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MONITORING TIMES

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January, 1984

EMP - EFFECTS ON COMMUNICATIONS

by Lawrence I. Cotariu

The ABC-TV production, "The Day After" poignantly dramatized the vulnerability of a technological age to a nuclear exchange.

At the time of the blast, all electronically-controlled equipment--automobile ignitions, communications gear, radio and TV sets--were deactivated by the powerful electromagnetic pulse emanating from the fireball.

Let's take a closer look at this threat as addressed by MT author Larry Cotariu.

The detonation of a nuclear weapon produces intense transient electric and magnetic fields. These fields are called the electro-magnetic pulse (EMP). Any electrical conductor which is exposed to the EMP will have induced transient voltages and currents on it.

Whether or not these transients will cause damage or malfunction depends upon both their magnitude and the sensitivity of components connected to the conductor.

These in turn depend upon the location of the detonation point with respect to the equipment in question and upon the electrical and mechanical details of that equipment.

Research during the past few years concerning EMP effects on electrical and electronic equipment indicates that in many circumstances damage or malfunction can result. Further, this damage can occur at distances from the explosion great enough to be completely free from blast or other nuclear effects.

Areas affected by the EMP from a single detonation can encompass hundreds of thousands of square miles. This is true particularly for high altitude detonations - those at an altitude greater than about 50 kilometers.

During a high altitude detonation, high level but somewhat less intense waveforms than those which appear in the ionized sphere

are radiated from the source. Various responses of surface equipment to EMP can be observed, ranging from static to burnout.

The most severe effects are associated with the more susceptible components which are connected to long exposed cables or antennas. One candidate for a severe effect would be a transistorized shortwave receiver connected to a large antenna.

The way in which the energy is collected is often complex but in general, the larger or more extensive the

runs, piping or conduit, large antennas, antenna feed cables, metallic guy wires or metallic antenna support towers, overhead power or telephone lines, buried cables or pipes and long runs of electrical house wiring.

FUNCTIONAL DAMAGE

If sufficiently large electric transients are introduced, a component or subsystem may become permanently inoperative until some part or parts are replaced.

Other types of func-

are often very sensitive to functional damage or burn-out. These are listed in the order of decreasing sensitivity to damage effects: microwave semiconductor diodes, field-effect transistors, radio-frequency transistors, audio transistors, silicon-controlled rectifiers, power rectifiers, semiconductor diodes, vacuum tubes.

Thus, systems employing vacuum tubes are far less susceptible to EMP effects than those employing transistors.

TESTS

A series of tests were performed on two FM receivers, one a standard size portable and the other shirt-pocket size. Both receivers, with whip antennas fully extended (19 and 25 inches in length) were subjected to 140 percent of threat level fields with no noticeable change in operating characteristics.

Both receiver chassis were next connected to the ground plane to maximize energy pickup and a series of 50 pulses were applied with no effect.

The receiver chassis were then connected to the top plane of the line with antennas pointing downward, and again, both receivers survived 50 pulse series.

For a final test they were placed in the tapered portion of the line and subjected to 50 pulses at approximately three times threat level. Both survived this test also.

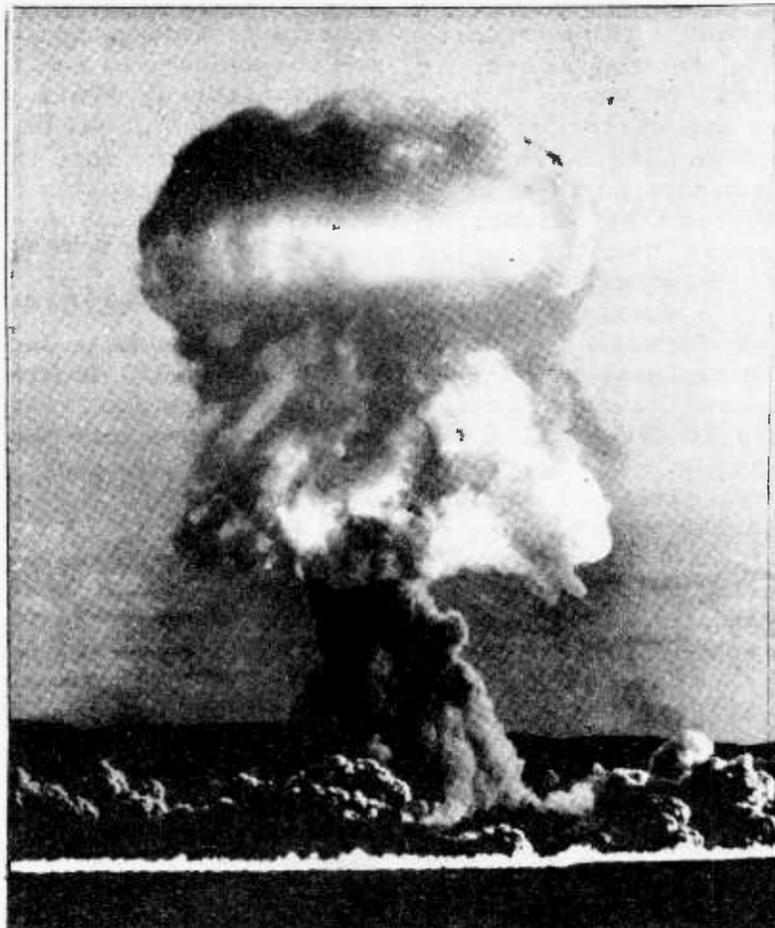
With the exception of the tests at three times threat level, which were not feasible due to the length of its whip antenna (40 inches), similar tests were performed on a citizens band walkie-talkie. The unit was pulsed while in both transmit and receive modes with no observable damage.

Preamplifiers for the 14 and 144 MHz radio amateur

Cont'd on p. 17

NEW!

COMPUTER-OPERATED SCANNER FROM ELECTRA! See page 4.



conductor, the greater is the amount of energy collected. For example, the whip antenna of an automobile radio will collect far less energy than an AM broadcast transmitting antenna.

The orientation of the conductor with respect to the source of EMP also plays a role similar to the positioning of a small pocket transistor radio. Here, the orientation of the radio can be varied to increase or decrease the received signal.

Typical collectors of EMP include: long cable

tional damage may occur wherein a particular device is rendered only partially capable of executing its entire range of functions. Another aspect of functional damage is the decrease in the lifetime of a particular component or subsystem.

OPERATIONAL UPSET

Small electrical transients may temporarily impair the performance of a system for only a few microseconds or hours. This temporary impairment of the system's operation is an operational upset.

Electronics components



**MONITORING
TIMES**

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REMEMBER!

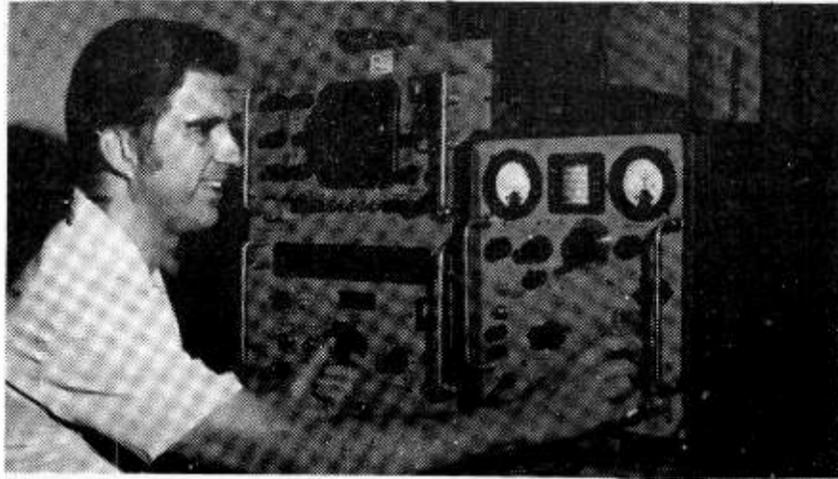
"S.A.S.E."

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 pre-paid calls weekdays 1-5 pm Eastern (704-837-2216)...Bob

FROM THE EDITOR



by Bob Grove

It seems hard to believe that only two years have passed since our inaugural issue was mailed. That first sample issue was a scant 8 pages in length. Wow; how we've grown!

Now a full-fledged 32-page monthly newspaper, Monitoring Times has become the ultimate source of information about the spectrum for thousands of serious listeners worldwide.

As a bit of insight for our new-found friends, Monitoring Times is composed and published by Grove Enterprises, Incorporated. As president of Grove Enterprises and editor of MT, I have often been asked how I got into this business.

Rather than belaboring the point with, "It all began..." let me simply say that as a youngster I was fascinated with gadgetry, cutting my teeth on Saturday afternoon science fiction serials at the local movie theater.

My interest in short-wave listening was peaked by access to my grandmother's old Philco multiband console radio and, by the time I was 13, I had my amateur radio license.

Still, I did far more listening than transmitting. Throughout my adult life the thrill of "listening in" has pervaded my leisure time.

After writing dozens of magazine articles for the ham and electronic trade magazines and several books for other publishers, it occurred to me that self-publication might be worth considering.

In 1980 the now-legend "FEDERAL FREQUENCY DIRECTORY" was finished and became an instant success. It listed over 100,000 frequency files directly from the U.S. Government's own data bank.

Although now out of print, owners of coveted copies of that book have told me they have been offered \$50 apiece for their editions!

Fortunately, an updated

master file was obtained just before the government reclassified the data and is now available from Grove Enterprises on microfiche.

Proud new owners of the FFD constantly wrote me asking where various accessories could be obtained to improve their listening; a short venture with another manufacturer to supply merchandise soon revealed that it would be best to manufacture it ourselves!

And what about 1984?

Grove Enterprises will continue to provide unique and effective products to enhance listening throughout the communications spectrum, and Monitoring Times will continue to provide our readers with the most informative, authoritative and timely news available.

Author! Author!

The applause is deafening. Each month, Monitoring Times authors are rewarded with accolades from appreciative readers. And they get paid, too!

Would you like to write for Monitoring Times? Opportunities for good articles from our readers are boundless. Payment is \$25 for a 500-1000 word article plus a free subscription to Monitoring Times.

Need a few suggestions to get the creative juices flowing? Try these on for size!

- 11-meter "out-of-band'er" networks/frequencies
- Preamps, preselectors and tuners...pros & cons
- Active and passive receiver antenna multicouplers
- The truth about coax
- The truth about receiving antennas and grounds
- Antenna connectors: facts and fallacies (including splicing)
- Frequency allocations and bandplans
- New equipment reviews
- Tips for better listening (monthly column)
- Computer applications and programs
- Antenna basics

☞ Cont'd on p. 15



VIEWPOINT

I have had one problem with Monitoring Times! How to keep it handy for reference without losing pages or tearing it up. I had an idea the other day that works great. Thought you might want to share it with your other readers.

I obtained one of the plastic covers that companies use to store computer printouts. The cover is the exact size of your publication. All I have to do is punch out holes and insert into the folder. Instant protection, easy access, and I can keep them in order. Also if you ever print a comprehensive index to the Monitoring Times I can insert it in the front and will really be in business!

Zel Eaton

Kirksville, MO

(Excellent suggestion, Zel! Thanks for sharing with fellow readers...Bob)

>><<

I do wish your "Tune In Canada" editor would show a little more restraint. At the present time, the Canadian Government is taking a close look at who is interested in what, and what information to make Public under the new Freedom of Information Act. They have frozen the release of all microfilm.

Indiscriminant publishing of frequencies and especially their source will only make things more difficult to acquire. Those who had access to the information were not reluctant to pass it on, but are now holding back, not desiring a visit from official authorities.

I, myself, was visited by my local Police Department, and advised to 'cool it' as the (provincial) Police Commission was 'aware' of my activities. My 'sources' became aroused, but as yet nothing further has developed, although my RCMA Newsletter is cleared by Canadian Customs now, and I did not receive the October issue. I can't help but wonder what may have been in it. Perhaps the RCMP will forward it when they are through.

This information is not as free in Canada as it is in the U.S. We therefore regard it with a little more reverence, and do not go

☞ Cont'd on p. 15

The Radio Spectrum: A Gift to the Weatherwise

PART I

by Bert Huneault

INTRODUCTION

Benjamin Franklin once said, "Some people are weatherwise, but most are otherwise." In spite of this quotation, a lot of people are very interested in the weather.

With their interest sparked by improved weather presentations on television (computerized weather displays and satellite cloud pictures) an increasing number of people have become weather conscious.

TV viewers have become more knowledgeable of meteorological facts of life, including weather map features such as low and high pressure systems, fronts and air masses, and precipitation echoes on weather radar.

Because the atmosphere is a very dynamic, ever-changing medium, keeping track of weather systems as they develop and move across continents and oceans (generally from west to east) can become a very interesting hobby.

Once bitten by the weather bug, many people become active seekers of meteorological information such as up-to-date weather reports, detailed weather forecasts and weather map analyses.

Acquiring this information lends an additional dimension to the hobby, making it downright fascinating! This is where radio listening comes in.

People who monitor the air waves have a definite advantage because the radio spectrum is a veritable cornucopia of weather information. From MF to VHF, the various bands offer a most interesting variety of meteorological goodies.

Of course, there are the usual local reports and forecasts frequently heard on the standard AM and FM broadcast bands; that's where most people get their daily weather information.

But for the amateur weatherman or for those who have more than just a passing interest in the weather--such as flyers, mariners and farmers--the information dished out by your local DJ or newscaster is usually not detailed enough.

Enter multiband radios, communications receivers and VHF scanners!

Because the various bands contain different kinds of meteorological information, we'll divide the spectrum into VHF, HF and MF, and within each segment

we'll look at what's available, including AM, FM, SSB, CW, FAX and RTTY transmissions.

Frequencies, broadcast schedules and various codes and symbols will be discussed.

We'll even explain how to plot your own weather map from data transmitted on HF, and we'll discuss a little meteorological shorthand that should enable listeners to copy aviation weather reports as rapidly as they are spoken on the air.

We'll also mention a number of books that are just chock-full of weather broadcast schedule, frequencies and codes.

So hang-in there, weather lovers, as we take you on a journey through the maze of weather information available to SWLs and scanner enthusiasts.

PART ONE--VHF RADIO

1. AIRCRAFT BAND (AM)

If your VHF scanner covers the aircraft band (118-136 MHz, AM mode), you have access to a most interesting variety of aviation weather information. Voice transmissions often include weather reports transmitted to pilots by air traffic controllers and radio operators in control towers and flight service stations.

While control tower frequencies vary from airport to airport, flight service stations (FSS) generally operate on standard frequencies: 122.2 MHz in the USA, and 126.7 MHz in Canada.

Pilots frequently contact the nearest FSS and request weather reports not only for the local airport, but also for the destination airport as well as airports along the route. This often gives the listener an opportunity to check on the weather within a few hundred miles.

Also, at very busy airports, a specific frequency is commonly reserved for continuous broadcasts of pertinent airport information for approaching aircraft, including current weather conditions. This service is referred to as Automatic Terminal Information Service (ATIS).

If you live close enough to a busy airport to pick up ATIS transmissions, you can keep yourself quite current on clouds, height, visibility, air temperature, wind direction and velocity. These ATIS tape recordings are usually updated every hour, more frequently when

necessary.

If you do not know the frequency of your local airport's ATIS transmitter, simply tune across the band, or put your programmable scanner in the search mode within the frequency limits of the aircraft band, and you'll soon discover it.

If there is an ATIS in your vicinity, you'll probably find yourself monitoring it frequently...it's an excellent source of information.

1. NOAA WEATHER RADIO (FM)

Well known to scanner buffs and weather enthusiasts in Canada and the USA are the continuous weather broadcasts heard in the VHF High Band on a frequency of 162.4, 162.475 or 162.55 MHz, depending on where you live.

These frequently updated voice broadcasts (FM mode), originating from National Weather Service offices around the USA, and from Environment Canada weather offices, generally include:

- 1) weather synopsis
- 2) regional and local forecasts
- 3) hourly weather round-ups
- 4) radar reports
- 5) near-shore and off-shore marine forecasts
- 6) special weather statements concerning severe weather
- 7) daily climatological summaries.

My monitoring station is in Windsor, Ontario, across the river from Detroit, Michigan. This listening area is served by NOAA Weather Radio station KEC63 (162.55 MHz) located at Detroit Metropolitan Airport.

In addition to a VHF/UHF scanner, I use a WEATHERALERT receiver which is permanently tuned to the NOAA frequency and incorporates a weather alarm. About thirty seconds before broadcasting severe weather bulletins (e.g. tornado watches and/or warnings, severe thunderstorm warnings, and marine warnings), NOAA transmits a special audio-tone signal which activates an alarm (loud beeper or siren) in all such radios left in the stand-by mode.

Thus alerted, users have sufficient time to reach their receivers and turn up the volume control before the special bulleting is put on the air. In this Great Lakes region, we often have severe weather during spring and summer, so I find this WEATHERALERT radio a valuable addition to my mo-

onitoring equipment.

3. MARINE BAND (FM)

There are numerous weather broadcasts in the VHF Marine Band (156.05 - 157.48 MHz; and 160.62 - 162.03 MHz). These FM transmissions by Coast Guard and commercial radiotelephone stations in the Great Lakes and coastal regions are specially tailored for marine interests.

They emphasize wind and wave information and include small-craft warnings, gale warnings, storm warnings and hurricane warnings. Obviously, these broadcasts are a must for weatherwise weekend boaters.

VHF Marine Band weather information is broadcast on a number of different channels, but severe weather broadcasts such as gale or storm warnings are normally transmitted upon receipt on the DISTRESS, SAFETY & CALLING channel (Channel 16: 156.8 MHz) by Coast Guard radio stations, and then repeated during scheduled broadcasts on a working frequency such as Channel 22 (157.1 MHz).

(Next month: The MAFOR Code)

☆☆☆☆☆☆☆☆☆☆

It's Still

"Theft of Services"

An article in the September/October 1983 issue of MT by Robert Severance has brought a number of interesting comments from readers.

Author Severance described a method of wrapping aluminum foil around the twin lead and adjusting it to act as a trap to clarify pay TV signals.

The article clearly indicated the illegality of the procedure but was printed for its technical interest.

Ron Neville of Glace Bay, Nova Scotia forwarded a news item which originated in Edmonton, parts of which are reproduced here (courtesy Broadcast News-Canadian Press News Service).

"A Canadian cable television association official says his group intends to prosecute other cases despite the acquittal of a Calgary couple on a charge of stealing pay-TV signals.

"The device the Millers used consisted of a piece of wire with tinfoil wrapped around it. They testified during the trial they learned how to construct the device from a federal government booklet and only used it to reduce interference."

- SCANNING ->

BEARCAT SCOOPS THE INDUSTRY

WITH COMPUTER-CONTROLLED SCANNER!

The Electra Company of Cumberland, Indiana has stunned the scanner industry with its announcement of a new generation scanner.

Designated the CompuScan 2100, the multiband scanner is entirely addressed by the popular Commodore 64 personal computer (not furnished).

Complete with programming disc, remote indoor whip antenna and interconnecting cables, the CompuScan offers 200 channel memory capacity (in ten selectable banks) and frequency ranges of 29-54, 118-136, 136-174 and 421-512 MHz.

While the present version of the 2100 is intended to be mated with the user's own Commodore 64, other versions are anticipated. The model 64 was a good choice; it offers 64k RAM at low cost and is a very popular, flexible PC. The Commodore disc drive is also required. Fundamentally, the CompuScan 2100 is the top-of-the-line Bearcat 300 with external address. It offers the same electronic specifications as its stand-alone forerunner.

But the similarity stops there. The low-profile cabinet offers only volume and squelch controls; all other functions are computer-keyboard accessed.

After loading the basic program, the operator is presented with a main menu from which he can choose the following functions: (1) CHANNEL DATA; (2) BANK DATA;

(3) SEARCH DATA; (4) MEMORY DATA; (5) STORER DATA; (6) SCANNER 1.

Selection among these entries allows an incredible amount of information to be entered and extracted. For instance, under CHANNEL DATA, the user may wish to write next to a frequency, "Chicago Police Department", (address), "tactical car-to-car, channel 4", organized crime surveillance", or whatever.

Selection of the SCANNER 1 command results in a 70-second load of data from the disc and another menu: (1) CHANNEL DATA; (2) BANK DATA; (3) PRIORITY DATA; (4) SEARCH DATA; (5) COUNT DATA.

Selection of the STANDBY mode permits user-selection of five commands: (1) MANUAL (displays frequencies in banks); (2) SCAN (samples memorized frequencies); (3) SEARCH (Samples all frequencies between user-set limits); (4) QUIT. (Ends scanning mode); (5) ZERO (cancels count register).

The system may at times appear cumbersome to use, especially to the newcomer to computers (and oldtimers with direct-entry scanners!).

However, it must be remembered that the long list of commands is available when needed, not mandatory for use constantly.

While the scan function is fast enough (12 channels per second), the search mode is extremely slow (one in-

Amateur Beacons Predict Low Band Skip

Scanner listeners may utilize reception of amateur 10 and 6 meter automatic beacons as an indicator of band openings worldwide.

The following list of beacons will provide identification of those transmitters now in operation, giving a clue as to propagation into those geographical regions.

Since they are in the 28 and 50 MHz range, they provide valid indicators for the 30-50 MHz band as well.

AMATEUR RADIO BEACON LIST

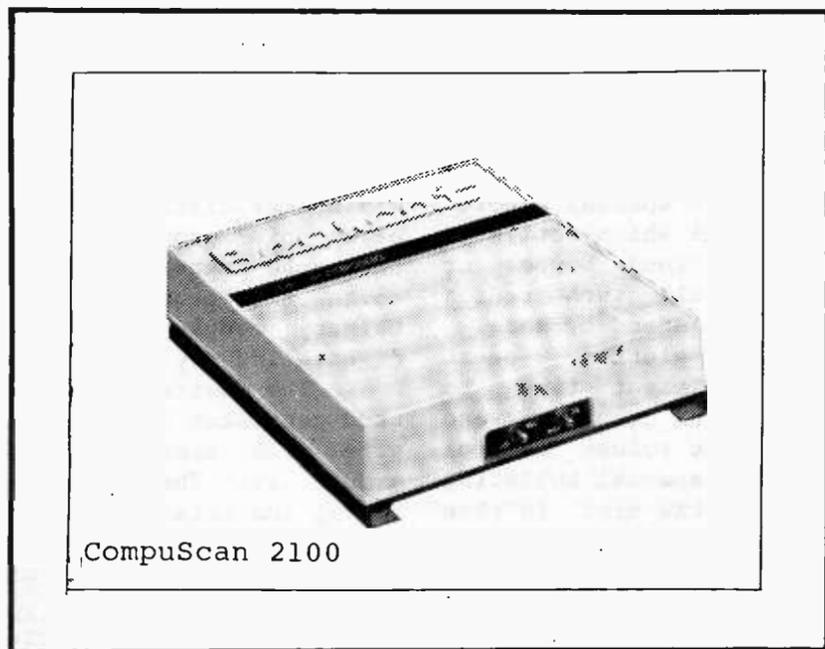
28 MHz Beacons

- 28.205 DL01GI Salzburg
- 28.2075 N4RD Florida
- 28.2125 ZD9GI Gough Island
- 28.213 GB3SX Crowborough
- 28.220 5B4CY Limassol
- 28.2225 GH5AIR Hungary
- 28.225 VE3TEN Ottawa
- 28.230 ZL2MHF Mt. Climie
- 28.236 VP9BA Bermuda
- 28.2375 LA5TEN Oslo
- 28.240 PY1CK Rio de Janeiro
- 28.345 A9XC Bahrain
- 28.2575 DK0TE Constance
- 28.260 VK (Australia)
- 28.265 VK3RWI Mt Baimbridge
- 28.270 VK (Australia)
- 28.290 VS6HK Hong Kong

50 MHz Beacons

- 50.0003 PY1 Rio De Janiero.
- 50.004 H44HIR Honiara
- 50.005 W6H7H/KH6 Honolulu
- 50.010 ZS1STB
- 50.023 HH2PR Haiti
- 50.025 6Y5RC Jamaica
- 50.030 ZS6PW
- 50.035 ZB2VHF Gibraltar
- 50.035 HC1JX Quito
- 50.037 FY7THF French Guyana
- 50.040 ZS6VHF
- 50.040 KL7CTG Anchorage

- 50.040 WA6MHZ San Diego
- 50.048 VE6ARC Alberta
- 50.050 WA1EXN Maine
- 50.050 K6FV San Francisco
- 50.050 ZS6LN
- 50.050 VE6NAB Alberta
- 50.055 WA9FEF Illinois
- 50.055 ZS6XJ S. Africa
- 50.055 ZL1UHF Auckland
- 50.058 PY2XB Sao Paulo
- 50.065 WB5ZRL New Orleans
- 50.070 ZS3E SW Africa
- 50.070 YV5Z2 Caracas
- 50.070 VP9WB Bermuda
- 50.073 W7KMA Columbia
- 50.080 W1AW Connecticut
- 50.080 T12NA Costa Rica
- 50.085 WA6RJA Los Angeles
- 50.088 VE1SIX New Brunswick
- 50.089 WD4CEI N. Carolina
- 50.093 WA8FTA Michigan
- 50.100 ZS6HVB
- 50.100 FO8DR Tahiti
- 50.100 KH6EQI Pearl Harbor
- 50.103 N8AJD Ohio
- 50.104 K4EJQ Tennessee
- 50.105 KC4AAD McMurdo
- 50.110 KG6 Guam
- 50.110 KHOAB Saipan
- 50.110 AL7C Anchorage
- 50.110 JD1YAA Min-Torishima
- 50.120 4S7EA Sri Lanka
- 50.144 KC6IN Ponape
- 59.500 5B4CY Cyprus
- 51.002 ZL1BPW Auckland
- 51.999 YJ8PV Port Vila
- 52.100 VK0BC Casey Base
- 52.150 VK5KK York Peninsula
- 52.200 VK8VF Darwin
- 52.300 VK6RTV Perth
- 52.330 VK3RGG Mt Anakie
- 52.350 VK6RTU Kalgoorlie
- 53.400 VK7RNT Ulverstone
- 52.420 VK (Australia)
- 52.435 VK3RWV Mt Baimbridge
- 52.440 VK4RTL Mt Stuart
- 52.520 ZL2VHM Palmerston No
- 52.500 JA2IGY Nagoya
- 52.510 ZL2MHF Mt Climie
- 52.800 VK6RTW Albany
- 52.900 VK6RTT Carnarvon
- 53.00 VK5VF Mt Lofty
- 52.013 P29SIX Port Moresby



CompuScan 2100

crement every two seconds). The slow speed is the result of the limitations of the computer, not the scanner, and that function is recommended for long-term unattended counting of frequencies to be discovered by the CompuScan. They can be called up later by the operator on the video terminal and memorized or monitored.

It is expected that this bold new Bearcat entry from Electra will list for nearly \$600 with software available soon for other models of home computers.

Electra has always had a reputation as an innovator; the CompuScan is a daring challenge to the computer and scanner industry and will most certainly set the direction against which later high-tech consumer electronics will be measured.



FCC Cracks Down on Illegal Gulf Net

U.S. Marshals from Mobile Alabama accompanied FCC engineers from Atlanta in mid-October to seize 53 ship transceivers being used illegally by patrons of a Bayou La Batre marine sales and service company, according to an article in the Mobile Press Register (October 22, 1983).

No arrests were made at the time of the confiscation of an estimated \$39,000 worth of transceivers from S.E.E. Incorporated, cited as responsible for the illegal operation of transmitters on frequencies not authorized for marine use, but for land mobile services.

Thanks to MT reader Reed Darsey for this interesting item.

PIRATE RADIO



CLANDESTINE CLOSE-UP
by John Santosuosso

GRENADA: Although all shortwave transmissions from Radio Free Grenada had ceased at least several weeks before the recent invasion, a medium wave transmission from the station gave the world its first report that the island was under attack.

