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MONITORING TIMES

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At Last! A Hands-on R-7000 Review

THE CSE: Canada's Ear on the World

by Martin C. Barry

The Communications Security Establishment, Canada's ear on the world set up after World War II to monitor radio intelligence, was unknown to most Canadians, including government members, for over 35 years. In the early 80's, however, with the revelation of the CSE's existence and its rumored potential to eavesdrop on private communications, controversy broke in Canada's media and Parliament.

This building is presumed to be headquarters for the CSE (All photos by Martin Barry)

While the furor has abated and cooler heads now prevail, a shroud of mystery still surrounds what is undoubtedly one of the world's most sophisticated monitoring agencies.

What is known about the CSE has come mainly from American sources who have linked it to the National Security Agency (NSA) in Fort Meade, Maryland. Until 1983, the Ottawa-based CSE wasn't even mentioned in Canadian government spending estimates or budgets.

At one time it was rumored that many Canadian defense ministers had never heard of it, even though the CSE is in their jurisdiction. It has also been said that there isn't a Canadian law or piece of legislation which establishes the CSE's mandate.

In 1974 a television documentary reported the CSE had a staff of 250 to 300.

Please turn to p.4

INSIDE THIS ISSUE

IMRA: People Helping People

by Rev. Michael Mullen, C.M. WA2KUX

Unknown to most people, their influence spreads halfway around the world. The majority of Americans have never heard of them, yet day after day, they fill the air with messages of consolation to people overseas. They reach out to those who are lonely or isolated, or whose lives have been ravaged by natural disaster.

The International Mission Radio Association, almost 25 years old, is a group of hams banded together to help missionaries of all denominations and other Americans overseas communicate with their families by means of amateur radio.

NATURAL DISASTERS

During those years, however, the organization through its daily network, has done far more than that. It has dealt with life and death situations on a regular basis and often has been the only means of communication in times of need and disaster.

In 1970, an earthquake ripped through 1,000 miles of mountain range north of Lima, killing 70,000 people. The roads along the mountainsides were shaken and the canyons were choked with dust. An American Jesuit moved into the disaster area with ham radio. For three weeks, living in a tent in a cow pasture, he alone directed the planes and helicopters that were bringing in emergency food and supplies.

In 1972, an earthquake devastated Nicaragua and the IMRA net handled 2,000 health and welfare messages into and out of the States. In 1974, when Hurricane Fifi roared through Honduras, the net was busy with 4,000 pieces of emergency traffic.

In 1979, Hurricane David slashed through the Dominican Republic leaving 80,000 people homeless. In New York City, Catholic Relief Services, with a plane load of supplies, could not move until they could get clearance to land --the airfield was under water. An IMRA member located a ham in the U.S. Embassy in Santo Domingo and expertly handled all communications for one week.

In 1985, Mexico City was shaken by an earthquake that sacrificed 7,000 lives, and for a week communication was cut off with the outside world. Two IMRA members there ran thousands of messages to and from the States, while in New York

Please turn to p.4

Rev. Michael Mullen, C.M., WA2KUX, at his operating post.

MONITORING TIMES

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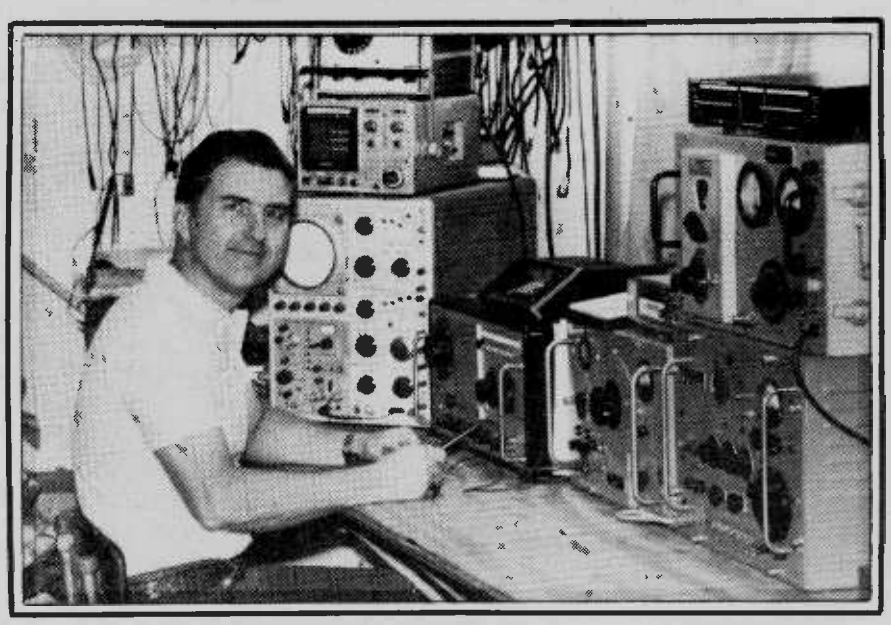
FROM THE EDITOR



A GIANT STEP FORWARD... and a Gentle Look Backward

With this June issue, Monitoring Times prepares for the largest step in its history, a merger with another publication, International Radio (formerly Shortwave Guide). We are excited to have a professional journalist of Larry Miller's stature join with us and look forward to many years of continued growth in both content and quality.

While the preparations for this new adventure have taken months of exhaustive work, it has been stimulating and enjoyable. Larry and I have a common goal; it may sound hackneyed and altruistic, but it is true. We want to provide the most accurate, timely and comprehensive information available for the listener to the radio spectrum.

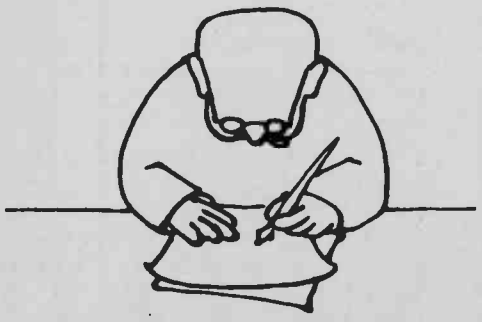
At present MT serves the hobbyist and the professional alike. Our publication is considered "must reading" by CIA, NSA, military intelligence agencies, and countersurveillance personnel.

But as I sit in a busy office, telephone ringing off the hook and correspondence piling up, it is tempting to remember those simpler days just over five years ago when MT evolved from a dream into an eight-page newsletter. My, how we've grown--the July inaugural issue, now in preparation, will number 60 pages!

In just a couple of days I will be driving to Atlanta to pick up our new Hewlett Packard Laserjet printer and three IBM computer terminals with a total 70 megabyte capacity! All this to accommodate our exploding list of subscribers.

Yes, MT is certainly a success, but not all by itself. You, our faithful subscribers, made it all come true. Without you MT would still be a dream, but with you and your constant input, MT has soared to its position of respect and leadership.

I take this nostalgic opportunity to say good-bye to the old Monitoring Times and look forward with great optimism and pride to seeing you all again next month--in the NEW Monitoring Times!



Viewpoint

SCANNING EXPO '86

I enjoyed the last issue of Monitoring Times (May '86) like always but thought I would add some additional information to James R. Haye's article on Expo radio frequencies. Although the following are not marine related frequencies they are Expo related.

Expo Site:	
410.2875	Vancouver-Skytrain
442.662	Roaming Mobile Robot (R2D2)
447.662	"
449.287	Maintenance crews
449.337	Guards, gates, grounds (Delta, Echo)
449.362	?
449.487	Production Logistics Personnel
449.537	?
449.587	Monorail, Maint.

I found the above frequencies in about twenty minutes, using a Bearcat 300 and Regency MX1000, while driving around looking for a parking spot. I know that there are many many additional radio frequencies in use around Expo (like RCMP's, city police, securi-

M-6000 "Glitch" Resolved

In our previous issue, we mentioned that a letter received from Digital Electronic Systems noted a software error in the new Infotech M-6000 multimode demodulator. We have been notified now that the error occurred in only a small number of units (serial numbers 7227 through 7277) and that letters had been sent to all owners.

Apparently, the software error affected one line in the EPROM which could cause a temporary lockup in the automatic step-up sequence resulting in a delay for about ten seconds.

The error is easily corrected in those few units which were affected and would not, in any case, result in improper reception of signals in any mode.

PRIVACY ACT UPDATE

Listeners nationwide are still quite concerned about the possible outcome of House Bill HR 3378 and companion Senate Bill S1667 which intend to regulate the services which can be intercepted and monitored over the airwaves.

At this writing a mark-up session for this session of Congress is in doubt. The latest version prohibits the monitoring of cellular telephone conversations, voice paging, beepers, and terrestrial microwave.

Several members of the subcommittee have expressed willingness to support an "intercept and divulge" standard for unencrypted radio, already in law as section 705 of the 1934 Communications Act; the members additionally indicate that Title 3 coverage should be provided to prevent unauthorized reception of encrypted radio transmissions.

Title 18, section 2512, specifically says that it is illegal to advertise or sell equipment primarily intended for interception of wire or oral communications. Since scanners are not primarily intended for that use, it is not illegal to manufacture, sell, possess, or use any scanners capable of tuning the 800 megahertz cellular telephone range, and no legislation is being proposed or even considered at this time barring such equipment.

In addition to easing the original wording of the proposed bill, the Justice Department has recently modified their previous position, stating that they would support criminal penalties only as a misdemeanor for willful interception of cellular telephone transmissions, but they would not commit to enforce that law.

For the moment, the Federal Communications Commission does not want to get involved with the issue by going on record either in opposition to or support of the proposed bill, but pressure on them is increasing to make a stand.

Clearly, the proposed "Communications Privacy Act of 1985" is in a very volatile state and will not be resolved for months to come.

DVP SCRAMBLING BROKEN!

A late breaking news item reports that a private laboratory may have broken digital voice encryption using the DES (digital encryption standard), commonly employed by federal and military intelligence agencies.

Built around the proprietary Motorola encoder/decoder chip, the development was intended to crack audio scrambling on TV satellites and accidentally decoded the high level digital voice encryption used for SECOM (secure communications) as well.

MT will have more on this story as it unfolds.

VIEWPOINT cont'd

ty and media groups).

I hope that other readers might send in their findings to you as well.

(Name withheld by request)

LEGAL ADVICE OFFERED

My law library here is quite extensive and should any of the readership require free legal advice on a federal level, or photocopies of any particular case, they are invited to correspond with me.

Although I specialize in criminal post-conviction law, I do have the time and resources to help in any area I can. I will not solicit or accept a fee at any time for an opinion or photocopy of a case.

Alfred Carl Juhl
(Reg. No. 03373-010)
P.O. Box 1500
Co. One Unit
El Reno, OK 73036

ENCODING AND DECODING

Did anyone come up with an explanation of the "Ciphers on 40 Meters" article on page 9 of the Feb 1986 issue of MT? I offer the following ideas:

Only the characters A, B, D, E, N T, U, V, 4 & 6 are used for transmission, because of what I believe to be for error-reduction means. Consider the characters in Morse and their reversals:

E	.	T	-
A	.-	N	-.
U	..-	D	-..
V	...-	B	-...
4	....-	6	-....

The system resembles the famous German ADVXG Cipher used in 1918. See David Kahn's Codebreakers book for additional details.

The format of the transmission suggests that the text is sent in pairs: DE 4T U6 6V BA TN etc. This would allow 100 pairs: AA AB AD AE...6V 64 66. Hence, common letters like E and T could have more than one substitute.

If the text has been cracked, I would like to hear more about the system.

Frederick W. Chesson
144 Fiske St.
Waterbury, CT 06710

>>>>><<<<<

"Code-breaking" always includes analysis of the situation in which the method is used. The tradition in that culture is also vital. A Talmudic scholar would probably use the A/N folded alphabet crypto; an Italian Cardinal, the Vatican straddle matrix; a French Cardinal, the Richelieu masked grill...

And that that answers a question I had wrestled with for years--WHAT METHOD DID MARY, QUEEN OF SCOTS, USE? It was some technique that was easily broken, if known to be encrypted. Mary was raised in France, married the Dauphin. A straddle was secure--her's was wide open during most of her last years. If some kind of mask was suspected, then overlaying pages would show up the pattern. Poor Mary never had a chance.

I am certain digital scrambling must be very vulnerable. If you could isolate a known sound, and work out what pulses encoded it, you would have the key to the scramble. DIAL TONES might be complex enough to give the data Certainly, matching a voice against a similar encoded passage would do it.

Bob Russ
Walworth, WI

>>>>><<<<<

I recently purchased an Info-Tech M6000 from you and I want to tell you that I'm really pleased with this new product from Info-Tech.

Some comments on the use of the M6000 so far follows:

1. When the (1) key is activated for a speed readout and the unit is in ASCII mode above 300 baud, the video display can become scrambled. The only way I was able to get out of this was to power off and on.

2. When stepping the (B) key to Baudot mode, toggling the UP/DOWN switch will allow the BAUD rate to be adjusted instead of the shift. Normally I want to adjust the shift, so I have found that by toggling the HI/LO tone switch will now allow the UP/DOWN switch to affect the shift rate. This is also useful under FDM mode for fine tuning the shift rate without having to press the (9) key for changeover to UP/DOWN shift.

3. When in TDM mode, sometimes noise glitches will cause the unit to get into a "data error" mode and garbage data will start printing. I have found two ways to reset the unit: 1) push the (4) key and this will cause the unit to loose lock and re-lock without the data error. If this does not work, 2) push the (5) key which also causes a re-lock without the data error although sometimes this will cause a lock on "data error" which also gives you garbage data. If either of the above two steps don't work then the signal is too noisy for a satisfactory reception. There are some TDM transmissions that appear to be garbage data but are in fact coded transmissions as long as the "data error" light is not lit.

I really like this unit so far and can see that some enhancements might be needed.

David E. MacDonald
Coon Rapids, MN

FEEDBACK

I recently discovered Monitoring Times and immediately subscribed. I also ordered all the "Best Of" anthologies, as well as your Shortwave Directory.

Having had some weeks to digest all this material, I would now like to provide you with some reader feedback:

1. The tabloid packaging of Monitoring Times is great for quick distribution of timely information, and for keeping costs down. However, it's not so great for storing back issues neatly on the shelf. POPULAR COMMUNICATIONS looks better, and is easier to read, but sometimes the material is three months out of date. My suggestion would be to resist the temptation to get slicker. You and POP'COMM serve slightly different needs, and both do so very well. I think you should maintain the differences between the two publications.

2. I thought Havana Moon was going to disappear. Please don't let him change his mind. His writing is smug and hard to take.

3. Your strong suit is definitely your excellent, specific technical information: everything from current MIL-TAC freqs to quieting that damn Regency beep. Keep it up, and add some more cheap, useful build-it articles, and I'll become a lifetime subscriber.

4. You plug your own products just a little too much in the articles.

5. You asked for feedback about offering a basic, tunable VHF/UHF receiver. DO IT! One of my favorite radios is a 15 year old Radio Shack Pro-3A tunable. Scanners have their place, but when you are exploring new bands, there's nothing like twisting a dial. I would love a quality tunable receiver that covered 220-420 MHz.

6. Could you please publish a listing of known channel designations for SAM frequencies? I'm not sure if these are the same as the FOX-TROT channels I've seen referenced elsewhere. All I know is that when AF-1 changes frequencies, they go

NEW REGENCY PROGRAMMABLES

Two new hand-held programmable scanners are slated for production by Regency Electronics, according to an informed source. The model HX2200 will replace the HX2000 and offer better immunity to strong signal overload, a common complaint of its forerunner. Other capabilities remain unchanged.

The HX1500 is the next step up from the popular HX1200, featuring 55 memory channels in four overlapping banks, any number of channels.

MT will have more information as it becomes available. The scanners will be stocked by Grove Enterprises and other MT advertisers.

DAYTON SCORES AGAIN

The Dayton Hamvention, an annual pilgrimage for faithful hams worldwide. This year, as in years past, the April 25-27 extravaganza brought record numbers of electronics enthusiasts--now estimated at 24,000--to see commercial displays, attend technical forums, and visit the enormous flea market.

As always, Grove Enterprises and Monitoring Times were well represented; Bob, Judy and son Bill were in constant attendance at their booth, with Bob and Bill occasionally succumbing to the seduction of the flea market, leaving Judy to answer the barrage of questions from visitors.

The SLW/scanner forum was well attended with presentations by Bob, Fred Osterman of Universal Shortwave, and Chuck Gysi of RCMA and the All Ohio Scanner Club.

The courtesy and efficiency of the hams who volunteer their services each year from the Miami Valley Amateur Radio Club contribute to the professionalism which earns the event the title of "world's largest hamfest."

IMRA con't from p.1

City another IMRA member put Catholic Relief Services headquarters in touch with their directors in Mexico City so that they could distribute a $50,000 preliminary aid allotment.

HISTORY

The IMRA was founded in Hudson, New Hampshire, in 1963, when 50 Catholic priests and Brothers who were hams decided to band together and use their skills to help missionaries contact their families. They called themselves the Catholic Mission Radio Association. However, in a few years, they brought in the laity, opened it up to missionaries of all denominations, and changed the name to the International Mission Radio Association.

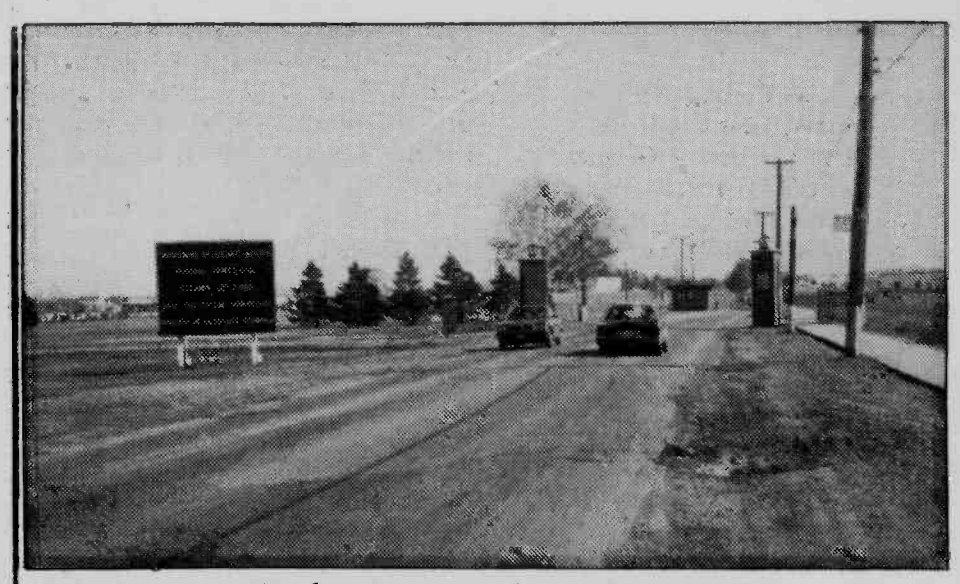
Today the group comprises 800 hams scattered through 40 countries. Over 200 are clergy or religious affiliated. Senator Barry Goldwater (K7UGA) and William Wilson, U.S. Ambassador to the Vatican, are honorary members.

