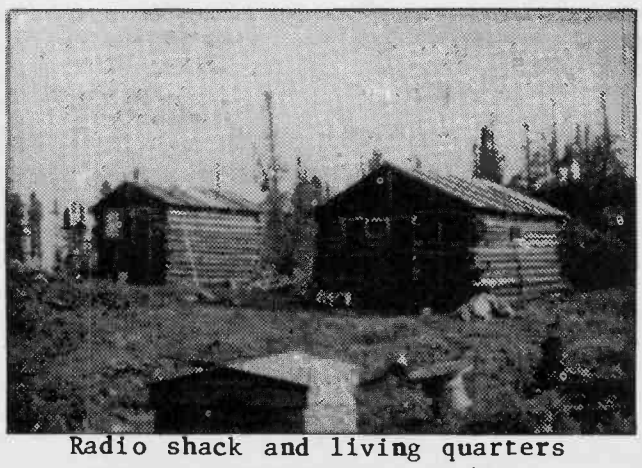
We loved our pilots (they brought us our mail and food!) so we got a big kick out of doing this for them. This procedure wasn't



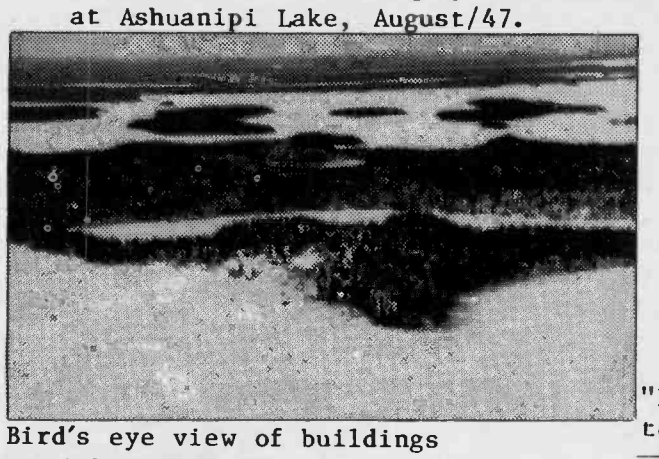
HF and VHF equipment in the control tower at Knob Lake Airport, April/49.

One of the 100-ft. towers supporting radiobeacon antenna. Knob Lake Airport, Dec/48.



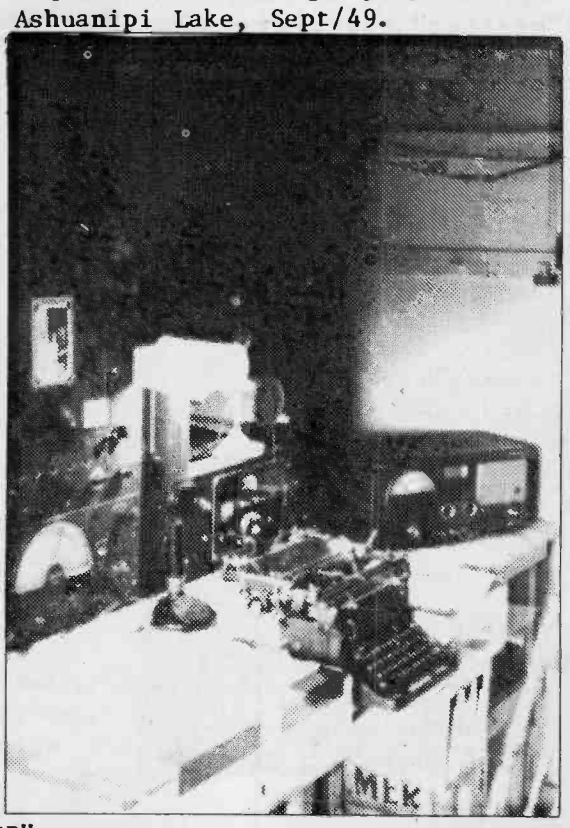


Radio shack and living quarters at Ashuanipi Lake, August/47.



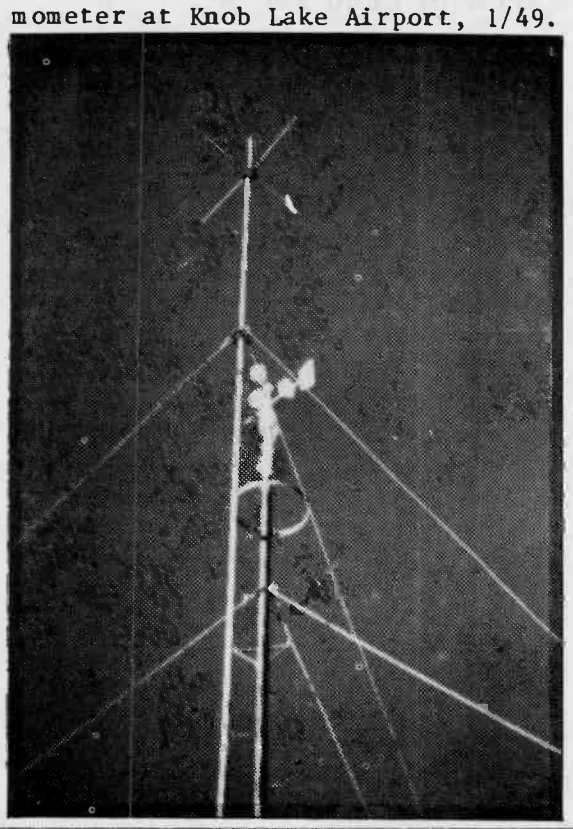
Bird's eye view of buildings at Ashuanipi Lake in sub-arctic Labrador, Feb/48.

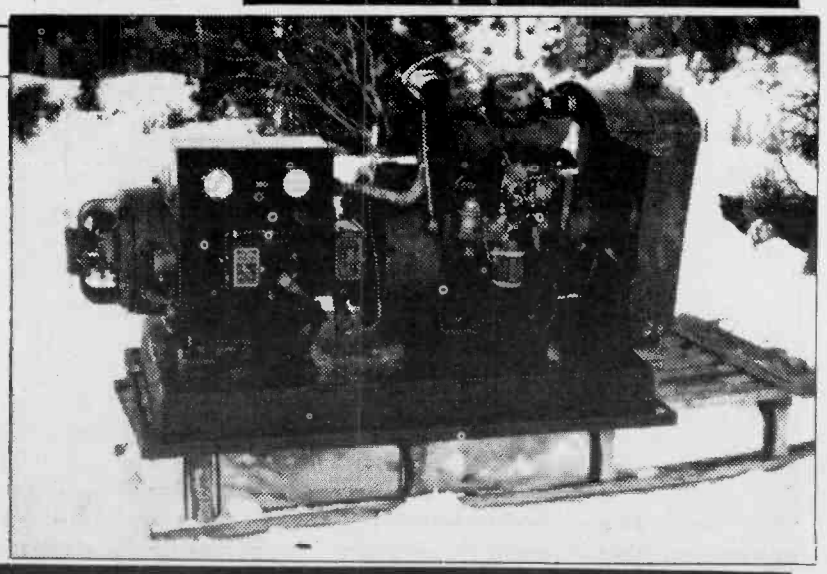
Improved receiving equipment at Ashuanipi Lake, Sept/49.



"BXB" engine driven generator unit at Ashuanipi Lake.

VHF antenna, wind vane and anemometer at Knob Lake Airport, 1/49.



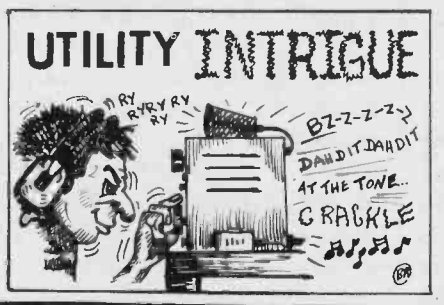


AVIATION RADIO cont'd

exactly according to government radio regulations, mind you, but our company planes were the only ones using that VHF frequency in our neck of the wood, so there was no harm done. And when the pilots needed to communicate with us for any reason during the ball games -- and for position reports, revised ETAs, or in case of emergency -- they still had full use of our regular HF channel.

So those are some of the incidents and capers that I remember very well from that bygone era of bush planes and unsophisticated aviation radio. All in all, those two- and- a-half years were quite an experience for me. I learned a lot about radio, aviation, and weather, and all three of these fields have remained hobbies of mine ever since.

I am now an electronics teacher in a community college, but I often think back to those "good old days" in Labrador in the late 'forties. The living conditions may have been primitive, but I didn't know it then, and I enjoyed every minute of that northern adventure. ●



by
Don Schimmel
516 Kingsley Rd SW
Vienna, VA 22180

kHz	DTOI/MODE/IDENTIFICATION AND COMMENTS
3039	200049/CW/IDR8 (ROME NAVAL RADIO, ITALY)
4316	190248/CW/CQ DE ZSC (CAPETOWN, SOUTH AFRICA)
4542.5	190239/CW/JHS DE ? (JAPANESE ALLOC)
4615	190238/CW/IDR (ROME NAVAL RDO, ITALY)
4780	210208/CW/NO CALLS/SIX 5L GRPS RTD SVRL TIMES
4811.8	190233/RTTY 50-170/NO CALLS/CODED WX
5458.8	230032/RTTY 75-850/NO CALLS/PRESS IN ENGLISH
6305.3	212352/CW/NO CALLS/CODED WX
6347.6	212359/CW/DE HWN (PARIS-HOUILLES-FRANCE)NAV RDO
6365.3	220001/CW/DE WPD (TAMPA, FL)
6378.6	220005/CW/DE GKB3 (PORTISHEAD, ENGLAND)
6384	220007/CW/NO CALLS/5L GRPS/SPEC CHARAC AA IM
6403.7	220010/CW/DE PCH30 (SCHEVENINGEN, NETHERLANDS)
6407	190223/CW/DE GKC (PORTISHEAD, ENGLAND)
6421	190221/CW/DE FFL2/FFL3 (ST LYS RDO, FRANCE)
6491	220012/CW/DE PJC (CURACAO-WILIEMSTAD, CURACAO)
6494	220014/CW/RIW DE EZZN (KHIVA NAV RDO, UZBEK SSR FROM ETHIOPIAN CALL)
6495	251941/CW/DE GKE (PORTISHEAD, ENGLAND)
6500	190216/CW/DE KPH (SAN FRANCISCO, CALIF)
13068.5	201946/CW/DE TFA (REYKJAVIK RDO, ICELAND)
13079.5	201949/CW/DE HEC (BERNE, SWITZERLAND)
13092.8	201951/CW/DE ZSC (CAPETOWN, SOUTH AFRICA)
13099	201952/CW/DE WNU (SLIDELL, LA)

UTILITY INTRIGUE cont'd

13178	201955/VOICE USB/CONVERSATION IN FRENCH
13236	191858/CW/DE HWN (PARIS-HOUILLES-FRANCE)NAV RDO
13248	241258/CW/NO CALLS/PT MSG IN UNIDEN LANGUAGE
13293.2	291957/CW/NO CALLS/PT MSG IN FRENCH
13333	222038/CW/NO CALLS/5L GRPS (CUT NBRS) ZAMBIA IN HEADING OF MSG, POSS CUBAN EMBASSY
13382	191903/CW/DE GFT (BRACKNELL, ENGLAND)
13387.9	242424/RTTY 750170/PORTION OF PRINT-OUT APPRS TO BE SCRAMBLED
13391.9	212334/RTTY 50-170/NO CALLS/5F GRPS
13488.5	191909/VOICE LSB/CONVERSATION IN FRENCH
13514.8	212222/RTTY 50-170/DE CLN405 (HAVAN CUBA) RY'S
13615.5	241429/CW/NO CALLS/POLISH PT MSG
13623	251929/RTTY 750-170/CODED WX
13716	191917/CW/NO CALLS/SPANISH LANG, MIL TEXTS
13996.8	202004/RTTY 50-850/FRENCH PT MSGS
14436	241421/FAX/NO IDENT
15785	251906/FAX/NO IDENT
16323.8	241355/RTTY 50-170/DE Y2V38A/23/47 (BERLIN GDR)
16346.6	251903/RTTY 50-170/PRENSA LATINA (HAVANA) WITH PRESS ITEMS IN ENGLISH
16414.7	241403/VOICE USB/CONVERSATION IN ITALIAN
16424.5	251719/CW/5L GRPS (CUT NBRS) SPANISH CHATTER
16754	222050/CW/PT MSGS IN PORTUGUESE
17003.6	202103/CW/DEHKB (BARANQUILLA, COLOMBIA)
17317.1	241352/VOICE USB/SHIP-SHORE LINK/CONV IN ENGLISH
17544.3	241348/RTTY 50-170/PRESS IN FRENCH
16712.5	241343/CW/UJY2 DE CLN573 (KALININGRAD, USSR POSS HAVANA-BAUTA-CUBA)
18056	241334/CW/UDPV DE D3M93 (RUSSIAN SHIP FROM LUANDA NAVAL RDO, ANGOLA)
18092.4	241328/RTTY 50-170/CODED WX
18365	241322/CW/FARR DE 6WW (POSS FRENCH SHIP FROM DAKAR NAVAL RD, SENEGAL)
18419.8	212204/RTTY 50-170/SPANISH LANG. PRESS
18650	192107/CW/CLP23 DE CLP1 (? FROM HAVANA) PART OF CUBAN MIN FORN AFFAIRS NETWORK
19615.6	241315/RTTY 75-170/DE NBA (US NAVY STN PANAMA)
20349	241312/RTTY 74-170/DE BNA (US NAVY STN PANAMA)
20469.4	241308/RTTY 75-170/NBA DE CXR (US NAVY STN PANAMA FROM MONTEVIDEO URUGUAY

— SCANNING →

Hear 850 MHz On Your PRO 30

by
Bob Parnass, AJ9S

A recent article (see MT, Feb. 1985 page 19) described the technique of using multiple injection frequencies, and introduced an equation which permits listening in the 512-657 MHz range (UHF television channels 21 through 44) using radios designed to receive 402-512 MHz.

This article introduces another equation, permitting 851-1158 MHz reception using a Radio Shack PRO30 scanner designed to receive 380-512 MHz. The equation may be applicable to other scanners.

Using this equation, my Radio Shack PRO30 scanner receives the Illinois State Police District 15 (855.4875) when the radio is programmed for 381.9250 MHz. James Cavanaugh of Palatine, Illinois, reports that his PRO30 receives the Palatine Police (856.7125 MHz) when programmed for 382.4500 MHz.

THE METHOD

In the equations that follow, all frequencies are in units of Megahertz. To listen on a frequency Y between 851 and 1158 MHz, tune your radio to:

$$\frac{3(Y) + 10(IF)}{7}$$

where IF is the intermediate frequency of the receiver.

Conversely, if you hear a strange signal when your UHF radio is tuned to X MHz, you may be simultaneously listening to the frequency of:

$$\frac{7(x) - 10(IF)}{3}$$

When using this technique to receive microwave signals on a scanner, the signal may be very weak, because a typical scanner radio is not nearly as sensitive in the 851-1158 MHz range as it is on the frequencies for which it was designed.

TECHNICAL EXPLANATION

What's happening is that an injection signal with multiple constituent frequencies is being fed to the mixer stage. To hear the Palatine Police signal (856.7125 MHz), the PRO30 is set to 382.45 MHz. At this setting, the local oscillator/tripler chain is injecting a signal into the mixer stage at:

382.450 - 10.7
=371.750 MHz.

This 371.750 MHz signal is the output of a frequency tripler, whose input frequency is:

371.750 / 3
=123.9167 MHz.

But, in addition to this 3rd harmonic, there is a 7th harmronic component present:

7(123.9167)
=867.4167 MHz,

which when mixed with the police signal on 856.7125 MHz, produces a 10.7 MHz IF:

867.4167 - 856.7125
=10.7042 MHz

One may think of this 7th harmonic as being the sum of the 3rd harmonic, the signal the circuit was designed to produce, and the expected 4th harmonic, described in the previous article.

POOR SENSITIVITY

During reception of both police transmitters described above, the signal came directly into the mixer stage through the PRO30 case, bypassing the antenna and RF amplifier stages! Tests were made using the supplied external antenna and an external 146 MHz antenna. The connection of either antenna made no difference in signal strength. Disconnecting the antenna altogether made no difference either. Apparently, the RF amplfier/antenna combination attenuated the microwave signals more than the plastic case, which is painted with a conductive substance.

Don't expect very good range on these frequencies. In both cases, the microwave transmitters were within one mile of the scanner.

A Regency HX1000 scanner (216 MHz IF), was tested for microwave reception using this equation, but proved unsuccessful. Once again, readers are urged to experiment to find other frequencies to which their scanner may be receptive.

by James R. Hay

MEXICO

Having spent some time explaining the channeling systems, it seems time to again have a look at some stations and frequencies; this month we will look at Mexico. At the end of the column I will include a listing of callsigns and stations.

In the low frequency telegraphy band we start with two major groupings of stations on groups of frequencies. First, on 441, 451, and 489 kHz, are XFF, XFN, XFP, XFQ, XFS, XFU. Secondly, on 455, 461.5, and 470 kHz, are XFA, XFB, XFE, XFK, XFL, XFM, and XFY. XFC can be found on 441, 451, 455, and 489 kHz. The remaining stations and frequencies in that band include

	kHz		kHz
XFA	475	XFM	441
XFB, XFL	451	XFP	461.5
XFE, XFQ	485	XFS	465
XFF	432	XFU	470
XFK, XFN	420	XFY	489

The remaining low frequency, 448 kHz, along with 4346, 6442.5, 8690, 12790, and 17069.6 kHz, are all shared by the following stations:
XFB2, XFB3, XFF2, XFF3, XFK2, XFL2, XFM2, XFQ2, XFQ3, XFS2, XFS3, XFS4, XFS5, XFU2, and XFY2.

In the 4 MHz telegraphy bands the following can be found:

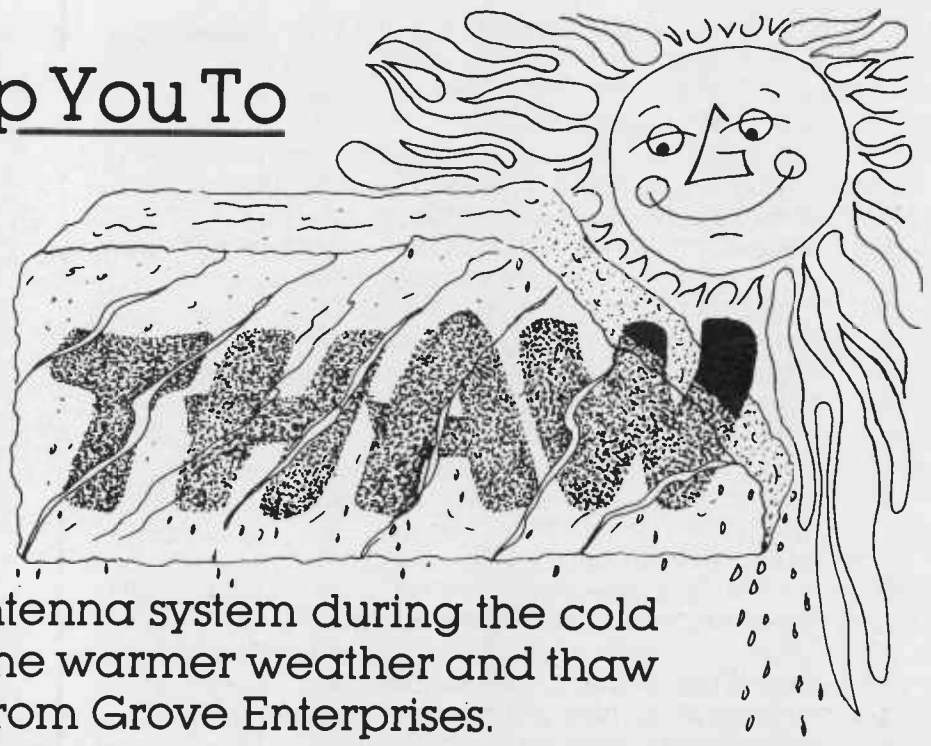
4225 kHz	XFM, XFN
4244	XFF
4250	XFL
4268	XFC, XFK, XFQ
4271	XFS, XFY
4285	XFN
4292	XFA, XFP
4307.5	XFB, XFE

Six megahertz telegraphy has the following to offer:

6358	XFN
6360	XFQ
6365	XFS
6367	XFN
6414.5	XFN
6435	XFB, XFY
6436.5	XFF
6439	XFP
6442.5	XFN2, XFR2
6350	XFK

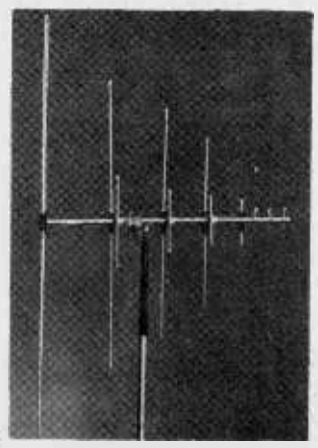
Let Grove Enterprises Help You To

Accelerate The Spring...



If you have tolerated an inadequate antenna system during the cold winter months, then take advantage of the warmer weather and thaw out your reception with these hot items from Grove Enterprises.

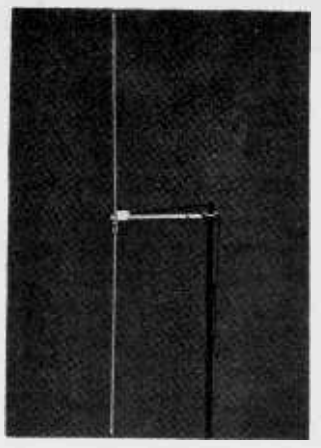
Scanner Beam



Simply the world's finest low-cost directional antenna for wideband/VHF/UHF receiving and transmitting (up to 25 watts with balun provided)! The Grove **Scanner Beam** is an eleven-element log periodic dipole array, designed to provide no-compromise directional reception from 108-512 and 806-960 MHz, and bi-directional reception from 25-54 MHz. Includes 14-inch offset pipe which allows elevation tilt for satellite communications. Also comes equipped with standard TV-type "F" connector for easy connection to low-loss 50 or 75-ohm coaxial cable (Grove CBL series recommended; see below). Write for brochure.

ANT-1B — ONLY $40.00 (plus $3.00 UPS; $6.00 U.S. Mail)

OMNI



Now you can enjoy total frequency coverage for the new breed of scanner with just one high performance antenna! The exciting **OMNI** is an omnidirectional vertical dipole with continuous 25-960 MHz reception—including the increasingly popular 225-400 MHz military aircraft and satellite band. Has been used successfully to hear the Space Shuttle, orbiting communications satellites, distant military and civilian aircraft in flight, federal and domestic law enforcement agencies, and many other users of the VHF/UHF spectrum. Recommended for use with Grove CBL low loss coaxial cable and Grove CK-1 connector kit. Includes offset mount for anchoring to any mast up to 1½ inches in diameter, plus a handy "F" connector.

ANT-5B — ONLY $19.00 (plus $3.00 UPS; $6.00 U.S. Mail)

Cable and Accessories

- **RG-6/U Loss Coaxial Cable:** Now choose your own 50, 100, 200 or 1000 foot increments of one of the lowest loss, lowest cost cables in the industry for your VHF/UHF listening. RG-6/U is 100% shielded, foam dialectric, solid copper center conductor, PVC-covered all-weather coax. **(CBL-2, 50 feet: $7.50 plus $2 UPS; CBL-3, 100 feet: $15.00 plus $3 UPS; CBL-4, 200 feet: $30.00 plus $3.50 UPS; CBL-5, 1000 feet: $125.00 plus $10 UPS)**.