This broadcast, made on October 26 at approximately 0940 GMT, would be the last RFG would ever make. However, before being silenced, it did have time to urge islanders to blockade roads and order members of the country's militia to report to their posts.

Based on the limited resistance offered, it is doubtful that many listeners heeded the station's pleas.

When the end came for RFG, it came with a bang. Ammunition stored inside the studio building exploded, and the entire structure burned to the ground. Most reports indicate that the station was an early target of the invasion forces and was destroyed rather quickly, but one source claims it actually survived until the second day of the invasion.

With the disappearance of RFG, the closest thing to an official radio voice on the island came from the American invaders themselves. Using portable clandestine transmitters, based both on a ship and on land, they urged the defenders to surrender and the civilian population to remain calm and indoors while "democracy was restored."

According to Terry Krueger in the November 2 issue of DX South Florida, 1580 may have been one of the frequencies used for such transmissions.

One of these transmitters is undoubtedly utilized by "Spice Island Radio," the identification given on the broadcasts made by Grenada's governor, General Sir Paul Scoon.

The first of the Spice Island Radio transmissions was made Saturday night, October 29, Grenada time, when Scoon announced a curfew but asked all government employees to return to work on Monday.

Whether Spice Island Radio transmits on 1580 or the former RFG frequencies of 535 and 990 is not known.

Although none has yet emerged, monitors should be on the look out for a Grenadan clandestine. It is always possible that one might be established in Cuba or possibly Nicaragua. In the meantime, the El Salvador clandestine Radio Farabundo Marti is trying awfully hard to fill the void.

In its Spanish language broadcast of October 29, Radio Farabundo Marti actually went so far as to call itself the "voice of the people of Grenada." The people of the island were urged to resist the invasion while Ronald Reagan and American imperialism were denounced.

In later transmissions the station has continued to attack the invasion. Look for RFM around 0200 on 7030.

Amateur radio transmissions made by Mark Barttella, a student at St. George's medical school, during the fighting received rather wide publicity in the American media. However, Florida's Dan McCarthy on October 28 at 1127 GMT monitored what may have been an amateur broadcast by a native Grenadan.

The man, who spoke with a Caribbean accent, described in considerable detail the evacuation of the medical students and then took the unusual step of closing his transmission with a prayer and a Bible reading from Isaiah. Dan notes that 14283 was the frequency in use.

While Radio Free Grenada will make no more broadcasts, the United States Government has made public some interesting information about its past activities. The station definitely was sending encrypted messages to guerrillas and agents.

Several years ago, based on material supplied by Havana Moon, this writer published a report to this effect, noting that the messages were delivered in the form of obituaries. I have also suspected that certain bus schedules announced by RFG may have had the same purpose, although proof is lacking.

The report that RFG was indeed involved in clandestine activity was questioned in at least one major DX club bulletin but has now

been positively confirmed.

Regardless of who was in charge on Grenada it was always fun to monitor the island's shortwave transmissions. Found on 15045 and 15105 these included fascinating local advertisements and announcements as well as some delightful music.

During the days of the Maurice Bishop regime much that was heard on the broadcasts remained the same, but the listener could also detect the Marxist, pro-Cuban slant of the government. RFG was clearly a political voice.

No matter what kind of government emerges it will undoubtedly want and need some sort of permanent broadcasting facilities. It

may well decide that shortwave is no longer necessary.

Radio Free Grenada's shortwave transmitters were acquired from the old Windward Islands Broadcasting Company when the country gained its independence from Britain in 1974. When Britain controlled an extensive amount of territory throughout the Caribbean, shortwave could be a useful device for helping to link the islands together.

Now, a tiny independent Grenada with a population of 110,000 and 133 square miles of territory really has no need for shortwave to reach its people. Nor does such a small nation normally have any use for an international

Cont'd on p. 24

RADIO GRENADA

The only Broadcasting Facility in the Country
P. O. Box 34,
St. George's,
Grenada.

Your Reception Report on our Broadcast of Nov. 20th 1974 on 5015 KHZ Frequency is confirmed.

With very Best Regards

Yours very truly
Radio Grenada
Ray Delzin—Ag. Manager
By... C. ALEXIS

Radio Free Grenada, formerly Radio Grenada, was one of the casualties of the recent invasion.

MONITOR



Do it yourself and save. Why pay for someone else to have all the fun? 73: Amateur Radio's Technical Journal publishes more easy-to-build construction projects than any other ham magazine. Every issue is packed with simple articles that will put your soldering iron to work.

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BROADCASTING... REVOLUTIONARY RADIO

LIBYA: AGGRESSION ON THE AIRWAVES

by Vito A. Echevarria

Libya's leader Colonel Moammar Qaddafi, a reputed troublemaker against African & Middle Eastern unity and stability, would like to have influence over a large part of Africa if he gets his way.

Qaddafi's past adventures include the ill-fated and unknown four day July 1977 border war it had with Egypt, the deployment of Libyan troops into Uganda in an effort to save the toppling regime of Idi Amin (who is now in exile in Saudi Arabia) in 1979 and Libyan intervention into Chad, which actually began in the fall of 1980.

Qaddafi has used radio to help him try to win influence over not just the Arab World, but countries like Chad, Sudan and Upper Volta. In this report, we'll look at the "participants" in the radio wars that Qaddafi and his foes had set up:

Voice of the Sudanese Popular Revolution: This clandestine station, believed to be one of Qaddafi's enterprises, broadcasts anti-government propaganda to stir up dissent against the pro-Western government of Sudanese General Nimeiri.

One can hear roaring revolutionary speeches and Sudanese tribal music being played on its frequency of 17940 kHz. Heard in progress from last summer to the present, this loud claud can be heard with good signals in Arabic from 1300 to past 1600 GMT.

Voice of the Libyan People: This recently elusive clandestine, broadcasting from an unknown source, sprung up in the late fall of 1982. The claud broadcasts material hostile to the Qaddafi government, mostly in Arabic (ID: "Huna Saout Shabii al Libyah") to the "oppressed" people of Libya. On the day that member states of the O.A.U. (Organization of African Unity) was holding their annual meeting in Tripoli (2/24/83), DXer Anthony Pavick reported in the January 1983 issue of R.I.B. (Review of International Broadcasting) that "Voice of the Libyan People" broadcast in English at 2138 GMT on its frequency, 11365 kHz, exposing the "excesses of the Qaddafi regime and how he was really trying to undermine the African commu-

nity to destroy the O.A.U." This was directed specifically to members of the O.A.U.

During this special broadcast it was learned that the claud was brought by the unknown NATIONAL FRONT for the SALVATION of LIBYA (NFSL), who wants to overthrow Qaddafi and bring a democratic and constitutional government to Libya.

But this chapter of Libyan clandestine history does not end here. In response to this station's activities, Libya decided to use its Radio Jamahiriya transmitters to jam Voice of the Libyan People's programs.

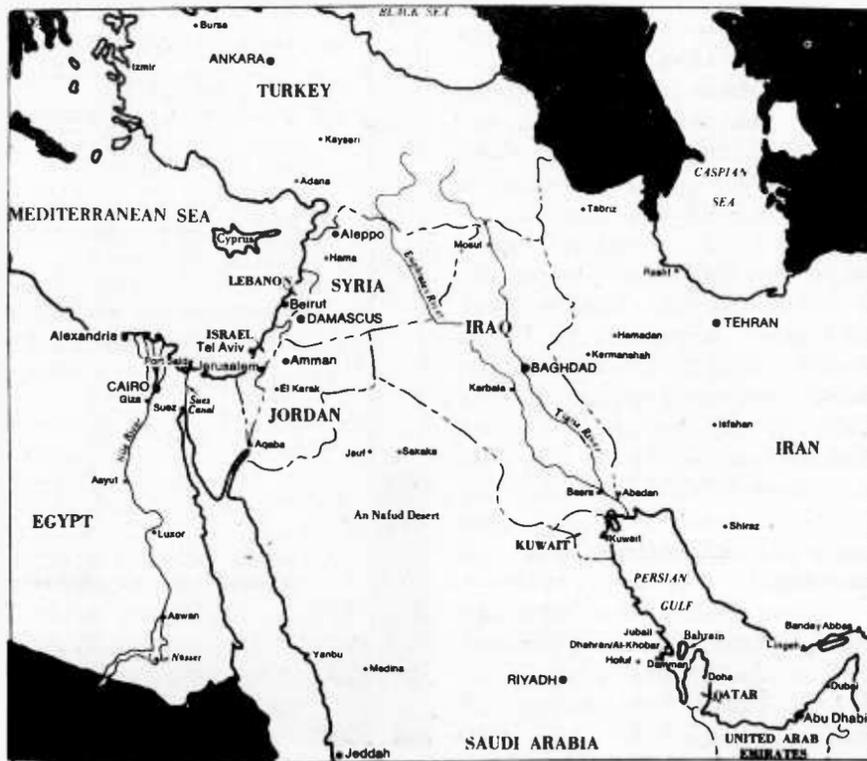
This was observed in December 23 at 2115 GMT when Tripoli's Arabic program (which was parallel to 11815 kHz) overpowered the claud station. This jamming was done throughout the winter.

Until late spring, Voice Of the Libyan People was heard on varying frequencies with fair to poor reception in North America from 11305 to 11390 kHz on various times (2130-0015 GMT).

DXers speculate that this claud is either transmitting from Sudan or most probably Egypt (as suggested by DXer Steve Reinstein). But after the disappearance of the station during the height of the Chad Civil War this summer, now even troubled Chad can be nominated as a possible source of this mysterious station.

Radio Bardai: When the Chadian civil war heated up over the summer, a new claud was being heard over the

Cont'd on p. 19



LISTENING TO THE WORLD:

The Middle East Hotbed

by Roger N. Peterson

Most of us began our shortwave hobby by chasing stations all over the globe. The more logged, the merrier. Somehow, we got information about one or more DX clubs; receiving their monthly bulletins increased our list of stations heard.

Eventually, we reached our limit. Except for an occasional new broadcaster here and there, the limitations of our set and/or antenna pretty well closed down our ability to reel in new stations each week.

Some listeners probably lost interest and only occasionally turn their sets on. Others started chasing the foreign language broadcasts and found a whole new world of DXing open to them. Others, like myself, found that on the way to logging one hundred or so broadcasters, we began to listen to more than simply the station I.D. We became program listeners.

I suspect that there are more program listeners out there than most people expect. With stations such as the BBC, Radio Netherlands, Radio Sweden, Radio Australia and numerous others, listeners have found programs that are either very informative or entertaining.

This list is changing and growing regularly so that there is always gratification from tuning in to the world each day.

The objective of this monthly column is to pass along news and tips on programs to listen to by the

international broadcasters, especially those who tend to send out the best programs.

We don't rule out the newcomer or even a pirate broadcaster if he can be picked up consistently. But the stations covered each month will be primarily the big ones which listeners with even modest equipment can receive.

As I write this, the situation in Lebanon is still bad with no satisfactory solution in sight. While our television and AM Radio news reports keep us up-to-date, they can't compare with our shortwave broadcasts for in-depth reports and background facts. This situation really brings out the best in the shortwave hobby.

While not all the embattled nations over there in the Middle East offer English language broadcasts that are reasonably easy to pick up, enough of them do to make it possible to go to the "horse's mouth" to get various viewpoints and news.

Following is a line-up of the various Middle East SW broadcasters and their program times and frequencies:

LEBANON: Not the best station to get, but try it at 1830-1900 UTC on 11.955 or 9.545 MHz. Hopefully, this station will still be on the air when you read this. But with the bombs and bullets flying around....

ISRAEL - Kol Israel (The Voice of Israel) broadcasts daily to North America at a number of times of the day. The best time to pick them up is from 0000-0030 and 0100-0125 on 11.655 or 9.815 or 7.410.

News is always the first order of business and each day some excellent feature programs follow.

At 0200, tune to 7.410, 11.655 or 9.815. Good reception is usually available at 2230-2300 on 9.815, 11.655 or 15.585.

EGYPT - Radio Cairo puts out a pretty good signal at 0200-0330 on 12.000 and 9.475. Their programs may give you a new insight into the problems of the area.

IRAQ - Radio Baghdad is a very interesting station

Cont'd on p. 29

For more Broadcasting, see Hank Bennett, p. 19

PROFILES



Listener's log

NELLIS AFB, NV
 contributed by
 Robert Dotson, Las Vegas

173.5875 Fire & Crash
 148.300 Police
 165.1875 Security
 173.5625 "

SPRINGFIELD, MO SCANNING
 contributed by Kent Hawkins

VHF-LOW BAND

38.45 Army National Guard
 39.98 Greene Co Rd & Brdg
 42.06 State Hwy PatrlBase
 42.12 " " " (Carthage)
 42.22 " " " (paired
 with 42.06)
 42.32 " " "
 42.38 " " " (Troop to
 troop)
 47.42 Am. Red Cross
 (Springfield)

Springfield Regional Airport

119.05 ATIS
 116.9 VOR
 119.9 Tower
 121.1 Approach/Departure
 121.9 Ground Control
 122.1 FSS (paired/116.9)
 122.2 FSS
 122.5 FSS
 122.8 Downtown Airport
 122.95 UNICOM
 124.95 Approach/Departure
 126.86 Kansas Cty Center
 127.5 " " "
 135.175 " " "
VHF-HIGH BAND
 146.64 Amateur repeater
 146.91 " "
 147.12 " "
 151.19 Conservation Prot.
 151.22 " Forestry
 151.265 " Forestry
 151.37 " Protection
 152.66 SW Bell Telephone
 152.78 " " "
 154.13 Springfield Fire Dp
 154.4 Greene Co VFD
 154.755 " " Sheriff Ch 2
 154.86 Springfield Police
 Dept Ch 2, So.side
 155.04 Republic Police Dep
 155.055 Lawrence Co Sheriff
 155.145 Greene Co Civil Def
 155.16 Ash Grove Comm Amb
 155.235 St John's Regional
 Health Ctr Amb Disp
 155.265 LEC Med. Ctr. Coro-
 nary Care Ambulance
 155.28 Spgfld Paramedics
 155.34 HEAR syst ambulance
 (all hospitals)
 155.37 PD pt-to-pt statewd
 155.475 PD mutual aid
 155.49 Spgfld PD N.side #1
 155.595 State Water Patrol
 155.73 MO sheriff Depts #1
 155.895 Dade Co sheriff #4
 158.775 Reg airport maintnc
 161.13 Burlington No.RR PBX
 161.16 " " " Ch. 1
 161.4 " " " Car shop

162.4 NOAA weather, Spgfld
 162.55 NOAA weather, Joplin
 163.4375 US Army Corps of En
 170.15 KTTS remote bdcst
 170.475 U of MO Ext. Off.
 173.275 Spgfld newspaper
 173.76 Wilson's Ck Natl
 Battlefld Pk (Rep)

UHF

234.2 Reg Airport App/Dep
 241.8 Army Natl Guard
 243.0 Military Emergency
 255.4 FSS Spgfld Reg Air
 257.8 Spgfld Tower
 450.05 KTTS newsroom
 456.475 State Hwy Patrol
 (Rpts 42.22)
 456.525 " " " (Rpts 42.22)
 461.375 Comm.Rptr.System
 461.425 " " "
 461.475 " " "
 461.5 " " "

CHARLOTTESVILLE, VA
 contributed by Kenneth Reitz
 Louisa, VA

453.650 Charlottesville PD
 453.950 " "
 39.420 Orange Sheriff
 39.880 Staunton PD
 39.860 Albemarle PD
 39.500 " "
 42.880 State Police
 154.660 " "
 155.455 " "
 155.460 " "
 159.165 " " Car-Car
 159.135 " " Base-Car
 154.665 " "
 460.025 UVA Police
 460.075 " "
 153.980 All Counties Sherfff
 154.935 Mineral/Louisa PD
 155.835 Charlottesville/
 Albermarle Rescue
 155.805 Louisa Rescue
 155.745 Fluvana Rescue
 468.175 Orange Rescue
 155.255 Scottsville Rescue
 155.160 Wintergreen Rescue
 155.220 W.Albermarle Rescue
 155.235 Madison Rescue
 155.295 Stuarts Draft Rscue
 155.340 All Hosp. Rescue
 42.420 Charlottesville Fire
 " "
 42.560 " "
 42.600 " "
 46.460 " " (most active)

AIRCRAFT FREQUENCIES

121.250 Charlottvl Approach
 121.900 " Ground
 121.000 " Tower
 125.750 Washington
 125.250 "
 124.750 "

TOLEDO EXPRESS AIRPORT
 contributed by Kevin Trickey
 Delta, Ohio

118.35 Approach/Departure
 120.8 South " "
 126.1 East " "
 128.0 West " "

118.1 Tower
 121.75 Clearance Del.
 121.9 Ground Control
 118.75 ATIS (weather)
 122.95 Natl Flight Serv
 (UNICOM)
 123.35 Cessna Serv. Ctr.
 123.9 Cleveland Ctr.
 128.85 Liberty Airlines
 130.0 Com Air Inc
 130.05 U.S. Air
 130.2 Air Wisc. Inc.
 130.4 TWA
 130.5 U.S. Air
 131.6 Express Aviation
 460.65 Air Wisc. Inc.
 460.725 United Airlines Inc
 155.775 Toledo-LucasCo.Fort
 Auth(Security Gds)

AIR NATIONAL GUARD(confirmd)

32.85 Planes
 34.20 "
 41.45 "
 49.75 "
 149.50 Fire & Crash
 163.485 Security
 165.135 Maintenance

132.0 Goodyear Blimp-co.
 operations
 151.625 " " -Pub.Relations
 122.9 Toledo Suburban
 Airport
 122.7 UNICOM Metcalf Fld/
 Toledo Municipal
 123.3 Crow Inc, Metcalf/
 Toledo Mun.

SKIP-MOBILE TELE. FREQS.
 (confirmed)

35.26 Roseburg, OR
 35.38 LA/San Diego
 35.46 " " /Oakland
 35.50 New York City
 35.66 " " "

^*****^

contributed by Henry Ponder
 Lawndale, NC

(kHz)

5683 Coast Guard Air to
 Mobile Flight ops
 5683 " " Air to Miami
 flight ops
 6702 Air Force Two to
 Andrews
 11243 MAC 00276 to McDill
 Airways-Phone Patch
 to "FORMAT"
 11243 MAC 67948 to McDill
 Airways
 11243 MAC 3087 to McDill
 Airways
 11243 "IVORY" 77 to
 McDill Airways
 11246 "SWING" 12 to Mc-
 Dill Airways
 10384 MAC 132 to McDill
 Airways
 10384 MAC 132 to Charles-
 ton AFB

WEST POINT & U.N. SCANNING
 contributed by Paul Cerza
 Poughkeepsie, NY

38.55 W. Pt. Motor Pool
 38.70 " " Military Pol.
 38.85 " " Fire Dept.
 38.95 " " Maintenance
 49.80 " " Range Control
 150.700 " " Keller Army
 Hosp (paging & 2-wy
 w/ambulances,MEDAC)

165.0625 " " Signal base
 165.6125 U.N. paging, F2
 165.7125 " " (Secretary Gen.
 operation, F3?)
 166.1000 " " security, F1

Monitoring Times reader Don Schimmel of Vienna, Virginia is not a casual listener to the shortwave bands. He monitors intensely some of the most intriguing transmissions, mostly CW, to ride the airwaves.

Using a Kenwood R-600 receiver and his Yaesu FR-101 ham receiver, Don has logged hundreds of hours over the last few months. Many of his catches are worth passing on the MT readers.

The following log has been condensed for brevity, but provides some indication of the activity Don has caught on the air (all CW unless otherwise noted).

Freq.kHz	Time	ID/Traffic
6756	1229	XMK CONTROL.
	1303	MNZ, LGX, YLN, LOK, DQS, CAX, MIF, ZFB, ZMB, ZXM, GMF, RBA, MOL, ZXR, NXF.
6762	1501	TWO TONES, USB SKYKING MESSAGE
6988.4	0204	RLC TO TAG, TAN.
13394	1451	6 NUMBER GRPS
13434.8	2134	GMP6(ENGLAND) TO PWAD(BRAZILIAN SHIP)
13435	2145	5 LETTER GRPS
13449	1207	4 FIGURE GRPS
13786	1458	5 FIGURE GRPS
13790	1648	HIGH SPEED CW
13925	0234	CLP1(HAVANA, CUBA) TO DIPLOMATIC INSTALLATIONS.
13979	1720	TAG TO TAN, RLC, DWM(THIS POSS. DAY FREQ AND 6988.4 KHZ IS NIGHT FREQ)
13981	1809	CLP1(HAVANA, CUBA) TO CLP 38, SENDS NUMBERS GROUPS. POSS.BREAKOUT=A-1,U-2,W-3, M-4,I-5,R-6, G-7,D-8,N-9, T-0. 1900HOURS SKED ON 13925 KHZ.
14487-	2100-0300	
14993		YOR (CONTROL STATION) TO IOC.
7428.5	1410-1650, 2100-2200	KCU (CONTROL STATION) TO AUL BOF
13420-		
13450	1230	UNUSUAL CARRIER.COVERS 30 KHZ.
13440	2039	5 LETTER GRPS, PROB. SOVIET
13444	2050	FRENCH PLAIN-TEXT
13576.7	1308	(OMAN)
13504/		
14392	1315	ODF TO 7L
14476	1312	K MARKER & 5 NUMBER GRPS

Cont'd on p. 8

Canadian Aircraft Monitoring

by Gilles Thibodeau

ABBOTSFORD, British Columbia	
344T	Comm-Radio
126.7	"
122.5	"
295.0	"
119.4	Tower
121.0	"
295.0	"
121.8	Ground
119.8	Atis
BAKER LAKE, N.W. Terr.	
126.7	Comm-Radio
122.3	"
282.3	"
114.5T	"
403T	"
5680	"
ST-HUBERT, Quebec (Military)	
125.15	Comm-Montreal Arr.
287.2	"
118.4	Tower
122.5R	"
352.5	"
126.4	Ground
283.4	"
124.65	Montreal Dep.
323.2	"
135.9	A/G St-Hubert Military Operations
268.0	"
118.0	Atis
124.1	"
DRUMMONDVILLE, Quebec	
122.1	Comm-Sherbrooke Radio
126.7	"
122.8	UNICOM
GAGNON, Quebec	
122.2	Comm-Radio
126.7	"
122.8	ARCAL (available when FSS closed)
LA GRANDE RIVIERE, Quebec	
126.7	Comm-Radio
122.3	"
282.3	"
132.1	PAL:Montreal Centre
112.2	VOR/DME: YGL

Canadian Airports

MT reader Colin Gaskin (45365 Westview Avenue, Chilliwack, BC, Canada V2P 1L8) has responded to our request for Canadian aero listings. Colin would appreciate any additions or corrections to his list (as would we!).

Thanks, Colin!

PROFILES from p. 7

14492	1248	SZ6H TO UGN	4243	0426	4XZ (HAIFA NAVAL RDO, ISRAEL)5 LET. GROUPS
16668	1545	SPANISH PRESS	4581	2320	ONY27 TO ONY24 (ROUVEROY, BELGIUM)LETTER/NUMBER GRPS
13412	2019	SPP(5 FIGURE GRPS-POSS SZC-ZECIN POLAND)	6995	0200	AFF2EP (US AIRFORCE)USB
13414	2111	2-3 LET. GRPS	6995.7	0201	(MALE SPANISH) USB "TORRE DE AMERICA", "PRIMAVERA DE AMERICA"
13415	2115	"GRAY 8" TO "GRAY 2";USB	13444.6	2156	11 TO 00
13428	2135	5 FIGURE GRPS, FEMALE SPANISH	13500	2052	310
13436	2031	Y7L36(CW CALI TAPE, THEN GOES INTO RTTY)(E. GERMAN EMBASSY HAVANA, CUBA)	14441	1932	A6N(4 CHAR. GROUPS)(A-1, U-2, V-3, E-5, B-7, D-8, N-9, T-0)
13483	0109	5 CHAR.GRPS PLUS SPANISH NYEH (MW)	14515	1941	011 444 REPEATED
13490	1332	5 LETTER GRPS (PROB SOVIET)	13340	2330	CLP1 AR(HAVANA, CUBA)
13498	0203	SPANISH OFFICIAL GOVT.TFC	13383.8	2052	RMN3(OMSK, SOVIET UNION)
13499	2103	07A	13412	1205	ENGLISH & AFRICAN LANG TFC
13503	2140	U2K	13428	2041	"107"
4107	0415	5 LETTER TFC. PROB SOVIET	13429	2129	FEMALE SPANISH NUMBERS

I would like to hear from readers that can monitor RCMP XJE 355 at Dorval Airport and XJD 225 at Mirabel Airport on the frequencies 413.0375 and 413.2875 MHz. Also, you can send me the frequencies in use at airports in Canada for maintenance, security, and emergency (ground only).

Send information to: Gilles Thibodeau, 3653 Montcalm, Lac-Megantic, Quebec G6B 2H8 Tel: (819) 583-1817 (after 6 PM).

13468	2311	"902"
13925		SPANISH PLAIN TEXT CW
13981		CLP1 NETWORK; CW NUMBERS
13498	2022	FRENCH GOVT.
13512	2313	6 FIGURE GRPS 5 GRPS IN MSG. PREV HRD ON 13395 AND 14583
13526.5	2054	CCS(SANTIAGO NAVAL RADIO, POLISH LANG.
13615.7	1756	POLISH LANG.
13657	1755	IDR5 (ROME NAVAL RADIO)
13704.7	1712	USB SPANISH, INTERAMERICAN MILITARY NET.
13814	1745	KRH50 (US EMBASSY, LONDON, ENGLAND)
14397.6	1417	"CAPE RADIO" USB
14411	1136	5 LETTER GRPS
14507	0210	SOVIET
14555.2	1735	RIW (KHIVA NAVAL RADIO, UZBEK, USSR)
14580	0118	SOVIET
13424.6	2124	SPANISH FISHNG
13431.5	2137	CIPHER GRPS
13498	0005	FRENCH GOV TFC
13504	2055	5 CHAR GRPS. MIXED LTRS/NBR SIMILAR TO7428 7492&6643 KHZ.
13510.4	2325	SOVIET
13629	1134	HIGH SPEED
13698	1116	5 LETTER GRPS SOVIET
13816	1647	"BT 18888"
14555	0226	5 LETTER GRPS. SOVIET
14580	1629	5 LETTER GRPS. SOVIET.

Thanks, Don, for sharing your excellent reception reports with Monitoring Times readers!



