



SPECIAL SPRING ANTENNA SECTION
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MONITORING TIMES

Volume 4-Number 3

BRASSTOWN, NORTH CAROLINA 28902

March, 1985

SHIP TO SHORE TELEX MONITORING

by Michiel Schaay

(Ed. Note: Michiel Schaay is a respected Dutch short-wave enthusiast and author. His publications are available in this country through Universal Shortwave, an MT advertiser. Reviews of his books appear from time to time in our Library Shelf column, and his newest work, "U.S. Military Radio Communications" will be presented within the next two months.)

The Dutch are a seafaring nation with a long maritime tradition. Although a true son of my country, I have never had any difficulty staying away from the water that surrounds this country of dykes. I guess you could say I suffer from hydrophobia (among other things) and that rapidly diminishes any inclination to maritime expeditions.

For some miraculous reason, last year I took an interest in two maritime-related hobbies. Some people collect photographs and detailed information on ships; others tune the maritime radio bands, listening in on ship-shore traffic. I combined the two.

SITOR

Most of my receiving is done in the ARQ- or SITOR-mode of RTTY. Fine decoders such as the popular Info-Tech M-600 make maritime DX'ing a real joy. With two receivers and two decoders, it becomes even more thrilling, since that allows one to watch the coast station and the ship simultaneously.

A state-of-the-art receiver with memory channels should also do the trick, although you may encounter the loss of some characters as a result of the frequency-switch. SITOR communications require two transceiving stations: One end acts as the information-sending station while its counterpart is in the slave position, receiving text and emitting a control signal. After change-over, these duties are reversed.

FREQUENCIES

Where exactly can these maritime communications be heard? The following frequency ranges are assigned to coast and ship stations transmitting in the SITOR-mode (all frequencies in kilohertz).

Coast station	Ship
4350.0 - 4357.0	4170.5 - 4179.5
6494.5 - 6506.0	6256.5 - 6269.5
8705.0 - 8718.5	8297.6 - 8357.5
13071.5 - 13100.5	12491.5 - 12526.5
17197.5 - 17232.5	16660.5 - 16705.5
22561.5 - 22595.5	22192.5 - 22227.5

More detailed listings can be found in the GUIDE TO UTILITY STATIONS by West Germany's Joerg Klingenfuss (source listed later).

Interesting and very active stations from both sides of the Atlantic are Chatham Radio of Massachusetts with call-sign WCC and Scheveningen Radio, the Netherlands, with call-sign PCH. They operate the following frequency pairs:

WCC	Ship
6504.5	6266.5
8712.5	8351.5
8715.0	8354.0
13081.5	12501.5
13090.0	12510.0
17207.5	16670.5
17216.0	16679.0
22571.5	22202.5

PCH	Ship
1919.5	1972.5
4351.5	4172.0
4355.0	4175.5
6496.5	6258.5
6504.0	6266.0
8713.0	8352.0
8717.0	8356.0
13077.0	12497.0
13088.5	12508.5
17217.5	16680.5
17230.0	16693.0
22565.0	22196.0

The transmitter for the 1919.5 frequency is actually located on the small sandy island of Ameland in the Waddenzee, north of the Netherlands. With a power of only 400 watts, this would be a great catch for North American SWL's.

Just recently, the Scheveningen Radio AUTOTELEX

was inaugurated.

Via many of Scheveningen's channels, ships can now directly dial the landline telex number they wish to connect to without having to consult an operator first.

Next year Scheveningen will be completely automated so that landline telex subscribers can automatically call the ship they wish to communicate with. Of course, there will always be a living operator available on request. Ship radio officers only have to transmit OPR+ in order to switch from the bits and bytes of the computer to a real human being.

Once you regularly tune in to ship-shore telex communications, you soon get acquainted with the standard procedures. After contact has been successfully established, the coast station transmits the sign "GA+?"

which means that the ship can go ahead. The ship's radio officer can then choose to transmit either "DIRTLX12345+?" or "TLX-12345+?."

If he picks the second option, the coast station will accept the telex message, store it and relay it to the landline telex subscriber at a later time. If, on the other hand, he transmits "DIRTLX12345+?" the coast station will reply with "MOM+?" and dial the required landline telex number.

After a while, the ship will be able to communicate directly with the landline telex subscriber. The connection is cleared if the ship transmits KKKK.

For traffic to the coast station there are special commands. For

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**SEE PAGE 36
FOR THIS MONTH'S
"VIEWPOINT"**

A CALL FOR AUTHORS

Each time MT expands its page count we are pleased to consider more manuscripts from our talented readers for publication within its pages.

Typical word count should be 1000-2000 and reproducible art (black and white photos, line drawings, tables, charts, etc.) is encouraged.

Beginning with the next issue, payment is \$35 plus a free subscription for each article accepted for publication. Regular columnists will receive \$50 per installment.

Subjects may include any aspect of listening, from the lowest frequencies through microwave and satellites. Topics may be technical, tutorial, descriptive, humorous, historical -- you are the best judge of that.

Send an outline of your proposed article to Bob Grove, Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902. Be sure to enclose an SASE (self-addressed stamped envelope) for an immediate reply.

"WHERE'S THAT ICOM INTERFACE?"

With ICOM's popular R-71A now in worldwide use for well over a year, many of us are wondering whatever happened to the computer interface listed as an option on the manufacturer's literature. A call to ICOM brought a tentative answer.

Apparently the Japanese manufacturer is nowhere near producing the hardware; an English language 200-page documentation of the circuit requirements is now being evaluated in an effort to determine whether hardware will ever be available for the receiver, or if the manufacturer will simply publish the pinout details so that the user can interface his own computer.

It would appear at this writing that the definitive answer is still considerably distant.

ARRL Still Having Problems

The American Radio Relay League of Newington, Connecticut, headquarters for over 400,000 American amateur radio operators, has been besieged by poor management relations over the past several years. Disgruntled ARRL members and employees alike have charged everything from incompetence and mismanagement to self-serving dishonesty.

At this writing the release of the results of a poll taken of employee grievances is still awaited, but it is expected that the usual concerns will be aired: incompetent management, obscure promotional practices, and the recent change from a four- to a five-day work week.

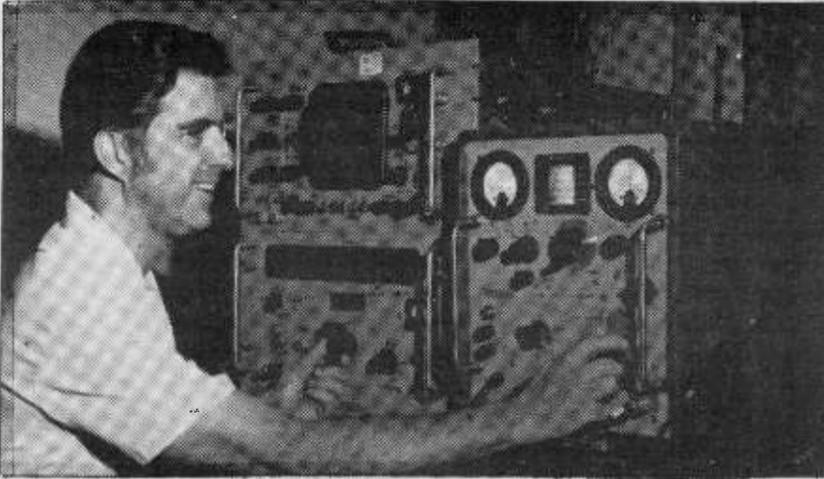
Dave Summer, former general manager of the League, has had his title changed to executive vice president, now serving under president Larry Price, former area four section manager.

A coalition government of five departments with input from five parallel committees now provides for greater employee input as well as more direct accountability from the management.

The new departments were created by consolidating a number of previously autonomous offices; for example, Production, Circulation, Advertising, and Technical Services are now chaired by one department head, veteran ARRL staffer Paul Renaldo.

At this point it is impossible to say whether the new plan will bring relief to the strained organization; the next few months will be crucial.

FROM THE EDITOR



DISCOVERY MISSION 51C--Why the Mystery?

The January 24 launch of the Space Shuttle Discovery heralded a new era for the U.S. space program: military intelligence. For months, the Department of Defense refused to supply the press any details on the launch, even restricting the exact time of launch to the last few minutes.

Just what was on board? And why the secrecy? The press, with its limited pool of information, speculated. Apparently on board was a SIGINT (Signals Intelligence) satellite, capable of monitoring virtually the entire communications spectrum from an unlimited vantage point over the equator above the Russian continent from some 23,000 miles in altitude.

But that wasn't all. There is considerable evidence to show that the Space Shuttle Discovery itself is to become a spy plane, directed to various vantage points to monitor and measure the offense and defense capabilities of unfriendly (and friendly?) nations.

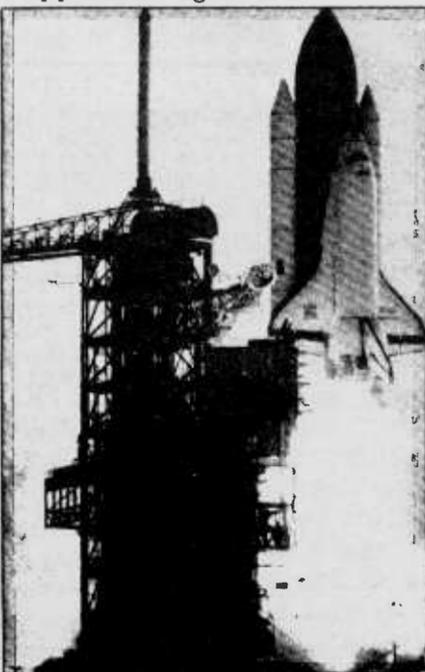
To support this theory is the fact that Vandenberg Air Force Base is now completing "Slick Six," the Space Launch Complex -- SLC6-- north of Los Angeles. This huge city on a military base, complete with towering buildings, is the future home of Discovery--and of all shuttle military missions in general.

And what about monitoring communications on the shuttle? This is also open to speculation. A few MT

readers and listeners reported minor voice communications between Discovery and Houston in the 225-400 MHz military aircraft band in clear speech AM. An even smaller amount of activity was reported on the standard HF NASA channels as part of the routine prelaunch support and solid rocket booster recovery activities.

The NASA Tracking and Data Relay Satellite will unquestionably be called into greater use as will other forms of microwave satellite communications capable of restricted interception and encrypted speech.

Only future monitoring will confirm the destiny of listening in on the new space program. We will be grateful for any information sent in by our readers concerning changes and new frequencies used by NASA and supportive agencies.



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

SHIP TO SHORE TELEX cont'd

example, "AMV+?" means that the ship wishes to send an AMVER message (to the international Automated Mutual Assistance Vessel Rescue system); these reports will, among others, contain the position, speed and next port of call of the ship.

Detailed information may be obtained by request from the Commander, Atlantic Area, U.S. Coast Guard, Governors Island, New York, NY 10004.

Other special commends include "OBS+?" for ships' weather reports. These are explained in the publication, "Worldwide Weather Broadcasts" by Bert Huneault, available from Grove Enterprises.

The ship's position, which is an important detail to the DX'er, is also transmitted in the report following the "TR+?" command. If neither of these position reports is transmitted, this information can sometimes be deducted from the telex messages the ship sends to the ship-owner.

If you have absolutely no clue at all, you might consult the ships' travel reports frequently published in the coastal areas' newspapers. There are a few very expensive Lloyd's publications that can provide this information as well. We'll talk about them later.

MORE SIGNS

First a round-up of the other special commands in SITOR ship-shore traffic: "MED+?" means the ship requires medical advice; "TGM+?" means that the radio officer wishes to send a telegram. These usually contain birthday congratulations to relatives ashore. "RTL+?" stands for radio telex letter, while "SVC+?" indicates a service message. Finally we have the "HELP+?" command which, just like many of the modern home computers, will provide the ship with a list of available options.

INTRIGUE

Many different types of ships will be heard while sifting the appropriate channels. Tankers from oil companies such as Shell, Conoco, Exxon and Osco are among the more common catches. These frequently sail to the Caribbean area, South America, and the Persian Gulf. You won't be hearing oil tankers underway to South Africa unless they are sending fraudulent position reports because oil deliveries to the Apartheid regime are usually undercover operations.

The Iranian-Iraqi war often extends to the Persian Gulf where foreign tankers are attacked by military aircraft. On Christmas day of last year, I succeeded in receiving a Dutch tug near an Indian tanker which had come under attack. The master of the 51-meter-long AMSTERDAM (registered in Panama and assigned the call-sign 3ES12) was in contact with the Wijsmuller company in Ijmuiden, one of Holland's illustrious salvors. They were apparently quite eager to get a mandate for this towing job!

Being aware of the possibility that competitors might eavesdrop on their communications, part of the traffic was coded into 5-letter groups of the type so often encountered in embassy radio communications. It was the first time I noticed this on the maritime bands, but salvage companies obviously need it since they are dependent on their privacy.

At another time I received the tug RODE ZEE (PHCQ) from the famous Smit Internationale in Rotterdam, Holland. It had just extinguished a fire on the CONSTANTIA, a cargo ship from Cyprus. At the time of reception, the RODE ZEE was in the Gulf of Aden, towing the CONSTANTIA to Jibuti.

When I received the trench vessel EXPLORER 2 (3FVK2) it was laying 10 inch gaslines 5 hours off the coast of Den Helder. The daily progress report sure was detailed!

But, of course, the bulk of intercepts are common cargo ships. When I received the Philippine-registered MALAYAN VICTORY (DZHL) with a telex to Manila, it was underway to Galveston. The West German vessel MAGDALENA WSCH (DNMG) was sailing New Zealand heading for Sydney and Port Moresby.

A Dutch ship was reporting a rare accident at New Mangalore, India. While loading granite, the Indian crane driver made a misjudgement and a granite block broke a big hole in an oil tank.

One special type of cargo ship can carry frozen food; some of these refrigerated cargo ships transmit lists of hold temperatures and humidity values.

The Dutch LANAI (PFMV) was heard while sailing from Longbeach to Ecuador. From my location in the center of the Netherlands, that's a true DX catch.

A summary of other ship types heard in the last couple of months would include large passenger ships,

a livestock ship, and a luxurious sailing yacht in the Mediterranean. Several research ships came booming in with good signals.

The new West German survey ship POLARSTERN (DBLK) was heard at a position approximately 250 miles northeast of Jan Mayen Island while making a test cruise to the Northpole region. It was commissioned to make trips to the Antarctic afterwards.

The crew of the French Oceanographic ship CAPRI-CORNE (FNBG) was performing a job in the West African Gulf of Guinea when I received an OBS weather report to Meteo Paris via Saint-Lys coast radio.



What makes this hobby of receiving ships' communications even more realistic is to collect ships' photographs as well; this way, you can actually see the vessel or tanker that was received. My logbook, in which each received ship is assigned its own A4-size page, is brightened up by a large number of pictures and drawings.

Several magazines for ship lovers, as well as professional magazines, are devoted to publishing photographs and feature articles. Examples of such magazines are: De Blauwe Wimpel (Netherlands), Cargo World (West Germany), MacGregor Magazine and Fairplay International.

You may even write to shipowners to ask for a folder or photograph of their ship. The U.S.-Norwegian Viking Line sent me a very attractive color photograph of the Royal Viking Sea, which I received while it was on a cruise from San Francisco to Van-

couver. However, you'd better not tell the company that you are eavesdropping on their communications; they might not particularly like that.

In general, it is best not to send reception reports and ask for QSL-cards. If you want proof of your reception, buy yourself a printer to match the SITOR decoder or simply save the intercept on a cassette or tape recording.

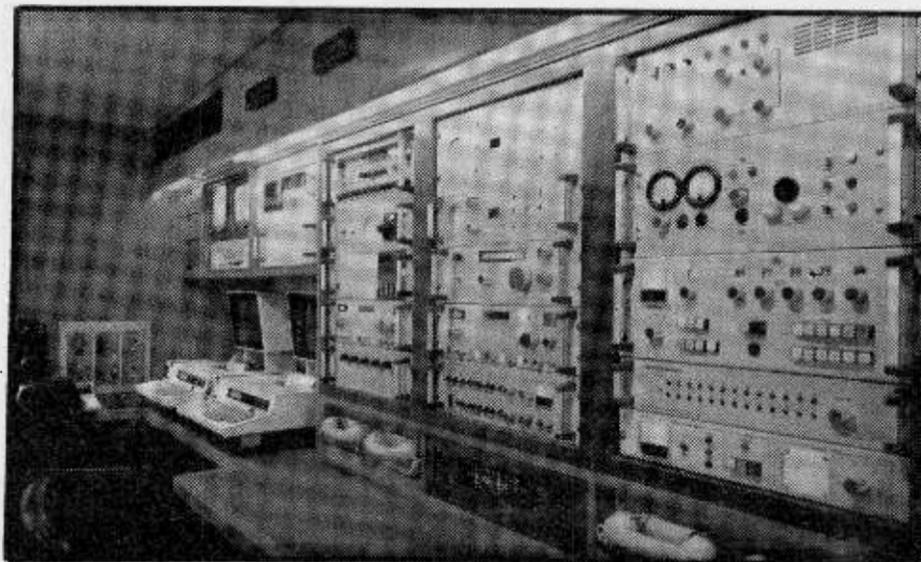


When you really wish to get involved in ship DX'ing, you'll need some professional and amateur publications to facilitate the identification of your intercepts. As a valuable source for frequencies, I've already mentioned the Klingenfuss' GUIDE TO UTILITY STATIONS, which is available in the U.S. through Universal Electronics, Inc., 4555 Groves Road, Suite 3, Columbus, Ohio 43232.

The International Telecommunications Organization, a part of the United Nations, offers two interesting publications. The LIST OF CALL-SIGNS IN THE MARITIME MOBILE SERVICE (list VIIa) carries over 300 pages crowded with typeset listings and is indispensable. Edition 1983 costs 35 Swiss francs.

Also published by the ITU is the LIST OF SHIP STATIONS, an excellent buy at 53 Swiss francs, providing well over 1300 pages of shipping information listed alphabetically by ship's name. It is a good and cheap alternative to the LLOYD'S MARITIME DIRECTORY (see below) but in a face-to-face comparison, the latter provides far more information.

Prices of both ITU books include postage costs



A ship radio communications console.

inside Europe; airmail charges to the U.S.A. are likely to sharply increase the costs. You can write to the International Telecommunications Union, General Secretariat, Sales Service, Place des Nations, CH-1211 Geneva 20, Switzerland, for their free list of publications and address of a possible U.S. retailer.

If you would like to have more detailed information on holiday cruise ships, you may consider FIELDING'S WORLDWIDE GUIDE TO CRUISES by Antoinette DeLand, available from Fielding Publications, 105 Madison Avenue, New York. There are truckloads of other ship-related books around if you take the trouble to shop around a little.

The most valuable source on ships, however, is the LLOYD'S REGISTER OF SHIPPING. Within reason, this is out of reach for the average DX'er. If you are lucky, you might be able to lay your hands on an obsolete supplement of two years ago (or even a complete old volume) if you have contacts as a shipping or insurance company.

The second best source is the LLOYD'S MARITIME DIRECTORY; the 1984 copy offered nearly 950 full-size pages with very relevant data for each ship (owner and address, ship's name, type, age, speed, flag, call-sign and measures). The book costs UK £ 48 and I can assure you that I certainly wouldn't be without my copy.

You can ask for more information or place your order direct via The Promotion Manager, Lloyd's of London Press, Ltd., Sheepen Place, Colchester, Essex CO3 3LP, Great Britain; or from its North American representative LLP Maritime & Business Publishing Inc., 87 Terminal Drive, Plainview, New York 11803.

Lloyd's furthermore offers two very comprehensive weekly publications. A weekly copy of Lloyd's Shipping Index, each day containing particulars of approximately 25,000 ships including the latest reported movement for each vessel, costs approximately £ 530 per year including airmail to North America.

Its sister publication, the Lloyd's Voyage Record, concentrates on reporting ships' next ports of call and estimated times of arrival (ETA's). A weekly copy of that publication will cost you approximately UK £ 686.

Obviously, only the very wealthy (or very dedicated) will treat themselves to a subscription! Perhaps a group of interested DX'ers could collectively subscribe and distribute the contents by means of photocopies, although this would probably result in a copyright violation.

● What will the future bring us in the world of maritime radio communications? The number of ships equipped with SITOR is still relatively low, but steadily increasing. More and more ship-owners will see the advantages of autotelex facilities as compared to the more traditional radio-telephone and CW procedures and the usual long waiting times.

On the other hand, a number of larger companies have already made the step to the satellite age. Through one of the geostationary Inmarsat satellites, ships can receive and send telex messages. A very few refrigerated cargo ships even have their automated control equipment coupled to the Satcom system; this way, the ship-owner automatically receives the ship's position, fuel data, motor details such as the number of revolutions per second, loading hold temperatures, and much more.

These kinds of systems require extremely high investments, and ship masters are not very keen to have them installed on their ships since such systems retransfer much of the decision making to the shipping office ashore. Also, the dish-elevation systems in use to maintain a steady angle with the earth surface are far from perfect. I already heard a ship using short-wave SITOR because the swell was too high for successful satellite communications.

Compared to the total output of ship-to-shore communications, the Satcom system is insignificant. For the remainder of this decade, the increasing number of new SITOR users can be expected to exceed the number of ships switching exclusively to Satcom.

If you start today, you'll have years of exciting ship reception ahead of you. But never tell a seaman that you like ship DX; as it happens, in his jargon the expression "DX" stands for "I AM SINKING..!"



PRESIDENTIAL INAUGURATION COMMUNICATIONS

by Lark Spur

January 21, 1985, was a busy day in the nation's capitol as the President of the United States was to take the ceremonial oath of office and attend numerous festivities that were being held in his honor.

Below zero temperatures forced cancellation of the outdoor ceremonies and parades, but this did not dampen this monitoring enthusiast's efforts to tune in on the activities of those dedicated individuals who were assigned to protect the President, his family, and distinguished guests.

Beginning on Friday, January 18, activity on various frequencies began to pick up as dignitaries began arriving in Washington for the long weekend of festivities. During that evening, a repeater on 164.725 MHz was heard -- a sort of V.I.P. limousine service. The drivers of these vehicles were being heard clearly, though it sounded like they were responding to D.V.P. commands.

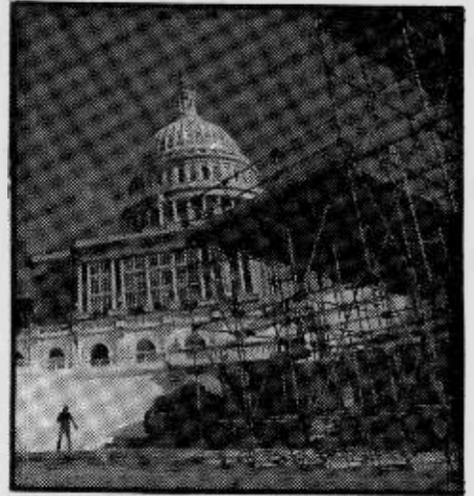
Many drivers apparently were new to the Washington area, as they reported themselves lost or unable to interpret traffic signs. National Airport was reported several times to be at a standstill. POLICE CALL lists 164.725 as being assigned to the Bureau of Land Management, National Park Service, Department of Transportation, or the Tennessee Valley Authority.

On Saturday, Sunday, and Monday, many Secret Service communications channels were very busy, as well as U.S. Capitol Police, U.S. Park Police, and Washington Metropolitan Police channels. The Secret Service Washington Field Office repeater on 165.6875 was very busy, but mostly non-inaugural communications between special agents.

Most activity consisted of tactical communications between agents fanned out on the streets and fixed stations. Fixed station "Horsepower" kept in constant touch with agents who were assigned to monitor demonstrations in the vicinity of the inaugural activities.

Agents reported on the size and organizing group's name to "Horsepower" in the simplex mode on 165.375. A helicopter, "Hercules," also operated on this frequency for a short time on Monday, but it had to land because of the extreme cold.

Another fixed station,



"Command Post," operated in the simplex mode on 165.7875. This station communicated with the special agents assigned to the various events being held at the Capitol Center in Maryland, the District of Columbia Armory, and the posh hotels in downtown Washington.

Bob McGovern's article, "Tune in on the Secret Service" (May 1984 MT), is an excellent report on the communications operations of the U.S. Secret Service. However, the special agents and uniformed officers of the service are not very talkative on the radio. When one agent would report that "We have a departure," it could be any member of the President's or Vice President's family, or even someone else, especially when the code names that McGovern mentioned are not being used.

This monitoring enthusiast tuned elsewhere in the spectrum when the evening inaugural parties began, to see if it could be determined what portion of the many parties the President and his entourage were going to visit.

The Washington Metropolitan Police Department (MPD) operates many UHF repeaters in the 460 MHz band for district dispatching and car to car tactical communications. Since MPD was responsible for clearing and securing many of the routes that the President would take to the various parties during the evening, I decided to tune in on the tactical channels assigned to downtown Washington.

Many of the parties were located in the first police district, and MPD officers were assigned to the streets around each function. Repeaters on 460.400 and 460.450 were very active with field reports from officers who gave the location of whom he





by Michael Precker

Reprinted with permission of The Dallas Morning News

From his cluttered study on a quiet street in Tel Aviv, Michael Gurdus has the biggest ears in the Middle East.

They eavesdrop on radio stations, airplanes and military maneuvers just about everywhere. They uncover secrets, break through news blackouts and

INAUGURATION cont'd

or she perceived as "THE MAN," as lines of limousines sped through the frosty streets.

Many officers and supervisors got "limo'd out" by all the V.I.P.'s and frequently erred in their reporting of who actually was arriving at a particular location. "Is that THE MAN?" an officer would ask. "No, that's his daughter," etc. would sometimes be the reply.

Some MPD supervisors outside various functions would switch to UHF simplex channels for tactical communications, thus putting an end to such citywide "broadcasting," but enough information about the various motorcades was transmitted over the MPD tactical repeaters to provide exciting listening.

Most MPD officers were equipped with Motorola "converta-com" type hand-holds with many different channel combinations possible. Channels were referred to as "A-11" or "D-1" instead of "tac 1" or "city-wide" making identifying specific frequencies more difficult if one is using a frequency directory; MPD has many potential channel combinations with its hand-holds.

Even though I used only a Bearcat 210XL with its own telescoping antenna for listening (and I was some distance from all the pomp and circumstance) many exciting communications were monitored during this special period. Many more sophisticated monitoring stations in the area probably tuned in to the interior of the presidential limousine or MARINE ONE, but even my simple station was very satisfactory.

embarrass governments. And they make Gurdus one of the world's best armchair scoopers, a reporter who consistently breaks big stories without leaving his apartment.

"I just wanted to combine my love for radio with my love for journalism," he said. "In this part of the world radio broadcasts have great significance. You can learn a lot, not only what's happening but what to expect."

Gurdus hit the headlines again earlier this month when Arab hijackers held a Kuwaiti airliner for six days in Tehran and killed two American passengers. Two other American passengers were beaten. At one point, the hijackers tried to force the Kuwait government to submit to their demands by beating and torturing a Kuwaiti hostage.

Reporters at Mahrabad Airport in Tehran knew what was going on. But only Gurdus, 600 miles away, produced a tape of the brutal scene after tuning in radio transmissions from the plane's cockpit. The bone-chilling screams were broadcast first on Radio Israel and made the evening newscasts on U.S. television.

"It was the most terrifying thing I ever heard," he said. "They just left an open microphone and let him (the hostage) shout. I was really shivering, waiting to hear the gunshots any second."

But it was just another day's work for Gurdus, a genial 40-year-old reporter for the state radio and television who says he's never had the urge to chase police cars or stalk the corridors of Parliament for a story.

He learned his trade from his father, who, living in Warsaw in the 1930s, covered Eastern Europe and the Soviet Union for the London Daily Express by monitoring broadcasts. In high school Gurdus got his first radio, a World War II-vintage Hammarlund, began tipping off Radio Israel about military coups around the region and was hired full time in 1970. He doesn't go on the air; his tapes and analyses are forwarded to the network.

"In the Middle East most of the stations are

official, so a comment on the radio is usually the official position of the regime," he said. "If you monitor that and learn to analyze it, many times you can forecast crises just by listening in."

With Lebanon, where there is a crisis nearly every day, the job is different. "Every faction has its own station, so when the fighting is going on you get versions from all sides. Sometimes you can even hear the shelling."

"Hear that?" he said, fiddling with dials as a faint voice broke through the static. "That's a Saudi plane calling Bombay airport."

Amid the daily routine, there has been a remarkable string of scoops. In 1974, when Archbishop Makarios of Cyprus was overthrown in a coup and reported dead, Gurdus picked up faint signals of the Cypriot leader appealing for help. The British rescued him, Makarios returned to power, and he called in the Israeli envoy to express his thanks.

The same year, Gurdus tuned in to Air Force One during President Richard Nixon's final Middle East trip and taped a frantic call from Washington. It was a presidential aide reporting that the Watergate special prosecutor wanted to remove some of Nixon's tapes

from the White House safe.

"Don't even let them see the tapes," replied Air Force One. Years later Gurdus gave the tape to an American television network, which identified the voice as that of Alexander Haig, Nixon's chief of staff, who then was facing Senate confirmation hearings as secretary of state. Haig had some explaining to do.