- **Universal Connector Kit:** The new Grove connector package is ideally suited for mating with RG-6/U. Consists of two PL-259 connectors, reducers, Motorola plug with crimp ring, two F-56 connectors with crimp rings, coax seal, BNC/UHF adaptor, UHF (PL-259)/Motorola connector, 36" length of RG-6/U cable and instruction sheet **(CK-1 — ONLY $9.95; free shipping if ordered with CBL above, or $1.50 UPS if not)**.

- **The Grove Multicoupler:** If you use more than one scanner you don't need two antennas and two feedlines. The multicoupler allows you to feed signals from one antenna into two receivers. Super for combination AM/FM car radios and scanners using one outside antenna. All adaptors and cables provided. 30-1000 MHz. **(CPL-1 — $14.00, plus $1.50 UPS)**.

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HIGH SEAS cont'd

6314	XFM
6484.5	XFL
6390	XFC, XFE

The offerings from 8 megahertz in telegraphy are the following:

8380.5	XFC	8568.5	XFM
8470	XFL	8595.5	XFP
8505	XFK	8613	XFY
8514	XFA	8621	XFN
8545	XFF	8630	XFQ
8562.5	XFB, XFE	8644	XFS
		8656	XFN

The final frequency is 8690 kHz which is shared by XFA2, XFF2, XFN2, and XFR2.

Mexican telegraphy on 12 Mhz is as follows:

12675	XFB, XFK	12775	XFN
		12815	XFY
12703	XFL	12824	XFC
12708	XFQ	12829.5	XFM
12727	XFN	12843	XFP
12752	XFA	12900.5	XFF
12761	XFS	13006.5	XFE

And finally, on 16 and 22 megahertz:

16896.5	XFN	22389	XFE
16927.5	XFE	22395	XFL
16935.5	XFA	22415	XFA
17115.5	XFL	22477	XFN
17134	XFN	22511	XFN

Now, just to confuse the issue a bit, I have saved one last station which has not yet been mentioned: XDA. On telegraphy it can be found on the following frequencies:

8567	12836	17120.5
8575.5	12855	17140
8590.5	13014.5	22385
8626	16914.5	22400
12740	16942.5	22471
		22516

It should be noted that all stations except XDA have both 500 and 2182 kHz for cw and ssb respectively.

In the medium frequency range, the following stations can be found:

2431, 2470, 2560
XFA, XFE, XFK, XFL, XFM, XFQ, XFY

2270, 2320, 2542
XFB,XFC, XFF, XFN, XFP, XFS, XFU

2160	XFQ3
2600	XFA
2605	XFF, XFK
2685	XFM
2710	XFY
2725	XFP, XFN, XFE
2738	XFS
2745	XFQ
2756	XFS
2802	XFC
2805	XFL, XFU

The following listing covers the RF radiotelephone bands and channel numbers, along with the station call-signs. In a previous column we explained how to convert the channel numbers to frequencies.

403, 408	XFL
403, 421	XFS2, XFY2
404, 421	XFB2, XFB3, XFL2, XFM2, XFQ3, XFS3
403, 413, 421	XFE
403, 408, 421	XFA, XFC, XFF2, XFQ5, XFS2, XFU2
404, 413, 421	XFB, XFF, XFF3, XFK, XFK2, XFM, XFN, XFP, XFQ, XFS4, XFU, XFY
601, 603, 606	XFM, XFN, XFS3
601, 604, 606	XFL, XFP, XFQ, XFS, XFU, XFU2
603, 604, 606	XFA, XFC, XFE, XFF, XFK, XFS4
606	XFB, XFY
809, 821	XFY2
809, 821, 826	XFA, XFB, XFB2, XFC, XFE, XFF2, XFL, XFQ2, XFS2, XFS5, XFU2
817, 821	XFL2, XFM2, XFQ3, XFS3
817, 821, 829	XFB3, XFF, XFF3, XFK, XFK2, XFM, XFN, XFP, XFS, XFU, XFY, XFS4
821, 826, 829	XDA
812, 821, 827	XFQ
1209, 1221	XFY2
1209, 1221, 1222	XFA, SFB, SFB2, XFC, XFE, XFF3, XFM, XFP, XFS5, SFU
1209, 1221, 1225	XDA, XFL, XFS2, XFU2, XFY
1221	XFK2
1221, 1222	XFL2, XFM2, XFQ3, XFS3
1221, 1222, 1225	XFB3, XFF, XFF2, XFK, XFN, XFQ, XFQ2, XFS, XFS4
1604, 1614, 1621	XDA, XFA, XFB, XFC, XFE, XFF, XFM, XFP, XFS, XFS4, XFU2, XFY
1604, 1621	XFK, XFL, XFQ, XFS3, XFU
1614, 1617, 1621	XFN
2221, 2225, 2234	XDA, XFA, XFB, XFC, XFE, XFM, XFS5
2221, 2225, 2238	XFL, XFP, XFS, XFU2, XFY
2221, 2234, 2238	XFF, XFK, XFN, XFQ, XFS4, XFU

Finally, as promised, the Who's Who of Mexican coast stations:

XDA	Radiomex Radio
XFA	Acapulco Guerrero Radio
XFB	Ciudad del Carmen Campeche Radio
XFB2	Campeche, Campeche Radio
XFC	Cozomel, Quintana Roo Radio
XFE	Ensenada, Baja California Radio
XFF	Coatzacoalcos, Veracruz Radio
XFF2	Coatzacoalcos, Veracruz Radio
XFF3	Minatitlan, Veracruz Radio
XFK	La Paz, Baja California Radio
XFK2	La Paz, Baja California Radio
XFL	Mazatlan, Sinalda Radio
XFM	Manzanillo, Colima Radio
XFN	Progreso, Yucatan Radio
XFP	Chetumal, Qintana Roo Radio
XFQ	Salina Cruz, Oaxaca Radio
XFQ2	Frontera, Tabasco Radio
XFQ3	Salina Cruz, Oaxaca Radio
XFS	Tampico, Tamaulipas Radio
XFS2	Ciudad Madero, Tamaulipas Radio
XFS3	Tampico, Tamaulipas Radio
XFS4	Tecolutla, Veracruz Radio
XFS5	Tuxpan, Veracruz Radio
XFU	Veracruz, Veracruz Radio
XFU2	Veracruz, Veracruz Radio

That's all for this month. Any correspondence which you may have for this column should be sent to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q., Canada H9S 4Z2.

LISTENING IN ON THE U.S. COAST GUARD

As boating season approaches, the United States Coast Guard will be shifting its emphasis from winter activities to small boats.

Many communications are paired; that is, the ship channel and coast channel occupy different frequencies. The list below contains the most frequently reported Coast Guard channels monitored on the east coast.

If any of our readers have detailed lists as to uses for these channels, how about sharing them? A complete list of Coast Guard HF frequencies is found in Bob Grove's authoritative Shortwave Directory.

Frequencies as used by USCG shore stations in comms with USCG cutters and NOAA weather ships, USN ships as needed.

SCN (standard communications network? Suppresed carrier network?) and phone patch frequencies identified by off air monitoring by east coast monitors.

Frequencies marked with "*" have been mentioned as having same use as SCN frequencies by west coast and Hawaiian sources.

Any help in further identification of specific uses for the frequencies having no notations would be appreciated, as would specific identification of frequencies used actively by USCG cutters aside from 2182.0/2670.0/5320.0 kHz and the common USCG aircraft frequencies.

UNITED STATES COAST GUARD PAIRED VOICE FREQUENCIES

	SHORE TX	SHIP TX
	4376.0	4081.6
4MHz P/P	4400.8	4106.4
4MHz SCN	4428.7 *	4134.3
6MHz SCN	6506.4 *	6200.0
	6512.6	6206.2
6MHz P/P	6518.8	6212.4
8MHz P/P	8718.9	8195.0
8MHz SCN	8765.4 *	8241.5
	8768.5	8244.6
	8774.7	8250.8
13MHz SCN	13113.2 *	12342.4
	13150.4	12379.6
	13156.6	12385.8
	13196.9	12426.1
	17248.4	16475.5
17MHz SCN	17270.1	16497.2
	17307.3 *	16534.4
	17347.6	16574.7
	22611.5	22015.5
	22648.7	22052.7

"PLANE TALK"

We welcome this month to the growing ranks of MT columnists Jean Baker, whose enthusiasm and expertise in monitoring aircraft communications will be reflected in her monthly columns.

For those of you who are newcomers to the exciting world of VHF (AM) Aero Band monitoring, here are some tips to help you get started:

THE RECEIVER

If you do not already own a receiver which has the capability of 108.000 - 135.975 MHz reception, **do not** rush out and purchase an expensive scanner for this purpose. Radio Shack, Sears, SounDesign, and other

PLANE TALK cont'd

manufacturers put out excellent multi-band radios which include the VHF aero band. Those radios are ideal for the novice aero band monitor (and for experienced listeners, too), and do not cost an arm and a leg. Then, if you decide in a few months that you are really not interested enough in aero band monitoring to pursue it seriously, you will not be out a whole lot of money.

Granted that these multi-band receivers are not digitized, but with a little practice you will be able to set the dial in just the correct place so that you can hear your favorite aero frequencies. Of course, if you presently do own a scanner which receives the VHF aero band, you're ahead of the game, aren't you? Remember you can always upgrade your equipment if you are seriously interested in monitoring the aero band.

ANTENNAS

The antenna which comes with your receiver (extendable whip type) is often sufficient to assure you of very good aero-band reception. One fact to remember is this: The higher the flight level at which the airplane is, the greater the distance at which their transmissions can be heard.

If you live further than 40 miles from an airport, you will not be able to hear the ground station, but you will hear plenty of transmissions from air - craft talking with Air Route Traffic Control Centers, Aeronautical Enroute Stations, airline company transmissions, and a lot more. I live in an apartment - and of course, an outside antenna would be verboten - but you should hear the reception I get from just my rig's whip antenna! However, if you **must** have an outside antenna, there are plenty of available; the Grove Omni, Scanner Beam and Spectrum Probe are three good examples.

WHERE TO LOOK

Frequencies which are of the most interest are those within the 118.000 - 135.975 MHz range; these are the voice communication frequencies which include the Air Route Traffic Control Centers' communications, airline operations, tower ops (approach, departure, ground, clearance, delivery, ATIS, etc.), unicom, multicom, flight service stations, etc.

The frequency range from 108.000 - 117.975 MHz is for aeronautical navigation purposes. Although some of these are also capable of voice comms, they're not nearly as interesting to monitor as are the freqencies from 118.000 up.

TOURING THE TOWER

Contact your local Air Traffic Control Tower manager and ask permission to visit the facility. Whether you live near a large international airport or close to a grassy landing strip in Cornfield County, the tower management personnel will be more than happy to arrange a tour for you.

If a visit is absolutely impossible for you, then call the tower manager and ask if they will send a list of the local frequencies currently in use to you. Explain that you are just starting to monitor the VHF aero band frequencies, and any literature they could spare in addition to frequency listings would be appreciated. Sometimes they will also give you charts and maps such as that of the local TCA (Terminal Control Area) and other goodies.

If you are fortunate enough to live near one of the 23 (counting one each in Hawaii, Alaska, and Puerto Rico, respectively) Air Route Traffic Control Centers scattered across the country, call and arrange a visit with them, too. The controllers who work at these facilities direct air traffic from the time it leaves the airport of its departure point until it approaches the aerodome of its destination.

If you do not reside close enough to visit one of these, find out which Center is nearest to you and write to the Manager of Operations there and request that they send an Air Traffic Control Center sector chart to you. Here again, explain that you are a novice aero band monitor and you would like to have one of these charts to assist you in order to understand this form of monitoring more thoroughly.

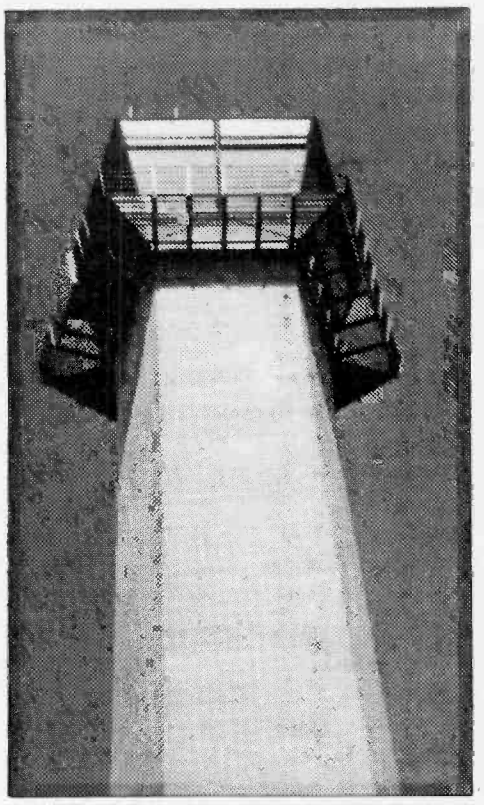
These charts are simply maps of various frequencies and locations of their remotely controlled transmitters of the particular control center area in which you live.

FOR YOUR READING

I highly recommend the following two books to those of you who want even more insight into our fascinating hobby:

PRESSURE COOKER, by Don Biggs. The author spent six months with air traffic controllers at both the Los Angeles International Airport ATC tower, and at the Los Angeles Air Route Traffic Control Conter. He gives a totally unbiased picture of the daily activities, pressures and duties of controllers.

Indianapolis FAA Control Tower



AIR PLANE TALK, by Captain Carlson. This book gives an in-depth explanation of air/ground communications and how to utilize them correctly.

There are quite a few others available, but the two mentioned above are the most comprehensive for both the novice and for the experienced aero-band monitor. Your local public library probably has both of these on their shelves. However, if they are not available, write to me at the address at the beginning of this column and I'll send the addresses of the publishers of these books so you can order them directly. Both of these books are currently in print.

You will enjoy your new hobby if you just remember that aero-band monitoring - like any other communications form - has its own terminology, and it will take a little effort on your part to acquire at least a rudimentary knowledge of it. This can be best accomplished by time and patience.

CORRECTION OF A CORRECTION:

It seems that errors have a habit of compounding themselves! On page 17 of the March 1985 issue, the "y" in Gene Krolak's formula should be a "4".

SIGNALS FROM SPACE

by Larry Van Horn

This month I will continue the Signals from Space series on geostationary communications satellites with a review of the Russian Loutch series satellites.

The Loutch satellite packages were probably designed to compete with the INTELSAT satellite system series V satellites. The new Russian satellites will probably go head-to-head with the EUTELSAT - ECS satellites which operate on the same band as the Loutch satellites.

As mentioned previously, monitors should not view the Loutch system as separate satellites, but as a communications package that will ride piggyback on an existing Gorizont or Raduga satellite.

As proposed to the ITU, the Loutch communications packages will have 10 transponders in the international fixed-satellite service subbands: 10.95-11.2 GHz and 11.45-11.7 GHz (also used by INTELSAT V and ECS). Each transponder has a nominal bandwidth of 34 MHz like the Gorizont C-band satellites, and 50 MHz separated center frequencies.

The following is a breakdown of the Loutch transponders:

Channel	Uplink (GHz)	Downlink (GHz)
1	14025	10975
2	14075	11025
3	14125	11075
4	14175	11125
5	14225	11175
6	14275	11475
7	14325	11525
8	14375	11575
9	14425	11625
10	14475	11675

Eight orbital positions have been proposed for the Loutch satellite communications system:

Loutch 1 14°W Statsionar 4
Loutch 2 53°E Statsionar 5
Loutch 3 90°E Statsionar 6
Loutch 4 140°E Statsionar 7

Loutch P1 25°W Statsionar 8
Loutch P2 45°E Statsionar 9
Loutch P3 85°E Statsionar 3
LoutchP4 170°W Statsionar 10

The significance of the "P" in the second set of Loutch listings is not known. But if one thinks (or reads) back to past issues of Signals from Space there could be an indication.

The first set of Loutch's (without "P") correspond to Gorizont Statsionar, while the second set (with "P") corresponds to Raduga Statsionar positions. This would indicate that the Soviets either wanted to leave their options open which host spacecraft would fly the Loutch communications packages or they are using this method to distinguish host spacecraft carrying the Ku-band package.

Those of you in Europe equipped for Ku-band operation might want to drop this column a note about video received from the Loutch satellites. You can reach Signals from Space by addressing the column c/o Grove Enterprises.

● COMSAT General Corporation has announced that on November 27, 1984, COMSTAR D-1 was removed from geostationary orbit and communications usage. The satellite operated for eight and a half years of perfect performance.

COMSTAR D-1 was the first satellite used by AT&T for domestic public switched message traffic in the United States. COMSAT General leased the entire communications capacity of COMSTAR D-1 and its sister COMSTARs (D-2, D-3, and D-4) to AT&T under a long term lease agreement. AT&T used the satellite for their long-distance telephone traffic and other domestic services.

COMSTAR D-1 provided excellent service since its launch on May 13, 1976, far exceeding its design life of seven years, with no downtime attributed to spacecraft failure.

COMSTAR D-1 was retired because of lack of sufficient fuel to keep it in geostationary orbit. COMSTAR D-3 will assume the orbital slot previously occupied by COMSTAR D-1, with COMSTAR D-2 acting as an in-orbit spare.

● Project OSCAR, Inc. has prepared a new set of orbital predictions for 1985, providing the UTC times and longitudes for all south-to-north equatorial crossings of the four Russian satellites carrying Mode A transponders (RS5, 6, 7, and 8). Additionally, the UTC time, sub-satellite latitude, longitude, and argument of perigee will be provided for each apogee of AMSAT-OSCAR 10 (AO-10). Used with the appropriate plotter and document the user will be able to determine his access time to all presently available amateur radio satellites carrying active transponders.

A minimum donation of $10.00 is required for these comprehensive databooks for shipment to North America; elsewhere the minimum is $12.00. To order your copy, send your check or money order (in U.S. dollars only please) along with your name and address to: Project OSCAR, P.O. Box 1136, Los Altos, CA 94022. Project OSCAR donates thousands of dollars to the AMSAT organization and is well worth the $10.00 donation to receive these valuable tracking aids. (Information courtesy of ASR, No. 93.)

● FLEETX 85 marked a milestone in naval communications history-- Leasat was used for the first time. Leasat, an acronym for "Leased Satellite," in its initial test and evaluation provided the best voice and data transmission of any satellite system designed for that purpose, according to Navy officials. The USS Carl Vinson (CVN-70) and USS Constellation (CV-64) aircraft battle groups were the first to use Leasat.

Leasat is unique because it is the first civilian satellite dedicated solely to providing communications services for the U.S. Armed Forces over a long term. The Leasat system will transmit data and voice signals for hundreds of stationary and mobile ships and units of the Navy, Marine Corps, Air Force, and Army.

Owned and operated by Hughes Communications Service, Inc., Leasat (designated in orbit Syncom IV-2) was launched from the Space Shuttle Discovery in August 1984. This is the first of four Leasat satellites the Navy plans to lease from Hughes. The other three are scheduled for launch on future shuttle missions through 1985.

The space satellite is only one part of the Leasat system; the ground control portion of the system includes Hughes Communications Operations Control Center, two movable ground stations and four satellite control sites. The Naval Space Command Operations Center in Dalhgren, VA, will coordinate all Leasat operations. (Information courtesy of the Navy Editors News Service.)

I believe that the satellite is located at 100° west. STS-51A, launched in November, 1984, placed Syncom IV-1 into orbit; at this time I do not have an orbital location for that satellite.

At this writing Syncom IV-3 is scheduled for launch onboard STS-51D (March 19, 1985. STS-51I is currently scheduled to launch the last Hughes Leasat, Syncom IV-4, sometime in August, 1985. UHF monitors are encouraged to send reception report information on these satellites to Signals from Space.

Those readers desiring a complete rundown on the Leasat system including frequencies should consult the new book, COMMUNICATIONS SATELLITES from Grove Enterprises.

● Speaking of COMMUNICATIONS SATELLITES, I missed last month's column because of the necessity to get the manuscript completed and sent on to Bob and the staff. For years now I have wanted a frequency guide to satellites but could not find one. Bob let me do the next best thing -- WRITE a satellite frequency guide!

The new book includes the following major topics and appendices: amateur radio satellites, general satellite information, weather satellites, domestic and miscellaneous COMSATs, international COMSATs, direct broadcast satellites, the Soviet space program, U.S. military satellite program, U.S. space shuttle, space surveillance systems, NASA/Soviet tracking networks, a list of sources, alphabetical list of satellites, geostationary orbital slots (ITU), and a frequency list of satellites.

In addition to the written information, pictures and illustrations have been included to aid the listener of satellites. This book as well as the recently published ARRL SATELLITE EXPERIMENTERS HANDBOOK will start the newcomer as well as the old pro on the way to great listening adventures on the satellites over our heads.

● My mail ran about 100% in favor of including 225-400 MHz military aircraft information in this column, so this month I will outline FAA military aircraft frequencies that are currently

SIGNALS FROM SPACE cont'd

in use. These frequencies are assigned to the FAA for Air Traffic Control usage throughout the U.S.

239.0	290.2	329.6	353.9
239.3	290.3	329.9	354.0
243.0(Air/Marine Emergency)			
251.1	290.4	330.2	354.1
254.3	290.5	330.5	357.4
255.4(Flight Serv. Stations)			
256.7	291.6	330.8	357.6
256.9	291.7	331.1	360.6
257.6	296.7	331.4	360.7
257.7	299.2	331.7	360.8
257.8(Mil.Aircraft-FAA twrs)			
257.9	306.2	332.0	362.3
261.5	306.3	332.3	362.0
263.0	306.9	332.6	363.1
263.1	307.0	332.9	363.2
267.9	307.1	333.2	363.8
269.0	307.2	333.5	364.8
269.1	307.3	333.8	369.9
269.2	307.8	334.1	370.9
269.3	307.9	334.4	371.9
269.4	316.1	335.0	372.0
269.5	317.4	335.5	372.1
269.6	317.5	335.6	377.1
270.3	317.6	338.2	377.2
272.7(Flight Serv. Stations)			
273.6	317.7	338.3	379.1
277.4	319.0	343.6	379.2
278.3	319.1	343.7	379.8
278.5	319.2	343.8	379.9
279.6	319.8	343.9	380.2
281.4	319.9	346.3	381.2
281.5	321.3	346.4	381.4
		348.6 (Mil.	
Aircraft-FAA towers)			381.5
282.5	322.3	348.7	381.6
282.3	322.4	350.2	385.4
284.6	322.5	350.3	385.5
284.7	323.0	351.7	385.6
285.4	323.1	351.8	387.0
285.5	323.2	351.9	387.1
285.6	327.0	352.0	388.0
287.1	327.1	353.5	388.8
287.9	327.5	353.6	393.0
288.1	327.8	353.7	393.1
288.3	329.3	353.8	398.9

Listeners should be aware that these frequencies are not in use at every location in the U.S and that there could be other ATC type frequencies in use. These frequencies, however, are the primary ATC frequencies in use for such operations as flight service stations, civilian control towers, approach/departure controls, and in-flight air traffic control though major centers.

Readers are invited to send your military 225-400 MHz frequencies to this column. If other information is available (i.e.-tactical callsigns, squadron command post frequencies, etc.) be sure to include these also. Send your information to Signals from Space, c/o Grove Enterprises.

Now crank up those Scanverters and MX-5000's and I hope to hear from you real soon!