PROVINCE	AIRPORT	TOWER	GROUND	ATIS	V.F.R. APPROACH	V.F.R. ADVISORY	PRECISION APPROACH	CLEARANCE	ARRIVAL	DEPART	CENTRE	CENTRE	CENTRE	CENTRE
B.C.	VICTORIA	119.7	121.9	118.8	119.1	-	-	-	-	-	-	-	-	-
B.C.	VANCOUVER	118.7	121.7	124.6	124.0	125.2	118.1	121.4	120.8	120.5	132.3	132.7	133.7	134.8
ALTA.	CALGARY	118.7	121.9	127.2	-	-	118.0	121.3	125.9	119.8	132.85	134.2	133.3	125.3
ALTA.	EDMONTON(MNT)	118.3	121.7	128.0	-	126.0	-	124.1	120.5	120.5	132.15	134.7	134.9	-
ALTA.	EDMONTON(MNR)	119.1	121.9	125.4	-	118.8	-	121.3	119.5	119.5	-	-	-	-
SASK.	REGINA	118.6	121.9	-	-	-	-	-	120.1	120.1	123.8	-	-	-
SASK.	SASKATOON	118.3	121.9	-	-	-	-	-	119.9	119.9	133.1	133.9	-	-
MAN.	WINNIPEG	118.3	121.9	120.2	125.4	121.0	-	121.3	119.5	119.9	118.0	119.7	120.5	134.4
ONT.	OTTAWA	118.8	121.9	121.15	126.2	-	-	119.4	127.7	128.175	135.2	-	-	-
ONT.	THUNDER BAY	118.3	121.9	-	119.9	-	-	-	119.2	119.2	-	-	-	-
ONT.	TORONTO	118.7	121.9	114.8	118.0	119.3	-	121.3	127.925	128.8	132.175	132.475	134.575	134.925
QUE.	MONTREAL(MNR)	119.9	121.9	120.2	119.3	125.4	-	125.6	125.15	124.65	133.2	132.4	-	-
QUE.	MONTREAL(MIR)	119.1	121.8	125.7	-	125.4	-	120.5	125.15	124.65	-	-	-	-
QUE.	QUEBEC	120.3	121.9	121.0	-	-	-	-	119.5	119.5	125.1	-	-	-
N.B.	FREDRICTON	119.0	121.7	-	-	-	-	-	-	-	124.3	-	-	-
N.B.	MONCTON	118.3	121.9	-	-	-	-	121.9	119.3	119.3	132.2	132.5	132.7	133.4
PEI.	CHARLOTTETOWN	118.0	121.7	-	-	-	-	-	-	-	-	-	-	-
N.S.	HALIFAX	118.4	121.9	121.0	-	-	-	-	118.7	118.7	-	-	-	-
NFLD.	ST. JOHN	119.3	121.9	-	-	-	-	-	-	-	133.15	-	-	-
NFLD.	GANDER.	118.1	121.9	-	-	-	-	119.4	128.5	128.5	124.8	125.9	132.6	133.9

TUNE IN CANADA

by Norman H. Schrein

It sure has been a busy time lately, looking into the many requests for frequency information throughout Canada. This month's column will show the result of some of that research.

I did receive a letter from a reader in Ottawa wondering if I had information for that section of Canada. Yes, I do, and for all other parts of Canada as well. So if you do have a request for specific information about your area that you would like me to look into, do not hesitate to let me know.

First of all let's take a look at the licensees on the frequency of 166.110 MHz in Ontario:

VCO 696	Geofroy Construction, Ltd.	Elliot Lake, ON
VCO 290	Van Keulen, Gerrit	Bluevale, ON
VCZ 650	Chiachia, Katherine	London, ON
VCN 881	Two Bay Enterprises, Ltd.	Moosonee, ON
XNE 76	Blue Line Taxi Co. Ltd.	Ottawa, ON
VCW 460	Sheddon Farm Equipment	Sheddon, ON
VCW 979	Stead & Lindstrom, Ltd.	Thunder Bay, ON
CYB 204	Blue Line Taxi, Ltd.	Ottawa, ON

I had a request recently for frequencies in the Salmo, BC area. Following is the list:

157.440	152.990	CJZ 416	Canadian Bcg. Corp.
164.490	163.710	VGK 456	B.A. Benson & Son, Ltd.
158.445		XJG 611	Village of Salmo, BC
138.585	139.320	XJL 73	RCMP
138.675	139.410	XJL 73	RCMP
139.080		XJL 73	RCMP
139.140		XJL 73	RCMP
163.335	164.205	XLV 95	B.C. Dept. Lands, Forests&Water
163.830		XLV 95	" " " " "
163.890		XLV 95	" " " " "
148.285	143.295	XMV 443	B.C. Ministry of Highways
148.795	143.445	XMV 443	" " " "
148.855	143.895	XMV 443	" " " "
149.110		XMV 612	Emergency Health Svc. Comm.
149.680		XMV 612	" " "
153.410		XOF 42	W Kootenay Power & Light
154.130		XOF 42	" " " "
152.750	158.010	CJW 235	B.C. Telephone Company
165.930	165.300	XOK 452	B.C. Hydro Authority
414.5125	419.5125	XOK 452	" " " "
414.3625	419.3625	XMW 904	B.C. Ministry of Highways

The following frequency is located Salmo Creek, B.C.
165.780 165.210 XOK 842 B.C. Ministry of Highways

Following is a hodge podge of frequencies from the Essex County, Ontario area, which is near the city of Windsor:

27.235		XKD 563	Chrysler Canada	Windsor, ON
27.680		XNA 687	Desjardins, Gera	Tecumseh, ON
27.700		XKD 87	Grace Hospital	Windsor, ON
27.960		VCP 403	Chrysler Canada	Windsor, ON
27.960		XKC 234	Univ. of Windsor	Windsor, ON
140.070		XKD 921	Bridgeview Electr	Leamington, ON
140.070		XKE 431	" "	Tilbury, ON
140.430		XKE 442	G.M. of Canada	Windsor, ON
140.490		XJD 305	RCMP	Windsor, ON
142.215	138.195	XJJ 961	Windsor Police	Windsor, ON
142.770	138.750	XJJ 961	" "	" "
148.285		XKC 725	E&A Management Ent	Windsor, ON
148.555		CHC 569	Cherry, Louis John	Windsor, ON
148.655	149.495	CJW 300	City of Windsor, ON	" "
148.685		CJW 300	" " "	" "
154.145		CJM 429	Chrysler Canada	Windsor, ON
154.145		XJG 97	Windsor Fire Dept.	" "
154.680		XJI 759	Tilbury Fire Dept.	Tilbury, ON
154.710		CJN 30	Ford Motor of Canada	Windsor, ON
156.300		VBE 2	Canadian Coast Guard	Leamington
156.350		XJP 56	Windsor Harbour Comm	Windsor, ON
156.600		VBE 2	Canadian C. G.	Leamington, ON
156.600		XJP 56	Windsor Harbour Comm	Windsor, ON
156.700		XJP 56	" " "	Windsor, ON
156.800		VBE 2	Canadian C.G.	Leamington, ON
156.800		XJP 56	Windsor Harbour Comm	Windsor, ON
157.100		VBE 2	Canadian C.G.	Leamington, ON
157.175		VBE 2	" " "	Windsor, ON
157.455		VCT 687	Frgllomeni, Tony	Windsor, ON
157.470	152.210	VCT 701	Ormsby, Anthony J.	Pt Aux Rchl
157.545		VCV 535	Krause, Karl Rudy	Leamington, ON
158.040		CHC 26	Bell Telephone Co.	Windsor, ON

160.665		CHB 477	Canadian Nat'l RR	Windsor, ON
160.665		CZV 413	" " "	Tecumseh, ON
160.695		CZV 411	Canadian South RR	Windsor, ON
160.785		CHB 477	Canadian Nat'l RR	Windsor, ON
160.905		KNX 885	Essex Terminal RR	Windsor, ON

From Fruitvale, BC come the following frequencies:

157.500	152.960	CJZ 414	Canadian Bcg. Corp.
153.260		VGK 775	Philipzyk, Edward
138.585	139.320	XJE 252	RCMP
138.675	139.410	XJE 252	RCMP
139.080		XJE 252	RCMP
139.140		XJE 252	RCMP
151.475		XJL 930	Fruitvale Water Works Dept.
153.830		XJL 930	" " " "
148.285	143.295	XMV 447	B.C. Ministry of Highways
148.795	143.445	XMV 447	" " " "
148.855	153.895	XMV 447	" " " "
152.090		XNI 786	Hearn Brothers Lumber Co.

Finally here is a small frequency sampling from the Hamilton, area:

155.055	150.550	CJY 669	Radio Rogers, Ltd.
171.150		CKA 216	Shell Canada, Ltd.
152.315		VCO 777	McCarthy, Thomas Keith
142.485	138.465	XJF 359	Hamilton Police Dept.
142.635	138.615	XJF 359	" " "
142.770	138.750	XJF 359	" " "
143.085	139.005	XJF 359	" " "
156.600		XJF 496	" Harbour Commission
156.800		XJF 496	" " "
154.070		XJH 89	Hamilton Fire Dept.
154.250		XJH 89	" " "
154.830		XJH 89	" " "
31.420		XKC 24	St. Joseph's Hospital
30.020		XKC 57	Chedoke Hospitals
30.460		XKC 57	" "
454.225	459.225	XKC 57	" "

Remember, if you would like to see specific information for your area in this column, do not hesitate to contact me at: 1107 Sharewood Court

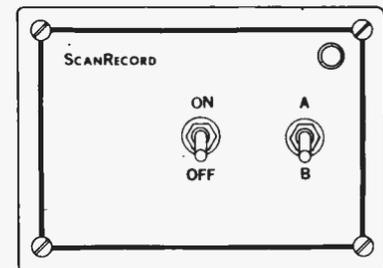
Kettering, OH 45429

1-513-298-5746

Until next time-----good monitoring.

While you were out... SOMETHING HAPPENED!

Now you can record all the scanner action that occurred while you were away for playback later. The Scan Record recorder coupler will automatically turn on your tape recorder when your scanner is receiving a message and route the audio from the scanner to the recorder.



The recorder runs only when a message is received. It does not run when the scanner is just scanning. This lets you record a lot of traffic on one tape. In addition to scanners, it will work with any receiver that has a squelch control.

The easy to use ScanRecord features user selectable drop-out delay, adjustable sensitivity, activity indicator and recorder control switch. The unit is all solid-state with no relays to stick or wear out. It operates on 9 to 15 volts DC and can be powered by a 9 volt battery or AC adapter.

All you'll need in addition to your scanner and the ScanRecord is a tape recorder with a microphone jack and a remote control jack. The ScanRecord comes complete with all connecting cables.

Your complete satisfaction is guaranteed. Order your ScanRecord today for only \$35.75 plus \$2 shipping and handling.

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CW ON THE HIGH SEAS

by James R. Hay

While listening to maritime stations one hears many terms with are unique to radio, and also special procedural signals which speed things up, especially on cw.

The most prominent set of procedural signals or "service abbreviations" is the Q code, a set of three-letter signals. Those signals in the series QOA to QUZ concern the maritime service.

Most of the signals can be turned into a question by simply adding a question mark after the signal. An example would be "R?" which asks the question, "Shall I reduce transmitter power?"

The reply might be "QRP" meaning, "I will reduce transmitter power" or

"yes" or "no" or possibly even "R" ("Roger") indicating the affirmative.

There are some signals already familiar to DXers because of their use by amateur operators. These include:

- QRM I am being troubled by interference (Followed by a number for 1 (slight) to 5 (severe))
- QRN I am being troubled by static (followed by a number as in QRM)
- QRP I will decrease transmitter power.
- QSY I am changing transmitter frequency to...kHz (or MHz)
- QRU I have no traffic for you
- QRZ You are being called by... (on...kHz (or MHz)). (Or, who is calling me?)

A comprehensive list of Q signals is included in Bob Grove's Shortwave Frequency Directory (BOK-13) available from Grove Enterprises and other Monitoring Times advertisers.

Another signal often heard in the SWL and DX community is "QSL" which asks the question, "Can you acknowledge receipt?" and gives the reply, "I am acknowledging receipt." This is one signal which is widely misused in the radio hobby.

When we talk about QSL's and QSL cards we are stretching the point. QSL is a term which is properly used to mean that the transmission of a message is acknowledged, and that the receiving station copied it correctly.

In the proper context it does not refer to cards or letters sent by the post but is nothing more than a procedural signal. The card or letter being more properly called a verification card or letter.

Some other common signals include:

- QRC My accounts for charges are settled by...(name of agency)
- QRD I am bound for...from..
- QRE My estimated time of arrival (ETA) is...
- QRO I will increase transmitter power.
- QRV I am ready. (Asks "Are you ready?")
- QRY Your turn is number...
- QSB Your signals are fading
- QTO I have left port
- QTP I am entering port

A while ago I heard a story which might be interesting to some readers regarding the last two signals. A gentleman who was a deck officer and also a certified radio officer was speaking to a ship's captain.

The operator on the

ship had just been arrested and the ship could not leave until he was replaced. During the conversation it was revealed that the gentleman held an operator's certificate, and the captain hired him as a replacement wireless operator.

When approaching Trinidad the replacement operator (who had not operated a radio for some time) called and asked if there were any messages for the ship, by sending the signal QRU? Trinidad answered with the signal "QTO or QTP?".

The operator, not having a copy of the Q signals handy and not recalling the meaning of the two signals replied "QTO? QTP?". The reply came back from Trinidad as "Are you coming or going, stupid?!" and to this day the gentleman concerned reports that he has not forgotten the meaning of QTO and QTP!

There are also several other signals which are occasionally used which are also included in the International Code of Signals. Among these are:

- QTI My true course is...degrees.
- QTJ My speed is...knots (or km/h or mph)
- QTL My true heading is...degrees (not the same as QTI; ship's head can be pointing in another direction due to wind, current, or tide)
- QTW Survivors are in...condition and urgently need...
- QTZ I am continuing the search for...
- QUO Please search for...
 1. aircraft;
 2. ship;
 3. survival craft)
- QUW I am in the...search area

XXX XXX XXX

In the July/August issue of MT a few errors crept into the Arctic DX articles. I would like to correct these now. First, for some reason known only to my typewriter, I put Killineck in Newfoundland while it is actually located in the Northwest Territories.

A sharp-eyed reader also sent me a note to say that "Yakute" is correctly spelt Yakutat and that the USN station at Adak, AK is actually on Adak Island, AK.

If you have any comments about this column, or if you would like to suggest a possible topic which you would find interesting, please let me know. I would also be interested to include any loggings which are noteworthy.

Please address correspondence to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q. Canada H9S 4Z2.

See Shuttle Via NASA Satellite

by Mike Smithwick

There was once a time years ago, when space travel was something special. It was a time when we would wake up, hours before dawn, to see the improbable: men going into space.

What space watcher could forget CBS demonstrating Gemini docking procedures using Revell models mounted on little toy trains? Or Christmas Eve 1968, as the crew of Apollo 8 read from the opening verses of Genesis? Through television we were able to participate in these great adventures.

Yet, as space travel becomes much more common with the passing of each shuttle mission, gone are the days of the Network's "liftoff to splashdown" coverage; the shuttle flights receive a 2 minute shrug at the end of the evening news.

However, it's not as bleak as it seems. For there is a special service provided by NASA which can make even the most confirmed shuttle freak cry "enough!" All one needs is a 4 meter

satellite TV dish and a little luck, and he will be treated to NASA's own in-house television network.

Termed "NASA Select Television" the broadcasts carry anything from 14 hour-a-day shuttle coverage to more mundane things as weather satellite launches and teleconferences. And with 10 shuttle missions scheduled for this year, there will be no shortage of things to see!

Oriented primarily towards NASA's own bases and contractors, the shuttle broadcasts begin 2 or 3 days ahead of the launch date with occasional news conferences and weather updates. (The feeds are by no means continuous, so don't be worried if you find no signal whatsoever).

The actual flight programming starts up at about 6 hours before liftoff and runs continuously through the landing with timeouts during the crew's sleep periods. During the countdown, viewers are treated to shots of the crew eating breakfast and ingressing into the spacecraft.

Audio from the launch ground-loop communications is heard along with the more pedestrian announcements from the "Voice of Launch



TV photo of shuttle crew live from NASA Select.

Control." Best of all, there is none of that inane chatter from Tom Brokaw, and no "Gee-Whizzes" from David Hartman!

About 20 minutes after launch, replays of the entire liftoff sequence from all available color camera positions are transmitted. At 45 minutes into the flight we are presented with a series of breathtaking replays from the special close-up on pad engineering cameras.

After liftoff, broadcast control is taken over by Houston. For the rest of the mission the programming consists of all of the downlink TV, daily television schedules and news conferences.

NASA Select TV opens up a whole new dimension on space watching. Recent

Cont'd on p. 32

SIGNALS FROM SPACE

SATELLITE MONITORING--Getting Started

by Larry van Horn

I started my satellite monitoring early in my SWL career. It was March of 1966. I'd been DX'ing for 4 months on a Hallicrafters S-120 general coverage receiver my family had purchased used as a Christmas present.

I had been interested in Space for quite sometime and the chance to monitor realtime communications from space charged me up even more. My family would even let me play hooky from school for the launches and recovery of each U.S. Space mission.

Little did I know that the Gemini 8 mission would change my SWL listening habits forever. Astronauts Armstrong and Scott had been launched early on the 16th of March 1966. Naturally I was glued to the old tube watching the launch. Everything appeared normal early on so I monitored the flight periodically via the shortwave and the VOA.

Around 8 hours after launch during the docking phase with the Agena Docking Target trouble started. I was monitoring the newscast at the top of the hour when the announcer told the world that the Gemini 8 had docked but was in trouble.

Shortly after linkup both vehicles began tumbling and spinning, out of control, as a result of a jammed thruster. The astronauts escaped only by firing their retro-rockets, and had to return to earth 2 days early.

During the time of the emergency 15016 kHz was used by Gemini 8 to pass almost continuous vital voice information to the hastily assembled recovery forces in the Pacific. This got me started in this fascinating sector of the monitoring hobby almost 18 years ago and I have stuck with it ever since.

Over the last several years I have monitored the switch from conventional HF to satellites of different communication services (i.e. -point to point, marine band military comms, etc.). It's time for other SWL's to jump on the bandwagon!

Satellites, by nature of their height above the



earth and transmission frequencies, provide reliable communications without regard to propagation. The old rule of thumb is, "If it's within visual range (horizon to horizon) you can hear 'em!"

In months to come, I hope to present the wide world of space communications available to the readers of MT.

Satellite transmissions occur primarily in the HF-VHF-UHF-Microwave portions of the spectrum.

I have specialized in several areas of space comm monitoring over the last few years. Although I study and monitor just about everything that goes up into space (I'm a hard core space junkie!), I specialize in the Russian space program, manned and unmanned, amateur radio satellite comms (amateur call N5FPW, AMSAT member), and U.S. Military satellites (probably because of my U.S. Navy affiliation).

My files of information on satellites extend well past these areas though. When you are a hardcore space junkie you collect anything and everything on the subject.

Recently, in the July/August 83 issue of MT, Bob carried a list of several 136-138 MHz frequencies he has heard with satellite activity. I have attempted to plug in the information with known current satellites that are actively transmitting on those frequencies. While I did not cover all those frequencies listed, I will continue to research Bob's list.

136.080...ISIS 1/2 (Canadian scientific satellite)

136.440...European Space Agency (ESA) widely uses this frequency for their COMSAT's general housekeeping telemetry beacons. (ie- ECS-2, ETS-4, etc)

136.380...Used by the early GOES weather satellite series as a telemetry beacon

136.500...Old Nimbus weather satellite frequency

136.725...Japanese telemetry frequency used by

TV Satellite Reception: Some Cold, Hard Facts

by Robert Lonn

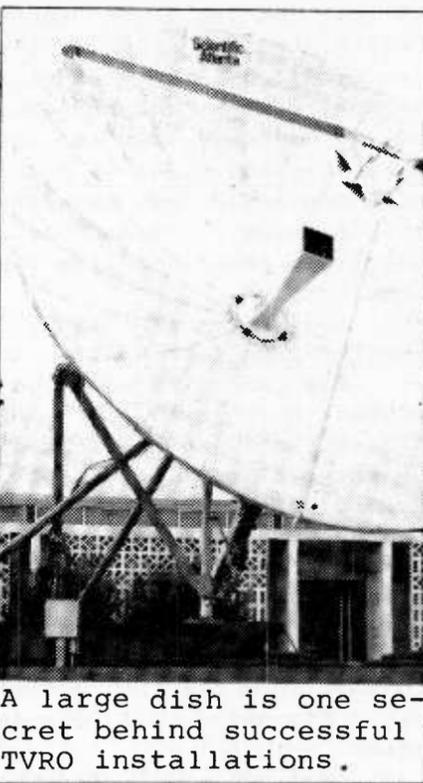
Chief Engineer
Cox Cable San Diego
The TVRO (Television - Receive Only) terminal has progressed from a minimum nine meter antenna at \$50-60,000 (plus \$2,200 or less/receiver) to a 4.5 or five meter dish size for under \$6,000 (plus \$2,200 or less/receiver). In this article we'll learn some characteristics of satellite-transmitted signals which affect all installations.

The satellites sit in geosynchronous orbit 22,300 miles in space above the equator, moving at a velocity of about 6,900 miles per hour which exactly matches the rotation of the earth and thus appear stationary.

Each satellite is a self contained package with power systems and transponders (repeaters) onboard. Signals are transmitted to the satellite in the 6GHz (6000 MHz) band from a high power transmitting dish.

The power of these ground stations is usually about 80 DBW (80 DB above 1 watt reference) or 100,000,000 watts effective! Due to the high path loss (199 DB at 6GHz) only -89 DBM arrives at the Satellite Relay.

The satellite receives this signal via a high gain antenna, changes the frequency for retransmission in the 3.7 to 4.2GHz band,



A large dish is one secret behind successful TVRO installations.

such satellites as MS-T4/Astro 1.
136.770...US weather satellite frequency (NOAA series)
136.800...Used by US Explorer 50 for scientific data.

Cont'd on p. 31

amplifies, and retransmits via an antenna designed for full continental US coverages with a spot beam for the Hawaiian Islands.

Output power is about 35 DBW, and the signal encounters a path loss to Earth of 196 DB (nominal) which results in a signal of about -133 DBM at the TVR). This will vary somewhat depending on the geographical location within the satellite footprint (or downlink antenna pattern).

THE VARIABLES

The basic TVRO terminal consists of a high gain parabolic antenna, a low noise amplifier (LNA), and the microwave receiver itself.

The high gain parabolic antenna can be of several sizes and feed configurations. The five meter antenna is the most popular but larger and smaller sizes are used depending on geographic location.

The gain of a typical five meter earth station is 44.5 DB. The LNA has a gain of 50 DB with a noise figure of 1.5 DB (120 degree Kelvin units). This is the most common but 80 to 110 degree Kelvin are available at a premium cost.

A good rule of thumb is: The larger the dish, the higher the Kelvin rating of the LNA that can be tolerated.

We have -133 DBM of signal available at our location. The gain of the five meter dish was about 44 DB. Thus, the output signal of the dish will be at -89 DBM.

The LNA has a gain of 50 DB, a 1.5 DB (120 degree) noise figure and a carrier-to-noise ration of 14 DB. The result is -39 DBM output from the LNA.

Input level to a LNA is a very critical calculation. If the cable loss to the receiver is nominal, say 3 DB, then the receiver will see about -42 DBM.

At this time we will convert from DBM to DBMV which is used by most cable companies as a means of measuring signal. The result is -7DBMV, a signal level most receivers can use to produce interference-free pictures.

In review, what your pictures look like is directly related to dish size, LNA noise figure, and bandwidth noise figure of the receiver itself.

Before an investment of many thousands of dollars, research your particular geographic location, consult an expert to show you, in writing, what signal parameters you would receive with a particular installation.

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



by Havana Moon

O.K., you've read a lot about that inviolate crypto-system in this column in the past few months, but you're skeptical. I don't blame you. The past few months have been downright confusing.

Well, I've finally got it together in a semi painless and non-technical format. I've even steered clear of most buzzwords and technical jargon.

First, let's take a look at the mail and other bits of important information.

THE POSTMAN RINGS

Remember my mention of SPEEDX and Mike Chabak's U.S. Navy comment? Find your Sept./Oct/ '83 MT if you don't remember.

Mike has been kind enough to clarify his cryptic comments. Here's a portion of what Mike had to say:

"...My Speedx column comment was directed to the monitor who logged the MCW traffic to ascertain if he actually copied US Navy type coded traffic (answer was "no"). My comment was in no way to be interpreted, that I suggest that the USN is participating in the numbers xmsns. If you examine all freqs in number use, you can easily find correlations with many US agencies, as well as foreign sources. Since number xmsns are "clandestine," freqs used are probably coincidental, in regards to those authorized to use them..."

A big thanks to Mike for taking time from his busy schedule to clarify this matter. "Los Numeros" is very happy to devote a few column inches to a reporter of Mike's calibre.

There was another interesting letter from a person with a valid reason for requesting anonymity. Mr. X has this to say:

"...what better ploy is there, than for a numbers operation to deliberately inject a signal, in with some of their xmsns. Radio Havana Cuba, VOA idents and programming blurbs, would be an excellent mis-information tactic, to confuse and mislead number investigators..."

Good point, Mr. X. I have a hunch that I'll be hearing more from this person.

And finally, there was a response from Florida's Dade County. Unfortunately, I misplaced the card. I do, however, remember that this person was reporting some type of a numbers transmission mixed with a conversation in Spanish. Sorry about the loss.

THE INTERCEPTS

As of this writing, the old 3060/3090 kHz circuit continues to be active on the hour on 3090 kHz. The repeat is at 15 past the hour on 4030 kHz. These frequencies, however, may have changed by the time you read this.

I rather doubt that the numerous frequency changes of the past several months have been instigated to elude those that actively monitor numbers transmissions. A signal that stands out like international orange is easily located.

Also note that there were NO unusual numbers traffic patterns monitored during the invasion of Grenada.

SELF PROTECTION GUIDE

Don't forget to pick up a copy of The Truth About Self Protection at your local bookstore. It's written by Massad Ayoub and published by Bantam. This is the only complete guide to total self-protection and security by a true professional. Available about the time you read this.

RED ROUTE 20 AND SOVIET ELECTRONIC MISINFORMATION

The hints of dawn continued to play a sort of hide-and-seek as the Captain maneuvered his 747 into the frigid Alaskan sky and set course for "Jet Route 501," a flight path along the Aleutian Islands.

In a matter of minutes the Captain would make radio contact from one of 5 radios with Anchorage from check-point "Bethel."

"Red Route 20" was the next flight path on 007's bizarre journey. The aero maps were not devoid of warnings. the 10-point type in non-repro blue read: "Unlisted radio emissions from this area may constitute a navigational hazard or result in border overflight unless unusual precaution is exercised."

This sobering and slightly cryptic warning would not delay or deprive KAL 007 of its macabre rendezvous with destiny.

In a very short time the missiles from a Soviet Su-15 would be heard around the world and...

The victims of Sakhalin --past and present--will not soon be forgotten.

A luxury (?) seldom afforded the professional intelligence officer of the free world is a society where everything is secret --where what's true and what's not true is only discussed in guarded whispers. This is the dark and shadowy world of the KGB and GRU.

This is a sinister world where legitimate radio and radar transmissions are abruptly terminated and replaced by bogus radar and radio transmissions. This is especially true when spy satellites are overhead of sensitive areas or when aircraft on valid flight paths are scheduled to fly near Soviet territories. One such route would be "Red Route 20."

Here--in a general sense--is how the Soviets operate this massive electronic misinformation network: the KGB and GRU provide each military unit with updated schedules showing the exact times that Western reconnaissance satellites will overfly their area as well as the track it will follow. Airline schedules are also made available to these units.

My source tells me that American computers are at the base of this amazing operation. Trajectories of satellites as well as commercial airline flight plans are constantly updated.

Few of the Soviet military know of the reasons for their orders to cease operation of their legitimate radar or radio transmissions. They institute bogus electronic emissions at stated times without question.

One can only speculate regarding the nature of the bogus radio and radar transmissions in the vicinity of "Red Route 20" on the morning of 007. Those are the tapes the NSA will not release.

THE HACKERS

War Games. Downright frightening is how teens use home computers to gain access to DoD computers. DoD spokesmen have been quick to assure us that no classified or sensitive data was compromised.

It is most frightening to realize that the security

of our nation is only as good as the security of the computers that control U.S. defenses.

It is equally alarming at the lack of foresight of our NSA in trying to stop institutions of higher learning from conducting research into methods of compromising computer security.

INVIOLEATE

97652	87246	63022	97556
88852	55990	83768	16253
55948	68729	73214	96502
33233	00233	56937	78235
88552	58504	31256	10142
85634	96143	16217	25750
99966	54924	83426	78253
19219	11272	12142	49995
36876	69893	54525	66897
21045	19836		

O.K., have a go at it with pencil and paper, calculator or computer. Remember that each 5-digit group only represents one character. Also remember that the cipher text conveys meaningful information of the "Dick and Jane" variety.

Here's another clue: the first group equates to the letter "E." "E" also appears several other times.