TUNING IN

The IMRA conducts a traffic net every day except Sunday from 2:00 to 3:00 Eastern time on 14.280 MHz from Central and South America. Each year, the IMRA net handles 18,000 check-ins and over 9,000 pieces of traffic or phone patches.

The IMRA also helps missionaries to get on the air themselves, providing them with transceivers if they are licensed hams in the country where they work. Much of the equipment is donated by the members themselves, while 30 Catholic and Protestant Church groups support the IMRA with funds to purchase the rigs.

Every Wednesday, various professors from St. John's University School of Pharmacy in New York join the net to conduct a discussion on topics concerned with medicine. Often, missioners who are running remote clinics have drugs donated to them by drug companies, but are unfamiliar with their applications. Missioners are particularly grateful for this service.



Entrance to Uplands Airport and Armed Forces Base

The work of the IMRA goes on day after day. The job is done without fanfare by many people who unselfishly offer their time and their skills for Americans who work in foreign lands, far away from their families. ■

(For further information contact: Rev. Michael Mullen, C.M., Director, Public Relations, International Mission Radio Association, Inc., St. John's University, Jamaica, NY 11439 (718)990-6744)

CSE con't from p.1

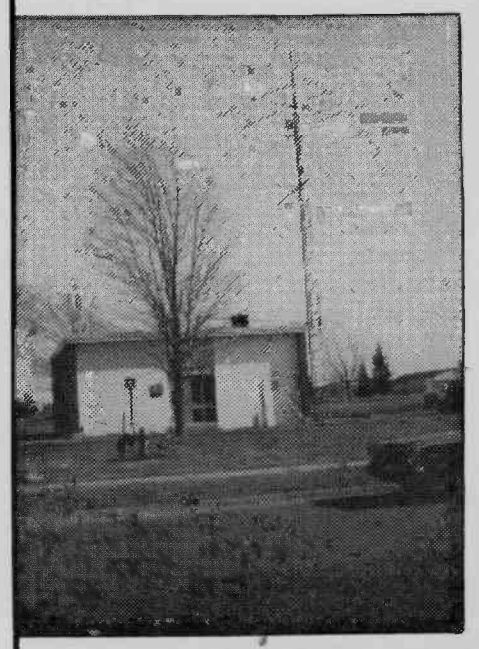
Nine years later a government employees' union negotiator revealed that the agency had doubled in size when he said he represented 583 CSE employees, not including 60 additional management workers. By comparison, the NSA has a staff of more than 60,000 computer technicians, cryptologists, translators, and intelligence analysts.

PART OF WORLDWIDE NETWORK

The CSE technically is known as a "signals intelligence operation"; its mandate is to gather electronic signals entering and leaving Canada--"footprints" as they say.

The CSE is part of a worldwide monitoring network set up in 1947 by special agreement between the British and American governments. The head of the network is the National Security Agency.

The English section, made famous by Winston Churchill in World War II by his brilliant use of it, is General Communications Headquarters (GCHQ), otherwise known as Signals Intelligence (SIGINT), with its



An HF yagi placed inexplicably beside a phone company building at Uplands.

VIEWPOINT cont'd

to something like "112" or "267" instead of "6.731", and I've had no luck trying to track these down.

7. Interested in some UHF-MIL frequencies in use around the Boston area?:

364.2 - Although this is listed as a NORAD frequency, much Navy aircraft traffic is heard here calling "Huntress." This seems to be based at Brunswick NAS in Maine, and my guess is that they are Orions.

294.5 - Is currently in use here as the primary SAC bomber-tanker freq for mid-air refueling ops.

8. RE: U.S. Military Radio Communications by Michiel Schaay. What the hell are his political views doing in a reference book? Is he trying to single-handedly get H.R. 3378 passed? Turkey.

That's it for this reader's feedback. Keep up the good work, and good luck with Grove Enterprises.

Bruce Frederick
Burlington, MA

>>>>><<<<<

Your new product ideas are good. There will always be at least 5% of the Ham/SWL population out there looking for that extra something different...and willing to lay out the bucks to have one...The more I read MT the better I like it. I found out more about my Regency MX7000 from MT articles than Regency itself! They should read MT!

Richard B. Krepps, W1ACG
Houston, TX

>>>>><<<<<

Just a word to tell you I have enjoyed reading Charles Robertson's Skip Editorials and Reports in the Monitoring Times. We should have more editors like him in MT.

John Skibinski
Sterling Hts, MI

GOOD BOOKS

I thought your readers would be interested in learning about the availability of the following publications:

National Security Affairs Monograph Series 84-2 "National Emergency Telecommunications Policy: Who's in Charge?"...

This rare glimpse at the NCS (National Communications System) was written by Colonel Robert A. Reinman, United States Air Force. It was published by the National Defense University Press, Fort Lesley J. McNair, Washington, DC 20319, IN 1984. The NDU Press publishes results of research conducted by research fellows of the university and other institutions such as the National War College, the Industrial College of the Armed Forces and the Armed Forces Staff College.

This monograph is 55 pages long. It can be ordered from:
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Important: Stock number-
008-020-00982-2
Price: $2.50

Following is another book your readers may be interested in:

"Rebel Radio: the Full Story of British Pirate Radio," by John Hind and Stephen Mosco.

This book was published in 1985 by Pluto Press, London (U.K.) and Sydney (Australia). It is 163 pages long. In the U.S. it can be purchased by mail through:
Longwood Publishing Group
51 Washington Street
Dover, NH 03820
ISBN: 0-7453-0055-3
Price: $5.95

Armand Di Filippo
Philadelphia, PA

MISSING THE CONNECTION

From the "nothing is ever easy" department comes a peculiar story about an IC-R71 DC connector. I had ordered the DC power cables for the R71, figuring it was an inexpensive, easy to perform modification which could be useful during power failures.

When I went to install the DC jack in the receiver, I found out that the DC connector which was supplied with the receiver lacked the necessary mounting flanges to snap onto the bracket supplied with the DC cables.

If you've had any similar experiences, the correct connector is available from ICOM. I telephoned them and had it free of charge within a week. Installing it with the proper inserter/extractor tool is easy, and should also be possible using small needle-nose pliers if the user is careful. Alternatively, ICOM offered to do it if I sent the receiver to them.

Greg Doerschler
Wethersfield, CT

■

CSE cont'd

huge listening post in Cheltenham, England.

Along with Australia, New Zealand and Canada, they divide the planet into areas of responsibility for intercepting telecommunications. Tasks handled by the network might include monitoring airborne telephone, telegraph, telex, microwave, and satellite signals.

Some persons speculate that sensitive receivers are used to tap microwave transmissions of telephone conversations. A computer with speech recognition capabilities then filters through thousands of taped intercepts, seizing on key words such as diplomat, terrorist, bomb, or explosion.

The CSE has been surrounded by at least as much controversy as mystery. While the agency's mandate is to provide security for Canadian government communications and gather information about foreign countries by intercepting and studying their radio, radar and other electronic transmissions, its accountability has always been vague.

In principle the CSE is controlled by a government committee overseen directly by the Prime Minister. It is thought, however, that only raw data is gathered in Canada then forwarded directly to Fort Meade where it is analyzed and interpreted. There have been suggestions that, in this way, the NSA selectively releases bits of intelligence to participating countries, while withholding the bulk.

The Canadian government has said that the CSE - or, in fact, any organization or individual - may legally eavesdrop on conversations traveling over public airwaves or bounced off satellites. They have also said that the CSE is prohibited under an internal policy directive from monitoring microwave signals. In fact, says the government, the CSE follows a policy of not intercepting phone calls in Canada by Canadians whether the calls are being received or sent.

If this is true, however, the CSE's methods differ from those of the NSA. In 1975 a U.S. Senate committee revealed a series of NSA projects to intercept telephone and telex messages of specific American citizens. The Washington Post a year earlier reported that the NSA had monitored communications by Jane Fonda and Dr. Benjamin Spock relating to their anti-war activities.

LAX SECURITY

The CSE, while ostensibly operated by Canada's Ministry of National Defence, goes by another name in another department. It is also known as the Communications Branch of the National Research Council or CEBRC and is listed as such with the NRC's general enquiries desk in Ottawa.

While the CEBRC's phone number - 998-4028 - corresponds to the Uplands Research Institute (a facility located at Ottawa's international airport which also doubles as a Canadian Forces base), calls are answered by "CSE control room."

A recent visit to Uplands revealed that, if indeed the CSE is quartered here, security is virtually non-existent.

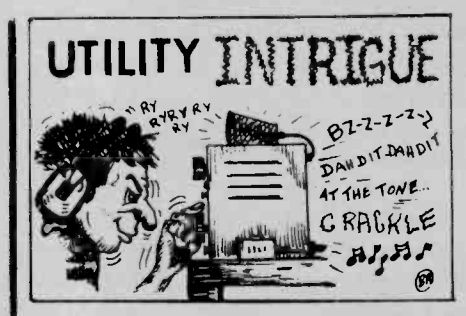
The gate of the NRC's installation is wide open and we were able to wander about snapping photos unimpeded. A warning to trespassers put up by the Department of National Defence is posted on the wrong side of a barbed wire fence to be seen by persons leaving rather than approaching. This contrasts sharply with an earlier report in Monitoring Times which outlined strict security at facilities in New Zealand similar to the CSE.

No sophisticated antenna arrays were seen at the NRC Uplands installation. In fact, the only antenna of note was an HF yagi placed (oddly enough) beside a nearby phone company switch building. (It should be noted, however, that Ottawa lies in a valley. A monitoring agency like the CSE might choose to locate antennas in an area that is more strategic and less conspicuous.)

SUSPICIOUS BUILDING

There is a building not far from Uplands that at one time looked like so many other government buildings in Ottawa. Today it is surrounded with barbed wire fence and manned with guards around the clock. It has two fairly unremarkable antennas on its roof, one of which is a loop. Not even Canada's National Defence headquarters looks as conspicuous.

The word in Ottawa is that this is the new home of the Communications Security Establishment. ■



by
Don Schimmel
516 Kingsley Rd SW
Vienna, VA 22180

● While tuning in the 13 MHz region I ran across an unusual transmission on 21 March at 1341Z. This CW signal was heard on 13888 kHz and consisted of the transmission of the number five (5) repeated over and over. The signal had a bubbly-sounding tone to it and the rate of transmission was approximately one character per second with a character being skipped at irregular intervals. At 1345Z the signal went down.

● Messages of 6F groups were copied on 4514 kHz on 25 March at 0150Z. The headings were very brief; sample follows: 33 C DE O -P-241955Z -GR28 BT. I stayed with this activity for quite awhile but was unable to obtain any identification data.

● Our thanks to Mike Hardester of N. Versailles, Pennsylvania, who sent us a news release concerning the upcoming International Naval Review (INR). According to the article, "More than 35 Navies from around the world will enter New York Harbor 4th of July weekend and participate in an International Naval Review hosted by the U.S. Navy as part of "Liberty Weekend 86," a four-day celebration to commemorate the centennial of the Statue of Liberty.

"To date, 36 Navies are planning to attend the event with either modern Naval Vessels, Naval Sail Training Ships or Delegations. Twenty-one Foreign Naval Vessels from 14 countries will join 11 U.S. Navy Ships for the INR, the fifth such gathering of military vessels in U.S. History.

"The ships will sail up the Hudson River July 3 and anchor in locations throughout the harbor and river. The morning of July 4, USS Iowa (BB 61) will exchange honors with the visiting ships.

"The U.S. Navy's flight demonstration team, the Blue Angels, will perform also.

"Immediately following the INR, another event entitled `Operation Sail 86' will take place. The parade of 21 `Tall' ships from around the world will bring together vessels from 12 Foreign Navies. They will be joined by other smaller craft.

"The last INR was held in honor of the Bicentennial of the U.S. in 1976. his year's event will symbolize the diversity of cultures that make up the U.S. and will recognize the ocean travel that brought millions of immigrants to America."

Again, our thanks to Mike for providing this information; we expect this will be an interesting event to monitor.

● Mel Smith of Crisfield, Maryland, has asked about a transmission he picked up on 11240 kHz which was enciphered groups of mixed letters (phoneticized) and numbers, sent in the English language. From the description provided by Mel as to the operating procedures and the fact the reported frequency is only 3 kHz away from a known USAF Strategic Air Command frequency, I suspect that what he heard was a "SKYKING" broadcast. These broadcasts are described in the Grove Shortwave Directory on page 2, accompanied by related information on frequencies and frequency designators.

Mel also sent in his

CSE's QTH is listed officially at this unguarded NRC facility.

UTILITY INTRIGUE cont'd

attractive QSL card, fashioned after an old-time drawing. We thought this would be of interest to readers so here it is.

Rt. 2 Box 15 Anchor Drive
Crisfield, Maryland 21817

● The following is an extremely interesting summary of monitoring efforts prepared by Greg Wilson of Browns Mills, NJ.

"On April 7, 1986, between 1439-1555 UTC, I rolled upon and copied an interesting net. At 1439 on 13455 kHz, I copied T9BG calling Y5IO in CW. At the same time, a Y4SV called Y5IO and passed a 4 digit message with the preamble Ø1 13 1815 BT (Zero cut to T).

"Within three minutes, T9BG called 6NA9 and passed a similar 4 digit message preambled as Ø1 Ø6 1843 BT - as this was a six-group message, the preamble probably equates to NR Ø1 GR Ø6 TIME 1843 (1843 is four hours ahead of UTC leading one to believe that this is Moscow time).

"Between 1439 and 1516, T9BG, Y4SV and a third (barely audible) unidentified station called stations Y5IO, H09Z, S47F, 4YDE, AR8D, E3DV and 6NA9. One intriguing feature of these three stations is that they called the same outstations but never each other, which points to duplex operation. Yet another puzzling feature is that each station would periodically begin sending letter markers. For instance, T9BG sent `C´ slowly and deliberately occasionally (the weak, unidentified station sent `D´).

"While monitoring this activity in memory (I run an ICOM IC745), I began systematically searching above and below this frequency. At 1535 on 13554 kHz, again in CW, I copied ZGZR calling S47F (an outstation callsign appearing on the previous frequency). All of the traffic and callsigns were consistent with that copied on 13455 kHz. It is interesting to note that the two frequencies are nearly 100 kHz apart.

"At 1543, with the two frequencies in memory, I found NQBD calling ZGZR on 13268.2 kHz (in CW). 13455 and 13554 are in the band allocated for fixed operation, but 13268.2 is in the aeronautical mobile band (strange but consistent with the following analysis):

Zero cut to T (a Soviet feature);
Message preamble time=UTC+4 (Moscow time);
`D´ & `C´ markers sent (possibly for DF or homing purposes);
Outstation NQBD found in aero mobile band.

CONCLUSION: This net could possibly be an example of some sort of Soviet air to ground (military) activity.

"Research shows similar activity, down to the frequencies or callsign structure, was reported in the Dec 84 MT (Sep 84 loggings of Utility Intrigue 13349.8 and 13395.5), May 84 MT (Utility Intrigue--last paragraph) and Nov 85 POPCOMM (Communications Confidential - 10814.6 and 13453.6 kHz)."

Greg, many thanks for your remarks. We believe this material will be of interest to fellow utility buffs! ■

MARCH 1986 LOGGINGS

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2185	240155	USB/HALIFAX CG STN TRYING TO GET WEAK STN TO GO TO CH 57 BUT OTHER END DOES NOT HEAR
2240.9	210021	CW/78EAL DE 72JKL/SPANISH NAVAL STNS
2293	240153	CW/DE MTO(ROSYTH NAVAL RDO, ENGLAND)
2348.6	210029	CW/DE 72WTT (SPAIN NAVAL STN)
2383	240017	CW/WX IN ENGLISH FOR SPANISH SAHARA
2390	210031	USB/TWO OM CONVERSING IN GERMAN
2600	210048	USB/CANADIAN WX IN FRENCH
2988.5	210037	CW/NO CALLS/5 CHARAC GRPS, MIXED L/F
3011	210053	CW/5F GRPS, HAND SENT, NO IDENT
3171	210057	CW/FRIT DE FUF (FRENCH SHIP FROM FORT DE FRANCE NAVAL RDO, MARTINIQUE)/PT NAVAL TFC IN FRENCH
3178	210102	CW/5L GROUPS, HAND SENT, SLOPPY FIST
3196	240208	CW/5L GROUPS, HAND SENT, SOUNDS LIKE SAME OPR AS ON 3178/210102Z
3310	250143	CW/NO CALLS/MARS MSG RE MARS RECRUITING BROCHURE
4245	230254	CW/DE DAL (NORDDEICH, GFR)
4600	210324	USB/MANY STNS, SOME OM, FEW YL´S/ EXCHANGING 4F GRP MSGS
4665	232350	CW/WAP, MZK DE AUL/UNIDEN, SPANISH CHATTER
4724	240004	USB/WX IN ENGLISH FOR BRITISH AIRPORTS
4780	230300	CW/NO CALLS/5L GRPS
4898	210348	CW/WX IN SPANISH, MEXICAN LOCATIONS MENTIONED IN TEXTS, OTHER END QSL´S BY VOICE
4715	210345	SCRAMBLED VOICE
5460	210316	RTTY 75-425/PRESS IN ENGLISH
5558	210322	RTTY 50-425/NO CALLS/5F GRPS
5872	210354	CW/NO CALLS/5L GRPS, AUTOMATIC SENT
8090	292310	CW/WX IN ENGLISH
8190	220208	TRRY 75-850/NO CALLS/QUICK BROWN FOX AND RY´S WITH INT ZBZ AT END OF TAPE
8226	220211	CW/BSNN DE BSNQ (CHINESE SHIPS)
8518	312124	CW/NO CALLS/PT ENGLISH TFC RE ARRIVAL IN KOBE, JAPAN
8680	212126	CW/DE WSC (MC GLOBAL MARINE COMMO, WEST CREEK, NJ)/TRAFFIC LIST
8745	312129	USB/TWO OM/EE DISCUSSING MISSING PORTION OF SHIPMENT, CREW MEMBER SAW IT REMOVED BUT DOCK SAYS IT NOT OFF-LOADED
11182	312144	USB/YL/EE GIVING WHAT APPEARS TO BE SERIES OF SHIP POSITION REPORTS
13369	292306	RTTY 50-425/DE 5YD (NAIROBI, KENYA)
13378	211359	RTTY 75-425/PT MSG, POSSIBLY BULGARIAN)
13440	251415	CW/CONG DE CLQ (CUBAN SHIP FROM HAVANA-COJIMAR-CUBA)
13615	211352	CW/PROB SON261 (WARSAW, POLAND)/PT POLISH MSG WHICH APPEARS BE LISTING OF TRANSMISSION FREQS WITH TIME SCHEDULES
13622	211349	RTTY 75-850/CODED WX, 5F GRPS
13844	312220	RTTY 75-850/DE KRH51 (US EMB,LONDON)
13995	211339	RTTY 50-415/PRESS IN FRENCH, ITEM RE TERRORIST ACTIVITY
16522	211408	USB/CONVERSATION IN SPANISH, RE UNIDEN SUPPLIES/MATERIALS
18190	211429	RTTY ASCII 110-425/UNIDEN STN SENDS ENCIPHERED TRANSMISSION THEN SHIFTS TO CW AND SENDS QRU QRU, THEN DOWN

An Introduction to...