●

REQUEST DENIED:

The John Demmitt Case

by
Ronald M. Coogan

Once he was a cop; today he lives his life on the other side of the bars. You may already have been made aware of his situation. His name is John H. Demmitt. He was convicted of a serious crime and is now in the process of paying his debt to society at the State Correctional Institution at Rockview (Bellefonte), Pennsylvania.

Like many of us, John Demmitt was introduced to shortwave in his youth. And, like many of us, that introduction came almost by accident. There were a number of radio-TV repair shops in the area where he grew up. John chose to hang out in them rather than in the nearby pool halls which drew his contemporaries.

One day his father brought home an old Atwater Kent radio he believed was beyond saving. John fixed it up, got it working, and was delighted to discover the far away stations he could hear.

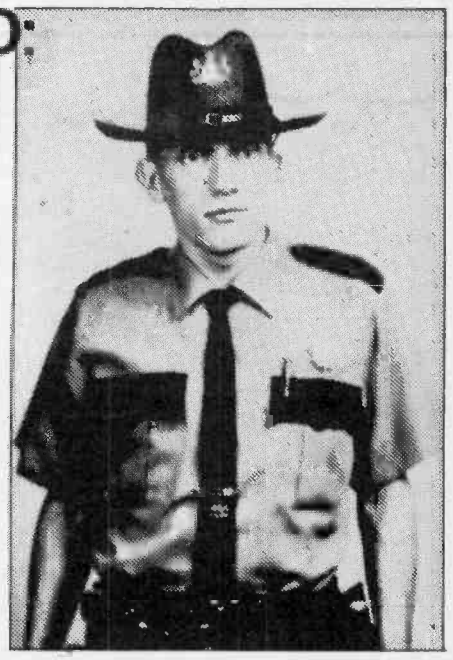
That was a medium wave radio; John didn't discover shortwave until a repairman gave him an old floor model four-band Philco. That first station - Radio Moscow - hooked him on shortwave for good. Later he obtained a Hallicrafters SX-40 and expanded the range and scope of his listening even further.

His shortwave interests grew with him into adulthood and into his profession as a police officer. There are unavoidable gaps in the story at this point. Since there are legal proceedings yet to be taken in John's behalf, neither he nor his lawyer wants the specifics of John's crime publicized.

John carried his love of shortwave with him through his trial and confinement, but he is not allowed the item central to any shortwave enthusiast - the receiver itself.

For some two years Demmitt has been trying to change the State of Pennsylvania's rules which do not allow inmates access to a shortwave radio. He has met mostly frustration, setbacks and indifference. His personal appeals in the hobby press resulted in some of his already-limited privileges being taken away for a time.

Authorities give a number of reasons why they won't allow prisoners to have shortwave radios. Most often cited is the belief that a shortwave receiver would permit the inmates to listen in on police calls or internal prison communications. As any **Monitoring Times** reader knows, this is an impossibility. Such forms of two-way communications moved out of shortwave frequency ranges decades ago.



John Demmitt in better days.

Prison authorities apparently also fear that ingenious inmates might somehow convert a shortwave radio to pick up frequencies it othewise wouldn't cover, or even be altered into a transmitter. Again, these concerns have no basis in reality.

"Not at this time" is another favorite reply, a generalization so devoid of content that it amounts to no answer at all.

Still another reservation is the extra paperwork involved in keeping track of who has a shortwave and who doesn't. However, prisoners are allowed one radio and there is no need to make a distinction as to whether that radio is AM only, AM-FM, SW, or some other combination.

Shortwave hobbyists have geared up a campaign aimed at getting the rules changed and a shortwave radio into John's cell.

Robert Leary of Galaxy Electronics has mailed hundreds of information packets to hobbyists, hobby leaders, and those more directly involved with the problem.

Pennsylvania State Representative Matthew Ryan has taken up the cause and has interested some other members of the state legislature as well. Several law enforcement officers in various areas are also doing what they can.

The Ryan staff member who is handling work on the campaign notes that the Governor's office is also

REQUEST DENIED cont'd

looking into the matter but little progress is being made. The staff member gets the impression that the Governor's office has little real enthusiasm for the project, that it is not high on the list of their priorities.

Disturbingly, she also notes that she can recall having received only one letter of supuport from a hobbyist. Ryan's office says they don't feel their efforts are "getting anywhere" and really aren't sure of what avenue to try next.

It should be noted that Pennsylvania is not alone in outlawing shortwave radios for prison inmates; indeed, it is in the majority. On the other hand the Ryan staffer said she believes there are about 12 states which do allow shortwave for inmates. One which does, Massachusetts, has had no problem with prisoners listening to shortwave radio.

Demmitt notes that there is one individual, apparently a shortwave listener himself, who is in charge of the list of items allowed inmates at a large correctional institution in the south. That person is in favor of change and is working to get such a change at his institution.

Demmitt says he "wants to learn", to know what is happening and understand why it is happening...to appreciate the needs and concerns of the people in the world. John says, "someday I will be released and...do not want to come out culturally deprived and lacking in the basic information that affects our lives."

He wants to "unwind from the daily tension of the daily prison environment at the end of each working day by spending that free time listening to international radio stations."

John also points out that Pennsylvania prisons contain a number of foreign citizens, some of whom cannot even speak English. The obvious advantage of giving these people access to shortwave is to link them with their native countries, hearing programming in their native language.

Demmitt says that his health is "not the best" and that there are some days when he cannot work so he just spends the time in his cell, watching TV or listening to AM or FM but, as any shortwave listener knows, the offerings there are pale in comparison.

Meantime, John Demmitt waits and hopes. No shortwave hobbyist would condone his crime. But those who can sympathize with a fellow shortwave listener who is needlessly deprived of that educational and rehabilitative pastime can help change the rules.

For a general information packet write to: Robert Leary, Galaxy Electronicis, Box 1202, Akron, OH 44309. Letters in support of a rule change can be sent to the following people:

Mr. Glenn R. Jeffries
Commissioner
PA Bureau of Corrections
P.O. Box 598
Camp Hill, PA 17011

Representative David Sweet
Chairman
Sub-Committee, Correctional Facilities
Room 601, Main Capitol Bldg
Harrisburg, PA 17120

Representative Matthew Ryan
1 South Oliver Street
Media, PA 19063

Support letters--courteous, reasoned and intelligent--are very important if any change is to be affected.

Readers who wish to correspond with Demmitt and-or send letters of moral support may write to:

John Demmitt
Box A K08408
Bellefonte, PA 16823

John says that "nothing would make me happier than to learn the rule is going to be changed...permitting us to have shortwave receivers. That would really give meaning and purpose in an otherwise depressing environment." ●

THE FCC AND THE "LEGAL"(?) PIRATE

Alan Weiner and J.P. Ferraro thought it was about time that Yonkers, New York had a broadcasting station. Since Yonkers faces enormous competition from licensed New York City stations, they tried an alternate route.

On November 7, 1984, Weiner and Ferraro went on the air on 1622 kHz, just above the AM broadcast band, using the legitimate call sign KPF941, issued by the FCC for remote broadcasting use...but not for direct broadcasting.

Remote broadcasting licenses are intended for relaying on-the-scene reporting, not for transmitting directly to home receivers. But our intrepid home broadcasters thought they had found a loophole. The FCC did not agree, however, and on November 29 the station voluntarily shut down after the commission threatened them with legal action.

But we have not heard the last of the Yonkers pair; as of March 4, 1985, the 100 watt transmitter of KPF 941 was back on the air - this time as a "production tool"! ●

MORE TIME AND FREQUENCY STATION ADDRESSES

In the March 1985 issue we presented an interesting article on the time and frequency standard stations by Ed Soomre. A list of addresses for those sample stations discussed was included.

There are many other such stations on the air, many of which are monitored by listeners around the world. This month we present an extended list of additional station addresses provided by the author.

ATA National Physical Laboratory, Hillside Rd., New Delhi 110012, India
BPM Shaanxi Astronomical Observatory, Chinese Academy of Sciences, Box 18, Lintong, Shaanxi China
BSF Telecommunications Laboratories, Box 71, Chung-Li, Taiwan 320, Republic of China
CCV Institutio Hidrografico de la Armada, Casilla 324, Valparaiso Chile
FTH/FTK/FTN Labatorie Primaire de Temps ET des Frequences, Observatoire de Paris, 61, Avenue de l'Observatoire 75014, Paris France
IAM Instituto Poste e delle Telecommunicazioni. Uffico 8, Rep 3, Viale Europa, I-00100, Rome Italy
IBF Instituto Elettrotecnico Nazionale, I-10125, Torino, Italy
JJY Radio Research Labs, Koganei, Tokyo 184, Japan
LOL Observatorio Naval, Avenida Espana 2099, 1107 Buenos Aires Argentina
MSF National Physics Lab, Division of Electrical Science, Teddington Middlesex TW11 OLW, England
OMA Czechoslovak Academy of Sciences, Time Division, Budecska G, Prague 2, Czechoslovakia
PKI/PLC Post and Telecommunications, Frequency Management, JI. Kebon Sirih 37, Jakarta Indonesia
PPR Costal Station EMBRATEL, 2300 Guaratiba, Rio de Janeiro, Brazil
Y3S Amt fur Standardisierung Messwesen und Warenprufung, 1162 Berlin, Furstenwalder Damm 398, German Democratic Republic
ZUO National Physical Research Laboratory, Box 395, Pretoria 0001, Republic of South Africa
4PB Colombo Radio, Radio Station 4PB, Colombo 8, Sri Lanka ●

BEHIND THE DIALS

REGENCY MX-7000 PROGRAMMABLE SCANNER

After some two years of premature announcements, the long awaited MX-7000 wide frequency coverage scanner is finally in limited distribution. Essentially the same in appearance and function as its precursor, the popular MX-5000, the 7000 includes the new 800 MHz "cellular" mobile band. Continuous frequency ranges are 25-550 and 800-1300 MHz, AM or FM on both ranges.

A large liquid crystal display prompts many functions including priority, frequency, channel, lockout, delay, scan, AM/FM and search (and increments); it is edge lighted for night viewing.

Programmable search increments of 5, 12.5 and 25 kHz allow appropriate frequency selection on different bands. There is no hold provision on search, requiring manual rotation of the squelch control to prevent search resuming after a signal drops out. Search and scan rate is about three increments per second in the fast mode.

The sound level of the annunciator "beep" at keypad depression is now adjustable by the volume control. But similar to the MX-5000, microprocessor noise is still apparent on some frequencies when using the unit with the attachable whip antenna; the problem disappears when an outside antenna, fed with coaxial cable, is used.

Sensitivity and selectivity are unexcelled in the scanner marketplace. Average

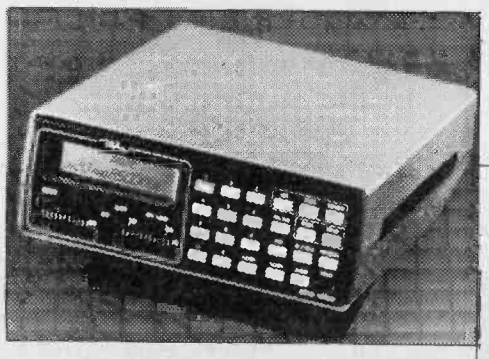
BEHIND THE DIALS cont'd

sensitivity on all ranges is 0.25 microvolts with adjacent channel rejection down 50 dB.

Still, one problem remains: Although the 750 MHz intermediate frequency provides superb image rejection below 550 MHz, the 45.025 MHz IF for the 800 MHz band causes severe imaging about 896 MHz. In actual measurement, there was no detectable difference between the strength of the primary signal and its image 90.05 MHz higher. Since the majority of interest lies on lower frequencies, the extent of the impact from this problem will depend upon the individual user.

Retail priced at a healthy $699, the MX-7000 is available in limited quantities for only $479 from Grove Enterprises.

REGENCY MX-4000 PROGRAMMABLE SCANNER



The new Grove catalog lists the most recent release from Regency, the new MX-4000 with the 800 MHz band. With a suggested price of $629 ($429 from Grove) it should be good!

Unpacking the unit from its shipping carton we found a very compact unit (6" x 2" x 6-1/2") lightweight and in a plastic enclosure like all Regency products, the MX-4000 offers a panel filled with pushbuttons, slide switches, slide volume and squelch controls as well.

Two plug-in antennas are provided with the unit--a telescoping whip for the standard low, high and UHF bands, and a 2-1/2" "miniduckie" for the 800 MHz band. Although the manual states that two antenna connectors are provided on the MX-4000, there is only one--a standard Motorola type.

The speaker is bottom mounted, but a tilt bracket is provided for desk top mounting; mobile installation is made possible by a bracket and hardware.

SERENDIPITY

Although not obvious from the literature, the MX-4000 comes with internal rechargeable batteries and may be used as a portable scanner in lieu of external AC or mobile supply.

BUT HOW WELL DOES IT WORK?

Equipment for review is always greeted by a mixture of anticipation and skepticism, both of which are usually justified. While the myriad pushbuttons may appear momentarily overwhelming, the manual quickly informs the user of their functions--operation is straightforward and simple.

Sensitivity of the unit was quite good, certainly equal to any other unit we have had sitting on the desk here at MT; our lab test confirmed excellent sensitivity on UHF and 800 MHz as well as VHF, verifying the 0.5 microvolt spec in the owner's manual. Although the addendum sheet by Regency decreases the specificied sensitivity to 1.5 microvolts.

With only 20 channels of memory, the scan rate of 15 channels per second assures that most any transmission will be accessed quickly. Memory is non-volatile thanks to an internal backup battery which is suspposed to last the lifetime of the unit. Even when the nicads are fully discharged the memory is retained.

Audio level is marginal--120 milliwatts may be adequate for a quiet room, but inadequate with the built-in speaker for mobile applications. A jack is provided on the rear apron for an external speaker and this may help.

The LCD display shows excellent contrast and large characters; loads of status readouts (channel, frequency, battery condition, delay, AM/FM, priority, search increments) are presented. While easy to read in ambient light, the built-in night illumination is useless.

Search increments of 5, 10, 12.5 or 25 kHz are user-selectable; FM or AM mode may be chosen for any channel and any frequency; channel 1 includes a priority function; scan may be delayed for 2 seconds; and both scan and search modes may be speed controlled.

The manual is nicely printed and organized; additional offset printed instructions have been inserted to update the manual.

SO...HOW ABOUT IT?

While the 20 channel memory, low level audio and poor nighttime display visibility may weigh in disfavor, the sensitivity, frequency coverage, compactness, operating ease, and convenient portability are definite plusses. All aspects considered, the Regency MX-4000 is a welcome addition to the growing family of programmable scanners.

COMING NEXT MONTH: Reviews of the Butternut SC-3000 scanner antenna and the Microlog "Short Wave Listener" C-64 RTTY/Morse decoder.

CHiPS ANNOUNCES SCANNER TEST RESULTS

The California Highway Patrol puts new scanners through rigorous laboratory tests to determine their applicability for official monitoring. Chosen for this report were the Regency models MX-3000, MX-4000 and MX-7000. A synopsis of findings is presented below.

MX-3000

AUDIO DISTORTION: 10% at 1.65 watts
SENSITIVITY (12 dB SINAD):
42.34 MHz, 0.26 uV;
154.28 MHz, 0.24 uV;
460.45 MHz, 0.47 uV
MODULATION ACCEPTANCE BANDWIDTH: ± 9.2 kHz
ADJACENT CHANNEL SELECTIVITY
42.34 MHz, -64 dB;
154.28 MHz, -65 dB;
460.45 MHz, -45.6 dB
INTERMODULATION ATTENUATION:
42.34 MHz, -56.8 dB;
154.28 MHz, -62.5 dB;
460.45 MHz, -47.2 dB
ADDITIONAL COMMENTS: Scan rate is 2 seconds for 30 channels; may be converted to 10 channel scanner by cutting jumper adjacent to pin 35 of IC-109; then scan rate is 1/2 second for 10 channels and channel selection requires only one digit entry (i.e., "2" rather than "02"). Performance of the MX-3000 is equal to or better than the earlier M-100.

MX-4000

AUDIO DISTORTION: 3.6% at 120 milliwatts (rated maximum power)
SENSITIVITY:
42.34 MHz, 0.26 uV;
159.30 MHz, 0.23 uV;
460.100 MHz, 0.45 uV
MODULATION ACCEPTANCE BANDWIDTH: ± 9 kHz
ADJACENT CHANNEL SELECTIVITY
42.34 MHz, -52 dB;
159.30 MHz, -59 dB;
460.100 MHz, -50 dB
INTERMODULATION ATTENUATION:
42.34 MHz, -46 dB;
159.30 MHz, -56 dB;
460.100 MHz, -48 dB

MX-700

AUDIO DISTORTION: 10.5% at 1 watt (rated maximum power)
SENSITIVITY:
42.34 MHz, 028 uV;
159.30 MHz, 0.18 uV;
465.100 MHz, 0.23 uV
MODULATION ACCEPTANCE BANDWIDTH: ± 6.2 kHz
ADJACENT CHANNEL SELECTIVITY
42.34 MHz, -47 dB;
159.300 MHz, -54 dB;
465.100 MHz, -49 dB
INTERMODULATION ATTENUATION:
42.34 MHz, -46 dB;
159.30 MHz, -44 dB;
465.100 MHz, -49 dB

We would like to thank MT reader and inveterate experimenter Rene Borde of Sunnyvale, California, for submitting this enlightening information.

REGENCY HX-2000 HANDHELD SCANNER

The recently announced and eagerly anticipated HX-2000 programmable handheld scanner from Regency is finally available. Having heard mixed comments from early users, we were anxious to try a sample.

THE SPECS

The HX-2000 is a lightweight (16 oz.), compact (3"W x 7"H x 1-1/2"D), plastic-encased, 20 channel programmable scanner which covers the 118-174.995, 406-525.9875 and 800-999.975 MHz, AM or FM mode on any frequency.

Equipped with a sponge-textured leatherette cover and plastic belt clip, the scanner comes with a rechargeable NICAD pack, charger, two rubber duckie antennas (VHF/UHF and 800 MHz), and earphone.

Two antenna ports are accessible from the top panel: a standard screw-in type identical to the early Bearcat 100 and a 3.5 mm phone jack. Both duckies are the screw-in variety.

The keypad format and LCD display are virtually identical in function and appearance to the MX-4000 reviewed above, including selectable search increments, delay, priority, dual scan/search speed, lockout, non-volatile memory and excellent liquid crystal display which, like the MX-4000, cannot be seen at night with the built in light.

BUT DOES IT WORK?

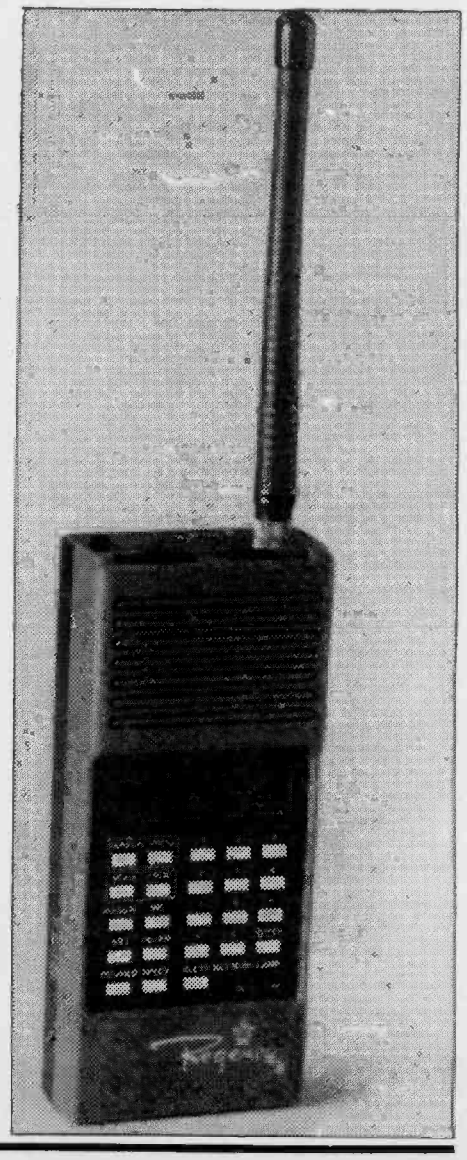
Our sample did! Contrary to early-user caveats of poor sensitivity and weak audio, our unit showed approximately 0.5 microvolt squelch threshold on all ranges including 800 MHz. Audio was certainly as strong as on the companion MX-4000, comparing favorably with or exceeding competitive hand-held scanners.

While the absence of the 30-50 MHz low band might seem disadvantageous to many listeners, it must be remembered that the most applications for hand-held scanners are likely to be in a large city where low band is least used. It's a reasonable trade-off for inclusion of the 800 MHz band.

Because of the variant channel plan at 800 MHz there is a 12.5 kHz offset switch; when the user tunes cellular channels he engages the offset, and when he listens for conventional communications in that band he leaves it in its normal position.

CONCLUSION

The Regency HX-2000 is the most advanced hand-held scanner presently available and should provide satisfaction to the user. It carries a relatively high price ($569.95 list; $409 including shipping from Grove Enterprises), but it does have aircraft band and 800 MHz as well as conventional high band and UHF. ●



NEW ARRIVALS

YAESU ANNOUNCES NEW GENERAL COVERAGE RECEIVER

Facing stiff competition from the Kenwood R-2000 and ICOM R-71A receivers, Yaesu has finally yielded to the pressure and announced the imminent release of their new FRG-8800 general coverage receiver.

Preliminary specifications would suggest that the 8800 is designed to fill a niche between the R-2000 and ICOM R-71A; with a suggested retail price of $600, the receiver features 150-29999 kHz continuous frequency coverage, AM/CW/LSB/USB/FM modes, and an optional VHF converter to provide 118-173.99 MHz reception as well.

Sensitivity is 30 uV AM and 3 uV SSB/CW at broadcast band and below; 4 uV AM, 0.4 uV SSB/CW, and 1 uV FM with the VHF converter.

Selectivity (6/50 dB points) are 6/15 kHz AM wide, 2.7/8 kHz AM narrow/SSB/CW, and 12.25/30 kHz FM.

The 8800 provides 1.4 watts of audio to its internal speaker and can be operated from 120 or 240 VAC, 50/60 Hz. Twelve channels of memory can be scanned. The LCD display doubles as a signal stength

indicator and shows functions called up as well.

It is expected that the new product will be available in the United States some time in the next few months. MT will have a hands-on report as soon as a model becomes available for our tests.

A SCANNER FROM YAESU!

Yaesu, prominent Japanese amateur radio equipment manufacturer, has just announced the imminent (May) availability of their new FRG-9600 synthesized programmable VHF/UHF scanner.

Covering 60-905 MHz continuously in AM, FM, upper sideband and lower sideband modes, the 9600 has an LED light bar signal strength indicator, 100 channels of memory, and seven different scanning/search step increments including 100 kHz for wideband FM broadcast band searching.

A computer port supplies TTL level logic for an optional RS-232 serial interface. An AGC line is available for algorithm voting; an optional video card output provides video for a standard monitor, and there is a multiplex output for an SCA adaptor as well.

Powered by either 120 VAC or 12 VDC, the 9600 is equipped with an SO-239 coaxial antenna connector.

It is expected that the new scanner will carry a $600 retail price; MT will present a review as soon as the limited allocations of this new product are met. ●

CLUB CORNER

Paul Swearingen
P.O. Box 4812
Panorama City, CA 91412

We'll have to start this month's column on a sad note. Via Ruth M. Hesch comes word that George Greenwood, the founder of Radio Communications Society of the World, died suddenly on December 24, 1985. A note to Ms. Hesch from Gordon Jay, Mr. Greenwood's nephew, gave her the impression that RCSW would not continue. Perhaps other members of RCSW could step in and continue the good work just barely started by this organization.