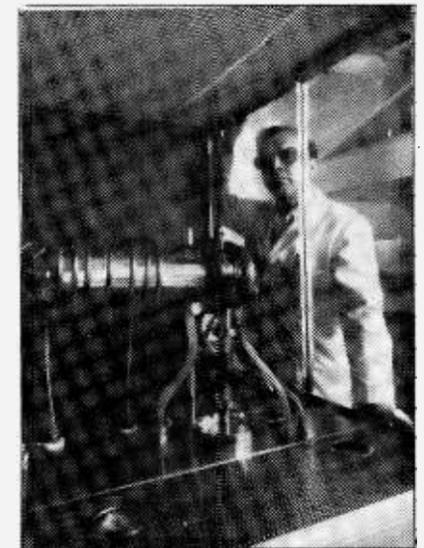
If any of you computer-assisted code breakers of the NSA eavesdroppers manage to solve this cipher, I'll be happy to spring for the Tecate and "Big Mac."

Next issue I'll furnish the plain text and all other related information. Also see a most interesting bilateral substitution that just might look familiar.

HAPPY NEW YEAR!

Time now for a Tecate and . . . Adios,

Havana Moon



Buck Rogers

Ray Gun? Nope,

just a new organometallic-vapor phase epitaxy reactor! In simpler terms, a NASA-developed method of producing high-output photovoltaic solar cells from gallium arsenide for producing power in space. (photo courtesy NASA)

LISTENING LAWS

SECTION 605... A LITTLE HISTORY

by Bob McGovern

Some states and lesser governmental entities have enacted laws forbidding or restricting the use of monitor receivers. Why do they exist and what prompted them?

Let us examine some actual events which concern unethical uses of monitor receivers.

During February of 1973, Gerald Lane of Los Angeles, California installed a scanner in his automobile. On the 16th of July, the Los Angeles Police Department was engaged in an undercover narcotics investigation in both Los Angeles and Orange Counties. A detective unit followed the suspects to Anaheim and continually broadcasted its route and other related information over a known police frequency.

Upon arrival in Anaheim, the suspects entered a motel room and shortly thereafter, the telephone rang. Mr Lane advised one of the suspects that two of the men with him were undercover police agents. It was also suggested by Lane that the suspect dispose of any drugs that he might have in the room.

References to the two agents were made over the radio prior to the telephone call. At the trial, Lane had been identified by witnesses as having been seen at the motel.

One the following day, a Mr. Zimmerman visited Mr. Moran, a friend of Lane. Moran told Zimmerman that he and Lane had been monitoring the narcotics investigation with a scanner.

Subsequently, Zimmerman left and went to the police and advised them of what Moran had told him.

Later, police placed a concealed transmitter (commonly known as a Fargo Intelligence Kit) on Zimmerman and he returned to Moran's resident. As instructed by police, he told Moran that he knew someone who wanted Moran and Lane to cover a large marijuana sale by monitoring police frequencies.

Moran boasted that he and Lane had saved about 25 to 30 individuals from arrest by alerting them to police involvement.

Moran and Zimmerman arranged to meet Lane later that day to permit Zimmerman to see how the radio worked and to discuss the monitoring of the drug sale. This

conversation was recorded by police.

Still wearing the transmitter, Zimmerman and Moran went with Lane in Lane's vehicle; Lane demonstrated his radio equipment.

Lane remarked that he could receive the LAPD detectives, the LASO, and the FBI; he then described the events which had transpired earlier at the motel. Lane agreed to provide the service requested for a fixed percentage of the drug sale.

Lane was taken into custody on the next day but he denied possessing any radio equipment capable of receiving police radio signals.

At the trial, Lane admitted possessing a scanner and that he had demonstrated it to Mr. Zimmerman. Lane was convicted of conspiracy, aiding and abetting a conspiracy by others to distribute and possess a controlled substance, and unauthorized interception and divulgence of radio communications (Title 47, Section 605 of U.S. Code).

Lane was sentenced to a five year prison term on Count I, and probation with special conditions for Counts II and III.

In this case, Title 47, Section 605 of the United States Code was used in part for a successful prosecution. It can be said that some unauthorized divulgence of radio communications can cause a person a considerable amount of trouble, as depicted above.

It can be argued that this criminal case adds support to the retaining of 47USC605 and unfortunately the statute does not make provisions for the divulgence of non-sensitive information not used for any criminal purpose or monetary gain.

A presentation of Section 605 and a discussion of its merits will be presented at a later time.

Let's examine another situation. Until recently, Philadelphia, PA maintained a municipal ordinance which forbid the possession of monitor receivers. This particular law was enacted primarily to deal with the riots and other forms of civil disobedience which occurred in the 1960's.

It was believed at that time that numerous persons attempted to hamper police effectiveness by monitoring the police communications and taking "appropriate" actions afterward.

Other persons believed

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that burglars, arsonists, and other major law violators routinely monitored police transmissions and used this information in avoiding detection and effecting an escape from the area.

* * *

In another case, the State of New Jersey enacted a law generally banning the mobile installation of monitor receivers. In one case, *Smith v. State*, the court stated that "interest in avoiding interference with police, fire, and other governmental agencies in carrying out their functions and making it more difficult for those engaged in illegal activities to become aware of their detection justified enactment of this section."

It has also been said that this statute does not violate First Amendment right to freedom of speech; a person does not have a constitutional right to be a party to communications transmitted on such frequencies.

It has also been noted that a New Jersey official stated that this law was enacted primarily because "the presence of well-meaning or curious individuals at accident or emergency scenes more often than

not hinders the operation of the authorized emergency personnel.

"I believe it would not be in the best interest of our citizens to encourage and facilitate the presence of such individuals at those critical situations.

"In addition, the possibility exists that the criminal element in our society will take advantage of this bill to monitor police activity from automobiles and thereby gain advantage in their illegal enterprises."

* * *

These are just a few examples of what has prompted the establishment of anti-monitor laws. Of course there are many justifiable reasons for the usage of monitor receivers in a motor vehicle or on foot.

In the next installment, the pro-scanner side of the story will be presented, followed by a suggested "model scanner statute", if one must be adopted or maintained in community setting.

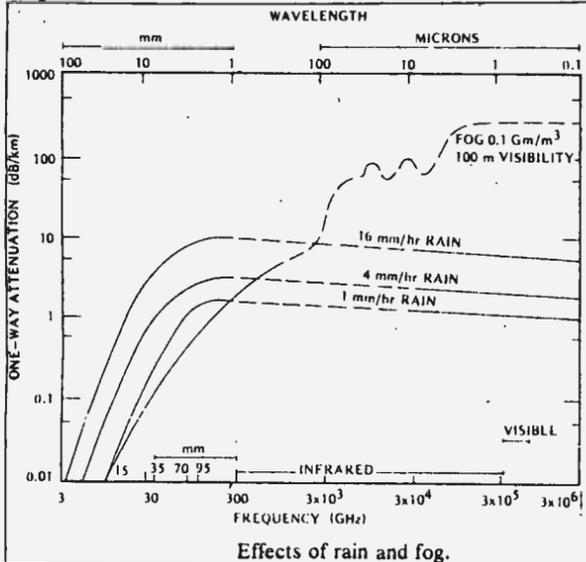


**Millimeter Waves:
This End Up**

PART II

by Larry Ledlow
5179 Stone House Vil. Ct.
Sykesville, MD 21784

Terrestrial communications links may be either long or short range. For short links (less than about 20 km) propagation through the atmosphere is possible. The combination of narrow beamwidth and high attenuation at MMW frequencies can provide very reliable communications that are significantly free from both interference and signal interception.



Effects of rain and fog.

Aside from the obvious military applications of such systems, we can imagine practical MMW communication systems linking railway terminals, buildings within an industrial park, or computers on a large university campus. Many such applications are already in existence both here in the U.S. and in Japan.

For long-haul communications circuits, MMW waveguides, much like those used in microwave transmission, could be used to provide very reliable, high rate data links. Since a waveguide system would be closed, it could be filled with nitrogen gas so that atmospheric attenuation would not be a problem over long distances.

The Bell System operated a test system in New Jersey several years ago. The system was 14 km long and was capable of handling 475,000 two-way conversations. This was possible by transmitting a data rate of 274,000,000 bits per second. Its designed bit error rate on a coast-to-coast circuit was no worse than 0.0000001. In other words, the probability of a 1 sent from New York being mistaken for a 0 in Los Angeles was .00001%.

Interest in MMW long distance communications systems has diminished considerably since optical fibers (literally optical waveguides) have begun to show a

great deal of promise for reliable, high data rate communications.

So what is in this millimeter wave business for us radio enthusiasts? Don't expect a MMW band on your scanner any time soon. And millimeter wave DXing may never really become very popular, although there are amateur bands in and around the MMW frequency range. However, I am only aware of a very little experimentation being done at 24 GHz.

Unfortunately for those experimenters among us, there is very little opportunity for work. MMW components are still fairly expensive, and many items must be custom manufactured using very expensive, complex laboratory equipment, typically available only at universities and large industrial plants.

It will also be some time before surplus and used MMW equipment becomes available to the experimenters' market, because MMW systems are simply

not widely used anywhere yet.

The consumer market will eventually see the introduction of more local, wideband MMW communications systems, perhaps connecting personal computers (PCs) to large, centralized computer complexes, thereby allowing processing and information transfer at rates heretofore unheard of in the PC arena.

Millimeter wave guidance and collision avoidance systems in small aircraft and even automobiles may be just around the corner. And small MMW intrusion alarm systems for homes and businesses are already available today, offering many advantages to ultrasonic alarms, although these are still relatively expensive.

In short, with all the advantages MMW systems have to offer many kinds of applications, it is not difficult to see that these tiny wavelengths will be entering our lives in many ways in the not-too-distant future.

For the more technically inclined reader, I have included a bibliography for further reading. These should be available at most large libraries, especially college libraries, or ask your local librarian about inter-library loans.

BIBLIOGRAPHY

Button, K.J. and Wiltse, J.C., Editors. Infrared and Millimeter Waves, Volume 4, Millimeter Sys-

Australian CB Service

The impact of the U.S. CB boom of a few years back has been felt by technologically-advanced countries worldwide.

Australia has been attempting to come up with a workable band plan for its citizens, copied almost verbatim from the U.S. Plan.

Forty channels in the 27 MHz range allow virtually unmodified use of U.S. type-accepted equipment in Australia.

The 27 MHz transceivers are limited to 4 watts carrier power for full carrier AM and 12 watts peak envelope power on SSB (same as U.S.).

The full band plan draft is presented below.

HIGH FREQUENCIES (MEGAHERTZ)

Channel Frequency

1	26.965
2	26.975
3	26.985
4	27.005
5	27.015
6	27.025
7	27.035
8	27.055A
9	27.065B
10	27.075
11	27.085C
12	27.105
13	27.115
14	27.125
15	27.135
16	27.155D
17	27.165
18	27.175
19	27.185
20	27.205
21	27.215
22	27.225
23	27.255
24	27.235
25	27.245
26	27.265
27	27.275
28	27.285
29	27.295
30	27.305
31	27.315
32	27.325
33	27.335
34	27.345
35	27.355
36	37.365
37	27.375
38	27.385
39	27.395
40	27.405

tems. Academic Press, New York. 1981.

Special Issue on Microwave and Millimeter-Wave Integrated Circuits. IEEE Trans. Microwave Theory Tech. Vol. 26, No. 10. 1978.

Warters, W.D. Bell System Technical Journal. Vol. 56, pp 1825-1829. 1977.

Zur Heiden, D., and Oehlen, H. Electronic Communication. Vol. 52, February, pp 141-145. 1977.

A=Road Channel; B=Emergency Channel; C=Call Channel; D=Single sideband call channel (lower sideband)

NOTE: New and existing 18 channel equipments incorporating the frequencies 27.095 MHz and 27.195 MHz are licensable until 1 January 1985 and may be relicensable thereafter.

ULTRA HIGH FREQUENCIES (MHZ)

Channel Frequency

1	476.425
2	476.450
3	476.475
4	476.500
5	476.525B
6	476.550
7	476.575
8	476.600
9	476.625
10	476.650
11	476.675C
12	476.700
13	476.725
14	476.750
15	476.775
16	476.800
17	476.825
18	476.850
19	476.875
20	476.900
21	476.925
22	476.950
23	476.975
24	477.000
25	477.025
26	477.050
27	477.075
28	477.100
29	477.125
30	477.150
31	477.175
32	477.200
33	477.225
34	477.250
35	477.275
36	477.300
37	477.325
38	477.350
39	477.375
40	477.400A

A=Road channel; B=Emergency channel; C=Call channel

CHANNEL ARRANGEMENTS - REPEATER STATIONS

(Interim Arrangements)

Repeater Output Channels (MHz)

Channel Frequency

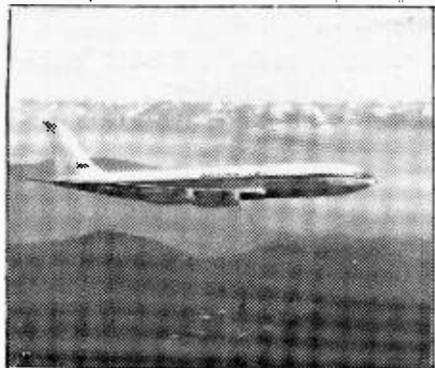
1	476.425
2	476.450
3	476.475
4	476.500
5*	476.525
6	476.550
7	476.575
8	476.600

Repeater Input Channels (MHz)

31	477.175
32	477.200
33	477.225
34	477.250
35*	477.275
36	477.300
37	477.325
38	477.350

*Channels 5 and 35 reserved for emergency communication purposes.





SO LONG, 707

After 19 billion air miles, the ubiquitous Boeing 707 is now a closed chapter in commercial aviation history, but its many variations live on in military applications.

We wish to thank Thomas R. Cole, Public Relations Manager for Boeing, for his preparation of this interesting insight into his company's famous aircraft.

The commercial 707 line descended from the Boeing jet prototype, the 367-80, commonly called the Dash 80. This airplane was donated to the Smithsonian in 1972. The 707 series consists of the -100 and -300 series, each of which have variations, including the -200, and the -400, which were simply engine variations. Then came the "B" models, which were fanjets, and the "C" variation which was cargo-convertible. A deviation was the 720/720B series, slightly smaller and faster.

The only military use of any of these airplanes has been as cargo and troop carriers by the Canadian Armed Forces (5), the Federal Republic of Germany (4), and the Iranian Air Force (14). The Canadian airplanes have wingtip "stores" for hose and drogue refueling and the Iranian airplanes have both those and the centerline "flying boom" for refueling. The U.S. Air Force has five used only for carrying VIPs around (one is commonly known as "Air Force One.")

In addition, also descended from the Dash 80 but in its own separate lineage, is the KC/C-135 series, which looks like a small 707 but is different. We delivered 820 of these, 808 to the U.S. Air Force and 12 to the French Air Force. The U.S. Air Force got 732 tankers (with the "flying boom") and various others for recon, photography, command posts, etc.

Since the deliveries (which ended in 1965), many of these airplanes have been modified so much the genre is called "the plane of 1,000 faces." It's used for NASA and much other research

AUTHOR! from p. 2

- Clandestine, 'pirate, numbers, beacons and unlicensed stations
- ELF/VLF monitoring (what's there, equipment, techniques)
- Satellite reception (TV, communications)
- Business/industrial radio system profiles
- FCC news affecting listening and frequency assignments
- Modifications and improvements for receivers and scanners
- Aircraft and public safety communications profiles
- Radioteletype and facsimile loggings (regular column)
- Telemetry: How does it work?
- Surveillance, bugs, countermeasures
- Scrambling and encryption techniques
- Home projects (converters, antennas, preamps, receivers, filters, tuners, etc.) (regular column)
- Radio astronomy and experiments
- Interference reduction (computers, TV, scanners, video games) power line noise, automotive, lightning, radio signals)
- Controversial articles (sensitive frequencies, unlicensed radio)
- Videotext/electronic mail
- Planning a monitoring post (equipment and accessories)
- Planning a library (good book list and sources)
- Unusual frequencies/unknown transmissions
- Unusual modes of transmission and reception (ECSS, AGSB, SCA, meteor burst, packet, ISM, ionosonde, etc.)
- Unusual insights (historical or technical)
- New technologies/future of radio
- Foreign radio systems/bandplans (Canada, Mexico, Russia, Europe, etc)
- Club profiles/starting a club
- Broadcast AM/FM/TV DXing
- Contests/teasers (prizes supplied by MT) (regular column)
- Technical topics (regular column)
- Solar, wind, water power supplies (alternate energy electricity)
- Mobile antennas
- Lightning protection for antennas and power lines
- Emergency/standby battery supply (mains-charged)
- A look at the spectrum... who's where?
- ...and many, many more.
- With Monitoring Times

work. Not even the Air Force has a coherent list of the many variations. None of these airplanes has ever been used as a bomber.

now a monthly publication and growing rapidly, opportunities for good writers, new and experienced alike, are soaring.

Contact editor Bob Grove immediately with your thoughts and become a part of the Monitoring Times success story.

VIEWPOINT from p. 2

around boasting and advertising its availability. You have reported some sign that this official attitude is spreading to the U.S., and some of the reasons behind it.

I am only suggesting a soft pedaling of the issue, and not abandoning it. Canada is not the U.S., but our officials are every bit as paranoid as some agencies in the U.S. if not a little worse.

(name withheld)

>><<

Please renew my subscription to MT for another year, ...I really enjoy reading MT from cover to cover. I especially enjoy TUNE IN CANADA, and I wish that there will be more input from the Canadian scanner buffs. Also I would like to see more on home made antennas for VHF and UHF. I am glad that MT is going monthly, even though the cost is a little more it's well worth it. Keep up the good work.

Steve Lapshinoff
Crescent Valley, BC
>><<

The article "A Deadly Cloak of Secrecy" by Hanava Moon brought up some old memories from WW 2, specifically around 1943.

I was a radio operator on a Navy troop transport and besides standing a split fone watch on 500kc and 8280kc distress freqs, I copied about 8-10 hours of press daily.

Two of my propaganda sources were JAP and JUP, the two stations Mr. Moon included in his article.

The frequencies were the same, too: JAP on 11980kc 0530 GMT, JUP on 13065kc 0400 GMT, 0510 GMT & 0700 GMT.

Both running about 25-30 wpm and their signal sounded like a buzz-saw. Very distinctive.

Also copied JAU on 7350kc at 0830 GMT.

I enjoy MT so very much. Have been a ham for 37 years but my first love is SWL, cw of course.

73

Gerald Johnson
Santa Ana, CA

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I've received several inquiries from readers about

the mailing address that was published in the last issue of a Monitoring Times Catalog/Newsletter for my company, FIRECOM COMMUNICATIONS. The address on 14th Street in New York that you provided to your readers is not our proper mailing address and is only used in conjunction with shipments made by UPS. Persons with inquiries should not use this address as mail will not be delivered properly.

Our correct mailing address is: FIRECOM COMMUNICATIONS, P. O. Box 61, New York, NY 10011.

In addition, there are other companies doing business under the "Firecom" name, both here in the New York area and in other parts of the United States. Your readers should be advised that Firecom Communications and Michael Esposito are not affiliated with or connected to any other company bearing the same or similar name. We have no franchises, and no one else is authorized to represent us. Our only address is the one provided above, and our telephone number is (212) 989-5773. Persons with information about companies misrepresenting themselves as being affiliated with our organization should report this to us.

Mike Esposito
Firecom Communications
>><<

I have established a separate phone number to accept DX tips from SWL's in the Washington, D.C. area. Input is condensed and placed on the introduction message for the following day. Serious SWL's are invited to call any time, and leave up to date DX news of timely importance on the answering machine.

In Silver Spring, MD
301-588-0846.

Carl Olson
Chevy Chase, MD
>><<

Just a note to tell you about the response to the Stock Exchange ad I had in the last paper. I got my paper on a Friday, had 1 phone call Sat., 2 Sun., made a trade for 1 pc. of equipment Sun. nite, got 2 letters and phone call Mon., 6 more letters in next week. --Now tell me, somebody IS reading M.T.--I love it, and hope you go on forever. Best #@ publication I've received (and that's a bunch).

Dan Mulford
Osgood, IN

>><<

Regarding the Federal Emergency Management Agency, as WGY908, all I am told (by KOA-Denver) is that FEMA HF

Cont'd on p. 18

Miller Publishing

Tune In the World

Kenneth MacHarg

Ken MacHarg is a 25 year veteran SWL. He is regularly heard on HCJB's "DX Party Line." And now he is the author of an exceptional book that profiles some 70 shortwave stations. Each profile is packed with facts on the station's history, programming, personalities and facilities. Plus articles on SW news, music, drama and more. It's the listener's guide to international SW radio.

NETHERLANDS WORLD BROADCASTING RESEARCH

Everytime there's a poll on SW listening, Radio Netherlands comes in right at the top. It's the most popular and progressive station on the bands and its roots date back to the 1920s. Former Radio Netherlands announcer and producer Robert Haslach traces those roots with a scholar's eye for detail. The result is a fascinating story that every serious student of SW will want to read.

The Shortwave Book

L. Miller & K. MacHarg, editors

Whether you're a brand new SWL or a seasoned veteran, you'll find one of the best overviews of the SW hobby in The Shortwave Book. It's intelligent, non-technical and comprehensive with articles on topics from jamming to clandestines, radio clubs to history and programming. And it's written by experts like George Wood, Andrew Steele, John Santosuosso, Ken MacHarg and many more.

Each (paperback) book \$9.99 plus \$1.50 postage (outside the U.S., \$2.50 postage). Checks or money orders in US\$ or their equivalent to Miller Publishing, Dept. MT, 424 West Jefferson St. Media, PA. 19063 USA. PA res. add 6%. Dealer inquiries invited.



Colorful QSL's From The Philippines

F.E.B.C. Radio International, a religious broadcaster in Manila, is now offering a series of picturesque color QSL's to listeners.

To qualify for the cards, listeners must submit detailed reception reports including SIO ratings.

The new QSL's will be sent airmail to all listeners who include some IRC's along with their reception reports.

Address your reports to: John H. Redman, Overseas Program Manager, Far East Broadcasting Company, Box 1, Valenzuela, Manila, Philippines.



TV Frequency Allocations

Recently, reader Ken Greenberg of Skokie, Illinois forwarded us a newspaper clipping which mentioned the use of aircraft frequencies by cable TV companies.

He was naturally incredulous and wondered just what the facts were.

Besides the normal VHF/UHF TV channels 2-83 a number of cable TV carriers use channels outside the TV bands, ostensibly confined by coaxial cable distribution.

Unfortunately, poor connections, inadequate shielding and overpowered amplifiers frequently result in unlawful radiation which may be heard on radio frequencies for miles.

Recent cases of such RF pollution have brought stiff fines to lax cable companies.

Reprinted below is a complete list of all TV allocated channels in the United States along with their respective frequencies. Note the unusual cable channels in aircraft, high band and even UHF military portions of the spectrum.

TV CHANNEL ASSIGNMENTS WITH FREQUENCIES

CHANNEL NO.	FREQUENCY RANGE MHz	PICTURE CARRIER MHz	COLOR SUB-CARRIER	SOUND CARRIER MHz
VHF LOW BAND CHANNELS				
2	54-60	55.25	58.83	59.75
3	60-66	61.25	64.83	65.75
4	66-72	67.25	70.83	71.75
5	76-82	77.25	80.83	81.75
6	82-88	83.25	86.83	87.75
FM	88-108			
VHF HIGH BAND CHANNELS				
7	174-180	175.25	178.83	179.75
8	180-186	181.25	184.83	185.75
9	186-192	187.25	190.83	191.75
10	192-198	193.25	196.83	197.75
11	198-204	199.25	202.83	203.75
12	204-210	205.25	208.83	209.75
13	210-216	211.25	214.83	215.75
UHF CHANNELS				
14	470-476	471.25	474.83	475.75
15	476-482	477.25	480.83	481.75
16	482-488	483.25	486.83	487.75
17	488-494	489.25	492.83	493.75
18	494-500	495.25	498.83	499.75
19	500-506	501.25	504.83	505.75
20	506-512	507.25	510.83	511.75
21	512-518	513.25	516.83	517.75
22	518-524	519.25	522.83	523.75
23	524-530	525.25	528.83	529.75
24	530-536	531.25	534.83	535.75
25	536-542	537.25	540.83	541.75
26	542-548	543.25	546.83	547.75
27	548-554	549.25	552.83	553.75
28	554-560	555.25	558.83	559.75
29	560-566	561.25	564.83	565.75
30	566-572	567.25	570.83	571.75
31	572-578	573.25	576.83	577.75
32	578-584	579.25	582.83	583.75
33	584-590	585.25	588.83	589.75
34	590-596	591.25	594.83	595.75
35	596-602	597.25	600.83	601.75
36	602-608	603.25	606.83	607.75
37	608-614	609.25	612.83	613.75
38	614-620	615.25	618.83	619.75
39	620-626	621.25	624.83	625.75
40	626-632	627.25	630.83	631.75
41	632-638	633.25	636.83	637.75
42	638-644	639.25	642.83	643.75
43	644-650	645.25	648.83	649.75
44	650-656	651.25	654.83	655.75
45	656-662	657.25	660.83	661.75
46	662-668	663.25	666.83	667.75
47	668-674	669.25	672.83	673.75
48	674-680	675.25	678.83	679.75
49	680-686	681.25	684.83	685.75
50	686-692	687.25	690.83	691.75
51	692-698	693.25	696.83	697.75
52	698-704	699.25	702.83	703.75
53	704-710	705.25	708.83	709.75
54	710-716	711.25	714.83	715.75
55	716-722	717.25	720.83	721.75
56	722-728	723.25	726.83	727.75
57	728-734	729.25	732.83	733.75
58	734-740	735.25	738.83	739.75
59	740-746	741.25	744.83	745.75
60	746-752	747.25	750.83	751.75
61	752-758	753.25	756.83	757.75
62	758-764	759.25	762.83	763.75
63	764-770	765.25	768.83	769.75
64	770-776	771.25	774.83	775.75
65	776-782	777.25	780.83	781.75
66	782-788	783.25	786.83	787.75
67	788-794	789.25	792.83	793.75
68	794-800	795.25	798.83	799.75
69	800-806	801.25	804.83	805.75
70	806-812	807.25	810.83	811.75
UHF TRANSLATOR CHANNELS				
71	812-818	813.25	816.83	817.75
72	818-824	819.25	822.83	823.75
73	824-830	825.25	828.83	829.75
74	830-836	831.25	834.83	835.75
75	836-842	837.25	840.83	841.75
76	842-848	843.25	846.83	847.75
77	848-854	849.25	852.83	853.75
78	854-860	855.25	858.83	859.75
79	860-866	861.25	864.83	865.75
80	866-872	867.25	870.83	871.75
81	872-878	873.25	876.83	877.75
82	878-884	879.25	882.83	883.75
83	884-890	888.25	888.83	889.75
RCI SUB CHANNELS				
01	11-17	15.75	12.17	11.25
02	17-23	21.75	18.17	17.25
03	23-29	27.75	24.17	23.25
04	29-35	33.75	30.17	29.25
05	35-41	39.75	36.17	35.25
CATV MID BAND CHANNELS				
A	120-126	121.25	124.83	125.75
B	126-132	127.25	130.83	131.75
C	132-138	133.25	136.83	137.75
D	138-144	139.25	142.83	143.75
E	144-150	145.25	148.83	149.75
F	150-156	151.25	154.83	155.75
G	156-162	157.25	160.83	161.75
H	162-168	163.25	166.83	167.75
I	168-174	169.25	172.83	173.75
CATV SUPERBAND CHANNELS				
J	216-222	217.25	220.83	221.75
K	222-228	223.25	226.83	227.75
L	228-234	229.25	232.83	233.75
M	234-240	235.25	238.83	239.75
N	240-246	241.25	244.83	245.75
O	246-252	247.25	250.83	251.75
P	252-258	253.25	256.83	257.75
Q	258-264	259.25	262.83	263.75
R	264-270	265.25	268.83	269.75
S	270-276	271.25	274.83	275.75
T	276-282	277.25	280.83	281.75
U	282-288	283.25	286.83	287.75
V	288-294	289.25	292.83	293.75
W	294-300	295.25	298.83	299.75

EMP from p. 1

bands were constructed, using junction field-effect transistors. Comparable results were obtained with both units. They survived 10 pulse tests with whip antennas up to 40 inches long.