SCANNING

by Bob Grove

It´s been more than fifty years since the Detroit Police Department had an idea: They put a radio receiver in one of their patrol cars, and then dispatched it to calls via a transmitter in the police station. Miracle of miracles, it worked! Thus was born the land mobile service, an enormous pot-pourri of users now ranging from police and ambulances, to taxis and truckers. As a result, more and more frequency bands are being created for use by the land mobile services.

Up until the close of World War II, many home radios could tune in police communications just above the standard broadcast band; networks of police communications were heard throughout the 2 MHz region.

THE BIRTH OF VHF-FM

But the advantages of the higher frequencies were being felt. VHF low band (30-50 MHz) was gaining rapidly in its popularity; there was less signal fade during daylight hours, antennas were smaller, and the noise resistant characteristics of FM over AM were a further incentive to change.

Technology rallied to provide new answers to new problems. More users could be crowded into the same spectrum space by reducing

SCANNING cont'd

the bandwidth necessary to transmit a signal; thus narrow-band FM was born. Additionally, increased sensitivity and lower internal noise were two new design parameters that were realized, along with narrower bandwidth, and these helped to extend the reliable range of two-way VHF communications.

The trend to higher and higher frequencies continues to this day. The 151-174 MHz VHF high-band is probably the most populated portion of the VHF/UHF spectrum; as a result, more and more land-mobile users have switched to UHF (450-512 MHz), with a concerted drive on to open more of the newer 806-960 MHz band.

Let's take a look at some of the equipment available to listen in on these fascinating communications.

RECEIVING EQUIPMENT

No longer can a listener tune in on mobile radio services with his Philco console radio; the shortwave band is devoid of this sort of activity below 25 MHz, except for some specialized government services.

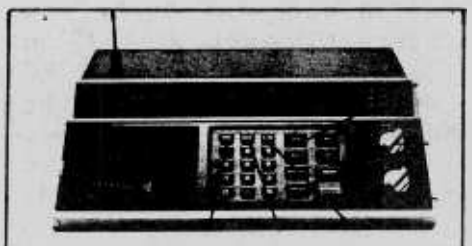
Although early manufacturers of shortwave receivers (like Hallicrafters) attempted to extend the tuning range of their radios into the VHF region, their performance was poor. Several new manufacturers sprang to the VHF forefront, including Monitoradio, Allied, Regency, and Lafayette. Their entries were initially all high-frequency variations of the tunable superheterodyne receiver and usually provided squelch.

They were tube-type, of course, and had the usual disadvantages associated with tube-type equipment: Constant tube replacement, high current drain, awkward size and weight, heat and humidity degradation, thermal frequency drift, and so on.

The invention of the transistor revolutionized all phases of the radio communications industry. Finally, radios have become truly portable; battery replacement is inexpensive on personal portables. Repair and maintenance time and costs have been reduced considerably, both because of increased reliability, and the availability of plug-in replacement modules in commercial equipment.

CRYSTAL CONTROL

Early in the development of radio, it was discovered that the stable-frequency characteristics of



The BC 800XLT by Uniden is the state-of-the-art's top representative in the VHF scanner market. The microprocessor allows it to do everything but sit up and beg.

quartz crystals could be used to advantage in frequency control of transmitters and receivers. The same basic approaches are still in use today, with some improvements. Different "cuts" of the quartz crystal allow smaller dimensions, and frequency dividers and synthesizers permit the use of one or two crystals to cover a wide range of discrete frequencies.

While the first crystal-controlled VHF-FM monitor receivers required manual selection of frequencies, a radical innovation appeared in the mid-1960's: An obscure product called "Bearcat," manufactured by an upstart company called Electra, introduced to the world a receiver with automatically switching crystal oscillators which would continue to select channels in sequence, until it intercepted a signal which would lock the oscillator on that frequency. They called this device a "scanner," and the rest is history.

Because the purchase of crystals generally averaged about five dollars a shot, multi-channel radios were expensive to get "crystalled-up." Early in the 1970's, another innovation was introduced by Teaberry, and subsequently developed by Tennelec: Programmable Crystal Synthesis.

Using a minimal number of crystals, frequency dividers and multipliers were employed to create incremental steps throughout the entire tuning range of interest. It was obvious that this technique was vastly superior to any other scheme, and the frantic boom in the CB industry indirectly assisted scanner development by perfecting the frequency synthesizer, designed for use in 23 and 40-channel transceivers.

COMPETITION IS KEEN

Several pioneers have come and gone in the treacherous game of radio manufacturing. A few years ago, Hallicrafters, National and Hammarlund disappeared from the field of shortwave radios, while Monitoradio, Optiscan, Allied/Knight, and Tennelec have vanished from the VHF market.

At this writing, these programmable scanner manufacturers dominate the consumer market: Uniden (Bearcat), Regency, and Radio Shack. Many private house-brands (such as Sears) are made by one or more of the major manufacturers.

WHAT'S ON THE MARKET?

Most manufacturers compete desperately to stay ahead of their rivals; it is difficult to stay abreast of new developments and products in the swiftly-moving field of electronics technology. However, a few generalizations may be made about the present batch of programmable, frequency synthesized FM scanners: They cover three frequency ranges --VHF low and high, and UHF (some include the VHF-AM aircraft band as well); they operate from either 120-VAC, or 12-VDC; they have a search feature allowing the unit to explore its tunable range continuously, looking for unknown signals and then display them for the listener; they have digital frequency readout; they have sensitivities better than one microvolt, and they have squelch. Additional features such as channel priority, selectable search or scan rate, and clock readout vary with the product.

LOOKING AHEAD

Although it would be impossible to predict with any degree of certainty which manufacturers will produce what new products next, a few unpaved avenues remain for further development: The addition of a signal strength meter (S-meter); the extension of frequency ranges to include more spectrum space now ignored by present products; external computer control--other options must surely occur to manufacturers and users alike.

ANTENNAS

The high sensitivity of the modern scanning receiver is both an advantage and a disadvantage. In a metropolitan areas, the sensitive amplifier stages of the receiver's tuning section often produce overload problems like "intermod," the reception of the same signal in multiple locations throughout the tuning range.

The use of an outside antenna greatly aggravates this problem, which is characteristic of all budget-conscious consumer radio products. For this reason, manufacturers usually include a small whip antenna which they recommend using. If you live near a populated area where high-powered transmitters

SCANNING cont'd

(including those of FM broadcast and television) are located, you had best heed the manufacturer's advice pertaining to antenna installation!

On the other hand, many listeners enjoy the challenge of "utilities DXing," searching for weak or distant two-way signals which often elude the casual listener. In that case, an outside antenna is usually mandatory.

TRANSMISSION LINE

There is probably more misguided information propagated about the proper way to attach an antenna to a receiver than in any other aspect of hobby listening.

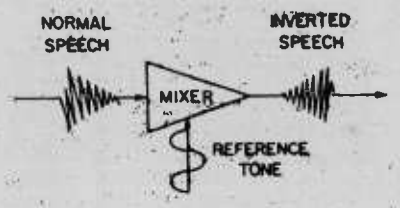
A few good "rules of thumb" will help set the record straight. Virtually **all** commercial radio equipment, and consumer radio equipment, is designed for 50 ohm coaxial cable. However **no** antenna made for the hobby market maintains a perfectly constant impedance over its entire listening range. For that reason, it is more important to choose a low-loss transmission line than to worry about exactly matching the SWR at some hypothetical single frequency.

While TV twin-lead ribbon has very low loss when new and dry, it becomes extremely inefficient when sun-baked, and/or wet. A good grade of coax is a better choice.

The higher the frequency range of interest, and the longer the down lead connection must be, the more signal will be lost in the cable. At shortwave frequencies below 30 MHz, this poses little or no problem, but for receiving UHF, the degradation of signal strength can be very severe. Foam-dielectric RF-8U cable is probably the most satisfactory choice for runs in excess of 50 feet. However, low-loss CATV-type RG-6/U 75-ohm coax will often give excellent results. Make sure the coax you use has a low-loss dielectric (like foam), plenty of outer shielding (foil is preferable), and is fresh--from a known manufacturer.

Because most modern scanner manufacturers utilize the Motorola-type antenna jack, adaptors are often necessary to interface between a coax connector and the radio. Because all adaptors have some loss in signal strength, it is always better to design your receiving system with a minimum number of adaptors. However, using a commercial adaptor is always preferable to doing a sloppy job of mating a connector to the transmission line.

The Capri Speech Converter is one of a number of voice descramblers available on the market.



Here is a waveform diagram of heterodyne speech scrambling and descrambling.

SCRAMBLERS

Because of the astronomical increase in the number of listeners to the VHF/UHF law enforcement frequencies, some of these agencies have gone to "scrambling," the process of rendering the transmitted voice unintelligible to anyone who is not equipped with a "descrambler."

The most common form of scrambler is the frequency inverter, a heterodyning device which takes the voice frequencies (typically 300-3000 Hz) and reverses them (3000-300 Hz); thus, high voice sounds are lowered while low voice sounds are raised.

De-scrambling is a simple procedure once the heterodyning frequency is known: Simply mix the scrambled speech with the proper tone, and the speech is normalized once again! In actual practice, a scrambler and a descrambler are exactly the same thing; when transmitting, it scrambles the operator's speech; when receiving it rearranges the scrambled speech back to normal again.

Because of the ready availability of descramblers (commonly called "decoders"), many agencies are switching to digital encoding, which is considerably more sophisticated; it is virtually impossible to break without a computerized decoding system.

LISTENING AND THE LAW

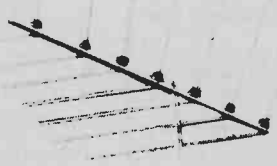
It has been over a half century since Congress passed the 1934 Communications Act, and it is past due for a radical revision (which is presently being done). The portion of the act which specifically affects scanner listeners is section 705, which states, in effect, that no one who intercepts a communication not intended for him may divulge either the existence or contents of the message, nor may he use what he heard for personal gain. This act is enforced by the FBI.

At this writing, any U.S. citizen may listen to any type of radio communication, regardless of its sensitivity. Unfortunately, largely because of the number of abuses of this constitutional privilege, a number of states and local municipalities have instituted their own ordinances disallowing **mobile** police receivers. Although there is an unresolved question as to whether these local laws are in conflict with the constitution, it would be wise for you to check with local authorities before installing a scanner in your car!

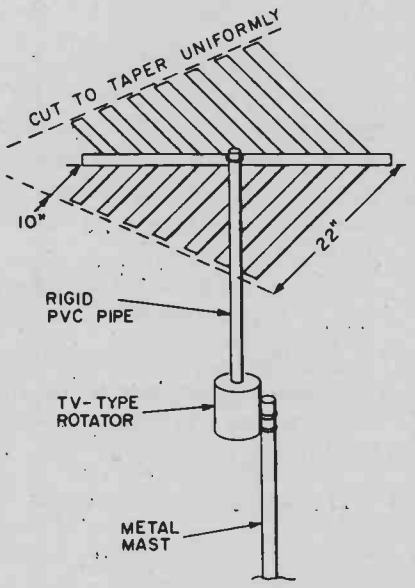
Arrests and convictions have been made for violations of section 605, but almost exclusively when the violation has been accompanied by a criminal act, and the reception of communications was used to avoid apprehension.

* * * * *

The VHF/UHF communications spectrum is fascinating; with the proper equipment, and a knowledge of frequency allocations, the hobby of "utilities monitoring" can be the most fascinating of all armchair hobbies. Ask anyone who has been doing it for only a short time, and you're likely to hear the very same thing! ■



The drawing at right shows how a standard TV log periodic antenna, such as the one pictured above, can be converted for use as a high gain VHF high band monitor antenna.



Here are the dimensions used in converting a TV-type log periodic antenna for VHF high band monitoring. It's still a directional antenna, so you'll need to use a rotator.

A standard 4:1 TV matching balun must be used to connect the coaxial cable to the television log-periodic beam antenna to minimize signal loss; impedance mismatch.

SCANNING

with NORM SCHREIN

Fox Marketing, Inc.
4518 Taylorsville Rd.
Dayton, Ohio 45424

Scanning the Far North

This month I am going to share with you some information that I received from the Whitehorse (Yukon, Canada) area. The contributor noted the low output power on many of the stations. Usually in the U.S., mobile stations will operate from 25 to 110 watts, and base stations from 110 to 250 watts. You will notice quite a difference on the Whitehorse listings.

Our contributor also sends along some HF frequencies for the area (all freqs kHz USB):

Alkan Air, Ltd. Hangar A
Call: VGK 526
Freq: 4441, 4520
Radiophone call: SQ 972
Air North, PO Box 4998
Call: VGK 380, VGK 379
Freq: 4441, 4925
Caron E. Diamond Drilling, 7 Roundel Road
Call: CJP 516
Freq: 4425
Capital Helicopter, Hangar A
Call: V6P 374
Freq: 4441
Hudgin Air Service, 10 Sunset Drive North
Call: VGP 824
Freq: 4441, 4520
Terr-Air Rotary, Air North Hangar
Call: CJM 30
Freq: 4441

***NORM SCHREIN** cont'd*

ALASKA AREA:

Tyee Airlines, 1515 Tongass, Ketchikan, AK
Call: ZE 8600
Freq: 4696
Krystal Corp., Box 133, Homer, AK
Ship: Krystal Star
Call: WRA 9497
Freq: 4125
Flyum's Barge Service, 267 City View Ave, Homer, AK
Ship: Nanuk
Call: WI 8480
Freq: 4125
The Message Center, 211 Marine Way, Kodiak, AK
Call: WHG 806
Freq: 4125

Finally here are some ten codes and signals that are used by the Yukon Territorial Communications Project. This is run by the government of the Yukon Territory, Dept. of Highways in Whitehorse, Yukon.

10-1 Receiving poorly (cannot understand)
10-2 Receiving well
10-3 Stop transmitting
10-4 Message acknowledged (OK)
10-5 Relay to....
10-6 Busy (stand by)
10-9 Repeat. Conditions bad
10-10 Out of service--subject to call
10-11 You are dispatching too rapidly
10-12 Officials or visitors present
10-13 Advise weather & road conditions
10-18 Complete present assignment as quickly as possible
10-19 Return to our station
10-20 What is your location?
10-21 Call this station by telephone
10-22 Take no further action on last information
10-33 Emergency traffic at this station
10-35 Confidential information
10-36 Correct time
10-68 Repeat message
10-70 All stations message
10-99 EMERGENCY -- All stations and units copy
MAY DAY -- EMERGENCY - All units discontinue transmission until emergency traffic is passed

It looks as though they have adapted the standard APCO ten codes for their use there.

One other final note. I was looking through the manual for the Yukon Territorial Communications Project and found this interesting paragraph on Secrecy of Communications.

"Radio operators and other persons who become acquainted with radio communications are bound to preserve the secrecy of correspondence. No person shall divulge the contents of, or even the existence of, correspondence transmitted, received or intercepted by a radio station, except to the addressee of the message or his accredited agent, or to properly authorized officials of the Government of Canada or a competent legal tribunal, or an operator of a telecommunications system as is necessary for the furtherance or delivery of the communications. The foregoing restrictions do not apply to the messages of distress, urgency or safety or to messages addressed to 'ALL STATIONS,' i.e. weather reports, storm warnings, notices to navigation, etc.

"Any person who violates the secrecy regulation is liable, on summary conviction to a penalty not exceeding twenty-five hundred dollars ($2,500), or to imprisonment for a term not exceeding twelve months or both fine and imprisonment."

Wow!! It makes me wonder why they bother to use radio, if their communications are that secret, although this is similar to a U.S. ruling on the same subject.

Until we visit another scanner port of call--Good Monitoring.

LICENSEE	FREQ	POWER (WATTS)	LICENSEE	FREQ	POWER (WATTS)
Whitehorse Airport	116.600		Northwestel Radiophone	152.540	25
"	118.300		"	152.630	"
"	121.600		"	152.720	"
"	121.900		"	152.810	"
"	122.600		"	157.800	"
"	122.900		"	157.890	"
"	126.700		"	157.980	"
"	130.750		"	158.070	"
"	132.100		"	168.010	"
Trans North Turbo	118.500	10	"	503.200	"
Airlines	123.450	"	Whitehorse Transport.	162.900	20
"	129.350	"	Yukon 2 meter Amateur	146.880/146.280	
"	140.100	"		146.440	
Yukon Airways Airlines	165.930	10	NCPC W'horse Power Dam	155.220	10
"	170.850	"	Yukon (Parks,Hwy,Govt)	153.470	25
Yellow Cabs	152.150	10	"	162.960	"
Yukon Taxi	168.120	10	"	168.730	"
Co-op Cabs	162.150	10	"	170.470	"
CHON-FM	98.100	8	"	169.520	"
CKRW (610 kHz)	450.0875	15	"	173.940	"
"	471.4875	"	"	173.975	"
" (mobile)	166.250	"	"	159.060	"
CBC - North (UHF link)	455.1875		"	158.820	"
Ambulance	155.160	20	"	154.380	"
"	155.790	"	Trojan Security	170.340	10
Fire Department	153.830	20	Atlas Tours	168.275	5
Whitehorse City Depts.	153.380	15	Yukon Forestry Services	162.930	25
Whitehorse By Law Net	167.100	10	"	162.750	"
"	158.640	"	All School Alarms	414.0125	
R.C.M.P.	155.160	25	Yukon Army Cadets	36.100	
"	155.480	"	Canadian Armed Forces	156.900	
"	155.670	"	Direct Delivery, Ltd	159.060	10
"	155.850	"	Exco Research, Ltd	153.230/	
"	162.180	"		158.370	10
"	162.240	"	"	153.290	"
"	162.440	"	"	153.320	"
"	168.240	"	"	153.320	"
Dept. of Communication	166.110		RTTY?	152.560	
"	442.600		"	152.830	
White Pass Yukon Rail	160.170				
"	160.305				
"	160.425				

NASCAR UPDATE

Immediately following the WORLD 600 RACE on May 25 please forward your 1986 Winston Cup scanner frequencies to:

RADIO RESEARCH
10 Elf Lane
Greenville, SC 29611

All lists will be combined for the next available issue of "MT".