A new club has formed in the radio-active Great Lakes area. The Michigan Area Radio Enthusiasts have already published a newsletter and hope soon to become an ANARC affiliate. They welcome anyone interested in radio listening in all bands, although their target area is Michigan-Ohio-Indiana-Ontario.

If you'd like to become a member, send $3 (to receive their bimonthly newsletter) to Michigan Area Radio Enthusiasts - 24500 Union - Dearborn, MI 48124. Good luck to charter members Joel Ashby, Harold Dye, Randy Erickson, Jerome J. Goodell, Speed Gray, editor Donald Hosmer, Lavoyd Kuney, Steven Lare, Zack Schindler, and Craig Wicks.

It's encouraging that as our hobby grows new clubs are coalescing around specific geographic areas or hobby interests. If you'd like to be profiled in this column, send a copy of your club's bulletins directly to me, rather than to MT, as Bob Grove has to remail items sent to him. At least two items which could have been in last month's column were delayed when sent to MT instead.

The Amateur Radio Research and Development Corporation (AMRAD), a worldwide club of 500+ amateur radio and computer experimenters, publishes a very interesting technical bulletin. The club's purposes are to develop skills and knowledge in radio and electronic technology; to advocate design of experimental equipment and techniques; to promote basic and applied research; to organize technical forums and symposiums; to collect and disseminate technical information; and to provide experimental repeaters.

AMRAD is affiliated with the ARRL. If you'd like to become a member,

CLUB CORNER cont'd

annual dues are $15 ($5 for students) and should go to AMRAD - William P. Pala, WB4NFB - 5829 Parakeet Drive, Burke, VA 22015.

The Gateway DX Club International (Eric Bueneman, 836 Lamplight Lane, Hazelwood, MO 63042) is looking for help in compiling a TV station logbook; and Decalcomania, the promo material collectors club, is settling in at its new publishing address (David C. Laskey, RD #1, Hillcrest Avenue, Olean, NY 14760). Send an SASE for more information.

Although not a club, Glenn Hauser's Review of International Broadcasting provides many of the same services while offering an exhaustive list of program details for worldwide broadcasting stations (SW, AM, LW, and FM). David Newkirk, who edits the Radio Equipment Forum, is considering starting his own technical publication for SWL's. Write to RIB at P.O. Box 490756, Fort Lauderdale, FL 33349, and to David Newkirk at P.O. Box 85024, Seattle, WA 98145-1024, for details, for details and include an SASE with your request.

The International Mission Radio Association, a world-wide, non-profit, interdenominational group of over 600 hams and supporters, provides services to missionaries and volunteer workers through a bimonthly newsletter and a net on 14.280 kHz Mon-Sat, 1900-2000 GMT. Send an SASE for information to Br. Bernard Frey, O.F.M. CAP., Trinity Retreat, 1 Pryor Manor Road, Larchmont, NY 10538. Regular dues are $5 per year.

In the '70's, many frustrated, would-be deejays discovered that for a few bucks they, too, could become instant radio announcers. And to the dismay of truckers and others who had used CB for legitimate purposes, the CB channels became clogged with unnecessary noises. By the mid-'80's, the noise had diminished somewhat but CB's reputation had already been tarnished.

A January MT article by Michael Prosise brought an inundation of letters to MT, many protesting coverage of the band. One organization whose reputation might just turn the tide of public opinion to positive is REACT, and Fred Chappell of Windsor, ON forwarded the following information to MT.

REACT stands for Radio Emergency Associated Citizen Teams. It is well-organized and respected by all law enforcement agencies anywhere in Canada and the U.S.

To belong, a person files an application. One must be cleared by the local law enforcement agency and must be a respected citizen. A prospective member cannot be an unruly person, like some people who flood CB with foul language and who don't care what they say or how they say it. REACT will not accept this behavior for any reason.

Next, the application and police clearance are presented at a meeting. The applicant is not allowed to attend the next meeting at which the team goes over the application. After acceptance, a long period of training follows.

REACT teams meet once or twice a month and members are expected to volunteer for various assignments. They use CB radio for the most part, although some may use a VHF-HI channel in Canada, or GMRS in the U.S. The group in Windsor, ON takes turns manning their communications center of CB channel 4, VHF-HI, and channel 9 CB, as they sometimes receive calls over the latter from Canada or the U.S.

The objective is to use the radio service for emergencies, disasters, and to be able to offer aid to individuals. They offer assistance to motorists, coordinate help via communications with the Red Cross, Civil Defense, local public authorities whenever needed, and give road reports and turn information over to local radio and TV stations.

Other duties REACT has taken over include patrolling traffic in areas used by runners, walk-a-thons, and parades.

To give you an idea of the depth of organization used in getting a parade underway may startle you. Several meetings may be held before the parade date with police, fire, ambulance personnel, parade marshals, radio and TV people, and Jaycees who make up the list of entries who will be in the parade. A copy of this list is given to all who will need it during the parade.

One of the leaders of the team with all radios in his car leads the parade. Some work with parade marshals in getting the parade in order takes place first. When the parade starts, another double-checks his list with another parade marshal, as with entries passing by. This person radios to a command car the actual order of parade entries, which may be different from the original list. The command car then radios the team posted with each radio and TV crew along the parade route. If there are any changes, the TV people especially are informed so that they don't look stupid on camera by giving wrong information. Everyone has a vital job to do.

There can be unexpected interruptions as we experienced during our last Santa Claus Parade. We knew of two funerals while forming the parade and made allowances, but the fire alarm at a local hospital was unexpected and several fire trucks and ambulances in the midst of the parade route could have thrown us for a loop. Fortunately, our team had prepared for such emergencies and everything went off according to plan, even though there was a little confusion.

Wherever there is a REACT team, I know they would welcome any respectable new member if you would care to join. Your own CB is an asset, especially if portable.

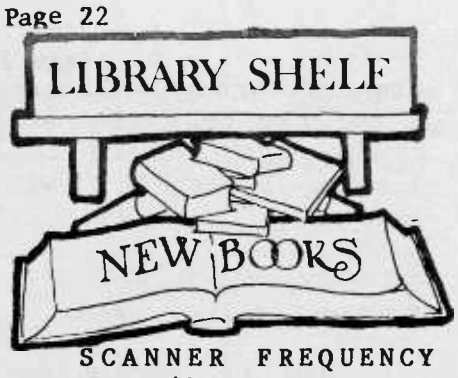
Thank you for the information, Mr. Chappell. It's unfortunate that certain bucket mouths have besmirched the reputation of citizen's groups such as REACT, and I hope that the childish individuals who also moved into the ham bands with their foul language are weeded out soon. Send an SASE to REACT International, Inc., 3653 Woodhead Drive, Northbrook, IL 60026 for more information, or contact your local organization.

Things I Like: Let's highlight two things this time, since I neglected to do so last month. I like the new appearance of the ANARC Newsletter, as revised by new publishers Mike Knitter and Randy Erickson. Although the clean-but--classy cover and mastheads are unique, I'd wager that the Ontario DX Association's bulletin was carefully scrutinized, as its quality appearance is the best among DX clubs' bulletins, followed closely by WTFDA's UHF-VHF Digest. Speaking of that bulletin, I like Doug Dornbos' "Antenna News", Bill Fahber's "Television News", and Dr. Bruce Elving's "FM News" as three outstanding examples of specialty writers who continue to volunteer their efforts to that club's publication, helping it to continue as a real class act.

It's not too soon to begin planning for ANARCON '85, July 19 to 21 in Milwaukee. For information, send 2 mint U.S. stamps or 3 IRC's to ANARCON '85 Convention, P. O. Box 24, Cambridge, WI 53523-0024.

And a last minute note from Wayne Heinen, NRC's "Medium Wave Interlude" announcer for HCJB: Wayne and another Denver area DX'er are trying to get in touch with area radio listeners for future get-togethers in his area. Call Rodney J. Johnson, Jr. at 832-4070 or Wayne at 699-6335, or write Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013.

That's it for this time; remember, April 10 is the deadline for the June column. Keep the good stuff rolling in. ●



SCANNER FREQUENCY DIRECTORY (for Northwestern Ohio, Southeastern Michigan) by Daryll Symington (83 pages, 5" x 8", softbound; P.O. Box 399, Dept. MT, Holland, OH 43528)

This third edition of Symington's compact scanner guide is quite current and includes a handy quick-reference table of contents, some introductory comments about using the book in general, and some helpful hints about getting the most out of your scanner.

Emphasis is on the primary quarry of scanner hobbyists: public safety, federal and local government, aircraft and marine, business and mobile phones.

The book is alphabetized by licensee, cross referenced by frequency and includes thousands of listings for the 16 county area. Special unit designators and codes for some law enforcement are also presentd.

SCANNER RADIO LISTINGS (Detroit/Windsor area) by Norm Schrein (257 pages, 8-1/2" x 11", softbound; $9.95 from Fox Marketing, 4518 Taylorsville Rd., Dept. MT, Dayton, OH 45424).

This latest in a growing series of detailed scanner listings from Fox, edited by MT's own "Tune in Canada" editor, Norm Schrein, contains over 10,000 frequencies and covers three additional counties not included in the earlier edition. Its total listings more than double that original volume!

Inadvertently, the proof-of-purchase logo was omitted from this directory; users who wish to obtain the free county printout may substitute a sale slip when making the request.

Review: THE WRTH

by
ken wood

Were the late Jack Benny alive today he and the 1985 edition of the **World Radio TV Handbook** would have something in common. They'd both be 39. Thirty nine years of publishing dates the WRTH back to just after World War II concluded. Lots of **us** aren't that old!

It might be an item for "Ripley's Believe It or Not." There are legions of shortwave broadcast listeners out there who have never heard of the WRTH! And being without one is nearly comparable to an airline pilot who hasn't got a flight plan, though perhaps not as dangerous.

The 1985 edition is neither a carbon copy of the last nor a radical departure from what we've come to expect. You'll find the usual continent-by-continent, country-by-country breakdown on domestic and international broadcasting, with times, frequencies, powers, languages, addresses and such.

It seems apparent that a genuine effort has been made to keep up with the landslide of changes which have taken place in Latin America over the past year although no listing, no matter how good, can be fully up to date for very long. The WRTH listings, however, seem as complete as can reasonably be expected.

Listeners who prefer program listening to DX'ing will find the usual solid data on the international broadcasters although the notes on actual programs are limited for obvious reasons - space and changeability.

This edition features another fine set of receiver and accessory reviews by Larry Magne, president of International Broadcasting Services, Ltd., although the section seems a mite smaller than in years past.

Other features of the 1985 edition include a review of the history of Swiss Radio International as that station celebrates a half century of service; a look ahead to the future of international broadcasting regulation; a feature on tropical band DX'ing and propagation expert George Jacobs peering into his crystal ball to predict 1985 reception conditions. There are also the usual compilations of DX clubs, time signal stations, programs in English, abbreviations, and the like.

Because of the nature of shortwave and its continual changes (propagation, stations coming on, going off, changing facilities, transmission hours, and such) the WRTH cannot fully cover everything. No book can. But the WRTH and its editors do the best job around in trying to capture all the aspects of the shortwave broadcasting picture.

Neophyte shortwave broadcast listeners will have many of their questions answered by studying the book and its listings.

For its scope and format, the WRTH simply cannot be beaten in the amount of information packed into one volume. Although its price continues to rise (now $19.50 but includes free book rate shipping if ordered from Grove Enterprises) it is still a bargain, even for the sometime- shortwave- broadcast listener. Don't pass it by.

(Ed.Note: A few weeks ago we asked MT reader and monitoring enthusiast John Parnell if he would like to write an objective review of our latest anthology, "The Best of Monitoring Times," 1982 through 1984. The agreement was that he should be totally honest and not pull any punches. He was, and here it is!)

Review: THE BEST OF MONITORING TIMES

More than three years ago, Grove Enterprises unveiled to the monitoring world an exciting and informative monthly publication: **MONITORING TIMES.** Since the first issue back in January 1982, MT has grown vastly and is now known as one of the field's most prominent publications.

Recently, however, Grove Enterprises outdid themselves again by introducing The Best of Monitoring Times, an anthology of the most popular articles appearing during the year. Three volumes are currently available, one for each year of the publication's existence. These volumes are simply a gold mine of information. Not only are the more traditional topics covered, but also the kind of information and expertise that can be found nowhere else.

The articles are bound neatly in these three volumes, each with a table of contents, allowing the reader access to the information. Each unique volume warrants a more detailed discussion.

The Best of 1982 Monitoring Times contains about fifty selections. The July 1982 article entitled "Listen in on VHF/UHF Press Relays" provides many timely tips and information on monitoring reporters of major radio and television stations. Another short but intriguing article, "Receiving Shortwave: Without A Shortwave Receiver" explains how a listener can combine an inexpensive signal generator and a tv set to monitor the world-wide transmissions between 2-30 MHz!

Several selections discuss the ongoing legal dilemmas in the monitoring world (i.e. who can listen to what). Although these legalities may never be completely fair, rational, or even understood, they represent a hot topic toward which more and more attention is being directed.

My favorite article in this volume has to be the article, "Out of Band Programming Tricks: Teaching Your Scanner to Do Tricks." This in-depth article discusses many models, emphasizing the popular Bearcat 300, 250, 220, 210XL, 200, 160, and 100 models with techniques for searching frequencies well out of the boundaries of each unit.

In addition to these (and many more) delightful articles, the 1982 volume also houses 23 questions and answers, many on topics for the more advanced reader.

The Best of 1983 Monitoring Times contains about 75 of the year's best selections. This edition contains several top-notch articles on short-wave and scanner antennas including instructions for building home-made antennas as well as information on choosing the best antenna for one's needs.

"Listen to Your Neighbors' Christmas Presents" is another of MT's extraordinarily intriguing passages; frequencies are provided for intercoms, portable telephones, radio-controlled devices, wireless microphones, multiple-point distribution systems (i.e. relays of satellite tv programs), and even microwave ovens!

Air to Ground Telephone" is a short but sweet selection providing the reader with frequencies and a few of the basics about aircraft telephone communications.

A personal favorite is "Tuning in on TV News Crews," which provides more insight into the world of press relay monitoring. This article not only contains more frequencies but also tells of exciting news stories, what was said, and how they were monitored.

Two "Survival Communications" articles by Mark W. Johnson are also reprinted. These passages discuss how government and other officials are likely to react to certain emergencies, what agencies and organizations are responsible for emergency management, and most importantly, how one can monitor those agencies.

The Best of 1984 Monitoring Times holds almost 150 readings. This volume is full of the types of "improvement" articles

LIBRARY SHELF cont'd

for which Grove Enterprises and MT have become famous. In addition to a wide variety of recent developments, human interest stories, and technical discussions, shortwave accessories (e.g. pre-amps, tuners and preselectors) are discussed. Eight of the most popular shortwave receivers are even covered!

In "Receiver Specifications: What Do They Mean?", sensitivity and selectivity are explained simply, but in sufficient detail, by Larry Antonuk. Adopted from the SWL Digest of Radio Canada International is a passage discussing harmonics and images, two examples, two examples of the "odd, unexplainable reception" one sometimes encounters on a typical shortwave receiver.

The volume also features numerous techniques to improve reception and control interference, building long-wave and medium-wave antennas, vertical antennas, pre-amplifiers, and preselectors. These have been reprinted from the "Experimenter's Workshop" column.

Highlights of the feature articles include "Scanning in the U.K.", which is simply a listing of frequency allocations in the United Kingdom. Bob McGovern's "Listening Laws: Section 605", and "Listening Laws: Pro-Scanner Legislation", help keep us up to date on new monitoring laws.

Unlicensed broadcasters, including the so-called "pirates" (i.e. radio hobbyists who enjoy broadcasting their own programming) and "clandestines" (i.e. government or politically controlled stations), are discussed in detail in John Santosuosso's article reprinted from August. This informative selection even provides logged frequencies!

Bob Grove's brilliant article, "Planning for Nuclear Survival", is an excellent discussion of the Federal Emergency Management Agency (FEMA) and its role in the event of an enemy attack or natural disaster. Various other passages address the topics of monitoring particular worldwide shortwave broadcasters; one even discusses reading Russian RTTY!

In summary, the three Best of Monitoring Times volumes are an absolute must for operators of any kind of communications equipment for several reasons:

1. Articles are written by experts in their respective fields. As editor of "Monitoring Times", Bob Grove obviously does an excellent job of filling his publications with timely news articles written by experienced personnel.

2. The selections are about subjects often covered only by MT. "Monitoring Times" is one-of-a-kind publication, covering a unique scope of monitoring interests. Each Best of Monitoring Times volume is full of vital information that may never be available anywhere else!

3. Each article has been incorporated into an easy-to-follow directory; the reader can instantly locate articles on ANY subject.

If value could be placed on knowledge, the cost of these three volumes would be astronomical! Fortunately, the Best of Monitoring Times is available at a very reasonable cost, representing one of the best book values available today.

IMPORT CATALOG FOR DEALERS

Are you a consumer electronics dealer or distributor? Then the Japan Electronics Buyers' Guide is for you! With almost 1000 pages in an 8-1/2" x 11" format, this profusely illustrated guide is published by Dempa, Japan's oldest and largest electronics industry publisher.

From tiny circuit components through elaborate satellite receiving stations, the Japanese EBG lists manufacturers, distributors, and their products cross referenced by product category, manufacturer, and representative or agent for import.

Published once a year, the EBG costs $140 for the full volume and is thus not an impulse item; but for prospective dealers and distributors who are serious about inquiring as to what is avaiable in the consumer electronics market from Japan, it is the ultimate reference.

For further information about this and other Dempa electronics industry publications, write Karen Lewitz, Circulation Manager, Dempa Publications, Inc., 400 Madison Avenue, New York, NY 10017.

BROADCASTING. . .

HANK BENNETT ON SHORTWAVE

PIRATES - AND SOME UNFINISHED BUSINESS

In the second portion of our brain stumpers that we ran a couple of months ago, the winner was Ron Zimmer of Medford, New Jersey. Congratulations! He will be receiving a book from the Grove library in near future.

One further item - back in the January issue we tossed out a question concerning one Eugene Orowitz. We mentioned that he used to tease our dogs and we wondered if anyone out there knew who he was. The answer: Little Joe Cartwright of the "Bonanza" series, probably better known as Michael Landon. We received many answers on this one but not a correct one in the bunch.

As mentioned in my column last month, I've been asked to present my views on pirates and bootleggers. I've avoided this subject in the past partly for personal reasons and partly out of deference to the fact that we have some mighty fine people writing on that subject right here in Monitoring Times.

Back in the days when I was writing monthly columns for the Newark News Radio Club and later, for another and virtually unknown shortwave club, I very rarely gave any publicity to pirate stations operating within the confines of the United States. For taking the position that I took, I was criticized and praised, probably about half and half.

I have never approved of anyone living within our country operating a radio transmitter without being properly licensed. I suppose the basic reason for this is the fact that I had to obtain a license to operate my own ham station many years ago (which is still intact, by the way) and I had to get it the hard way - by learning the Morse Code and sufficient technical knowledge to pass the FCC examination, to say nothing of radio laws and regulations.

Why should I condone anyone else coming along and getting on the air by ham radio, or as a standard or shortwave broadcast station, or any other way, simply by acting like a big shot and thinking the government is going to look the other way? And yet this is being done more and more every day with the operators virtually thumbing their noses at Big Uncle.

Those pirate stations operating in any other country was, to a point, another matter. Many of them could well be operating with the knowledge of the officials of their respective countries. Some of them might even qualify as a good DX catch, but whether their QSL cards, if obtainable, would qualify their owners in any awards program would be highly debatable.

And yet, not all of the blame can really be heaped on the bootleggers themselves. There have been times when our own FCC simply would not act to put them off the air. Years ago I was tuning 1600-1700 kHz (just above our AM broadcast band) and I found a signal that I knew shouldn't have been there. The more I listened the more I was convinced that it was a pirate and I made it a point to try and find out where.

The operator, obviously a teenager, in between pieces of music, made mention of the fact that their school was to be closed the next day because of a very heavy snowfall - and he mentioned the depth of the snow. He also mentioned the name of the school but at the time that meant little because it was a regional name and did not contain the name of the city or town in which the school was located.

My first telephone call was the National Weather Service to ascertain what area had just received a snowfall to the depth mentioned on the air. No problem; the only area within 500 miles of me was a small area in Massachusetts in or near the Berkshires and then, only in a very small area.

Call number two went to a relative in that state who was an educator by profession. Given the name of the school, it took her only a few minutes to locate the town. A quick note to the the principal of the school requested that he investigate the goings-on and shut down the station since it obviously wasn't licensed. The station was not on school property but certain remarks made on the air led to the quick discovery of the boys involved.

My intention was to try and convince these kids that the could run into serious problems that could easily affect their future and if I could help them in any way to become affiliated with a licensed operation, they could still get some good broadcast education in a legal manner and probably

HANK BENNETT cont'd

get paid for it as well. The principal took the matter in hand and convinced the kids to shut down their operation and no one was any the wiser.

A short time later I learned that another party had also heard the station and had tried to get a near-by FCC office to investigate and possibly to run down the bootleggers. The FCC office reportedly couldn't be bothered.

There are many bootleg stations opearating as I write this and some of them are really entertaining. On the other hand some of the stations should be busted as quickly as possible because of the offensive nature of what is being allowed to be sent over the air. Nevertheless, none of the stations is legal and, under our present laws, they are operating in complete defiance of the rules of our country.

Now and then we get word that a station here or there has been found and quickly forced off the air but others are still there and more are popping up each day.

The upshot of all of this is that we have rules and regulations in our country governing pirate stations. These rules should be strictly enforced without exception. OR THEY SHOULD BE REPEALED.

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As long as we still have laws regulating against pirating and bootlegging, I shall not publicize any station operating in this manner. However, this is not to say that I am against anyone else giving them publicity or even encouragement. Good friend John Santosuosso and unknown acquaintance Havanna Moon both have find columns on the subject in this publication and what they write is their business. And long may they be able to continue their columns.

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Next month I shall continue on the subjects of pirates and I will try to offer a possible solution to this problem. Please tune in to this column at that time, read it carefully, and let us have your opinions and comments.

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Do you have your own station card? We're referring to what is probably more commonly known as SWL card-swapping cards similar to the ham radio QSL cards. Send us one that we might be able to use in a forthcoming column. ●

SWL WORLD WATCH

by Ken Wood

If you've never had the experience of sitting in front of a typewriter, staring at a blank piece of paper, and wondering what to lead off with - well, you haven't lived. I have to admit that it's a fairly new (and unsettling) experience. Even Jeeves had no ideas for me but I suspect he's holding back, saving something for further down the line. Despite a long list of pretty good loggings, recent conditions have been less than spectacular and the digging is tough. Let's get right to it.

TOP 'O THE LINE:

KCBI, the new religious station near Dallas, was testing during late December and early January using 11.790 between 1900 and 2100. As of this writing they are off the air again but were expecting to begin regularly scheduled programming in March. A few have already received QSL cards. The address is KCBI, Dallas, TX 75221.

A long-silent Venezuelan, Radio Liberatador has returned to the air on 3.245 variable. Try it in the evenings. Sign off not monitored but is probably around 0400.

AFRICA

Angola - Radio Nacional continues to be heard quite regularly on 5.334 variable, all Portugese, late afternoon and evening US time.