However, a single pulse caused noticeable gain reduction when the whip was lengthened to 55 inches. After three pulses with the longer antenna, each ceased operating due to failure of the FET.

The results of the somewhat limited EMP susceptibility tests described above allow the following conclusions to be drawn regarding transistorized communications gear:

- 1) Typical receiving units with self-contained batteries and loopstick type antennas are not susceptible to direct damage from EMP. However, their antennas or circuits may pick up damaging amounts of energy if located too near conductors that might carry heavy EMP produced currents.
- 2) Equipment employing bipolar transistors can be safely operated with antennas up to 40 inches long.
- 3) Any receiving gear using an unprotected FET front end might suffer EMP damage if connected to an antenna exceeding 30 inches in length.

EFFECTS

Because of the broad and distributed coverage of this threat, unhardened (unprotected) telephone circuits and teletypewriter landlines, switching terminals and switchboards are not anticipated to survive and remain functional or to be re-established for some period of time following the threat.

Radio blackout effects would, depending on the number of high altitude bursts which occurred, disrupt high frequency transmission of 3 to 30 MHz for several minutes and at 200 MHz for a few seconds.

For additional information read the following publications from the Federal Management Agency:
 EMP Threat and Protective Measures - TR-61, August 1970
 EMP Protective Systems - TR-61B, July 1976
 EMP Protection for AM Radio Broadcast Stations - TR-61C, July 1976.

Logic Bomb in Nuclear Laboratory?

The scenario was reminiscent of the popular movie, "War Games." A Group of high-school computer hackers--compulsive hobbyists who thrill at breaking through private, and usually sensitive, password-protected data bases--got access to the Los Alamos National Laboratory computer system.

Cryptically called the "414 gang" (all shared the same area code during their on-line shenanigans), the persistent students managed to use up only \$300 worth of telenet time, but created nearly four months of work for systems managers and security personnel at the

top-secret nuclear facility to find out just what they had done.

According to Jim McClary, Security and Safeguards Division leader at Los Alamos, there is no way to determine whether or not a logic bomb has been entered into the massive computer installation.

A logic bomb is a programming command entered into a data base which could include instructions to alter or even destroy a computer's operating system and data files at a later time.

"I see no way to guarantee that there is not one," McClary told the House of Representatives Science and Technology Subcommittee investigating the security

breach. "Software verification is a very difficult problem; no one knows how to do it now," he continued.

The incident, which happened in June, 1983 was not isolated. Other attempts have been made to access the computer without authorization, and at least one other was successful. The FBI is investigating.

How is such a vulnerability even possible? Continued McClary, "We were disappointed that certain system managers had not changed the passwords (that came from the manufacturer). The nature of open computing is such that things like this are going to happen occasionally."



SWL HEADQUARTERS

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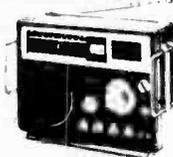
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Editor's note: A computer industry spokesman recently told MT that virtually all Japanese home computers appear to be purposely faulted with one or more shortcomings to encourage early replacement thus keeping up the momentum of the buy/replacement cycle.

The following guest editorial broadens the perspective of this interesting thesis to include shortwave receivers as well.

A JAPANESE

CONSPIRACY?

Guest Commentary

by James Beckett, WA2KTJ
Corning, NY

Although today's technology has produced revelations in communications equipment (SWL and Amateur) there remains a very strange problem that cannot be explained by normal means.

All of the foreign receivers on the market today (we will exclude the commercial and military models) suffer from what I call "built in obsolescence." To be more specific, it is the omission of necessary features or the inclusion of very strange features that detract from the receivers' long-term usefulness.

Most new radios are microprocessor controlled which offers tremendous versatility potential. One popular brand includes automatic sideband selection; that might be OK if you are that lazy or listen only to amateur radio...but this receiver is general coverage and sports a memory.

If the channel you place in memory doesn't match the processor's idea of what sideband it should have, you end up on the wrong sideband. When you change the sideband, your frequency changes!

If you install a 500 Hz filter for RTTY narrow shift you quickly discover that, because of the IF design, those tones will not pass through the filter unless the frequency of the receiver is shifted.

The receiver should adjust the frequency display to reflect that change. It doesn't. Any receiver that will not give you a correct frequency display is immediate "junk".

There are other brands that offer sideband yet give you no resolution in order to properly copy it. Some sellers now offer modifications to correct the problem

requiring you, the buyer, to pay to correct a deficiency in design that the manufacturer should correct.

These problems are so basic, so easily understood, that it is hard to account for them with reasonable explanations. It is as if they were intended. The reason (I suspect) is to create a continual situation that forces buyers to "buy out of the problem."

The problem for the buyer is that while the one problem might be corrected another (just as serious) is introduced--and you come full circle. Since the foreign firms dominate this market, you have little choice.

When you write to any of these firms you get almost zip response. "It's controlled by a processor and it can't be changed" is the usual answer. So far they have been able to get away with it.

Another problem is warranty length. My opinion of 90 day warranties is that they reflect the faith the manufacturers have in their products. Think about that one for a while.

My best guess is that the equipment today is designed for quick replacement - forced through design trickery.

Somehow, we need to inform the foreign manufacturers that we're on to them and they'd better change their ways. If we don't, it will be the same old game. If you can find one foreign general-coverage receiver (under \$700) that comes across as "sane" let me know!

I don't care how many clocks they stuff into them or how many bells and whistles they add; if it only has a 100 Hz resolution, they can keep it. If it changes frequencies when I select the opposite sideband, they can keep it. If it costs me almost a fifth of its price for an IF filter, they can keep it. If it decides the sideband I want is different than it wants, they can keep it.

And lastly, if it is up-conversion and is supposed to be ultra-super and yet I am able to get images where I shouldn't, they can keep it.

While I appreciate a "pretty" radio, I am tired of the "petty" trickery. You cannot tell me that these firms, who have produced radios for the amateur market for as long as they have, don't know better.



Aftermath of Grenada

Several readers contacted MT offices immediately after the announced occupation of Grenada, exchanging listening notes with us.

Reader Peter Fort of Columbia, MD was particularly helpful with his list of amateur frequencies used for morale messages to families back home.

Depending upon the time of day and signal propagation, communications were reported on or near 21300, 21374, 14250, 14303, 14139, 14351 and 14247 kHz.

Although these voice communications are out of the normal amateur-assigned allocations in some cases, U.S. State Department intervention allowed expeditious Special Temporary Authorization (STA) from the FCC.

A great deal of tactical support on clear voice was reported by one listener; his list follows:

- 37.225 MHz USMC, Grenada (FM)
- 30.55 MHz USN, Grenada (FM)
- 40.50 MHz emrgncy/cling ("")
- 7391.5 kHz USN/USA liaison (USB)
- 8223 kHz USN (USB)
- 8291 kHz USN (USB)
- 14398 relay to S.Africa ("")
- 14500 kHz USAF Wash.DC/ Grenada ops (USB)
- 14804.5 kHz USAF air strip ground ops (CW)
- 16581/ kHz USN Spanish/
- 16578 English (USB duplx)
- 17279.5 kHz USAF air strip ground ops (CW)
- 17292 kHz "
- 17310.5 kHz "
- 17316.5 kHz "
- 17325.5 kHz "

Many thanks to our readers who share information like this with fellow listeners!

Project ELF

Vandalized

Project ELF, a low frequency transmitter installation under construction by the U.S. Navy, recently suffered the indignity of having its surveying stakes pulled up by an anti-Project group.

Charles Turvey, spokesman for Citizens Against Trident/ELF, claimed that members of six anti-ELF groups removed the stakes along 32 miles of the 56 mile antenna route.

Project ELF has been under constant fire by conservationists concerned that the high powered signals could disrupt both human and non-human forms of life near its broadcasting site at Clam Lake, Wisconsin.

VIEWPOINT from p. 15

facilities in Denver (area) are the first (and fastest) means used in their current structure to activate EBS tests by broadcasters. The EBS stations are networked hierarchically by coverage, etc. and FEMA HF has different ciphers (CW) to activate EBS by individual station, strata of stations, or all. Also test/nature of emergency ciphers, and probably others. All EBS stations monitor FEMA HF channels throughout their hours, and HF is the primary link from FEMA Hz in Denver to each station; the right cipher activates any station's EBS mechanism that is called. There have been a lot of EBS tests especially in Colorado lately. Whether this is all WGY908 is used for, I don't know.

Al Smith
Wamsutter, WY

>><<

A report on the number groups I've heard over the past couple of months, using a Globescan CVR-2 and my Bearcat 300 scanner:

Time (GMT)	Freq (CVR-2)	Freq (Act1)
1430-1442	127.455	13.455
0020-0028	123.075	9.075
0900-0906	121.890	7.890
0505-0510	122.040	8.040

In all of the above cases the starting times are not the beginning of the transmission, but rather the time at which I first tuned to the broadcast. The voice was that of a woman speaking the numbers in spanish, and ending the broadcast with the word "fin" or sometimes "final" (pronounced feenall).

I don't know what your thoughts are on these broadcasts, but I tend to believe, based on signal strength and possible purposes for them, that they originate in Langley, VA. It certainly seems like a strange way to communicate!

George J. Marthenze
Sheboygan, WI

Shortwave in Prison?

A recent article in Monitoring Times by prison inmate John Demmitt resulted in the largest volume of mail received on any topic so far.

A number of correspondents wondered if there is precedent for the use of shortwave receivers in penal institutions. We would be grateful for any information regarding this; please send your information and suggestions to John M. Kapinos, 86 South Quinsigamond Avenue, Shrewsbury, MA 01545.

BROADCASTING, Libya from p.6
European and African airwaves. Radio Bardai, a station belonging to rebel leader Goukouni Oueddei and set up by ally Qaddafi, transmits programs hostile to Hessein Habre's pro-Western government on 6009 kHz from approximately 1800 to 2030 GMT.

This schedule was recently noted by the BBC Monitoring Service:

1800-1830 French, 1830-1900 Colloquial Arabic and 1900-2000 in local languages (there are seven, which may include Sango).

Rebel leader Oueddei has been reported to use Radio Bardai to air his revolutionary speeches to a nation where over 4 million people own an estimated 75,000 radios.

La Voix de Revolution Popular Voltaigue: The frequency of 6009 kHz does not go dead after 2030 GMT. Another Libyan-inspired clandestine is beamed to Upper Volta from 2030 to 2100 GMT to help set up the pro-Libyan government of Thomas Sankara.

British World DX Club (WDXC) member Mike Barracough reported in the Sep-

tember issue of R.I.B. that this clandestine, well heard in England, is broadcasting in French with "highlife music."

It is also throwing in some items in English by announcer Miriam Makeba with hints of anti-Imperialist, pro-Revolutionary propaganda.

Since the coup was a success, this clandestine may close down at any time if it hasn't already.

With Qaddafi still seeking control over north-east Africa and even influence over certain black African countries, only time will tell where his clandestine activities will be beamed to next. Tunisian, Egypt, Jordan or even Zaire can be subjected to Libyan-inspired clandestines in the future.



Sankara and Ouédraogo

...a little nostalgia

by Hank Bennett

The other day we slipped on the headphones, made sure a couple of connections were good and tight, diddled a couple of knobs, and enjoyed a program of old music from back in the 30's and 40's.

The station to which we were listening was not DX by any stretch of the imagination because it was only about 20 miles away. But the music from this station was much the same as that which we used to enjoy some 40 years ago from the same station.

This was quite fitting, too, because I happened to be listening in on a marvel of the early age of radio - a 1902 Westinghouse crystal set which used no tubes, no resistors, no fixed capacity condensers, no transistors, and no batteries or other visible power source.

Many of our readers have never heard of such a receiver and most have never even seen a picture of one. It really was a very simple affair but, like many of the present-day receivers, the box around the set was more glamorous than what was inside.

A peek into the innards revealed very little because there wasn't much to begin with. There was a coil of

A RADIO RECEIVER THAT USES NO POWER-?

wire (homemade crystal sets usually had a couple of dozen turns of bell wire around a circular oatmeal box), a tuning condenser and a crystal activator with a "cats-whisker."

A piece of galena usually did the duty for the crystal, although we have had fun in the past using other substitutes. A piece of hard coal often worked best. The "cats-whisker" was generally a piece of stiff wire that had to be touched to the crystal at various spots to find the best place for reception.

Tuning the condenser really wouldn't do much because the reception spectrum was very broad. But if you had a couple of strong stations near you that were at opposite ends of the broadcast band, you could separate them to a good degree with the tuning condenser.

I've mentioned that the tuning spectrum was very broad: on our one dial, at no particular place, we could pick up the Philadelphia airport (from the long-wave band), broadcast stations (from the broadcast band), a local police station (on 30 megacycles), a number of ham operators (on various bands), and other odds and ends.

To complete the receiver, you needed a good out-

door antenna and a good, tight ground. No need to fool around with a loudspeaker - most crystal sets wouldn't generate enough signal power to be heard on a speaker. So you used headphones.

We've heard many stations on our old Westinghouse, including one broadcast station several hundred miles to the west. We even heard a couple of shortwave broadcast stations that, according to theory, weren't supposed to be heard on such a crystal set. But as I have said, the tuning spectrum was considerable.

And more than once, while I was still in school, I'd listen in on the headphones after lights out at night. And my Mom would come in before she hit the sack and unwind the phones from around my ears.

We were asked a couple of times to demonstrate this old set at some of our local schools and the kids were absolutely fascinated - and mystified - at how we could hear programs on a radio that had no visible power source.

There was no line cord to the nearest 110 volt outlet. There were no batteries anywhere around. The only power that this old set used was the power gained from radio waves coming through the air and being picked up through the anten-

na.

It sort of makes one wonder how much progress we have actually made in the last four-fifths of a century. Sure, we have miniaturized receivers, but do we have any that use NO POWER?

Since it would seem that we're on a nostalgic binge this evening, we have a number of questions we'd like to give you. For most of them, you would have to be an old-timer or one who has read up on radio-in-the-past.

Try these, then write in and let us know how many answers you come up with. Send your replies and guesses to Hank Bennett, MONITORING TIMES, P.O. Box 3333, Cherry Hill, NJ 08034.

(1) Back in the 1930's and early 1940's there were a number of high-powered Mexican border stations that inhabited the broadcast band. They were all in violation of power agreements but that didn't stop them. How many can you list by callsign, location, power, and frequencies?

(2) There is a 50,000 watt broadcast station in operation today. It has had homes in three different cities, in two of them on two different occasions. Further, it has a distinctive callsign. Can you name the callsign and the three cities? Hint: all three

Cont'd on p. 20

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BROADCASTING from p. 19

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

cities are east of the Mississippi River.

(3) There was once a station that broadcast time signals in the broadcast band. Only time signals. Can you name the station, the frequency, location, and time of the time signal broadcast?

(4) What USA standard broadcast station, with 50,000 watts, still in service today, once used very high power after midnight on an experimental basis? The callsign changed at midnight, but it was still the same basic station.

Name the two callsigns, location, frequency, and power of the after-midnight transmitter.

(5) Who was Dr. John R. Brinkley? What did he advertise? Name at least one station that carried his broadcasts.

(6) W5XAU - what frequency was it on? What was the purpose of the station? Location? Power?

(7) WCAB, WDJM, WGEO, WRUS, W1XAL - what were these stations and where were they located?

(8) Does anyone remember WPGC, WPEE, or VYR? How about the "sister stations" WHWV, WPWV, and WSWV?

(9) Where were WANH, WANI, WANJ, WANK, and WANL? Can anyone recall the distinctive feature of these five stations?

(10) Does anyone remember WANC or WWTA?

(11) The old but famous type 30 radio tube. It was extremely popular among SWLs, especially with those who were ham radio minded. Why?

The first letter received with the most correct answers will win a new book from the Grove library.

If any of you would like to submit brain teasers such as these, send them in. We'd be glad to include them in a future column. As for the answers to the above questions - well, check in here next month.

For years we have noticed a very peculiar phenomenon with the signal from WOR, New York City, on 710 kHz. I'm sure that it isn't because of my location, for I've heard the same effect when tuning the station in upper New York State and in New England.

It is a very deep, heavy, mushy fade, in which the actual signal level drops very little but the audio becomes virtually impossible to understand for upwards of several seconds.

Curiously, I've never noticed a mushy fade such as this on any other station.

For those of you who possess a general coverage short wave receiver, you truly have the "world at your fingertips"! However, a quick flick around the dial at any one moment may give you the idea that no one speaks English!

This is not true, of course, and it does help to know where to look for English language broadcasts from foreign countries. Believe me, there are many.

This column will be devoted to guiding you to find the most reliable and interesting stations, including seasonal changes, to which the world's broadcasting systems adapt successfully.

We will be considering on a regular basis the major broadcasting organizations whose stations put in a RELIABLE signal all the year round: and, of those, the ones which provide the best in news, sports, music, national events and commentaries.

On a monthly basis we will look at a continent (to include some of the lesser-known stations), and a subject (such as news...analyzing the restrictions and bias to be encountered).

In the first instance I have attempted to concentrate on one station from each continent to serve as a source of news and music representative of the region and, of course, covering world events (at least as seen from their point of view).

Has anyone else experienced this fade and have any theories on the cause of it?

We've been informed of a new softbound 200-page computer printout of shortwave broadcasting schedules which will be published in December and made available to individuals, international broadcasters and research organizations shortly thereafter.

Titled RADIO DATABASE INTERNATIONAL, the printout is designed to provide a convenient reference source to frequencies in use, target areas, and schedules of all shortwave broadcast stations between 2.3 and 30 MHz. Cover price is said to be \$11.95 and there will be a summer edition in June of 1984.

For complete details, readers may contact Gilfer Associates, P.O. Box 239, Park Ridge, New Jersey 07656, and you may call them at (201) 391-7887.

You may be surprised to know that this is no easy choice. Much of the best on shortwave emanates from Europe and North America; it will not be easy for us to agree on the other continents. There are differences in signal reliability between East & West coast reception in the U.S.A. & Canada.

I am also taking into account the listening habits of the majority who probably work approximately 9 a.m. to 5 p.m., and may devote their radio listening time to breakfast and evening hours.

Following is a suggested listening format for you to utilize as convenient. These stations can provide you will an amazing amount of information and pleasure, and I think you will find them among the more reliable signals.

EUROPE.

No argument here. The BBC, London, England sets the world's standards for News reporting and many other types of programming as well. To North American ears they are sometimes rather "stuffy" and antiquated in style (they didn't earn the nickname "Auntie BBC" for nothing!), and perhaps uninteresting in sports with so much cricket and soccer.

The reliability of the BBC World Service is in part due to their extensive use of powerful relay stations around the globe.

BBC WORLD SERVICE: News at 0000, 02000, 03000, 04000, 05000, 1200, 1300 UTC. Other excellent programs include "The World Today," "From Our Own Correspondent" (both focussing on political and world events); "New Ideas," (science in industry and home), "Jazz For the Asking" (request music), "Meridian" (arts), etc...

Complete list of frequencies used to North America at different times of day: 15260, 15215, 15070, 11910, 11835, 11775, 11750, 9915, 9740, 9590, 9515, 9510, 7325, 6195, 6175, 6120, 6005, 5979 kHz. (But note certain other frequencies can be very good--see list summary).

NORTH AMERICA

U.S.A.: VOICE OF AMERICA

Despite some variation in outlook and programming philosophy from time to time, the VOA has a tremendous signal "punch" with relay transmitters and high power in its favor.

News: 1800 (17870, 15600); 2200 (21485, 15600, 15580, 15600, 15445); 0000 (17730, 15205, 11740, 9650, 6130, 5995--same at 0100).

More to follow in later issues.

Good programs include "Music USA," "The Magazine Show" and "Weekend."

AFRICA

Only one source of reliable service here, and that rather shaky on signal strength in some seasons: RADIO RSA, THE VOICE OF SOUTH AFRICA.

News 0200; an hour long program on 11730, 9615, 5980 kHz. Includes "Our Wild Heritage," "Africa Review," "Spotlight" and political commentaries with a rather nationalistic pro-government point of view.

OCEANIA

Pride of place of one of the world's finest broadcasting services goes to Australia (Overseas Service of the A.B.C.)

RADIO AUSTRALIA, Melbourne. News 1100, 1200 (9770, 9580, 5995 kHz); 0200, 0300, 0400 (17795, 15320 kHz).

Among the many interesting programs heard are "Four Corners" (current affairs), "Profile" (Australians speak about their work) and Australian news-in-brief; on the half-hour.

ASIA

Most of the larger organizations in this part of the world have rather unreliable signals. My choice is Kol Israel.

ISRAEL: Tel Aviv

News 2000, 2230 (15585, 12025, 11655, 9815 kHz); 0000, 0100, 0200 (11655, 9815, 7410 kHz).

Programs include political commentaries on the Middle East, and Hebrew folk music.

SOUTH AMERICA

Subsequent to the "demise" (hopefully only temporary) of the Brazilian service on 15290, we are left with the ever-faithful Voice of the Andes.

ECUADOR: Quito, HCJB

News 0030-0045 "Today in Review," items from their news room and Associated Press. 15155/9745 kHz.

* * * * *

All times in this column are given in U.T.C. (G.M.T.), so convert to your local time. For your convenience a list summary of the most reliable times and frequencies of these stations is presented below. Naturally these are not the only times the broadcasts can be heard. Freak propagation conditions can wipe out a regular channel, and also make audible a frequency normally useless.

If you find you hear any of the above services at other times (or on different frequencies) on a regular basis, please write me and they will be included in

Cont'd on p. 29

RTTY/FAX

READING RUSSIAN RTTY

by Rickey Stein

A commonly received RTTY (radioteletype) signal is that transmitted between Soviet vessels and Soviet Maritime Coastal Stations. These messages are transmitted using the Soviet national language--Russian--and that language is written with Cyrillic letters.

This type of RTTY transmission is called "third shift." Why the term "third shift?" Let's take a few moments to examine RTTY (Baudot) transmissions and the term should become clear.

Regular RTTY characters are made up of 5 bits. Initially, this can yield on 32 possible combinations (2⁵=32). By shifting between two cases, the letters case and figures case (or using second shift), we can get 32x2 minus 2 (for shifting between cases) combinations.

Our 5 bit code can now perform this double duty simply by shifting between letters and figures case. There are instances, however, when an agency will need to transmit up to 78 symbols. This is true with certain Asian and African languages that have more than our 52 symbols.

Additionally, the Soviets like to have the capability to deal with both Latin and Cyrillic alphabet symbols using only a single machine.

But how do we achieve a total of 78 symbols? Easy - we simply provide a third register--one for numbers, a second for the Latin alphabet, and a third for the Cyrillic alphabet. By shifting among the three registers, all of the desired symbols (letters and figures) can be created. Thus the term, "third shift."

With this explanation behind us, let's look at recognizing and interpreting the messages. Third shift transmissions can be recognized because no letters are printed (or displayed on a CRT). One sees only figures, but the message will contain what appear to be word groups of normal length. This will help to distinguish a valid message from garbage.

To be able to read the message, the DX'er must cause the unit to print out letters. If the RTTY demodulator has an 'UPSHIFT ON SPACE' switch as is found on the Infotech series, moving that function to the up (on)

position will give readable results.

The Russian message is now displayed in Latin (Roman) letters and many words can be easily recognized. This is accomplished because at the time the code was put together, a correlation was maintained between the Cyrillic letter and the Roman letter with the same sound.

Thus the Russian "А" reads out as "A", the "Б" as "B", etc. Some letters have no equivalents and have been assigned a Baudot code which gives a non-equivalent Roman letter ("Q", etc.).

A list to convert the symbols produced on the Infotech into the corresponding Cyrillic letter is available for those people who might wish to transliterate the message and then translate it. (Fig. 1)

Third shift transmissions are easy to locate and can be heard almost any time of the day. Messages are sent 24 hours per day and can be found if you tune between 12460-12535, 16660-16710, 22170-22225, or 25080-25100 MHz.

The speed is usually 66 wpm, shift 170Hz., and phase (sense) is normal. Don't forget to place the "upshift on space" in the "on" position.

A telegram usually takes the following form, using a standard header like this:

```
! TR SKALISTYJ BEREK
KLD/.4 50/224/5 38 22/8 0400
(OI WWXI PRPP)*
(*with upshift on, the last numbers print in the letters case)
```

This translates to the following:

```
! (probably) ATTENTION!
TR class of vessel (this is a fish carrier)
SKALISTYJ BEREK name of vessel
KLD name of port/port station being used (this is Kaliningrad)
/.4 unknown
50 unknown-but stays constant during transmission
224/5 message number
38 unknown-but constant
22/8 date (Aug. 22)
0400 closest GMT hour
```

The second line is the address line - KALININGRAD 8 SOWETUKIJ KW 10 GORDUNKO: KALININGRAD town (destination)

8 SOWETUKIJ street address KW 10 apartment 10 GORDUNKO a proper name-probably the recipient

The third line is the message line. Here is a

very short list of commonly observed and frequently occurring words and their meanings: (**N.B.-the apostrophe is a part of the transliteration of the word**)

CELU kiss
DAET NASTROJKU for adjustment purposes (seen with RY tests)
DNEM ROVDENIQ birthday
GODA/GODY I am well
HOROGO goodbye
KAK what
KOPIQ copy
KREPKO/KREPKOGO affection
KW apartment (abbrev.)
MENQ I, me
OBNIMA' hug, embrace
PRIWET hello, hi
REBOTA/REBOTU work assignment
SAMOGO self (my, your, etc.)
SERIQ series
SNOWA over
SROK date
TOLIKA only
VELA' wish
WSE all, everything
WSEGO best wishes to you
WSEGO DOBROJO good luck

These words will occasionally appear in a slightly altered form due to their positions in sentences. Russian nouns are inflected (as Latin nouns are declined and Hebrew nouns also changes with added suffixes) and their endings will change giving rise to variations.

As indicated earlier, some words can be read directly; others require a bit of imagination. These following are very similar to English words. These were taken from a long transmission that was not from a ship. However, third shift RTTY was used.

Frequency here was 16644, 66 wpm, but with a shift of 425Hz.

AFGANISTANA
AFGANSKOJ
AMERIANSKOE
AMERIKANSKIH
AWGUSTA
CENTRALXNOJ
DELEGALA
DIALOGA
DIREKTOR
DRUGIH
EWROPE
IMPERIALISTOW
INTERGRACI'
INTERWNECI'
KAMPURII
KANDIDAT
KOMITTA
KONFERENCH
KOMMUNISTOW
KONSTRUKTIWNYJ
KONTAKT
KONTINENTE

KRYMSKIE
LAOSA
MADRIDSKOJ
MILITARISTSKOJ
NACIONALXNOGO
PEKINSKIH
PERSPEKA
POLITIKE
PRESIDENTSKOJ DIREKTIWY
PROBLEMAM
PROGRESSUC
REFORME
SITUACII
SOCIALISTRIEKI
SOWETA
SOWETSKO
SPECIALIZACII
SSSR
STRATEGII

There are two additional areas that bear watching. One is abbreviations (prefixes) used for ship type. The following have been determined by cross checking the vessel name against a listing of Soviet ships. The ships are actually very easy to ID when they are running on RY test. They usually give their call or name and call. The name can also be pulled out of the header. The ITU list will cross list names and calls. There is also a publication entitled "Soviet Bloc Merchant Ships" that has most of the names, a few specs, and some line drawings.