UNITED STATES COAST GUARD CUTTERS

by Mike Chabak

The following list is from official USCG sources. It depicts the cutters 65 feet or longer on the active inventory as of Jan 86, or whose construction has already been approved. The list is arranged alphabetically by cutter name. Following the name is the N-series radio call letters and the cutter type/hull number. The mailing address can take one of two forms: either care of a shore facility, or through a P.O. box.

A FEW NOTES...

In some instances XXXX will appear for the radio call letters or mailing address. CG Cutters lacking radio call letter data are basically the inland/river types. These cutters use VHF but why their call letters do not appear on CG listings is omewhat baffling. Not all cutters listed are now active, but some of those that are in the process of being built have already been assigned a home port address.

All WHEC 700 series Hamilton/Hero class cutters will undergo a FRAM modernization program. This will lay up a cutter for about 12 months. USCG Hamilton is now undergoing FRAM and is not due back in service until mid 1987. If the FRAM schedule is maintained, cutters Mellon, Sherman, Dallas and Munro will follow suit during 1986.

The WMEC 900 series Famous Cutter class are continuing to enter inventory. WMEC 906 through 913 are due in during 1986/87. The newest cutters are the WPB 1301 Island class. WPD 1301 Farallon is now in service and the remaining 14 are due in by mid 1987. This list only had data on the first seven - WPB 1301 through 1308.

The lead ship of the WSES surface effect craft Sea Bird class, WSES 1 Dorado, was on loan from the U.S. Navy, and in 1981 was returned to the Navy.

This is a most rewarding endeavor for you QSL hounds, since all cutters will readily verify. The only instances when this is not true, is when the cutter is involved in some sort of "tactical" mission. If you decide to QSL a cutter, the following example shows the proper way to address it:

USCG POINT AREA - WPB 82346

This is to be followed by the mailing address. Do not include the cutter's radio call letters.

If you wish, you can mark it for the attention of either "Commanding Officer"

U.S. COAST GUARD CUTTER FREQUENCIES AND MODES

FREQ	MODE	FREQ	MODE	FREQ	MODE	FREQ	MODE
2003.0	USB	2707.0	USB	6218.6	USB	13196.9	USB
2082.5	USB	2710.0	USB	6221.6	USB	12491.0 to	
2093.0	USB	2738.0	USB	6260.0 to		12502.5	RTTY
2182.0	USB #1	2748.0	USB	6267.5	RTTY	12518.5	RTTY
2203.0	USB	2830.0	USB	6381.0	RTTY	12519.5	RTTY
2234.0	RTTY	3023.0	USB #2	6521.9	USB	15654.5	RTTY #3
2243.5	RTTY	3241.0	USB	7349.5	RTTY #3	16475.5/	
2328.0	RTTY	3253.0	USB	8195.0/		17248.4	USB
2442.0	RTTY	3382.0	USB	8718.9	USB	16497.2/	
2512.0	USB	3387.0	RTTY	8241.5/		17270.1	USB
2606.0	RTTY	4081.6/		8765.4	USB	16534.4/	
2638.0	USB	4376.0	USB	8245.0	USB	17307.3	USB
2659.0	USB	4106.4/		8295.0 to		16574.7/	
2662.0	USB	4400.8	USB	8297.1	RTTY	17347.3	USB
2670.0	USB	4125.0	USB	8343.5 to		16660.0 to	
2672.0	USB	4134.3/		8355.0	RTTY	16671.5	RTTY
2675.0	USB	4428.7	USB	8768.5	USB	16693.0 to	
2678.0	USB	4170.0 to		9108.0	RTTY #3	16694.5	RTTY
2680.0	RTTY	4177.5	RTTY	9125.0	RTTY #3	18195.5	RTTY #3
2683.0	USB	4376.0	USB	10136.0	RTTY #3	22015.5/	
2686.0	USB	4419.4	USB	10166.0	RTTY #3	22611.5	USB
2690.0	RTTY	5320.0	USB	11434.0	RTTY #3	22052.7/	
2691.0	USB	5680.0	USB #2	12342.4/		22648.7	USB
2694.0	USB	6200.0/		13113.2	USB	22192.0 to	
2698.0	RTTY	6506.4	USB	12379.6/		22203.5	RTTY
2699.0	USB	6206.2/		13150.4	USB	22224.5	RTTY
2702.0	USB	6512.6	USB	12426.1/		27540.0	RTTY #3

NOTES:
#1 - International distress & calling
#2 - Intrnational Search and Rescue
#3 - Arctic/Antarctic Icebreakers

(Freq/freq) are duplex USB ship/shore. Some cutters use USB simplex on shore duplex frequencies. (Freq to freq) are multiple duplex RTTY channels. RTTY is usually 75/170R or 75/850R.

U.S. COAST GUARD CUTTERS
(Includes new vessels not yet assigned to a port)

NAME	CALL	HULL NO.	ADDRESS
Acacia	NODY	WLB406	c/o USCG Station, Grand Haven, MI 49417
Acushnet	NNHA	WMEC167	PO Box 303, Gulfport, MS 39502
Alert	NZVE	WMEC630	c/o USCG Training Center, Cape May, NJ 08204
Anvil	NMFN	WLIC75301	PO Box 2647, Corpus Christi, TX 78403-2647
Apalachee	NRKC	WYTM711	c/o USCG Base, 259 High Street, S. Portland, ME 04106
Aquidneck	NBTC	WPD1309	XXXX
Axe	XXXX	WLIC75310	c/o USCG Base, S. Broad St., Mobile, AL 36615-1390
Basswood	NODG	WLB388	FPO Seattle, WA 96661 (Guam)
Bayberry	NBKE	WLI65400	c/o USCG Station, 2700 W. Commodore Way, Seattle, WA 98199
Bear	NRKN	WMEC901	c/o USCG Support Center,4000 CG Blvd, Portsmouth, VA 23703
Biscayne Bay	NRUS	WTGB104	c/o USCG Station, St Ignace, MI 49781
Bittersweet	NODH	WLB389	c/o USCG Base, Woods Hole, MA 02543
Blackberry	XXXX	WLI65303	c/o USCG Station, 2700 W.Commodore Way, Seattle, WA 98199
Blackhaw	NODI	WLB390	c/o USCG Base, Yerba Buena Is, San Francisco, CA 94130
Bluebell	NODD	WLI313	c/o USCG Port Safety Station, 6767 N. Basin St., Portland, OR 97217
Bollard	XXXX	WYTL65614	c/o USCG Station, 120 Woodward Ave, New Haven, CT 06512
Boutwell	NYCQ	WHEC719	FPO Seattle, WA 98799
Bramble	NODK	WLB392	PO Box 786, Port Huron, MI 48060
Bridle	XXXX	WYTL65607	c/o USCG Base, SW Harbor, ME 04679
Bristol Bay	NRLY	WTG102	c/o USCG Base, Foot of Mt.Elliot Ave,Detroit, MI 48207
Buckthorn	NADT	WLI642	c/o USCG Base, Sault Ste Marie, MI 49783
Buttonwood	NRPX	WLB306	PO Box 1902, Galveston, TX 77553-1902
Campbell	NRDC	WMEC909	XXXX
Cape Carter	NJSJ	WPB95309	PO ox 21009, Auke Bay, AK 99821
Cape Corwin	NVUN	WPB95326	c/o USCG Station, Maalaea Harbor, Maui, HI 96793
Cape Cross	NPDZ	WPB96321	PO Box 215, Crescent City, CA 95531
Cape Current	NLIE	WPB95307	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Cape Fox	NIPO	WPB95316	c/o USCG Group, Key West, FL 33040
Cape George	NYRW	WPB95306	FPO San Fran, CA 96662 (Guam)
Cape Gull	NRLZ	WPB95304	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Cape Hatteras	NRDA	WPB95305	PO Box 1010, Petersburg, AK 99833
Cape Hedge	NZPO	WPB95311	PO Box 1319, Morro Bay, CA 93442
Cape Henlopen	NYOE	WPB95328	c/o USCG Base, Woods Hole, MA 02543
Cape Higgon	NRDE	WPB95302	General Delivery, Glouchester, MA 01930
Cape Horn	NPUF	WPB95322	USCG Mooring, Ft Tilden, NJ 11695
Cape Jellison	NJTB	WPB95317	PO Box 46, Seward, AK 99664
Cape Knox	NGBO	WPB95312	c/o USCG Base, 196 Tradd St., Charleston, SC 29401
Cape Morgan	NFLW	WPB95313	c/o USCG Base, 259 High St., S Portland, ME 04106
Cape Romain	NLBB	WPB95319	PO Box 5278, Ketchikan, AK 99901
Cape Shoalwater	NSDT	WPB95324	PO Box 10447, Riviera Besch, FL 33404
Cape Small	NCFQ	WPB95300	PO Box 4819, Hilo, HI 96720
Cape Starr	NJVB	WPB95320	c/o USCG Station, Atlantic City, NJ 08401
Cape Upright	NBZF	WPB95303	PO Box 1399, Tybee, GA 31328
Cape Wash	NOBE	WPB95310	1275 Embarcadero, Morro Bay, CA 93442
Cape York	NRZY	WPB95332	c/o USCG Base, Key West, FL 33040
Capstan	NFKO	WYTL65601	Ft Belvoir R&D Center, Ft Belvoir, VA 22060-5606
Catenary	XXXX	WYTL65606	c/o USCG Base, King & Cumberland Sts., Glouchester City,NJ 08030
Chase	NLPM	WHEC718	c/o USCG Base, 427 Commercial St., Boston, MA 02109
Chena	XXXX	WLR75409	PO Box 299, Hickman, KY 42050
Cherokee	NNGP	WMEC165	c/o NAVPHIBASE Little Creek, Norfolk, VA 23520
Cheyenne	NGXJ	WLR75405	c/o USCG Base, Foot of Iron St.,St Louis, MO 63111
Chilula	NPIN	WMEC153	PO Box 56, Atlantic Beach, NC 28512
Chinook	NRKL	WYTM96	c/o USCG Support Center, 4000 CG Blvd., Portsmouth, VA 23703
Chippewa	XXXX	WLR75404	c/o USCG Station, 201 CG Lane, Owensboro, KY 42301
Chock	XXXX	WYTL65602	c/o USCG Base, 4000 CG Blvd, Portsmouth, VA 23703
Chokeberry	XXXX	WLI65304	PO Box 349, Crisfield, MD 21817
Cimarron	XXXX	WLR65502	PO Box 55, Buchanan, TN 38222
Citrus	NRPQ	WMEC300	PO Box 1179, Coos Bay, OR 97420
Clamp	XXXX	WLIC75306	c/o USCG Base, Galveston, TX 77550
Cleat	XXXX	WYTL65615	c/o USCG Base, King & Cumberland Sts.,Glouchester, NJ 08030
Clover	NRPK	WMEC292	c/o USCG Mooring, Foot of Commercial St., Eureka, CA 95501
Confidence	NHKW	WMEC619	c/o USCG ANT, Port Angeles, WA 98362
Courageous	NCRG	WMEC622	c/o USCG Group, Key West, FL 33040
Cowslip	NAFO	WLB277	c/o USCG Base, 4000 CG Blvd., Portsmouth, VA 23703
Dallas	NPCR	WHEC716	FPO New York, NY 09567-3905
Dauntless	NDTS	WMEC624	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Decisive	NUHC	WMEC629	c/o USCG Station, 600 8th Ave SE, St Petersburg, FL 33701
Dependable	NOWK	WMEC626	PO Box CG, Panama City, FL 32401
Diligence	NMUD	WMEC616	c/o Patrick AFB, FL 32925
Dogwood	NUNA	WLR259	PO Box 7627, Pine Bluff, AR 71611
Durable	NRUN	WMEC628	Box 1 Star Route, Brownsville, TX 78521
Eagle	NRCB	WIX327	c/o USCG Academy, New London, CT 06320
Edisto	NLKY	WPB1313	XXXX
Elderberry	NUKD	WLI65401	PO Box 550, Petersburg, AK 99833
Escanada	NNAS	WMEC907	XXXX
Escape	NBPG	WMEC6	c/o US Naval Station, Charleston, SC 29408
Evergreen	NRXD	WMEC295	Fort Trumbull, New London, CT 06320
Farallon	NABK	WPB1301	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Fir	NRYR	WLB212	c/o USCG Support Center, 2700 W Commodore Way, Seattle, WA 98199
Firebush	NODL	WLB393	PO Box 65F SUPRTCEN, Kodiak, AK 99619
Foreward	NICB	WMEC911	XXXX
Gallatin	NJOR	WHEC721	FPO GovernorsIs,NY 09570
Gasconade		WLR75401	PO Box 12337, Omaha, NB 68112
Gentian	NRPI	WLB290	PO Box 247, Atlantic City, NC 28512
Glacier	NAAO	WAGB4	Reserve Center Pier, 6735 N Basin Ave, Portland, OR 97217
Hamilton	NMAG	WHEC715	undergoing FRAM
Hammer	NNWM	WLIC75302	900 Seaway Drive, Fort Pierce, FL 33450
Harriet Lane	NHNC	WMEC903	c/o USCG Support Center, 4000 CG Blvd, Portsmouth, VA 23703-2199
Hatchet	XXXX	WLIC75309	c/o USCG Base, Galveston, TX 77550
Hawser	XXXX	WYTL65610	c/o USCG Station, Governors Is, NY 10004
Hornbeam	NODM	WLB394	c/o USCG Training Center, Cape May, NJ 08204
Hudson	NCWX	WLIC801	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Ingham	NRDL	WLEC35	c/o USCG Base, 4000 CG Blvd, Portsmouth, VA 23703
Iris	NODN	WLB395	c/o USCG Base, Astoria, OR 97103
Ironwood	NRPN	WLB297	PO Box 65I, SUPRTCEN, Kodiak, AK 99619 Kodiak, AK
Jarvis	NAQD	WHEC725	FPO San Francisco, CA 96669

CG CUTTERS cont'd

or "Communications." The larger cutters have their own radio room and personnel. On the smaller cutters, comms are carried out by the bridge officer, or designated crewman on the bridge.

None of the cutters have their own QSL card, so it would be wise to include your own prepared card or form letter along with your reception report. In any event, be sure to include return postage.

I would suggest that you do not attempt to QSL a cutter using a tactical callsign, such as SHARK ###. These are tactical mode law enforcement operations, involving the USCG and other U.S. government agencies. As such, they are probably forbidden to acknowledge reception reports. Other than these tactical mode exceptions, your chances of obtaining a QSL is close to 100% every time. ■