Picking up military transmissions with techniques he won't divulge, Gurdus was the first to report Libya's invasion of Chad. He tracks virtually every airplane hijacking in the region, often breaking news before the government-controlled media in the countries where the action occurs.

In the initial stages of Israel's 1982 invasion of Lebanon, when the military released few details, Gurdus became the Israelis' main source of war news by relaying Lebanese radio accounts of the battles.

Four years ago Gurdus picked up conversations between pilots of the U.S. transport planes and helicopters on their way to rescue American hostages in Iran. After the mission failed, he reported that the aircraft had taken off from Egypt, refueled in Oman and used Bahrain as a communication center.

MONITOR



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ISRAELI REPORTER cont'd

All three countries, sensitive about offending Iran and their own Islamic populations, were deeply embarrassed. Gurdus also disclosed that four of the American craft had lost contact with the others, embarrassing the Pentagon.

The U.S. State Department formally complained to Israel. "I didn't expect it," Gurdus said. "On the one hand they were so frustrated they had to blame somebody, but on the other hand I always believed the U.S. was supposed to have a free press. Anyhow, my boss totally rejected it."

Gurdus had held the story until the mission was over, having learned his lesson several years earlier when West German troops stormed a hijacked plane in Somalia.

The monitor heard about the plan as the rescuers flew toward Africa, and he told his editor. Israel Television reported it five hours before the attack was scheduled, and the Bonn government pleaded frantically with foreign news organizations not to carry the story.

"Fortunately it ended OK," Gurdus said. "But since then I don't trust anybody

until it's safe to release the story."

With such a track record, Gurdus' visitors expect to find him at the controls of something resembling Mission Control in Houston. "I guess they're surprised," said Gurdus, who tends to wear house slippers on the job.

About a dozen radio receivers are stacked on a desk, along with a remote-control device for the 62-foot antenna on the apartment building roof. The walls are layered with posters, magazine cutouts and radio station decals, while toys belonging to Gurdus' 18-month-old daughter cover the floor.

But Gurdus, who speaks seven languages, is about to go big time. In January he and Israeli Middle East expert Ehud Ya'ari plan to inaugurate a 24-hour monitoring service providing comprehensive reports and analyses to news agencies, embassies, think tanks and anyone else who wants to sign up.

With the extra help, Gurdus should have more time to relax and listen to the radio for pleasure instead of work. His favorite station after a hard day roaming the airwaves?

"Actually, I prefer television," he said.

AVIATION RADIO IN LABRADOR

- CIRCA 1947

PART I

by Bert Huneault

From time to time, MONITORING TIMES digs up the past and looks through the rear-view mirror at events that occurred decades ago, including fascinating stories about the golden days of radio broadcasting in the 1920s and 30s, World War II communications, etc. It is in the same nostalgic spirit that I would like to share with MT readers recollections of those bygone days when I was first introduced to wireless communications. The anecdotes which follow remain very vivid in my memory, even though they go back some 35 years.

As an 18-year-old whipper-snapper fresh out of Marine Radio School in Montreal, I was hired by Canadian Pacific Airlines in the summer of 1947 and assigned to a radio/weather station up in the Labrador bush country for my very first job. Little did I know that I was destined to spend the next two and a half years in isolation in that sub-arctic region of eastern Canada. As a matter of fact, Labrador wasn't even part of Canada back then -- Newfoundland and Labrador did not join the Canadian Confederation until 1949.

That first posting was in a log cabin on the shore of Ashuanipi Lake in western Labrador, over 150 miles north of civilization. There I was to fulfill the duties of radio operator and weather observer; our call letters were VOXL. C.P. Airlines had a contract to fly supplies to the remote iron ore mining development at Knob Lake, 150 miles further north; Knob Lake is now the community of Schefferville, on the Quebec-Labrador border.

At first, the only company I had up there was a "bushman" and a dog. I was to look after technical things such as observing and reporting the weather, relaying c.w. traffic and talking to pilots over air/ground radio, while the bushman took care of the chores, such as finding and fetching firewood and cooking meals.

OUR FIRST EMERGENCY

Once winter set in, we were really isolated for a while. Skis replaced pontoons on bush planes but for the first month of winter the ice was not thick enough

to safely support the weight of an aircraft -- and no helicopters were available then. Mail was air-dropped to us during that time and it was during that awkward period that we had our first emergency.

One day the gasoline engine which drove our electrical generator quit -- What a bind! Not only did we lose electrical power for lights but we couldn't operate the radio transmitter and couldn't call for help! The bushman and I looked at the engine but couldn't figure out what was wrong with it.

Because the mercury often dipped to 40 below outside, we removed the engine from its foundations, put it on a sled and, with our dog's help, pulled it over to the radio shack where we could work on it in relative comfort. I spent the next couple of days studying the service manual from cover to cover, examining the engine, and trying to figure out why it did not tick!

I finally reached the conclusion (educated guess) that the fuel pump was defective; unfortunately, we had no spare pump. So we just sat there, thinking that someone would eventually come to our rescue. With the absence of weather reports from Ashuanipi the company was bound to start worrying about us sooner or later!

Our HF radio gear included an emergency battery-operated receiver which was fix-tuned to our company frequency, 5705 kHz. For three days we kept listening from time to time, to see if radio operators at our other company bases were talking about us. They weren't!

Finally, on the fourth day, we heard the pilot of a DC-3 calling us blind, saying: "I hope you can hear this... we assume you're having some sort of difficulty, as we haven't heard you for several days...if you need anything, please write it down on the lake; we'll be over your station in a few minutes."

I quickly put on snowshoes and rushed onto the snow covered lake; there I walked around, tracing 20-foot long letters in the snow, spelling the message "FUEL PUMP NEEDED." The DC-3 was soon overhead; it circled once or twice while I finished writing the message. As I walked towards

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AVIATION RADIO cont'd

the shore I waved my arms to the pilot; he rocked his wings and headed south back to civilization.

The next day the DC-3 was back, flying low over the lake where he dropped the anxiously awaited parcel: a fuel pump, well packed in a mail bag. I retrieved the "present from heaven" and proceeded to install the new fuel pump. We took the engine outside and tried to start it...to my utter amazement, it worked! Necessity is truly the mother of invention.

THE VOICE OF AN ANGEL

After several months in the bush with no women in sight, a young fellow can readily fantasize upon hearing the sweet sound of a female voice, even if it is only over the air! American Airlines had female radio operators and used a frequency of 5707 kHz -- well within the passband of our receivers tuned to 5705 kHz. In the evening the "skip" allowed us to hear several American Airlines stations located in southern USA.

One woman operator in particular, in Shreveport, Louisiana, had an absolutely angelic voice... the kind that made a young man dream! I used to listen to her night after night and think of how great it would be to talk to her. Even though she was almost 2,000 miles away, her voice came in loud and clear; I wondered if she could hear me just as well.

If only I could gather up enough nerve to call her! But would she answer?... I didn't know. One evening I decided that I just had to do it! I mustered all the courage I could, nervously picked up the mike, and called: "Shreveport from Ashuanipi, over"... Silence. I couldn't stop now, "Hello Shreveport, Shreveport, this is Ashuanipi, over"... Again, dreaded silence!

Perhaps she wasn't hearing me, or maybe she couldn't pronounce the name ASHUANIPI, let alone know where the call was coming from... But I persisted. After three or four calls, a male operator came on the air: "Shreveport, this is Jacksonville; Ashuanipi is calling you." Ah ha!...my signal was getting out after all, all the way down to the Gulf States... So, she couldn't ignore me any longer!

Sure enough, a moment later, that sweet voice was on the air: "Ashuanipi, this is Shreveport, go ahead." My heart skipped a beat at I grabbed the mike and ner-

vously said, "Shreveport from Ashuanipi, we're receiving you five by five up here; how are you receiving our signals? Over." She replied: "You're also coming in loud and clear; over." I simply answered: "Roger; thank you."

Wow! I had done it.. I had spoken with that angel! If my memory serves me right, I think I remained excited about that QSO for at least two weeks afterwards! To this day I wonder if that young lady ever found out where Ashuanipi is located!

FOUR O'CLOCK INTRIGUE

In 1948 the mining company started its own airline known as Hollinger Ungava Transport. C.P. Airlines lost its Labrador contract and I transferred over to H.U.T. This new company expanded operations, hired more radio operator/weather observers, and agreed to supply the Canadian Meteorological Service with around-the-clock hourly weather observations from Ashuanipi and Knob Lake.

After a brief weather course in Montreal I was posted to Knob Lake Airport. Over the next two years I alternated between Knob Lake and Ashuanipi, six months per posting.

At Knob Lake, our call letters were VB6T and our new company frequencies were 5715 kHz for air/ground voice communications (AM modulation; we didn't have single sideband back in those days) and 5742.5 kHz for point-to-point c.w. traffic (weather reports, company messages, etc.)

One day, as I was preparing to transmit my 4:00 p.m. weather report to our control station at Seven Islands (Sept Iles, Quebec, on the north shore of the St. Lawrence River), I was surprised to hear a whole network of c.w. stations parked right on our frequency and exchanging ciphered information.

Who were they?... What were they doing?... Where were they located?... I tried contacting them with QRZ DE VB6T QRA?... but to no avail. Their signals were so strong that I had to delay the transmission of the weather report due to the QRM. After a few minutes, they stopped transmitting and our channel was clear once again.

I didn't hear them again until 4:00 p.m. the next day when, once again, several stations obviously reporting to a net control station took turns transmitting cipher groups that made no sense to us. As I recall

they didn't even use call letters! Were they military?... The intrigue continued as they adhered to that 4:00 reporting schedule daily for ten days or more.

A noticeable chirp on their c.w. tones was a tell-tale clue that they were probably using portable equipment with poorly regulated power supplies; hence our conclusion that they were probably Canadian or American troops on field maneuvers.

The only part of their encrypted transmissions that made any sense to us was that as each station in the net completed its report, the operator would transmit in familiar "Shave-and-a-haircut" rhythm: "dit di-dit dit," to which the control operator would reply: "dit-dit."

One day I got a break -- it was my big chance to break into the net, so I moved fast! One operator had just transmitted his "dit di-dit dit" and as soon as I noticed a delay in the reply, I quickly tapped "dit-dit" on my own Morse key, just to see what would happen.

The operator must have been alert enough to notice the lack of a chirp on my c.w.tone because, after a week of trying, I finally succeeded in extracting a

response from one of the stations; he simply keyed a cautious "WHO?" in plain English! I replied "VB6T." He came back: "WHERE?", to which I replied, "BUSH, QUEBEC-LABRADOR BORDER." That so-and-so then transmitted: "GOOD PLACE FOR YOU, OM."

Well, that did it! I sent, "YOU ARE INTERFERING WITH US," to which he answered: "YOU, REPEAT YOU ARE INTERFERING WITH US!" I then tapped: "WHO GOT THIS FREQUENCY IN THE FIRST PLACE?". His last transmission was: "WHO DO YOU THINK HAS MORE WEIGHT WITH THE GOVT?". After that, he simply ignored me!

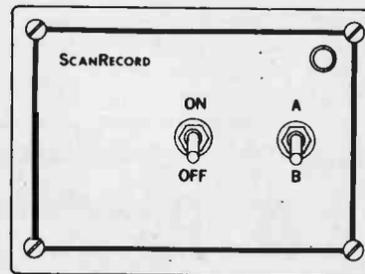
The daily 4:00 p.m. interference continued for a few more days and then stopped, never to be heard again. The intrigue was never solved; to this day, I do not know for sure who they were or what they were doing, but for a week or two they added a little spice to our existence! Does this caper bring back memories to any MT reader who might have been involved? if so, please drop me a line, c/o MONITORING TIMES. I'd love hearing from you!

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The Bootleggers Are At It Again

From time to time groups of individuals will form their own unlicensed (and unlawful) networks, snatching a frequency out of a hat on which to perch.

Most recently the bootleggers (they even identify with "BL" numbers!) have been reported on 3466 kHz, operating from states throughout the country.

Activity usually picks up around 0030 UTC, peaking on the weekends. Typical chit-chat is reminiscent of CB and quite possibly the group is nothing more than displaced 11 meter outbanders.



THE RADIO SPECTRUM AT A GLANCE

by Bob Grove

(Updated reprint of an article published by 73 Magazine, November 1980.)

Spies, smugglers, military missions, rescue operations, foreign broadcasts, undercover surveillances, medical relief messages, and

space and satellite communications are but a tiny fraction of the communications networks humming throughout the most concentrated portion of the radio spectrum: 2-512 MHz.

To keep these millions of radio operations worldwide from landing on top of each other, nations of the Earth, developed and developing, have established departments to regulate the users of the radio spectrum.

On an international level, the United Nations provides a cooperative effort known as the International Telecommunications Union. Entirely voluntary, it was the ITU which conducted the East World Radio Administrative Radio Conference at its Geneva, Switzerland, headquarters.

The ramifications of agreements made at WARC '79 will not be fully appreciated until further meetings are held for ratification. But there will be some changes in the next few years.

In the United States, two government agencies provide for regulation of the users of the radio spectrum. We are familiar with the agency closest to amateur radio, the Federal Communications Commission. It is the primary purpose of the FCC to draft rules and regulations pertaining to the non-federal government users of the spectrum. Police and fire, trucking, business and industry, amateur and CB, common carrier services, ship to shore, and many other conventional services are regulated by rules proposed and maintained by the FCC.

At the federal level, it is the Interdepartment Radio Advisory Committee, now a function of the Department of Commerce, which regulates government radio assignments. Interestingly enough, although the FCC regulates non-government communicators, they are a government entity and their communications are therefore regulated by IRAC!

Callsign blocks for both government and non-government operations are issued by the FCC. Table 1 shows the basic band plan as allocated in the United States.

With this brief introduction to the agencies which cooperatively do their best to prevent chaos on the radio bands, let's have a closer look at the spectrum itself and see who is doing what with whom, where!

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- Frequency Stability: Less than 250 Hz after switch on 1 min to 60 mins, and less than 50 Hz after 1 hour. With option CR-64 high stability crystal: Less than +50 Hz after switch on 1 min to 60 mins, and less than ±10 Hz after 1 hour at normal room temperature. Less than ±100 Hz in the range of -10°C to +60°C.
- Receiving Mode: A', A/J (USB, LSB), F' (Output FSK audio signal), A', F'.
- IF Frequencies: 1st: 70.4515 MHz, 2nd: 9.0115 MHz, 3rd: 455KHz, 4th: 9.0115MHz (except F'); with continuous Passband Tuning (except F').
- 2nd IF Center Frequency: SSB (A'/J) FM*(F) — 9.0115 MHz, CW (A') RTTY (F) — 9.0106 MHz, AM (A') — 9.0100 MHz.
- Sensitivity (when preamplifier is ON): SSB, CW, RTTY: Less than 0.15 microvolts (0.1—1.6 MHz: 1 microvolt) for 10 dB +N/N; AM: Less than 0.5 microvolts (0.1—1.6 MHz: 3 microvolts); FM*: Less than 0.3 microvolts for 12dB SINAD (1.6—30MHz).
- Selectivity: SSB, CW, RTTY: 2.3 KHz at -6dB (Adjustable to 500 Hz min), 4.2KHz at -60dB; CW-N, RTTY-N: 500 Hz at -6dB, 1.5KHz at -60dB; AM: 6KHz at -6dB (Adjustable to 2.7KHz min), 15KHz at -50dB; FM*: 15KHz at -6dB, 25KHz at -60dB.
- Antenna Impedance: 50 ohms Unbalanced (Single wire can be used on 0.1—1.6MHz).
- Weight: 7.5kg (16.5 lbs.).
- Dimensions: 111mm(H)x286mm(W)x276mm(D)(4 1/4" x 11 1/4" x 10 7/8" in.).
- Power Supply Requirements: 117V or 235V ±10% 50-60Hz 30VA, (100V/200V/220V use requires internal modification).

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Because of reliable ground wave coverage, the spectrum below the standard broadcast band, 10-540 kHz, is utilized primarily by long-distance point-to-point and ship-to-shore communications. The lowest portion (10-15 kHz) is occupied by navigational signals such as Omega.

Some high-speed Morse and a great deal of narrow-shift radioteletype is encountered by listeners while monitoring this basement band of radio. There is no voice below 150 kHz. although 160-285 kHz is used for broadcasting in parts of Europe.

The venerable 200-400 kHz range has been used for aeronautical navigational beacons since before World War II and still is filled with tone-modulated Morse

UTILITY INTRIGUE cont'd

identifiers for airports all over the world. From 400-535 kHz, CW transmissions from government and non-government ocean-going vessels communicate with their land stations.

Above the broadcast band, from 1.6 to 30 MHz, we encounter the best-known region of the radio spectrum. Classically called "shortwave" because the wavelengths of emissions are shorter than those first encountered in the early low-frequency days of radio, this frequency range is polluted with virtually every imaginable electromagnetic emanation! AM and sideband, CW and RTTY, telemetry and multiplex, broadcasters and broadcast jammers, facsimile and data - the high-frequency range is a veritable polyglot of activity.

In the United States, frequency allocations are made on an alternating basis; that is, the same service will be assigned at intervals throughout the spectrum. For example, international broadcasters are assigned discrete frequencies in the ranges 5950-6200, 9500-9775, 11700-11975, 15100-15450, 17700-17900, 21450-21750, and 25600-26100 kHz.

This alternating allocation procedure is used for aeronautical, maritime, fixed and mobile, and mobile services. We see this procedure in our ham hobby, with amateur bands spaced at intervals as the 160-, 80/75-, 40-, 20-, 15-, and 10-meter bands, with others added at WARC '79.

For convenience of discussion, all radio operations are divided into two basic categories: broadcasting and "utilities." The broadcasters don't listen; they radiate signals for reception by anyone who is interested in listening. All two-way communications are classified as utilities.

Are there some "hot spots" of listening intrigue? Yes, there certainly are. The most interesting portion of the shortwave spectrum is between 3 and 18 MHz, outside of the foreign broadcast bands and ham bands. They center around the most-used military bands and include spies, embassy communications, tactical maneuvers, smuggling operations, undercover agencies, and other drama.

To avoid monitoring, clandestine operations frequently change operating frequencies, but because of propagation, antennas, or equipment limitations, they

generally will occupy certain key portions of the spectrum. These include 50-100 kHz or so up or down from the following center frequencies (kHz): 4725, 5700, 6700, 7400, 9000, 11250, 13300, 15050, and 18000.

VHF/UHF

As communications congestion becomes increasingly worse, frequencies used by communicators become increasingly higher (Grove's Law of Proportionate Pollution!). So it has been with shortwave and higher frequencies for years.

The sunspot cycle has contributed a great deal to motivating users to new frequencies, and worldwide skip can be heard up through 50 MHz.

The 30-50 MHz spectrum peaks in the afternoon, with worldwide land mobile users of every language (including profane) populating "low band," as this block of spectrum is commonly referred to.

In the United States, the most common users of low band are military bases, paging systems, and state public safety agencies. FM mode dominates, although occasional AM is encountered.

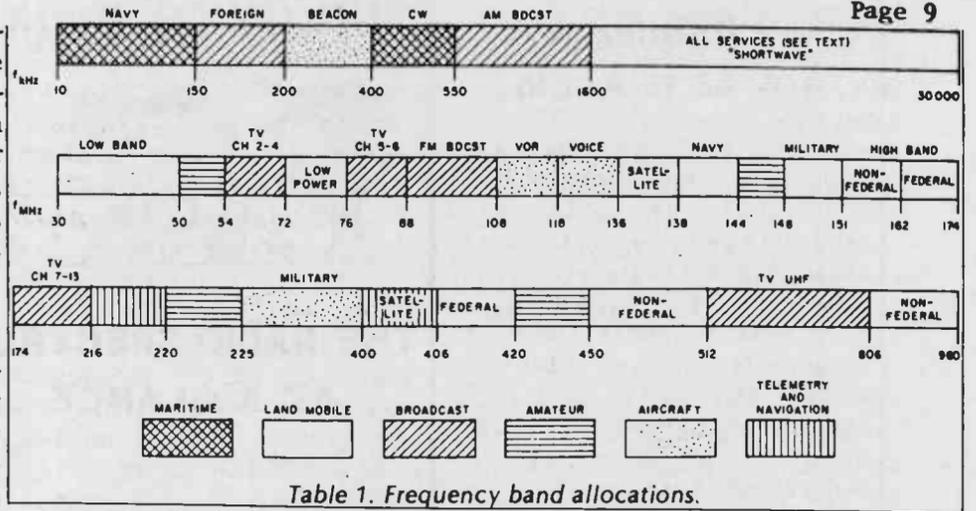
Above 54 MHz, TV broadcast (channels 2 through 6) dominates through 88 MHz, with a short break between 72-76 MHz. A variety of low-power industrial and public safety communications may be found there, especially in larger cities. The familiar FM broadcast band is 88-108 MHz (with low-cost "bugs" popularly used between 86-90 MHz - listen in on your neighbors!).

Aeronautical services share the exclusive use of the 108-136 MHz band. Aeronavigational beacons (VOR) dominate 108-118 MHz; this is why most aircraft scanners include only 118-136 MHz, the active air-to-ground band. Emission in this range is always AM voice. Commercial carriers chat with their home offices in the 129-132 MHz portion of this range, and when pilots get bored (?!), they get together on 123.45 MHz.

There still is some satellite activity in the 136-138 MHz region, with ATS-3 commonly reported on 135.575 MHz with FM voice relays from scientific users all over the hemisphere.

Military agencies use land mobile on their bases on each side of the two-meter band: 138-144 and 148-150.8 MHz.

VHF high band is divided into two distinct halves: 150.8-162 non-gov-



ernment and 162-174 federal government. There are very few exceptions within this range. Mobile telephone may be found from 152.51-152.8 MHz (30 kHz channel separation); police and fire are most commonly assigned in the 154-156 MHz portion; ship-to-shore is in the 156-158 MHz range (with some telephone traffic from boats to shore clustered near 162 MHz).

High band is the most populated mobile band in the spectrum, with government services from every agency represented in the upper portion. Military, agriculture, FBI, Secret Service, VA hospitals, Indian Affairs --everybody is up there. While some sensitive intelligence is openly conducted, most of those voice communications are encoded or even

encrypted beyond recognition.

TV channels 7-13 occupy 174-216 MHz, and a few navigational and control signals may be found from 216-220 MHz.

Above the 220-225 MHz ham band, military aeronautical communications dominate nearly 200 MHz of spectrum! AM tactical and air-to-ground voice is heard from 225-400 MHz, usually channelized at 100 kHz intervals. The space shuttle uses 259.7 and 296.8 MHz as UHF backup while in flight. Air Force, Navy, Coast Guard, and Navy aircraft use this band constantly.

While AM is the operating mode almost exclusively, the FLEETSATCOM military satellites may be heard using FM in the 240-270 MHz portion, shared with air-to-ground AM.

DXER's DIRECTORY

Most radio listeners are undertaking their hobby in a vacuum ... out of contact with other listeners in their locale. Few would argue that the DXing hobby is more enjoyable and productive when you know other listeners in your area with whom you can discuss mutual interests. The problem has always been; How do you find other listeners with similar interests in your area?

Universal is pleased to present a solution! We are presently compiling a directory of listeners. This computer-based list will offer accurate and current information on active listeners, including name, address, phone number, type of listening, and club affiliations. The directory will also include a list of all large and small listening clubs.

We need your help to make it happen! WE WANT TO INCLUDE YOU IN THE NEXT EDITION. Please send a SASE to receive your free registration form. Your listing will be without charge. You will be notified when the directory is available, but you are under NO OBLIGATION to buy one. It costs nothing to be listed. We will even include a photo of you and/or your "shack" if you care to send one! We would like your information whether you wish to buy the directory or not. So help us bring DXers together! Send a SASE for full info.!



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Div. of Universal Amateur Radio, Inc.

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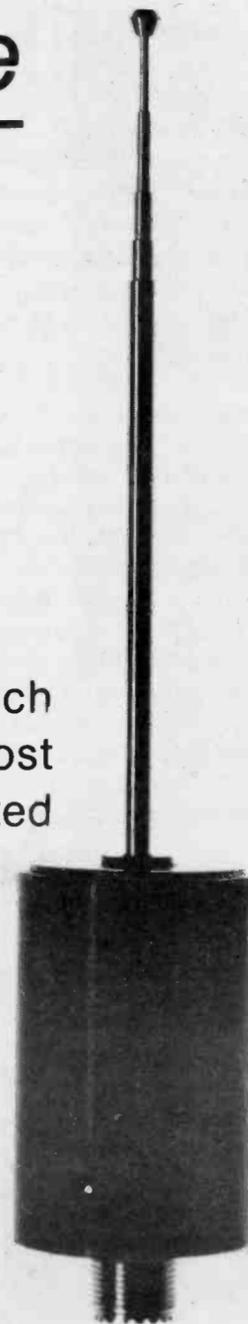
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by James R. Hay

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CANADA H9S 4Z2

Last month the various calling channels were set out as found in the channelization plan for radiotelegraphy. This month will take a look at the working channels (ship transmitting frequencies); frequencies of the coast stations are either set out in the List of Coast Stations or the ship is told on what fre-

quency to listen.

In the four megahertz band there are sixty-two frequencies starting with channel 1 (4188.5 kHz) and ending with channel 62 (4219 kHz). Each sequential channel is spaced 0.5 kHz from the others.

In the six megahertz band channel 1 is 6282.75 kHz and channel 57 is 6324.75 kHz; each channel is spaced 0.75 kHz from the others.

In the eight megahertz band there are 117 channels between 8377 and 8435 kHz with a different numbering sequence. The first channel is 8377 kHz, channel two is 8378 kHz, and this continues on to channel 59 at 8435 kHz, all with channel spacing of one kilohertz. In between each of these chan-

nels, offset by 0.5 kHz and still spaced 1 kHz, is another set of channels: 1b (8377.5 kHz) continues through 8434.5 kHz (channel 58b). Thus, the sequence is as follows:

Channel 1	8377 kHz
1b	8377.5
2	8378
2b	8378.5
to	
58	8434
58b	8434.5
59	8435

The system used for the 172 channels in the 12 MHz band is similar; channels are numbered from 1 to 58 with intermediate channels 1a through 57a, and 1c through 57c.

The main series (channel 1 at 12565.5 kHz through

channel 58 at 12651 kHz) is spaced 1.5 kHz apart. Offset by 0.5 kHz is the next series starting with 1a (12566 kHz) and continuing through channel 57a (12650 kHz) each channel spaced 1.5 kHz apart and 0.5 kHz higher than the main series.

The third series is offset 1.0 kHz above the main series and starts with channel 1c (12566 kHz), continuing through channel 57c (12650.5 kHz). Thus, the series runs as follows:

Channel 1	12565.5 kHz
1a	12566
1c	12566.5
2	12567
2a	12567.5
2c	12568
to	
57	12649.5
57a	12650
57c	12650.5
58	12651

The 209 channels in the 16 MHz band are similarly arranged with 53 channels in the main series and 52 in each of three additional series.

The first main channel is 16754 kHz with spacing two kHz apart up to channel 53 (16858 kHz). The next series starting with channel 1a (16754.5 kHz) continues with 2 kHz spacing to 16856.5 kHz; this series is offset 0.5 kHz from the main series.

The third series is offset 1.0 kHz from the main series starting with channel 1b (16755 kHz) and continuing with 2.0 kHz spacing through 16857 kHz (channel 57b).

The final series is offset 1.5 kHz from the main series and starts with channel 1c (16755.5 kHz) and continues with 2.0 kHz spacing through channel 52c (16857.5 kHz).

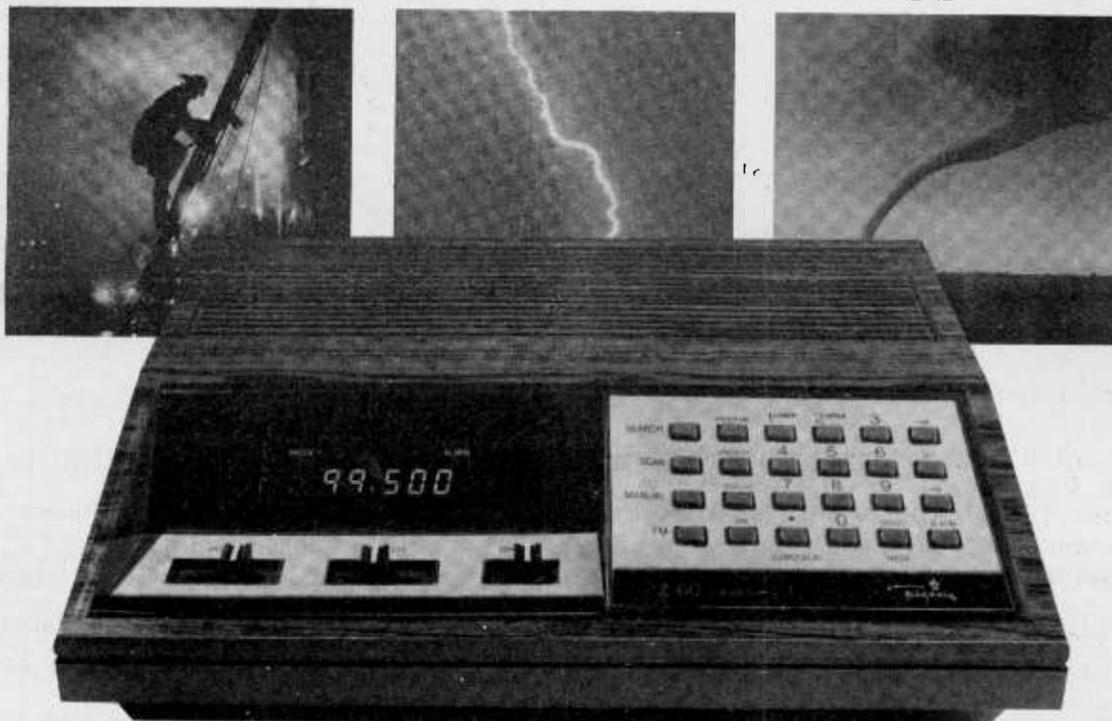
The channelling looks like this:

Channel 1	16754 kHz
1a	16754.5
1b	16755
1c	16755.5
2	16756
2a	16756.5
2b	16757
2c	16757.5
to	
52	16856
52a	16856.5
52b	16857
52c	16857.5
53	16858

For readers wondering what the relationship between the bands of calling and working frequencies are, below are the limits of the two.