Cameroon - Younde has English from 2100 on 9.745.

Equatorial Guinea - Radio Malabo is on 6.250 to sign off at 2200 and again from 0500 sign on. Radio Bata on 4.926 in the same time periods, both all Spanish.

Ethiopia - Voice of Revolutionary Ethiopia in English at 1500 on 9.560 with news and features. In Amharic with station identification and mentions of Ethiopia on 7.110 at 0400.

Guinea-Bissau - Radio Nacional on 5.475 to 2355 sign off and again at sign on just before 0600 with drums, identification and anthem. All in Portugese.

Liberia - ELWA now using 4.760 and heard from 0600 sign on. LBC (ELBC) noted on 3.255 at 0600 with English and a variety of music.

Madagascar - Radio Madagasikara on 5.010 from

opening with interval signal on 0255.

Malawi - Malawi Broadcasting Corporation on 3.380 from 0330 in English.

Mali - Radiodiffusion Nacional du Mali at 2300 on 7.285 up to sign off at 0000 and in parallel to 5.995.

Mozambique - Radio Maputo, 3.210 noted at 0330 with a time check, chimes, identification all in Portugese. Also in Portugese at 0355 on 9.618 (Gary Hickerson, Arkansas).

Nigeria - Plateau Broadcasting Service at Jos on 5.965 in English around 2100. Signs off at 2305 after network news from Lagos.

South Africa - Capital Radio, Transkei on 3930 with English and disc jockey; rock music at 0300.

Swaziland - Trans World Radio, good at 0400 sign on on 9.725 in English with an ID. (Hickerson, AR).

Zambia - Zambian Broadcasting Corp. on 4.910 after 0400 sign on with African music, English announcer until 0430 when into vernacular.

Zaire - La Voix du Zaire at Lubumbashi has reinstituted 4.751, in parallel to 7.205. Late afternoons and from 0400 sign on. Radio Candip, 5.066 also signs on around 0400 but is an especially tough logging.

Zimbabwe - Zambabwe Broadcasting Corp. at 0325 on 3.396 with English and an identification.

ASIA

Bangladesh - Radio Bangladesh heard by Gary Hickerson from 1315 sign on on 7.105 beaming in Nepali to Nepal. Exotic music but transmission lasts only half an hour. (Hickerson)

New Kabirpur transmitter in use for English at 1230-1300 on 11.935.

Burma - Look for the Burma Broadcasting Service on 4.725 in the mornings around 1100 GMT, in Burmese.

Indonesia - Radio Republik Indonesia at Ujung Pandang on 4.719 is the most regular of the low band Indonesians. Check around 1200. Network news from Jakarta carried on the hour.

Japan - NSB can sometimes be heard with Japanese language programming around 1100 on 3925.

Nepal - Radio Nepal on 5.005 at 1300 but weak, in Nepali and playing local music. Watch out for the Radio Malaysia outlet at Sibu, Sarawak, also here in that time frame.

North Korea - Radio Pyongyang being heard in English at 2300 on 9.745 and 15.230, 0800 on 9.765 and 0000 on 12.115.

Sri Lanka - Sri Lanka Broadcasting Corp. heard at 1500 in English with its commercial service on 15.425.

USSR - Radio Dushambe on 4.635 can occasionally be heard around 0100, in Russian. Vladivostok on 5.015 hard with Mayak relay around 1200.

CENTRAL AND SOUTH AMERICA

Bolivia - Among the more reliably heard Bolivians are Radio Padilla, 3.479; Radio Riberalta, 4.697; Radio Mamore, 4.739; Radio Nueva America, 4.797; and Radio Illimani, 6.025 - all early mornings or evenings.

Brazil - Radio Equatorial at Macapa on 3.375 noted after 0430 with quite good signals. Is a new name for Radio Educadora Sao Jose.

Chile - Radio Agricultural on 9.630 heard with news in Spanish at 2300.

Colombia - Two stations from this country, normally covered by utility outlets have surfaced recently; Ecos del Combeima on 4.785 and Ondas del Orteguaza on 4.975 both in evenings or early mornings.

Cuba - Radio Rebelde continues to be heard on 5.025 at good strength although it was missing for a few days in January.

Falkland Island - Gary Hickerson hears FIBS on 3.958 as early as 0200, best in upper sideband which cuts down on the ham, QRM, he says.

Ecuador - La Voz de Upano, 5.040 is often good around 0400 in Spanish as is Radio Catolica Nacional on 5.055.

French Guiana - RFO

***WORLD WATCH** cont'd*

Cayenne signs on with an interval signal and anthem at 0900 on 5.055.

Guatemala - Radio Tezulutlan has reactivated its 3.370 frequency, running in parallel with 4.835 early mornings and evenings.

Guyana - GBC noted on 5.950 with Hindi music following a 1000 newscast but rather badly QRM'd.

Mexico - Radio Huayacocotla 2.390 occasionally in the early evenings but beward of La Voz de Atitlan, Guatemala, also here.

Nicaragua - The three Sandinista stations continue to be well received. La Voz de Nicaragua pm 6.015 (with English at 0100 and 0400), Radio Sandino on 6.200 and Radio Zinica on 6.120 (best early mornings).

Paraguay - Emisoras Paraguay now heard occasionally on 6.015 from around 0830.

Peru - Radio Colonial, 6.137, can occasionally be squeezed out of the QRM around 1130 (but sign-on is highly variable). Good Latin conditions may also bring in Radio Municipal de Calca around 0200 on 6.242.

Uruguay - Radio El Espectador on 11.835 noted occasionally around 0200 or earlier. All Spanish with news, time checks and station identifications.

EUROPE

Albania - Radio Tirana scheduled in English to North America at 0000-0030 on 7.065 (variable); 0130-0200 and 0230-0300 on 7.120; 0330 to 0400 on 6.200 and 7.300; and 1230-1300 on 9.555 and 11.960.

Finland - Radio Finland heard at 1800 in English on 11.955 and at 1500 on 15.400.

Luxembourg - Radio Luxembourg at 1800 in French on 15.350, and at 0030 and 0330 on 6.090 in English with rock music, ads, weather, news.

Malta - Radio Mediterran in French and English to 2328 sign off on 6.110. Uses the Deutsche Welle "Cyclops" transmitter.

Vatican - Vatican Radio on 6.252 in late afternoons and late evenings, in Italian.

Yugoslavia - Radio Yugoslavia noted with English at 2000 and again at 2315 on 9.620.

NEAR AND MIDDLE EAST

Afghanistan - Radio Afghanistan vis USSR facilities on 4.450 at 0300.

Clandestne - "Radio Iran" carried by Iraq transmitter on 7.425 from 0120 to 0330.

Iraq - Baghdad now uses 6.190 rather than 7.130 to 2300 sign off. In parallel with 7.120, 7.260, 9.505, 9.635 and 9.665.

Kuwait - Radio Kuwait on 9.840 at 1700 in Arabic; at 1900 on 11.675 in English with their usual wide variety of music.

Lebanon - Voice of Hope heard just before 2205 sign off on 6.215 with English ID, requests for reports. This is run by High Adventure Ministries which is also putting KVOH on the air from California.

Qatar - QBS is on 9.905 in Arabic from around 1430 tune in.

Saudi Arabia - Broadcasting Service of the Kingdom of Saudi Arabia now heard with English at 1900-2100 on 11.840. Also regular in Arabic on 5.870 at 0400, a move downward of 5 kHz.

South Yemen - Aden occasionally noted on 6.005 in Arabic late afternoons and evenings around 0300 although often through heavy QRM.

Syria - Damascus now has English to North America at 1200-1300 on 17.510, and English to Europe at 2000-2100 on 11.685.

United Arab Emirates - Voice of the UAE, Abu Dhabi has a high power transmiter now on 4800, mostly Arabic but some English IDs; noted 2200 and well into the evenings with QRM from Ecuador. Reports requested to P.O. Box 63, Abu Dhabi.

Yemen - Radio San'a tough on 4.853 in Arabic around 0400.

NORTH AMERICA

Alaska - Current schedule of KNLS is English from 0700 to 0900 on 9.540; Russian from 0930-1200 on 6.170; Chinese 1200-1500 on 6.170; Russian from 1500-1730 on 7.355; and English 1730-2000 on 7.355.

OCEANA

Cook Islands - Radio Raratonga now runs 24 hours per day on 11.760.

Kiribati - Radio Kiribati's most recently available schedule (in English and Kiribatese) 1830-2000, 0000-0130 and 0600-0930 weekdays; 1830-0130 and 0600-0930 Saturdays; 0000-0130 and 0600-0930 Sundays on 9.825 or 14.802.

New Caledonia - Radio Noumea 7.170 all French during the 0600 time period and running well into the early morning hours.

Papua New Guinea - Radio Western Highlands, 3.375 at 1200 in Pidgin with country western music.

Solomon Islands - SIBC on 5.020 and 9.545 around 0800 in English and pidgin with pop music, BBC news, public service announcements.

CHALLENGER--Try Turkish Police Radio which, despite its name, is a broadcaster, not a ute. Operation is from 0600 to 1000 (at least that the official schedule; it's been noted earlier than that - 0500 - as I recall). Needs good conditions but many DX'ers have bagged it over the years. Verification is by QSL card.

JEEVES SAYS--I've been out shoveling white stuff and just came in to look over Ken's collection of logging goodies. Not bad at all considering, as he notes, generally poor conditions of late. Keep watching for the official arrivals of WMLK - NDXE - KVOH - KCBI all due on during the first half of this year.

Don't forget to keep us advised of what stations you are logging - we'd like to include them via Monitoring Times headquarters. Ken and I will see you next month. 73's -- and thanks.

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

The subject for this month is TRAVEL AND TOURISM!

It's a rather strange thing; I feel, that so few stations have actual program time dedicated to Tourism; that's not to say they have no interest in the subject, but they tend to miss an audience, I believe, by leaving other sections of their programs to include material which may be very stimulating to one's ideas about visiting a foreign country.

Let's take a look at what is available to the shortwave listener.

AUSTRIA

ORF does cater specifically to tourists with the program "Report from Austria" on Saturday/Sunday when it includes "For Tourists", aired at 0130/0330 for East Coast listeners and at 0430 for the West Coast. The problem is reception clarity since they have limited frequencies; they used to be on 5945/9700 but I hear them now on 6000 which is badly interfered with by other stations.

ISRAEL

Kol Israel has a special program: "This Land-Tourism" at 2000 and 000/0200 UTC on Tuesdays, respectively on 13745/11655/11960/9815/9440 to Europe, some of which might be quite strong; and 11655/9815/7410 to North America, the latter providing good, reliable signals.

SWITZERLAND

SRI has an interesting program which although not acutually entitled for tourists, provides the kind of information that might spark your interest; it's "Roundabout Switzerland", aired on the weekends...and don't forget their competition I mentioned previously-"Swiss Mosaic" ... Someone is going to WIN a free holiday there! Sunday is the day for "Roundabout" on 6135/9725/ 9885/12035 to the east coast at 0145; and 9735/12035 to the west coast at 0430.

CHINA

Yes, believe it or not, Radio Beijing has a regular program to encourage visitors! It is aired on Tuesdays and is entitled "Travel Talk". It seems that these days just about everybody who can arrange a conference or some kind of educational trip is going off to visit the land of Mao! I suppose this is a reflection of the country's leadership wanting to open up their land to the foreign visitor (though not as a resident so easily!). Programs are beamed to North America and elsewhere-try 11860/11650/9860/9820 at 0000/1100/1200 and see which is the best with you; they are apt to switch channels without much notice and these may not be up to date when you read this.

The 9 MHz band seems to be the most reliable, so "fish" for them in this region. They have some most attractive descriptive programming and the music is fascinating.

SPAIN

As previously mentioned, REE has a regular series of programs: "Looking Around Spain" (Monday), "Visit To Spanish Towns and Cities" (Tuesday), "Shopping in Spain" or "Tourist Newsletter" (Thursday), "Spanish Cookbook" (Friday)....well, you can't ask for much more than that, can you? Try 9630/11880 at 0000 and 0200 daily. Excellent signal on 9 MHz channel, really the "indicator" for propagation conditions on the band.

HOLLAND

Radio Nederland has a "Monday Report" program, but I'm not sure whether one should include this with tourism or not! The bulletin describes it as "A survey in magazine form of life in the Netherlands"...so you must listen

ENGLISH LANGUAGE cont'd

and judge if it might increase your appetite for a visit! 0230 on 9590/6165 and 0530 on 9715/6165...the latter (6 MHz) being more reliable in strength.

AUSTRALIA

Two programs of interest here: "This Australia" about life, culture, and industry at 0330/0610/1810 UTC and on Saturdays only (also once at 2112 on Friday); and "You Asked For It," answering listeners' questions-0100 Sunday, 0330/0730 Thursday. 9580 is the old faithful channel but see the chart for other possibilities.

TURKEY

If you can hear Ankara (I haven't recently, but then they are an "in-and-outer", sometimes with terrific signals), they have a specific tourist-oriented program "Turkish Album" listed for Tuesday at 1200/2200. 9560 seems to be the only frequency available, but I would not be certain about this since I prefer to speak from reception experience.

ECUADOR

Not only does the Voice of the Andes inspire interest in the country with its beautiful music, and programs of vivid description about the different regions of the land, but they actually organize tours of HCJB and Quito. Write to them for details if you are seriously interested: Box 553000, Opa Locka, FL 33055. As for programs, the most informative is "Passport" which features on Fridays special topics such as "Carnival in Ecuador", and "Banos-Doorway to the Jungle", to quote two recent examples.

SOUTH AFRICA

Radio RSA has some fascinating high quality programs about the natural attractions of the country. It's difficult to say what might interest you on a given day, but try "Our Wild Heritage" and "People of South Africa" for stimulating ideas. Perhaps the best, however, is "Under The Southern Cross"; yours truly just heard a most interesting commentary and interview program about a "different" kind of holiday-the Summer School at the University of Capetown, sounded very interesting including the accomodations at Fuller House. See regular schedule for times and frequencies.

U.S.A.

Yes! Even the VOA has some programming indirectly related to the visitor, but I expect it is more interesting to the overseas listener! "Magazine Show" features interesting events of special nature in different parts of the land (Americana and culture-0230 to the Americas).

U.S.S.R.

Radio Moscow presents "Round About the USSR"-short of actually doing it, the best way to visit the USSR--as their bulletin describes it. Tuesdays at 0230/0630/1230/1930; Thursdays at 0430/0930/1630/2230. Frequencies? Just about anywhere! They "own" the 41 meter band, for example!

BRITAIN

Well, well! Bottom of the list! A totally lamentable lack of enterprise on the part of the BBC leaves me at a loss as to what to say on this subject. There are, perhaps, three programs that might be of interest to you, but they are a bit off the topic and whether they would inspire you to call your travel agent, I really don't know!

Try to listen to one of these: "Outlook" - people, events, opinions, latest UK news, sports, weather (ugh!) - not all about the UK by any means; "About Britain" - looking back on the week's events - might be anything from politics to sport! "News About Britain" is just that and might scare you away (battles of the miners, strikes, etc.). But you never know; sometimes there are intriguiging items of information.

So that's it folks; good listening, and have at least a good armchair journey!

MONTHLY SUMMARY OF MAIN INTERNATIONAL BROADCASTERS

BRITAIN: BBC	1100-1400	17790	15070	11775		
	1400-1800	15400	15260	17885		
	1800-2030	15400	15070	12095		
	2200-0430	15260	9515	7235	6175	5975 *
	0430-0600	9510	7185	6175	5975 *	
	0600-0900	9510	7150	6175	5975 *	
RADIO AUSTRALIA	0800-1600	9580	(6060)	(6080)		
	2100-0400	17795	15395	15320		
RADIO RSA	0200-0256	9615	6010	5980		
USA (VOA)	0000-0400	11675	11580	9455	6130	5995
ISRAEL	0000-0230	9440	7410			
ECUADOR HCJB	1200-1530	17890	15115	11740		
	0030-0700	15155	9745	(6095)		

*indicates available part of time slot
( ) frequencies may be audible

PIRATE RADIO

by
John Santosuosso
P.O. Box 1116
Highland City, FL 33846

CHILE: On December 16 the government of military dictator Augusto Pinochet raided a clandestine rebel radio station, Radio Liberacion, in a Santiago suburb. Fernando Vergrea, a member of the Revolutionary Left Movement, was killed in a shootout with the police in an unsuccessful attempt to keep them from entering his home where the station was located. In addition to broadcasting equipment, the government said it seized sticks of dynamite and two submachine guns. Our thanks to David R. Alpert of New York for this information.

PERU: "In 1984 the most violent and aggressive terrorist group in the world was the Sendo Luminoso (Shining Path) of Peru. Radio Havanna regularly broadcasts instructions to the Shining Path in English, Spanish, and Quechua (an Indian language). One Cuban radio program is devoted exclusively to inciting its listeners in Peru, Bolivia, and Argentina. The program is entitled, 'A Los Cuatros Suyos' (the four of yours), and its popular slogan is 'Justice is written in blood.'"--Ryan Quade Emerson in **Terrorist Intelligence Report,** Jan. 15, 1985. Does anybody know the scheduled time for this broadcast?

CUBA: A confidential source claims that once Radio Marti begins broadcasting the Reagan Administration will not interfere with clandestine broadcasting efforts by anti-Castro organizations. Past transmissions have been stopped so that the Administration could appeal to Congress that there were no successful broadcasting efforts directed toward the island.

This same source declares that both Radio Marti, operated by Junta Patriotica Cubana, and Radio Antorcha Martiana, the station of the Movimiento Insurreccional Martiana, plan to greatly increase their output. A major suburban Miami company, well known in the Cuban exile community, is said to be the chief source of funding for the Antorcha Martiana transmissions. In a related development, a new anti-Sandinista station, operated by CIA-supported Contra groups, is supposed to begin transmitting to Nicaragua in March or April.

Meanwhile, Florida's David Crawford has received word from recently reactivated La Voz de Alpha 66 that they will be using the frequency of 6666 kHz. Dave reports hearing them January 31 from 0200 to 0229 sign off, although reception was poor. This writer logged them around 0215 on February 5 with a fair to good signal.

For those of you on the West Coast who may find reception of the anti-Castro clandestines somewhat difficult, California's Chuck Boehnke has had good reception of La Voz del CID transmissions on 6300 kHz.

BRITISH COLUMBIA: The Vancouver Sun reported that on December 31 Canadian authorities shut down a pirate in the Vancouver suburb of Burnaby. Broadcasting on 89.7 MHz, the station called itself Underground 90 and was heard as far away as Ferndale, Washington. It used a 50-watt transmitter and a $600 antenna located on the balcony of the 17th floor apartment of Marty Young. His associate Andy Hoffman claims to have actually started the station in Delta in 1979 with a one-watt transmitter built from surplus cable TV equipment.

The present operation had been on the air about a year when the authorities raided it. In addition to the transmitter and antenna, about $5,000 worth of stereo

PIRATE RADIO cont'd

equipment was seized. Station policy was to play "everything and anything." Thanks to British Columbia's Alan Latval for this report.

NEW DX PROGRAM: Phillip Dampier of the DX Radio Network informs us that his organization will be producing a DX program for shortwave station KNLS in the near future. The program will devote considerable time to clandestine broadcasting. We hope to provide readers with information on time and frequency at a later date.

PROGRAMMING PERSPECTIVE BY JOHN T. ARTHUR: "74-WKUE, where all the good songs have gone" blares the radio; then Mr. Koffee wires up with Paul Revere and the Raiders, the Kingsmen, the Turtles, and Tower of Power. WKUE is a new station specializing in old music and "we make the WIMP weep!" The signal is well modulated with processed audio for maximum readability; programs are "pro-sounding", to quote one listener. The telescoped tape I received contained only a good cross section of music and live IDs, but Mr. Koffee hasn't had time to do much production. With just a little more creativity I expect 74-Q will become a favorite. Watch for this one!

WKUE is presently getting QSL cards printed and will send a form sheet until the arrive. Send a detailed reception report and three mint first-class stamps to 74-WKUE, Box 5074, Hilo, HI 96720.

QSL DIRECTORY: Here are the mailing addresses of some of the free radio stations listed in the 5th edition of John Arthur's Directory: WCFR, 2226 South Gunderson, Berwyn, IL 60402; KDNF, 2248 West 37th Street, San Pedro, CA 90732. KHO, Box 144, Riverside, NJ 08075; Radio Sound Wave, Box 393, East Moline, IL 61244.

The following can all be reached via Box 245, Moorhead, MN 56560: WDX, Radio North Coast International, The Crystal Ship, Zeppelin, and Radio Worldwide.

Remember to enclose three mint first-class stamps with your report. Mail drops only forward mail. They cannot guarantee a reply.

THE KFAT LEGEND: We received a very interesting letter from Robert Severance of Idaho. He notes that there have been various pirate operations based on the original KFAT. However, the man who originated this unique humor/country format was "Dallas Pobro," is actually Michael Hess.

Hess, a friend of Bob's, was a disc jockey at KSKI in Ketchum, Idaho, before he took the job as program director and DJ at the original KFAT in Gilroy, California. There he developed quite a "cult" following. The various pirate KFAT's continue to use his format and sometimes his original tapes. We hope to have an in depth look at this man behind the legend in a future column.

IRAN: The Kuwaiti airliner hijacked last December and flown to Tehran was involved in an unusual clandestine radio communication. The hijackers apparently forced an American, Charles Kipper, to broadcast a radio message from the cockpit of the plane. Kipper said the hijackers wanted to end the issue peacefully, but that their demands had to be met because they were serious. He pleaded for cooperation to prevent further killings.

LOGGINGS: We were amazed at the tremendous number of loggings received from readers over the past month. Keep up the good work everybody! Now let's take a look at what you've been hearing.

Rex Whetzel in Indiana reports an unidentified pirate on the FM band Christmas Day from 0547 to 0652. The station played a mix of Christmas and rock music but did not identify itself. This logging is a reminder that not all pirate activity is confined to the shortwaves.

From Massachusetts Dave Beauvais writes again to let us know he heard one of the classic Radio Morania tapes being aired January 5 from 0900 to 0930 on 1622. This program contains the hilarious skit entitled, "On the Trail of the 6,000 Pound Spaghetti Harvest," which is a satire on the type of programming sometimes aired on Eastern bloc stations.

Only two Radio Morania programs were ever made, and we understand there will be no more. Although now several years old, they still turn up from time to time, and they always make for entertaining listening.

In Nova Scotia Norman Morgan informs us he pulled in Pirate Radio New England on a clock radio! The station was broadcasting 1940's era songs along with comedy skits, January 1 from 0513 to 0600 on about 1615 kHz.

Do you have to be a veteran DXer to bag pirates? Some think so, but Jeff Everetts of Ohio proves this is not the case. He has been DXing for only about four months and already has two. January 19 he logged KQSB on 7416 from 2008 until 2021 sign off with music, comedy, and phoney ads. January 26 produced an unidentified on 7391 kHz from 2130 to 2140. This one featured a comedy skit about an invasion of "killer sheep" and ended with the sheep invading the studio. Anybody know who this was? Jeff would certainly like to know.

Out in California Chuck Boehnke heard KNBS "Free Radio Relay Station" January 27 on 7420. Chuck tuned them in at 0300 and listened for two hours until deteriorating conditions made him call it quits. We understand this station specializes in relaying programs produced by other pirate loggings.