Kanawha	XXXX	WLR75407	PO Box 3058, Foot of Auction St, Memphis, TN 38173-0058
Katmai Bay	NRLX	WTGB101	c/o USCG Base, Sault Ste Marie,MI 49783
Kennebec	NRDJ	WLIC802	c/o USCG Base, 400 CG Blvd, Portsmouth, VA 23703
Kickapoo	XXXX	WLR75406	PO Box 31 Vicksburg, MS 39180
Lantana	NRQX	WLR80310	PO Box 1343, Natchez, MS 34120
Laurel	NRPJ	WLB291	c/o USCG Base, Terminal Is, PO Box 10280, San Pedro, CA 90731
Legare	NRPM	WMEC912	XXXX
Line	XXXX	WYTL65611	c/o USCG Station, Gov Is, New York, NY 10004
Lipan	NBOZ	WMEC85	c/o USCG Group, Key West, FL 33040
Mackinaw	NRKP	WAGB83	c/o USCG Sation, Cheboygan, MI 49721
Mallet	XXXX	WLIC75304	PO Drawer 1622, Corpus Christi, TX 78401
Mallow	NODO	WLB396	FPO San Francisco, CA 96672
Maninicus	NDIS	WPB1315	XXXX
Manitou	NAEP	WPB1302	100 MacArthur Causeway, Miami Beach, FL 33139
Mariposa	NODP	WLB397	c/o USCG Base, Foot of Mt.Elliot Ave, Detroit, MI 48207
Matagorda	NAYM	WPB1303	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Maui	NBEI	WPB1304	c/o USCG Base, 100 MacArthur Causeway, Miami Beach, FL 33139
Mellon	NDIT	WHEC717	FPO Seattle, WA 98799
Mesquite	NRPW	WLB305	c/o USCG Station, Charlevoix, MI 49720
Midgett	NHWR	WHEC726	FPO Seattle, WA 98799
Mobile Bay	NRUR	WTGB103	c/o USCG Station, 2501 Canal Rd, Sturgeon Bay, WI 54235
Mohawk	NRUF	WMEC913	XXXX
Mohican	NRKI	WYTM73	c/o USCG Base, 4000 CG Blvd, Portsmouth, VA 23703
Monhegan	NEGS	WPB1305	XXXX
Morgenthau	NDWA	WHEC722	FPO San Francisco, CA 96672
Morro Bay	NRWY	WTGB106	c/o USCG Reserve Training Center, Yorktown, VA 23690-5000
Munro	NGDF	WHEC724	FPO San Francisco, CA 96672
Muskingum	XXXX	WLR75402	PO box 626, Sallisaw, OK 74955
Mustang	NJSH	WPB1310	XXXX
Naushon	NEWR	WPB1311	XXXX
Neah Bay	NRUU	WTGB105	c/o USCG Station, 1055 E. 9th St., Cleveland, OH 44114
Northland	NLGF	WMEC904	c/o USCG Support Center, 4000 CG Blvd, Portsmouth VA 23703
Northwind	NRFJ	WAGB282	c/o General Delivery, Wilmington,NC 28402
Nunivac	NHPX	WPB1306	XXXX
Obion	XXXX	WLR65503	c/o USCG Base, Foot of Iron St, Louis, MO 63111
Ocracoke	NGBL	WPB1307	XXXX
Osage	XXXX	WLR65505	Foot of McKnown Lane, Sewickly, PA 15143
Ouachita	XXXX	WLR65501	Foot of Old Harrison Pike, E Chattanoooga, TN 37416
Pamlico	NAYE	WLIC800	c/o USCG Base, 4640 Urquhart St., New Orleans, LA 70117
Papaw	NRPZ	WLB308	c/o USCG Base, 196 Tradd St, Charleston, SC 29401
Patoka	XXXX	WLR75408	PO Box 468, Greenville, MS 38701
Pendant	XXXX	WYTL65608	c/o USCG Base, 427 Comercial St, Boston, MA 02109
Penobscot Bay	NIGY	WTGB107	XXXX
Petrel	NACN	WSES-4	c/o USCG WSES Division, Key West, FL 33040
Planetree	NRPY	WLB307	c/o USCG Base, Ketchikan, AK 99901
Point Arena	NJKT	WPB82346	c/o NAVPHIBASE West Annex, Little Creek, Norfolk, VA 23520
Point Baker	NIQK	WPB82342	c/o USCG Station, PO Box 667, Port Aransas, TX 78373
Point Barnes	NLVA	WPB82371	c/o USCG Station, 900 Seaway Drive, Ft Pierce,FL 33449
Point Barrow	NUFN	WPB82348	c/o USCG Group, 100 Lighthouse Ave, Monterey, CA 93940
Point Batan	NAKH	WPB82340	c/o USCG Training Cetner, Cape May, NJ 08204
Point Bennett	NAVH	WPB82351	PO Box 582, Port Townsend, WA 98368
Point Bonita	NSMF	WPB82347	c/o USCG Base, Woods Hole, MA 02543
Point Bridge	NLDW	WPD82338	c/o USCG Mooring, 13871 W. Fiji Way, Marina del Rey, CA 90291
Point Brower	NMEX	WPB82372	PO box 6478, Point Loma Station, San Diego, CA 92106
Point Brown	NKFW	WPB82362	c/o General Delivery, Rodanthe, VA 27968
Point Camden	NKIG	WPB82373	c/o USCG Base, PO Box 8, Terminal Is, San Pedro, CA 90731
Point Carrew	NNZL	WPB82374	c/o Channel Is Harbor, 4201 Victoria Ave, Oxnard, CA 93030
Point Charles	NJGJ	WPB82361	Drawer M, Cape Canaveral, FL 32920
Point Chico	NIOO	WPB82339	PO Box 37, Bodega Bay, CA 94923
Point Countless	NVOA	WPB82335	c/o USCG Group, Port Angeles, WA 98362
Point Divide	NRJG	WPB82337	c/o USCG Mooring, 1911 Bayside Dr, Corona del Mar, CA 92625
Point Doran	NLLX	WPB82375	c/o USCG Mooring, 609 14th St., Everett, CA 98201
Point Estero	NZON	WPB82344	PO Box 1198, Gulfport, MS 39501
Point Evans	NCCE	WPB2354	c/o USCG Mooring, 205 Marina Drive, Long Beach, CA 90803
Point Francis	NDCH	WPB82356	c/o USCG Group, Highland, NJ 07732
Point Franklin	NYVC	WPB82350	c/o USCG Training Center, Cape May, NJ 08204
Point Glass	NCNR	WPB82336	PO ox 798, Gig Harbor, WA 98335
Point Hannon	NCNP	WPB82355	c/o USCG Mooring, West Jonesport, ME 04649
Point Harris	NKEQ	WPB82376	c/o Prince Kalanianaole Fed Bldg, 300 Ala Moana Blvd, Honolulu, HI 96850
Point Herron	NUEL	WPB82318	c/o USCG Station Fire Is, Babylon, NY 11702
Point Heyer	NVRC	WPB82369	c/o USCG Base, Yerba Buena Is, San Francisco, CA 94130
Point Highland	NWNO	WPB82333	c/o USCG Group Eastern Shore, Chincoteague, VA 23336
Point Hobart	NSWA	WPB82377	PO Box 809, Oceanside, CA 92054
Point Hope	NKJX	WPB82302	PO Box 488, Sabine, TX 77655
Point Huron	NECA	WPB82357	c/o NAVPHIBASE West Annex, Little Creek, Norfolk, VA 23520
Point Jackson	NSGB	WPB82378	c/o USCG Base, Woods Hole, MA 02543
Point Judith	NJIL	WPB82345	c/o USCG Mooring, 111 Harbor Way, Santa Barbara, CA 93109
Point Knoll	NTKD	WPB82367	c/o Fort Trumbull, New London, CT 06230
Point Ledge	NDLK	WPB82334	PO box 1760, Ft Bragg, CA 95437
Point Lobos	NSDA	WPB82366	c/o USCG Station, Panama City, FL 32407
Point Lookout	NELL	WPB82341	PO Drawer 2488, Morgan City, LA 70380
Point Martin	NRQJ	WPB82379	c/o USCG Base, Atlantic Beach, NC 28512
Point Monroe	NBRM	WPB82353	Route 2, Freeport, TX 77541
Point Nowell	NLEZ	WPB82363	PO Box 1007, Port Isabel, TX 78578
Point Richmond	NWGM	WPB82370	PO Box 698, Anacortes, WA 98221
Point Roberts	NFDU	WPB82332	PO Box 385, Mayport, FL 32067
Point Sal	NBEN	WPB82352	c/o USCG Station, PO Box 844, Grand Isle,LA 70358
Point Spencer	NXFN	WPB82349	c/o USCG Base, 4640 Urquhart St, New Orleans, LA 70117
Point Steele	NGYD	WPB82359	PO Box 2549, Ft Myers Beach, FL 3393?
Point Stuart	NFIJ	WPB82358	PO Box 6478, Point Loma Sta, San Diego, CA 92106
Point Swift	NLBI	WPB82312	PO Box 3248, Clearwater, FL 33515
Point Thatcher	NMDS	WPB82314	PO Box 969, Kokomis, FL 33555
Point Turner	NICC	WPB82365	#3 Goat Is Marina, Newport, RI 02840
Point Verde	NZZF	WPB82311	c/o USCG Mooring, 10605 Gulf Beach Hwy, Pensacola, FL 32507
Point Warde	NUIH	WPB82368	PO Box 2029, San Juan, PR 00903
Point Wells	NTDG	WPB82343	PO Box 820, Montauk, NY 11954
Point Whitehorn	NMEI	WPB82364	PO Box 416, St Thomas, VI 00802
Point Winslow	NHMV	WPB82360	PO Box 3778, Eureka, CA 45501
Polar Sea	NRUO	WAGB11	FPO Seattle, WA 98799
Polar Star	NBTM	WAGB10	FPO Seattle, WA 98799
Primrose	NRZT	WLIC316	PO ox 237, Atlantic Beach, NC 28512
Rambler	NRPO	WLIC298	c/o USCG Base, 196 Tradd St, Charleston, SC 29401
Raritan	NRPS	WYTM93	New c/o USCG Base, Gov Is, York, NY 10004
Red Beech	NJLE	WLM686	c/o USCG Base, Gov Is, New York, NY 10004
Red Birch	NGFH	WLM687	c/o USCG Yard Curtis Bay, Baltimore, MD 21226
Red Cedar	NPDC	WLM688	c/o USCG Base, 4000 CG Blvd, Portsmouth, VA 23703
Red Oak	NPKF	WLM689	c/o USCG Base, Glouchester City, NJ 08030
Red Wood	NDTE	WLM685	c/o USCG Mooring, 150 BankSt, New London, CT 06320
Reliance	NJPJ	WMEC615	PO Box 1626, Cape Canaveral, FL 32920
Resolute	NRLT	WMEC620	c/o USCG Base, Astoria, OR 97103
Rush	NLVS	WHEC723	FPO San Francisco, CA 96677
Sagebrush	NODR	WLB399	c/o USCG Base, Box S-2029, San Juan, PR 00903
Saginaw	NJOY	WLIC803	c/o USCG Base, S. Broad St., Mobile, AL 36615
Salvia	NODS	WLB400	c/o USCG Base, S. Broad St., Mobile, AL 36690
Sangamon	XXXX	WLR65506	c/o USCG Mooring, Foot of Washington St, E. Peoria, IL 6.
Sanibel	NDCK	WPB1312	XXXX
Sassafras	NODT	WLB401	FPO San Francisco, CA 96678
Scioto	XXXX	WLR65504	c/o USCG Mooring, 221 Mississippi Dr, Keokuk, IA 52632
Sea Hawk	NEHM	WSES-2	c/o USCG WSES Division, Key West, FL 33040
Sedge	NODU	WLB402	PO Box 101, Homer, AK 99603
Seneca	NFMK	WMEC906	XXXX
Sepelo	NHKD	WPD1314	XXXX
Shackle	XXXX	WYTL65609	c/o USCG Base, 259 High St, S Portland, ME 04106
Shearwater	NKBT	WSES-3	c/o USCG WSES Division, Key West, FL 33040
Sherman	NHMJ	WHEC720	FPO San Francisco, CA 96678
Sledge	NSAD	WLIC75303	c/o USCG Yard Curtis Bay, Baltimore, MD 21226
Smilax	NRYN	WLIC315	PO Box 1278, Brunswick, GA 31521
Snohomish	NRKR	WYTM72	c/o USCG Station, Rockland, ME 04841
Sorrel	NRZI	WLB296	c/o USCG Base, Gov Is, New York, NY 10004
Spar	NODV	WLB403	c/o USCG Base, 259 High St., S Portland, ME 04106
Spencer	NWHE	WMEC905	c/o USCG Support Center, 427 Commercial St., Boston, MA 02109
Spike		WLIC75308	PO Box 385, Mayport, FL 32267
Steadfast	NSTF	WMEC623	c/o USCG Station, 600 8th Ave SE, St Petersburg, FL 33701
Storis	NRUC	WMEC38	c/o USCG Support Center, Box 658, Kodiak, AK 99619
Sumac	NTLZ	WLR311	c/o USCG Base, Foot of Iron St, St Louis, MO 63111
Sundew	NODW	WLB404	c/o USCG Station, 1201 Minnesota Ave, Duluth, MN 55802
Sweetbriar	NODX	WLB405	PO Box 300, Cordova, AK 99574
Sweetgum	NRQW	WLB309	PO Box 385, Mayport, FL 32267
Swivel	XXXX	WYTL65603	c/o USCG Station, Rockland, ME 04841
Tackle	XXXX	WYTL65504	PO Box 430, Crisfield, MD 21817
Tahoma	NCBE	WMEC908	XXXX
Tamaroa	NHGR	WMEC166	c/o USCG Station, New Castle, NH 03854
Tampa	NIKL	WMEC902	c/o USCG Support Center, 4000 CG Blvd, Portsmouth, VA 23703
Taney	NRDT	WHEC37	c/o USCG Support Center, 4000 CG Blvd, Portsmouth, VA 23703
Thetis	NYWL	WMEC910	XXXX
Thunder Bay	NRTB	WTGB108	c/o 13th CG District, Fed Bldg, 915 2nd Ave, Seattle, WA 98174
Towline	XXXX	WYTL65605	c/o USCG ANT, 1 Thames St., Bristol, RI 02809
Unimak	NBYG	WHEC379	State Pier, New Bedford, MA 02740
Ute	NBXL	WMEC76	c/o USCG Group, Key West, FL 33040
Valiant	NVAI	WHEC621	PO Box 1942, Galveston, TX 77550
Vashon	NJEH	WPB1308	XXXX
Venturous	NVES	WMEC625	PO box 3148, San Pedro, CA 90731
Vigilant	NHIC	WMEC617	State Pier, New Bedford, CT 33701
Vigorous	NQSP	WMEC627	c/o USCG Academy, New London, CT 06320
Vise	XXXX	WLIC75305	c/o USCG Station, 6008th Ave SE, St Petersburg, FL 33701
Wedge	XXXX	WLIC75307	c/o USCG Base, 4640 Urquhart St, New Orleans, LA 70117
Westwind	NLXL	WAGB281	PO Drawer 1248, Mobile, AL 36633
White Heath	NAQE	WLB545	c/o USCG Base, 427 Commercial St, Boston, MA 02109
White Holly	NAOY	WLM543	c/o USCG Base, 4640 Urquhart St, New Orleans, LA 70117
White Lupine	NARO	WLM546	c/o USCG Station, Rockland, ME 04841
White Pine	NODE	WLM547	c/o USCG Base, S. Broad St., Mobile, AL 36690
White Sage	NAPC	WLM544	c/o USCG Base, Woods Hole, MA 02543
White Sumac	NAKD	WLM540	c/o USCG Station, 600 8th Ave SE, St Petersburg, FL 33701
Wire	XXXX	WYTL65612	c/o USCG Base, Gov Is, New York, NY 10004
Woodrush	NODZ	WLB407	PO Box 4598, Mt.Edgecombe, AK 99835
Wyaconda	XXXX	WLR75403	c/o USCG Mooring, 60 East First St, Dubuque, IA 52001
Yocona	NMHB	WMEC168	PO Box 65Y, Kodiak, AK 99619

Terminal Control Procedures

An inside look at standard procedures in a modern airport control tower.

CONCLUSION

We continue our look at Terminal Control practices and procedures in this issue. (PT=Plane Talk; TP= Thomas Parks, Chief of the Indianapolis International Airport Air Traffic Control Tower)

APPROACH

PT: Suppose for a moment that I´m a pilot of an aircraft who plans to land at Indianapolis International. I´ve just been handed off from the Indianapolis Center to the Approach Controller here. How would I be taken from Approach Control to Local (Tower) Control and then to Ground Control as I land?

TP: Okay, let´s say suppose you were coming from Louisville´s Standiford Airport at 12,000 feet. Of course, you will be talking to the Indianapolis Center because you will be in their airspace shortly after you depart Standiford Airport. As you come up over the Shelbyville VOR, which is located to the southeast of Indianapolis, down fairly close to the Attebury proving grounds, the Center Controller will make a handoff to Approach Control (Incidentally, the Shelbyville VOR is depicted on both radarscopes, the Center´s and the Approach Control Facility´s).

Since the Center´s computers and ours are interfaced, they perform the handoff. It is done by voice if the primary radar is down. The computer performs the handoff in the following manner: The Center controller makes an entry on their computer to make the aircraft target flash onto our radarscope. When we make an entry signifying that we accept the handoff, the target stops flashing on our scope and flashes on theirs indicating the handoff is accepted.

We will start talking to the pilot when the Center hands him off to us. By the book, here are some of the rules that we must follow: We can´t change a pilot´s heading or altitude until he´s in our airspace if we´ve taken him as a handoff outside our airspace; outside our airspace means both on a horizontal and vertical basis. At 12,000 feet, he´d be above our airspace (remember, Terminal Control´s allocation airspace is 10,000 feet and below).

The reason for this rule is so that the Center can go ahead and work their aircraft without having to worry about us turning or climbing the aircraft which we are controlling; i.e., the ones which we are taking as handoffs, or the aircraft which we are about to hand over to the Center.

Upon initial contact, the controller will identify him/herself as Indianapolis Approach. The pilot will give his call sign and say what altitude he is leaving if he is not level at 10,000 feet. The pilot will then advise the pilot which runway is active at that time; he might say, for instance, Runway 31 (31 meaning the magnetic heading of the runway).

Since the pilot would be coming in from the southeast, the controller would put him somewhere between a 340° and a 360° heading, so as he comes off the VOR, he makes a slight left turn. The objective is to place the aircraft in a position where the pilot can intercept the localizer for Runway 31 (The localizer is a navigational aid with a radio beam that projects out onto the center of the runway). So giving him that heading off of Shelbyville allows him to run into that signal.

Then the pilot will be told to turn inbound and follow the localizer in. If you´re high enough, you can pick up the localizer 25 or 30 miles out, so it´s quite possible that the controller will only have to give the aircraft one turn. The controller could say, "Leave Shelbyville on a 340° heading, intercept the 31 localizer, and fly it inbound." The pilot says "Roger," and follows these instructions.

Since the pilot has an approach plate, he knows what frequency to tune in for the 31 localizer and where the runway is located on the airport surface. He will then comply with the controller´s instructions and leave Shelbyville on a 340° heading, and when he gets an indication on his instruments that he is getting close, he will start turning inbound. When he gets a lock on the signal from the localizer, he flies it straight in toward the airport.

He also will have a glideslope indicator, and he´ll start his descent on the glidepath upon interception of it. Once the controller gets the pilot established upon the glidepath, he clears him for the approach and tells him to report passing the outer marker.

The outer marker is another navigational aid which indicates to a pilot that he is about 5-1/2 miles from the approach end of a runway and the pilot will be instructed to contact the tower (Local Control) as he crosses it. When the pilot receives the indication on his instruments that he is indeed at the outer marker, he calls the tower and reports his position. The tower controller then says, "Roger, you´re cleared to land Runway 31."

Upon landing, he will then be advised to contact Ground Control. The Ground Controller will tell him how to get to his parking area if he´s a general aviation pilot going to a fixed base operations area, or how to get to his gate if he´s a commercial airlines pilot.

...AND DEPARTURE

PT: I see. Now let´s reverse the process and show our readers how departure procedures work for a flight.

TP: Okay, let´s pick a Continental Airlines flight, for instance, one going to Denver. One of the pilots will contact Clearance Delivery and say "This is Continental Flight so-and-so, going to Denver." We´ll have a strip on them because they´re a commercial air carrier which files the same flight plan day after day. We´ll read the clearance to the pilot and, in turn, he will read it back to us.

When the flight is ready to taxi, which will usually be about 10 minutes before their scheduled departure time, one of the pilots will call Ground Control. The controller says "Continental number so-and-so, taxi to runway 22R (22 Right)."

If they have any pertinent information concerning traffic entering or leaving the Continental flight´s area, construction on the ramps or near taxiways and other necessary data, they will give it to the flight at that time. Then the Ground Controller takes the flight strip with all of the pertinent information concerning the Continental flight on it and gives it to the Local Controller (Tower Control).

The Air Traffic Control Tower of the Indianapolis International Airport Terminal Control Facility. The radar room is located in the building behind it.

The Continental flight in question taxis out to the runway and then contacts the Local Controller. The Local Controller then will say "Twenty two (22) right for Continental so-and-so, you´re cleared for take off." So, our flight takes off and when he clears the end of the runway, he is told to contact Indianapolis Departure Control on a particular frequency.