Regency Scanners

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Regency Scanners bring you the local news... as it happens. From bank hold-ups to three alarm fires. It's on-the-scene action. While it's happening, from where it's happening... in your neighborhood.

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The Z family

Introducing the Z series scanners from Regency. Four exciting new programmable scanners that offer you a variety of options to fit your personal needs.

First, there's the Z 10, a basic ten channel scanner that covers the six public service bands. It lets you hear your choice of over 15,000 frequencies at the touch of a finger. Or, if you prefer, locate new,

active frequencies using the search function.

If you like the Z 10 but need more channels, step up to the Z 30. It gives you all the same features with a thirty channel memory and, surprise, a programmable alarm clock that stays on even when the power switch is turned off.

For the guy who wants to tune into the aircraft and tower transmissions, we've got the Z 45. It's got the same coverage as the Z 30 with the addition of the aircraft band with forty-five total channels.

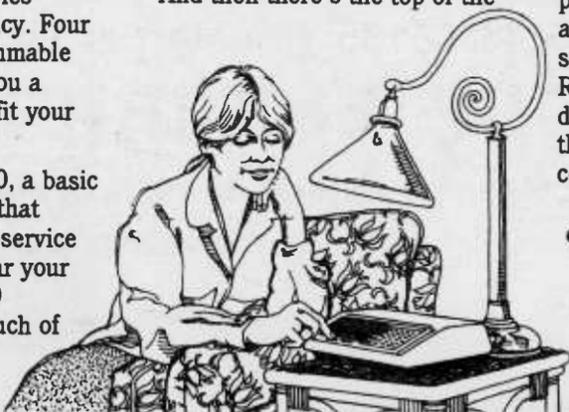
And then there's the top of the

line Z 60. It covers all the public service bands plus aircraft and FM radio broadcasts with sixty total channels.

Common to all the Regency Z scanners is a contemporary simulated wood grain cabinet and a bright, easy-to-read vacuum fluorescent display with prompting messages. They even come preprogrammed with frequencies so you can scan "right out of the box".

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Regency stands behind the Z family with a full one year parts and labor warranty. And a tradition of building great scanners. So stop in your Regency dealer today for a demonstration, or write us at the address below for a full line color brochure.



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4 MHz
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 Working 4188.5-4219

6 MHz
 Calling 6270-6280.8 kHz
 Working 8282.75-6324.75

8 MHz
 Calling 8360-8374.4 kHz
 Working 8377-8435

12 MHz
 Calling 12540-12561.6 kHz
 Working 12565.5-12651

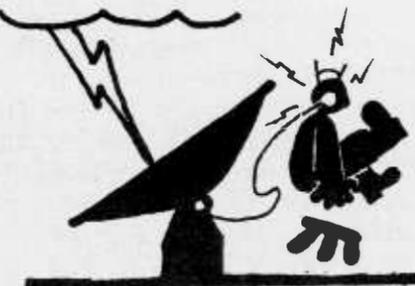
16 MHz
 Calling 16720-16748.8 kHz
 Working 16754-16858

22 MHz
 Calling 22227-22247 kHz

25 MHz
 Calling 25070-25076 kHz

As always your comments, questions, suggestions and loggings are welcome. ●

SIGNALS FROM SPACE



SPACE SHUTTLE VIDEO: An Update

by Mike Smithwick

(Ed.Note: Author Smithwick's previous articles in MT regarding monitoring the satellites have proven quite popular. He points out in the comments below that the previous direct video feed by NASA on RCA's SATCOM have been bumped around quite a bit. Perhaps this information will get us back on track.)

NASA's own transponder was noted for very weak video signals because the transponder was used for both video and telemetry at the same time, robbing power from the video. In light of this, RCA donated an unused transponder for a full-strength video feed so we "small fry" users could share in the adventure. Unfortunately, that service was terminated following the STS-41C mission in April 1984 as RCA was needing the extra transponder for a paying customer.

To make matters worse, NASA's transponder was moved from the Satcom F3R further west to Satcom F5 (still transponder number 13) which favors Alaska and the Pacific.

The weaker signals seen from the August 1984 STS 41-D mission prompted several watchers to write NASA about this problem. On the following mission, NASA purchased transponder time on F3 for the entire period and shall continue to do so throughout 1985. I was told that they eventually plan to move the telemetry over to a separate channel so as to increase their video power. When that is done they hope that they'll be able to drop the parallel feed.

MORE ON THE MOLNIYA

(Ed.Note: Mike Smithwick's informative introduction to Russian programming in the January issue drew some interesting comments from our readers. One reader in particular, John Wilson, has considerable experience installing TVRO systems related to both Molniya and Gorizont satellites. We reprint herein a portion of this letter which corrects some misconceptions and provides additional insight into these Russian satellites. We are grateful for his contribution.)

Molniya Siberian programming begins at 1600 eastern time local (midnight in Moscow and 0800 the next day in Siberia) ending about 2300 Siberian time.

The primary purpose of Molniya is to provide in-country network programming to Siberia because of the tremendous land area of the Soviet Union requiring TV reception. Some areas of the Soviet Union cannot be serviced via the Pacific Ocean Gorizont geostationary satellites because of look angle problems encountered in the higher latitudes. This also applies to the geostationary Raduga series of satellites.

This does not mean that Molniya does not offer other "benefits" in terms of communications, but its purpose is not a spy satellite or to provide programming to the "boys in Cuba." The Russians have a separate Molniya-type network of polar orbiting satellites paralleling closely Molniya orbit. Such a spy satellite had to be turned off at U.S. request to Russian within the last year or two when the Voyager satellite probe to Saturn

signals were being "wiped out" by these Russian satellites.

The U.S.-Russian "hotline" has been carried on SCPC TP4 for a number of years now in encrypted RTTY format. Two 60-foot antennas/electronics located at Fort Dietrick, Maryland, are dedicated to the hotline. One continually "chases" Molniya and the other is locked on an Atlantic geostationary satellite which serves as a backup. The hotline now is being upgraded to include encrypted FAX and other modes of transmission capability.

The Canadian apogee serves the Russians' interest best in illuminating Siberia; the U.S. down to Brazil also gets "illuminated" because of the relatively high transponder EIRP and antenna pattern. While reception in Cuba is possible, the same Programa 1 TV service is more easily accessible via the geostationary Gorizont 7 satellite to which the Cubans can uplink directly. Molniya is not an external TV broadcast service to the U.S., Cuba, Nicaragua, or anyplace else in the world.

The only 24-hour Molniya programming is audio via the 7.5 MHz subcarrier which broadcasts the Russian version of PBS (National Public Radio). Molniya does not transmit 800-1,000 MHz signals, nor are SCPC transmissions 4KC USB/LSB. For the most part, such transmissions are FM SCPC, FAX, and encrypted RTTY.

Your pictures of Molniya reception published in Monitoring Times show two things. First, your receiver IF bandwidth is too narrow and due to some video sync information being "lost" out of passband, your picture is tearing or beginning to tear. Secondly, your signal to noise/carrier to noise ratio is rather poor. Since you are using a 13 foot antenna and a 100°K LNA your reception should be much better.

Your comment regarding not using a right hand circular-feed relationship to receiving a right-hand circularly-polarized signal is incorrect; by using an orthogonal feed with only linear polarization capability, you are giving up 3 dB of signal strength.

In your area of California, Molniya should have an EIRP of 31.5 dB or better. The late afternoon eastern time Molniya was replaced last month and has about 1 dB more EIRP, so you should be getting at least 32 dB+ EIRP.

Your statement regarding "simple audio circuits" being available for Molniya audio is misleading. First, the audio is being carried as part of the video sync information; next, the threshold plus signal level which must be maintained in order to achieve stable, noise-free audio must not break PLL lock and "motorboat." There are other technical considerations which I won't get into.

The following suggestions are made regarding improving your Molniya reception:

1. Insure your 13-foot antenna is efficient--not twisted or warped. It should have at least 53 dB gain at



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SIGNALS FROM SPACE cont'd

a 55% efficiency rating.

2. I assume you are using a Chapparral feed or a similar type. Order a Teflon probe from Chapparral Communications and insert it 45° from the 8 to 2 clock position. You may have to file the sides slightly for a secure friction fit. Leave about 1/4 inch protruding from the mouth of the feed. Adjust your polarization control for the highest signal meter reading.

Molniya primary audio channel decoders are available from CTVES, Inc., one of the companies for which I am a Technical Representative, through my address for \$375 each, plus \$10 packing/shipping. The unit is hand-crafted using state of the art technology and requires 12VDC @50 MA (taken from inside receiver at 12VDC modulator power supply point) and baseband audio receiver output. Multi-standard monitors and VCRS (NTSC/PAL/SECAM) are also available.

John Wilson
6413 Bull Hill Road
Prince George, VA 23875

Hams To See Shuttle On TV

The next "ham in space," Tony England W00RE, has been given final NASA approval to take on board the Challenger spacecraft a Robot 1200 C (modified) SSTV transmitter for 10 meter downlink operation.

The equipment is expected to be operational during the April mission of the 51F Skylab-2 mission.

Tony will also be heard on the amateur 2-meter band using the special Motorola handie-talkie that worked the world last year aboard the shuttle from the hand of astronaut-ham Owen Gariott.

Scanner listeners near larger cities who want to tune in on other amateur TV operations may hear the TV signals on popular UHF frequencies including 421.250, 426.25, 434.000 and 439.250 MHz. These are fast scan and the video will be a "buzzing" sound.

Slow scan TV may often be heard on the HF amateur frequencies, sounding like a rapid, musical chirping sound. For more information, listeners may wish to tune in on the new North American Fast Scan Television Net which meets on 14.245 MHz each Sunday morning with check-ins from all over the continent.



INTERNATIONAL SATELLITE USERS' CONFERENCE

The second International Satellite Direct Broadcast Services Users' Conference will be held April 15-19, 1985, at the Holiday Inn near the Baltimore-Washington International Airport. The purpose of this conference is to provide a forum for an exchange of information between the user community and the designers, operators and managers of NOAA and GOES environmental satellites. It is one of several events marking the 25th anniversary of the launch of the world's first weather satellite on April 1, 1960.

Users of weather satellite direct broadcast services include U.S. and overseas government and military weather agencies, commercial meteorologists, doctors, educators, radio hams, private pilots, sugar cane and coffee growers, utility and petroleum companies, electronics firms, commercial and recreational boat owners, and many others. More than 1000 receiving stations have been established in over 120 countries; the number of end users of direct broadcast services and products is too extensive to count.

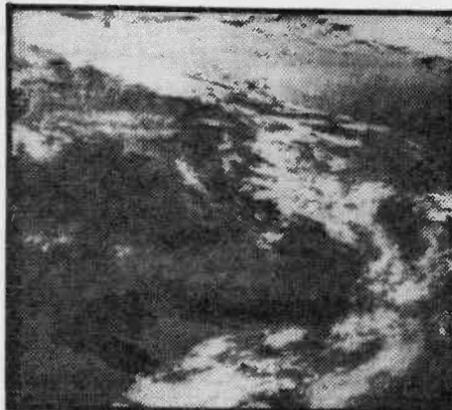
Present and future satellite direct readout systems and operations, as well as international government and private sector data uses will be discussed.

MAYDAY AUTOMATION

A Mount Vernon, New York, manufacturer is attempting to outfit the eastern seaboard with automatic repeaters to alert Coast Guard rescue vessels of a boat in trouble. The system is already in use in southern California.

Pro-Com Corporation has developed a transmitter that senses seven intrusion, fire, bilge water and other alarm points on board and sends a signal which is relayed over a 30-mile radius by a repeater.

When activated, the telemetered message is transmitted in 30-60 seconds; a computer compares the data with its memory and provides a description and general location to the Coast Guard who can often



About 40 exhibits of environmental satellite receiving and processing equipment will be displayed.

Current co-sponsors of the conference are the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), the World Meteorological Organization (WMO), and the American Meteorological Society. Other organizations being invited to co-sponsor include the National Science Teacher's Association, the American Society of Photogrammetry, and the American Radio Relay League.

For further information, contact:

Robert W. Popham
NOAA Co-chairman
ISDBSUC
NOAA/NESDIS
Washington, DC 20233
Tel: 301-763-7289

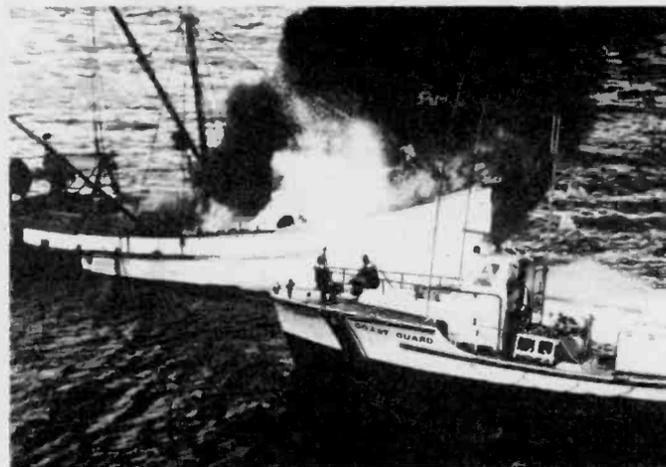
John Kamowski
NASA Co-chairman
ISDBSUC
Code 974
NASA/Goddard Space Flight Center
Greenbelt, MD 20771
Tel: 301-344-5083

Jessie Rodriguez
Program Manager
ISDBSUC
NOAA/NESDIS
Washington, DC 20233
Tel: 301-763-7289

locate the vessel in distress by helicopter in as little as 15 minutes.

Pro-Com would like to add LORAN-C capabilities to the system, enabling location accuracy to within 400 feet.

The boat installation



KEARNEY (NEBRASKA) HAMFEST

The Midway ARC of Kearney will celebrate its 8th annual Nebraska ARRL Spring Convention at the Holiday Inn, March 30-31, 1985.

The Friday night pre-activity will be the North American Tele-conference Radio Network live from the Holidome. The 2-hour program features Jim Larsen, K7GE of Larsen Antennas, and will begin at 8:00 P.M. CST.

FCC license exams will be sponsored by the Lincoln ARC on Saturday morning.

Convention symposium speakers include John Champa, K8OCL on AMSAT; Ralph Wallio, W0RPK on packet radio, and Joe Eisenberg, WA0WRI on frequency coordination and RFI.

Events are planned to distract the ladies from their hubby's favorite hobby, and there's a banquet with terrific cuisine, Four Keys music, ventriloquism, humor and more. Kearney definitely has a convention for the whole family.

NEW HAM BAND

The amateur community was awarded three new HF bands at WARC '79 in Geneva, but only one (30 meters) has thus far been officially opened by the FCC. Now there is talk that a second band is near authorization.

The frequencies 24890-24990 may become available to amateurs for SSB, CW, RTTY, SSTV and FAX within the next few months. This will leave only one band, 18068-18168 unavailable until the end of the decade.

presently costs \$1895 with an additional \$30 per month monitoring fee. Pro-Com hopes to eventually have some 500 repeater sites along both U.S. coasts and throughout major waterways.

We would like to thank MT reader Danny Jones of Rocky Mount, NC, for sharing this interesting note with fellow listeners.

THE NATIONAL COMMUNICATIONS SYSTEM: An Update

by Arnold Di Filippo

While trying to find out more information in regards to the Vint Hill Farms-Warrenton NCS numbers transmission facility reported in Monitoring Times (April 1984), I recently received an information packet from Major David N. Stone, U.S. Army, Executive Officer, Office of the Manager, National Communications System (NCS), Washington, DC.

Detailed is the NCS "Organization and Functions" along with additional information concerning the "National Plan for Communications Support in Emergencies and Major Disasters."

Following are some of the more interesting facts concerning NCS - keeping in mind the discovery of the numbers stations as reported by your publication (emphases mine).

"...The NCS is a confederation in which Federal Government departments and agencies participate with their telecommunications assets to provide essential communication services for the Federal Government under all conditions ranging from normal day-to-day situations to national emergencies and international crises, including nuclear attack. The principal assets of the NCS include telecommunications networks of the Departments of the State, Defense, Interior, Commerce, Energy and Transportation (which includes networks of the Federal Aviation Administration and the U.S. Coast Guard), the Federal Emergency Management Agency, the U.S. Information Agency, the National Aeronautics and Space Adminis-

tration, the General Services Administration and the Central Intelligence Agency."

"...Telecommunications facilities are planned, funded, and operated by the parent agencies to satisfy their respective mission requirements; however, through joint planning, standardization and other coordinated management activities of the NCS, they are available to satisfy national requirements transcending those of the individual operating agencies."

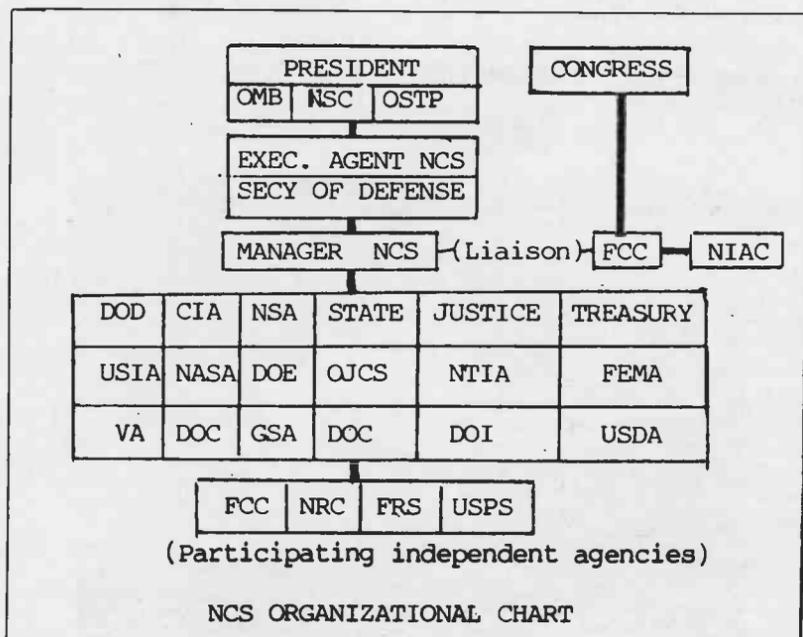
"...The Secretary of Defense designated the Director of the Defense Communications Agency (DCA) to serve as the Manager of the NCS. In order to carry out the NCS management responsibilities, an Office of the Manager, NCS, was established at 8th Street and South Court House Road, Arlington, Virginia; it is co-located with the Headquarters of the Defense Communications Agency and receives administrative and logistical support from the Defense Communications Agency."

I certainly believe the possibility exists that our numbers station operated by the Army can in fact be used to support CIA, State Dept., National Security Agency, etc. activities.

The following bit of information is very interesting. A little time for fun and speculation is in order:

"...The Manager, NCS, performs the following functions in support of the NCS mission: ... develops scenarios and implements test programs to evaluate the performance and effectiveness of the NCS through modeling and simulations..."

Is this a possible cover for "numbers transmissions"?



Receiving Antennas

Butternut Introduces SC-3000 A Scanner Antenna for the "Pros"!

Butternut's patented "trombone" phasing sections increase capture area and let you pull in the weak signals that aren't even there on conventional scanner antennas.

- Covers 30-512 MHz scanner ranges
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Tune in the weak ones. Butternut's exclusive inductive stub-tuned dipole requires no heavy lossy traps. Specifically engineered for maximum signal to noise on the popular 13, 16, 19, 25, 31 and 49 meter foreign broadcast bands. Covers 2-30 MHz. Includes 50 ft. of feedline. Maximum overall length 73 ft.

Dealer inquiries invited

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If any readers want the "NCS Organization and Functions" or "NCS National Plan for Communications Support in Emergencies and Major Disasters" publications, write to the NCS, Officer of the Manager, Washington, DC 20305-2010. A reply can take up to two months.

Some interesting sources which MT readers may be interested in:

WESTON BOOKS, RD1 Box 90, Weston, Vermont 05161. One dollar gets you their latest catalog of books dealing with codes, ciphers, intelligence and espionage. Their current list has some 437 books for sale.

THE INTELLIGENCE QUARTERLY - tentative title of newsletter to begin publication on or about March, 1985 - will be a joint venture of Michael F.

Speers, owner of Weston Books, and Nigel West, author of the history of MI5, MI6 and The Branch. To receive subscription information when it becomes available, send a SASE to "Weston Books" requesting same.

ESPIONAGE MAGAZINE, sample copy available for \$2.00 (U.S.), Canadians pay \$3.00 (U.S.). Subscription cost is \$11.70 for U.S. delivery, \$13.70 for Canada, \$14.70 for all other countries. Check payable to "LEO II Publications, Ltd." Mail to Subscription Dept. #CRG, Espionage Magazine, P.O. Box 8974, Wilmington, DE 19899.

For an inexhaustible supply of information concerning books on any topic, consult "Books in Print" at your local library.

GROVE TO SPEAK AT DAYTON

Bob Grove has been invited once again to speak at the Dayton Hamvention, April 27 and 28, the world's largest amateur radio convention. Details next month.



Tactical Communications Surveillance

In our January '85 issue (page 15) we printed this photo of a new military intelligence mobile monitoring laboratory and mused how we would love to have a look inside. Well, MT reader Bob Margeson, engineer for Sanders, the prime contractor for the system, has given us just that opportunity!

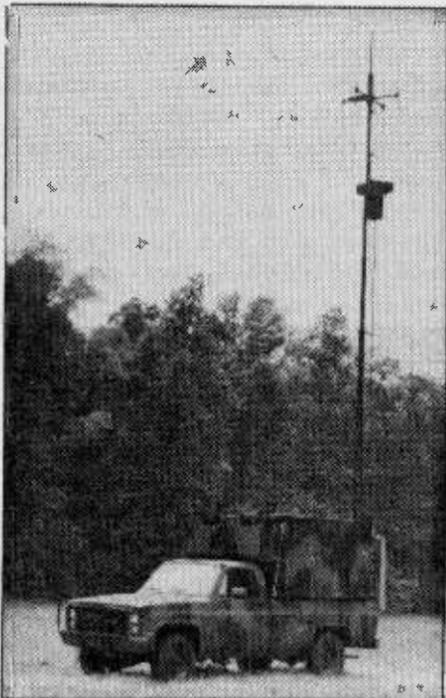
We are grateful to Mr. Margeson for forwarding the following unclassified description of the system's operational parameters for fellow MT readers.

INTEGRATED AUTOMATIC INTERCEPT AND DIRECTION FINDING

Hostile radio communications used for command and control can be exploited as a source of essential tactical intelligence. Sanders has developed an advanced tactical electronic support measures (ESM) system which intercepts, locates and monitors communications transmissions to obtain important information about hostile forces and their intentions.

Designed for one-man operation, each station covers the HF, VHF and low UHF communications frequencies with automatic environment, catalog, surveillance, monitoring, and direction finding modes.

Automation of repetitive functions and emphasis on human factors in design of the operator interface facilitate efficient, error-free system performance. The interactive touch entry display screen simplifies control of automated features through menu-driven operation. Integration of the direction finding and monitoring functions eliminates time delays and errors



in associating position fixes with intercept reports. Rapid and accurate direction finding enhances the interpretation of information extracted from intercepted transmissions.

Multiple stations may be connected by wireline or radio to form a coordinated automatic direction finding and emitter position fixing network.

BUILT FOR THE BATTLEFIELD

The rugged system is rapidly deployable in the field. The self-aligning VHF/UHF direction finding antenna is easily elevated by a pneumatic mast which is integral to the shelter; the light-weight, foldable high frequency direction finding (HFDF) antenna is also erected in the field.

The S-250 shelter which houses the electronics is environmentally controlled, improving both operator efficiency and system reliability.

A complete power panel monitors voltages and protects against transients. Each major equipment is

controlled by a separate circuit breaker and the environmental control unit has a separate control. White light is automatically extinguished and a red light illuminated when the station door is opened. The level of interior illumination is adjustable for maximum operator comfort.



OPERATING FEATURES

(1) **The Touch Panel Entry Display** concentrates the operator's attention on the functions being performed in the selected operating mode. The screen defines only those entry functions which are currently enabled, providing prompt visual feedback for each operator command or response input. Direction finding and fix requests are automatically formatted and dispatched with the results output as lines of bearing and as fixes in either UTM or lat/long formats. The operator can edit individual lines of bearing through the display to optimize the position fix.

(2,3) **Two HF Receivers and two VHF/UHF Receivers** are automatically controlled providing rapid scanning and exceptional performance. Synthesized local oscillators offer precise and repeatable frequency setting. The receivers also serve the direction finding function on a time-shared bases.

(4) **Map Display.** Direction finding position fixes are presented on a large display, which automatically plots multiple lines of bearing from the master and slave direction finding stations as an overlay on a previously entered digitized version of the local field map. A digitizing tablet enables preparation of maps for loading through the magnetic tape interface.

(5) **Audio Distribution.** The demodulated audio output from the receivers is available to the operator through

a split headset. Selection of the audio from each receiver or the tape recorder is accomplished either through the central processor or by manual control. The operator has access to external voice communications and can also record his own comments on an audio tape along with the selected receiver audio.

(6) **Central Processor.** Direction finding, emitter location and control of all major system functions are coordinated by the central processor which interacts with the operator and the remotely controlled equipment installed in the station. Special signal processing algorithms result in optimized direction finding and emitter location processing, as well as efficient control of the station's total resources.

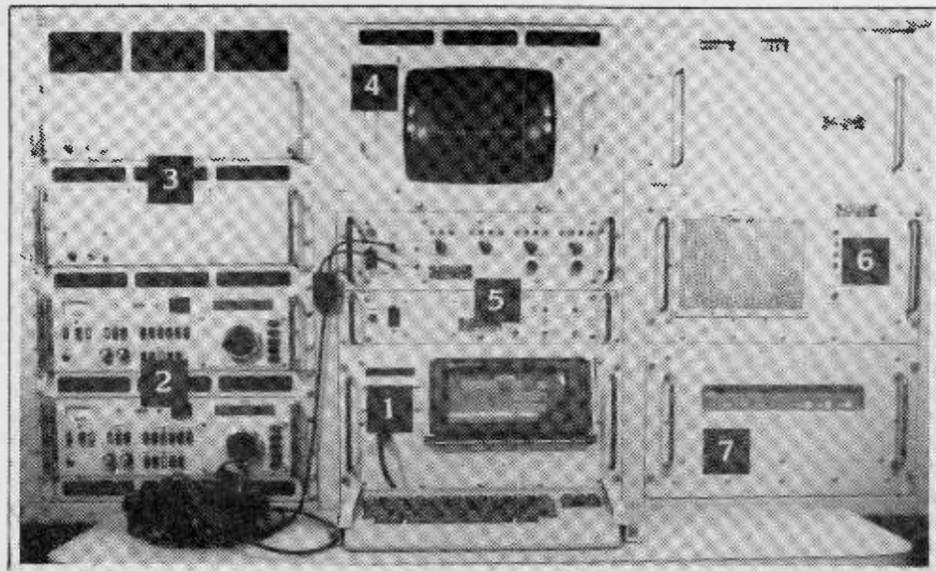
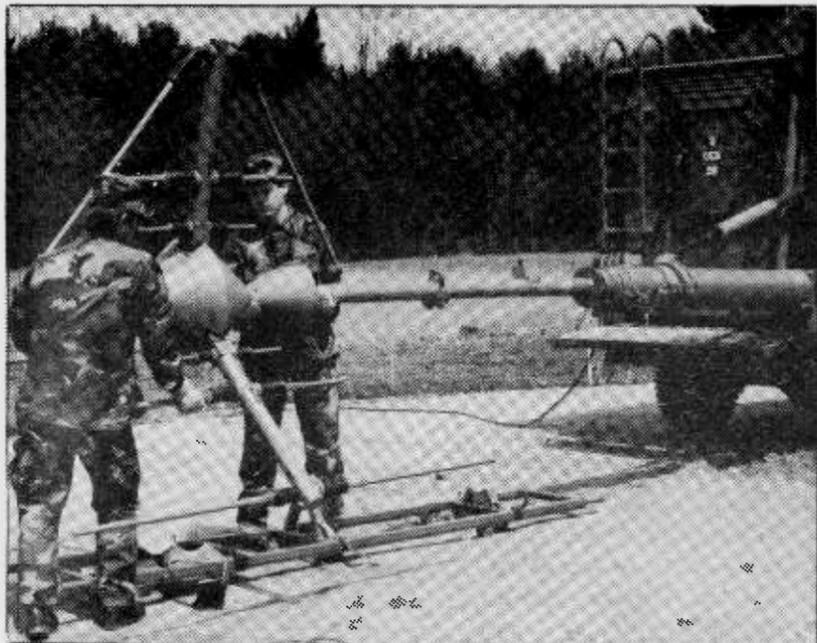
(7) **Line Printer.** Results of spectrum surveys, task lists, operator entered logs and map displays can be converted to hard copy by a line printer.