Access to a current set of "Lloyds Register of Shipping" can also be helpful. This register, which covers all merchant ship, is in three large volumes and is issued every year. It lists NAME, CALLSIGN, TYPE, HOME-PORT, OPERATOR, DIMENSIONS and CAPACITY.

There are several ships with the same name, so you will need to list the prefix and port abbreviation. Remember also that the name will come across transliterated in some cases. Some of the Latin letters printed by the RTTY unit may not be the same as in the registry (for example, Sevastopol may read Sewastopolx).

These are some of the prefixes:
BMRT, BRT, RTM, RTMS factory trawlers
LK ice breakers
NI research ships
PZ fish factory ships
TH general cargo ships
TK tankers
TR fish carriers

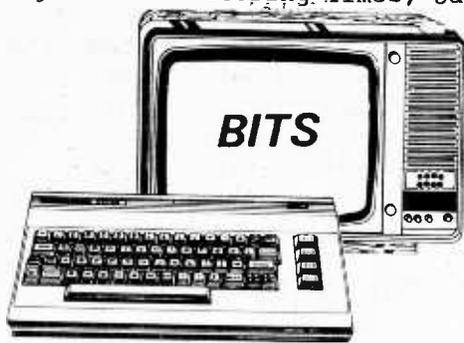
Lastly, there are the three-letter abbreviations for the ports:

Cont'd on p. 31

FIG. 1

LATIN TO CYRILLIC CONVERSION CHART

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ
-	?	:	\$	3	!	£	#	8	'	()	.	,	9	0	1	4	5	7	;	2	/	6	"	
						Э	Ш	Щ	Ю								Ч								



DOCUMENTATION

by Mike Edelson

This month's article on documentation enlarges last month's article on FLOW-CHARTING. Documentation is a method of recording all information necessary about a program, allowing you to go back into a program at a later date to repair, expand or enhance that program.

Flowcharting can be the beginning of a full documentation system. One major computer company manufactures a software device that documents programs. It generates a flowchart and does everything needed to document a program.

But for small system users, a homebrew version is the best.

In addition to flowcharting, documentation includes a statement of the program's purpose, the handwritten program (never go to

a terminal without writing the program up first; composing a program on-line wastes time and in many systems, if you stop for too long, the system will disconnect you), a printout of the program (fully debugged and running), a description of how to use the program (what type of data, how to enter the data, etc.); and finally, a description of the output in terms of what it represents and how it should look.

You may also wish to enter a notation of any sources of information you used to develop the program.

It may be necessary, a few years after a program is developed, to update it. Without documentation this may never get done and you may not recall what the program does.

On Air Help

I am available on the Novice 40 meter band; my call is KA2SPH. I am usually on from 2300-0100 UTC and 0200-0600 UTC daily.

I will be available for MONITORING TIMES readers on Wednesdays near 7125 or 7110 depending on QRM. I will probably be on other times as well.

On a more serious note, many of you have written me

with requests for information. I have provided what information I could. Some of you thanked me for this information and to you I say, "It's my pleasure." A few readers followed up their requests with poison pen letters and in one case, a telephone call that was of the most vile and disgusting language.

These dissatisfied readers seem to expect freebies that I can not give. Programming is my livelihood; I get paid for what programs I write. I am not able to provide programs I don't have. Many of you have asked me for a program to process RTTY/CW signals. For these systems to be interpreted by a computer requires more than a program in some cases. There are some programs on the market now for this purpose.

I do not have the knowledge to program in BAL (BASIC ASSEMBLER LANGUAGE). That is what is required to write an RTTY/CW program. I will include programs as I can in MT if they will help me discuss the subject at hand.

I am developing a file of information from various manufacturers for my readers. As I get it, I will report on it.

Many of you have asked about LOGGING; there are some systems available called data bases. A data base is a system that stores various types of data for you and allows you to manipulate it and retrieve it as you require. If it is from a reputable dealer, the program is sure to work.

If you require a telephone contact, please send a note at my address (P.O. Box 203, Roselle Park, NJ 07204) and I will phone you (if it is outside my local phone area, I will also have to call collect).

I welcome any information or programs you would like in MT. What subjects do you want to read about? For those of you who send me programs that are useful to radio hobbyists (not copied from someone else's work) I will provide you with a copy of a program for radio hobbyists that I am writing now.

Would any of you contribute to a Program Exchange? In this case, you can write to me and tell me what programs you have, with a brief description; I will maintain a file on them and if someone contacts me and needs a program you have, I can refer him to you.

See you all next month!

COMPUTERS ON THE AIR

PART I

by John Edwards

If you're the proud owner of a microcomputer and telephone modem, you know that the most disturbing time of bulletin-board hopping comes at the end of every month--that's when the telephone company tells you how much money you spent swapping messages, perusing databases, and downloading software!

As telephone costs continue to spiral upward, thousands of computer users have disconnected their modems, abandoned their telephone lines, and powered down their terminals. No, these folks haven't given up on telecomputing, it's just that they've found a better life in the wild, blue airwaves.

Imagine a place where you can download public domain software, transmit electronic mail, and hold CB-like conversations--all without any line or time charges. No gimmicks. No membership fees. Just an endless flow of free information. That place is known as amateur radio.

While federal law prohibits the use of amateur bands for business purposes, thousands of home computer

operators are finding the service an inexpensive and indispensable tool for personal computer communication.

Unlike Citizens Band radio where users are restricted to voice communication, amateurs are allowed to transmit many different types of signals: voice, morse code, television, and, of prime interest to computer enthusiasts, digital information.

Currently, amateurs are using three different methods to transmit and receive digital information--radioteletype, on-air mailboxes, and a new technology known as packet communication.

Let's examine these methods one at a time.

RADIOTELETYPE

Radio amateurs have been experimenting with radioteletype (RTTY) since the late 1940s--about five years before the first practical computer came on-line. Anyone who has ever used CompuServe's "CB" or The Source's "Chat" modes should have a pretty good idea of what RTTY is all about.

Conversations can range from discussions of the latest computer and radio gear to heated political debates.

The transmission of

RTTY art created with the aid of a dot-matrix or daisy wheel printer is also a popular pastime.

A RTTY conversation is started by a station picking an amateur frequency and sending a "CQ" (a general call to all stations). When received, the transmission looks like this:

CQ CQ CQ CQ DE KI2U KI2U
CQ CQ CQ CQ DE KI2U KI2U
CQ CQ CQ CQ DE KI2U KI2U
K

"KI2U" is the callsign of the station, "DE" is ham slang for "from," and the "K" signifies that the caller is now waiting for a response (since all RTTY communication is half-duplex, users have to be careful not to step on one another's signals). If station WB2LWJ hears the call and feels like chatting he would reply:

KI2U DE WB2LWJ K

...and the conversation begins.

EQUIPMENT

In addition to a computer, RTTY users require also two additional pieces of equipment. Most important is a suitable radio transceiver. These are available both new and used for prices ranging from about \$150 to \$3000.

A good source of used equipment are computer and

ham radio flea markets. Most communities feature one or more of these events each year; check your local newspaper for times and dates.

The second unit is a piece of equipment known as a terminal unit. This item (not to be confused with a computer terminal) looks and works much like a telephone modem. But instead of interfacing a computer to the Ma Bell, the terminal unit connects the computer to a radio transceiver.

Terminal units range in price from about \$150 to \$500. Most are designed to operate with a specific type of computer and are shipped with the appropriate software and connectors.

A terminal unit will work with virtually any radio transceiver, and requires no technical ability to install.

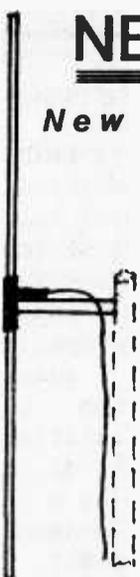
RADIO MAILBOXES

Ham radio mailboxes are the wireless twins of computer bulletin boards. Sponsored either by local radio clubs or public-spirited amateurs, most mailboxes have the same general aim as their telephone-based counterparts: to disperse free information and provide a meeting place for people with similar interests.

Cont'd on p. 32

NEW ARRIVALS

New Antennas Announced by Grove Enterprises!



OMNI II

Nice things often come in small (and this time, inexpensive) packages.

Three new antenna products from Grove Enterprises really fill the bill.

The new ANT-5B OMNI II combines the advantages of the earlier models ANT-5 OMNI and ANT-6 discone into one low-profile, high-performance, total-coverage 30-512 MHz antenna.

The unique OMNI II vertical dipole works on the principal of harmonic resonance. Cut to center frequencies of 40, 150, 250 and 450 MHz, its element thickness allows broadband coverage between those frequencies as well.

Recent tests show excellent coverage of 30-50 low band, 108-174 MHz aircraft and high band, 225-400 MHz military aircraft and 406-512 MHz UHF as well as out-of-band frequencies near those widely-monitored ranges.

Mounted horizontally, the OMNI II could be used in metropolitan areas as an outside antenna for TV and FM reception as an alternative to paying cable costs or expensive antenna installation.

Best of all, the new OMNI II represents a considerable savings over its smaller-coverage competition, only \$19 (plus \$3 UPS)!

AN IMPROVED SCANNER BEAM

Yes, the world-famous Grove SCANNER BEAM, used by military and government agencies as well as serious scanner enthusiasts around the globe, has actually been improved.

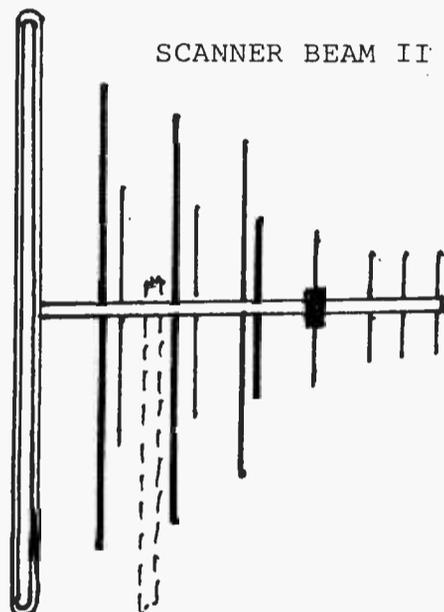
The main shortcoming of the early ANT-1 SCANNER BEAM was its reduced performance on the 30-50 MHz low band. Now, a low band section has been added for a tremendous improvement in that frequency range.

Additionally, elements for the 806-960 MHz range have been added to accommodate the new generation of scanners, due for imminent release from several manufacturers.

The new Grove SCANNER BEAM II boasts continuous performance from 30-960 MHz for both in and out of band reception throughout the VHF/UHF communications spectrum.

High quality, low loss coax like the new Grove CBL series is recommended for use with SCANNER BEAM II.

The extra cost for development and manufacture of the improved SCANNER BEAM II has been absorbed by Grove Enterprises; the "world's best scanner antenna" is still only \$49 (plus \$3 UPS).



SCANNER BEAM II

... AND CABLE TO MATCH

A new line of low loss coaxial cable has been added to the Grove catalog. Boasting exceptional efficiency characteristics, the CBL series offers RG-6/U performance in a small RG-59/U size.

The Grove CBL cable is available in 50, 100 and 200 foot put-ups, with loss per 100 feet of only 2.5 dB on high band and 4 dB at UHF. When compared to losses of 8 to 12 dB for regular RG-58/U, substantial signal improvement is possible for scanner listeners.

Cost is only \$.15 per foot plus shipping.

THE GROVE SHORTWAVE DIPOLE

An increasing number of SWL's have requested a high-performance shortwave receiving antenna which doesn't suffer the pitfall of trap dipoles: reduced performance outside the international broadcast bands.

After considerable experimentation, an excellent general coverage dipole was developed. Off-center fed and only 66 feet long, it may be erected in several configurations: inverted V, L, flattop (horizontal) or even bent at the ends for restricted room.

SKYWIRE

Interestingly, even though the new ANT-2 SKYWIRE was designed for optimum 2-30 MHz signal capture, it is capable of local 30-512 MHz scanner reception as well!

The Grove SKYWIRE also provides reception at the

standard AM broadcast band (550-1610 kHz) and below to match all modern general coverage shortwave receivers.

The new Grove Skywire comes complete with porcelain insulators and a coax-connector center insulator for use with any type of cable. (ANT-2, \$19 plus \$2 shipping)

☆☆☆

PIRATE RADIO from p. 5

broadcasting service.

Even the government of Maurice Bishop appeared to believe that shortwave at best was of limited usefulness, although it continued the broadcasts. Bishop's close friend and ally, Fidel Castro, built him a new transmitter to better reach Grenada and neighboring islands, but it was the 75 kW transmitter found on 990 kilohertz.

Unfortunately, shortwave may have been a permanent casualty of the Grenadan invasion. Any additional information on radio activity before, during, or after the Grenadan invasion which MT readers might be able to supply would be deeply appreciated.

SURINAM: One of the most unusual clandestines to emerge in recent years is the new one attacking the leftist military government of Surinam. Calling itself Radio Frei Suriname, the station was monitored here on 4650, September 28 at 0105 in Dutch and local languages. Signal strength was quite good, and it has been heard several times since first being received.

This one does verify. According to Radio Nederland's Media Network, the address is Council for the Liberation of Surinam, P.O. Box 737, Rijswijk, Holland.

BOOK-REVIEW: We have just seen an advance copy of Netherlands World Broadcasting by Robert D. Haslach. The book is a thoroughly researched and well illustrated history of all shortwave broadcasting from the Netherlands.

Clandestine fans should especially like the excellent treatment of Dutch broadcasting activities during the Nazi occupation. It can be ordered for \$11.95 plus \$1.50 postage from Miller Publishing, 424 West Jefferson Street, Dept. MT, Media, PA 19063. (See review in MT Library Shelf this issue.)

PIRATE NEWS: Hawaii's John T. Arthur has sent us some extensive information

on addresses for American pirate stations, both active and inactive. Most of this we will have to hold until later due to lack of space.

However, here are a few that are not often found elsewhere: KHO, Box 144, Riverside, NJ 08075; Sumari Radio, Box 155, Dunlo, PA 15930; Fantasy Broadcast Station, Box 23792, Phoenix, AZ 85063.

If you send reception reports to these or any other maildrop for pirate stations remember that the maildrop can only forward your letter. It cannot guarantee you any sort of a reply.

Always include three 20-cent postage stamps for the forwarding of your report and, hopefully, the station's response.

Charles George of Texas writes that on several nights he has heard a pirate with pop music on 1620. The station gives no ID's, but he suspects it is in Texas. Charles has told us what he is hearing. Let's hear from more MT readers. Don't keep your monitoring a secret. Share the information and the fun.

E.T.: Back Again?

MT reader George Primavera shares this interesting announcement being pasted all over downtown Philadelphia by someone with a penchant for stick-on labels.

"PUBLIC NOTICE"

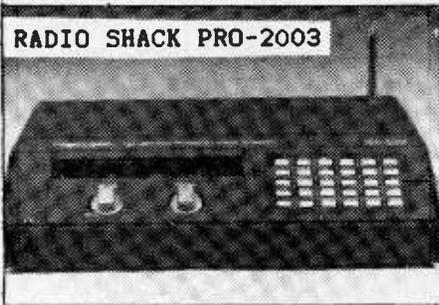
Arnold Toynbee's conception of the colonization of outer space as depicted in the movie "2001 A SPACE ODYSSEY" on the ability of science to bring every dead molecule of every human body of history back to life on the gigantic planet of JUPITER.

We beg the people of this community to accept us as we have been denied acceptance by media and press.

Please write us at P.O. Box 42678 Phila. 19101 (U.S.A.) and TUNE 6.25 Megacycles (48 meters) short wave (Saturday nights, midnights)."

MT would like to know if any of our readers hears anything from this pirate.

BEHIND THE DIALS



With the extinction of the PRO-2002 from Tandy, we watched with suspicion an announcement regarding its replacement. The newly-released PRO-2003 was a pleasant surprise.

It appears to be a cross between the Regency D-810 and the earlier PRO series of programmable scanners.

Cosmetically enclosed in a low profile, wood-grain plastic cabinet, the rubber keypad has an excellent "touch". Audible "beep" entries confirm keyboard commands.

A front-mounted head-telephone jack (1/4") invites listening privacy; the accompanying instruction manual is well-written and includes an excellent block diagram of the system.

Frequency range is expanded from earlier models: 30-50, 88.1-136, 138-174 and 410-512 MHz; there is no out-of-band programming technique possible.

While signal sensitivity is excellent, squelch hysteresis is quite loose (typical of Radio Shack receivers), requiring the squelch setting to be retarded enough to reduce high sensitivity response.

When the receiver is first switched on, scan and search speed is automatically set slow; the speed key must be depressed to increase the rate to the most commonly used speed.

Keypad numerals are small and dark, making them hard to read; the plastic cabinet may invite signal intrusion in dense RF environments.

Let's take a side-by-side look at the three top contenders to see how the new PRO-2003 stacks up:

Characteristic	PRO-2003	BC-300	D-810
Image rejection	good	good	good
Priority	yes	yes	yes
Recorder control	no	yes	yes
Audio	very good	fair	very good
Memory channels	50	50	50
Scan/search speed	8/sec	15/sec	13/sec
Memory backup	battery	non-volatile	non-volatile
Frequency coverage	good	narrowest	widest
Display	flourescent	fluorescent	fluorescent
Clock	no	yes	yes
Brightness control	no	yes	yes
Pre-programmed banks	none	11	8
Sensitivity	excellent	excellent	fair
Logic noise	absent	present	----
IF selectivity	good	good	good
Suggested retail	\$349	\$599	\$499

THE BOTTOM LINE:

The new PRO-2003 from Radio Shack represents an honest value, certainly competitive with others in the field at even higher costs.



Looking remarkably like a Radio-Shack version of the popular Bearcat 100, the new PRO-30 has good reason to suspect the similarity.

About a year ago the Electra Company sold basic patent rights to Tandy Corporation for proprietary designs of their programmable synthesized scanning receivers.

The new PRO-30 is lightweight, sports 16 channel memory, and the usual ancillary features found on most good scanners: priority channel, lockout, search and adjustable search /scan speed.

Distinct improvements include illuminated LCD display, keyboard lock to prevent accidental bump commands, and a very nice frequency range.

Bands covered include 30-54 MHz FM, 108-136 MHz AM, 138-174 MHz FM and 380-512 MHz FM.

The multipurpose LCD display signals various status commands including frequency, channel, scan or search, manual, lockout, priority, monitor, program and low battery.

Additionally, an error message will display when an impossible frequency entry

is attempted.

The PRO-30 works off rechargeable NICADS, throw-away zinc-carbon AA cells or optional AC adaptor/charger.

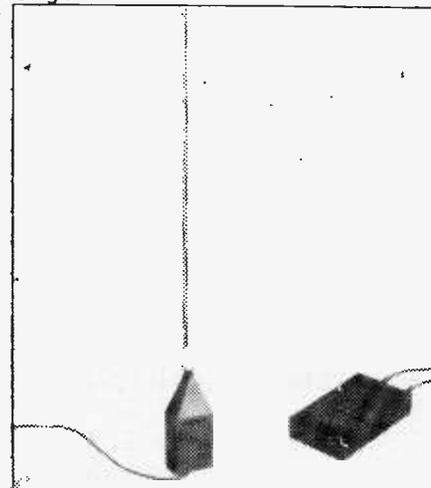
Three additional silver oxide cells are needed for the memory function.

A handy spring-loaded belt clip offers convenient carriage, and a sensible BNC antenna connector allows use with either the accompanying rubber ducky or an external multiband antenna.

Three top-mounted redundant keys (speed, scan and manual) permit ready access to these commands while carrying the unit on a belt; the squelch and volume controls are also top-mounted.

While audio level is adequate for isolated environments, an external speaker or earphone (jack provided) would be recommended for noisy areas such as in a vehicle or on the street.

Sensitivity is adequate for most applications. While our lab tests showed sensitivity to be below that of a higher-priced base/mobile model from a competitor, the PRO-30 would work well in a metropolitan area, and probably quite acceptably in the suburbs with an external antenna for critical listening.



SONY AN-1 ACTIVE ANTENNA

When Sony designs something, they do it well. The new AN-1 active shortwave/longwave antenna is no exception.

Designed for outdoor mounting, the weather-sealed RF module contains a high gain field effect transistor with good intermodulation (overload) characteristics.

Gain of the amplifier is relatively flat over the entire 150 kHz-30 MHz design range, rolling off gradually below and above those limits.

The indoor control unit may be operated from batteries (90 hours lifetime) or from an optional AC adaptor.

Approximately 40 feet of coax is provided to interconnect the indoor control unit and the rooftop antenna module with its 59" whip.

The control box allows selection of a 20 dB attenuator in case of strong signal overload; another switch permits selection of a broadcast-band filter (provides rapid rolloff below 1.6 MHz) if desired to remove those annoying images or intermod products from the shortwave spectrum.

Several adaptors are included with the AN-1 package to facilitate hookup with a variety of receivers, including those with ferrite bar internal antennas. BUT DOES IT WORK?

You bet! The Sony AN-1 performs as well as or better than any active antenna we have ever tried. In fact, its signal capture equalled that of a 134 foot Grove dipole!

Unfortunately, Sony overlooked the fact that the majority of serious listeners will need a PL-259 connector for their receivers, but that oversight may be quickly overcome by a trip to the nearest Radio Shack or electronics part store.

HOW ABOUT INDOOR USE? While the AN-1 is capable of operation inside a dwelling, its signal pickup will be profoundly affected. In our test, indoor use decreased signal levels an average 20-40 dB below rooftop levels.

Place the antenna outside and as high as possible for maximum performance. IS IT WORTH THE PRICE?

For those listeners thwarted by limited access to outside antenna facility, the AN-1 is a logical answer. Its performance rivals or exceeds competitive active antennas costing twice as much.

(SONY AN-1 active antenna, \$79.95 from Grove Enterprises and other Sony dealers.)

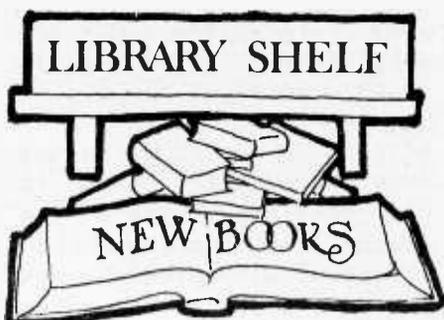


ELECTRA FREEDOM PHONE 350

Contrary to the general economy, the cordless telephone business is brisk. Entries from dozens of manufacturers in dozens of different styles appear regularly on the marketplace.

Because of its relatively low cost (\$159.95), low profile (no visible antenna on the handset) and advertised features, we decided to have a closer look at the recently-introduced

Cont'd on p. 26



SCANNER RADIO LISTINGS

by Norman H. Schrein, Minneapolis/St. Paul and Dallas/Ft. Worth editions (129 and 157 pages, 8-1/2"x11", softbound).

One of the fastest-rising publishers of scanner frequency directories is author Norman Schrein, familiar to MT readers as the columnist for "Tune In Canada."

These recent additions to the scanner buff's library are published by Fox Marketing, manufacturer of radar detectors and, most recently, scanning radios.

As with all Schrein's recent directories, these latest entries are cross-referenced by alphabetized agencies, callsigns, category of user and frequency.

Virtually all imaginable active VHF/UHF users are covered in Schrein's books, corroborated by actual off-the-air monitoring. Aircraft, federal government, public safety, business, marine, hams, satellites--something for everyone in these handy guides.

For ordering information call 1-800-543-7892, and tell them you read about it in Monitoring Times!

THE PUZZLE PALACE by James Bamford (655 pages, 5" x 8", softbound).

Bamford's recent release about the National Security Agency (NSA) has had a meteoric rise as a bestseller.

Copiously indexed, PALACE takes us on a hush-hush tour of the most sensitive agency in the United States. Operating out of Ft. Meade, Maryland, NSA operates the most elaborate listening complex the world has ever known.

With receiving sites worldwide, virtually nothing can be transmitted by wire or radio without being subjected to scrutiny by super-sensitive electronic eavesdropping devices.

Learn how all this is done by land and satellite in the pages of this revealing publication from Penguin Books, available from libraries and newsstands. (\$7.95 from Penguin Books, 40 West 23rd St., New York, NY 10010).

RADIO COMMUNICATIONS RECEIVERS by Cornell Drentea (280 pages, 5" x 8", softbound, \$14.50 from TAB Books, Dept. MT, Blue Ridge

Summit, PA 17214).

We were first alerted to this new publication by complimentary reviews in other trade magazines. A casual glance revealed the reason for its praise.

Liberal illustrations, RECEIVERS is immensely informative without being oppressively technical. Terms are explained and concepts are developed logically.

Mathematical equations are shown with examples so that the reader can follow the theory.

Chapters are clustered by topic: history, superheterodynes, conversion, front end, mixers, oscillators, IF amplifiers, AGC, product detectors and BFO's, audio amplifiers, power supplies, etc.

Design is carefully studied and interpreted for the reader, everything from early radio concepts to the most modern proprietary Bragg-Cell receivers.

An excellent reference for the serious listener, technician, amateur or engineer.

NETHERLANDS WORLD BROADCASTING by Robert D. Haslach (105 pages, 8-1/2" x 11", softbound, from Lawrence Miller Publishing, Dept. MT, Media, PA 19063).

For the international broadcast buff, this historical insight provides a fascinating look at the evolution of one of the most powerful--and respected--broadcasters in the world Radio Netherlands.

Illustrated with some two dozen archival photographs, BROADCASTING follows the formative years of this influential broadcasting organization.

Read the wartime influence by BBC, Dutch partisanship and radio, the first overseas service, the first live broadcasts, guerilla warfare and Radio Netherlands and much more in this lively, easy-to-read insight.

INTRODUCTION TO AND THE OPERATION OF AMTOR by Phil Anderson WOXI (37 pages, 8-1/2" x 11", softbound, \$3.95 from Kantronics, 1202 E. 23rd St., Dept. MT, Lawrence, KS 66044).

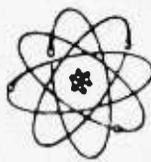
TOR (teletype over radio) is a fairly recent addition to the numerous RRTY sounds encountered over the shortwave spectrum. Phil Anderson, president of Kantronics, a leading firm manufacturing accessories for the reception and transmission of radioteletype and author of "Computers and Amateur Radio (Prentice Hall) has penned this tutorial introduction to AMTOR (amateur radio TOR).

The informative guide

GALAXY ELECTRONICS

BOX 1202--67 EBER AVE., AKRON, OHIO 44309

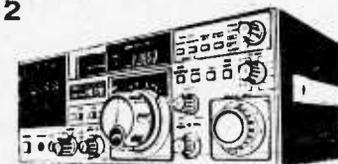
(216) 376-2402



KENWOOD R-2000

R-2000...