The pilot working the radio complies and now he is talking with the Radar Departure Controller who will say, "Radar contact; confirm leaving 2,500 feet." From then on he´ll use the altitude depicted on the radar scope for separation purposes.

The controller then can issue a climb to 10,000 feet since that is the limit of his airspace, and would at that time normally issue instructions for this climb. Then, somewhere between 12-25 miles or so from the airport, the controller will hand the flight off to the Center.

As you´ve probably noticed, it works the same way outbound as it does inbound, only in reverse. We instruct our computer to generate a flashing signal to the Center, and when the Center accepts, it causes the generated signal to flash on our radarscope indicating an acceptance of that flight by them. We can then inform the pilot to contact the Center on a given frequency, assuring him that there is no conflict with any traffic before he goes over to them.

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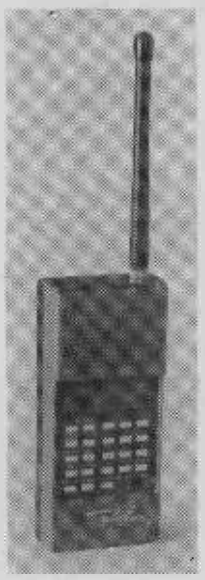

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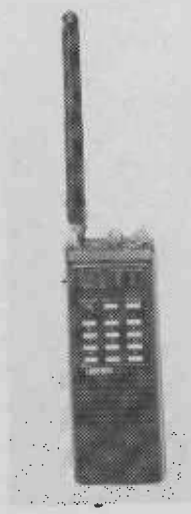

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PLANE TALK cont'd

EQUIPMENT

PT: You had mentioned that the handoffs are normally handled by the computers just as they are over at the Center. We understand that the Center has several backup systems just in case of a problem with one of the primaries. Also, if push comes to shove, they can be handled by land lines (telephones). What kinds of backups does this facility have?

TP: If we can't do it by ARTS, we can communicate via hotlines, telephone and, if absolutely necessary, by radio. There's always built-in, multiple-redundancy for backups. The only thing that we don't back up here is that antenna (pointing out the window to the radar dish) turning out there. If that antenna quit turning, we'd have nothing at all!

PT: Just as the Center does, I assume that you have regularly-scheduled maintenance performed on your equipment?

TP: Certainly; what we call "preventive maintenance."

PT: As Harold Hale at the Center pointed out to me, the maintenance technicians should get a big hand. They're the unseen and unsung heroes that really would be hard to get along without.

TP: I don't question that at all! One thing that we're all in agreement is that the equipment has certainly gotten more sophisticated, but at the same time it's gotten a lot more reliable. Everything that's in use nowadays is solid state.

TERMINOLOGY

PT: Quite a few of our readers have written to me asking for definitions of terminology that they hear utilized regarding Terminal Control. Would you define some of them for us?

TP: Certainly.

PT: What is the exact meaning of an aircraft being on a **short final**?

TP: That is a subjective term that some pilots (and controllers) use. Let's say, for instance, that for some reason a pilot of an inbound aircraft had radio problems and didn't or couldn't change frequencies when crossing the outer marker as he normally would have. The pilot might say to us "This is so-and-so on a short final for Runway 31."

This indicates to us that he's getting very close and either has to have a clearance to land or he's going to have to take the aircraft around again. Usually it means that they are not at a common spot or area when they call us.

If they're at the outer marker, they say so such as, "We're at the outer marker, inbound." But if they're inside the outer marker, they'll probably say that they're on a short final, which can be anywhere from five miles out or less.

PT: When a pilot is on a **base leg**, what does that indicate in relation to landing?

TP: A base leg is a 90° leg to the final approach course. If you're going to land on Runway 31, which is a 310° heading, the final approach will be 310°. So, 90° from that would be a base leg from either side - a right turn or a left turn.

PT: In relation to Terminal Control procedures, what are the **spacing standards** for aircraft?

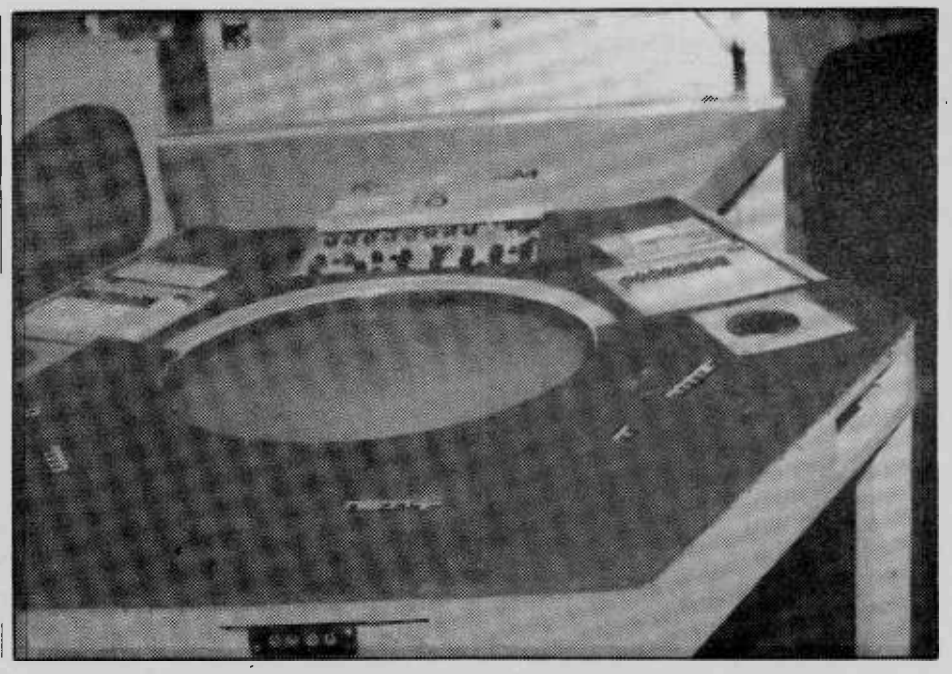
TP: In a terminal radar service area, we can run a mile-and-one-half between aircraft under certain circumstances, depending on whether the aircraft are IFR (Instrument Flying Rules) or VFR (Visual Flying Rules), and what the weather conditions are at that particular moment in time. Otherwise, we run IFR spacing between all aircraft which can vary from 3 miles up to 6 miles.

What spacing we run depends on the type of aircraft we're working. If you have two little Cherokees on final approach, one after another, you can run them three miles apart. If you're using visual approaches, they can be even closer together than that. However, if you put a Cherokee behind a 747, there has to be six miles of separation between them.

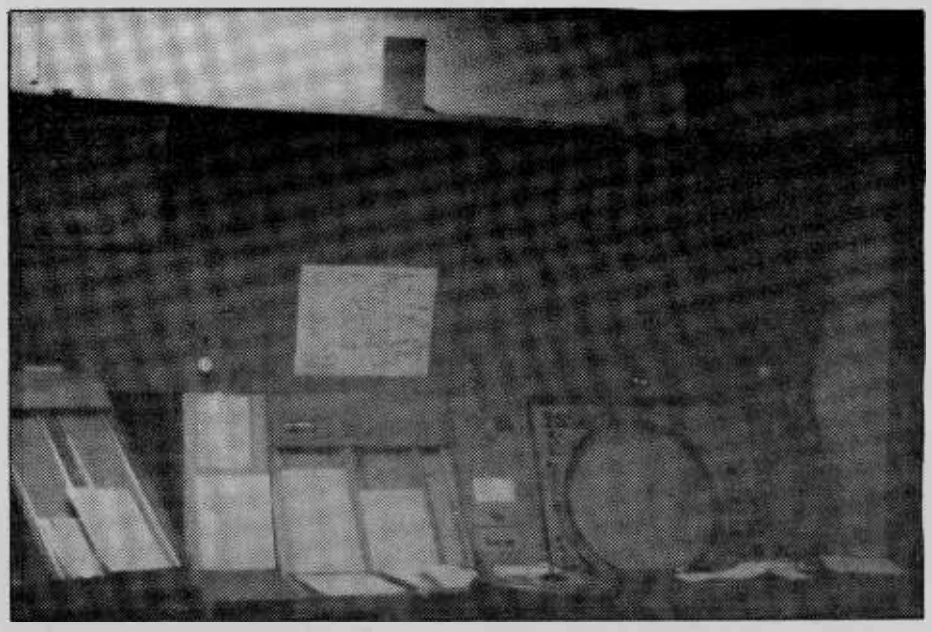
You might find in certain circumstances that a controller will run big jets behind other big jets because they don't have to have six miles of separation between them; six miles is a lot of separation! Consequently, on occasion, you'll hear a controller landing several large jets one behind another, and then you'll hear us clear the little guys in.

Most controllers will try to keep things as uncomplicated as feasible; instead of trying to run three miles this time and then five miles the next, then back to three miles again, we try to keep the same types of aircraft together if possible. Of course, if you're busy, it makes a big difference - if you're not, it doesn't.

PT: Another term that the readers have asked about is the ATIS.



A close-up of the "flat display" type radar screen used in the radar room along with the vertical display radar scren also shown last month.



TP: The ATIS is the Automatic Terminal Information Service. This is a continuous looped tape which Level Three and above terminals use. It supplies to the pilot (both on arrival and departure) information that is necessary for him (or her, as the case may be) to have.

Obviously, you can't put control instructions on those tapes, but what is contained on them are runway conditions, weather, altimeter, construction information (if any is going on) around the taxiways, gates, and bays.

One of the ATIS's reasons for being is so that the Controller won't have to take the time to tell the pilot about it and, conversely, he can get this information any time he wants it just by setting his radio on the ATIS's frequency (which varies from airport to airport), so it's not time-critical.

The ATIS is updated every hour on a mandatory basis, and more frequently if the weather conditions should change before that or if other conditions should make a change necessary. This morning, with the fog and all, we were updating the ATIS every 10 to 12 minutes because the weather was changing that rapidly!

On initial contact with Clearance Delivery, that controller will ask you, the pilot, if you have the current ATIS. It's always identified by characters: Alfa, Bravo, Charlie, and so forth. So the controller might ask you if you have Alfa information (or whichever one is current). And if you, in turn, as a pilot, have in fact listened to the ATIS, you'd say, "yes," that you have Alfa.

In fact, we're required to insure that you have the information; if you don't have it from the ATIS, we must provide it for you. We have to read the weather to you and give you all other pertinent information.

RADAR SERVICE AREAS

PT: Mr. Parks, do you think that Airport Radar Service Area classifications will replace Terminal Radar Service Area classifications in the near future?

TP: Yes, I do. And the two biggest reasons, of course, are safety and standardization. What we have today are called "Terminal Radar Service Areas."

(PT: A "Terminal Radar Service Area" is the air-

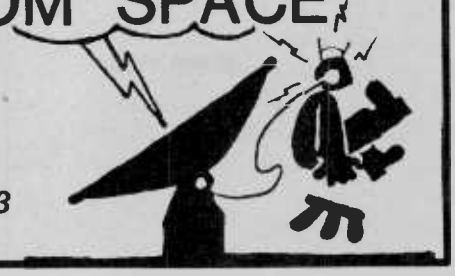
☞

ATS-1 RETIRED FROM SERVICE

The oldest continually operating communications satellite, the ATS 1 (Applications Technology Satellite), has been turned off. Originally intended for a three-year mission, the Hughes satellite operated for 19 years!

SIGNALS FROM SPACE

by
Larry Van Horn
160 Lester Drive
Orange Park, FL 32073



Monitoring the MIR

MT readers worldwide have been reporting intercepts from the Russian orbiting space station MIR. I have also monitored transmissions from the new space station and the two Cosmonauts, Vladimir Solovyev and Leonid Kizim.

Due to the volume of reports, I will summarize the monitor efforts of veteran satellite monitor, John Biro, K1KSY. John has recorded by far the most useful information to date concerning operations aboard the MIR.

John monitored transmissions from the MIR almost from the beginning of its occupancy by the Soyuz T-15 crew on March 15, 1986. On MIR orbit #382 from 2307-2315 UTC, John received voice transmissions on 143.625 MHz, a fairly common Russian voice frequency. This frequency has not been used by the previous two space stations, however. John was using a Bearcat 100 with a rubber duck antenna (as I have said before, you don't need a lot of fancy gear, just patience).

John also uses a Regency MX-5000 with a GASFET preamp (less than .8 dB noise) and a 22 element RHCP (right-hand circular polarization) beam under azimuth and elevation rotor control. Additionally, John uses a FRG9600 into a discone antenna at 30 ft.

John's initial comment concerning MIR: "MIR has a very strong signal."

On April 1, 1986, John reported a further interesting development. He caught the MIR space station sending RTTY on 143.625 MHz. According to John, the signal was a typical AFSK with 134 Hz shift, 50 baud, normal, low tone pairs. In addition, both John and I monitored a Radio Moscow broadcast that stated that the cosmonauts had successfully tested the SDRN (Satellite Data Relay Network).

As for the RTTY transmissions, I have included a sample for all to see. My preliminary analysis indicates that the numbers could represent on orbit instructions to the crew for experiments and communication times. Anyone with any ideas, please feel free to drop me a note.

If, in fact, Radio Moscow's report is accurate, the Soviets are probably

☞

PLANE TALK cont'd

space surrounding designated airports wherein ATC provides radar vectoring, sequencing, and separation on a fulltime basis for all IFR and participating VFR aircraft. Service provided in TRSA is called Stage III Service. AIM - Airmen's Information Manuals - contain an explanation of TRSA. Graphics depicting TRSA layout and communications frequencies are shown in Graphic Notices and Supplemental Data.)

But the ones that are in use - and there are a lot of them in the United States - are not standard at all. A lot of them have little cutout places for airports, extensions, directions, and other things. They pretty much designed them for each specific location with a lot of room for give and take in there.

In ARSAs (Airport Radar Service Areas), they would like to do the opposite of that; they would like to say pretty much, "This is the ARSA, and this is the way it's going to be put in."

PT: Would you explain how each works?

TP: The biggest difference between the two is that TRSAs (Prounounced TARSA) as we have today, are not mandatory, although that's not the whole truth of the matter. A TRSA is similar to an Airport Radar Service Area - which is mandatory, by the way.

And when I say it's mandatory, that's because a pilot must have a two-way radio (in an ARSA), and be in communication with us in order to go through the area or land at the airport that's the controlling facility.

TRSAs aren't the same because you don't have to have clearance to go into certain portions of them; by definition, you don't have to have clearance, that is. But if, in fact, you wanted to land at this airport, you would still have to contact us because we have an air traffic control area here. And that means within a five mile radius of this control tower which, by law, you're not allowed to come into or out of without talking to us.

In that respect, as far as the controlability part of it, we think that the safety factor will be enhanced because now we'll be talking to everyone by radio (when ARSAs are put into effect), and providing the necessary separation - or "conflict resolution" as it's called.

PT: I see what you mean regarding enhancement of safety; that will be necessary the way that air traffic is continuing to increase.

NOISE REDUCTION

PT: I understand that a lot of airports adhere to very stringent (and mandatory) noise abatement procedures. Do we have any requirements for this in the Indianapolis area?

TP: We don't have a formal program, no. We do try to use what we call the "good neighbor" policy, in that if you live directly off of one of our runways, we're not going to run airplanes over you constantly day in and day out for days on end. We pretty much rotate runways' usage as the weather permits us to rotate them.

We have approaches that are better for runways than others; for instance, we can land on 22R (22 Right), which means that we come in over the city (which is relatively quiet) and depart to the southwest, out over the interstate. The Airport Authority owns a lot of land to the west and southwest, and there's nothing out there, so by preference that's what we try to do. We always try to run departures out over the least populated places.

PT: Mr. Parks, thank you for answering our questions and explaining the terminal control procedures to us. We appreciate your thoroughness!

* * * * *

Next column, Plane Talk looks at an airline's radio communications setup. Until then,

■ 73s and out

SIGNALS FROM SPACE cont'd

using the Cosmos 1700 satellite that is parked at 95° east (the slot registered as CSDRN) for SDRN comms. This would give the Soviets a complete view of the Soviet Union, Indian Ocean, Australia, and some of the Western Pacific.

The following information is provided to MT readers that might be equipped to monitor SDRN transmissions.

MIR uplink to SDRN satellite
15.05 GHz
SDRN downlink to MIR
13.52 GHz
Moscow/Khabarovsk uplink to SDRN satellite
14.62 GHz
SDRN satellite downlink to ground stations
10.82 11.32 13.7 GHz

Orbital slots reserved for the SDRN satellites include: 170° west, 95° east (currently occupied by Cosmos 1700), and 16° west. When the two unfilled positions are filled by satellites listeners on the west and east coast will have a chance to experiment with receiving SDRN signals. More about this in future Sigs from Space columns.

All in all MT readers should watch the following frequencies for possible Soviet manned activity:

19. 954 MHz FSK-PDM: From add-on module spacecraft to MIR
20.008 MHz CW-PDM: From the MIR and Soyuz spacecrafts
142.417 MHz WBFM: Voice channel from Salyut 7 might be aboard MIR also
165.000 MHz PPM-AM: 300 kHz wide signal, telemetry, Salyut
166.000 MHz PPM-AM: 300 kHz wide telemetry signal, Soyuz and Progress supply spacecraft
192.000 MHz PPM-AM: 300 kHz wide telemetry signal, Salyut and maybe MIR
922.750 CW @ 10W: All manned related vehicles
926.070 CW @ 10W: All manned related vehicles

All MT readers so equipped might want to pay special attention to the 922.0-927.0 MHz region for possible telemetry signals from MIR and related mission spacecraft.

● Speaking of MIR, Jim Hale--head of the Amateur Satellite Observer group--has spotted MIR visually. Jim saw both Salyut 7 and MIR on March 3--20 minutes apart. The distance closed over the next few days. Jim reported that MIR appeared to be between 1/2 and 1 magnitude brighter than Salyut. MIR's magnitude appeared to be between +1 and +2.

Jim states that as more modules are added, MIR will only get brighter. He thinks that it could become as bright as Venus and will be seen in any city and cast a shadow in the country. Should be a sight worth seeing.

If you would like more information on the satellite observers' group write:

Amateur Satellite Observers
c/o Jim Hale
HCR 65
Box 261-B
Kingston, Arkansas 72742

Please enclose an SASE and a small donation and mention to Jim you saw it in MT's Signals from Space.

● From the SFS mailbag comes a letter from John Cooper. John provided the following military aircraft frequencies for the Kansas City area.