FREQUENCY RANGE:
Intercept 0.5 to 500 MHz
Monitor 0.5 to 500 MHz
DF 1.5 to 500 MHz

SIGNAL DEMODULATION:
AM, FM, Morse, SSB
(others optional)

OPERATING MODES:
Catalog, Surveillance,
Monitor, Direction Finding,
Built-In Test

POWER REQUIREMENTS:
Supplied by trailer-mounted generator.



Operations Control Panel

BEHIND THE DIALS

COMING NEXT MONTH: HANDS-ON REVIEWS OF REGENCY HX-2000, MX-4000 AND MX-7000!

THEY SAVED THE BEST 'TIL LAST...

NATIONAL'S SOLID STATE HRO-500

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

To those of you familiar with the tube receivers of the 1950's, names like Hallicrafters, Hammarlund, and National are old friends. However, if you feel that these names are part of the past, you no doubt swear by your trusty Sony, Icom, Yaesu, Kenwood or whatever. Don't sell the old "relics" short, though, for there is a lot of life in some of them.

Receivers like the Hammarlund SP-600 JX and Collins R390A still bring a few hundred dollars on the open market. Many a newcomer to ham radio or shortwave listening has started his or her career on one of these or even on a Hallicrafters SX series. Some amateurs still use these receivers as backup units or in some cases for day to day HF work.

My first receiver (other than a modified AM table radio) was an old

Zenith "all band" receiver complete with huge wooden cabinet, state of the art in 1940; it was all I could afford and opened the door to the fascinating hobby of shortwave listening.

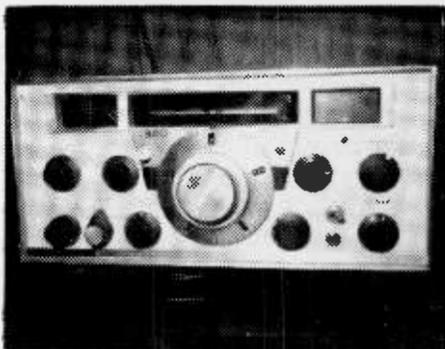
A few years ago the avid listener wanted nothing more than to get his hands on a Collins or a National receiver, then the ultimate in used equipment. Zenith's Transoceanic series were the only portables worthy of the name, but they were quite large compared to the solid state rigs available today. The advent of the transistor sounded the death knell for tube receivers, although the communications types are still around.

Little was heard of general coverage receivers as the new digital citizens band gimmicks began the inroads that would eventually lead to the digital receivers of today. Equipment with digital synthesizers, seven segment readouts, phase locked loops, programmable channel selects, offsets, etc. became the rage. The end result is that you can now count on the fingers of one hand the manufacturers producing a true general coverage communications receiver.

National had established a reputation in the 40's and 50's with their ultra-reliable HRO series. The

only thing preventing acquisition of a National was my vow to do away with all tube equipment. I had just gotten rid of my last SP-600 JX when I noticed in an electronics catalog a National HRO-500. The description matched the old HRO to a "T" except for the solid state part.

The unit arrived checked out and functional and included a copy of the original manual.



Abbreviated Specifications
 Modes: Selectable USB/LSB, MCW, FSK, AM and CW
 Synthesizer Accuracy: Within 250 Hz over the entire tuning range when zeroed at 10 MHz.
 Sensitivity: AM - better than 2.0 uv. for 10 dB S/N. SSB/CW - better than 1.0 uv. for 10 dB S/N.
 Selectivity: 6dB bandwidths at 500 Hz, 2.5, 5, & 8 kHz.
 Image Rejection: Average 80 dB, Minimum 50 dB.

The HRO-500 covers 5 kilohertz through 30 megahertz in sixty 500-kHz bands. Modes are AM and SSB, with provisions for a 500 Hz bandpass for CW work. In addition to the 500 Hz bandpass setting, there is a rejection notch filter which is tunable across the i.f. passband, giving a -50 dB notch at the rejection frequency. In operation this filter is very narrow and deep, allowing virtual elimination of a single interfering heterodyne signal. Figure 1 provides a block diagram of the receiver.

A synthesizer set to the appropriate frequency to mix with the incoming signal in the first conversion mixer yields an intermediate frequency in the range of 3.25 to 2.75 MHz. This in turn is fed to the second mixer along with a tunable 3.48 to 2.98 MHz oscillator to yield a second i.f. of 230 kHz.

A front panel BANDWIDTH switch selects either a tunable filter or an 8 or 5 kHz filter whose output feeds the 230 kHz i.f. amplifier. The front panel

CORRECTION:

512-657

SCANNER RECEPTION

In our February issue (page 19), Bob Parnass provided an interesting article on how multiple oscillator injections present on all scanners can produce out of band responses that can be utilized.

At least one reader, Gene Krolak, found that the formulas didn't work as shown and suggests another formula which works for him:

$$\left[3 \left(\frac{X+IF}{y} \right) \right] + IF$$

where X is the desired TV sound frequency and IF is the intermediate frequency of the scanner.

We appreciate corrections and contributions like these from our readers and are pleased to pass them on to fellow hobbyists.

HUMAN SPECIFICATIONS

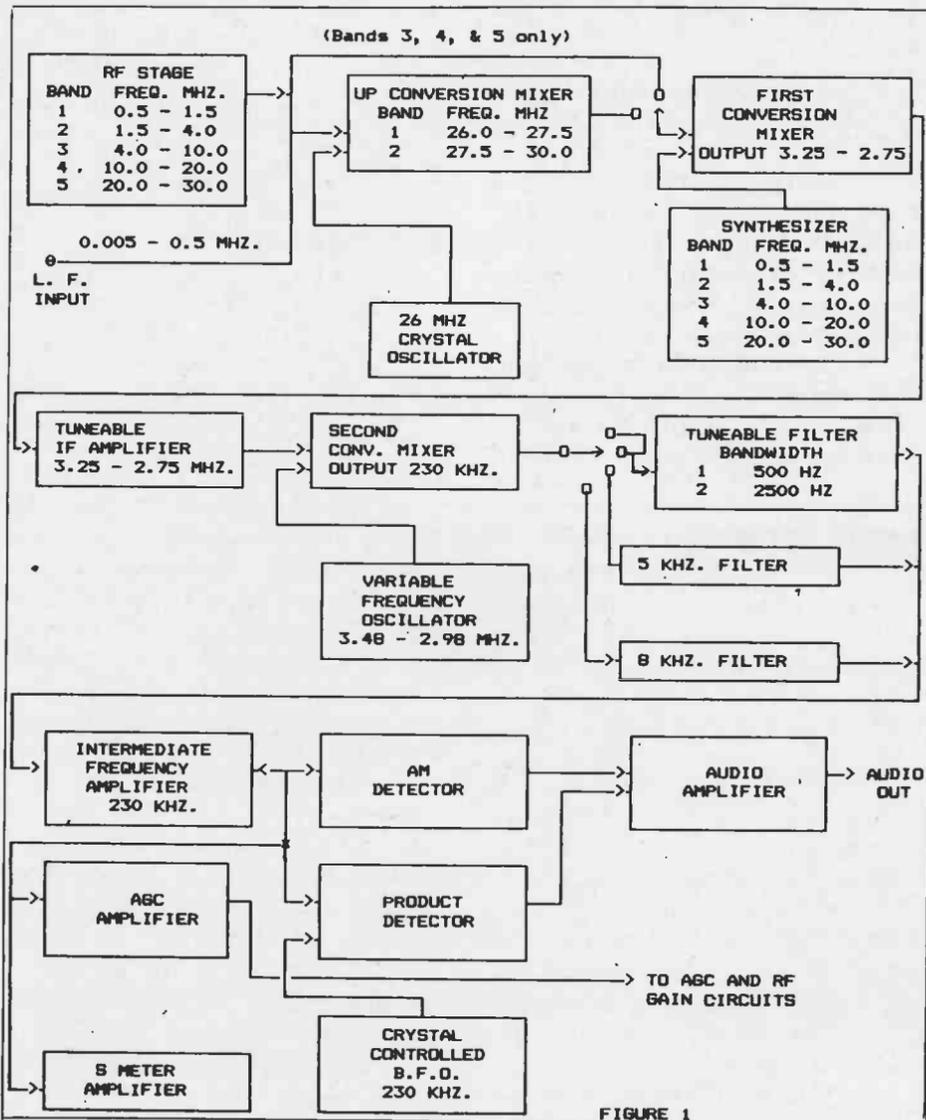
While many of us can call out sensitivity specs, frequency ranges, and selectivity options of our equipment, how many of us know the specifications of the normal human body?

Under relaxed conditions, your temperature should be 98.6° Fahrenheit; your blood pressure 120/70 (youthful) to 140/90 (mature); your pulse rate 72 beats per minute; and your respiration rate 15-20 breaths per minute.

Naturally, circumstances may cause some variation in all of these "vital signs," but when not exerting yourself, your readings should be close.

FUNCTION switch then selects either an AM or a product detector to recover the audio signal from the i.f. amplifier which also drives the AGC and S meter amplifiers. A crystal controlled BFO signal is fed to the product detector as needed. A PHASE LOCK warning light indicates when the synthesizer circuits are not locked.

From 5 kHz to 4 MHz an up-converter mixes the incoming signal with a 26 MHz oscillator to give an output range of 26.005 to 30 MHz which is fed to the first conversion mixer and handles in the same manner as a true 26 to 30 MHz signal.



NEW ARRIVALS

CES: THE ELECTRONICS SHOW

The 1985 International Winter Consumer Electronics Show, which concluded its four-day run in Las Vegas on January 8, set the stage for another record-breaking year for the consumer electronics industry.

More than 101,000 trade visitors came to see and evaluate new products offered by 1,411 exhibitors occupying 808,000 net square feet -- the equivalent of nearly 20 acres -- of floor space.

"The Winter CES has tripled in size and attendance since it was moved to Las Vegas eight years ago," said CES Vice President and Show Manager Dennis Corcoran. "Due to the cooperation of the City of Las Vegas, the positive attitude of exhibitors and the support of our contractors, this was the most successful Winter Show ever!"

The Winter CES produced news in every product category. In audio, the success and consumer acceptance of the compact disc (CD) player was evidenced by the more than 30 manufacturers who showed this revolutionary product. Introduced only a year and a half ago, retail prices have plummeted to easily affordable levels. In addition, several thousand discs are not available in everything from classical to country.

In the scanner line, Regency showed their newly-announced HX-2000 hand-held programmable and the MX-4000 base/mobile version. Both are slated for imminent

release with the long delayed MX-7000 soon to follow.

Bearcat was conspicuous by their absence with any new products, but a spokesman for that company revealed that several new products would be introduced at the June show.

Digital technology was also in evidence in video, with the introduction of a combination video/audio disc system, shown for the first time, as well as the emergence of digital TV, one feature of which is a screen within a screen.

Also in video, retailers saw a number of other innovative technologies. Stereo television hardware was displayed by more than 20 manufacturers, as were stereo VCR models. Retailers were also introduced to video cassette players (VCPs) for the first time, at attractive prices, by several manufacturers new to this field.

Video cameras in three basic formats (Beta, VHS and 8-mm) and camera-recorder combinations, or "camcorders," were displayed by a growing number of manufacturers.

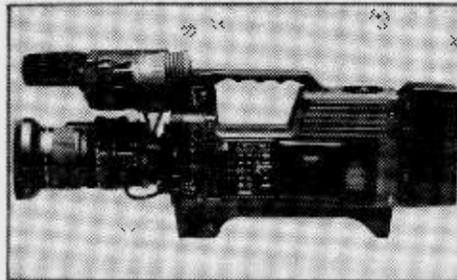
More than 60,000 buyers, 1,800 journalists, 8,000 visitors from more than 70 countries, hundreds of market and financial analysts, and thousands of manufacturers, engineers and advertising executives participated in a host of activities in addition to the exhibits themselves, in what has become the world's largest annual trade show.

A special "Live From Las Vegas" television program, featuring highlights

the synthesizer block.

When phase lock is lost, the front panel indicator is lit and a sawtooth signal is fed to the varicap instead of the error signal to obtain a wide frequency shift to allow phase lock to be regained.

Should there be indications of a great deal of interest in this receiver, I may undertake a second article to more completely spell out the performance and technical capabilities. Interested parties may contact me directly, but if you are expecting a reply please include a stamped self-addressed envelope. If enough interest is apparent, perhaps an HRO User's Group could be formed. There must be more of these fantastic receivers still in use out there.



"NITE HAWK," one of a dozen or more new entries by Panasonic into the home TV market including cameras, special effects generators, monitors, recorders and dubbers.

of the Show, was beamed via satellite to New York area retailers. This marked the first time that live TV coverage of a major trade show has been provided to dealers in another part of the United States.

Television took the long-heralded move from pure technology to consumer product with the introduction of flat-screen TV, the forerunner to "wall television." In addition, a variety of

miniature color and black-and-white TVs were exhibited at last week's CES.

Most manufacturers underscored their commitment to the marriage of audio and video, showing complete home entertainment systems including some with expanded multi-product, remote-control capability.

Consumer telephone equipment -- corded and cordless phones as well as answering devices -- occupied some 20 percent of total exhibit space, as the industry moved into the new cellular technology in a significant way.

As expected, a broad range of computer software for education, personal productivity and entertainment was shown at the Winter CES, and at popular price points. This Show also saw the introduction of new, more sophisticated home computers at dramatically lower prices.

CLUB CORNER *Paul Swearingen* 7310 Ensign Ave Sun Valley, CA 91352

For twelve years or so I was a schoolteacher, and I'm afraid that the need to educate people has never left me. I'm currently a TV-stereo-VCR-computer salesman for a large department store, and people purchasing these complicated gadgets often need more coaching than an owner's manual can offer -- the human touch, as it were.

And we salesmen give it freely -- in person, over the phone, by letter; whatever it takes to get the critter going. ("Oh, you mean my VCR needs to be hooked up to the antenna?" "What does 'formatting' a disk mean?" "I'm relieved to know that I don't have to leave my TV on to record a program on my VCR." Etc., etc.)

A few days before Christmas, however, a certain fellow insisted that I teach him how to use the Commodore 64, how to program in BASIC, and to break open sealed software programs and allow him to try them out. Then he might decide to buy the computer. He became rather surly when I referred him to the local users' groups and turned my back on him.

The time has passed when the local retailer should be expected to provide complete instructions on how to use and program a computer; after all, how many of us still buy a car from a dealer and expect him to throw in driving lessons with the deal?

Another example -- a fellow writes me, asking for

my recommendation of one of two expensive receivers. He doesn't tell me for what purpose he'll be using them, for casual listening, RTTY, DX or whatever. He assumes that I'm "experienced" (I've never used either rx), and he wants me to find someone to sell him a radio. The corker is that he also mentions that he plans to drop his subscription to *Monitoring Times*...

The moral to these stories is that both persons went to the wrong places for information. The dealer certainly can help a purchaser get started with a specific piece of equipment, or help him select an item for specific use. But a person who needs a lot of information should turn to the many fine clubs I've recommended and find one which offers what he needs.

My advice to the second fellow was simply "Advertise your willingness to buy in hobby publications; a seller will surely find you. If you need questions answered before buying, ask as specific questions as possible of club members; read the equipment reviews. Subscribe to the ANARC newsletter; they include mention of reviews of receivers in various club publications to which you could write for copies for a small fee." And in closing I reminded him of the acronym, "TANSTAAFL" (There Ain't No Such Thing As A Free Lunch).

His next step should be to join one or more clubs

BEHIND THE DIALS cont'd

The synthesizer circuit in the HRO-500 is composed of a reference 500 kHz crystal oscillator feeding a "spectrum generator" (harmonic amplifier).

Another crystal controlled oscillator at 4.75 MHz is fed to the phase detector along with the output of the i.f. amplifier, and a phase error signal is generated which is then fed to a varicap in the high frequency oscillator; the i.f. frequency will be phase locked to the reference oscillator and the phase detector will track the phase variations at an audio rate, constantly correcting the high frequency oscillator to maintain lock. Figure 1 does not show the phase detector which is part of



GROVE ANNOUNCES NEW ANTENNA BOOK

The new book, "ANTENNAS FOR RECEIVING" by Wilfred Caron is now at the printers and should be ready for shipping this month. This latest publication by Grove Enterprises results from the constant requests for antenna information received at MT; virtually every kind of antenna from the lowest to the highest frequencies is covered.

ANTENNAS FOR RECEIVING covers both theoretical and practical aspects of antenna

and transmission line design and application. The first portion of the book offers mathematical bases for antenna design, while later chapters dwell more on the practical considerations.

Beginners may wish to skip the theory and go right into the more descriptive chapters. Enough information is presented to allow the more adventurous readers to design effective receiving (and transmitting) antennas of their own.

Caron's background in theory, supported by liberal illustrations, results in one of the most informative books on antennas ever written for the listener. Windoms, Beverages, Yagis, log periodics, vertical and horizontal wires, active antennas, rhombics, slopers, dipoles, coax, twin lead, limited space antennas, traps, loops, preamps, tuners, direction finding-- you name it and it's probab-

ly covered!

This valuable reference work is available for only \$14.95 including free book-rate shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

AMATEUR RADIO, SUPER HOBBY by Vince Luciani K2VJ (1984 edition, 275 pages, paperbound, 6" x 9", \$9.95 from McGraw-Hill Book Co., 1221 Avenue of the Americas, New York, NY 10020).

If you have even an inkling of interest in or curiosity about ham radio, this book is compelling reading! Written in a friendly, conversational style, AMATEUR RADIO presents a message that is infectious with warmth. Author Luciani is the consummate ham and conveys all the spirit ham radio has to offer.

Meet a precocious four-year-old who studied for his ham license with his parents and now enjoys the same hobby as celebrities like Donny Osmond, statesmen like Barry Goldwater and King Hussein, astronauts like Owen Garriot, and performers like Chet Atkins.

Ham radio is like no other hobby--intellectually stimulating, global in scope. It knows no boundaries of geography, culture, or social stratum.

Luciani's updated book has information on licensing tests with sample questions, contest descriptions, even a little basic theory. It is a pot pourri of stimulation for the prospective ham as well as a neat perspective

on our hobby for the licensed old timer.

OHIO FEDERAL FREQUENCY DIRECTORY (35 pages, 5" x 8", softbound; \$4 from Scan America, Dept. MT, P.O. Box 292711, Kettering, OH 45429)

Not to be confused with the Federal Frequency Directory published by Grove Enterprises (now out of print), this new pocket guide to Ohio's federal agencies was distilled from a variety of official and private frequency records.

With data collected and edited by Dave Jones, president of the All Ohio Scanner Club (AOSC), the directory concentrates on the 25-465 MHz portion of the radio spectrum. Listings include virtually all agencies receivable, including both sensitive and non-sensitive government communications.

The directory is arranged in frequency order, by a call sign cross reference, and by agency. While its emphasis is exclusively Ohio listings, many entries are used nationwide.

Accuracy is quite good, although there is a tendency to include many local and state law enforcement frequencies on which some federal agencies may occasionally interface. This is a mixed blessing since it can confuse the prospective user who is looking for exclusively federal frequency assignments.

Barring that one minor criticism, the directory is a cornucopia of frequencies used by federal agencies in Ohio and nationwide.

CLUB CORNER cont'd

catering to his particular interest and participate in club meetings, if he is able, or communicate his needs to the membership. Radio club members, as a rule, are willing to take an incredible amount of time and effort to share their knowledge and experience with others. Those who have with me I now am proud to call my friends, even though some (who live as far away as Germany and New Zealand) I've never met face-to-face.

A new club member will find himself soaking up information for some time, perhaps a year or two, before he dares to venture a new opinion. Then, suddenly, if he has been indoctrinated properly, he'll find himself offering advice to newer club members in the true spirit of TANSTAAFL. That's how some clubs have endured over a quarter- or even half-century -- by offering, unselfishly, aid to their members who, in turn, pass along advice to others.

My point is simple: if you've been a taker too long, become a giver. Support your club's activities; help out another member.

I'm pleased to announce that the All Ohio Scanner Club (AOSC) is expanding its coverage to Indiana, Kentucky, Michigan, Pennsylvania, Tennessee, West Virginia, and Ontario, and would welcome anyone to their club from these states (or others). They've received many requests for coverage of these states and have decided that enough

prospective members were available to support club activities outside of Ohio.

Prospective members can order a sample newsletter for \$1.00 plus a 22-cent stamp (\$1.25 for Canada, no stamp), or they can request an information flyer for a 22-cent stamp (25 cents for Canada, no stamp) from AOSC - 1043 Princewood Avenue - Dayton, OH 45429. Dues for new members are \$15.00. I mentioned a few months back that AOSC's bulletin would be an excellent model for new clubs in other states to follow, and with the expansion it now can only get better.

Incidentally, scanner enthusiasts in need of frequency lists will want to write to AOSC member Dave Jones for information. Send an SASE to Scan America - P.O. Box 292711 - Kettering, OH 45429.

ADXR publisher Reuben G. Dagold writes to assure me that the Association of DX Reporters does, indeed, cover longwave DX, along with most other bands. He also notes that one doesn't have to stay up late to hear European or African BCB DX, as I implied in my December article on BCB DX'ing in MT, as TA's start rolling in at sunset on the east coast. So they do; I recall hearing a wicked het from Conakry, Guinea-1403 on 1400 a couple of times in the early evening hours, but I never managed to pull audio from them.

DECALcoMANIA, which serves collectors of promotional materials and recordings from broadcast stations, has moved its publishing operation to

David C. Lasky - RD #1 Hillcrest Avenue - Olean, NY 14760. Publicity and promotions will continue to be handled by Mark Strickert in Berkeley, CA.

Club dues are a bargain - \$6.50 per year for U.S.A., \$7 (US) for Canada, for 10 issues. Requests for subscriptions should go to DECALcoMANIA - Box 355 - Berkeley, CA 94701-0355. They also guarantee reciprocal publicity for other clubs' activities; send 'em a sample bulletin and they'll respond with same.

Dates for the summer conventions are firming up: ANARCON '85 July 19-22 in Milwaukee (ANARCON '85 - P.O. Box 24 - Cambridge, WI 53523); IRCA in Portland, OR July 26-28 (call Bill Block [503] 256-2354 from 1600 to 2200 PLT); WTFDA in New Orleans probably in August, and NRC in Rhode Island over the Labor Day weekend.

My next deadline will be March 10 for the May issue. Until then, 73.

SCANNER RADIO LISTINGS: MILWAUKEE/WAUKEGAN AREA by Norm Schrein (150 pages, 8-1/2" x 11", paperbound; \$9.95 from Fox Marketing, Dept. MT, 4518 Taylorsville Rd., Dayton, OH 45424-2497).

MT's own Norm "Tune In Canada" Schrein has done it again! With umpteen scanner directories now available throughout the land, this latest leads the pack with up-to-the-minute frequencies, call signs, locations, and identifications of businesses, law enforcement and emergency agencies, federal and local government, aircraft and marine services, conservation and weather stations, amateur radio and broadcasting...just about everything that can be heard on a scanner in the Milwaukee/Waukegan area!

As always, Schrein's meticulously prepared directory is cross referenced by licensee, call sign, frequency, and service.

WHO IS WGU20 ON 179 kHz?

Apparently WGU20 is active again! Operating a somewhat erratic schedule, the FEMA low frequency station, WGU20 at Edgewood Arsenal, Aberdeen, Maryland, constantly stimulate inquiries here at MT headquarters.

Part of the nationwide communications network to guarantee continuity of governmental control in case of enemy attack, WGU20 was built as a prototype station some years ago. Listeners assumed that it would be dismantled as newer technologies emerged, but it has been remarkably persistent, commonly heard with time announcements in full carrier AM mode.

Due for a concentrated buildup of "nodes" (as the various sites are called) during 1985-86, the GWEN system looks for an eventual distribution of 200-300 installations nationwide, possibly including Canada and Alaska to supplement the obsolescent DEW Line equipment.

During times of dangerous relations with foreign powers it is possible that the nodes may swell to some 500.

Excellent historical and technical insight into the FEMA/GWEN network is provided by Vince Pinto in the January, 1985 issue of Lowdown (sample \$1 from Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057.)

For further information, see "Gwen and VLF" in the September, 1984 MT.

THE ALMOST-YAESU GREY MARKET

Price too good to be true? That's what many amateur radio operators thought when they purchased Yaesu FT757GX transceivers through a grey market dealer recently and found that these models had some disarming attributes.

The transceivers were not-for-export models intended for Japanese internal use and came without CW filter, without the new WARC band frequency capability, and cannot be serviced in the U.S.

While most amateur dealers are reputable, it is best to buy from a respected vendor. Check the shipping carton to be sure that it is the U.S. model. According to Fred Maia's W5YI Report ("Dits and Bits"), most complaints seem to originate from purchases made through a southeastern U.S. mail order specialist who is not an authorized Yaesu dealer.



by Ed Soomre

TIME AND FREQUENCY STATIONS

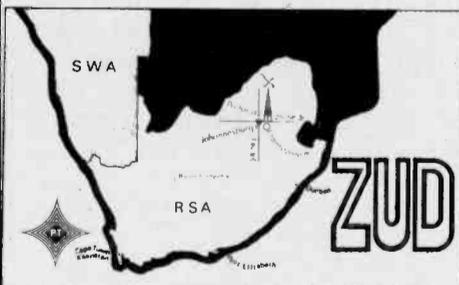
There are quite a few excellent SWL and DXing publications available (magazines, club bulletins and books), but only a few talk about time and frequency station listening and DXing. Information about these special stations is available, but mostly to the users of these special frequencies rather than the SWL.

Time and frequency stations transmit accurate time signals on fixed (standard or non-standard) frequencies for navigational, scientific, and aeronautical purposes. For the SWL they are also useful for accurate time, checking receiver alignment and learning propagation condition information.

Transmissions consist of various audio tones, voice and cw identification announcements, propagation and weather forecasts, wait and start broadcast signals, and specific coded signals (sometimes in cw). Some stations indicate the time in UTC or GMT, others in their local time.

Specific frequencies are standard on 2.5, 5.0, 10.0, 15.0, and 20.0 MHz. U.S. stations WWV and WWVH fit this format, as do JJY in Japan, MSF in England, and ZUO in South Africa. While this works out well for those needing a standard time and frequency station, it has mixed blessings for us DX'ers.

The good part is that as propagation conditions change, one station may fade out and another may be there; the bad part is that listeners (like me) who want



REPUBLICA ARGENTINA
INSTITUTO GEOGRAFICO MILITAR
IGMA
DIVISION SERVICIO INTERNACIONAL DE LA HORA
SECCION CONSERVACION DE LA HORA
SENALES RADIOHORARIAS

LQB 9 8167.5 KHz. Lat. -34°26'23" (S) Calle 38 N° 865 Villa Maipú		LQC 20 17550 KHz. Long. -03°54'28" (W). SAN MARTIN Pcia. de Buenos Aires
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to DX stations on these frequencies have problems due to strong transmissions of WWV and WWVH. How I wish they would go off the air for a few days so I could hear BSF China, IBF and IAM Italy and ATA India!

Many radio time and frequency stations do not use the standard frequencies, but non-standard ones. This is great for DXing, as many stations broadcast their time and frequency transmissions on many frequencies parallel to each other, so wherever you are, chances are good you will hear one or more of them.