Bill Dang up in Alberta writes again with a host of loggings. If you can assist Bill in tracking down his unidentifieds he would appreciate it. He did get an ID for KRZY, a USB station, heard 0103 December 25 on 6240 with Beatles, Blood, Sweat and Tears and other groups.

Back on October 7 Bill had what appears to have been a relay of KWGX-FM Tulsa, Oklahoma. He logged this on 6209 kHz at 0212 carrying a program entitled, "Jazz Revisited." The relay station is not known.

October 15 brought an unidentified on 7412 at 0144. The station had a phone-in show with an 800 number and took calls from Chicago, California, and Washington. On November 1 Bill got a logging of WBST on 7413 at 0129. The station had a satire on an evangelist and also a monster attack.

A station which appeared to be IDing as WTRA or WPRA was heard November 10 on 7404 kHz with Beach Boys music until 0238 sign off. Finally, on November 22 on 7433, he logged a station playing rock music until it abruptly left the air at 0038.

That's it for this month. It was great to have three Canadian contributors. Now does anybody down Mexico way read this? Una carta, por favor! Muchas gracias!

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon

BACKROOMS AND CODED MESSAGES

Spanish, German and English transmissions of the four and five-digit types are at an all-time high from 6800 to 6995 kHz most evenings!

If--I STRESS THE WORD, "IF"--you have NEVER heard a "numbers" transmission, this portion of the spectrum is where the action can be monitored from 0000Z to 0500Z each and every evening. In addition to these transmissions, you'll hear transmissions of the "KPAZ and CIO2" variety as well as the mystery "D" beacon on 6804 kHz, usually first audible about 2330Z.

These frequencies are rapidly assuming "Casablanca"-like characteristics. One wonders in amazement at the web of intrique so OVERTLY spun on these once "ho-hum" frequencies.

It's most difficult to label these transmissions as "spy" since it is logical to assume that spies would communicate in a far more covert manner. It often seems as if those behind these mysterious "number" transmissions are going to great lengths to be heard around the world.

These are certainly not the transmission types that governments DON'T want you to hear!

The mystery deepens...

PHONETIC ALPHABET STATIONS

The most commonly monitored "phonetic alphabet" stations (female voice repeating, "victor lima bravo two") include:

VLB2....4670 kHz
SYN2....5640 kHz
CIO2....6790 kHz
KPA2....7445 kHz

All frequencies are plus or minus 2 kHz.

It might be noted that VLB2 is often monitored as early as 0000Z. This station was last heard on 02/11/85. KPA2 may be monitored on several other frequencies other than 7445 kHz.

Monitors are reminded that these stations are often difficult to tune. This is--in part--because

LOS NUMEROS cont'd

SOME of these stations transmit upper sideband AM.

HOT "NUMBERS" FREQUENCIES

You'll find 5-digit Spanish most evenings and early morning hours on these frequencies:

3445 kHz....0440Z
4055 kHz....0330Z
4125 kHz....0230Z
4443 kHz....0200Z*
5220 kHz....0600Z
6225 kHz....0400Z
6770 kHz....0700Z
6780 kHz....0730Z
6880 kHz....0430Z
6895 kHz....0700Z
7525 kHz....0300Z

*This repeat frequency for 4443 is 3444 kHz at 0230Z.

These two frequencies have been monitored only on Saturday. There are several "numbers" frequencies that are active only one or two days a week. Messages are usually very short on these transmissions.

THE ON-AGAIN, OFF-AGAIN SAGA OF RADIO MARTI

There's another delay in Radio Marti's transmission target date. No official reason except for vague mentions of technical problems. The last anticipated target date was January 29th.

You may hear them by late spring on 1180 kHz. I often wonder if the folks in Washington are really all that serious about this broadcast venture; they've certainly spent enough of the taxpayer's money over the months!

It's doubtful if you'll ever see a Radio Marti QSL on the pages of Monitoring Times.

THE RETURN OF ALPHA 66

Is Alpha 66 fed up with the delay of Marti transmissions? Whatever the reason, the Voice of Alpha 66 can be heard around 0200Z on various frequencies just above 7400 kz. Signals are weak with heavy distortion.

A CITY OF INTRIGUE: MIAMI, FLORIDA

Secret meetings among various exile groups with strange sounding names as Miami fast becomes the "intrigue center" of the United States.

My sources tell me that Miami has now become the meeting place of choice for Latin American and Cuban intriguers.

Many deposed leaders of Latin American countries have resided in Miami as exiles over the past years. The most recent of note was the late General Anastasio Somoza of Nicaragua.

My Florida sources also indicate that 5-digit daytime Spanish transmissions are common on 3090 and 4030 kHz. Another highly reliable source says that a "numbers site is located very near Miami." The same source also says that it's his opinion, from past experience, that sites also exist near Havana, Cuba.

It's most curious that this source does not think that these 5-digit transmissions are spy related; he will not go into further detail.

KEY WEST, KEY LARGO AND POINTS BETWEEN

Those KGB and GRU nasties are at it again. Recent press reports indicate that OUR Government--in anticipation of the opening of the new and strategically located Washington Soviet Embassy--has undertaken some very-high-tech safety measures to prevent the KGB and GRU snoops from using electronics means to listen in on conversations of the U.S. Senate Intelligence Committee.

Among other things, offices are said to be shrouded in aluminum.

A STRANGE GROUP OF TRANSMISSIONS

A "phonetic alphabet" station transmission mixing (?) with a 4-digit Spanish transmission? The time was 0200Z on 02/11/85 on 6840 kHz. EZI2 (phonetically) joined by a 4-digit transmission about five minutes after start of EZI2 transmission. The 4-digit Spanish transmission ended abruptly after about 30-seconds. Transmission ended in the middle of a group. EZI2 transmission also ended at this time. Very strange "knocking" tpe sounds heard for several minutes after this curious mix.

THIS EZI2 IS SAME AS SKPA2 YL! SIGNAL ON BOTH WAS VERY STRONG!

To Larry in Miami = Al-44 not agreeable. Hal M.

THE LIBRARY SHELF

'GOVERNMENT RADIO SYSTEMS. That's the title of a new publication by Robert Kelty of San Jose, California. I'll venture this is a great publication without even taking a look.

The fact that Mr. Kelty is a long lost friend that suddenly appeared on the pages of Monitoring Times really blew me away. It's your turn to be shocked, Robert. I'm going to let you wonder for a while before I contact you. Here's a clue for you: remember all of that stale coffee and those long and often boring Honolulu nights? You might also remember the Santa Cruz merry-go-round.

It's good to know that you're doing well, friend. Next time I'm in San Jose I'll give you a call just like last time.

I JUST CAN'T RESIST

I just can't resist terminating this column with a few codes groups. Have a go at these groups: 35221, 30301, 60690, 90070, 94604 Clue: You can find this code in a book. Have a go at this one, Bob Russ.

LOS NUMEROS READERS

Thanks for your letters and continued support. I wish I could answer, or even acknowledge, every request you make. While this isn't always possible, each letter or request is seriously considered. Every effort will be made to reply to your letters personally or through this column. Your patience is appreciated. Your views, opinions and intercepts are most welcome.

Time now for a Tecate and...

Adios,
Havana Moon y Amigas

The views expressed in this column are those of Havanna Moon and do not necessarily represent the views of the Monitoring Times management, staff or readers.

"CRYPTO"

by Bob Russ

Because the need to conceal meaning was born within a few minutes after man invented speech, the art we know as "crypto" is as old as spoken language.

As soon as man devised ways to make marks in sand, or to paint on rock walls, the art of crypto was carried over into written forms. The techniques we make use of today in our wonderful high tech culture have roots that run way back into the times before cities were invented or rocks were shaped into blocks to be piled into structures.

We find clear evidences of this in the ancient records and carvings that have lasted through time until our period. In fact, in the beginning, writing itself was crypto. The chieftain kept trained men near him who could read and write.

Because the true beginnings are hidden in the haze of ages, we cannot really know who invented the different kinds of hidden writing but because the first large body of literature we have is Greek, we tend to credit various types of crypto to Greek authors.

A moment's reflection shows that Sumer had much the same need as did the much later Athens, and that it is probable that the cuneiform tablets could show us much older versions of "slides," "grids," and "tables." Nevertheless, if we are to appear properly scholarly, we must use the names we have for the crypto methods we have received from our cultural stream.

One of these modes of concealment is called the "polybius." In the Greek version of this crypto, each letter of the encrypted text is represented by two letters or two numerals in much the same way that we note a location on a roadmap like a town, a river, or a mountain. Some authors refer to polybius as a "bi-literal" crypto.

The idea is to set up a block of letters:

ABCDE
FGHIJ
KLMNO
PRSTU
VWXYZ

Then the ranks and files are annotated:

abcde
a
b
c
d
e

This is simple to set up and easy to use. But a little playing with it shows that it is among the most vulnerable forms, being easy to recognize and to duplicate with little effort.

About the time of Martin Luther, European politics were pretty hairy, and the men in top positions simply had to have more secure communications. The old techniques were refined and vastly improved.

The ancient polybius, a very poor crypto, was recast in a novel form by a secretary to the Vatican, and a most powerful tool came into being. This new crypto kept the block format, but tossed in an "uncertainty factor" by not annotating certain lines; thus, some encrypted letters were represented by only a single symbol.

To further complicate matters for a snooper, the least used letters were dropped, and the most used were duplicated. Even worse, certain spots in the block were meaningless, while others represented common words.

The result was a nightmare for a mind trying to

"CIPHERS" cont'd

crack the code. The guess of this writer is that unless the men using the system were very careless, this excellent crypto could not be broken. Because of the way the Vatican version skipped over some files the technique is called a "straddle," and because it indicates both words and letters, it is a code.

In more recent times, a different version of the straddle has been used by Communist secret agents. This version was used as a "cipher" for letters and punctuation only. I call it the "able" straddle in the illustration. Both types were written without spaces between letters.

VATICAN STRADDLE CODE

	0	1	2	3	4	5	6	7	8	9
	a		i				o			
0		p	e	t	&					
2	r	b	c	d	f					
4	g	h	%							
6	l	m	@	n	o					
8	q	u	s	u	z					

(& = and; % = the; @ = with)

But It's Not In The History Books...

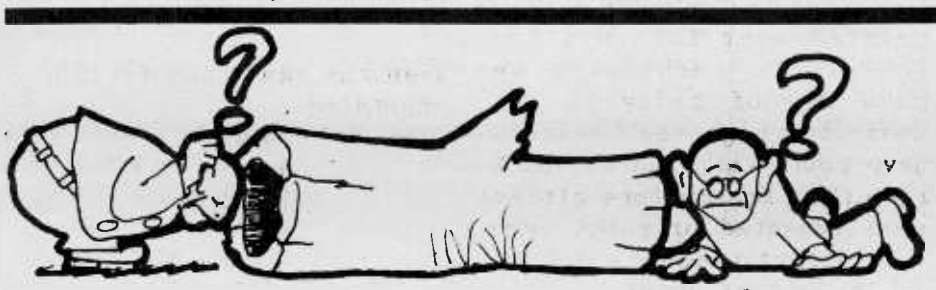
The most flagrant example of industrial espionage in the history of civilization occured some two centuries ago when George Washington, in need of information to begin industrialization in the United States, sent Paul Revere to England.

Revere was a skilled artisan; more important, he had an incredible memory. After touring factories and mills in the mother country he returned to the states and prepared detailed, scale model drawings of everything he had seen.

Certainly, Revere would never had been allowed near the mills if his photographic recall had been suspected!

THE ABLE STRADDLE

	0	1	2	3	4	5	6	7	8	9
	a	e	i	n	o	r	s	t		
8	u	b	w	y	c	d	f	g	h	j
9	k	l	m	p	q	v	x	z	.	/



listener's log

GOING TO DAYTON?
MONITOR THESE
SCANNER FREQUENCIES!
contributed by Mike Day

OHIO STATE HIGHWAY PATROL

Ohio has 88 counties, divided into ten districts as follows:

District	Base	Mobile	Inter-System
1	44.94	45.26	42.56
2	44.98	44.82	45.86
3	44.74	44.86	45.14
4	44.98	44.82	45.86
5	44.74	44.86	42.08/ 45.14
6	44.94	45.26	42.42
7	44.94	45.26	42.42
8	44.98	44.82	45.86
9	44.74	44.86	42.56
10	44.74	44.86	--

OTHER STATEWIDE FREQS OF INTEREST

45.02 Intersystem: Aircraft/radar
45.10 Backup Intersystem: Special operations
154.680 OH State Law Enforcement Emergency Radio Network
154.935 Same as 154.680
155.370 Intercity Network
155.475 Nat'l Police Emergency Channel

DISTRICTS
(By counties)

#1. Allen, Defiance, Fulton, Hancock, Hardin, Henry, Lucas, Paulding, Putnam, Van Wert, Williams, Woods
#2. Crawford, Erie, Huron, Marion, Morrow, Ottawa, Richland, Sandusky, Seneca, Wyandot
#3. Ashland, Holmes, Lorain, Medina, Stark, Summit, Wayne
#4. Ashtabula, Columbiana, Geauga, Lake, Mahoning, Portage, Trumbull
#5. Auglaize, Champaign, Clark, Darke, Logan, Mercer, Miami, Montgomery, Preble, Shelby
#6. Delaware, Fairfield, Franklin, Knox, Licking, Madison, Perry, Pickaway, Union
#7. Belmont, Carroll, Coshocton, Guernsey, Harrison, Jefferson, Monroe, Morgan, Muskingum, Noble, Tuscarawas, Washington
#8. Adams, Brown, Butler, Clermont, Clinton, Fayette, Greene, Hamilton, Highland, Warren
#9. Athens, Gallia, Hocking, Jackson, Lawrence, Meigs, Pike, Ross, Scioto, Vinton
#10. Cuyahoga

DAYTON POLICE DEPARTMENT
Dayton, Ohio

158.730 Channel A
460.375 1st & 2nd districts
460.050 3rd & 5th districts
460.475 Channel 4 (detectives, spec ops)

MONTGOMERY COUNTY SHERIFF
Dayton, Ohio

155.415 Channel A
155.670 Channel B
155.565 Channel 5 (detective, spec ops)
154.785 Jail operations

Montgomery County consists of 465 square miles, over 881 miles of roadway, 25 different police agencies, 325 emergency units and LEADS (Law Enforcement Automated Data System).

NORTHWEST NORTH CAROLINA AND SOUTHWEST VIRGINIA SCANNER MONITORING
contributed by Jimmy Howell, Miller's Creek, NC

155.610 Wilkes Co. #1
154.830 Wilkes Co. #2
155.790 N. Wilkesboro PD
155.010 Wilkesboro PD
154.400 Wilkes Co. Fire
45.60 Wilkes Board of Ed
154.845 Ashe Co (Jefferson & W. Jefferson
155.775 Ashe Co Fire
154.815 Alleghany Co(Sparta)
154.430 Alleghany Co. Fire
155.070 Surry Co.
154.800 Mt. Airy P.D.
155.640 Pilot Mt. P.D.
155.490 Alexander Co. (Taylorsville)
154.325 Alexander Co. Fire
155.655 Watauga Co.
155.130 Boone P.D.
155.265 Beech Mt. Ski Patrol
158.850 A.S.U. Campus Police
155.625 Avery Co.
159.165 Virginia H.P.
159.000 Virginia H.P.
158.895 Virginia H.P.
39.56 Hillsville & Independence VA
39.54 Carroll & Grayson Co. VA
158.730 Galax VA P.D.
39.64 Wyth Co. VA
39.40 Smyth Co. VA
39.68 Patrick Co. VA
39.62 Washington Co. VA
39.72 Floyd Co. VA
155.670 Henry Co. VA

NEW MEXICO SCANNER LISTENING
contributed by Richard Martinex and Tracy Hooker

ALAMOGORDO
155.760 Dept. of Public Safety CH 1
155.430 " , CH 4
155.820 Local Govt.
453.675 Parks/Recreation Street Dept.
155.220 School Bus Co.
48.3000 ElectricCo.
48.0200 Gas Co.
152.120 Contact-Mobile Phone/Paging
152.240 Contact-Paging
151.715 TV Cable Co.
161.640 KINN radio
161.700 KPSA radio
161.760 KKEE radio
146.850 Amateur Radio-Alamogordo
146.940 " - Alamo Pk.
145.230 " - Benson Ridge
44.8000 NM Game & Fish Dept
151.100 NM Highway Dept
151.130 "
463.100 Hospitals/Ambulance Med 5
453.950 NM Local Govt.
153.875 NM State Parks Dept
155.550 NM State Police-Alamagordo CH 2 mobile-mobile
155.730 "-" CH1, mobile-base
155.790 "-" CH1, base-mobile
154.920 "-Statewide CH4
155.370 "-" Law Enforc. Net
155.160 "-" CH3, search & rescue
154.875 "-Alamogordo, Inner City CH

OTERO COUNTY & AREA
153.785 Otero Co Sheriff CH1
154.310 State Fire Freq
155.040 Tularosa P.D.
155.115 Cloudcroft P.D.
155.175 " Ski Patrol
166.635 White Sands Nat'l Monument
161.550 Southern Pacific RR
153.725 Otero Co.Elec COOP
155.055 Mescalero Indian Res. Police
155.085 " " Administration
171.750 " " BIA
155.295 Alamogordo Search and Rescue
143.450 MARS repeater
143.950 MARS simplex
148.150 Civil Air Patrol repeater

LINCOLN NATIONAL FOREST
169.125 Repeater
415.250 Benson Ridge-Rptr
415.350 Wofford-Rptr
415.550 Weed-Repeater

LINCOLN COUNTY
155.310 Sheriff CH 1
154.740 Ruidoso P.D.
155.160 Ruidoso Search & Rescue
463.975 Sierra Blanca Ski Patrol CH 1
463.100 Hospitals/Ambulance Med 5
168.500 B.L.M.
162.550 NOAA weather radio-Buck Mt.
147.330 Amateur Radio-"
155.550 State Police mobile-mobile
155.370 " Law Enforc. Net
154.920 " CH 4
154.875 " Inner City CH
155.655 " mobile-base
155.565 " base-mobile

LAS CRUCES
155.190 P.D. CH 1
154.815 P.D. CH 5
154.845 P.D. CH 3
154.400 Fire Dept.
155.550 P.D. CH 6
154.800 P.D. Inner City CH
152.240 Contact-Paging

LISTENERS LOG cont'd

152.090 Contact-MobilePhones
152.010 Contact-Paging
155.070 Mesilla Town Marshall
464.8375 Mesilla Valley Mall
461.625 Las Cruces Cable TV
48.360 Electric Co.
451.450 Telephone Co.
162.400 NOAA weather radio
146.640 Amateur radio-Twin Peaks
146.760 "-Caballo Mt.
147.000 "- A Mt.
145.290 "-Caballo Mt.
462.975 Three Crosses Amb. Serv CH 1 dispatch
463.200 " "-CH 2
463.075 Hosptial/Ambulance Med 4
154.310 State Fire/Rescue
154.650 NM State Univ. P.D. CH 1
154.755 " CH 2
158.745 " Fire Dept/Paging
453.050 " KRWG TV radio stn.
168.575 B.L.M.
155.700 Southern NM Correctional Center
460.050 "
44.800 NM Game & Fish Dept
153.875 NM State Parks
453.975 NM State Local Govt
154.310 NM State Fire Freq
151.085 NM Highway Dept
151.130 "
463.075 Hospital/Ambulance Med 4 Caballo Mt.
463.100 " Med 5 Jacks Pk.
155.550 NM State Police Mobile-mobile CH2
155.535 " mobile-base CH1
155.520 " base-mobile CH 1
154.920 " CH 4
155.370 " Law Enforc. Net
154.800 " Inner City CH
154.905 " Mounted Patrol
155.160 " Search & Rescue CH 3

DONA ANA COUNTY AREA
155.910 Sheriff CH 1
155.625 " Metro CH
154.310 State Fire Freq.
154.800 NM Inner City CH
452.025 Fire CH
155.040 Hatch P.D.
155.580 Anthony P.D.
155.010 Luna Co. Sheriff CH1
154.725 Grant Co Sheriff CH1
463.100 Grant Co/Hidalgo Co Hospital/Ambulance Med 5

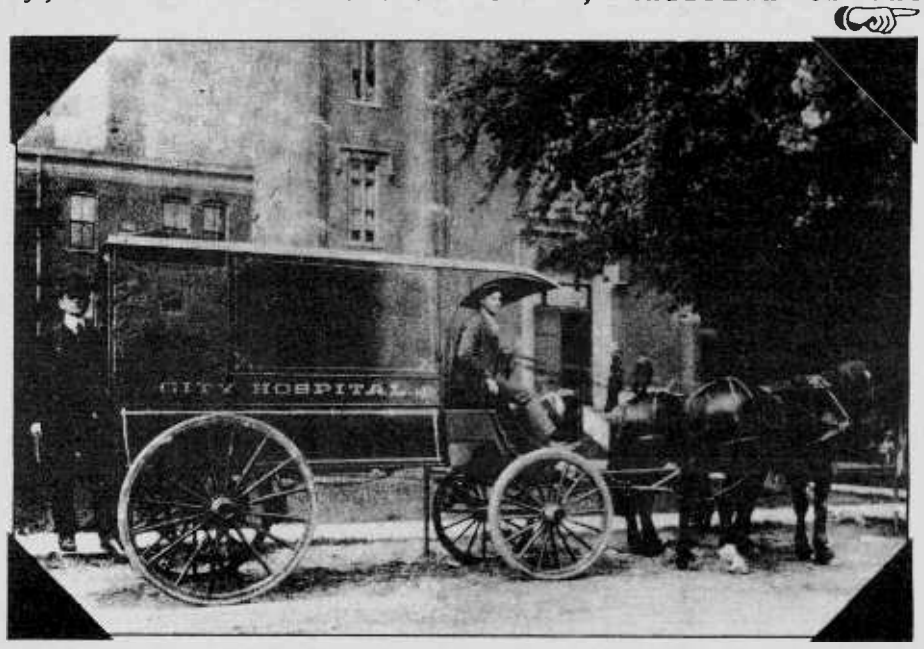
Grove Enterprises Annual Meeting

...An April First Special Report

Breathless anticipation would be an apt description of the mood which accompanied the Board of Directors at the Grove Enterprises annual meeting held this year at the Greater Brasstown World Trade Center.

This luxurious facility, located in the heart of the burgeoning Brasstown metropolis between the picturesque suburbs of Picken's Nose and Smackass Gap, is the hub of civic and cultural activity in this teeming western North Carolina industrial complex.

After a welcome by Bob Grove, Chairman of the



The Grove medical plan is exemplary for the electronics industry.

TUNE IN CANADA

by
Norman H. Schrein
FOX MARKETING, INC., 4518 Taylorsville Rd., Dayton, OH 45424

This month's column is going to be the start of something new with regards to Canadian frequencies. This month and then on alternating months, I will concentrate frequency information on licensed radio operations below 30 MHz. The information will again be taken from official DOC documents. On the other side of the coin, frequencies above 30 MHz will begin again next month and alternate.

To begin, I will start with the lowest frequencies shown as being licensed by the Canadian government. All frequencies shown are expressed in kilocycles (kHz).