Kansas City ARTCC
269.3 279.5 279.6 352.0 285.6 327.0 318.1 381.5 MHz

Minneapolis ARTCC
346.3 343.8 MHz

Richard Gebaur AFB, MO

236.6	Tower
289.4	Ground
372.2	Aircraft to base operations (PTD)
294.7	KC approach and departure
318.1	"

John, I can add the following to your list: 252.1 (442 TFG command post) and 227.8 (call sign "Ground Hog," 303 TFS Supervisor of Flying). Thanks for the nice list, John.

David Crawford from the Orlando area (just down the road a piece) dropped a note to add 4765 kHz to my list of Challenger disaster frequencies in the March, 1986, MT. David has also been hearing the old RS1 amateur satellite with occasional telemetry (sending 5015 in Morse code) on 29.400 MHz. David says that MIR in Russian also has two meanings, the publicized "Peace" and "World." The Russian cyrillic for MIR is M P.

MT columnist Chuck Robertson has jumped on the space bandwagon recently, getting several spacecraft signals in the 30-50 MHz band. Chuck has noted satellite telemetry on 40.000 MHz. He also heard a strange low-pitched "open-carrier" on 41.02 MHz. Both of these intercepts were probably satellites, Chuck. Which ones will have to await further information. Nice going.

For the information of MT readers, you should check the following areas in the 30-50 MHz band for signals from space:

30.005-30.015 MHz
39.986-40.020 MHz
40.980-41.015 MHz

David Gust has monitored several Russian NAVSATs on his Pro 30 scanner from Radio Shack and Grove's universal whip antenna atop. David noted the following frequencies active in the 149-150 MHz range:

149.910 149.940 149.945 149.970 149.975 149.990 150.000 150.005 150.030 150.035

Well, that about does it for this month. Remember to send your space related intercepts, frequencies and questions, as well as your military aircraft frequencies and questions to: Signals from Space, c/o Larry Van Horn, 160 Lester Drive, Orange Park, FL 32073 USA. Be sure to enclose an SASE if a personal reply is desired. ■

RUSSIAN RTTY

00612(06)
15.38.35 D-96,385
53,/ QYMEQAQUMVQOO
NB 15.´15.57
7(2 16.0 716

00613(07)
17.10.01 D-119,63
53,/ 18.02-18.33
-´(17.24-17.32
(2(17.35-17.41 AWT
UKW 17.42-17.46

00614(08)
18.41.26 D-142,87
53,/ 19.34-20.04
-´(19.00-19.07
(2(19.10-19.18
etc.

Copied by John Biro, K1KSY
29 March 1986
EQX time - 1820 UTC
EQX Long - 117.3° W
AOS - 18:45/LOS 18:53:22 UTC
John´s QTH-Massachusetts
143.625 MHz from MIR
50 baud/134 Hz shift, low tones using auto computized lock on mark and space. He´s not sure what tones are norm

BEHIND THE DIALS

The Elusive ICOM R7000 - It's Here!

Probably no receiver has been as loudly touted for so long a period of time as the R7000 VHF/UHF general coverage entry from ICOM. Announced a year ago and postponed repeatedly due to circuit updates to improve its performance to meet commercial and government specifications, 42 units were shipped to key dealers like Grove Enterprises--one each--in April. Monthly deliveries are expected to grow steadily.

FIRST IMPRESSIONS

This receiver means business. Nearly a look-alike of the leading R-71A HF receiver, the R7000 allows continuous coverage from 25-1000 and 1025-2000 MHz. Frequency entry may be by keypad or continually adjusted by a tuning dial. Tuning increments may be chosen from 0.1, 1, 5, 10, 12.5 or 25 kHz, matching frequency assignment bandplans for all services.

FEATURES

99 memory channels may be scanned at variable speed from approximately two to seven channels per second with delays of 0, 5, 15, or infinite seconds. Regretfully, scan will resume after the timed setting even if there is still a signal present on the channel being monitored. The operator must reach up and disable the scan function if he wishes to listen to that channel.

A wide variety of programmable scanning modes allows auto-writing into memory during search, priority, channel lockout, receiving mode scan, and others as well.

Receiving modes are AM, FM wide, FM narrow, and SSB (upper or lower sideband must be selected by a rear-panel switch). Spurious and image rejection is better than 60 dB.

Selectivity is automatically switched with the

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ICOM R71A (HP)

EEB is ICOM's #1 R71A Dealer. R71A for the serious DX listener. We're the leader in R71A modifications.

- 100KHz-30MHZ
- Keyboard entry
- 32 Programmable Memories
- SSB/AM/RTTY/CW (FM Optional)
- Wide dynamic range
- Digital PLL Synthesized
- Memory scan
- Pass Band and Notch Tuning

ICOM OPTIONS

CK-70: DC Connector Kit for External 13.8 VDC Operation (DC cord Incl) ..... $ 10.95
CR-64: High Stability Oscillator $56.00
EX-257: FM Unit. FM mode used only 29.5 to 30 MHz by amateurs. Some police. $38.00
EX309: Computer interface Connector $37.00
EX310: Voice Synthesizer $41.25
FL32A: CW Narrow Filter (500 Hz) $59.50
FL44A: 8 Pole Crystal Filter (2.4 KHz) $159.00
FL63A: CW Narrower Filter (250Hz) $48.50
RC-11: Infrared Remote Control $59.95

FREE: ICOM options will be installed at no additional charge with purchase of NEW ICR71A.
MEC-Commodore computer control Interface System. 705 Memories Auto Log. See our MEC Ads or call for more details.
INTRODUCTORY PRICE $199.95
EX309 Required (Not Included).

High Performance World Class Receiver 100KHz-30MHz

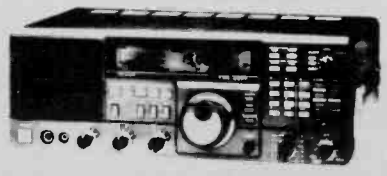
NEW!

R71 (HP) High Performance. EEB has the reputation of excellence when it comes to R71A modifications. Many of our modifications are proprietary and not offered by any other source.
EEB now offers a package deal including our most popular option, it's known as the R71 (HP) High Performance, and includes the following:

1. 24 Hour bench test. Realignment for optimum performance and 6 month warranty ..... COST $40.00
2. Mechanical 2.4 KHz Filter replaces stock ceramic SSB Filter: improves SSB,ECSS, and Narrow sensitivity ..... COST $95.00
3. Front End Upgrade - Improves Dynamic range (Plus) preamp enable below 1600 KHz ..... COST $35.00
4. 4 KHz Filter replaces stock 6 KHz wide filter-improves AM Selectivity ..... COST $50.00
5. Audio output modification - Increases audio output power, lowers distortion and widens audio bandwidth for pleasureable listening ..... COST $35.00
6. AGC time constant change decreases slow time and increases fast time constant ..... COST $35.00
7. Spike protection added, no need to spend $30.00 for a wall plug-in spike protector. It's installed right inside where it is most effective ..... COST $25.00
8. Final alignment and over-all check out ..... COST N/C
9. Installation of ICOM options purchased with your NEW R71A ..... COST N/C

TOTAL COST OF THESE OPTIONS IS $315.00
Purchase the R71 HP and SAVE $115.00
R71 HP (MF) Mechanical Filter $899.00
R71 HP (XF) 8 Pole Crystal Filter $949.00
R71A as it comes from ICOM $699.00
FREE: One year Option - Purchase R71A from EEB at $699.00 and you have 1 year to upgrade to the High Performance configuration HP (MF) $249.00 HP(XF) $299.00

YAESU FRG-8800 SAVE $80



150 KHz-30MHz
NEW LOW PRICE
$519.95
LIST $599.95

The FRG-7700 was a great receiver. Now the new generation FRG8800 takes you a step forward.

- CAT computer compatible
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- Keyboard frequency entry
- Dual 24 hour clock timer recorder control
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3. 2.4 kHz mechanical filter replaces SSB ceramic filter Installed $95

YAESU FRG9600 SAVE $80

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A premium VHF/UHF scanning communications receiver.

- The 9600 is no typical scanner. And it's easy to see why.
- You won't miss any local action with continuous coverage from 60 to 905 MHz.
- Cable T.V.-"Analyser." Check out everything on your cable.
- Satellite T.V. Analyser.
- You have more operating modes to listen in on: upper or lower sideband, CW, AM wide or narrow, and FM wide or narrow.
- You can even watch television programs by plugging in a video monitor into the optional video output. **$25.00**
- Scan in steps of 5, 10, 12½, 25 and 100 KHz. Store any frequency and related operating mode into any of the 99 memories. Scan the memories: Or in between them. Or simply "dial up" any frequency with the frequency entry pad.
- Plus there's much more, including a 24-hour clock, multiplexed output, LCD readout, signal strength graph, and an AC power adapter.

ICOM R-7000

Commercial Receiver
VHF-UHF 25-2000 MHz
SAVE $100.00

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Commercial quality scanning receiver. Same high quality as the world class R71A Receiver.

- 25-2000 MHz coverage
- Precise frequency entry via keyboard or tuning knob
- 99 Programmable memories
- Scan-Memory-Mode-Select Memory-Frequency
- 5 tuning speeds: 1,1.0,5,10,12.5,25 KHz
- Narrow/Wide filter selection
- Memory Back-up
- Noise Blanker
- "S" Meter or center meter for FM
- AM,FM Wide,FM Narrow, SSB,CW

Watch for ICOM full page Ads for more details.
EEB engineers are developing options for the enhancement of the R7000 performance-computer control video output, filter options and more. Call or Write for details.

R7000 LIST $969.00
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Optional AC wall adapter TAC 64 $11.95

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Sale $169.95
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Digital readout, wide and narrow selectivity BFO for SSB & CW.
- 3.5 - 31 MHz SW/MW/FM
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- Memories
- Keyboard entry
- Scan
- 24 hour clock

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- Ultra small pocket size
- AM FM 7 SW most popular bands—13 16 19 25 31 41 49 meters
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Professional Scanner

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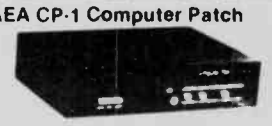
AEA CP-1 Computer Patch



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- Balanced trapped Dipole
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- All SW Bands 60-11 Meters
- Only 43 feet long - 100 Ft. feed line
- Complete - Everything you need

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- Performs as well as units costing $180.00
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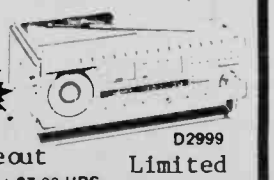
MAGNAVOX $150.00 OFF

NEW!



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- All new PLL Digital Tuning
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- 16 Program memories
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CLUB CORNER

Paul Swearingen
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It's always nice being part of a winning team, and I salute Bob Grove and Larry Miller for having the foresight to bring their two publications together to produce that winner. I was a charter subscriber to MT and was just a little bit in awe of having the opportunity to join MT's writing team two years ago. What next...the moon? Why not?!

● Let's get right into the current club news. Here's the correct address for those of you wanting more information about the **ASSOCIATION OF NORTH AMERICA RADIO CLUB**'s convention in Montreal July 18-20: **ANARCON '86** - c/o Ian McFarland, RCI, PO Box 6000, Montreal, Quebec H3C 3A8, Canada.

The **INTERNATIONAL RADIO CLUB OF AMERICA**'s annual get-together is set for the weekend of August 22 in Palm Beach, Florida, and is hosted by three nice guys from Alberta, California and Kentucky--Leonard Kesteven, Rich Toebe and Ted Fleischaker. Send Ted an SASE at 3023 Tremont Drive, Louisville, KY 40205, say "Pretty please," and he'll no doubt send more details.

An update on the **WTFDA** convention: It will take place August 1, 2 and 3 in Jamestown, NY. Send your request for information to Mike Lapinski, RD#2 2478 Palm Rd., Jamestown, NY 14701.

● I promised this issue to write about overseas clubs, and I'll devote a few paragraphs in this column and next month's to them.

The AUSTRALIAN RADIO DX CLUB is in the midst of a rollicking controversy, and they make no bones about it. Seems that three or four members "are apparently attempting to seize control of its operation and in particular its assets," according to the club's "barristers and solicitors." Quite a bit of space in the bulletin, "Australian DX News," is devoted to discussion of the attempted coup and, as a result, there are absolutely no mysteries to club members as to what is going on.

In spite of the obvious problems, DX reporting goes on as usual, and the bulletin is full of excellent DX tips and news items. The club covers all bands. For a sample copy, send 4 IRC's to Ron Goodwach, Secretary, ARDXC, P.O. Box 77, Glenhuntly, Victoria 3163. It's a good read, as they say.

If you share your DX tips with **RADIO SWEDEN INTERNATIONAL**, they'll send you copies of "Sweden Calling DX'ers" free. The tips are accurate, up-to-date, and they come from all over the world. Send your tips to RSI at S-105 10, Stockholm, Sweden, or for you computer fans through CompuServe (Easyplex 70247, 3516) or the UBIX computer bulletin board.

A club which has been around for twenty-five years, deserves some recognition, and the **SOUTH AFRICAN DX CLUB** publishes a bulletin which enhances its reputation. Concentrating on SW and MW, the listings sections have almost a North American flavor, as even the MW listings include many U.S. stations. There's plenty of technical advice and even humor. Ready to reserve your copy? Send 6 IRC's to P.O. Box 96148, Briston 2019, Republic of South Africa.

Another "down under" club, **DX AUSTRALIA**, also covers all bands. Founded in 1982, the club's bulletin, "DX'ers Calling," exhibits high quality standards and contains quite a few articles. You'd need to obtain copies of both ARDXC's and DXA's bulletins to get a complete picture of DX possibilities in Australia, in my opinion. For your copy of DXC, send 3 IRC's to P.O. Box 285, Mt. Waverley, Victoria 3149, Australia.

And while you're at it, you'd better complete a triad by ordering a copy of "New Zealand DX Times," the **NEW ZEALAND RADIO DX LEAGUE**'s bulletin. Like the two Australian clubs, NZRDXL could be termed "member friendly," as its informative bulletin also has an easy-going air about it. It also covers all bands. Reserve your copy by forwarding 4 IRC's to them at P.O. Box 1313, Invercargill, New Zealand.

The National President of the NZRDXL happens to be world-renowned DX'er and broadcaster Arthur Cushen, and you'll have a chance to listen to him at length on ABC TalkRadio's Ray Briem show Saturday morning, August 2, commencing at 3:05 am EDT.

With him live in the studios will be Radio Canada International's Ian McFarland and other DX personalities in around the world will join via telephone. I'll probably be in the background somewhere for this one, wondering where my lost sleep went...

Mr. Cushen will also be the featured guest at the August 3 **SCADS** meeting at the Village View School Auditorium, 5361 Sisson Drive, Huntington Beach, CA. The meeting will last from 10 am to 3 pm, and non-members are welcome to attend. An SASE to Director Don R. Schmidt at the above address (ZIP 92649) will get you more information. You can plan on equipment displays, refreshments, door prizes, an auction, and a lot of good discussion.

THE GREAT CIRCLE SHORTWAVE SOCIETY invites all amateurs and SWL's to tune in to its Amateur Radio Net every 2nd and 4th Sunday at 1330 UTC on the 80 meter band frequency of 3848 kHz LSB. How about other hobby nets' representatives forwarding information to me for a little free publicity?

THE ONTARIO DX ASSOCIATION does it again, forging into new territory. The club will be running a shortwave radio course at Humber College starting in September, with the class consisting of ten to twelve sessions of three hours each, once a week in the evening. If you'd like more information, write to coordinator Cedric Marshall at P.O. Box 232, Station Z, Toronto, Ontario M5N 2Z4.

DX history enthusiast Stephen Bohac needs help in locating source material for bio sketches of prominent DX'ers and radio club histories, primarily Universal Radio DX Club, Newark News Radio Club, the early American SWL Club, and the early North American SW Association. If you are willing to donate or sell such material for historical preservation, indexing, and eventual publication of histories in the DX press for the mutual benefit of DX'ers, write to him at R.D. #4, Box 750-A, Branchville, NJ 07826.

WE LIKE...

...the current discussion in the "Contact" column edited by Stephen G. Moye in NASWA's "FRENDX." Members are discussing whether or not the club should sponsor the purchase and donation of a SW transmitter to one or more small countries underserved by present facilities, and the discussion brings up some quite interesting points. If you'd like

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BEHIND THE DIALS cont'd

mode selected; a rear panel switch affords the operator a choice of normal (15/150 kHz) or very narrow (6/15 kHz) FM; AM selectivity (6/15 kHz) choices are internally selectable by removing the cabinet cover and moving a jumper wire. It is factory set for wide (15 kHz) AM selectivity.

The bright blue fluorescent display reads out to 100 hertz, the maximum resolution of the frequency synthesizer (There is no RIT). Stability is excellent at any frequency.

The signal path utilizes quadruple conversion on all modes (triple on FM wide) with a wide 10.7 MHz IF output for video or a spectrum display unit (pan-adaptor), now in development at Grove Enterprises. A TTL-compatible serial port allows the receiver to interface with microcomputers so equipped.

The receiver may be powered by its internal 117/240 VAC supply or from an external source of 13.8 volts DC at 1.65 amperes maximum. The instruction manual is well written and profusely illustrated with front panel instructions.

Sensitivity is typically 0.5 microvolts on all communications modes; side-by-side comparison with a Bearcat scanner showed slightly less VHF-high-band response to weak signals, but superior sensitivity at UHF.

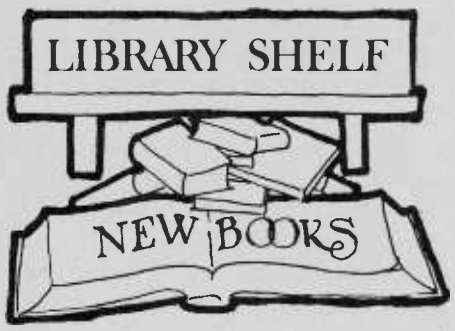
While squelch sensitivity is excellent, the control knob setting for FM narrow and AM is considerably different than for FM wide and SSB, so that scanning in mixed (AM/SSB/FM) modes is not possible without a considerable sacrifice in squelch sensitivity for the first two modes.

Any synthesized receiver with such an enormous frequency range is bound to have some spurious oscillator products ("birdies") present in its passband; the R7000 is no exception. Fortunately, shielding is excellent and the vast majority of the spurs are barely detectable, not even deflecting the S meter.

CONCLUSION

ICOM has done their homework. The R7000 deserves a place of respect in the design marketplace. While the design is extremely sophisticated and there is a multitude of flexible functions, actual operation is very simple. As a bold new entry into uncharted territory, the R7000 does its job well.