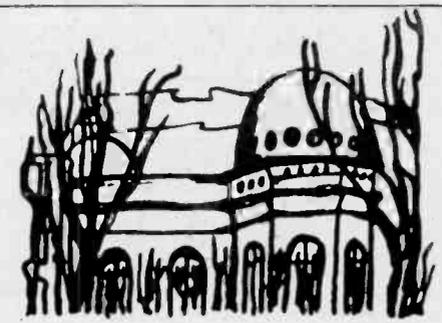
CHU in Canada chose their frequencies to aid the hams in calibration of the top end of the 20, 40, and 80 meter bands. Here is a partial list of non-standard stations:

Call Sign	Country	Freq. in kHz	Time of Operation (UTC)
CHU	Canada	3300 7335 14670	24 hrs
PPE	Brazil	8721	0025 1125 1325 1825 2025 2325
LQB/C	Argentina	8167.5/17550	2200 2345/1000 1145
DAM	W Germany	4265 6475.5 8638.5 12763.5 16980.4	1155 2355
ZSC/ZSL	S Africa	4291 8461 12724 17018	0755 1655
OBC	Peru	8650 12307	0155 1555 2055
VWC	India	4286 12745	0825 1625
VNG	Australia	4500 7500 12000	0945-2130/2245-2230/ 2145-0930
HD210A	Ecuador	3810 5000 7600	0000-1200/1200-1300/ 1300-2400
EBC	Spain	6840 12008	0959 1029
RWM	Moscow	4996 9996 14996	24 hrs
YVTO	Venezuela	6100	24 hrs

Addresses:

- CHU: National Research Council, Ottawa, Ontario, Canada, KIA OR6
- PPE: Servico da Hora, Observatorio Nacional (CNPq), Rua General Bruce 586, 20921 Rio de Janeiro, ZC-08-RJ, Brazil
- LQB/LQC: Servicio Internacional de la Hora, Calle 38 Gral. Nicolas Savio No. 865, Villa Maipu, 1650 San Martin, Buenos Aires, Argentina
- DAM: German Hydrographic Institute, P.O.Box 220, 2000 Hamburg-4, Federal Republic of Germany
- ZSC: Private Bag, Milnerton 7435, Cape Town, South Africa
- OBC: Estacion Central de Comunicaciones Navales (Radio), Callao, Peru
- VWC: Alipore Observatory, Calcutta
- VNG: VNG, Reference Measurements Section, Telecom Australia Research Laboratories, Box 249, Clayton, Vic. 3168, Australia
- HD210A: Instituto Oceanografico de la Armada, Casilla 5940, Guayaquil, Ecuador
- EBC: Instituto y Observatorio de Marina, San Fernando, Cadiz, Spain
- RWM: The State Committee of Standards of the Council of Ministers of the USSR, 9 Leninskii Prospekt, 117049, Moscow, USSR
- YVTO: Observatorio Naval Cagigal, Apt. 6745, Marina 69-DHN, Caracas 103, Venezuela

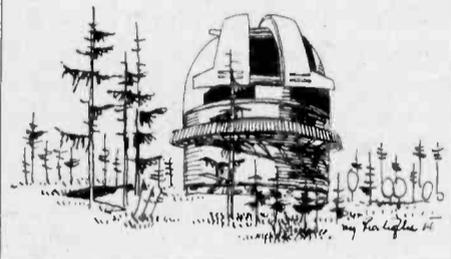
Most of these stations can be heard in the U.S. and will verify reception reports, either by QSL card or letter. The exceptions are the stations in the USSR, who feel these are not



LABORATOIRE PRIMAIRE DU TEMPS ET DES FREQUENCES

Observatoire de Paris
61, Avenue de l'Observatoire
75014 PARIS
France

OMA CZECHOSLOVAKIA



broadcast stations (like Radio Moscow), therefore they are not obligated to verify the transmissions.

A letter requesting a verification should contain

TIME STATIONS cont'd

time, date, and frequency of the broadcast as well as details of the transmission. These details can include voice and cw announcements, patterns of time transmissions, and anything else heard in the specific transmission of the station that makes it unique from the others.

Thank you for your reception report of BPM. This is to verify the following reports:

BPM

Call BPM Frequency 10MHz
 Location 109° 31' E. 35° 00' N
 Date 5/10/83 Time 10:30GMT
 Radiated Power 10 - 20KW
 Antenna omnidirectional

Signature *[Signature]*
 Title Chief, Section of Science and Technique

陕西天文台

It is helpful to include information about propagation conditions (other stations received at the same time from that area), your station equipment (receiver and antenna). Include return postage (IRCs or mint stamps) in most cases. Stations in communist countries, WWV/WWVH in USA, and CHU in Canada do not require return postage. Station ZSC in South Africa does require return postage since station personnel pay for QSL card costs.



Along with verifications many stations will send information folders about their operations and broadcast schedules. Verification time can take a few weeks or many months, dependent upon the stations's work load (number or reports to be answered), other work the staff has to do, and time for the report to be mailed to you. Sometimes reports will sit for a while before being mailed or sent surface mail.

Keep listening and be patient, as you can obtain some interesting station information as well as a beautiful collection of QSL cards and verification letters. All it takes is time!!

(ED.NOTE: An excellent publication dealing with the details of WWV services is entitled, "NBS TIME AND FREQUENCY DISSEMINATION SERVICES," NBS publication 432, available at no charge from the Time and Frequency Division, National Bureau of Standards, Boulder, CO 80303.)

SHORT-WAVE: NEWSROOM OF THE WORLD

by Peter J. DeHart

It is nearly seven a.m. I "wake to music" but rouse myself just a minute or two later as the local station joins the network for news. Perhaps the President is at Camp David. The cost of living is increasing and somewhere a strike has closed schools in a major city. It is however, the inclusion of a line about a brush fire in Australia which sends me to my listening room where Radio Australia is elaborating:

"In Australia, thousands of fire fighters and troops are continuing to battle brush fires out of control in several areas of the country's southeast. A state of emergency has been declared in several areas of New South Wales where nearly 100 fires are burning. Brush fires in neighboring Victoria have claimed lives of four people including a fireman and two other fire fighters are seriously injured and in hospitals. Police in southern South Wales said brush fires had burned out more than 120 sq. kilometers of country between Melanhanjie River and main Sydney Melbourne Highway. Australian Insurance companies estimate property damage at many millions of dollars with hundreds of houses destroyed and more than 14,000 sheep and cattle believed killed."

A bit later, the regional news from Perth on the east coast of the continent sheds more light on the situation:

"A major brush fire in Fern Hall is still burning out of control. The hospital located in the hills of Perth this afternoon was evacuated because of the brush fire. It was one of a series of fires in the bush area threatening a number of homes. At

Kalamanda, the local hospital, several patients were evacuated as the fire, fanned by strong winds, came within 100 meters of the building before fire fighters brought it under control. Patients were evacuated as a precautionary measure. Several were sent home and the rest taken to Swan District Hospital. The last to move were a mother and her baby, born while the other patients were being evacuated. The Kalamanda blaze burned out many hectares of state forest and bushland. Earlier, at Dunland, another fire threatened several homes in the local farming district. Sparks from power lines, brought down by strong winds, were believed to be the cause of the fire. It is hoped that tomorrow will ease the problem facing fire-fighters throughout Victoria.

"Tonight's major fires are in Cape Basin and near Landisville northeast of Melbourne and are being held on most fronts by a major back burning operation from Sydney. Extensive damage to plantations at Wondittigong. Threats to the mountain townships of Farabounten and Harrierville have lessened. Tonight two new fires are still raging uncontrolled near Victoria, fought by more than 100 fighters."

Thus, through short-wave broadcasting a news link between continents, nations, cities and small communities has been established and I am at least partially better informed about a dramatic situation than I would be had I not turned to the communications receiver.

The appeal of short wave news lies not only in its ability to serve as a useful follow-up tool for major news stories presented by our own networks, but also in its element of surprise. While there can be no disputing the fact that news services such as VOA and BBC do an outstanding job in covering of major events and consequently can claim huge audiences, the air waves abound with other news services as well - services which present extremely interesting "national, regional and local news stories."

For the news conscious listener, services from sources such as Radio Ghana, the Voice of Greece, and

Papua New Guinea are interesting and informative links with events in other societies. An examination of each classification or type of news story and some samples of typical news transmissions from these and other sources may add to your listening enjoyment.

"National" news, whether so labeled by Accra Radio, Kaduna Nigeria, Sweden or the "national" service of Papua New Guinea bears several characteristics. National news is intended for the whole of a nation, often flavored with phrases and terms understood and appreciated by its intended listening audience.

Sometimes its phrases strike the imagination enough to send the listener to a library or a friend for full appreciation of a news story. Recently, when Radio Ghana reported that "All occupants of government bungaloes have been told not to use these quarters for purposes other than for what they were intended..." I took notice. "Some are using these quarters for rearing livestock and for the sale of beer and other alcoholic beverages," Accra reported.

Government bungaloes, a remnant of earlier times under another government system, I later learned, dot Ghana's countryside. Many are quite large and easily adaptable for such practices.

When life is threatened, national stories quickly surface.

"Mt. Alavon started erupting about a week ago. Scientist Mr. McKee says an inspection of the volcano last week showed no lava flow, but only small explosions every minute. The activities should not bother anyone at this stage." (Papua New Guinea B.C.)

National news is often reflective of relations between two nations:

"The president of Gabon has arrived in neighboring Morut for a three day official visit to Nigeria. He will hold bi-lateral talks with the head of state." (Kaduna Radio)

or
 "The office of the Greek Deputy Foreign Minister, Carlos Populus, announced today the prices of new consignments of provisions to Ethiopia. A plane left Greece carrying tents, food and medicines." (Voice of Greece)

Once in a great while, the Voice of Greece turns cultural in its national news approach, featuring interesting stories about



SHORT-WAVE NEWSROOM cont'd

art treasures and painters - a unique approach surely appreciated by its citizens!

A station claiming to present "regional" news will likewise inform the listener with a unique slant to events in the broadcaster's region. News of Latin America via HCJB, Asian news from NHK in Tokyo, Paris Calling Africa, and ABC news from Perth, Australia, frequently carry information concerning regions on continents where the broadcaster resides or has an interest.

A regional news story generally carries two characteristics: First, it is a story affecting the area in close proximity to a broadcaster.

"The spokesman for the ruling Congress Party in Malawi has confirmed that President Bamba has dissolved the entire Malawian Cabinet..." (GBC)

Secondly, the truly regional story is often one of surprise, providing information over the plight of a nation on the same continent. It is often a story which can while informing evoke a sense of helplessness over situations seemingly out of control:

"The International Red

Cross says in a report issued in Geneva that the plight of the starving in Angola is passing unnoticed and that the country is expecting a crisis as grave as that in Ethiopia..." (GBC)

Finally, the regional story may be intended to spur a neighboring friendly nation into action - to cause improvement or change in a nation's attitude toward its neighbors.

"A Melanesian cabinet leader today called on the Australian government to take a stronger stand on the future of the French colony of New Caledonia. He said the Australian government should urge immediate independence for the island. Meanwhile, cruise ships are avoiding the capitol of Noumea because of trouble." (PNG)

Although short wave is a worldwide phenomenon, it is possible to rely upon it for some "local" coverage of news. We can be the beneficiaries of this interesting coverage and insight into the everyday lives of people far away, people who rely on short-wave frequencies to inform them about critical events in their city. A report may ask citizens to inform police upon sighting a certain sick person on the

streets of Monrovia, or to report persons wanted for questioning in regard to a coup attempt in Lagos. Or:

"Platoons are out again in Port Moresby, this time for an indefinite period. A deployment of soldiers sent as a request from police commissioner Garrison earlier, was approved by acting defense force commander Datola. The head of the central command, assistant commissioner Toyon, said the soldiers had been assigned to patrol troubled areas of the city..." (PNG)

"Localized" reports, although of extreme interest, seldom receive QSL responses. They are--needless to say--for the local population and that attitude seems to be persistent throughout much of the world.

A century and a half ago, Walden philosopher Henry David Thoreau spoke of the nearby village of Concord as a "great news room." In light of the short-wave listener's access to an endless variety and stream of information, I sometimes wonder how Thoreau would react to the wonders of the communication receiver, that instrument which makes the world for so many of us "a great news room."

SOURCES OF SHORT-WAVE NEWS:
Catch these "services" for samples of national, regional and local news.

1. Radio Cameroon, Yaounde. 4850 kHz; check 2130-2300 on half hour. (Primarily regional and national.)
2. Lagos Nigeria, NBC. 15120 kHz - 2130. (National)
3. Ghana Broadcasting Corporation, Accra (GBC) 4915 kHz. (Regional and news of Accra developments.)
4. South African B.C. Johannesburg - Radio Orion; 4835 kHz - 2100. (Regional coverage of events in surrounding nations.)
5. Perth Australia 9610 kHz, 1400. (Coverage of Western Australia and Perth events.)
6. Karai Service - Port Moresby, Papua New Guinea, 4890 kHz, 1300. (Coverage of Port Moresby, Papua New Guinea and some Pacific events.)
7. Solomon Islands B.V. 5020 kHz, 1300. (Excellent news source for South Pacific events.)
8. Voice of Greece 9420 kHz, 1915. (News of Greece, Cyprus & Mediterranean beamed to Europe.)
9. Radio South West Africa, Namibia 3295 kHz. (Check for news of South Africa and surrounding nations on hour and half hour beginning at 0300).

BROADCASTING. . .

HANK BENNETT ON SHORTWAVE

A CONTEST WINNER - ANSWERS - AND STRANGE NOISES

Congratulations to Mr. Darrell Symington of Holland, Ohio, for having won the first portion of our stumpers. Several were up there near the top but, as they say, Mr. S. simply nosed out the other competition. He should be receiving a gift of a book from the Grove Library. Next month, the winner for the second portion, as soon as we have all the entries tabulated.

Here are the answers to the balance of the questions, going from #37 to #55 inclusive.

37-Easy Aces. A difficult question, apparently.

38-Morton Downey, my Mom's favorite for years.

39-The Adams Singers were once heard on both the BBC, London, and the ABC, Melbourne; perhaps other stations as well.

40-Eddie Startz was, for years, Master of Ceremonies of the very popular "Happy Station Program" from Radio Nederland, Hilversum,

Holland. My wife and I once had luncheon with this fabulous gentleman in the Big Apple.

41-Vera Lynn. Most of you had this one correct.

42-Bing Crosby. I'm told I had his middle name wrong. I said Louis; it should have been Lillas. I stand corrected.

43-Frank Parker and Marion Marlowe. Would anyone possibly have any information as to Miss Marlowe's present whereabouts?

44-Durwood Kirby.

45-Denise Lor was the primary gal singer. She was another person that was as nice off the air as she was on TV.

46-The Golden Terror was a pro wrestler from the grunt-and-groan days. I'm told that Buddy Rogers (Nature Boy) was the original Golden Terror but I don't believe it.

47-The Mariners? Arthur Godfrey's show.

48-Yours truly. Remember, I said radio columnist, not a radio commentator. I began in May, 1948. If someone out there has been writing radio

columns longer than I, speak up.

49-"Let Me Go Lover" by Joannie Weber.

50-Everyone guessed Don Ameche and Frances Langford. Correct.

51-Paul Whiteman.

52-You people are great - they were remote broadcasts by the Big Bands of the day, from ballrooms and night clubs, and they were live broadcasts, too.

53-WPG, Atlantic City, was the "World's Playground" station.

54-After WPG went off and WFPG, Atlantic City, came on the air, they got into the act with "The World's Greatest Playground." In either case, I've been there and I reserve my opinion.

55-I have never heard from anyone who ever received a QSL card from WBZA in Springfield, Massachusetts, a satellite station for WBZ.

- . . . -

In the near future we'll have another shot at some more questions. From our response it would indicate that this is a very popular feature.

- . . . -

Now for those strange noises. I haul my bones out of the sack when my beauti-

ful bride sticks a hot cup of coffee under my nose and the last thing that I'm interested in at 5 AM is DX'ing although I have been known to do strange things like that in my day.

However, we get the receiver tuned to WIP, Philadelphia, 610 kHz for the early news. Nearly every morning we get a tremendous heterodyne on the high side of the signal and I cannot determine the origin of it. WIP is virtually in line of sight from me so there is no problem getting them but this outsider certainly makes reception difficult at times.

The other strange noise is something that I can only compare with that all too familiar sound known as the Russian Woodpecker that we all hear on the shortwave bands. Only I'm not hearing it on shortwave. Generally, I've heard it late afternoons while tuned to WPEN on 950 kHz. It comes on and leaves in just a matter of 8 to 10 seconds. Several times I've grabbed the knobs and found the peak of the woodpecker-like noises to be around 880 or 890 kHz but not necessarily confined to that area. I fail to think that it could be that



SWL WORLD WATCH



by Ken Wood

Yes, it's hard to believe but we are already within sight of the end of what is normally considered to be the "DX Season" on the shortwave broadcast bands. The died-in-the-wool DX'er takes no notice of such things, however; he just plugs away pretty much the year around.

Spring frequency changes have already taken place and that should result in a little less congestion down on the 49 meter band as some of the big international broadcasters spend more of their hours up on 31 and 25 meters. There are still lots of good things to tune



HANK BENNETT cont'd

Russian scatter radar or whatever it is supposed to be ... or could it?

On quite a different subject, our town has a twice-yearly Red Cross blood donor drive. If the town meets the quota by the few that show up, the entire town is covered for all its blood needs for that period. If it doesn't meet the quota, the families of the donors are still completely covered. Why not find out if your town has a similar donor program? It only takes a few minutes, it's harmless, you'll feel good knowing that you might be saving the life of another person, and the doughnuts are free.

I've been challenged by some certain people to put my views on pirate and bootlegger stations into print. I've avoided this to prevent any conflict with a couple of our fine pirate editors. However, next month I shall give my views and I invite you all to tune in. You just might be surprised at the words that will come popping out of this typewriter.

for, no matter what time of the year it may be.

TOP O' THE LINE

Occasional reports continue to be noted concerning a Cameroon station on 7.290 identifying itself as "Radio Fartu." All the other Cameroon outlets use their home city as part of the station name and I can't spot any city of this name in any of my three atlases. So this may be a QRM'd ID. If the station has a "morning" broadcast it should sign on at 0430 but it has not yet been traced.

What's going on in Cuba? Nothing good from the sound of it. The medium wave Radio Rebelde has opened up a transmitter on 5.025 and is being well and widely heard there at whatever hour 60 meters may be open. The 4.765 Mayak outlet has been generating powerful spurs on several dial spots from 4.710 on up.

There are odd, open carriers of considerable strength appearing at several other spots in the 60 meter range, including 4.952, which may or may not have a Cuban origination. The frequency 4.060 now carries Radio Moscow at a strength which makes it seem it may be from Cuba. And an outlet in parallel with 4.765 has opened up on 4.485 and this also seems from a Cuban site.

The SWL world apparently missed the ceremonies during which the 60 meter band was deeded to Havana!

The Falkland Islands continue to be fairly well heard on 3.958; look for FIBS to sign on at 0900 and run until around 0500. Reception isn't super strong but it's a darn sight better than a few years ago when FIBS qualified as a first class DX catch. Get 'em now before the seasonal switch puts them back on 2.380 which is a more difficult frequency.

MULTI-HOPS

SYRIA continues to use 12.085 during our daytimes and in our evenings you'll find them on 7.430, all in Arabic and with especially good strength in the evenings. It's a good thing the frequency and time usage aren't reversed or they'd be more difficult to hear.

ZAIRE has reactivated its transmitter at Lubumbashi, now heard on 7.205 (and supposedly in parallel with 4.751) from sign on just before 0500.

There's no fresh information in the way of an identification for the new COLOMBIAN on 5.936, announcing most often simply as

"Caracol Carreno." It seems obvious this one is located at Puerto Carreno on the Venezuelan border and is, of course, a Caracol network outlet. Check for a sign-on around 0900.

Radio Earth, via Radio Clarin in the DOMINICAN REPUBLIC on 11.700 no longer broadcasts at its former 0300 time during weekdays. Instead, Radio Earth's programming occupies the better part of the day on Sundays. Something to do instead of sports on TV.

HCJB in ECUADOR has hopped on 6.205, burying the signal of the Voice of GREECE which laid claim to that spot two or three months ago after a move down from 6.225.

Look for Trans World Radio in SWAZILAND signing on at 0300 or just prior to the hour on 3.200, 3.240 and 5.055. Broadcasts open with an English ID and continue with a religious program in English or go into a local language broadcast.

Like Syria, QATAR has discovered the 7 MHz range and is now heard with a strong outlet on 7.320 up to its sign off at 2130. It may be on this frequency in our evenings as well; I frankly haven't remembered to check.

The not-so-often-heard SUDAN is being noted with its broadcasts in Arabic around 0400 and later on 5.039. This station's recent history includes a number of inactive periods so if you need Sudan, better try to add them to your log now, while you can.

Radio Nacional de ANGOLA continues to be widely heard on a variable frequency around 5.335, both in the afternoons and evenings U.S. time. Broadcasts are entirely in Portuguese. This frequency is about the best reception available from Angola. Recently, though, a much rarer outlet - Emissor Regional do Zaire at Mbango Congo - has been logged to 2200 sign off on 4.885. Check also for a sign on at 0500.

The Voice of the People of KAMPUCHEA still uses 11.938, carrying 15 minutes of English at 1200 before switching to French at 1215 and various area languages at 1230. It's not snap to hear, especially with much quality.

Radio Centrafricaine from the CENTRAL AFRICAN REPUBLIC can be found when good African conditions grace the bands. Look for this one on slightly variable 5.035 in French from an 0530 sign on. Bangui isn't one of the strongest African outlets in the 4 to 5 megahertz range, but not one of

the weakest either.

If 49 meters is still open to your area during the 2000-2100 time period, try for the Democratic YEMEN Broadcasting Service from Aden using 6.005 in Arabic. It can also be heard in the evenings - 0300-0400 area - although through layers of QRM, including interference from Radio Reloj on 6.006. Another 2000 try is Radio Bardai, a clandestine using Libyan transmitters on 6.009 up to 2030 sign off, in French.

EQUATORIAL GUINEA's "servicio internacional" continues on variable 15.107 from as early as 1700 to 2200 sign-off, generally in Spanish, with a mixture that includes everything from rock and roll to English-language, US-produced religious programs.

Early mornings and early evenings (0200-0300) are the best times for hearing stations in GUATEMALA. Check for TGNA, the easiest, strong on 3.300 and less so on 5.955. Radio Chortis at Jocotan uses 3.380 to 0300. Radio Tezulutlan at Coban operates on 3.370 and 4.835. Radio Mam at Cabrican is on 4.825.

Less often heard is Radio Maya de Barillas in Huehuerenango on 3.325. La Voz de Nahualla is on 3.360 until 0230. Adventist World Radio's Union Radio in the capital is on 6.090 and sometimes gets through the QRM.

The only Guatemalan outlet that is not a religious/educational station is the government's La Voz de Guatemala, sporadically active on 6.180.

It may be too late in the season but check for All INDIA Radio's Aizawal transmitter site on 7.295 from 1130 sign on. The transmission lasts for only 45 minutes and is in local languages. Watch out for Radio MALAYSIA from Kuala Lumpur, also on this frequency.

As far as U.S. listeners are concerned, Radio BOTSWANA made a poor decision in moving from 4.848 to 4.820 where it now receives interference from the Honduran, HRVC. As an alternate try 7.255. Sign-on is around 0345 with the usual barnyard interval signal.

The ECUADORIAN religious outlet Radio Federacion at Sucua is occasionally noted on 4.960 in Spanish and local Indian languages. But it only runs til 0100 sign off, and sometimes pulls the plug even earlier. The signal is seldom very strong although it would probably be better if the

station were on later.

Meantime, 30 kilohertz lower, 4VEH the Haitian religious outlet (and the only active shortwaver from HAITI) puts in consistently good signals on 4.930 early mornings and evenings. Most programming is in French and Creole.

The ANTIGUA relay site carrying Deutsche Welle and BBC programs is currently heard on 6.040, 6.175, 6.195, 9.510, 9.535, 11.810, 11.820, and 15.335 at various hours.

The NICARAGUAN, Radio Sandino, continues to put in good signals on 6.200. Programs are all Spanish and the station seems to be running on a 24 hour a day schedule.

The semi-rare Mexican, Radio Universidad de Sonora, can be found occasionally on 6.115 with all cultural (classical music) programming in Spanish. The COLOMBIAN La Voz del Llano is always strong on 6.117 so expect it to cause some QRM.

GUINEA-BISSAU continues to operate a considerable distance from its former 5.041 frequency - now on 5.475. Check for Radio Nacional in Portuguese up to 0000 sign off and again at sign on, 0600.

AUSTRIAN Radio has closed down its lower-power home service transmitter at Aldrans which operated for years on 6.000. That frequency has been taken over by one of the high power Moosbrunn transmitters for ORF's foreign service broadcasts.

Early risers may want to try something from CHILE other than the easily heard Radio Nacional. A good candidate is Radio Minería on 9.750 around 1030. 'Taint easy though; there's a lot of QRM surrounding Minería's weak signal. Another one is Radio Patagonia on 6.080 which signs on around 1030. This one is at Colhaique.

It's still easier to log most of the unlicensed LEBANESE outlets than it is the government's Radio Lebanon which hasn't been noted in some time. Try the Voice of Hope on 6.215, Voice of Lebanon on 6.550, and Voice of Arab Lebanon on 6.233. The first two are heard from 0400 sign on, the latter around 2100, although it should be on the air in our evenings as well. None is very strong.

Radio Noumean in NEW CALEDONIA has been noted with programs in French around 0800 on 3.355, 7.170 and 11.710. The 41 meter band frequency should offer

the best reception in most areas.

Way, way "down under" the AFAN (Armed Forces ANTARCTIC Network) continues to broadcast from McMurdo base and can be heard occasionally around 0800 and later on 6.012. U.S. popular music may give you a clue.

Radio Illimani in BOLIVIA continues well heard in Spanish during U.S. evenings on 6.025. Fairly consistent but less strong is Radio Nuevo America in the evenings and around 1000 on 4.797.

CHALLENGER

Radio NYAB at Thimpu, Bhutan, has been one of the top two or three most difficult countries to hear. Now they've gone and made things even more difficult. They've dropped the former 4.610 frequency in favor of 3.395 where interference from Indonesian regionals would block the signal even in the one-in-a-million chance NYAB were to propagate this far! Best hope used to be mid-winter from 1100-1400 on Wednesdays and Fridays only.

I promise to provide an easier challenge next month!

JEEVES SAYS -

Still no sign of any activity from the various new U.S. shortwave stations, including WMLK in Bethel, Pennsylvania; KCBI in Dallas; or KVOH at Rancho Simi, California. Just proves the old rule that you should always tag on at least six months to any start-up date you hear about (One or more of these may be on the air by the time you read this, of course).

This is the prime time of the year to go after stations in Papua New Guinea. So, make a list of what you need and start searching them out during the 1100-1300 period.

Meantime, let's have your logs and other short-wave broadcasting news, in care of MONITORING TIMES headquarters. We'll be back with you again next month.

73's - Ken.

AFAN MCMURDO
NAVSUPFORANTARCTICA
FPO, SAN FRANCISCO, CA, 96601

WELCOME TO THE CLUB:
YOU ARE ONE OF THE FEW INDIVIDUALS WHO HAVE HEARD THE AMERICAN FORCES RADIO STATION IN ANTARCTICA. AFAN BROADCASTS 24 HOURS PER DAY FROM 77° 51' SOUTH 166° 39' EAST. AFAN SERVES THE MILITARY AND CIVILIAN PEOPLE WORKING WITH THE UNITED STATES ANTARCTIC PROGRAM. LISTEN AGAIN.

[Signature]
AFAN STATION MANAGER

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

This month we conclude our look at short-wave broadcasts from Europe.

ITALY: This is becoming a difficult country to hear in the English language! Try 5990/9575 at 0100 UTC (but see Vatican, below).

NETHERLANDS: The Dutch World Broadcasting system continues its fine reputation for signal strength and reliability; under any but the worst ionospheric disturbance they have a listenable channel somewhere! The evening broadcasts are directed to North America, although you may hear them beamed to Africa earlier in the day, especially on higher frequencies.

Programs maintain their usual high quality, and they are justly renowned for their news and news analysis content ("Newslines"). Some special programs include the well known "Media Network" produced by Jonathan Marks which looks at electronic developments; "Shortwave Feedback" which answers listeners questions (and has featured the "phone-in" type of program previously mentioned; if you want to call them the number is 31-35-18700).

Then there is that unique and friendly program each Sunday in which host Tom Meyer proves the reality of the slogan, "Keep in touch with the Dutch"! This is of course the "Happy Station Show" and always has an interesting content of music from all parts of the world, and greetings to listeners in their own native language from the multi-lingual host.

NORWAY: Radio Norway has a restricted English schedule -- Sundays only -- for about 30 minutes, I believe. 15 MHz at 1400, and 11 MHz at 1700 have been heard, but RNI reception is very dependent on good propagation.

PORTUGAL: Lisbon is something of an "in-and-

outer" as far as signal strength goes! At times they put in a real powerhouse signal, but other days you may be "fishing" to hear a weak and watery sound. They have quite interesting news bulletins, European-oriented, and uniquely fascinating folk music -- "fado" type. The 6 MHz frequencies in the evening are best heard since they are directed to our continent; however, like R. Nederland, we may sometimes hear the Africa beam on the 11 MHz band around 1700/1800.

SPAIN: Along with Holland this country puts out a consistently powerful signal. The Spanish Foreign Radio ("Radio Exterior de Espana") has two evening transmissions to North America on 9630/11880 kHz. Both of these, curiously enough, are listed as coming from the Noblejas transmitter site near Toledo, Spain. I would have thought that their relay at the Canary Islands would have been included, since this is such a favorable site to cover the Americas in bad propagation conditions, but the latest bulletin from Madrid makes no mention of the Canary station (perhaps it is off the air; does anyone have information on this?).

Anyway, the 9630 channel, excepting during fadeouts, is a solid entertainment level signal with me. Programs were covered in some detail previously, so I won't go over them again.