Freq	Emission	Call	Licensee	Location
8.000	3F1	VE9 LFO	Ontario Hydro	Savant Lake ON
20.000	8A9		Saskatchewan Power	Pasqua SK
20.000	8A9B		"	Saskatoon SK
28.000	8A9		"	Regina SK
28.000	8A9		"	Saskatoon SK
28.000	4A 7A		Quebec Hydro Comm.	Micoua PQ
30.000	2F2		Ontario Hydro	Oshwlsnt ON
30.500	2F2		"	"
32.000	2F1		"	Chrywdts ON
32.500	2F1		"	Oshwtntn ON
34.000	4A 3A		"	Knorats ON
36.000	4A 3A		Quebec Hydro Comm.	Sjncystm PQ
36.500	2F1		Ontario Hydro	Chrywdts ON
37.00	2F1		"	"
38.000	4A 7A		Manitoba Hydro	Letellir MN
38.000	2F1		Ontario Hydro	Chrywdts ON
38.000	4A 3A		"	Drydents ON
38.500	4A 3A		Macmillan Bloedel	Powell River BC
38.500	0.2F1		Ontario Hydro	Oshwtntn, ON
40.000	8A 9B		Saskatchewan Power	Beatty SK
40.000	8A9		"	Regina SK
40.000	0.2F1		Ontario Hydro	Ctsflgs ON
40.000	0.2F1		"	Frdstbts ON
40.000	4A 7A		Quebec Hydro Comm.	Manicogn ON
40.500	0.2F1		Ontario Hydro	Frdstbts ON
41.000	4A 3A		Macmillan Bloedel	Stillwater BC
42.000	1.5A1		BC Hydro & Power	Kellyiss BC
42.000	0.2F1		Ontario Hydro	Chrywdts ON
42.000	0.2F1		"	Frdstbts ON
42.000	4A 3A		"	Lakehdts ON
42.500	4A 3A		Macmillan Bloedel	Stillwater BC

Now on to some frequencies that are a bit higher.

9106.5	3A 3H	XJE 273	RCMC	Rae, NWT
9106.5	3A 3H	XJE 441	RCMP	Resolute Bay NWT
9106.5	"	XJA 23	"	Rankin Inlet NWT
9106.5	"	XJD 503	"	Snowdrift NWT
9106.5	"	XJE 74	"	Spence Bay NWT
9106.5	"	XJD 711	"	Tungsten NWT
9106.5	"	XJE 274	"	Yellowknife NWT
9115.5	3A 3J	XJL 969	Ahoust Band Council	Ahousat BC

The next frequency seems to be widely licensed throughout British Columbia to the Raven Society of British Columbia. I was not sure exactly what this organization was, and even the telephone information operator could not locate a phone number for the group. Does anyone have any ideas? Anyway the group uses the frequency of 9115.5 and emissions of 3A 3J. What follows is a partial list of some of their station locations and call signs.

CJL 238	Aiyansh, BC	VGD 337	Duncan, BC
CJL 577	Aktis Island, BC	VGE 888	Fish Lake, BC
CJL 237	Albert Bay, BC	VGC 850	Fort Langley, BC
VGH 697	Alexandria, BC	CJL 595	Friendly cover, BC
VGH 916	Alkali Lake, BC	VGC 861	Fort Saint John, BC
VGC 873	Anahims Flat,BC	VGD 336	Fort Saint John, BC
VGC 882	Babine BC	CFL 590	Fort Rupert, BC
CJL 235	Bella Bella, BC	VCG 866	Fort Saint James, B
CJL 571	Bella Coola, BC	CJL 576	Gilford Island, BC
VGC 865	Bridge River, BC	CFL 574	Greenville, BC
VGC 862	Burns Lake, BC	VGC 856	Haig, BC
VGH 919	Canim Lake, BC	VGD 338	Halalt, BC
CJL 585	Canyon, BC	VGC 874	Hanceville, BC
CJL 594	Chilliwack, BC	CJL 584	Hartley Bay, BC
CJL 606	Uchucklesit Inlet, BC	VGD 341	Hudson Hope, BC
		VGC 872	Ingenika River, BC
VGD 751	Campbell River, BC	BGC 855	Kamloops, BC
CJL 582	Coal Harbor, BC	VGC 857	Katz, BC
CJL 583	Comox, BC	VGE 265	Kingcome Inlet, BC
VGH 698	Deep Creek, BC	CJL 587	Kincolith, BC
VGH 917	Dog Creek, BC	CJL 596	Kispiox, BC

That is it for this time. In the next "Tune in Canada" column we will once again concentrate on scanner frequencies. Until next time -- Good Scanning.

ANNUAL MEETING *cont'd*

Bored, guests were treated to an aperitif of fermented prune juice and generous helpings of chocolate covered olives and grape jelly onion dip.

With spirited camaraderie now swelling among the guests, a tour of the progressive Grove research and development laboratories was next on the agenda.

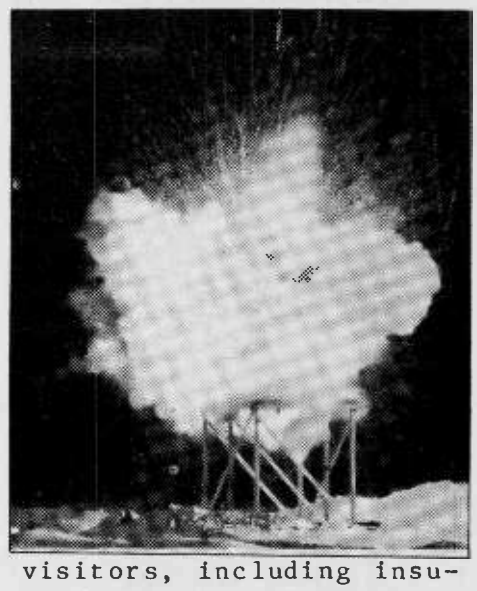
A stop at the Grove Clinic reassured the directors that the best of medical care is extended to our employees.

A rare peek inside the Grove "think tank" revealed the brainstorming of a new-product session being conducted by several of the world's leading electronics innovators.

Several top-secret, high-tech projects were unveiled for the prestigious visitors, including insulated cannisters to store used radio waves, transparent antennas for apartment dwellers with strict landlords, one-sided paper pads for conservationists who hate to leave the other side blank, a home security system armed with a nuclear warhead, and a lightning attractor for your residence to get free electrical power.

Instruction manuals are meticulously prepared for ease of reading and understanding.

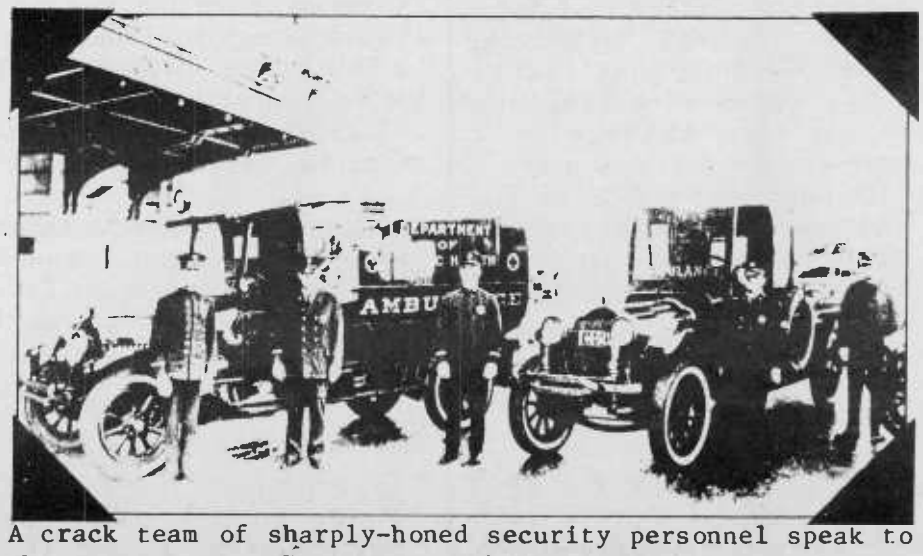
All products are thoroughly tested before shipping.



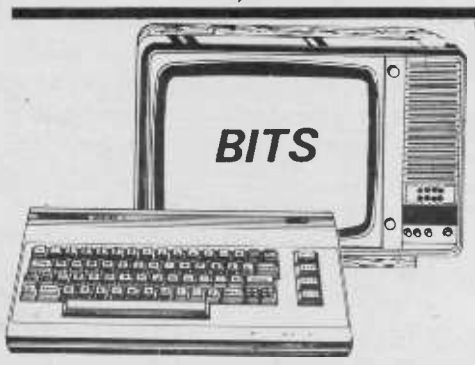
The Grove security corps, noted for their skill and discipline, supervised this part of the tour.

A light buffet lunch featuring Brussel sprout omelet and filet mignon wrapped in sardines was prepared by Grove chef Pierre de la Gland, and served in the octagon room by the hospitality staff.

As our guests departed we could sense their awe as they looked forward to next year's visit. Their general consensus? This year's would be hard to beat!



A crack team of sharply-honed security personnel speak to the Grove image of progress and modernization.



by
C.W. ELLIS
13 Public Avenue
Montrose, PA 18801

The growing trend in the ham shack or listening room is the addition of a computer of some type. This addition runs from a Sinclair to an IBM PC to a DEC minicomputer. The uses for such a device are many and varied, so much so that I will leave such a discussion for a later column. What I would like to kick around this month is R.F.I. - Radio Frequency Interference.

A computer in the ham shack, for instance, can be a victim of RFI, as well as an offender! RF from a transmitter has been known to get inside of a computer and do everything from causing random keystrokes to causing wrong data to be written to memory or diskette. From a listening standpoint, RFI can cause you to pull the plug on your computer as the only effective way to silence the overriding interference.

If you contemplate putting a computer next to a scanner, be forewarned of the myriad gremlins that will appear to pop right out of the woodwork. And to make matters worse, the blame might not fall on the real culprit.

When I first fired up my Bearcat 210 after installing an IBM PC/AT in the listening room, all was silence and bliss, until I tried to use the printer. Shipping a text file to the printer resulted in the scanner locking up on 146.1 MHz. The audio sounded like a buzz saw while data was being transmitted and was somewhat quieter when the printhead was returning.

Wow, I thought, am I in trouble! I had visions of hours and hours of trial and error to reduce the radiation or shield the scanner. Actually, the solution was quite simple. I didn't really have a radiation problem; a little experimenting revealed that shortening the antenna to less than 10 inches in length reduced the received signal to the point where the receiver would not lock up.

The problem was low level radiation from the printer cable. Moving the scanner away from the printer reduced the received signal level, but the ultimate solution was an outside antenna with shielded (coax) cable.

This article is being written on my personal computer which is sitting about 6 feet from the scanner, and operation of the scanner is now normal even with the internal whip antenna...except if the scanner stops on a transmitting station; I can hear clicks in the audio as I type and, on occasion, other strange little chirps and whistles.

Wondering what else in the way of RF might be lurking around the PC, I attached an 18 inch whip to the antenna connector of my HF receiver and tuned from 500 kHz to 30 MHz looking for local interference signals. They were there in abundance. I found a strong signal on every frequency that corresponded to a PC (personal computer) local oscillator frequency or its harmonics.

One big problem with PC's in particular (and digital devices in general) is that the fast leading edges of the digital pulses are rich in harmonics, and one thing most home computers have in abundance are oscillators! Digital pulse type oscillators with nice, sharp, square edges and loads of harmonics.

Try This Program For 512-657 MHz Reception On Your Scanner

by John P. Avery

An article in the February 1985 issue by Bob Parnass on receiving UHF TV on a conventional scanner (and the correction in the March issue)* drew considerable interest from MT readers.

I would like to contribute this Commodore 64 program to share with my fellow readers and consent to its unlimited use in the public domain. Simply enter the appropriate frequencies for automatic computerized solutions to a variety of scanner readouts and corresponding 512-657 MHz reception.

```
 4 PRINT"(CLR)":PRINT"TUNING 512 TO 657 MHZ"
 5 POKE53280,1:POKE53281,1:PRINT"(BLK)"
 6 PRINT"PRESS 1: TO FIND UNKNOWN APPEARING ON YOUR
   SCANNER":PRINT:PRINT
 7 PRINT"PRESS 2: TO TUNE SCANNER BETWEEN 512 AND 657
 8 GETA$:IFA$=""THEN8
 11 INPUT"FREQ BETWEN 512 AND 657";U
 12 INPUT"I.F. FREQ?";I
 14 PRINT"FREQ IS"(((U+I)/4)*3)+I
 20 INPUT"UNK FREQ BETWEN 512 AND 657";T
 22 INPUT"I.F. FREQ?";I
 24 PRINT"FREQ IS" (((T-I)/3)*4)-1
READY
```

*(Ed:See "Correction of a Correction" p.15 this issue!)

BITS cont'd

Computers, accessories, receivers, scanners, tv sets, and other radiation devices must be type accepted to meet FCC requirements, but that doesn't mean they will be silent on a nearby receiver.

A quick look under the covers of my PC turned up no fewer than six oscillators! One on the motherboard (12 MHz), one on the serial adapter card, one of the disk drive adapter card, one here, one there, one everywhere. I certainly wouldn't want the job of calculating all the harmonics.

Getting back to the HF spectrum, I could hear all those fundamental and harmonic frequencies and some noise-type signals that were hard to identify, all coming from the PC. What really surprised me, though, was that the relative signal strength was nowhere near as high as I expected it to be, and when the whip was replaced with the outside longwire, most of the signals disappeared into the mud. Just a few of the fundamental frequencies were discernable.

A well received signal would have to be very weak and right on top of the PC radiation for the PC to mask it. On the other hand, at 4:00 AM when you sit straining your ears for all you're worth trying to hear that rare DX station your buddy has been bragging about, any interference is too much! Obviously, this is one time you don't want a PC or any other unnecessary gear running.

I have a pulse train generator for computer testing that--incidentally--generates enough RFI to wipe out all reception in the FM broadcast band. Just what I need to keep me on the good side of my FM classical music fan neighbor!

Almost all electronics equipment generates some type of emission, somewhere in the spectrum, and much equipment radiates in many portions of the spectrum. Just imagine, if you will, what the designer is faced with during the design of an airborne communications receiver that has to work in the same aircraft containing several high power transmitters for electronic countermeasures use, along with radar transmitters, navigation gear, HF, VHF and UHF transmitters and receivers and so on.

A military aircraft may also have gun cameras, fire control electronics, missile launch and tracking gear. Any popular land based scanner would probably lock up tight on the first programmed frequency and refuse to budge for the duration of the flight!

Now that you have a feel for the reality of RFI, perhaps we can tackle some of the more common remedies for such unsociable computers in the listening environment. ●

GETTING STARTED

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

(We welcome another columnist to the MT family this month, John Avery. His bizarre sense of humor should elicit wonder among our staid readers. Risking that, John's common sense approach to radio promises interesting reading. This month John, which tongue gently nestled inside cheek, introduces us to his first exposure to the miracles of radio...Ed.)

John Avery's Space Cadet...

I sat down at my Commodore 64 to crank out a 1000 to 2000 word article on my favorite hobby, radio. All kinds of radio. Soon it dawned on me that the topic is so broad and is composed of so many little nifty whizzmos that I didn't know where to start it!

I could start with an electron, but I just opened a new box of continuous form paper (1,000 sheets) and I would probably run out just when it was really getting good. I could start with an antenna, I thought, but as soon as I got to impedance I'd go off on a tangent about antennas and resonant frequencies which would lead to inductance and capacitance, and then the newcomers would all die of boredom; Bob Grove wouldn't have anybody to sell this paper to, so he would go back to teaching biology in some school we've never heard of, and then where would we be?

Instead, let's start at the beginning--my beginning of radio, so that beginners could avoid all the mistakes I made and turn out to be reasonably happy with their new hobby!

I had just opened a new law office in a major metropolitan city. I had a house in the suburbs with a pool out back. I remember the day well. I had just settled a big case and I walked into the Radio Shack store just around the corner from my office with thoughts of buying a calculator or maybe some goodies for my stereo set.

I struck up a conversation with Greg, the manager of the store, and our conversation gradually turned to a gizmo he was just finishing in the back room that he was going to use to pick up something called "microwave signals" and display them on a TV set. For a modest sum, less than a hi-fi speaker, I could also be the proud owner of this astounding device. Sure.

About the time my unit was ready, he mentioned that I would need a tower. Only $468 and a short term lease on a pickup truck later I was the proud owner of a very heavy box of steel. About then I figured out I would need a hole. No problem. How big? "Six feet deep and three feet in diameter," the man behind the counter said. Easy.

Starting about six inches deep beneath the deceptively soft lush green grass of my yard is the hardest clay known to mankind. No problem; I would just dig a couple hours every night in the cool summer air. That July set a new record temperature for this century in Indiana. But after three weeks I was the proud owner of a hole six feet deep and three feet in diameter.

I started wondering if I would get into much trouble if I placed a certain Radio Shack manager upside down in that hole with about 2000 pounds of concrete to make him feel secure. After I learned the price of one and a half cubic yards of concrete delivered to that hole, I knew where Greg would fit into my little corner of the world!

Finally, one cool Indiana night, I stood and watched the biggest concrete truck in the world gracefully swirl concrete around the base of my tower, filling the hole to the top. I was filled with true pride as I observed the beginning of my tower, the stairway to electronic heaven.

As the truck pulled away, I realized it must have weighed in at about 600,000 pounds and had just put 4 ruts, each one foot wide and three feet deep, right through the middle of my front yard, gracefully crushing about $3,000 worth of plumbing to my septic tank system!

Next, I hired someone to come out with a gin poll to assemble the tower; he said he charged by the foot. Somewhere in a ditch beside a country road in the middle of Indiana lies the decaying body of a footless midget. At $1.00 a foot, he charged me $203.88 for erecting a 52 foot tower!

But I finally had a picture on my TV set. We watched a lot of microwave movies that summer. The regular TV stations had newscasters that bored us to death hashing and rehashing the mysterious disappearance of some Radio Shack Manager.

By then I was hooked. I had to know how that little aluminum box full of doodads worked. I learned that the microwave signals came to my antenna at a frequency of approximately 2154 MHz; from there they entered the "front end" of my down converter and were amplified by a 2N6304 Motorola transistor. A voltage controlled oscillator (VCO) at a frequency of 2,000 MHZ was then fed to a hot-carrier diode, double-balanced mixer where it was combined (mixed) with, and in the process was subtracted from, the incoming signal of 2154 MHz, leaving a frequency of about 54 MHz, the frequency of channel 4 on my TV set.

My microwave downconverter eventually succumbed to a painless death. Towering 52 feet above the Indiana clay is a deep fringe TV antenna turned vertically to capture signals for six scanners and some military radios. Behind the pool is a 10 foot dish.

From the above, several rules should be clear.

1. Be born rich. Very rich.
2. Be a doctor and make lots more money.
3. Marry a beautiful girl whose father drives a Rolls Royce and owns at least 51% of Watkins-Johnson, Inc.
4. Don't EVER tell your girl friend or wife how

TO THE NEW SHORT WAVE LISTENER

by Tom Williamson

If you have just recently found an interest in the best hobby in the world - congratulations! There are so many complications and "mysteries" associated with the world of short wave that the newcomer may become dispirited and confused. In these columns we will attempt to assist in dispelling doubts and ignorance.

From early days in the hobby there has always been a problem in getting information; please feel free to write to M.T. for answers to specific questions you may have. An SASE will bring a prompt, personal reply; others will be answered in columns as space permits.

I strongly recommend that you join a club. There are many available in all parts of the world, some catering to the general listener, others to those who specialize in selected aspects of the hobby such as utility stations, broadcast stations only, and so on. MT has info on the clubs but if you require more data, please write to Club editor Paul Swearingen.

I have nearly always belonged to one or more club and this has provided much fun, information, and many friendships. You may find out about a local group near your town...if so get out and MEET them!

THE LISTENING SPECTRUM

Let's start off with a brief analysis of the radio spectrum and the correct terms for the divisions of it.

kilohertz	
3-30	very low frequencies (V.L.F.)
30-300	low frequencies (L.F.)
300-3000	medium frequencies (M.F.)
megahertz	
3-30	high frequencies (H.F.)
30-300	very high frequencies (V.H.F.)
300-3000	ultra high frequencies (U.H.F.)
3000-30,000	super high frequencies (S.H.F.)

It is a fact that we tend to use these words sloppily. Now you have no excuse! Note that 3-30 megahertz is the normal SW area for broadcasting, ham and utility stations. The .54-1.6 MHz range is usually referred to in the hobby as the "AM Band" (which is illogical since SW broadcasters are also AM!) or better "BCB" which means broadcast band, on which your local city station operates.

The VHF/UHF spectrum is sometimes called the "FM" band since most radio communicating and broadcasting is in this mode. It has become outmoded to talk about "wavelength" in meters today, but from time to time some station will mention such figures. To calculate meters we use the following equation:

$$\text{wavelength (meters)} = \frac{300{,}000}{\text{frequency (kHz)}}$$

or more simply use one of the prepared tables offered by international broadcasters.

TRANSMITTING MODES

A radio wave is an electromagnetic impulse, the frequency of which depends on the nature of the electrical circuit generating the impulse. By simply switching it on and off, we can send "code" signals of variable length to correspond with the Morse code of early telegraph operators. This is termed "telegraphy" and the signals as "C.W." meaning "continuous wave" -- more correctly "I.C.W." for "interrupted continuous wave."

A radio wave can be made to "carry" another signal such as a voice from a microphone. This second electrical signal, from the output current of the microphone, is superimposed on the plain "carrier" wave. The imposing of such a signal is termed "modulation" and, in the case mentioned, is amplitude modulation (AM for short). Voice signals can be impressed on the carrier by another system termed "frequency modulation" - FM.

Amplitude modulation produces redundant sidebands which carry the audio information. These sidebands can be suppressed or eliminated, one or both, in varying degree; this is the basis of ham SSB (single side band) transmission which today is the usual type of voice transmission on short wave. However, at the receiver end, a half-band of a "wave" would be unintelligible; hence the receiver must generate a signal in its circuits which will be combined with the SSB signal received in such a precise manner as to "re-constitute" a complete signal.

So, in practice, we end up with varying modes of signal, such as "lower" or "upper" sidebands, and "double sidebands" with suppressed carrier.

It has long been the practice in official documents to use a code system to describe the particular type of radio mode used. For example in the old "A" code (now being replaced) we have the following classifications:

- A1: telegraphy, CW, "keyed" on/off
- A2: tone-modulated CW (common practice in commercial use)
- A3: telephony AM with both sidebands
- A3A: SSB variant - independent sidebands used - to carry different speech! Commonly used be commercial utility stations.

There are many other variants and code classifications which won't be discussed here.

If you possess a "communications" receiver you will find various options in its controls. For ordinary AM reception only RF gain, audio gain and tone cotnrols are needed. In many modern receivers the continuously variable RF gain control has been replaced by a switched "RF attenuator" control to prevent overload of the circuit by a strong signal. One operates the set with RF at maximum normally, but cut back on strong distorted signals.

For SSB reception it is normal to have a switch for upper/lower sideband and to use whichever is appropriate; a final adjustment may be made by a "zero" tuning device, or by gently turning the main dial knob until the speech is intelligible.

A variation on this type of tuning is termed "ECSS" - exalted carrier single sideband reception, and this can be used to tune AM signals. If there is interference from adjacent stations, the listener switches to upper (or lower) sideband and exactly "zeroes" the signal until speech is faintly but clearly audible. Frankly, this writer does not like this style, but I appreciate that some SWLs favor it!

Until next time...73!

GETTING STARTED cont'd

much some electronic gadget REALLY costs.

5. Start with a knowledgeable friend and build a solid foundation for this exciting, inexpensive hobby.

6. Don't buy the smallest or cheapest component...like an antenna rotor. You will put bigger and bigger antennas on top of your rotator. But be practical; any rotator powered by more than a 6 cylinder twin-turbo diesel engine is probably just wasting money.