10 memories, scanning state of the art features! Maximum flexibility and ease of operation



YAESU FRG-7700 429.50

High-Performance All-Mode Communications Receiver 150 KHz 29 999 MHz, SSB/CW/AM/FM Digital readout, LSI clock timer optional 12 channel memory with back-up Selectable AGC memory fine tuning, noise blanker, variable RF attenuator, built-in speaker 120/240vac 13 1/2" x 4 1/2" h x 9" d 13 lbs



BC 100

8 band, 16 channel programmable pocket scanner, ac adapter/battery charger, case, rubber antenna earplug and [6] AA nicad batteries included, jacks for earphone, ac adapter/battery charger

288.50



414.50

General Coverage Receiver 200 KHz 30 MHz 30 bands, each 1 Mhz wide 5-digit frequency display and analog dial 12-hour quartz digital clock & on/off timer Three IF filters 27 KHz (SSB/CW), 60 KHz (AM narrow) & 12 KHz AM (wide) Noise blanker, built-in speaker, three antenna terminals, RF attenuator, tone control, recording terminal, remote terminal, for access to timer on/off circuit & muting 120/240vac or 13.8 vdc with optional DC kit 12" w x 4 6" h x 8 7" d, 12 lbs

SHORTWAVE

KENWOOD	
R-2000 150 khz-30 mhz digital W/Memory	499.50
R-1000 200 khz-30 mhz digital Receiver	414.50
R-600 150 khz-30 mhz digital Receiver	339.50
YAESU	
FRG-7700 150 khz-30 mhz digital Receiver	429.50
SPECIAL Purchase a FRG-7700 with memory unit & get FREE Installation - Memory unit	137.50
YH-55 Headphones for Shortwave Receivers	19.95
ICOM	
IC-R70 100 khz-30 mhz digital Receiver	644.50
NRD-515 .1 khz 30 mhz digital Receiver	995.50
NVA-515 Speaker for NRD-515	48.50
PANASONIC	
RF-2200 8 band portable Receiver	179.50
RF-3100 31 band digital Rcvr *SPECIAL*	266.50
RF-799 Digital Rcvr, 10 ch Memory, AC/DC	CALL
RF-B300 1.6 khz-30 mhz digital Receiver	CALL
RF-B600 1.6 khz-30 mhz, digital Rcvr, Scans	CALL
SONY ICF-2002, digital, 10 memories	234.50
BEARCAT DX-1000 10 khz-30 mhz, Memory	505.50
*FREE UPS SHIPPING TO 48 STATES ON ALL ITEMS**	

SCANNERS

BEARCAT	
BC-100 16 ch programmable handheld AC/DC	288.50
BC-151 10 ch prog. 30-50, 138-174, 406-512	179.50
BC-200 16 ch prog. 30-50, 138-174, 406-512	188.50
BC-210XL 18 ch prog. 30-50, 144-174, 421-512	229.50
BC-250 50 ch prog. 30-50, 146-174, 420-512	279.50
BC-20/20 40 ch, prog. AC/DC, plus Aircraft	289.50
BC-300 50 ch, prog. AC/DC, service srch + AIR	359.50
BC-260 *NEW* 16 ch prog. for mobile, AC/DC	279.50
REGENCY	
D-100 10 ch prog. 30-50, 144-174, 420-512	164.50
DX-3000 30 ch prog. 30-50, 144-174, 420-512	179.50
D-810 50 ch 30-50, 144-174, 420-512 + FM + AIR	259.50
M-100 10 ch prog. mobile, night lighted keys	199.50
MX-3000 (REPLACES M-400) 30 ch, prog. AC/DC	214.50
HX-1000 20 ch, prog. Handheld, Priority + more	CALL
HX-3000 20 ch, prog. Hndhd, 25-550 COMPLETE	CALL
R/1040 10 ch, prog. much more, budget priced	137.50
COBRA 2000GTL AM/SSB CB radio, top of line	369.50
INFO-TECH M/600A CW/RTTY decoder	735.50
KANTRONICS "RADIO TAP" CW/RTTY DECODER	189.50
*FREE UPS SHIPPING TO 48 STATES ON ALL ITEMS***	

Cordless Phones • CB Radios • Radar Detectors • Frequency Directories
• True Discount Prices & Free UPS Shipping To 48 States Picture Catalog \$1.00 Refundable

is included free of charge in the new Radiotap RTTY/Morse decoder from Kantronics.

INTERNATIONAL LISTENING GUIDE by Bernd Friedewald (issued quarterly, \$6.50 per year from Rob Harrington, P.O. Box 3434, Dept. MT, Littleton, CO 80161).

A nicely-distilled compendium of English language broadcasts worldwide would be the best description of this handy guide, issued every three months.

Compiling the major international broadcaster, Guide is cross-referenced by time of day, country of origin and frequency.

A separate world news and commentary section provides separate schedules of this important aspect of broadcast monitoring.

HAM-HACKER SOFTWARE (catalog from Hawg Wild Software, P.O. Box 7668, Dept. MT, Little Rock, AR 72217). Various programs for various computers; covers radio propagation, code practice, amplifier design, etc.

Present series primarily for VIC-20, others coming. Gary Smith (president) is looking for authors of good programs.

Hams Broadcast

Shuttle Coms

The Federal Communications Commission has issued a blanket authorization to all requestors allowing the retransmission of audio and video communications by amateur radio licensees.

The FCC recognized that "amateur radio operators have a tremendous interest in space communication," and that such retransmission "affords licensees a unique opportunity to become better informed about space communications."

The ruling came about largely due to the good press received during previous amateur coverage plus repeated pressure through applications by NASA's Jet Propulsion Laboratory ham club, Spaceport Amateur Repeater Club and the Kettering Medical Center club.

During the STS-9 mission, astronaut-ham Owen Garriott W5LFL worked fellow radio amateurs from the Columbia on 145.55 MHz; uplinks to Garriott were separated every 20 kHz from 144.91 to 145.09 MHz.

☆☆☆

GETTING STARTED

☆☆☆☆☆☆☆☆☆☆☆☆☆☆

Determining Exact Frequencies On Your Non-Digital Receiver

Not everyone is fortunate enough to have a receiver with a digital frequency readout. Many DXers must depend on less-closely-calibrated printed dials, but there are methods to improve readout accuracy.

FAMILIARIZATION

To begin we must start with the receiver itself. Know its moods and all the conditions which have an effect on its performance. The more you know about your receiver, the more you'll be able to get out of it.

Let's assume you have already mastered the controls of your receiver and are ready to start mastering how to determine the correct frequency. There are several ways we can go about this.

READOUT

Most dial plates are very general and provide little information for the active DXer. If the dial plate has a 0-100 logging scale, this can help but it's still not the best solution.

Have you ever wondered why a station does not always fall on the same spot

on the dial? This is due to "backlash" caused when the dial cord slips.

Backlash may occur by tuning the receiver's dial beyond its limits at either end of the tuning range.

Move the tuning dial from one end to the other noting location of the weaker stations; reverse direction and note any change in position of those station to determine if your dial cord is slipping.

If the dial cord is slipping you should consider having it adjusted.

A homemade logging scale taped or glued to an unused portion of your dial may serve as an accurate calibration providing your receiver has no backlash.

Other things which can affect the calibration of your receiver include dampness, temperature and bumping. Set the receiver on a solid surface where it can't be knocked down. Don't set up your listening post by a heater; temperature variation will cause frequency drift in your receiver.

Leaving your set in a

damp room can cause moisture to affect receiver components.

Dust always manages to seek out the tuning capacitor producing dead spots and a scratchy noise every time the tuning is adjusted. A dust cover is recommended during off periods.

CALIBRATING THE SCALE

Now we are ready to plan to get accurate frequencies for our receivers. This requires a good up-to-date frequency list such as those available from radio club publications like SPEEDX, FRENEX and ASWLC, or collect current loggings and frequency schedules announced by shortwave broadcasters.

The next item needed for this project is onion-skin paper. The number of sheets will depend upon the number of hours you devote to DXing.

Normally one sheet per DX hour is all that's needed but some may wish to use a sheet for every half hour.

The advantage of using onionskin is that it provides a guide when placed on top of a form already filled out.

Make as many columns as you have bands on your receiver.

Assign an hour to each sheet and begin with the

least active band. This will vary depending upon the time of day, solar flux, etc.

Begin at one end of the band and adjust until you come across a frequency you can determine using a frequency list. Log the correct frequency alongside the name of the station in the appropriate column.

Continue this procedure throughout the bands. Soon you will have enough entries to interpolate (guesstimate) other frequencies as well.

additional retinue of parasitic elements which assist in capturing more of the upper frequency channels.

The VU-160 is intended for both VHF and UHF TV reception while the CP-28B is honed for channels 2-13 only. And it's big--some 162 inches, weighing in at 14 pounds.

Is it worth the additional cost? If you are in a marginal signal area, probably so. But don't forget the low-loss feedline to go with it!

For additional information on this and other Kay-Townes TV antenna products, write the factory for a recent catalog. Dealer inquiries are invited to participate in Kay-Townes' resale program.

BEHIND DIALS from p. 23

Freedom Phone 350 from Electra, famous maker of Bearcat scanners.

Aforementioned features include ten-telephone-number memory, automatic redial of last call made, and a security switch to prevent the base unit from being accessed by an unauthorized cordless handset when the system is not in use.

Three steps of received volume may be selected for various listening levels and a mute switch allows temporary disconnection of the microphone for momentary privacy while maintaining a call.

The duplex telephone utilizes the common 1.7 and 49 MHz cordless phone frequencies and has a maximum operating range of nearly 500 feet, confirmed in our field test of the compact unit.

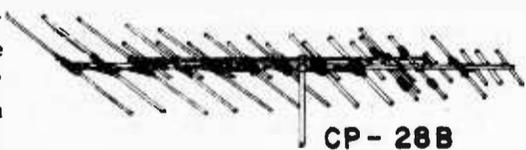
The Automatic recharging of the NICAD batteries is provided by the base unit when the handset is returned; LED status lights signal the line voltage and charging condition as well as off-hook (on) state of the handset.

Cosmetically, the 350 is smooth plastic beige with matching cords. A beige stick-on phone number table may be custom-conveniently

placed on the base unit for quick reference of memorized numbers.

The 350 is ready for installation upon arrival, complete with charged batteries and modular connectors for insertion in all modern Bell-compatible systems.

For more information contact your Electra dealer or write the factory direct (300 East County Line Rd., Cumberland, IN 46229).



CP-28B

KAY-TOWNES "COLORPHASE" TV ANTENNA

While many of our readers are into TV/FM DXing, all of us are concerned with good television reception (is there such a thing as good television?)

TV antennas are available in every description: indoor "rabbit ears," telescoping whips, compact hide-aways, camper fold-ups, Yagis, log-periodics, conicals, bow-ties...you name it!

With such a bewildering array of varieties on the market, it is no wonder that the consumer has a difficult time making the right deci-

sion.

For the city dweller, the problem is not so acute; most TV transmitters lay a saturating amount of power on metropolitan areas. Nearly any conductive surface may become an antenna, delivering adequate signal levels to the antenna terminals of the TV receiver.

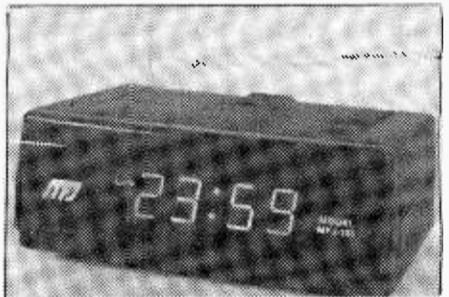
But as distances grow, so do the problems. Signals become weaker, interference becomes more severe and the choice of a proper antenna becomes more critical.

Here in Brasstown, North Carolina, we are more than 100 miles from any TV broadcasting station; the distance problem is compounded by stark mountain relief.

Recently, two competitive TV antennas were compared: the Radio Shack VU-160 (\$69) and the Kay-Townes CP-28B (from Kay-Townes, Inc., PO Box 593/607, Turner Chapel Road, Rome, GA 30161 (\$99).

Naturally, with a thirty dollar difference in cost, we expected some difference. And there was a difference. The Kay-Townes antenna provided better gain and sharper directivity.

While both antennas are log-periodic arrays, the Kay-Townes has a double-boom arrangement to support its



MFJ 24/12 HOUR DIGITAL CLOCK

Possibly no company has unleashed such a prodigious number of digital clocks on the hobbyist's market as has MFJ Enterprises, prominent manufacturer of accessories for radio communications.

Several outstanding features make this newest entry worthy of special mention in a world filled with digital clocks of every description.

The MFJ-103 radiates its time from sharp, blue 0.6 inch fluorescent digits, easily visible across a room.

A nine-volt battery provides memory backup during power outages (the clock runs on 120 VAC, 60 Hz.).

For communications installations, the clock has a nine-minute ID alarm which activates upon pressing an appropriate button.

A choice of either 12 hour (AM/PM display) or 24 hour time may be switch-selected. (There is no dual time zone readout.)

Cont'd on p. 31

EXPERIMENTER'S



WORKSHOP

Hear Cordless Phones On Your AM Radio

by Pete Haas

Most monitoring enthusiasts know that home cordless phones transmit one side of the conversation on 49 MHz, but did you know it's very easy (and fun) to hear both sides of the conversation on an AM broadcast band radio?

The modification does not require the addition of any components and is easily reversible. You'll only sacrifice a small portion of the low frequency AM coverage.

FM RECEPTION ON AN AM RECEIVER

On most cordless phones the base unit transmits back to the handset on 1695, 1725 or 1755 kHz. Even though it is an FM signal, an ordinary AM radio will work fine using "slope detection." Just tune the AM receiver slightly to the side of the received FM transmission and you'll hear the audio clear as a bell.

I have modified about half a dozen AM radios and reception has been very good to excellent.

Basically all you will be doing is raising the AM receivers' coverage slightly - about 100 to 150 kHz. You may have an AM radio with enough built-in overtuning (almost all do) to receive one or more cordless phone channels now, but using the described modification technique tuning won't be as "cramped."

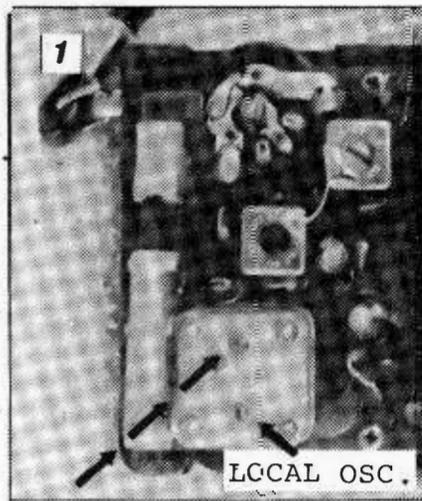
All you will need is a set of plastic alignment tools (since we are dealing with low frequencies you can get away with using jeweler's screwdrivers!).

HOW IT'S DONE

The first sample modification is for a Realistic 12-167B Pocket AM radio, commonly available at Radio Shack for about seven dollars.

First remove the back of the radio and refer to photo no. 1 for the peaking and local oscillator adjustments on the back of the main tuning capacitor.

Lay the radio face down on a flat surface and with a



PEAKING TRIMMER
fresh battery installed tune in a radio station on the high end of the AM band.

With an alignment tool turn the local oscillator trimmer adjustment so its plates are fully unmeshed. You can see these small plates through the clear plastic case of the main tuning capacitor.

You will now notice the radio station you have previously tuned in has disappeared. Tune the station back in again and you will notice it is slightly further down the dial and its reception is weaker.

Physically orient the radio for best reception of the same AM station and adjust the peaking trimmer for the loudest reception. The modification is complete.

If you own a cordless phone switch the handset to "talk" and you can easily tune in a dial tone. If you don't own a cordless phone leave the modified radio set near the high end of the dial and sooner or later you'll probably pick up a conversation, especially if you live in a residential area.

LET'S TRY ANOTHER ONE

The modification of a Realistic 12-171 (about \$9.00) is similar. I like this radio because it has a slide rule dial and small size.

Take off the back cover and refer to photo no. 2. Tune in a station on the high end of the dial and adjust the oscillator trimmer as before. If you cannot see these trimmer plates make small incremental adjustments of this trimmer until the tuned in AM broadcast station has moved down the dial as far as possible.



PEAKING TRIMMER

Its physical change on the actual dial will only be a fraction of an inch. Then adjust the peaking trimmer carefully for the loudest reception. That's all there is to it.

HOW ABOUT THE AM SECTION OF A STEREO?

Modifying the AM section of a hi-fi receiver is easy. Photo no. 3 shows a Kenwood receiver and no. 4 is a Rotel model. All similar receivers use ganged variable capacitors in the tuning section.



PEAKING TRIMMER
There are actually three adjustments you can play with here - the third option being the slug-tuned local oscillator coil.

After tuning in a radio station on the high end of the dial, turn either the local oscillator adjustment on the main tuning capacitor or the local oscillator coil's slug counterclockwise. (The local oscillator coil looks like an IF can close to the variable capacitor.)

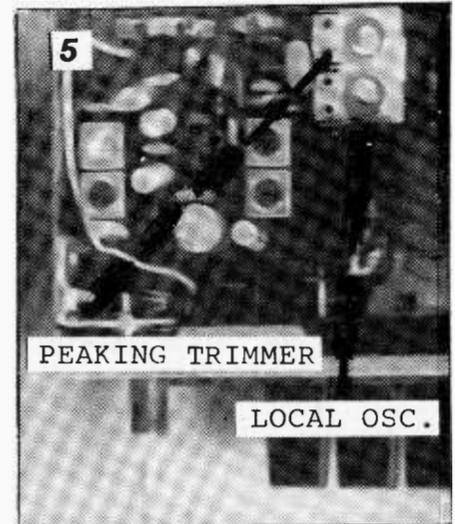
The exact amount of local oscillator adjustment will vary but you want to increase high end receiver reception to a bit over 1700 kHz. If the AM broadcast station is on, say 1600 on the dial, make the oscillator adjustment until it appears on about 1500.

The final step is to adjust the peaking trimmer for loudest reception. If the receiver has a signal strength meter the adjustment can be made very precisely and quickly.

AND HOW ABOUT CAR RADIOS?

AM car radios aren't much use these days with the popularity of FM stereo cassette units, but they do make hot cordless phone re-

ceivers! The radio in photo no. 5 is a Clarion unit.



Pull off the cover after removing 5 or 6 screws. Attach a 4 or 5 foot antenna to it and apply 12 volts to the proper connections.

As before, tune in a high band AM station and adjust the oscillator trimmer to lower the signal on the dial; peak its reception using the other trimmer capacitor.

AM/FM RADIOS

There are four miniature trimmer adjustments on the back of AM/FM tuning capacitors (see photo no. 6). Two are for the FM section and two are for the AM section.



Before proceeding any further mark a line through the slot of each trimmer screw with a fine tipped felt marker. This will allow you to reset the trimmer adjustments to their original settings in case you tweak the wrong one (i.e. the FM section trimmer).

The two trimmer adjustments physically closest to the ferrite antenna rod are usually the AM radio adjustments.

As earlier, adjust the local oscillator trimmer plates to a fully unmeshed position after tuning in a high end AM station; retune in the same radio station and adjust the peaking trimmer for loudest reception. It's a cinch.

RECEPTION HINTS

Once you discover where cordless phone conversations are heard, you can turn the

Cont'd on p. 31

"ANCIENT MODULATION?"

NOT BY A LONG SHOT!

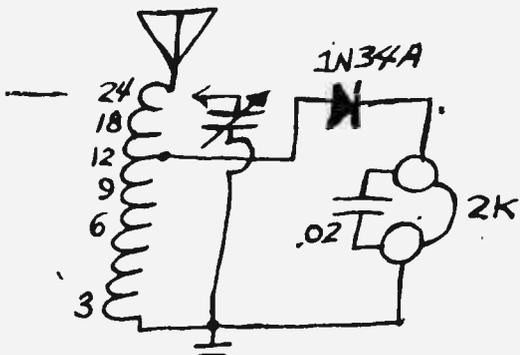
by Arnold Timm

This article is an attempt to encourage you to hear radio using crystal detectors. In doing so, it should encourage more investigation into amplitude modulation.

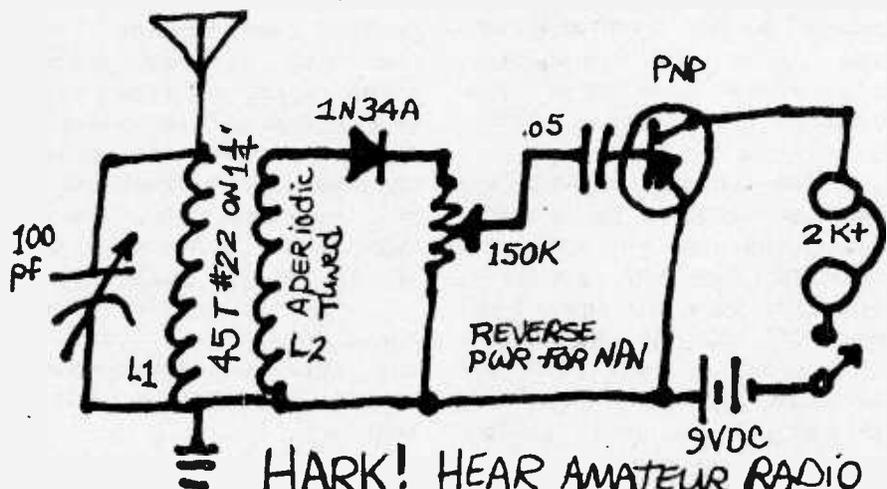
As the SWL knows, AM is most active with international broadcasters. Although some stations have augmented SSB, AM is the audible mainstay until programs are disseminated via microwave and FM. Although most radio amateurs operate SSB voice, major broadcasters may elect to beam programs by satellites soon; full-fidelity AM forever!

Reverting to the crystal detector, we may amuse ourselves by tuning into radio amateur AM. Attaining exact antenna/coil/capacitor adjustment to proper frequency 3860-3880 kHz may allow you to listen to double-nostalgia. The old transmitters and receivers discussed and used here (10PM-3AM) would enlighten youngsters and elders alike.

10-80 METERS



COIL - 24 TURNS #14 ON 1" DIA. TAPE EVERY 3RD TURN. CRYSTAL TO 12TH TAP (140PF)



HARK! HEAR AMATEUR RADIO (OVER) DX CRYSTAL DETECTORS!
3.860 - 3.880 WEEKENDS AM

Don Chester, K4KYV, Rte. 1 Box 281, Woodlawn, TN 37131 plans an AM newsletter if enough interest is obtained. The first sample issue is FREE (\$9 a year).

There is a small set manufacturer in California

headed up by Mr. & Mrs. Elmer G. Osterhoudt (MODERN RADIO LABS, P.O. Box 1477-EA, Garden Grove, CA 92642) which has been offering small panel/base sets since 1932. With his wife Mabel, Elmer single-handedly builds kits, crystal, one-tube, diode and transistor sets selling for a budget-pleasing \$10-20 each!

The catalog and informative handbooks (\$1 each) detail plans which even children enjoy. It may take you a month to receive your order, but rave reviews over the years show MRL kits well worth the wait.

Beginners don't understand that crystal sets can be useful. Listening to propagation fluctuations without AGC (as found in expensive receivers) can reveal band conditions and CW/RTTY pulse interference are dampened by a crystal set.

Elmer's stories while shipboard (1920-1923) will be presented in our proposed H*A*R*K newsletter (2308 Garfield Ave. S#304, Minneapolis, MN 55405).

Another manufacturer that may have been ignored by SWL's and experimenters is STELLATRON, 4942 Whitsett Avenue, Suite 205, N. Hollywood, CA 91607 (1-213-506-0415). They market Part 15 subpart D transmitters for AM/FM broadcast frequencies.

Their transmitters have kit and assembled price options and include various commercial quality outboard extras as well. For example, their FM stereo board offers 30 dB separation and 300 mV audio input sensitivity. It tunes 88-108 MHz, has 50 ohm impedance out and is highly stable with legal-range-plus capability!

The AM version delivers 60 mW of power using a double balanced modulator to

Ltd. hopes to interest Radio Amateurs and shortwave listeners/monitors who are able to operate and maintain a personal broadcast station.

Partaking of the STELLATRON exciters, we suggest mobile or portable stations.

Sharing your hobby at yard sales and other public events can be fun and educational for all.

Combining these endeavors, I intend to offer a crystal detector builders' forum through our H*A*R*K newsletter. Those who wish to participate are welcome to submit an SASE for schematics and an application form.

Radio hobbies nowadays have reduced size/weight ratios, thus allowing for more mobile diversions.

Let's make use of this historical period; AM ain't dead yet!

Those into kit assembly may enjoy "Hobby-Kits" from Morning Distributing Co., P.O. Box 717, Hialeah, FL 33011 (305)883-1274. According to their ads and catalog (\$2) you can experiment-learn electronics, build and design your own AM, FM, CW or SSB receivers, xmeters, etc. with their Mini-linear circuit kits. All kits come complete with etched and drilled circuit boards and all parts needed function as described. All boards, except their FLS-9 SSB filter, are under \$10. A complete set of modules to build a 1-watt SSB/CW monoband Ham receiver (less case, controls, pwr supply, spkr & mike) \$149.95 (specify band).

Applying RF-2 (\$7.95), Mix-2 (\$7.95), and OSC-2 (\$4.95) we can assemble an RF converter. You could bring the HF bands to your scanner or convert VHF/UHF to ten meters. Of course, you have to wind your own coils (part of the FUN?) but, for \$23.35 plus \$2.50 shipping you could enable yourself to be a proud owner of an "all frequency" receiver.

RADIO CONTROL

Those who are into radio control models might like to listen to R/C frequencies through your AM radio or scanner. Info, parts, kits, and converters are available from John R. Lange & Assoc., P.O. Box 1395, Melrose Park, IL 60160. Please include self-addressed-stamped-envelope.

The sounds of R/C may be a different diversion to acquire. The frequencies are as follows: 72.080, 72.240, 72.400, 75.640, 72.030, 72.550, 72.590, 72.630, 72.670, 72.710, 72.750, 72.790, 72.830, 72.870, and

Computer Bulletin Board at Universal

Universal Amateur Radio, Inc. now provides a unique service to amateurs and shortwave listeners--computer-based bulletin board service (BBS) designed with the communications enthusiast in mind.

The "UBIX" (Universal Bulletin Board and Information Exchange) consists of short items of interest, sale items at Universal, SWL and HAM DX tips, list of all users, messages for Universal and mail to/from other UBIX users.

The system is presently "up" from 8:30 PM to 9:00 AM Eastern Local Time.

UBIX is an open BBS. Users can install themselves on the system. Send an SASE for a free copy of the UBIX manual BEFORE getting on the system.

72.910 (aircraft)--75.430, 75.470, 75.510, 75.550, 75.590, 75.670, 75.710, 75.750, 75.790, 75.830, and 75.870 (boats/cars)--72.160, 72.320, and 72.960 (any use).

Flying two channel systems in R/C can be fun. The Glider requires only two-channel radios and it flies without added expensive engines. Launching the various Glider models by rubber-band pads or small engine enables the modeler to spend \$100 or less.

A super-performance, ultra-compact (5"x3"x1"thin) receiver by Caprice MK111 is available to ultralight pilots. An AM broadcast receiver with VHF converter sells for \$31.95 plus \$3 shipping and handling. It tunes from 108 to 162.5 MHz which is nice for a compact pocket-PAL. Order it from Window Supply Co., Dept Radio, P.O. Box 369, Reseda, CA 91335.

H*A*R*K is still open for crystal set builders' forum. Our membership drive for this fall/winter may have a prize-drawing of a Modern Radio Labs kit. We are trying to compile a list of active nets and round-tables of SSB and 10-FM repeaters, like the one in the Virgin Islands that blankets the entire USA during 10 meter openings. If you or your children would like to join H*A*R*K send an SASE to me for an application (Arnold Timm, 2308 Garfield #304, Minneapolis, MN 55405). At present, no dues or fees are charged. Have fun!



TECHNICAL TOPICS

by Bob Grove

Q Does anyone make a transistorized tunable receiver that has the sensitivity and selectivity that the old tube-type Monitoradions had?

Lawrence S.
Northfield, NJ

A No. While commercial, military and laboratory receivers are available at a premium from specialty manufacturers, no one at present makes a communications-quality consumer-oriented tunable VHF or UHF receiver. Not yet.

+--+--+--+

Q I need a weatherproof speaker for my boat capable of handling 5 watts audio, saltwater spray and 8 ohms impedance at voice frequencies.

Mort. P.
Prouts Neck, ME

A Can you fabricate an enclosure out of marine plywood or masonite? Use a small automotive speaker in the box, sandwiching a thin sheet of plastic wrap between the speaker and the front hole (port) or the baffle (enclosure).

If you need passive audio filtering, there is a good project in my book, "Communications Monitoring" (Grove BOK-1) describing how to install a couple of capacitors and coils to give good voice audio.

+--+--+--+

Q I would like to remote-monitor my scanner (a Bearcat 220) via a phone line.

How can I determine which channel is being monitored?