SWITZERLAND: SRI is not so good these days! However, you can usually hear their half hour broadcast on 6135 at 0145 with the well known music box interval signal and time from a Swiss watch! An alternate is 17765 at 1315, but not reliable reception. The evening broadcast includes a 500 KW station on 9725, but even this cannot overcome propagation fadeouts which, as I have indicated lately, are all too commonly affecting anything higher than the 6 MHz (49 meter) band.

Programs include the Swiss Shortwave Merry-Go-Round for DX fans; and don't forget the "Swiss Mosaic" competition...you might win a free trip to Switzerland!

SWEDEN: Radio Sweden used to be one of my favorite stations, especially on account of their "Sweden Calling DXers" program which contained all sorts of interesting and useful tips

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YOUR RECEPTION
REPORT AND
INTEREST.

PIRATE RADIO cont'd

postage stamps. Pirates are nonprofit operations. Be sure to tell the station what sort of receiver and antenna you are using in addition to how well you are hearing them. Also include some details about yourself. Pirates like to know who their audience happens to be.

Radio Clandestine is one of America's most popular pirates with a 10-year history of broadcasting. R. F. Burns assures us it is planning to return for an eleventh year. One of the reasons that the station has been around so long is that it does not maintain a regular schedule and uses many different frequencies. However, if you are listening for them some of the frequencies reported recently include 7355, 7375, and 11877.

CUBA: By the time you read this perhaps Radio Marti may have finally become a reality. Rumors are once again circulating that the station is about to take to the air, with January 28 being the date mentioned for the initial transmission.

There may be no connection at all, but in mid-December the Cuban medium wave network Radio Rebelde began transmitting on short-wave. You can hear them quite easily day or night on 5025 kiloHertz. Could this be a warning signal from Castro that two can play the radio game?

CLANDESTINE REPORT: A December 30 Associated Press report by Kay Bartlett claims there are at least 46 clandestine stations currently broadcasting. One anti-Khomeini clandestine, Voice of the Liberation of Iran, is said to be a CIA operation, according to staff persons at the BBC. The article also notes that under Czechoslovakian law collaboration with Radio Free Europe is high treason.

ISRAEL: Recently both the VOA and Israel Radio have again commented on the American request for a transmitter site in Israel to broadcast to the USSR. An Israeli commission has discussed the request, but no decision has been made. Although the State Department and the VOA refuse to comment, it appears that the site is wanted primarily for broadcasts about the situation in Afghanistan. Apparently several other countries said no to Washington before the request was made to Israel.

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



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The only exceptions to the above are those that are listed in the February column.

EXCLUSIVE

The circumstances really haven't changed drastically in well over a decade. It's intrigue in the guise of a YL with a somewhat mechanical sounding voice repeating the same 4-element alpha-numeric groups for several minutes. The intercepted groups or - possibly calls - are usually "Kilo Papa Alpha Two," "Charlie India Oscar Two," or "Victor Lima Bravo Two."

PHONETIC ALPHABET STATIONS

Another Look

A typical frequency is

NUMBERS: Is anybody else hearing the Spanish numbers transmission around 5615 about 0100? It is somewhat unusual in that the announcer is a man with rather unevenly spaced 5-digit groups repeated. This transmission seems far less "mechanical" than most numbers transmissions. Here in Florida the signal is very strong.

RECOMMENDED LISTENING:

The recent arrival of a QSL reminded us that one of the most enjoyable pirates we have heard in a long time is KFAT. It has a unique sound which features some little heard country and folk music. If you can catch them we think you will enjoy the sound. Normally KFAT programs are relayed by the Secret Mountain Laboratory. We heard them last fall on 7432 kiloHertz.

NEW ADDRESS: You can now send your pirate and clandestine news for this column directly to the editor. All contributions are welcome, and you may remain anonymous if you prefer. Send your letters to Radio News, Post Office Box 1116, Highland City, Florida 33846. We hope to hear from you soon!

7445 kHz. Typical times are 0215Z or 0245Z. As usual the transmissions are difficult to copy and are best received - in most cases - in the USB mode.

Hundreds of these intercepts have been reported over the years to most of the short-wave clubs that deal in utility transmissions. Phonetic alphabet traffic is often reported with few - if any - comments.

One area of neglect is that the "traffic frequency" of 7540 kHz is active 5-minutes after cessation of 7445 kHz activity!

The "traffic format" is as follows:

- (1)"JID" (Phonetically for several minutes)
(2)"Message" (2X)
(3)"Group Four" (2X)
(4)"Text" (2X)
(5)"HTIWF BEICE ZNVNG QBIMU" (Phonetically)
(6)"End of Message" (2X)
(7)"Repeat" (2X)
(8)"Message" (2X)
(9)"Group Four" (2X)
(10)"Text" (2X)
(11)"HTIWF BEICI ZNVNG QBIMU" (Phonetically)
(12)"End of Message" (2X)
(13)"End of Transmission" (2X)

If more than one message is transmitted, element #12 changes to: "End of Messages."

The 3-element identifier(?) in element #1 continually changes.

Another very curious aspect of these transmissions is that "November" is ALWAYS pronounced as "November!"

Other frequencies to watch:

- 4672//7605 kHz VLB2
9965 kHz CIO2
12950 kHz VLB2
13925 kHz CIO2

Monitors should tune just a few kilohertz higher in frequency after termination of the first phase of these transmissions. It's most likely that traffic will be passed as I have outlined.

As this column follows a literal interpretation of the Communications Act of 1934, the printed "crypt" is not an exact facsimile.

There'll be more on these stations in the next

issue of MONITORING TIMES.

THE OTHER SIDE OF THE STORY

Remember the lead shorty in this column a few months back about the USS Scorpion? Shortly after publication, the Norfolk Virginian-Pilot and the Ledger-Star reported a somewhat different version of my lead item.

Seems that these newspapers obtained information through the Freedom of Information Act that an accidental (italics mine) explosion of a torpedo was the probable cause of this disaster.

The sub's crew - according to the FOIA response - was attempting to disarm a malfunctioning torpedo when this tragic disaster occurred.

I - PURPOSELY - omitted the fact in my story that I had advance information on the upcoming release of these FOIA documents and parts of the contents.

It's not know at this time if those mysterious radio transmissions were mentioned in these FOIA releases.

Feel free to reach your own conclusion regarding this incident.

LANI HAS A CONTEST

Lani Petit resides in Sioux City, Iowa. Lani - a lady of intrigue - is the editor of "Spy Centre." This is a regular feature of The Ace. You find all kinds of "numbers" intercepts in Lani's column. How do you do it, Lani?

Lani decided it would be lots and lots of fun to have a contest(?) in the December issue of The Ace. Is the bearded gent by Lani's side Havana Moon, Alice Brannigan, The Babblor or ...

IT'S NOT ME, LANI! You're going to have to find a guy with no glasses and no beard. He should also have brown eyes and ...

Will the REAL Alice Brannigan please stand. Go for it, Lani!

HAVANA MOON'S MAILBAG

PHIL ABRAMS of Vienna, VA, checks in with Tyson's Corner (also in VA) information. Phil reinforces my statement that it's unlikely that "numbers" transmissions originate from Tyson's Corner.

Phil says VHF/UHF antennas abound in this area.

Thanks for the info, Phil. It's much appreciated.

JAMES INGRAM resides in the great state of California in a city by the name of Aromas. James was kind

LOS NUMEROS cont'd

enough to provide "Los Numeros" with a MOST UNUSUAL phonetic alphabet transmission on 6850 kHz SSB.

On 29 November James intercepted an OM (NOT A YL) literally screaming 5-element alpha groups phonetically. Time of this transmission was approximately 0545Z.

At the time of this intercept, James was using a Uniden CR 2021 with a 35' random wire running East-West.

I'm going to call this the UNUSUAL INCIDENT for this issue, James. Also unusual since you're the FIRST from California to respond to this column.

The tape and intercept were much appreciated, James. How about being a regular and could you check the Sonoma area for "numbers" transmissions?

A NEW YEAR'S EVE INTERCEPT

The time was 0500Z and the date was January 1, 1985. The frequency was 3447 kHz and a YL was reading 5-

digit groups in Spanish. Very prominent in the background was ANOTHER 5-digit Spanish transmission. Two tracks at the same time? One of the strongest transmissions I've ever monitored!

At 0200Z on a frequency of 3080 kHz another YL with 5-digit Spanish. Repeat frequency was 3444 kHz at 30 past the hour. A very pronounced "echo" on both frequencies.

A YL with 5-digit German was noted on 4575 kHz at 0520Z on same date.

On January 2nd, 5-digit Spanish noted on 3444 kHz at 0300Z with a repeat on 4444 kHz at 30 past the hour.

It appears that most - if not all - 6-digit Spanish transmissions now repeat at 30 past the hour rather than 15 past.

All of above modes were AM with frequencies being + or - 2 kHz.

INVESTIGATION CONTINUES

Am still researching various sources about those mysterious USS Scorpion radio transmissions. Watch this column for further

information.

During my research/investigation I have encountered two others with similar interests. How curious!

BY THE TIME YOU READ THIS

It's a possibility that the long awaited Radio Marti will be active, on a limited basis, on a frequency of 1180 kHz. Fidel's "jammers" can't be far behind!

"Los Numeros" would be most interested in printing a copy of the first "Marti" QSL.

MAINTAIN A CLOSE WATCH

Continue to monitor between 6840 and 6855 kHz. MANY, MANY strange transmissions in this area of the spectrum over the past months.

CHINESE NUMBERS TRANSMISSIONS

A most reliable source - speaking on the condition that anonymity be preserved - tells me that Chinese numbers transmissions can be traced back as far as 35-years!

The transmissions are

often reported in The Ace.

THANKS TO

Phil Abrams, James Ingram, Zel Eaton, Lani Petit, John Santosuosso, Bob Russ and those sources that wish to remain anonymous.

You made my day with the contest, Lani.

Thanks for your input. I wish it were possible to answer every letter. While this isn't always possible, I will make every attempt to acknowledge every letter through this column.

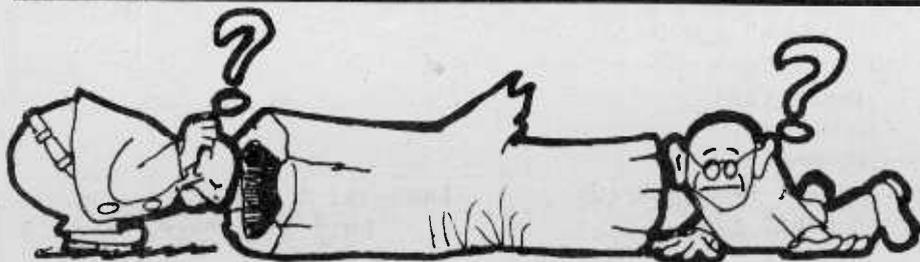
YOUR SUPPORT IS GREATLY APPRECIATED.

Time now for a Tecate and ...

Adios,
Havana Moon y Amigas

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

P.S. Don't feel bad about not caring for Tecate, Bob. There was a time when I had the same feelings.



listener's log

Interested in some unusual monitoring? How about swapping loggings of stations heard in the 1600-1800 kHz portion of the spectrum with veteran "top band" enthusiast Craig Healy?

The author invites fellow monitoring enthusiasts to send in their own interesting loggings and if accompanied by first class postage stamp, Healy will send you at no charge a copy of his 1984 "TOP END YEARBOOK."

From time to time MT has published updated lists of intriguing beacon and other intercepts from that curious chunk of spectrum; what follows is Healy's collection from February.

Logging 170 Meters

by Craig Healy - 66 Cove St. - Pawtucket, RI 02861

FREQ	IDENTIFICATION AND TIME/DATE
1607	0130 10/11 Cubic Argo (Chituck)
1610	ANGUILLA 0140 1/2 Caribbean Beacon (Harbison)
1610	ANGUILLA 0134 10/11 Caribbean Beacon (Chituck)
1613	GUATEMALA Rabinal 0100 1/2 RAB (Harbison)
1614	0352 11/27 long tone, 30/min (Chituck-ICELAND)
1617	0136 10/11 Cubic Argo (Chituck)
1619	0138 10/11 Cubic Argo (Chituck)
1620	0722 1/1 KA83316. ID every 4 min (Geary)
1621	0330 12/2 UBT (Saloka)
1621	0740 1/1 UBT (Geary)
1621	2314 11/24 Cubic Argo (Chituck-ICELAND)
1622	0324 12/8 KA83774 (Saloka)
1622	0545 11/9;0255 11/30 KA83774 every 4 min (Geary)
1622	0538 11/9 KA83776 every 4 min (Geary)
1622	NEW YORK Yonkers 0250-0518 11/30 KPF-941 music and IDs (Geary)
1625	ECUADOR Pastaza 0351 12/2 PAT (Saloka)
1625	0343 12/2 KA82777 (Saloka)
1627	0207 12/23 carrier w/AM modulation (Chituck)
1628	0110 11/2 Cubic Argo (Chituck)
1629	0146 12/26 H313 (Harbison)

1630	0354 11/27 carrier w/AM modulation (Chituck-ICELAND)
1632	0010 1/20 W182 (Geary)
1632	0306 12/8 KA83326 (Saloka)
1632	0142 11/2 Cubic Argo (Chituck)
1632	0508 9/18 KA83324 every 4 min (Geary)
1632	0510 9/18 1:1 and dash every 4 min (Geary)
1632	0520 9/18 DW03 and dash every 4 min (Geary)
1634	0143 10/11 Cubic Argo (Chituck)
1634	0323 12/27 B44 (Harbison)
1634	0231 1/4 B444 (Harbison)
1634	0233 1/4 T185 (Harbison)
1634	0046 11/25 I313 (Saloka)
1634	0047 11/25 A314 (Saloka)
1634	0045 11/25 J314 (Saloka)
1635	0416 12/17 L447 (Harbison)
1635	0426 12/17 F59 (Harbison)
1635	0427 12/17 A314 (Harbison)
1635	0456 12/17 Y190 (Harbison)
1635	0327 12/27 I313 (Harbison)
1635	2226 12/27 Y14 (Harbison)
1635	0141 12/30 KA84049 (Harbison)
1635	2255 1/9 I58 (Harbison)
1636	0402 12/2 I284 (Saloka)
1636	0356 12/2 R119 (Saloka)
1636	0357 12/2 0221 (Saloka)
1636	0356 12/2 L313 (Saloka)
1636	0354 12/2 KA80041 (Saloka)
1636	0143 1/1 L446 (Harbison)
1636	2254 1/9 R353 (Harbison)
1637	0125 1/3 J314 (Harbison)
1637	0125 1/3 S340 (Harbison)
1637	0040 11/25 S340 (Saloka)
1637	0127 1/3 0447 (Harbison)
1637	0129 1/3 I448 (Harbison)
1637	0130 1/3 U446 (Harbison)
1637	0131 1/3 E284 (Harbison)
1637	0137 1/3 I55 (Harbison)
1638	0005-0010 1/20 0381 (Geary)
1638	0005-0010 1/20 F59 (Geary)
1638	0005-0010 1/20 H181 (Geary)
1638	0005-0010 1/20 I55 (Geary)
1639	0333 12/8 KA83334 (Saloka)
1639	0148 11/2 Cubic Argo (Chituck)
1639	0209 12/23 carrier w/AM modulation (Chituck)
1642	0139 1/3 N322 (Harbison)
1642	0140 1/3 0448 (Harbison)
1642	0141 1/3 Y444 (Harbison)
1642	0142 1/3 H374 (Harbison)
1642	0143 1/3 0384 (Harbison)

LOGGING 170 METERS cont'd

- 1642 0144 1/3 Q450 (Harbison)
- 1642 0145 1/3 V448 (Harbison)
- 1642 0153 1/3 KA83797 (Harbison)
- 1642 0200 1/3 Z283 (Harbison)
- 1642 2300-2325 1/19 O442 (Geary)
- 1642 2300-2325 1/19 R448 (Geary)
- 1642 2300-2325 1/19 Z190 (Geary)
- 1642 2300-2325 1/19 C321 (Geary)
- 1642 2300-2325 1/19 R280 (Geary)
- 1642 2300-2325 1/19 O445 (Geary)
- 1642 2300-2325 1/19 B432 (Geary)
- 1642 2300-2325 1/19 B431 (Geary)
- 1642 2300-2325 1/19 L335 (Geary)
- 1642 2300-2325 1/19 Q17 (Geary)
- 1642 2300-2325 1/19 Q450 (Geary)
- 1642 2300-2325 1/19 L350 (Geary)
- 1642 0404 12/2 DT98 w/dash (Saloka)
- 1643 NORWAY Gandall 0210 11/23 LGB TLX (Chituck-ICELAND)
- 1645 0144 10/11 Cubic Argo (Chituck)
- 1645 2317 11/24 Decca HiFix (Chituck-ICELAND)
- 1646 0210 12/23 Cubic Argo (Chituck)
- 1648 0113 1/3 B381 (Harbison)
- 1648 0114 1/3 C44 (Harbison)
- 1648 0413 12/2 FRB (Saloka)
- 1648 0218 11/2 Decca HiFix (Chituck)
- 1650 0010-0020 1/20 B381 (Geary)
- 1650 0010-0020 1/20 E448 (Geary)
- 1650 0010-0020 1/20 P284 (Geary)
- 1650 0010-0020 1/20 J105 (Geary)
- 1650 0207 1/3 D448 (Harbison)
- 1650 0207 1/3 E448 (Harbison)
- 1650 0209 1/3 X448 (Harbison)
- 1651 0420 12/2 KA80045 (Saloka)
- 1651 0145 10/11 Cubic Argo (Chituck)
- 1656 0205 1/3 KA84070 (Harbison)
- 1661 1037 10/11 Carrier burst (Chituck)
- 1672 0231 11/2 Cubic Argo (Chituck)
- 1673 0209 11/23 Decca HiFix (Chituck-ICELAND)
- 1674 0146 10/11 Cubic Argo (Chituck)
- 1683 0233 11/2 Cubic Argo (Chituck)
- 1685 COLOMBIA Mercaderes 0042 12/17 MER (Harbison)
- 1685 COLOMBIA Mercaderes 0353 11/25 MER (Saloka)
- 1685 COLOMBIA Mercaderes 0714 12/3 MER (Hardester)
- 1690 0402 11/27 unid RTTY (Chituck-ICELAND)
- 1707 0236 11/2 "T" beacon (Chituck)
- 1709 SCOTLAND Rosyth Fife 0406 11/27 MTO (DE MRK CW) (Chituck-ICELAND)
- 1709 0149 1/11 "A" beacon (Chituck)
- 1712 0245 11/2 TTI (Chituck)
- 1714 0150 10/11 TTI (Chituck)
- 1715 ICELAND 0909 11/23 2-way comm, Iceland police (Chituck-ICELAND)
- 1715 COLOMBIA Puerto Asis 0716 12/3 NIS (SIS?)(Hardester)
- 1726 0206 11/23 Decca HiFix (Chituck-ICELAND)
- 1730 0248 11/2 carrier w/AM modulation (Chituck)
- 1735 0205 11/23 "
- 1737 0249 11/2 "
- 1739 0203 11/23 SSI (Chituck-ICELAND)
- 1744 0151 10/11 "A" beacon (Chituck)
- 1744 0250 11/2 "H" beacon (Chituck)
- 1745 0201 11/23 IT (Chituck-ICELAND)
- 1746 0152 10/11 1 tone/2 sec (Chituck)
- 1747 0252 11/2 1 pip/sec
- 1747 0159 11/23 unid CW (Chituck-ICELAND)
- 1748 0410 11/27 EET (Chituck-ICELAND)
- 1749 0153 10/11 Cubic Argo (Chituck)
- 1749 0153 10/11 Cubic Argo (Chituck)
- 1749 0153 10/11 "W" beacon (Chituck)
- 1749 0411 11/27 Norwegian voice comm (Chituck-ICELAND)
- 1751 0154 10/11 Cubic Argo (Chituck)
- 1751 0157 11/23 ST (Chituck-ICELAND)
- 1752 0254 11/2 Cubic Argo (Chituck)
- 1753 0155 10/11 Cubic Argo (Chituck)
- 1756 0155 11/23 TC (Chituck-ICELAND)
- 1758 0053 1/8 Navigational station (Harbison)
- 1758 0255 11/2 Cubic Argo (Chituck)
- 1760 0156 10/11 Cubic Argo (Chituck)
- 1764 0256 11/2 HT (Chituck)
- 1765 0157 10/11 HT (Chituck)
- 1766 0154 11/23 Decca HiFix (Chituck-ICELAND)
- 1769 0159 10/11 Cubic Argo (Chituck)
- 1769 0152 11/23 unid RTTY (Chituck-ICELAND)
- 1783 0010 1/8 Dot Dash beacon, no order (Harbison)
- 1783 0359 11/25 "beeps" (Saloka)
- 1796 0147 11/23 TT (Chituck-ICELAND)

Credits:

- Mike Hardester - Littleton, CO - R-1000, Radio West Active Antenna
- Kermit Geary - Walnutport, PA
- Bill Hardy - Abedeen, WA
- Norm Harbison - Monroeville, NJ - DX-302, 130' dipole
- Joe Sloka - Chardon, OH - Drake R4C, 160 meter dipole
- Bruce Chituck - Pax River, MD - DX-302, 65' wire
- Bruce Chituck - Kevlavik, ICELAND - same

TUNE IN CANADA



by
Norman H. Schrein

FOX MARKETING, INC.
4518 Taylorsville Road
Dayton, OH 45424

To begin this month's column, I would like to mention to those in the Windsor, Chatham, and Sarnia areas that the revised Fox Scanner Radio Listing is now available and contains information on Kent and Lambton counties as well as Essex County which had been covered in the first edition.

Here are a few frequencies from the area:

- 46.680 XLR 60 ON Min. of Nat.Resources Rondeau Park, ON
- 46.700 XLR 60 "
- 46.760 XLR 60 "
- 155.070 CJM 458 Chrysler Co. of Canada Windsor, ON
- 154.070 XJI 759 Tilbury Fire Dept. Tilbury, ON
- 149.770(P) CGG558 Bell Canada Windsor, ON
- 49.600 XOH 744 Ontario Hydro Wyoming, ON
- 151.45 VCW 515 Canadian Industries Courtright, ON
- 412.0625 XJK 533 Nanticoke Fire Dept. Waterford, ON
- 140.190 XJK 63 RCMP Sarnia, ON
- 140.310 XJK 63 "
- 140.400 XJK 63 "
- 140.490 XJK 63 "
- 149.290 XKD 55 St. Joseph's Hospital Sarnia, ON
- 165.510 CGE 217 Bell Canada Sarnia, ON
- 171.180 XNX 41 Lambton Co.Bd. of Edu. Sarnia, ON

Next is a mixed bag of frequencies across the country:

- 30.580 VE9 SP Canadian Motorola Electr.Throughout ON
- 417.4125 XJL 648 Montreal Public Works Montreal, PQ
- 149.665 XKE 935 Checkpoint Comms. Toronto, ON
- 168.180 XNE 890 B.C. Coal Sparwood, BC
- 168.270 XNE 890 "
- 168.660 XNE 890 "
- 168.8709 XNE 890 "
- 30.040 VCL 709 Larry W. Brown, Ltd. Chelsey, ON
- 165.600 VGJ 260 Northwood Pulp & Timber Prince George, BC
- 166.530 VGJ 260 "
- 150.995 VGJ 260 "
- 156.750 VGJ 260 "
- 154.620 CJJ 899 Societe De Energie De La Baie
- 155.550 CJJ 899 James Brisbay, PQ
- 154.740 CJJ 899 "
- 168.180 XNE 889 Orlick Transport Edmonton, AL
- 168.270 XNE 839 "
- 168.660 XNE 889 "
- 168.870 XNE 839 "
- 463.300 CJK 434 Rapid Transport Terminal Montreal, PQ
- 162.620 VCP 865 Nelson Crushed Stone Burlington, ON
- 156.870 CHD 752 Kartronix, Ltd. Airdrie, AL
- 158.190 CHD 752 "
- 451.037 CHD 752 "

Finally, here is a frequency listing for Jasper, Alberta. This would be a good list to take for this summer's vacations.

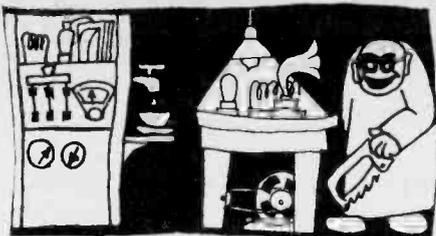
- | Base | Mobile | Call | Licensee |
|---------|---------|---------|-------------------------|
| 140.310 | | XNH 963 | Alberta Power Co. |
| 140.400 | | XNH 963 | " |
| 140.550 | | VCV 468 | Mclagan, George Douglas |
| 141.118 | 138.075 | XOV 266 | Alberta Power Co. |
| 141.180 | 138.705 | XNH 821 | " |
| 414.210 | 138.735 | XNH 821 | " |
| 141.240 | 138.765 | XNH 821 | " |
| 141.300 | 138.825 | XNH 821 | " |
| 141.330 | 138.855 | XNH 821 | " |

TUNE IN CANADA cont'd

141.330	148.900	CJM 276	Trans Mountain Pipeline
151.805		CHB 756	Canadian National RR
152.480	157.740	XNH 821	Alberta Power Co.
152.960		XNH 821	"
153.320		XOW 439	Commercial Electric Jasper
153.530		XHN 821	Alberta Power Co.
153.530	154.430	XNV 732	Northwestern Utilities
153.560	154.280	XNV 732	"
153.590	154.310	XNV 732	"
155.430	143.800	XJE 235	RCMP
155.640	155.040	XJE 235	"
155.670		XJE 235	"
155.700	154.950	XJE 235	"
157.620		XOQ 379	Inldic, Rajka S.
158.190		XNH 821	Alberta Power Co.
159.030		XNM 794	Seton General Hospital
160.215	160.905	CZA 27	Canadian National RR
160.275	161.145	CZV 567	"
160.365		CZV 567	"
160.395	160.965	CZA 27	"
160.665		CZA 27	"
160.785		CZA 27	"
160.935		CZV 567	"
161.025		CZV 567	"
161.205		CZA 27	"
161.415		CZV 567	"
163.560		XNB 658	Marmot Basin Ski Lift
164.310		XNX 333	Brewster Transport
166.050	166.650	XLL 882	Dept. of Indian Affairs
166.290		XLL 882	"
166.605		XLL 882	"
166.725		XLL 882	"
171.660		XOW 36	Marmont Import/Export
414.360	138.885	XNH 821	Alberta Power Co.

That's it for this time. Next month we will continue on the frequencies below 30 MHz. -- GOOD MONITORING!

EXPERIMENTER'S



WORKSHOP

CURING THE RFI ON THE MX-5000

by Bob Grove

Although an excellent wide - frequency - coverage scanner, the overall sensitivity of the Regency MX-5000 is often hampered by internally-generated multiplex noise which is especially severe when using the accompanying telescopic whip.

Regency has recently released a modification procedure which virtually eliminates this annoyance; it should be attempted only by persons familiar with electronic circuitry and delicate soldering procedures.

The approach consists of adding three 0.01 microfarad and one 100 picofarad ceramic capacitors, the miniature variety--any voltage rating.

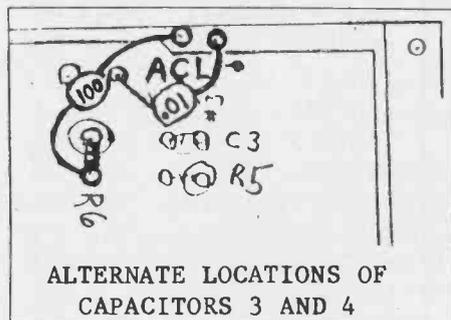
Carefully disassemble the cabinet, unplugging the

upper speaker cable from the main circuit board. You will need to remove the main PC board from the cabinet mounts to access the solder points for the capacitors. The CPU/LOC board will have to be removed from the front panel as well.

Consult the diagram below to determine the locations for the four bypass capacitors and be sure to clean the solder-resist material from the circuit board and resistor lead before soldering the capacitors in place.

Note the optional underside mounting procedure for capacitors 3 and 4 to avoid removing the LCD display. Capacitor 3 (100 pF) is attached to the top lead of resistor R6 and to the ground hole about "AC" in "ACL"; remember to scrape the coating from the resistor lead and the solder mask from the ground foil.

Capacitor C4 (.01) is connected from the hole next to "A" in "ACL" to the ground hole above "L" in "ACL."



ALTERNATE LOCATIONS OF CAPACITORS 3 AND 4

TECHNICAL TOPICS by Bob Grove

Q Since one side of a coax-fed dipole is connected to ground, wouldn't I get the same reception simply leaving it off and using only the section connected to the coax center conductor?

A No. The entire antenna length intercepts the on-coming wave, developing a voltage across it just as though it were a turn of wire in a transformer. Your coax is attached at a point which can be considered like a tap on that transformer winding, at a point where the transfer of energy is most efficient for the characteristic impedance of the coax.