Next month: We get down to business!

TECHNICAL TOPICS *by Bob Grove*

Q *What converters for 118-136 and 225-400 MHz will work with my Regency Z-10 programmable scanner? (J.W. Slater, Jonesboro, IN)*

A None. The Z-10 is an FM-mode-only receiver and all aircraft transmissions are in the AM mode. While the converter would provide signals to the scanner, all you would hear would be quieting when a signal came on and occasional distorted voices.

◆◆◆◆◆

Q *How can I eliminate aircraft and ham radio interference which plague my Bearcat on all fifty channels when I use an outside antenna? (Leroy Kovalcik, Joliet, IL)*

A Chances are you are experiencing both intermod and images from strong signal overload, a common complaint in metropolitan areas. I would recommend you try a trap filter like the Grove FTR-3 Scanner Filter; even so, it is capable of reducing only a narrow swath of frequencies at a time, but could provide some relief.

Some listeners use two filters in series for independent tuning of different parts of the VHF spectrum at one time. This is quite effective. But try one first to see if it helps--and it should if you follow the directions.

◆◆◆◆◆

Q *Where can I get a converter to tune in the secret government frequencies?*

Where can I get a clock that shows the time in different countries? (Gene Perryman, Kendrick, ID)

A There are no secret government frequencies which require special converters; virtually all government communications are conducted in the same part of the spectrum as other services and are readily accessed by common shortwave and scanning receivers.

Some scanners do not have wide enough frequency coverage to include federal frequencies and specialty

TECHNICAL TOPICS cont'd

manufacturers like Hamtronics (65 Moul Rd., Hilton, NY) offer converters to extend your listening spectrum.

Scrambling techniques are used to mask the content of sensitive messages and no descramblers are available to decode them.

World time clocks may display one additional time (usually GMT), but since there are 24 separate time zones around the globe, no conventional clock displays them all. Listeners usually settle for a 24 hour clock which shows Universal Time and consult a conversion chart for the local time in the country of interest.

International broadcasters always use Universal Time for programming in order to avoid the confusion, as do most other users of the short-wave spectrum.

HELPFUL HINTS

FREE WALL CHART

We have just received a sample of a free wall chart showing microwave (1-48 GHz) uses in the United States. Allocations for military and domestic satellites, land communications, radar, and other applications are detailed in this easy to read, colorful chart.

For your free copy, request the chart "U.S. Microwave Applications by Frequency" from Wavetek San Diego, Inc., P.O. Box 85265, San Diego, CA 92138.

M600A USERS: Take Note

by Mike Agner KA3JJZ

I have had the pleasure of owning a M600A for the past two years; it is easy to use, flexible, and has many desirable features.

However, to learn to use these features, one must find his way through a manual that has several omissions and errors. These could baffle even the most seasoned RTTY buff. More recent manuals have incorporated a few corrections. The following is a compilation of notes and experiences gathered over the last two years.

1. On page 10 of the manual, the paragraph that refers to the 3 conductor jack is in error. The ring it describes on the jack is the handshaking line, not the autostart line.

2. Page 21 of the manual, the first schematic for the autostart circuit, two items became evident:

(a) The ground connection for relay K1 is missing. The easiest way to complete this circuit is to ground the shell of J11 (which is not shown on the schematic!).

(b) Transformer T1 rated specs are a little odd, to say the least. I have been using a 117V transformer with a secondary of 12.6 volts (1 amp) with excellent results...a good deal easier to find!

When operating the autostart package, there is a very important point to keep in mind. If you wish to turn off the printer (to tear off print, for example), turn off the autostart control on the M600A. Failure to do this may cause a hard reset and possible damage to IC14, the MC2016 printer controller.

Other notes on use of the autostart function include:

(c) Pressing the screen print key "#" will turn on the autostart function for a brief period on occasion. In addition, switching to FEC mode (2nd press of the "d" key) can also cause this along with two characters appearing at the leftmost column of the screen/printer.

(d) If you wish to print an ARQ signal in autostart, use position B; this will cause the M600A to ignore the various control characters usually sent during this type of transmission.

(e) Jumper JU1 (which causes the autostart system to run open after a carrier drops out for a short period) may be located on the schematic labeled "M600-A Main Frame." Look to the left and slightly up on the schematic nearest the title.

3. If you are using the parallel printer option, the flyer that desribes the wiring of the M600 to a MX80 has an error. The "busy" indicator (pin 11 on the MX80) is pin 9 on the M600, not pin 8. The wiring diagram is correct, however.

You should also be aware of a serious problem with using the parallel print option. Actually, it is not the fault of the option, rather it is the cabling that connects the M600A to a printer - it radiates a high amount of RFI. Options to try to reduce this here have not been succesful.

4.If you like copying CW, you should be aware that the unit is set to respond to a pitch of 1 kHz; The passbands on some receivers (and transceivers) is 800 Hz. It might pay to have the pitch of the M600A reset as outlined in the manual.

5.I had heard that the M600A has a problem with handling RTTY art. This has not proven to be the case here, providing the 72 character/line limit is respected. In addition, it seems advisable to allow the transmitting station to send its own CR/LF (carriage return line feed), usually controlled by DIP switches within the printer.

I hope these notes help users better understand the operating "quirks" of this otherwise fine unit. This is not intended to be all-inclusive or the last word, so if there are other items you have found to be of interest, I'm sure the MT readers would like to hear about them.

Happy printing!

HEARING SHORTWAVE SIGNALS ON YOUR SCANNER?

by Bob Grove

On occasion, scanner monitoring enthusiasts have reported hearing shortwave signals on their scanners; this may take the shape of music, foreign language braodcasts, Morse code, or even the unmistakable sound of single sideband.

There are several possible causes for this phenomenon; let's take a look at them.

HARMONICS

Yes, even the big guys have them. Oscillators generate not only the fundamental frequency which is desired to transmit, but whole-number multiples as well. Thus, Radio Moscow may be heard on their intended fundamental frequency of, say, 11.8 MHz, their second harmonic at 23.6 MHz, and even on their third harmonic at 35.8 MHz.

Since these harmonics are at lower power levels than the fundamental frequency, they are harder to hear. They follow the propagation of the frequency bands on which they are transmitted; thus, you would hear that third harmonic of Radio Moscow on your scanner when low band skip is in from Europe or Asia.

IF BREAKTHROUGH

All superheterodyne receivers (shortwave sets, scanners, your hi-fi, pocket radio, and auto stereo receiver included) have a converter which changes higher frequencies to lower. Typically, scanners use 10.7 or 10.8 MHz as the intermediate conversion frequency.

If short-wave signals are strong enough at the antenna, they are picked up by the intermediate frequency amplifier stages and detected just as though the scanner was tuned to that frequency.

This phenomenon is particularly apparent when the scanner antenna has large aperture (capture area); its size approaches a resonant length at the lower frequencies, thus enhancing short-wave reception.

INTERMODULATION

Two strong signals may mix together in the receiver amplifier to produce a sum or difference frequency which the receiver will respond to. For example, the 11.8 MHz Radio Moscow signal listed above may mix with another broadcaster on 21.750 MHz to produce phantom signals on 33.55 and 9.95 MHz.

Intermod is readily spotted; a mix of the program content will be heard as well -- two voices, voice over music, etc. Intermod is a common scanner blight in metropolitan areas when strong TV signals, FM broadcasters, mobile telephones, and other repeaters may be picked up on mixed frequency products all over the tuning range.

SPURIOUS SIGNALS

A spur is an oscillator signal that is undesirable but present in the receiver's passband. Some preamplifiers will oscillate under certain conditions and their frequencies will mix with incoming signals to produce phantom signals on frequencies where they should not be heard.

Only a stable preamplifier can solve that problem, although unstable, oscillating preamplifiers can sometimes be tamed down easily by someone who knows what he is doing (like the manufacturer!).

An oscillating preamplifier can often be diagnosed by bringing metal near its circuitry; the spurious signals will shift in frequency.

Modern receiving equipment is a miracle of escalating technology; understanding the capabilities and limitations of your equipment and accessories can permit you to enjoy your hobby to the fullest.

Extra Memory For Your Pro-30

by Eugene Krolak

With a few keystrokes you can store three extra frequencies beyond the Pro-30's 16 channel memory. Although any frequency in the low, high and UHF ranges of the scanner may be selected, let's use a high band frequency for an example.

Press PGM, LIMIT, 154.355, ENTER. Pick any frequency that is several kHz higher, such as 154.400 MHz. Press LIMIT, 154.400, ENTER. The lower and upper limits are now set forthe search mode. Fully open the squelch (constant hissing) and step up or down with either of the two step buttons. Stop when 154.355 appears in the LED readout and press the MON button.

You can now set the squelch for normal operation; 154.355 MHz is stored in the MON (monitor) memory. To recall, press MANUAL or PGM, then MON and 154.355 will be recalled.

Next store two other frequencies in the lower and upper search limits as described in the owner's manual; always remember to set the lower limit first. To recall, press PGM, LIMIT to recall the first frequency, then press LIMIT again to recall the second frequency.

These frequencies will remain set as long as you don't reprogram the search limits.

Now you can store up to three secondary frequencies for police, fire, weather, or any other service in your area and stop using those 16 primary memories for those seldom used frequencies.

COAX CHARACTERISTICS

How do you choose the right coaxial cable for your application? For most receiving installations under 30 MHz, you may use virtually any coax made. From a practical standpoint, select a cable with at least 94% shielding to avoid electrical noise pickup. Impedance is not a consideration for general coverage reception.

Above 30 MHz, and especially at UHF frequencies and for runs in excess of 50 feet, the choice of coax becomes more critical. Pay particular attention to the attenuation tables -- the lower the attenuation the better.

Percentage shielding becomes more important the higher in frequency you go; this is why TV installers usually choose a foil to achieve 100% coverage. And if you intend to allow the cable to be exposed to outside elements (as most of us do), remember to replace it at least every 5 years; coax gradually takes on moisture and the resulting contamination means a reduction in signal strength.

Poor grades of coax need to be replaced even more frequently, especially if they are run underground or are in a marine environment. Premium grades of gas-filled or non-contaminating cables may last 20 years, and aluminum rigid cable ("heliax") may last indefinitely.

CHARACTERISTICS OF COAXIAL CABLE: Courtesy Radio Society of Great Britain and American Radio Relay League.

Cable No.	Nominal Impedance Z_o (Ω)	Cable outside diameter (in)	Velocity factor	Approximate attenuation (dB per 100ft) 1MHz	10MHz	100MHz	1,000MHz	3,000MHz	Capacitance (pF/ft)
RG-5/U	52·5	0·332	0·659	0·21	0·77	2·9	11·5	22·0	28·5
RG-5B/U	50·0	0·332	0·659	0·16	0·66	2·4	8·8	16·7	29·5
RG-6A/U	75·0	0·332	0·659	0·21	0·78	2·9	11·2	21·0	20·0
RG-8A/U	50·0	0·405	0·659	0·16	0·55	2·0	8·0	16·5	30·5
RG-9/U	51·0	0·420	0·659	0·16	0·57	2·0	7·3	15·5	30·0
RG-9B/U	50·0	0·425	0·659	0·175	0·61	2·1	9·0	18·0	30·5
RG-10A/U	50·0	0·475	0·659	0·16	0·55	2·0	8·0	16·5	30·5
RG-11A/U	75·0	0·405	0·66	0·18	0·7	2·3	7·8	16·5	20·5
RG-12A/U	75·0	0·475	0·659	0·18	0·66	2·3	8·0	16·5	20·5
RG-13A/U	75·0	0·425	0·659	0·18	0·66	2·3	8·0	16·5	20·5
RG-14A/U	50·0	0·545	0·659	0·12	0·41	1·4	5·5	12·0	30·0
RG-16/U	52·0	0·630	0·670	0·1	0·4	1·2	6·7	16·0	29·5
RG-17A/U	50·0	0·870	0·659	0·066	0·225	0·80	3·4	8·5	30·0
RG-18A/U	50·0	0·945	0·659	0·066	0·225	0·80	3·4	8·5	30·5
RG-19A/U	50·0	1·120	0·659	0·04	0·17	0·68	3·5	7·7	30·5
RG-20A/U	50·0	1·195	0·659	0·04	0·17	0·68	3·5	7·7	30·5
RG-21A/U	50·0	0·332	0·659	1·4	4·4	13·0	43·0	85·0	30·0
RG-29/U	53·5	0·184	0·659	0·33	1·2	4·4	16·0	30·0	28·5
RG-34A/U	75·0	0·630	0·659	0·065	0·29	1·3	6·0	12·5	20·5
RG-34B/U	75	0·630	0·66		0·3	1·4	5·8		21·5
RG-35A/U	75·0	0·945	0·659	0·07	0·235	0·85	3·5	8·60	20·5
RG-54A/U	58·0	0·250	0·659	0·18	0·74	3·1	11·5	21·5	26·5
RG-55/U	53·5	0·206	0·659	0·36	1·3	4·8	17·0	32·0	28·5
RG-55A/U	50·0	0·216	0·659	0·36	1·3	4·8	17·0	32·0	29·5
RG-58/U	53·5	0·195	0·659	0·33	1·25	4·65	17·5	37·5	28·5
RG-58C/U	50·0	0·195	0·659	0·42	1·4	4·9	24·0	45·0	30·0
RG-59A/U	75·0	0·242	0·659	0·34	1·10	3·40	12·0	26·0	20·5
RG-59B/U	75	0·242	0·66		1·1	3·4	12		21
RG-62A/U	93·0	0·242	0·84	0·25	0·85	2·70	8·6	18·5	13·5
RG-74A/U	50·0	0·615	0·659	0·10	0·38	1·5	6·0	11·5	30·0
RG-83/U	35·0	0·405	0·66	0·23	0·80	2·8	9·6	24·0	44·0
*RG-213/U	50	0·405	0·66	0·16	0·6	1·9	8·0		29·5
†RG-218/U	50	0·870	0·66	0·066	0·2	1·0	4·4		29·5
‡RG-220/U	50	1·120	0·66	0·04	0·2	0·7	3·6		29·5

* Formerly RG8A/U † Formerly RG17A/U ‡ Formerly RG19A/U

TRICKING THE ICOM R71A TO TUNE BELOW 100 KHZ

Bob Parnass, AJ9S
RCMA (IL-267)

The ICOM R71A general coverage receiver is designed for VLF reception down to about 97 kHz.

The following steps will confuse the microprocessor-based controller sufficiently to permit reception down to 0.0 kHz:

1. If all 32 memory channels contain frequencies, use the FUNC and CLEAR buttons to clear a memory channel.
2. Place VFO/M switch into the M (Memory) position.
3. Using all the manual dexterity you can muster, rock the MAIN TUNING knob back and forth, while simultaneously rocking the MEMORY-CH rotary control to switch between a memory channel with a frequency in it and a clear memory channel.

   Continue rocking both the controls until a frequency of 0.000.0 appears on the digital display.
4. Depress the WRITE button. This stores the 0.000 MHz frequency in a memory channel.

   You can now rotate the MAIN TUNING knob *clockwise* to tune up from 0.000 MHz to the frequency you want. *Be careful:* if you rotate the MAIN TUNING knob counterclockwise, the radio will immediately revert to 29.999 MHz.

To tune below 100 kHz in the future, just recall the 0.000 MHz frequency from the memory channel and use the tuning knob to tune upward. That way, you don't have to use two hands every time you tune to a VLF frequency.

I used a Wavetek 180 sweep/function generator to verify that the R71A is indeed receptive to signals below 100 kHz.

EXPERIMENTER'S WORKSHOP

Quieting the Regency Beep

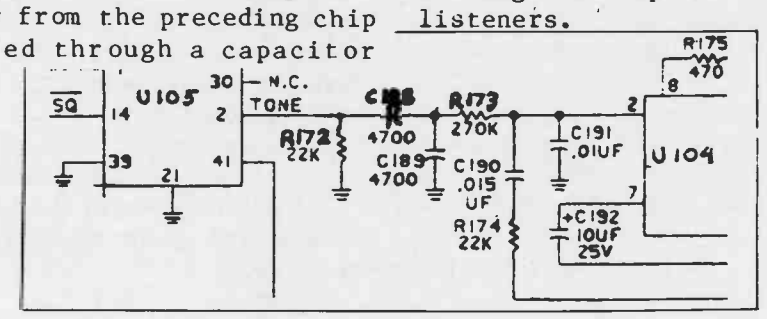
While the "beep" on Regency scanners confirms keyboard entry commands, it is frequently loud enough to be heard in the next county. Fortunately, there is a way to reduce the level without too much surgery.

A glance at the circuit diagram of the audio stage of the D-310, for example, reveals that the tone generator from the preceding chip is fed through a capacitor to the input of the audio chip.

Several possibilities exist here. One could reduce the capacitance of C188 (now 4700 pF), reduce the resistance of R172 (now 22K), or increase the resistance of R173 (now 270K). For custom control, either resistor could be replaced by a trimmer resistance. Perhaps simplest of all, the most accessible lead from R173 could be snipped and a 1 Megohm trimmer soldered between the resistor and its lead.

It is assumed that most Regency products probably utilize similar audio and tone generator circuitry and this basic approach would be apt to work.

We would like to thank MT reader D. N. Gunn of Oakland, California, for sharing this tip with fellow listeners.



STOCK EXCHANGE

PERSONAL

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JOIN A RADIO LISTENING CLUB. Complete information on major North American clubs for 25¢ and SASE. ASSOCIATION OF NORTH AMERICAN RADIO CLUBS, 1500 Bunbury Drive, Whittier, CA 90601.

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JIL SX-200 Scanner 16 channel 26-88, 108-180, 380-514 MHz AM/FM. One month new, under warranty. Excellent condition, magnet mobile antenna. Two books on freq. regs. $225.00 plus shipping. 1-718-932-4763. Mike Millazzo, 33-01 31 Ave. 2R, L.I.C. NY 11106

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WANTED: GROVE Minituner TUN-2 (NOT 3). Herb Balfour, 268 Hounslow Ave., Willowdale, Ontario, Canada, M2N 2B8.

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EYECOM 1000 Microfiche reader, 1984 HF, VHF & UHF microfiche. Must sell. $195. Mark Holmes; 5288-A Oldfield Road, College Park, GA 30349. 404-997-9626.

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SELL: DEFENSE ELECTRONICS TMR-5A VHF, UHF, SHF receiver with 5 plugins, $350. DEFENSE ELECTRONICS TR-711C VHF receiver $125. H-P 122AR dual trace scope $40. Bill, P.O. Box 5308, Clearwater, FL 33518 PH:813-442-4286

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WANTED: Technical manuals for military electronic equipment from 1900 to 1970 for research on a series of books on the same. Please drop me a line. Dean Soderling, 6725 Portland Ave., Richland, MN 55423: 612-869-9264

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FOR SALE: 6 boxes (two 19" rolls of bond and two carbon per box) of paper for UXH-2 and RJ-4 facsimile machines $30 per box plus shipping. Call Mike McCloskey for more information: 916-626-9126

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GROVE SCANVERTER, $40.00.

AEA MBA/RO Reader, 32 character display, Self-contained, Displays Morse Code, RTTY, ASCII, $200.00.

MAXON 49-S Headset Transceivers, 49.80 MHz FM 1/2 mile range, $100.00 for the pair....(more above).

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$25 payment must accompany ad. Send 2 1/4" wide x 2" long camera-ready copy or we will type copy (35 words maximum).

DAIWA AF-306 Active Audio Filter, 12BDC, $65.00.

Add $5.00 per item for UPS shipping. Money Order/Certified check only. John Avery, 2617 Constellation Dr., Indianapolis, IN 46229 (317)899-4207 No Collect calls.

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ICOM-R70 receiver (mint) with manual, perfect condition; $495 (205)381-2060.

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New PRO30 excellent condition. Purchased Jan. 1985. Reasonably priced, will include nicads and adapter. Keith Bucher, Route 20, Box 130, Reader, WV 26167 (304)386-4332

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YAESU FU101 External VFO; HEATH SB-620 Scanalyzer; DANCO DR30 receiver, DT20 Transmitter, DRAKE R7A; JAPAN RADIO NRD515; Active HF or VHF/UHF antenna; 6 mtr multimode transceiver; 432 MHz multimode transceiver; other HF/VHF/UHF communications gear. Signed letter offers only. D.E. Fairbrother, K1FKW, 15 Bank Street, Winsted, CT 06098

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FOR SALE: 1984 D.O.C. microfiche with 40 pages identifying some government frequencies by the call letter. Also microfilm reader at $98.00. Sample available for $1.00. Gilles Thibodeau, 3653 Montcalm, Lac Megantic, Quebec G6B 2H8 (819)583-1817 after 6 p.m.

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O'KEEFE & MERRITT PM-15 Radio Generator 10-12.5KW, 110/220 Volt, Single or three phase 400 cycle. Good condition, inside stored, with all instruments. Jeep engines and radiators are gone. MVSS, Box 73, Flaxville, MT 59222 (406)487-2884

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BOB'S BARGAIN BIN

Only a few left, so hurry on these low, low prices which include UPS shipping in US. All merchandise brand new with warranty.

SONY AN-1 active antenna, $75; **PANASONIC RF-9** pocket short wave/AM/FM radio, $75; **AEA MBA/RO** Morse/RTTY reader with AC supply, $250; **BROOKWELL PUBLICATION** package with good reading on product reviews, listening tips, frequencies and more for only $5 (book rate shipping included).

PANASONIC RF-B600 receiver, SW, MW, LW and FM. Brand new, $385. We ship prepaid. L. O. Nelson, 2608 Chase Drive, Wichita Falls, TX 76308 817-692-2255--no collect calls.

Looking for complete set of IF cans for T.M.C. Radio receiver model #GPR-90, or will buy junker for cans, or a parts source for same.

Also need diagram or print for a S.S.B. converter, Model CV-1694/GRC-129, made by Manson Labs, Inc.

M.J. Dube, 411 Colorado Blvd., Denver, CO 80206

INFORMATION PLEASE

Monitoring Times will print at no charge (as space permits) announcements and questions of a non-commercial service nature.

Need reader in the northern part of the State of Maine frequencies to be checked. Will swap frequencies with Canadian readers in Province of Quebec. Gilles Thibodeau, 3653 Montcalm, Lac Megantic, Quebec G6B 2H8

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RICH KRAMER please contact me--Greg Shepherd, 2012 Juniper Lane, Bloomington, IL 61701

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NEEDED: Manual or reprint for JOHNSON VIKING MATCHBOX; also want HAMMARLUND SP-600 speaker. Leo Ryder, 1904 7th Avenue, St. Albans, WV 25177 (304)727-8738

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WANTED: Manual, schematic, or any other info on R-808/GRC-14 receiver. Also info on compatible surplus RTTY equipment. Robert Severance, Box 811, Shoshone, Idaho 83352

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SCHEMATICS/Manuals wanted for the following items. Will pay copying costs/postage and $2.00@ for supplied items. Tony Zalvis III, P.O. Box 51, Wellesley Hills, MA 02181, 1-617-881-5108.

HEATHKIT Model DX-600 Transmitter; LAFAYETTE Model HA-63 Communications Receiver; EICO Model 460 Oscilloscope; PRECISION APPARATUS COMPANY SERIES 920 Electronic Tube tester (also need a meter for this set).

PACO Model G-30 RF Signal Generator; PRESICISION Signal Marking Generator Series E-200-C; SPECO Signal Tracers (Special Products Company, Silver Spring, MD); ACCUTATE INSTRUMENT COMPANY Utility Tester Model 161.

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