Dean McDermott
713 Linden Avenue
Elizabeth, NJ 07202

A Can any of our readers help Dean? Please let us know what remote control modifications you have made so we can share them with other MT readers!

+--+--+--+

Q A very powerful distant station interferes with a local weak one on the same frequency when monitored with my Scanner Beam. How can the interference be reduced?

Steven M.
Oak Park, IL

A First, try rotating your scanner beam while the undesired station is transmitting, listening for the weakest reception; this will be the null point. Mark it on your rotor control box for later reference.

Next, try reducing the squelch control to the point where the overpowering station just drops out. Now try listening for the local station on the same frequency. Hopefully, that will take care of it.

The only other possibility (besides moving) would be to use a second antenna as a "sense" antenna, spaced to provide a null from that direction. It would be connected in parallel with the main antenna by a short length of coax and moved around in position until the unwanted signal is cancelled. Touchy to tune, but effective.

BROADCASTING from p. 20
future articles.

ALTERNATES

The following stations also have good news services and usually provide reliable reception; some readers may prefer them to the selected six above.

HOLLAND: Radio Nederland 0230 (9590/6165), 0530 (9715/6165 kHz).

WEST GERMANY: Deutsche

Welle 0100 (9565, 9545, 6145, 6040); 0500 (9690, 9545, 6130 kHz).

U.S.S.R.: Radio Moscow; many channels, best reception at: 1300 (9600); 1400 (15150/15100); 1800 (11840/11820); 1900 (15100); 2200-0100 (11845, 9765, 9700, 9665, 7440, 7185, 7165, 7115, 7100, 6115 kHz).

CUBA: Radio Havana 0100 (15300/11930); 0330 (11760);

ENGLISH BROADCASTS. LIST SUMMARY. Selected times & frequencies.		
COUNTRY/STATION	TIME U.T.C.	FREQUENCY
BRITAIN B.B.C.	1200/1300	15215 11775 9510 6195
	2300/0000	11750 9915 9590 7325 6175 6120 5975
	0200/0300	11750 9515 7325 6175 6120 5975
	0500/0600	9510 6175 5975
U.S.A. V.O.A.	2200	15600 15580 15445
	0000/0100	17730 15205 11740 9650 5130 5995
SOUTH AFRICA R.RSA	0200	11730 9615 5980
AUSTRALIA R.AUSTRALIA	1100/1200	9580
	0200/0300	17795 15320
ISRAEL KOL ISRAEL	2000	15585 12025 11655 9815
	0000/0100/ 0200	11655 9815 7410
ECUADOR HCJB	0030	15155 9745

Books for the Ham Shack from WAYNE GREEN BOOKS



Novice License Study Guide
by Timothy M. Daniel
N8RK
This book emphasizes the practical side of getting a license and putting a station on the air. Complete with information about learning Morse code, the latest FCC amateur regulations and application forms, this guide is easily the best path into the exciting world of ham radio.
SG7357 \$4.95

General License Study Guide
by Timothy M. Daniel
N8RK
Learning rather than memorizing is the secret. This is not a question-and-answer guide that will gather dust when the FCC issues a new test. Instead, this book will be a helpful reference, useful long after a ham upgrades to General. Includes up-to-date FCC rules and an application form.
SG7358 \$6.95

Behind the Dial
by Bob Grove
This book explains, in detail, what's happening on all the frequencies, from shortwave up to microwave, including some of the secret stations of the CIA and FBI. Surveillance, station layout considerations, antenna systems, interlocking, and the electromagnetic spectrum are included.
BK7307 \$4.95

The New Weather Satellite Handbook
by Dr. Ralph E. Taggart
WB8DQT
This revised edition contains all the information on the most sophisticated and effective spacecraft now in orbit. The book is also an introduction to satellite watching, providing all the information required to construct a complete and highly effective ground station. Not just ideas, but solid hardware designs and all the instructions necessary to operate the equipment are included.
BK7383 \$8.95

The Magic of Ham Radio
by Jerry Swank WBHXR
Under various call signs WBHXR has been heard on the ham bands since 1919. He has watched amateur radio grow from the days of Model A spark coils to an era of microprocessors and satellite communications. Drawing on his own colorful experiences and those of many other hams, Jerry has compiled this word-picture of ham radio during the past six decades.
BK7312 \$4.95

World Repeater Atlas
2000 repeater listings are indexed by location and frequency, pinpointed on more than 50 maps covering the USA, Foreign listings include Europe, the Middle East, South America and Africa. In addition to covering the popular two-meter repeaters, the **World Repeater Atlas** lists repeaters for six meters, 220MHz, and the other bands.
BK7315
Special price \$2.00



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BROADCASTING,

Hotbed from p.6 to listen to. Try them at 2130-2225 on 9.845 and at 0300-0400 on 9.745. They always start with the news, then have some "belly dance" music, and then a five minute editorial feature which usually gives their side of the story about their conflict with Iran.

IRAN - Poor reception most of the time but try them for English programs at 1930-2030 on 9.765 or 9.0222.

LIBYA - While not in the current "hot spot" this country is usually in the news regularly as a "troublemaker." Reception is usually good for their English program at 2230-2400 on 11.815.

AFGHANISTAN - This is strictly controlled by the USSR and, in fact, their transmitters are actually located in the Soviet Union.

0630 (9525 kHz).
CANADA: Radio Canada International 2200 (11720/9625); 2300 (9755 kHz).
U.S.A.: American Forces Radio & TV Service 1200 (6030); 0000 (15430); 0100 (15330/11790 kHz).

They broadcast in English at 1900-1930 on 15.077 and 9.665 with reception being fair.

UAE - One of the most interesting Arab stations to listen to. This former British protectorate is one of the richest nations (oil) per capita in the world. Their broadcasts usually begin with a lady announcer who sounds as though she was educated at Oxford.

Unlike most SW programs, the news is not the first order of business. Instead, a talk about life in that country or philosophy or something then a period of music. Not Arab or Middle East music but the kind you hear on your local FM station.

Then comes the news with a format that is strictly from the BBC. Tune in at 1615 on 21.655, 17.775 or 15.320. Also at 1330-0400 on 17.775 or 15.435.

KUWAIT - Good signals and interesting programs at 1800-2100 on 11.675.

SAUDI ARABIA - Signal only fair but try them at 1700-2100 on 11.855.
See you next month!



HELPFUL HINTS

...Just under 30 MHz
THOSE SOUTH AMERICAN UTILITIES

How many readers have ever bothered to tune their shortwave receivers all the way to the top of its limits? Chances are that if you did you heard very little.

The 30 MHz range is susceptible to skip, and best reception is usually afternoons or early evenings, especially during winter months. Activity on the amateur ten meter band (28.0-29.7 MHz) can provide a good indication whether these higher frequencies are good hunting grounds for DX.

While there are a few U.S. federal government frequencies in common use between 29.7 and 30.0 MHz, most of the activity comes from South America--the rapid-fire Spanish language is a dead giveaway!

While specific band plan details are virtually non-existent to American listeners, some concerted listening shows a distinct pattern. Let's take a look at some loggings, the result of several weekends of monitoring.

- 29.71 FM
- .72 FM Spanish:point-to-point telephone
- .73 AM
- .75 AM;time-domain scrambling
- .754 Telemetry
- .76 Spanish;dial/paging

- .765 Time domain scrambling
- .77 FM English;mobile simplex (near Union Station)
- .774 FM Spanish; dialing
- .804 Telemetry
- .85 AM Spanish
- .88 AM Spanish
- .89 AM
- .90 AM Spanish
- .912 AM
- .92 AM Spanish
- .93 AM
- .94 AM Spanish
- .95 AM Spanish
- .96 AM Spanish
- .97 AM Spanish
- .98 AM Spanish

DESIGN YOUR OWN LOG SHEETS

All serious listeners, whether shortwave or scanner buffs, keep records of their catches. These may be filed for future reference, compiled into master data bases or simply discarded after a period of time.

Reprinted below are several samples of logsheet headings which may be adapted for your own use. Sample entries are shown as a guide for filling out the lines.

INTERESTED IN A LOGBOOK?

Monitoring Times is giving serious consideration to publishing logbooks for listeners. The book would be looseleaf and contain a number of informative introductory pages for reference.

Let us know if you would like such a logbook and what you feel would be a reasonable cost for the publication. We'll take it from there!

NEED A CRYSTAL?

Often, users of crystal-controlled scanners, monitors, transmitters and other quartz-operated oscillators have trouble locating crystals.

MT reader Bob Woods reminds us that one good, low-cost supplier is M-TRON Industries, P.O. Box 630, Yankton, SD 57078.

Next time you need a crystal, give them a try--and don't forget to tell them where you read the tip!

AUTHORIZED BEARCAT SERVICE CENTERS

Many readers inquire as to where to have defective scanners repaired. The following list of Bearcat service centers is the most recent.

- ELECTRA COMPANY**
 DIVISION OF MASCO CORPORATION OF INDIANA
 300 EAST COUNTY LINE ROAD
 CUMBERLAND, INDIANA 46229
 (317)897-7300
- ELECTRONIC REPAIR CENTERS**
 9490 FRANKLIN AVENUE
 FRANKLIN PARK, IL 60131
 (312)455-5105
- HAENDIGES ELECTRONICS**
 13313 PHILADELPHIA ST.
 WHITTIER, CALIFORNIA 90601
 (213)698-9465
- RADIO LAND, LTD.**
 178 WARWICK NECK AVENUE
 WARWICK, RHODE IS. 02889
 (401)737-3222

CRYSTALS AND CAT'S WHISKERS

A fascinating list of materials used as crystal detectors during the evolution of radio has been judiciously compiled by Harley Parkhurst (Box 415, Nenana, AK 99760).

If you are a trivia collector or history buff, this collection of detectors from Ajax to Zirconium is just what you need! Send one dollar to help defray Harley's cost for the photocopies.

HOME CONSTRUCTION MAGAZINE

Reader David Soliday alerted us to a special periodic edition of Radio-Electronics magazine called "Special Projects." It is on sale on magazine racks in larger stores and major cities.

Directed toward the home experimenter, the projects recently included a shortwave converter for a car radio, a variable voltage power supply and many other appealing and useful home projects.

A subscription to "Special Projects" costs \$9.00 a year (\$12 Canada, \$16 foreign) and is available from Special Projects Subscription Department, 200 Park Avenue South, New York, NY 10003.

FREQUENCY KHZ/MHZ	AGENCY SERVICE	LOCATION BEARING	CALLSIGN IDENTIFICATION	EMISSION MODE	SIGNAL QUALITY	TIME/DAY/DATE	ADDITIONAL INFORMATION
11243 KHz	USAF	AIRBORNE	LOOKING GLASS	USB	59+20	0141/TUES/1/3/84	FOXTROT BROADCAST

1 Form used by Bob Grove for logging intercepts

COMLAB MONITORING LOG

Q. kHz	MODE	CALLSIGN/ID	SERVICE (SINPO)	SIGNAL	TIME/DAY/DATE	TRAFFIC/COMMENTS/OPERATOR
5.34 MHz	FM	KDA226	EMT	FULL QUIETING	1419 TUES 1/3/84	AMBULANCE CALL

2 Earlier form used by Bob Grove for class instruction

MONITOR'S LOCATION: BRASSTOWN NC PG. 2 OF 4, REF. PAGE No. 3
 FROM 1/1, 1984 TO 1/6, 1984

BOX CODES: = UNABLE TO COPY, = SPANISH, = FEMALE, = MOBILE, = AIRCRAFT, = VESSEL

GMT DATE	GMT	FREQUENCY	MODE	TAPE, SIDE	IND	SEN	OPERATORS		* - VERY SIGNIFICANT, LEAD STATEMENT, SYNOPSIS, ETC.
							FROM	TO	
1/1	2240	14.450	U	1/2	31	✓	2238	2250	"JULIET 7" PROBABLY DRUG TRAFFIC.

3 Logsheet used by US Customs monitoring installation

LOG APPLICATION: Amateur Radio Citizen's Band Short Wave Listening

DATE TIME	STATION CALLED OR MONITORED	CALLED OR MONITORED BY	HIS FREQ. OR CHANNEL	HIS SIGNAL STRENGTH AND QUALITY	For Amateur & CB Use				Remarks (Name, type of equipment and notes on purpose of communication for Amateur & CB) (country, program, antenna, receiver, etc., for SWL)	QSL		
					MY SIGNAL RST	FREQ. OR CHANNEL	EMISSION TYPE	POWER INPUT (WATTS)		TIME OF END OF QSO	S	R
1/6	WA4PYQ	ME	7227	59+	59	7227	LSB	150	1625	EXCHANGED ANTENNA REPORTS	✓	

4 Universal logsheet designed by Allied/Radio Shack

CLUB CORNER

CB Publications Still Around

Occasionally we receive inquiries from MT readers as to the availability of CB periodicals for that hobby. With the demise of S-9 and CB magazines, only a few smaller publications persist.

Readers interested in keeping abreast of activities in the CB service may wish to write to the following organizations for samples of their publications. Enclose \$1 to offset costs of samples:

C.B. VOICE, R.R. 2, Oregon, IL 61061.

PERSONAL RADIO OPERATORS FEDERATION, 3302 Balboa St., San Francisco, CA 94121.

SIDEBAND RADIO DIGEST, Box 4001, Daytona Beach, FL 32021.

FAIR PRESS SERVICES, P.S. Box 19352, 20th St. Station, Washington, DC 20036.

Monitoring Net

Still On The Air

A number of MT readers have been inquiring as to the status of the North American Monitoring Net, a group of enthusiastic spectrum-monitoring amateurs who meet on the air weekly to discuss their intercepts and equipment.

The net is still active, meeting Wednesday evenings at 0100 UTC (8 PM EST) on the 7227 kHz lower sideband; 7268 is an alternate frequency in case of interference on the primary frequency.

Net control station is WA4PYQ, Bob Grove, editor of Monitoring Times and president of Grove Enterprises.

BEHIND DIALS from p. 26

Nearly-absolute time is assured because the clock may be set to the second when synchronized with a standard like WWV or CHU.

Twenty-four hour elapsed time measurement may be made by setting the clock at zero at the beginning of an event.

A 30 day money back trial period guarantees satisfaction; orders may be placed at authorized dealers or by calling MFJ directly at 1-800-647-1800.

(MFJ-103, \$34.95 plus \$4 shipping from MFJ Enterprises, P.O. Box 494, Mississippi State, MS 39762.)

SIGNALS from p. 11

- 136.860...Used by the US IUE scientific satellite for telemetry.
- 137.080...Used by the ESA weather satellites in geostationary orbit for general housekeeping telemetry.
- 137.300...Used by the Russian meteor weather satellite series.
- 137.500...Used by the US NOAA series of orbiting weather satellites.
- 137.620...Used by the US NOAA orbiting weather satellites.
- 137.850...Used by the Russian Meteor weather satellites.

Reader input is always the most important aspect of a successful column. I would like to hear from you. Send your questions, comments, frequencies (believe me, I do not have them all!), satellite mission information, monitoring experiences, station layouts, etc. to: Signals from Space, c/o Larry Van Horn, 1111 N. Carrier-Pkwy, B-107, Grand Prairie, Texas 75050. If you do desire a personal response, please enclose a SASE.

Monitoring the Shuttle: STS-9 SpaceLab

At press time, several frequencies in the HF range were reportedly in use by launch operations, support aircraft, booster recovery vessels and land-based tracking stations. All were upper sideband. Additional VHF/UHF air to ground AM and FM were also in use.

- 2678 kHz Cape Kenedy range control
- 5810 primary call-in
- 6693 support aircraft
- 7765 booster recovery ships
- 8972 US Navy Atl. support
- 8981 support aircraft
- 9043 " "
- 9132 " "
- 10780 primary call-in
- 11205 support aircraft
- 13170 " "
- 20192 Ascension Is relay
- 20197 (LSB) Ascension Is
- 46.40 MHz FM support aircraft
- 141.3 support aircraft
- 294.6 " "
- 296.8 shuttle UHF backup
- 259.7 " "
- 264.8 booster recovery ships

Additionally, two NASA centers relayed astronaut communications on the HF amateur radio bands via their ham clubs: JOHNSON SPACE CENTER (Houston) 3850 kHz 7230 21370 14280 28600

- ## GODDARD SPACE FLIGHT CENTER (Green Belt, MD)
- 3860
 - 7185
 - 14295
 - 21390
 - 28650

Astronaut/ham Owen Garriott could be heard working fellow amateurs from the shuttle with his specially-built Motorola handie-talkie on 145.55 MHz over a range of approximately 1000 miles. Backup frequencies of 145.53 and 145.57 MHz were also available.

Tape recorded telephone updates for listeners were available from the American Radio Relay League in Newington, CT (203-666-0688) and SCAN (800-722-6637).

MT readers are urged to retain this list for future space shuttle missions.

WORKSHOP from p. 27

receiver's volume down low; the ringing signal, which is very loud, will alert you. If cordless phones are common in your neighborhood you may hear 2 or 3 different phones ringing simultaneously or even multiple conversations. There seem to be more cordless phone conversations during the evening and weekends.

The ringing signal propagates further than the voice signal and you will not always be able to hear the phone conversation. And remember, just because you hear a ringing signal doesn't mean the cordless phone will be used to answer the call.

DXing these low power radio signals is a lot of fun and during daylight hours when you have a quiet band you will be surprised at the number of ringing signals and phone conversations you can hear.

Free QSL Cards

As a public service, RCA Government Communications Systems (Camden, NJ 08102) provides a limited number of colorful free QSL cards to technically-oriented individuals who request them.

The colorful cards depict a communications theme with a satellite above the earth, dotted lines showing skip propagation through the ionosphere.

Amateur radio operators interested in a communications career are invited to send their resume along to the same address.

Thanks to reader George Primavera for this useful tip.

RUSSIAN RTTY from p. 21

- ARH Arkhangelsk
- BTM Batumi
- IL4 Ilichevsk
- KLD Kaliningrad
- KLP Klaipeda
- NHD Nakhoda
- ODS Odessa
- SWG/SWS Sevastopol
- LNG Leningrad
- MRM Murmansk
- NWR Novorossiisk
- PTR Petropavlovsk
- TLN Tallin
- WLD Vladivostok

A note of caution--you will often see reference to "Radio--Odessa" or "Radio Kaliningrad". This is where the transmission is going to, not coming from. Don't be fooled into logging these as coastal stations which may actually be responding on another frequency.

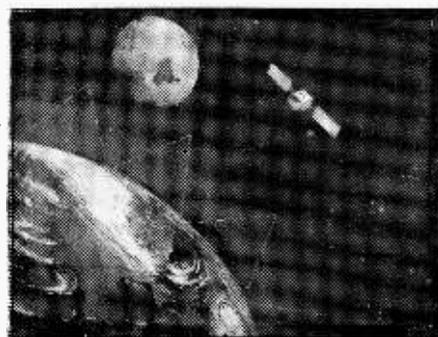
With all this information at your fingertips, you now have quite an insight into the workings of Soviet maritime transmissions. I've sat for many hours in front of my CRT with a Russian friend as he translated the messages. With very few exceptions, most are of a congratulatory nature, that is - "happy birthday, love and kisses on your marriage," etc. You begin to wonder how many birthdays the crew can be celebrating.

There seems to be a disproportionate number of congratulatory messages as compared to the ordinary message or those dealing with the day-to-day workings of the ship. Since all Soviet vessels have a resident KGB or political officer on board, it's my feeling that some of these messages are not what they appear to be. They may contain encrypted messages within the context of the telegram.

Now get out your pencil and pad and a Russian-English dictionary and get set for many hours of interesting DX-ing.

"Obnima'-Celu'" and "Wsego" on DX-ing the Soviets!

(A note of thanks to Fred Osterman, Chris Devendorf and Joerg Klingenfuss for their assistance in preparing this article.)



STOCK EXCHANGE INFORMATION PLEASE

Note: Monitoring Times assumes no responsibility for misrepresented merchandise.

SUBSCRIBER RATES: \$.10 per word, paid in advance. All merchandise must be listening related. Ads for Stock Exchange must be received 30 days prior to publication date.

SELL: The best short wave radio, COLLINS 51J4 allwave receiver, perfect, 3 filters. Tune the world in style. U-ship \$325 cash. Bill (714)525-8875.

Canadian D.O.C. microfilm that identify frequencies and services including Govt. services. Also BEARCAT 200 scanner working base and mobile. For more info send a SASE to Gilles Thobodeau, 3653 Montcalm St., Lac-Megantic, Quebec G6B 2H8 Canada (819)583-1817 after 5 hrs pm.

Listen to Ohio at work--RR's, aero, business, federal government PLUS MORE! Sample newsletter \$1 or SASE for details. All Ohio Scanner Club, 10 Avalon Rd., Mt Vernon, OH 43050.

FOR SALE: KENWOOD R-600 - new. Perfect condition. \$250 firm. Money order. Harold Ort, Jr., Army Public Affairs, 663 5th Ave., New York, NY 10022.

FOR SALE: PANASONIC RF 2800; SONY ICF 2001 with AC adapter and SONY ICF 4800, all in mint condition. Call Paul Friedberg, (304)343-8891/daytime, (304)343-6853/evenings.

NEED all frequencies of the Texas Parks and Wildlife "Gamewardens." Need all the channels they use car to car, car to repeater. The repeater Texas frequency is 159.27. Will exchange other frequencies you may want in Texas. Mike Johnson, PO Box 581, Angleton, TX 77515.

LISTEN TO THE WORLD! REALISTIC DX-300 quartz-synthesized general coverage communications receiver. 10 kHz-30 MHz. Retail \$379.00. Excellent condition. Asking \$175.00 plus COD shipping. David O. Chastain, (501)763-1288.

KNOW FIRST! Radio fanatics, you need THE W5YI REPORT - Twice monthly, award winning Hot insider newsletter. Confidential facts, ideas, insights, nationwide news, technology, predictions... alerts. Quoted coast-to-coast! We print what you don't get elsewhere! \$18.00 annually w/money back guarantee! Free sample for SASE with two stamps. THE W5YI REPORT, Dept. MT, PO Box 10101, Dallas, TX 75207.

SALE: DX-200 Communications receiver with frequency readout. Excellent condition \$200.00. Henry Ponder, Rt.1 Box 394-A, Lawndale, NC 28090. (704) 538-8364. No collect calls.

SPECIAL: ONE ONLY FROM GROVE ENTERPRISES!

HEWLETT-PACKARD dual-trace oscilloscope, good to 50 MHz, with probe and manual. Excellent condition. \$300 includes shipping in U.S.//KODAK microfiche reader, commercial quality. \$125 shipped in U.S. 1-800-438-8155 for charge order. or send check to Grove Enterprises, 140 Dog Branch Rd., Brasstown, NC 28902.

MONITORING TIMES WILL PRINT AT NO CHARGE (AS SPACE PERMITS) ANNOUNCEMENTS AND QUESTIONS OF A NON-COMMERCIAL SERVICE NATURE.

Need correspondent for all parts of province of Quebec. Many freq. to swap. In state of Maine if you receive 167.275, 162.925 I want to hear from you. Gilles Thobodeau, 3653 Montcalm st., Lac-Megantic, Quebec G6B 2H8 Canada (819)583-1817 after 6 hrs PM.

WANTED Manual or information on a HALLICRAFTERS AN/FRR71 Receiver. Gil Barber, PO Box 31654, Aurora, CO 80041, (303)364-2743.

WANTED: Schematic and information for printed circuit scanning board--low-med-hi-UHF Bands. Marked #44845987 also has Hitachi logo and HPCB-E-147 on it.

WANTED: Schematic for Sonar FM 40 Business Radio and info for converting to FM 10 meters. Clyde Lamphear, 3201 W. Calle Fresa, Tucson, AZ 85741.

WANTED: Owners manual and service manual for Standard Communications Corp. C890L 2 ch. VHF-FM 2-way commercial radio. PO Box 1171, St. Catharines, Ontario, CANADA L2R 7A7.

Toronto and area frequencies wanted. Please write to Russ Farrell, 208-358 Queenston St., St. Catharines, Ontario L2P2X4.

INFO WANTED: RESTRICTED SPACE ANTENNAS, particularly loops for 3-30 MHz SWling. Very small space available. Can anyone help with details, sketches as I live in an inner city location with a microscopic back lot. Brian Strong, P.O. Box 798, Wellington, New Zealand.

NEED MANUAL for ESL manufacture USAF R-902 A/L computer-control HF receiver, or contact with familiar avionics tech. Al Smith, c/o Box 280, Wamsutter, WY 82336.

INFO PLEASE: Is "Alden" the only manufacturer of FAX weather map receivers? Other manufacturers who have this type of equipment at a minimal cost and their addresses would be appreciated. Larry A. Smith, 1223 Vinsetta Blvd., Royal Oak, MI 48067.

NEEDED: Information on programming a Bearcat 210XL for out of band frequencies: also any interesting frequencies for shortwave. Please send information to: Kenneth E. MacLeond, PO Box 4125, Westborough, MA 01581.

WANTED: Information on how to disable the clock on a BC-250 without affecting other functions/circuits (assuming it's possible). Contact: B. Basinger, 9182 Cielito, Alta Loma, CA 91701.

INFO PLEASE: "Regency M100" (not E-Model) - can

anyone tell me how to get this scanner to perform in the 66-90 MHz mode (normally 30-60 MHz)? I will gladly refund postage etc., Philip Bridges (G6DLJ), 30 Mopley Close, Langley, Southampton, S04 1YL, ENGLAND.

NORMAN HILL, please send your new address to Rob Harrington, PO Box 3434, Littleton, CO 80161.

ELECTRONIC STUDENT will pay postage on any electronic equipment that is no longer wanted, especially a HP120-HP122 scope or a set of OS8U scopes and a TEK 180 and Heath S7 dual trace switch. I will trade the following for the above: TEK 517, TEK 105. Kevin Neal, Route A - Box 221A, Flippin, AR 72634.

SHUTTLE from p. 10

scenes which were never seen on the Network news included views of the constellation Orion from orbit, sunrise over the South Atlantic, inspection of the tiles underneath the orbiter, views of the crew through the overhead windows, and lightning flashes in the night far below.

With the advent of the new TDRSS 1 satellite, fully 45 minutes of TV per orbit is available. This will be extended to the entire 90 minute orbit as soon as TDRSS 2 becomes operational in the near future.

NASA Select may be found on the new Satcom 1R, transponder #13. Unfortunately, the signal levels fall considerably below those of the other users on the bird. The liftoff signals from Florida tend to be the weakest with Houston's pictures noticeably stronger.

I would appreciate swapping any signal reports, space video and audio tapes (of which I have many). Please contact me at: 25215 La Loma Drive., Los Altos Hills, CA 94022.



COMPUTERS from p. 22

Unlike telephone bulletin boards, which typically draw from a limited pool of local users, most radio mailboxes have a membership covering one or more continents.

A look at a typical mailbox's user log can turn up names from such far-flung places as Great Britain, Australia, Japan, and Antarctica.

On more than one occasion, users from the Soviet Union have been known to drop by and provide information on a technical or personal subject. Home computers, however, tend to be quite rare behind the Iron Curtain.

Accessing a mailbox can be a bit trickier than dialing your favorite bulletin board. Since radio operators are forced to rely upon the whims of nature (static and poor band conditions can often make access impossible), it's not always possible to log onto a system when you want to.

Also, radio mailboxes can often become quite crowded, especially during evenings and on weekends. Just as a bulletin board user often encounters a busy signal during these times, a radio operator might find that someone has beaten him to the system.

Like RTTY, all mailboxes operate in the half-duplex mode. To access a mailbox the user must turn on his transmitter, "open" the mailbox with a short message, and then watch for an acknowledgement.

Once in the system the user merely transmits the appropriate commands to store and read messages, read bulletins, and so on. Using a mailbox requires no additional equipment beyond that required for RTTY.

Next month, we'll look at a revolutionary new mode of computer telecommunication--packet radio.

PLEASE RUSH!

CONTENTS OF TIME VALUE

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