Q Regency shows a much narrower frequency range for their new HX-1000 handheld programmable scanner than what is advertised in the Grove catalog; which is correct? (Charles Skeen, St. Albans, WV)

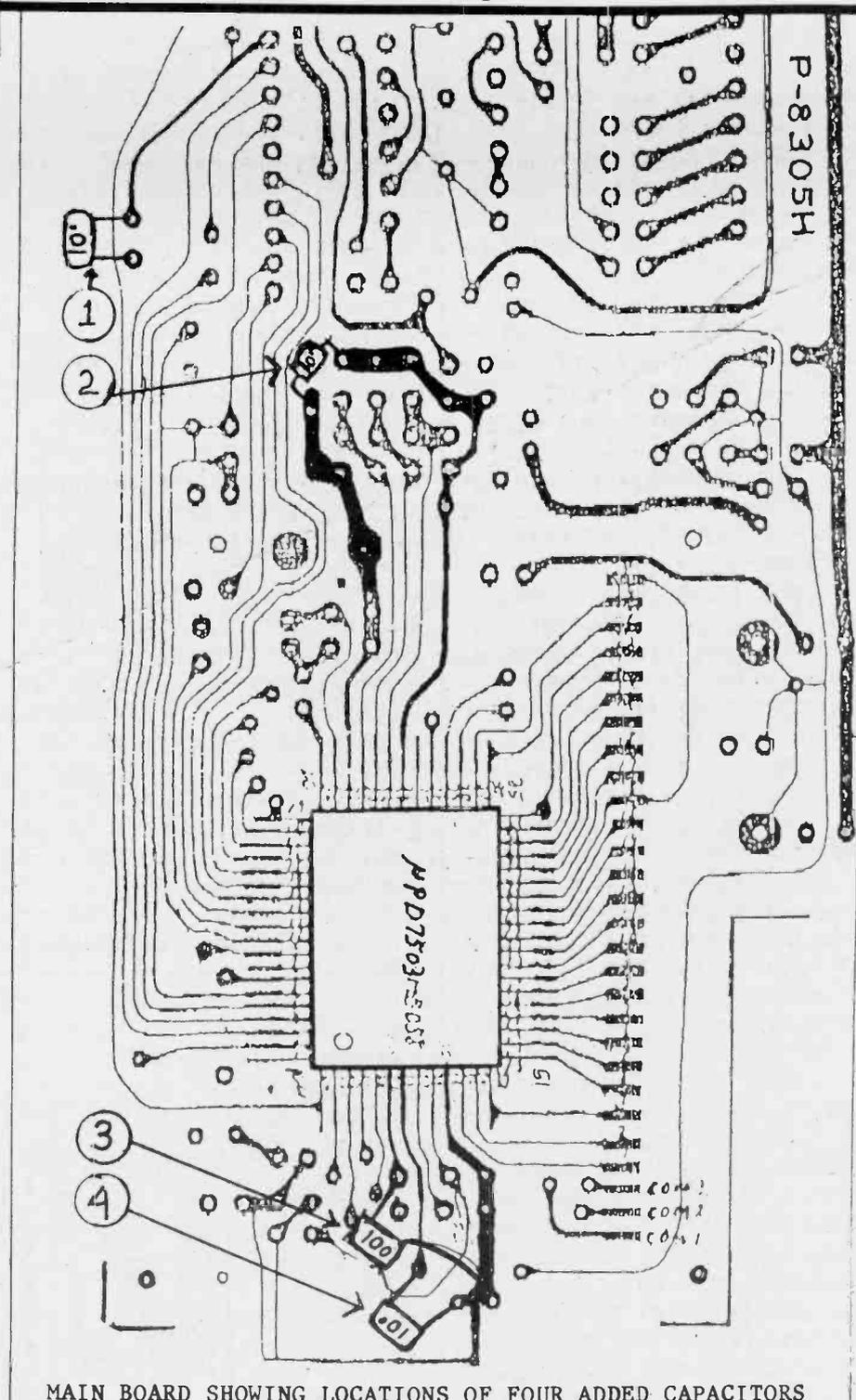
A The HX-1000 is made for Regency by a prominent

Japanese manufacturer; built-in frequency capability is greater than shown in the Regency specifications, and is correct in the Grove catalog. However, most of the overrange is in AM (aircraft and CB) or wideband FM (TV) which would be distorted or unreadable on the FM-only HX-1000.

Q Can I receive 800 MHz on my Bearcat 210? Will an inexpensive unscrambler be used to listen in on FBI traffic? (Craig Rocha, San Diego, CA)

A With an external converter like the Hamtronics 800 MHz unit and an appropriate antenna (about 3" per element) and low loss coax, you should be able to hear local 800 MHz traffic.

All consumer-type descramblers are of the speech inversion variety which is the lowest level of electronic encryption. While the most popular technique for low-cost applications, it is not used by federal agencies.



MAIN BOARD SHOWING LOCATIONS OF FOUR ADDED CAPACITORS



JOSEPH MURGAS: A Wireless Pioneer

By D. K. deNeuf, WA1SPM

One pioneer inventor in wireless telegraphy, is not prominently listed in its history. Joseph Murgas was born in 1864 in Tajov, Slovakia, and began studying for the priesthood at the age of 18. In 1884 he transferred to the Ostrihom Seminary where, in addition to his theological studies he experimented with wireless telegraphy.

He migrated in 1896 to the United States after being ordained to the priesthood. Shortly thereafter he took up a position in the parish of Wilkes-Barre, Pennsylvania.

In 1898 Murgas set up a laboratory in his rectory to pursue his wireless experiments. By 1900 he had produced his rotary spark gap transmitter which allegedly was a forerunner of systems employed by Marconi and Fessenden.

A U.S. patent was granted for his invention and he eventually obtained 17 more for improvements to what was known as his "tone system."

The Universal Aether Telegraph Company was formed in 1904 for the purpose of commercial application of Murgas' system. On 23 November 1905 it was successfully demonstrated with transmitting and receiving stations located at Wilkes-Barre and Scranton, some 32 km apart.

The double - tapered wooden towers used to support his antennae were the first of their kind, measuring 8 meters square at the base. They were spaced about 12 meters apart and at the 30 meter level were joined by a cross bridge; a wooden pole was attached at the 46 meter level.

The overall height of each tower was 61 meters. The top of each pole was joined by a steel catenary cable from which ten insulated copper wires were suspended to form the radiating system.

Murgas died in 1929. In recognition of his contributions the Slovak Republic in 1939 named its first and

Thanks to the hunt for a better antenna...

THE RADIO SPECTRUM EMERGES

by W. Clem Small, KR6A

Most people interested in communication today know that the early radio services initially developed in the longer wavelength (lower frequency) portion of the radio frequency spectrum, gradually moving upward to the shorter wavelengths (higher frequencies).

The first trans-Atlantic radio signals were transmitted on a frequency near 310 kHz, a wavelength of about 960 meters.¹ The maritime distress and calling frequency was long ago established at the 500 kHz (600 meters) in the medium wavelength band.²

Early trans-oceanic radio services operated on wavelengths from 5000 to 20,000 meters long³-- frequencies as low as 15 kHz which, if they were sound-waves, would be within the range of human hearing!

Modern technology has advanced to allow communication at really short wavelengths, right? Dead wrong! Although many people in radio circles don't realize it, when Heinrich Hertz discovered "radio waves" (or "Hertzian waves") around 1887, he used wavelengths in the vhf and microwave region to do it! Hertz used wavelengths as short as 60 cm (500 MHz) in his early demonstrations of radio waves.⁴ A bit later, when radio's first engineer, Guglielmo Marconi, began to experiment with the new Hertzian waves, the wavelengths in common use were still in the vhf and uhf regions of the radio spectrum.⁵

It may be hard to imagine, but the old-time spark-gap transmitters were capable of producing signals well into the microwave region; both Hertz and Marconi used cylindrical parabolic reflectors for their microwave antennas in the same fashion that today's parabolic dishes are used to provide high gain and directivity for our satellite TVRO microwave antennas!⁵ There were even microwave horn antennas and wave guides developed in that same period by Bose, the Indian scientist, who has been called "Marconi's im-

only broadcasting station after him and issued the postage stamp reproduced herein.



mediate predecessor."⁵

Why, then, do we find that the early history of practical radio communication began in the low-frequency, long-wavelength end of the spectrum, and that the extremely useful short waves, very short waves, and microwaves were ignored for decades? Well, as explained below, it all seems due to Marconi's search for a better antenna.

In 1895 Marconi began trying to increase his range of communication by making changes in his antenna system. One change which he made was to elevate the whole antenna. This worked but it wasn't too practical, as the Hertzian dipole antenna which he was using was physically part of the transmitter (see fig. 1).

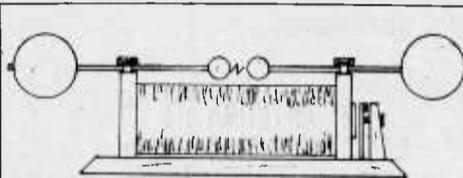


FIG.1. Spark-gap transmitter with Hertzian dipole antenna.

Next, he removed the capacity plate from one half of the Hertzian dipole antenna and put it high up in the air, connecting it to his transmitter with a long wire. He also removed the other half of the dipole, connecting the transmitter to the earth (see fig. 2). With this arrangement, he found that he greatly increased his range of communication.

His elevated antenna soon came to be called an "aerial" due to its "high-in-the-air" construction. The term "aerial" came to be a general term with roughly the same meaning as "antenna," but is now seldom used.

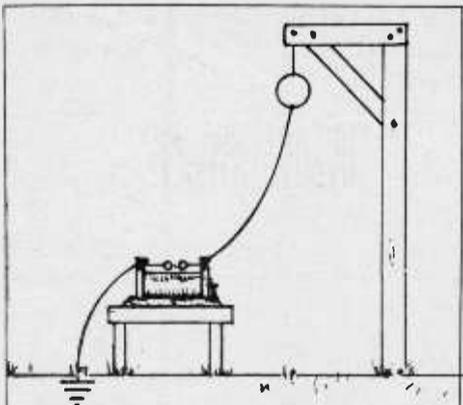


FIG.2. Spark-gap transmitter with Marconi aerial and ground connection.

The antenna shown in figure two is a grounded, vertical, quarter-wave antenna which is now frequently called a "Marconi" antenna.⁶ The higher up in the air Marconi put his

aerial, the farther he could communicate; this was a fantastic discovery and he pursued it with a keen interest.

But what interests us most is that as Marconi increased the length of his aerial, he coincidentally increased the length of the waves which he radiated from that aerial. There were no tuned circuits in these early transmitters and receivers other than the aeriels themselves! Thus, if the aerial length was changed, the frequency of the signals transmitted or received changed accordingly. Let's see now how this led wireless to move to the lower frequencies.

The vhf and higher frequencies which Hertz and Marconi had used earlier could provide only "line-of-sight" communication; similar to light waves (including the fact that they do not bend) they are sometimes called "quasi-optical" waves.

As Marconi's aeriels continued to lengthen, they not only allowed a greater line-of-sight coverage by their greater height, but they also produced longer and longer wavelengths. Interestingly, as the length of these waves increased, they exhibited less and less of the "quasi-optical" unwillingness to bend; in fact, as the wavelengths moved into the medium and low frequency ranges, they actually bent sufficiently to follow the curvature of the earth itself! This is described by McCleery who concluded, "The discovery of this fact was, of course, one of Marconi's major accomplishments..."⁷

Aitken pointed out, "...with each increase in vertical height of the antenna, the fundamental resonant frequency decreased; but the practical lesson drawn remained the same - long wavelengths meant greater distances. This was the rationale for the immense umbrellalike antennas, covering acres of ground, that were later erected at stations intended for transatlantic operation."⁴

In this pursuit, early radio engineers had completely skipped over the short wave bands, moving quickly from the vhf range to the lower frequencies with their longer waves. It wasn't until 1916 that Marconi and his engineer Franklin began to give attention to the shorter waves.⁸ Experimentation soon showed that they did indeed hold potential for long dis-

RADIO SPECTRUM cont'd

tance signal propagation. These workers also showed that high-gain beam antennas, a physical improbability on the low frequencies due to the huge size of those wavelengths, were now practical.

It was not understood in those days that signals in the short wave bands "skipped" off the ionosphere to provide long distance communication with greater reliability and with less need for power than was true for the more noisy longer wave bands. But the signals did just that, and in 1924 the British Empire junked its plans for building a chain of long wave, super power, long range stations in favor of the new short wave, moderate power, longer range system which Marconi and Franklin had developed.⁹ From that day to this, the move toward utilization of higher and higher frequencies has never diminished.¹⁰

REFERENCES

1. Dunlap, Orrin, E., Marconi: The Man and His Wireless. McMillan, 1937, Pp. 96.
2. Small, W. Clem, Perspectives on Radio...a little history, Monitoring Times, Vol. 4, No. 1, Jan. 1985, Pp. 20-21.
3. Morecroft, John H. Elements of Radio Communication, 2nd Ed, John Wiley and Sons, New York, 1934, Pp. 103.
4. Aitken, Hugh, G. J., Syn-tony and Spark, John Wiley and Sons, New York, 1976, Pp. 61, 197.
5. Ramsey, John, F., Micro-wave and Wave Guide Techniques Before 1900, Proceedings of the Institute of Radio Engineers, Feb. 1958, Pp. 405-415.
6. International Dictionary of Physics and Electronics, D. Van Nostrand, Princeton, NJ, 1956.
7. McCleery, D. K., Radio Today, Oxford University Press, London, 1961, Pp. 119.
8. Ladner, A. W. & Stoner, C. R., Short Wave Wireless Communication, 3rd Edition, John Wiley and Sons, New York, 1936, Pp. 11.
9. Vyvyan, R. N., Wireless over Thirty Years, George Routledge and Sons Ltd., London 1933, Pp. 75.
10. Desoto, Clinton B., Two Hundred Meters and Down, American Radio Relay League, West Hartford Connecticut, 1936. This small volume contains much of interest on the development of the short waves by radio amateurs.

ANTENNA SPECIAL

The search for a better antenna continues...

IDEAS FROM AN ANTENNA EXPERIMENTER

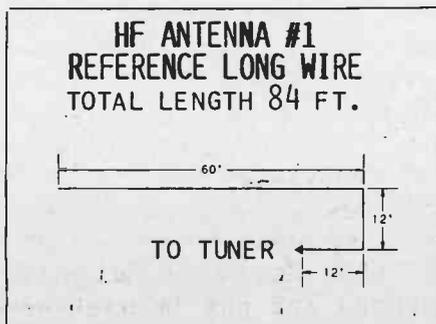
MT reader B.D. Snell is an engineering supervisor for Bendix Corporation and his excellent drafting shows it. Here we take a peek at Mr. Snell's monitoring post layout.

The descriptions of his installation are in his own words.

ANTENNA-AUDIO SYSTEM

HF ANTENNA #1

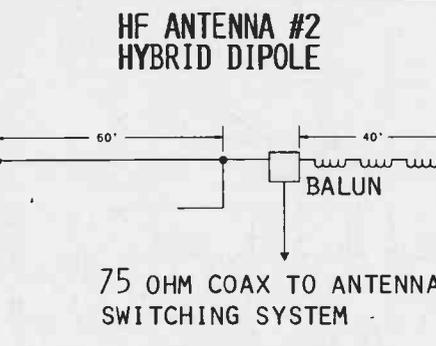
Mounted 15 ft. above ground and orientated North-South; acts as a reference antenna, considered representative of the majority of SWL antennas.



HF ANTENNA #2

Basically a dipole comprised of outdoor Antenna #1 and a 40 ft. trap section mounted indoors along the apex of a roof. The whole antenna forms a shallow "V" with its maximum radiation pattern NNE/SSW; it resonates at around 4.7 MHz but has good wide band characteristics.

This was erected to utilize the outdoor section as part of a lower frequency dipole where overall exterior space is restricted and the interior space is insufficient for a full length dipole.



HF ANTENNA #3

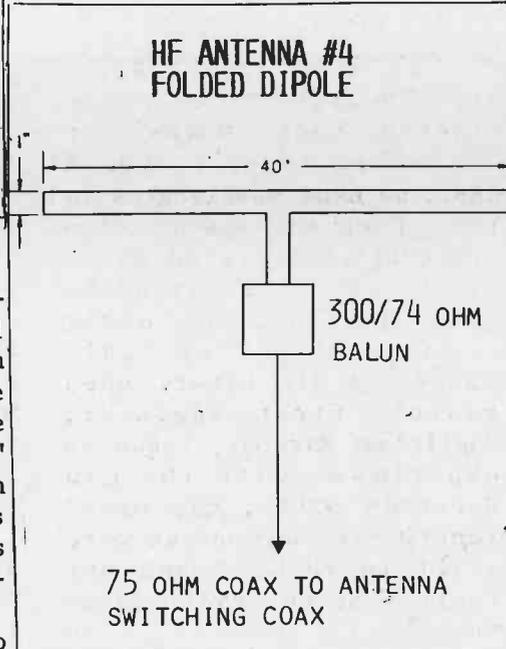
A 16-inch shielded loop with a switched matching/loading unit; can be used in the active or passive mode. The active mode uses a Sony active antenna RF amp mounted at the loop and fed

via an 0.01 Mfd capacitor. The passive mode is via a separate coax to the antenna switching unit.

It is mounted on a rotator 8 ft. above ground. Tests conducted on a military active antenna (Marconi-H-33-5500-01) indicated that between 6 and 8 ft. is the optimum height. Effective height can yield gains of up to 30 dB, which is useful when gain vs frequency of the active can be -30 dB at 2.0 MHz up to 0dB at 30 MHz. (Regardless of advertising.)

HF ANTENNA #4

Indoor, rafter-mounted folded dipole, utilizing open wire TV feeder (resonant freq. approx. 12 MHz).



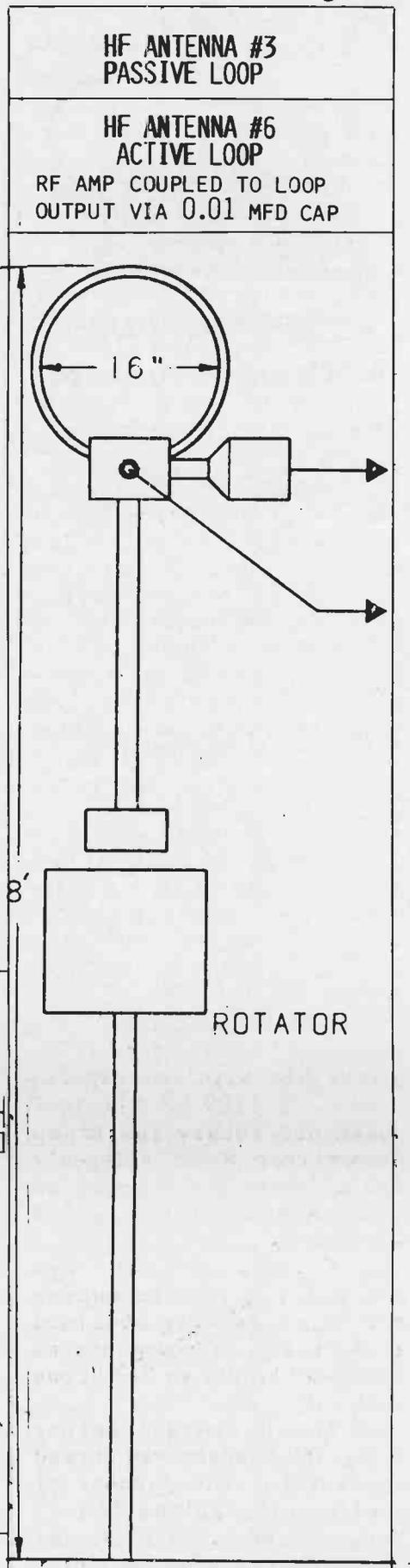
HF ANTENNA #5

A 40 ft. continuous length of aluminum guttering attached to the house 8 ft. above ground and fed at one end by 75 Ohm coax. Included as a "worst case" for a SWL in a zoning restriction area.

HF ANTENNA #6

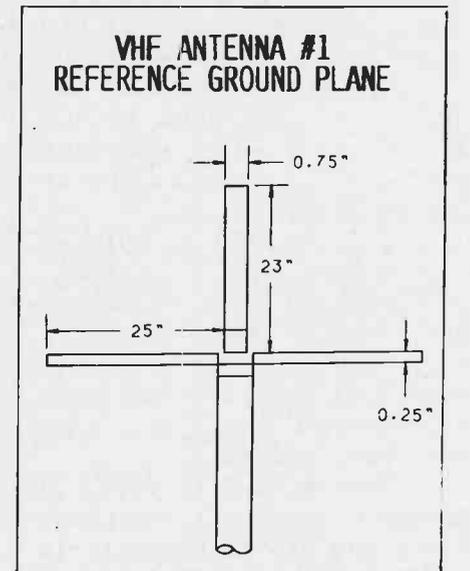
A "Linear inductance monopole" consisting of a SLINKY extended to 7 ft. mounted vertically over a radial ground plane 8.6 ft. in diameter and topped by a 2 ft. radial top hat.

Originally used as a quarter-wave monopole for 33 MHz and located in the attic; later modified by adding an FET RF amp at the base and has since been used over the HF bands.



VHF ANTENNA #1

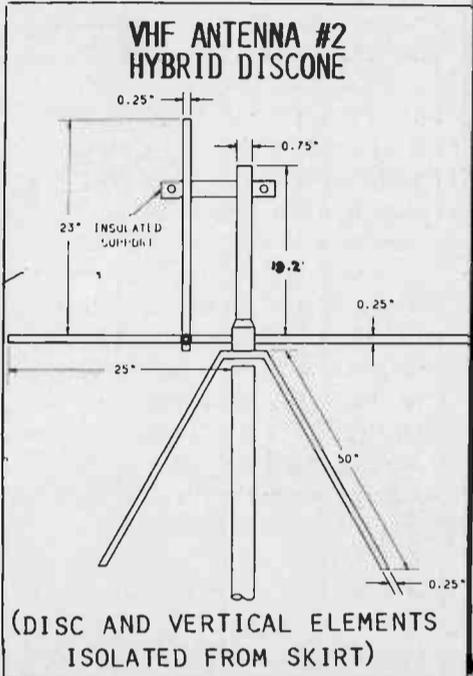
A 121.5 MHz ground plane with a 0.75 inch diameter vertical element; it performs well over the entire high band.



VHF ANTENNA #2

This "hybrid discone" antenna was constructed in an effort to utilize the wideband characteristics of the Discone mixed with a couple of discrete frequency vertical elements (145.5 and 121.5 MHz) hopefully possessing a high radiation angle.

Tests against the reference ground plane, in the aircraft band, indicated that it performs extremely well.



CONTROL

All antennas feed into an antenna switching unit in the attic, remotely controlled from the operating position: LED's indicate which antenna is selected. The system allows rapid switching between antennas so that comparisons can be made.

An audio switching system is also part of the control unit.

The whole object of this particular exercise is to provide some comparison data for the ordinary SWL utilizing home-built antennas. Future plans call for the provision of an exotic antenna farm.

Have a Lot of Real Estate and a Lot of Wire?

Then Build the

"SWL LPMA ANTENNA"

By Al Smith, Box 280, Wamsutter, WY 82336

A good directional, wideband, low incidence angle antenna which isn't common in antenna texts is the log-periodic monopole array, or LPMA. The design is similar to the popular log-periodic dipole array (LPDA), where the performance of the system is a periodic function of the logarithm of the frequency.

In practice it is virtually frequency independent, where subresonant (long) elements act to a degree as reflectors toward the resonant region, and supraresonant (short) elements act to a degree as directors.

By comparison to LPDA antennas, an LPMA can save some real estate and tower footage, and as a low profile wire beam can give high performance.

Its vertical/counterpoise structure optimizes reception from low angles of ionospheric refraction where international broadcast signals concentrate.

The two supporting towers or poles for an LPMA must only be 40 or 60 feet high on the high end for coverage from 9 or 6 MHz upwards, as compared to a much higher tower that is needed to optimize intercontinental reception off an LPDA or other horizontally-polarized beam.

Finally, an LPMA is both wideband and directional so one antenna serves for reception of all short-wave signals from a given direction.

Illustrated here are LPMAs dimensioned for 3 to 10 MHz, 6 to 22 MHz, and 9 to 26 MHz coverage. Or you can develop your own dimensions for other bandpass/gain parameters from LPDA formulae that are available in some antenna texts^{1,2}

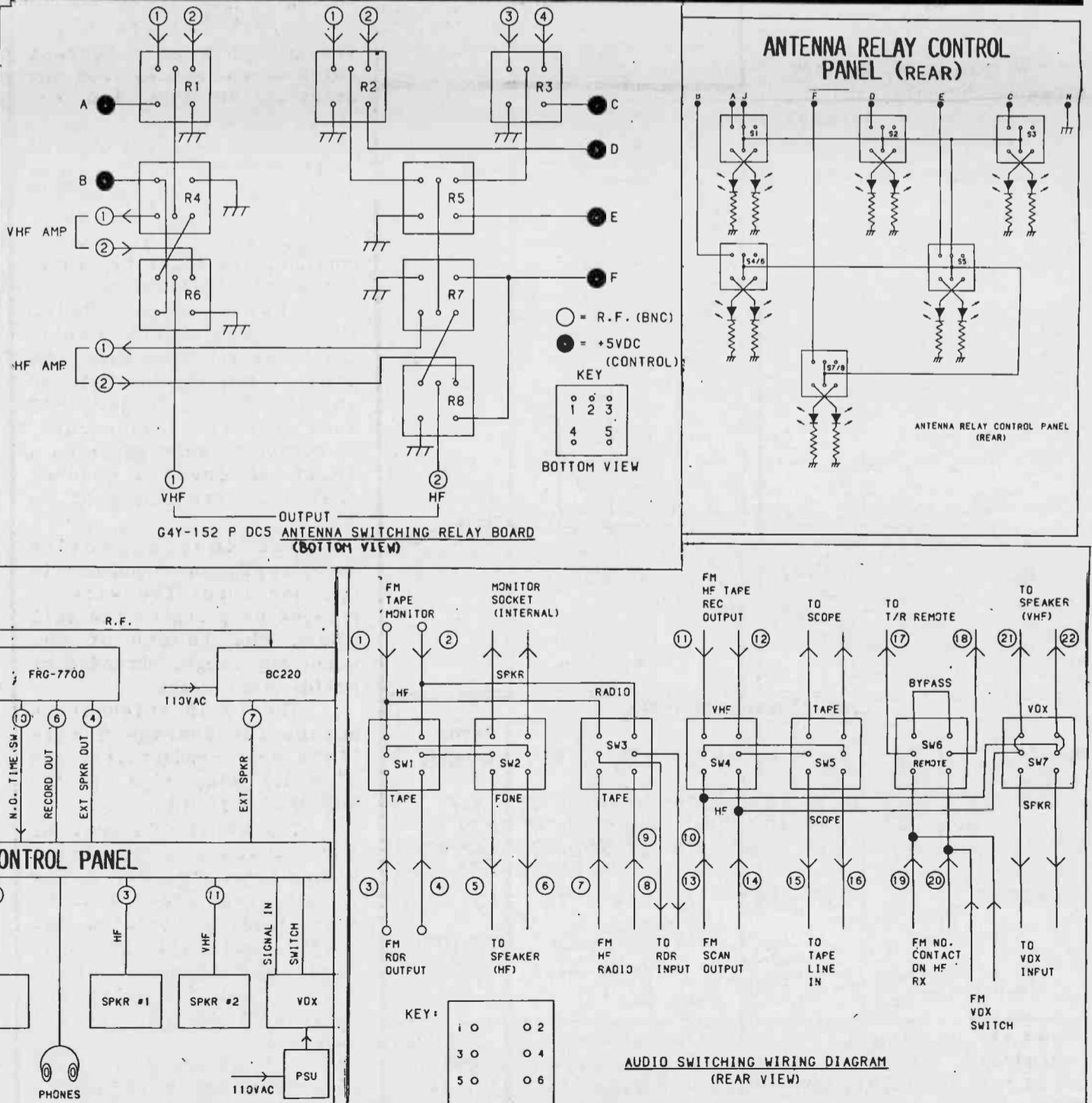
(see bibliography). In practice an LPMA works best with its counterpoise of horizontal elements suspended several feet above ground, perhaps high enough to walk under. Placing the counterpoise only inches off the ground could increase local noise pickup and would decrease input resistance and amplify VSWR.

The LPMA's planar element sets are balanced with respect to each other, and a balun (4:1) must be used in conjunction with a coaxial feedline. If coax was connected without a balun of the correct ratio, LPMA directionality and passband would be ruined.

Properly installed, any of the LPMAs in the table should perform near the design specifications, although any antenna's operating characteristics can vary from one site to another.

The best SWL antenna installation, regardless of its type, is away from suspended wires, tall buildings, and electrical noise sources.

The design for 9 to 26 MHz is very low profile for



SWL LPMA cont'd

a beam, and wire as thin as AWG#22 is okay; #18 is minimum wire size for the 3-10 MHz LPMA and #20 for 6-22 MHz.

Multistrand wire stretches a lot less than harddrawn copper wire and if the former is used, the wideband nature of log-periodics accept a bit of dimensional distortion without inducing an audible mismatch on the feedline.

One source of inexpensive wideband weatherproof baluns is Microwave Filter Co., 6743 Kinne St., East Syracuse, NY 13057, which sells the W2AU balun.

In building one of these antennas, remember to insulate all element ends and avoid short circuits which occur most easily by twisting its balanced spine.

Keep its wire out of shrubbery, trees and headway, and enjoy a performance edge on international listening with your LPMA!

BIBLIOGRAPHY:

- C. A. Balanis, "Antenna Theory". McGraw Hill, NY 1982.
- D. DeMaw (ed.), ARRL Antenna Handbook, ARRL, Newington, CT.
- W. I. Orr, Radio Handbook, McGraw Hill, NY 1981.
- Siemens, Planning and Engineering of Shortwave Links, Heyden, London 1982

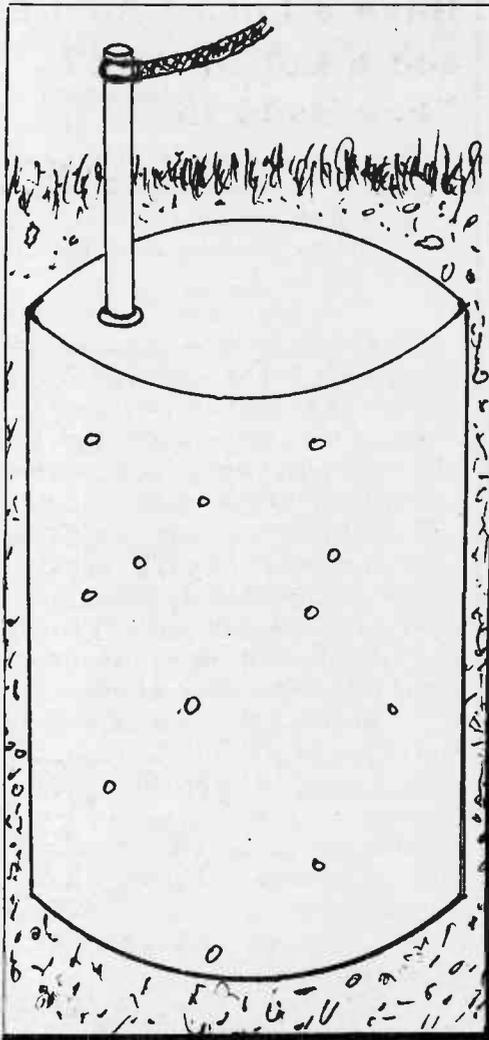
A SIMPLE (BUT SUPER) GROUND

MT reader Ken Hand has come up with an excellent idea for an effective ground for both transmitting and receiving. Ken's idea is to bury a discarded galvanized water tank approximately 9 feet in the ground; a pipe extending from the tank is used for electrical contact.

Ken suggests punching a number of holes in the tank and filling it with water periodically to encourage better electrical contact with the soil. It would also be a good idea to be sure that the pipe threads do not have any residual pipe dope on them or a poor connection is sure to result.

A few additional hints: the larger the tank, the better the ground; add some copper sulfate ("Bluestone") to the tank for even better electrical contact with the soil; use heavy braid from the pipe clamp to your rig (like the shield braid pulled off RG-8/U coax).

Thanks, Ken, for sharing your suggestions with fellow MT readers.



UNDERGROUND ANTENNAS

by Bob Grove

A recent editorial in Worldradio (December 1984) brought to mind a concept which seems radical from any practical point of view, but it works.

If you are interested in listening to frequencies at the standard broadcast band and below, and don't want to suspend an outside antenna, you might try burying your antenna wire!

That's right. Radio waves will penetrate soil; the lower the frequency, the greater the depth. This is why the Navy's Project ELF uses such low frequencies - to penetrate salt water to a depth of several hundred feet at a frequency of 76 Hz!

But despite soil's notoriously poor conductivity, use insulated wire to prevent coupling to the soil along the length of the wire. Any gauge, stranded or solid, will work.

The 10 dB attenuation points for average 8 millimho soil conductivity are 5" @ 3.5 MHz; 3" @ 10 MHz and 3/4" @ 14 MHz.

Try about 100 feet of any convenient insulated wire buried roughly a few inches deep. There will be some signal attenuation, but hardly noticeable at these frequencies. And best of all, it will be below the sources of most electrical line noise!

Let us know of your successes (or disappointments!).

How Long Should That Antenna Be?

When cutting an antenna for a specific frequency, apply two nifty formulas to provide the appropriate length.

If you are planning to erect a dipole for shortwave reception, the proper length in feet may be found by dividing 468 by the center frequency in megahertz. Thus, a 6 MHz antenna is ideally 78 feet long.

Computing quarter-wave ground planes and whips for VHF/UHF applications is just as simple: divide 2808 by the frequency in megahertz to find the length in inches. Thus, the correct length of a 155 MHz antenna element is 18 inches.

And another hint: Dipoles and ground planes without loading coils work well on odd harmonics. Use the 155 MHz antenna at 465 megahertz (3 x 155) and the 6 megahertz dipole on 18 or 30 megahertz (3 x and 5 x 6) for good performance.

Since receiving antennas are not overly-conscious of standing waves from impedance mismatch, they generally work quite well several percent away from their design frequency. This is the theory behind the design of the Grove Skywire and OMNI, two highly-effective, low-cost antennas for listeners.

A COMPACT SHORT-WAVE ANTENNA

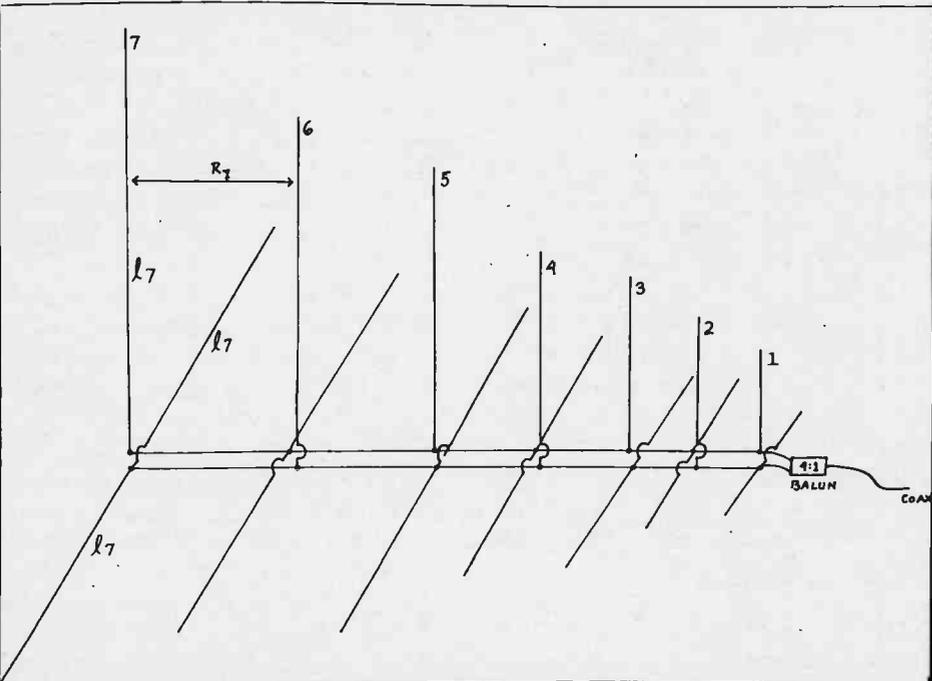
MT reader and veteran listener Duncan Cameron recently completed an experiment with his Grove Skywire dipole that he would like to share with fellow SWL's.

Desiring a smaller antenna, Duncan wrapped the two dipole wire elements around a nine-foot length of 1-3/8" wood dowel rod, converting the "flattop" dipole into a helix.

Subsequent monitoring seemed to show no reduction in signal strength; in fact, with only one mast support point the antenna could be rotated to the most favorable direction for best reception and greatest line noise rejection!

And how about fixing the antenna to a TV rotator? Or substituting rigid PVC plastic pipe for the wood dowel?

We would be pleased to hear from MT experimenters regarding their experience and suggestions for compact, directional HF antennas. Now, how about a rooftop RDF for the shortwave spectrum?



LPMA DIMENSIONS TABLE

Spacing	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	Array Length
3.2-10 MHz	12'2"	15'8"	20'0"	25'8"	33'0"	40'6"	147'
5.9-17.9 MHz	6'7"	8'6"	10'10"	13'11"	18'0"	22'0"	79'10"
9.0-28.0 MHz	4'4"	5'8"	6'9"	9'4"	12'0"	14'8"	52'9"
Elements	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	l ₇
3.2-10.0 MHz	24'2"	31'4"	40'0"	51'4"	66'0"	81"	103'10"
5.9-17.9 MHz	13'2"	17'0"	21'8"	27'10"	36'0"	22'0"	56'8"
9.0-28.0 MHz	8'8"	11'4"	13'3"	18'8"	24'0"	29'4"	37'9"

These are developed from a single parameter of [α(apex angle)=22°; σ(relative spacing factor)=0.14; τ(relative scale factor)=0.78]; beamwidth is 80° to 120°; gain is 5 dBd.

OPTIMUM RECEPTION ON THE GROVE OMNI

The OMNI scanner antenna from Grove Enterprises is an unusual design in the field of monitor antennas. While most manufacturers use loading coils or traps to decouple sections or elements, the OMNI utilizes the full element length on all frequencies, providing gain at higher frequencies.

The theory behind the OMNI design is simple enough: A dipole antenna matches the feedline impedance not only at its resonant half-wavelength, but on odd harmonics as well. Thus, a 50 MHz half-wave dipole will give a good accounting of itself at 150, 250, 350, 450 MHz and so on.

Of course the pattern changes, but with reflections of signals typical at these frequencies, this is not usually a problem. But how do we fill in the "missing" frequencies? A little more theory.

The bandwidth (high and low frequency limits) of an antenna depend in large measure on the thickness of the element; that is, the length-to-diameter ratio. Thicker elements have broader frequency characteristics, easy to accomplish at higher frequencies due to shorter element lengths.

The OMNI is constructed of TV-type aluminum elements, purposely thick for broadband applications. The OMNI was developed by carefully comparing it with several broadband discone antennas until it outperformed them; it was then locked into design and manufactured.

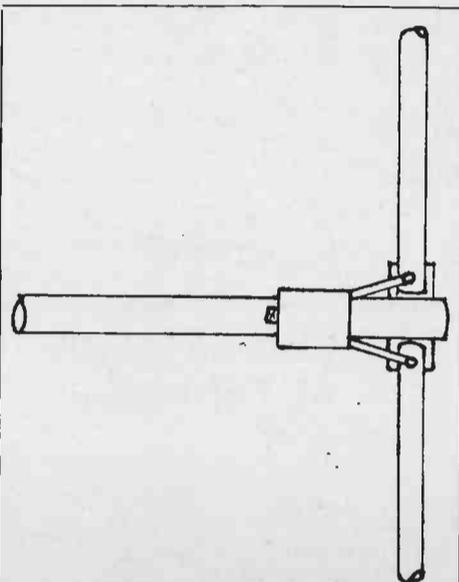
But when an antenna is mounted on its support, theory goes out the window. Nearby conductors (mastpipe, coax, power lines, rain gutters, etc.) may have a profound effect on final performance. Even though the OMNI comes with an offset boom, proximity to the parallel mastpipe will have an influence on the omnidirectional pattern, making it directional.

Ideally, the entire 96-inch length of the OMNI should be mounted on a non-metallic mast extension, and the coax should be led away at right angles from the antenna for at least four feet before turning down toward the ground.

Obviously, most of us have neither the hardware nor the patience to accommodate these theoretical advantages, so we resort to the next best method. We mount the antenna and listen to the results on our scan-

ners; if they are satisfactory we let it alone. If not, we rotate the position a few degrees and try again, searching for an acceptable compromise.

One additional hint may be useful to OMNI users: If you mount the antenna to a metal mast, the "hot" element (the one connected to the center conductor of the coax) should be the higher. If you don't have an ohmmeter handy to determine which element this is, it is the one pointed upward when you hold the OMNI so that the connector block is facing you on the right.



WITH THE OMNI MOUNTED AS SHOWN, THE UPPER ELEMENT IS "HOT" (CONNECTED TO THE COAX CENTER CONDUCTOR)

THE OMNI ON SHORTWAVE

A recent series of experiments showed that the OMNI, when used in conjunction with the Grove ANT-4C Power Ant Plus, can provide outstanding shortwave reception where a full-size outside antenna is not practical.

The OMNI is simply mounted as above, connected to the Power Ant Plus below at the operator position via low-loss cable like Grove CBL series. And, of course, this is even better for scanner reception in weak signal areas.

A simple signal splitter like the Grove Multi-coupler can be used for simultaneous shortwave and scanner reception, or the system can be alternately plugged between the shortwave and scanning receivers manually.

Because of the enormous gain of the Power Ant Plus, it is recommended that some sort of preselector like the Grove TUN-3 MiniTuner be used to avoid front end overload and resulting intermod, images, and desensitization.

In metropolitan areas scanner reception can be

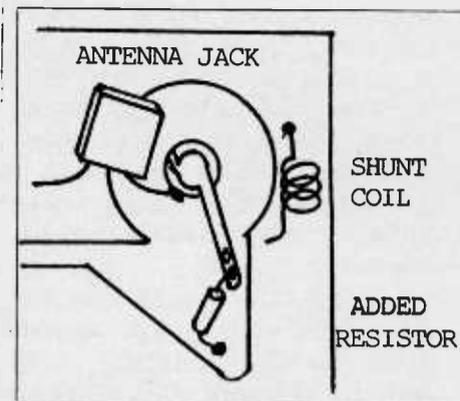
IMPROVING THE GROVE POWER ANT

The new Grove ANT-4C Power Ant wideband preamplifier from Grove Enterprises is an excellent low noise, high gain preamplifier, excellent for applications from below the AM broadcast band well up into the 900 MHz cellular band for improving receiver system sensitivity.

But in some installations the high gain of the preamplifier may oscillate, causing noises in the receiver, unusual intermod, or interference bars on a TV (if it is being used as a TV preamp).

Fortunately, the ailment is rare and easily corrected. It seems to be aggravated by an unmatched impedance in the feedline. The addition of a 100 or 220 ohm, 1/4 watt carbon resistor connected between the antenna jack terminal and chassis ground (jack shell or adjacent circuit board foil) should take care of the problem.

The resistors are readily available from Radio Shack, TV repair shops or parts stores at low cost, or from Grove Enterprises for an SASE. And if users are



reluctant to install the resistor Grove will do it at no charge as a customer service for only the cost of shipping.

The procedure is quite simple: Simply remove the two side screws of the cabinet and pull off the cover; locate the antenna jack and solder the resistor from the center lug to ground using the shortest possible leads. Reassemble and the job is finished!

If the preamp is to be used only on frequencies above 30 MHz, it is recommended that the shunt coil provided with the ANT-4C be connected as described in the owner's instructions. This will probably solve the problem without even having to install the resistor. ●

For the Adventurous Experimenter...

"BIG SKY ANTENNA"

By Al Smith, Box 280
Wamsutter, WY
82336

Here's an antenna project for aircraft, satellite, and space communications reception -- 100 through 500 (or 2500) MHz.

It is strung in a few hours and requires no tuning. It is a quad array of equiangular spiral antennae which can be slewed for clockwise or counterclockwise circular, horizontal, vertical or linear polarization modes.

Because any one of these modes is favored in reception at one moment by variables of motion, ionosphere, or troposphere, an antenna which can be remotely switched for polarization is an advantage in skyward reception.

An equiangular spiral is a frequency-independent extension of the helical antenna type common in

VHF/UHF satellite communications. The helix was developed after WWII as a hybrid of loop and linear type antennae, and subsequent work on antenna equiangularity yielded several types of spiral antennae.

The antenna that is diagrammed is an unbalanced single arm type, dimensioned for 100 to 500 MHz coverage (52 inch to 7 inch projection) or 100 to 2500 MHz (52 inch to 1 inch projection). Smooth VSWR is expected over either frequency range and gain is moderate (below 10 dB_c), which makes this easy to array in the diagrammed quad configuration.

The quad array has two spirals wound clockwise and two wound counter-clockwise. A pair of the spirals are connected in phase for the wanted circular or planar polarization mode, or all four can be connected in phase for a linear polarization mode.

Aimed vertically, the quad array has broad azimuthal (360°/3dB) and elevation (>100°/3dB) beamwidth. The four spirals in this array are set in a square

similarly impaired by too much signal onslaught, requiring interference reduction measures from accessories like the popular Grove Scanner Filter. ●

BIG SKY ANTENNA cont'd

spaced 52 inches between their 52 inch diameter bases, for a 13 x 13 foot assembly.

Forms for the four spirals can be cut in styro-foam cones, or the antennas can be wound through a conical polygon of fiberglass rods or other highly insulative material.

Our antenna is diagrammed for the space in the spiral between AWG#16 wire; AWG#14 through #18 stranded copper or silver wire is acceptable.

For the uniphase feed harness, four exactly-equal lengths of 75 ohm RG-11/U foam dielectric coax (not the polyethylene dielectric type) is a good match and has low loss (6dB per 50 feet at 2300 MHz, 1 dB per 50 feet at 136 MHz). Use it with weatherproof type N silverwash coaxial connectors, and select the best quality (low VSWR/insertion loss-milspec) coaxial relays to make up the required switching arrangement (see table).

The array can be used with a ground plane if one is needed to reduce noise pickup, but it must be mounted four or more feet above it to preserve bandwidth/beamwidth. And as with all VHF/UHF antennas, keep the coax run as short as possible to minimize dielec-

tric loss.

Unless az/el tracking is required, the array will do for the best part of most satellite/aircraft passes pointed vertically. If fifty feet of RG-11/U foam dielectric coax is used in the system, relative gain runs near 2dB at 2300 MHz to 7dB at 136 MHz, which probably indicates low noise preamps for weak signal reception, especially above 1000 MHz.

Just how the five available polarization modes are developed is apparent by adding the keyed spirals' signal vectors.

An equiangular antenna can be scaled

$$\frac{df}{d\theta} = f''(\theta)$$

to cover ten or more octaves of frequency; if an antenna of this kind is needed for another waveband check one of the referred texts for other possible pitch/gain parameters, and in the microwave range, conductor scaling.

If another receiver is brought into use, polarization diversity reception with this array will be possible by connecting the clockwise spiral pair in phase to one receiver and the counterclockwise spirals in phase to the other.

For outdoor installation, a weathershield of 10 mil plastic and 2 x 2's will keep moisture from altering

the array pattern without appreciably degrading reception.

REFERENCES:

Antennas. John Kraus, McGraw-Hill, New York, 1950.
 Antenna Engineering Handbook, Richard C. Johnson and Henry Jusik, eds., McGraw-Hill, New York, 1984.
 Antenna Theory. Constantine A. Balanis, McGraw-Hill, New York, 1982.

PARTS SOURCES:

- CZ Labs, 55 Railroad Ave., Garnerville, NY 10923: coax, connectors
- Fair Radio Sales Co., 1016 E. Eureka St., Lima, OH 45802: connectors, wire, relays
- MHz Electronics, 2111 W. Camelback Rd., Phoenix, AZ 85015: relays
- Nemal Electronics, 1327 NE 119 St., North Miami, FL 33161: coax, connectors

ARRAY TABLE:

- A:clockwisewound spiral
- B:counterclockwise wound spiral
- C:counterclockwise wound spiral
- D:clockwise wound spiral
- A+B:horizontal polarization
- A+C:vertical polarization
- B+C:counterclockwise circular polarization
- A+D:clockwise circular polarization
- A+B+C+D:linear polarization

ETCO ELECTRONICS, North Country Shopping Center, Plattsburgh, NY 12901 (Ph. 518-561-8700). Extraordinary inventory of every imaginable electronic part and much equipment as well. Some retail, some excellent values.

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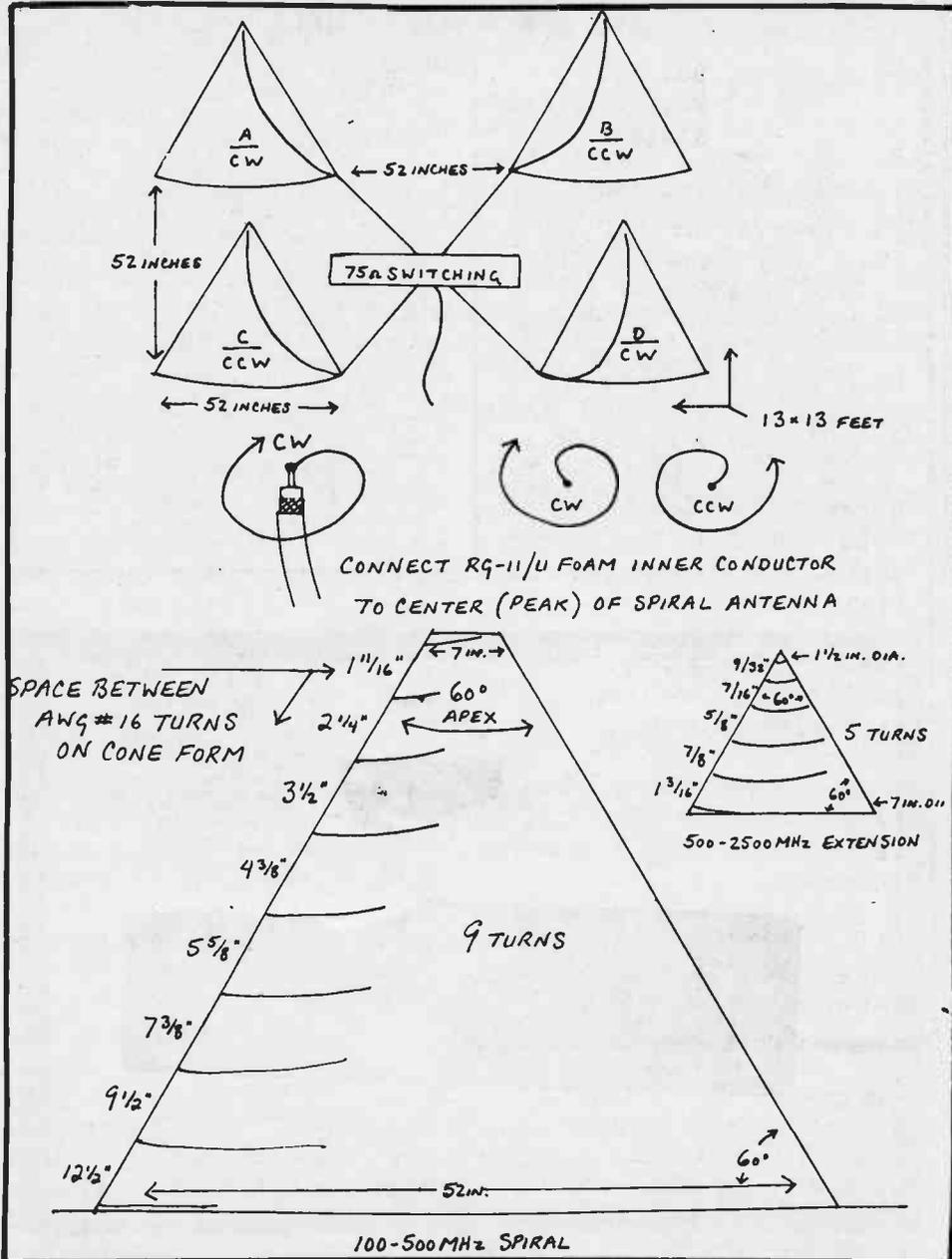
IF YOU FOUND THIS SECTION ON ANTENNAS INTERESTING AND CHALLENGING, SEE PAGE 19 FOR THE REVIEW OF A NEW BOOK ON ANTENNA DESIGN COMING FROM GROVE ENTERPRISES.

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STOCK EXCHANGE

PERSONAL

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

SUBSCRIBER RATES: \$.10 per word, paid in advance. All merchandise must be non-commercial and radio-related. Ads for Stock Exchange must be received 45 days prior to the publication date.

WANTED: Wish to exchange information on non-video satellite services. George Kalish, Box 786, Sandy Spring, MD 20860.

>>><<<

REGENCY ACT-720A 16 channel, digital aircraft scanner--\$150. Service manual for \$6. BEARCAT BC-2/4-AC handheld aircraft/UHF scanner with nicads, AC charger and 8 crystals for O'Hare airport--\$65. REALISTIC Minimus-17 extension speaker with walnut veneer case--\$12. COLECOVISION video game with many accessories--\$150. All items are in mint condition with original boxes and manuals. Call Rick at (312)653-3057 after 8 p.m. CST. No collect calls, please.

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Sell: Mint ICOM R-70 with FM board and DC, \$450. DITEX Keyboard outfit. MRS-100 and SCT-100 allows CW send and receive to 150 wpm. \$300. Greg Chester, WBZCLL, Box 57, Readington, NJ 08870.

>>><<<

INFOTECH M610 RTTY scope. Specially designed for INFO-TECH M600 and M200. Never used, must sell. New, \$225.00 will ship. Rudy Hilderbrandt, 2104 Sarazen Drive, Orlando, FL 32808 (305)298-1258.

>>><<<

O'KEEFE & MERRITT PM-15 Radio Generator. 10-12.5 KW, 110/220 Volt, Single or three phase 400 cycle. Good condition, inside stored, with all instruments. Jeep engines and radiators are gone. MVSS, Box 73, Flaxville, MT 59222. (406)487-2884.

>>><<<

FOR SALE: 1984 D.O.C. microfiche with 40 pages identifying some government frequencies by the call letter. Also microfilm reader at \$98.00. Sample available for \$1.00. Gilles Thibodeau, 3653 Montcalm, Lac Megantic, Quebec G6B 2H8. (819)583-1817 after 6 p.m.

>>><<<

WANTED: Schematic or info for 1960's marine direction finder (portable) FRONTIER ELECTRONICS model ADF-200. Also want to buy LOCATION TECHNOLOGY brand metal detectors. Bob Lamb, Box

COMMERCIAL

\$25 payment must accompany ad. Send 2 1/4" wide x 2" long camera-ready copy or we will type copy (35 words maximum).

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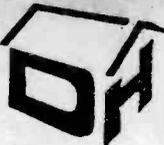
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WANTED: Old radio magazines, tin toys and tin trains. Have duplicate POPULAR ELECTRONICS to sell/trade. Bill Smith, RFD 238W3, Locust Street, Douglas, MA 01516.

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Unbeatable prices. New, BEARCAT 160 digital scanner, searches, scans 30-50, 144-174, 420-512 MHz. Stores 16 frequencies in two memory banks. \$135 plus \$5 UPS. New, PRESIDENT GRANT 40 channel AM-SSB transceiver with power mic. and all the "extras" \$135 plus \$5 UPS. Prompt shipment on receipt of postal money order, no checks. R. D. Carter, Box 418, Vass, NC 28394.

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JOIN A RADIO LISTENING CLUB. Complete information on major North American clubs for 25¢ and SASE. ASSOCIATION OF NORTH AMERICAN RADIO CLUBS, 1500 Bunbury Drive, Whittier, CA 90601.



Viewpoint

In your February '85 Monitoring Times p. 17 Listen to Communications on Your TV third paragraph down, you state UHF channels 14-83 occupy 470 to 806 MHz. I have also seen this mistake printed in my RCMA newsletter once, twice in Popular Communications and a couple of years ago in my SCAN magazine.

Since time began channels 14 through 83 have always been 470-890 MHz. 14-20 (470-512 MHz) in some cities is set aside for use other than TV and 70-83 is for translator use in remote towns around to bring in TV stations. Otherwise it's used for communications.

Tell people if they want to know if there's 800 MHz activity in their area just tune through the channels 70-83 806-890 MHz range and look and listen for anything. It won't always be intelligible but it will be an indication.

Robert Jedlicka
Oroville, CA

(We goofed! Reader Jedlicka is absolutely right...Ed.)

>>><<<

This is to clarify an item regarding American accents heard during the Deutsche Welle transmissions which Williamson mentions.

For many years before he became a personality with DW, Larry Wayne who is heard Monday through Friday doing the feature Germany Today, was a TV personality with Harbenito Broadcasting Co. here in Harlingen. The old hands at Harbenito remember Larry well.

Harbenito owns and operates KGBT-TV (Channel 4), KGBT-AM (Spanish) and KELT-FM, all located in Harlingen. So at least one of the announcers with DW comes by his American accent honestly.

Dave Larson
Harlingen, TX

INFORMATION PLEASE

Monitoring Times will print at no charge (as space permits) announcements and questions of a non-commercial service nature.

I would like to correspond with any persons who read the REACT team bulletins. Also wish to swap freq. and computer programs for the TRS80 especially MC-10 programs. Call 504-732-9903. David Fuller.

>>><<<

Need reader in the northern part of the state of Maine. Frequencies to be checked. Will swap frequencies with Canadian readers in province of Quebec. Gilles Thibodeau, 3653 Montcalm, Lac Megantic, Quebec G6B 2H8.

>>><<<

San Francisco Bay area: I need copies of the radio codes used on the public safety bands in this area. Will pay any cost incurred. Contact: Cliff Richey Jr., 5677 Oakmont Circle, Livermore, CA 94550.

>>><<<

CASSETTES: I am making "off-the-satellite" cassette copies of Ray Briem's DX SPECIAL from ABC's Talk Radio Network, broadcast December 15, 1984. Free of charge; just sent a C-120 (or two 60-min) cassette and SASE to Mike Pollock, Box 407, 303 Stadium Place, Syracuse, NY 13210-2737.

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