Recognizing that pricing and availability may fluctuate, Grove Enterprises is now offering the R-7000 at a discounted $849. ■



POLICE CALL RADIO GUIDE (8-1/2" x 11", paper bound, nine volume set; $6.95 per volume from Radio Shack outlets or from Police Call, Dept. 1-MT, Lebanon, NJ 08833)

For many years POLICE CALL has remained the most widely distributed directory of scanner frequencies in the country. Edited by Gene Hughes, the regionalized listings are classified by state, city and service, and cross-indexed by frequency and call sign.

Listings are extracted from actual FCC files and include public safety, aircraft, railroads, forestry and parks, and military.

FOX SCANNER LISTINGS, Pittsburgh area (8-1/2" x 11", paperbound; $9.95 from Fox Marketing, 4518 Taylorsville Rd., Dayton, OH 45424)

MT Scanning columnist Norman Schrein has just completed this latest directory in a rapidly-expanding set for Fox Marketing. As with the other volumes, the Pittsburgh edition has cross referencing by agency, call sign, service, and frequency (within service).

FOX SCANNER LISTINGS, Southeast Regional Directory. This new release from Fox is quite an ambitious undertaking, listing nine southeastern states and the territories of Puerto Rico and the Virgin Islands.

A massive 530 pages in breadth, the directory concentrates on public safety, conservation, mobile telephone, marine, aircraft, and NOAA weather.

The book is developed alphabetically by state, service and city. Cost is $12.95 plus $1.50 postage from Fox and from participating dealers.

...New from Universal Electronics (4555 Groves Rd., Suite 3 Dept MT, Columbus, OH 43232)

GUIDE TO FACSIMILE STATIONS by Joerg Klingenfuss; sixth edition (128 pages, 6-1/2" x 9-1/4", paperbound, price to be announced)

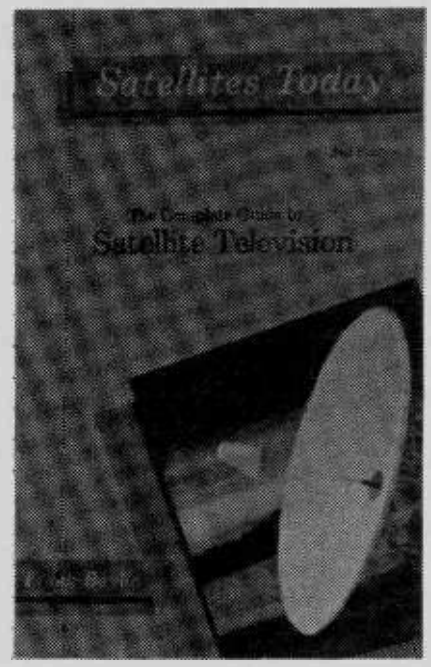
Containing 346 frequencies and 223 call signs, this new book makes FAX identification a snap. Chapters include schedules for press and meteo stations, information on satellites, sample charts and readouts, and additional information on equipment and techniques.

RADIOTELETYPE CODE MANUAL by Joerg Klingenfuss; ninth edition (86 pages, 6-1/2" x 9-1/4", paperbound, price to be announced)

If you have had the experience of copying RTTY over the air and received a printout of undecipherable abbreviations, you will appreciate this new handbook. Containing complete details of TOR, Cyrillic, third shift, test equipment, non-standard alphabets, multifrequency shift, crypt, and other aspects of RTTY monitoring, this new edition is loaded with help for the RTTY enthusiast.

SATELLITES TODAY by Frank Baylin; second edition (167 pages, 5-1/4" x 8-1/2", paperbound; $12.95 plus $2 shipping)

Written for the non-technical person who wants to understand about TV



satellites, SATELLITES TODAY discusses up- and downlinks, footprints and antennas,

SPECIAL EVENT AMATEUR RADIO STATION

The Texas State ARRL and Texas VHF/FM Society joint convention will be held at the El Tropicano Hotel, 110 Lexington, San Antonio, Texas. It begins at 6 pm on Friday, July 11, with most activities from 8 AM to 5 PM Saturday and 9 AM to 12 PM Sunday. There will be hospitality suites and day-care Saturday & Sunday.

There will be 18,000 sq-ft of indoor swap, vendor and manufacturer displays. There will be programs/meetings on: Shuttle Amateur Radio Experiment, FCC Watch, Amateur Radio - A Long Range Outlook, National Traffic System forum, Linear Amplifiers, Cellular Radio, Computers & Printers, AMSAT, Packet, OSCAR Satellite, MARS, SPAM, plus more.

SAN ANTONIO TEXAS SESQUICENTENNIAL

Convention registration $5 in advance, $7 at the door, family $2 advance, $3 at door. Swap tables $5, vendors $20 and manufacturer booths $100.

Send advance reservations to P.O. Box 18506, San Antonio, TX 78218, tele (512)698-1712 or (512)698-0560. Include SASE for return confirmations. Talk-in 148.66 simplex.

For further information contact:
Melvin H. (Andy) Anderson Jr., WB5NOL
(512)698-1712 or 698-1714
8932 Saddle Trail
San Antonio, TX 78255

Mark White, Governor of the State of Texas, signs the proclamation declaring July 7 through 13, 1986, as Amateur Radio Week in the State of Texas. Standing behind Governor White: Andy Anderson (WB5NOL), Peggy Fidler, Ed Golla (K3AHS), Gil Reed (K5TYV), Patsy Nester (KA5TUN), Jim Fidler (WB5KXK), Larry Gunter (WB5BEK), Patty Hanger (WB5WBO), Richard Banks (WC5O), and Chris Hanger (WA5LGM).

CLUB CORNER cont'd

to be able to voice your opinion, too, join NASWA by sending $16.00 to 45 Wildflower Road, Levittown, PA 19057.

And that's about it for this time. Join us again next month for "Club Corner" in the new, improved MT! ■

SW Broadcasts Getting "Old Hat"? Try for...

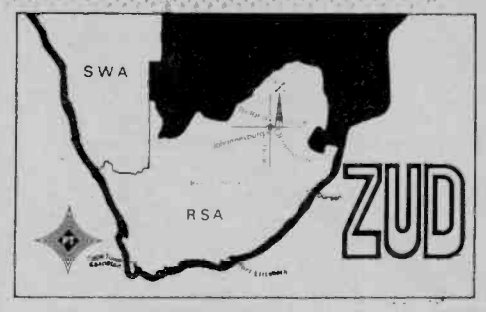
YOUR FIRST 25 COUNTRIES ON SW UTE

by Patrick O´Connor

For those who have never tried DX´ing the shortwave utility bands, the task seems formidable. There is so much Morse code, radio teleprinter and other "exotic" forms of transmissions heard that it seems a casual listener has no chance to hear DX. Actually, logging two-way communications from 25 countries is rather simple.

Below are 25 different countries often heard on ute frequencies. The list includes country, call, frequencies used, any comments, and a mailing address for QSL requests. Morse code stations are marked with an asterisk (*), the rest are SSB voice stations, usually upper sideband.

1) AUSTRALIA: Time station VNG in Lyndhurst is often heard on 4500, 7500 or 12000 kHz. ID is by voice every 15 minutes (VNG, Reference Measurements Section, Telecom Australia Research Laboratories, Box 249, Clayton, Vic. 3168, AUSTRALIA).
2) AZORES IS.: Santa Maria Aeradio, CSY, is often heard on the North Atlantic aeronautical frequencies. Listen on 8825, 6622 or 5598 kHz (Aeronautical Station CSY, ARINC, International Airport, Santa Maria, AZORES ISLANDS).
3) CANADA: Time station CHU can be heard throughout the U.S. on its three frequencies: 3330, 7335 & 14670 kHz. Identification is made every minute, alternating between English and French (Radio Station CHU, National Research Council, Ottawa, Ontario K1A ØR6, CANADA).
4) COSTA RICA*: Limon Radio, TIM, is often heard on several frequencies; listen for their marker signal on 4290 or 13100 kHz (Limon Radio, TIM, Radiografica Costarricense, Apartado 54, San Jose, COSTA RICA).
5) CZECHOSLOVAKIA: Time station OLB5 can be heard most nights on 3170 kHz. The station does not transmit any ID, just time pips on the second (Time Station OLB5, Astronomical Institute of the Czechoslovak Academy of Sciences, Budecska 6, 12023 Praha 2, Vinohrady, CZECHOSLOVAKIA).
6) DENMARK*: Lyngby Radio OXZ, can be heard with its CW marker on several frequencies; try 12753.3 kHz (Lyngby Radio-OXZ, Lyngby Radiotelegrafkonotr, Bagsvaerd Mollevej, DK-2800 Lyngby, DENMARK).
7) ECUADOR: Time station HD2IOA is often heard on its frequencies of 3810 or 7600 kHz, identifying every minute in Spanish (Station HD2IOA, Instituto Oceanografico de la Armada, Casilla 5940, Guayaquil, ECUADOR).
8) ENGLAND*: Portishead Coastal Radio, GH-, can be heard on many CW frequencies; try 4251.5 (GKC2) or 8684 kHz (GKJ4) (Portishead Radio GK-, BTI Radio Station, Highbridge, Somerset TA9 3JY, ENGLAND).
9) FRANCE*: The CW marker for St. Lys radio, FFL, is another commonly-heard signal. Try 4328 or 8502 kHz (Station Cotieres Sainte Lys Radio - FFL, M. le Chef de Centre Radio Maritime, 31470 Sainte Lys, FRANCE).
10) GREECE*: Athens Coastal Radio SV-, may be heard on 8687 or 13047 kHz, among many frequencies (Athiniai Coastal Radio, Hellenic Telecommunications Organization, Directorate of Technical Services, Radio Systems Dept., 15 Stadiou St., Athens, GREECE).
11) IRELAND: Shannon VOLMET (aviation weather) is easily heard here in the U.S., try 5640 or 8957 kHz (Shannon VOLMET-EIP, Ballygirrein, New Market-On-Fergus, County Claire, IRELAND).
12) ISRAEL*: Haifa Radio 4XO, is often heard on 8694 kHz (Haifa Coastal Radio - 4XO, Chief Radio Operator, Haifa, ISRAEL).
13) ITALY*: Italy has many widely-heard CW stations; try for IRM, Rome Medical, on 4342 or 8685 kHz (Rome Medical Radio Station-IRM, Via Dell´ Architettura 41, I-00144 Rome, ITALY).
14) NETHERLANDS*: Scheveningen Radio, PCH, is widely reported on many frequencies; try 8654.4 or 12853.5 kHz for their CW marker (Scheveningen Radio-PCH, Merwedestraat 1, Ijumuiden 1620, NETHERLANDS).
15) NEW ZEALAND*: Awarua Radio ZLB, might be heard nights on 12704 kHz (Awarua Coastal Radio-ZLB, NZPO, Private Bag, Invercargill, NEW ZEALAND). You might also try for Irirangi Naval Radio, ZLO, on 12717 kHz (Royal New Zealand Naval Radio-ZLO, Chief Radio Officer, HMNZS Irirangi, Waiouru 849, NEW ZEALAND).
16) NORWAY*: Rogaland Radio, LF-, is on many frequencies; try 8527.5 (LFN) or 12961.5 kHz (LFI) (Rogaland Radio (Coastal), P.O. Box 367, N-4310 Ganddal, NORWAY).
17) PUERTO RICO: San Juan Aeradio is often heard on several aero frequencies covering the North Atlantic, Caribbean and South American areas. Try 8846, 8825, 6586 or 5550 kHz (San Juan Aeradio-WWA3, ARINC, Chief of Center-Operations, International airport, San Juan, PR 00913).
18) REUNION*: A tough target for most other DX specialities, Reunion (an island in the Indian



QSL from ZUO, Olifantsfontain (Johannesburg), S.Africa

QSL from PCH, Scheveningen Radio, Netherlands

LIBRARY SHELF cont'd

programming formats, frequency and channel assignments, commercial aspects of the market, and other subjects as well.

SCANNER FREQUENCY DIRECTORY for Northwestern Ohio/Southeastern Michigan by Daryll Symington; fourth edition (91 pages, 5-1/4" x 8-1/2", paperbound; $7.95 from Midwest Software Services, P.O. Box 399, Holland, OH 43528)

This handy-sized guide to scanner listening is cross referenced by licensee´s name (alphabetized) and frequency. Listings include federal and local government, aircraft and marine, public safety and business.

Several pages of additional listings include ten codes used by agencies throughout the region.

TOP SECRET DIRECTORY OF FEDERAL SURVEILLANCE CODES, TERMS AND SLANG by Cathye J. Crozier (10 pages, 8-1/2" x 11", $5 from Communication Research, 534 Conkey St. Dept. MT, Hammond, IN 46324)

"We´ve been doing a bed to bed on the buba from a Fargo here in the cave; we think the mechanic has delivered a dead fish." Sound like a foreign language? Not to federal investigative agents.

This little packet of codes serves as an interpreter to the scanner buff who enjoys listening in on surveillance. An additional page show typical frequency ranges for federal agencies.

SPACE PORT SCANNER by Mark R. Knowlton (15 pages, 8-1/2" x 11", paperbound; $3 from the author by writing him at P.O. Box 1394, Dept. MT, Melbourne, FL 32902-1394)

If you are within scanner earshot of Cape Kennedy, this handy reference will provide you with the most exhaustive "Space Port" listing we´ve ever seen. Hundreds of space-related listings for Navy, Air Force, NASA, Coast Guard, National Guard, satellites, and even civilian law enforcement.

The guide is intended for use with the new continuous coverage scanners; a special HF is also provided for long range Cape Kennedy communications. ■

ICOM HF Receiver IC-R71A

The World Class World Receiver

ICOM introduces the IC-R71A 100KHz to 30MHz superior-grade general coverage HF receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to worldwide communications. With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (opt.), dual VFO's, scanning, selectable AGC and noise blanker, the IC-R71A's versatility is unmatched by any other commercial grade unit in its price range.

Keyboard Entry. ICOM introduces a unique feature to shortwave receivers...direct keyboard entry for simplified operation. Precise frequencies can be easily selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control.

Superior Receiver Performance. Passband tuning, wide dynamic range (100dB), a deep IF notch filter, adjustable AGC (Automatic Gain Control) and a noise blanker provide easy-to-adjust clear reception, even in the presence of strong interference or high noise levels. A preamplifier allows improved reception of weak signals.

32 Tunable Memories. Thirty-two tunable memories, more than any other general coverage receiver on the market, offer instant recall of your favorite frequencies. Each memory stores frequency, VFO and operating mode, and is backed by an internal lithium memory battery.

Options. FM, RC-11 wireless remote controller, synthesized voice frequency readout, IC-CK70 DC adapter for 12 volt operation, MB-12 mobile mounting bracket, two CW filters, FL32-500Hz and FL63-250Hz, and high-grade 455KHz crystal filter, FL44A.

ICOM

First in Communications

ICOM America, Inc., 2380-116th Ave NE, Bellevue, WA 98004 / 3331 Towerwood Drive, Suite 307, Dallas, TX 75234

FIRST 25 COUNTRIES cont'd

Ocean) can be rather easily heard thanks to French Naval station FUX; try 8475.6 kHz (French Naval Radio Station FUX, Marine National, 97419 La Posession, La Reunion, (Island), REUNION (via FRANCE)).

19) SCOTLAND*: Those willing to buck a little static should be able to land Royal Naval Station MTO in Rosyth on 2292 kHz at night (Royal Naval Radio-MTO, Royal Navy Operations Office, COMMCEN WHITEHALL, Old Admiralty Building, Whitehall, London SW1A 2BE, ENGLAND. Alternate address: Royal Navy Communications Station MTO, Rosyth Fife, SCOTLAND, UNITED KINGDOM).

20) SENEGAL*: French Naval station 6WW is regularly heard here on 16951.5 and 8993 kHz CW (French Naval Radio-6WW, Chef des Stations Informees de Transmissions, RUFISQUE-YEUMBEUL, BP 302H, Dakar, SENEGAL).

21) SOUTH AFRICA*: Time station ZUO can be noted on occasion with Morse code ID's under WWV/WWVH on 5000 kHz (Time Station ZUO, National Measuring Standards & Meteorology Division, National Physical Research Laboratory, Council on Scientific & Industrial Research, P.O. Box 395, Pretoria 0001, REPUBLIC OF SOUTH AFRICA).

22) SURINAM*: Paramaribo Radio, PZN, has been noted with a CW marker on 16956 kHz (Paramaribo Radio-PZN, LTT, Box 1839, Paramaribo, SURINAM).

23) UNITED STATES: Time station WWV on 2500, 5000, 10000, 15000 & 20000 kHz can be heard on at least one of these frequencies anywhere in the U.S. 24 hours per day. ID is on the hour and half hour (WWV, 2000 E. County Road 58, Fort Collins, CO 80524).

24) VENEZUELA: Another time station, YVTO, can be picked up on 6100 kHz. Try shortly before dark, as this frequency is smack dab in the middle of the 49 meter shortwave broadcast band (Tecnico Encargado, Station YVTO, Observatorio Naval Cagigal, Apt. 6745, Marina 69-DHN, Caracas 103, VENEZUELA).

25) WEST GERMANY*: Although the Norddeich stations, DA-, are widely heard, they have a firm "no QSL" policy. The best bet for a West German verification is NATO radio DHJ59; try 8648 kHz (NATO COMMSTA-DHJ59, Marinefernmeldegruppe 21, Marineanlage Sengwarden, 294 Wihelmshaven 31, FEDERAL REPUBLIC OF GERMANY).

QSL from PZN, Paramaribo, Surinam

Dear Sir, ☆6 GIU 1985

with reference to your letter of 27th May 1985, we are pleased to confirm your reception of the trasmission of our radio station "IRM" on 8685 kHz.

We take this opportunity to thank you for your collaboration and kind information about yourself and your radio activity.

Yours faithfully,

Nino Rizzo, M.D.,
Director

QSL from IRM, Rome Medical, Italy

Now, just tuning to these frequencies doesn't mean that you'll hear the station! Most stations use many different frequencies and will shut one down in favor of another depending on propagation conditions.

You might note that several of these stations use Morse code. When not engaged in traffic, they transmit "marker" signals that tell other stations that they are available and where to tune. Even if you don't understand ("read") Morse code, the marker signals are transmitted at a slow enough speed so that you should be able to jot down the dots and dashes and work out the message from a code table.

All these stations will verify a correct report. Some have their own QSL cards; others require a PFC. It is a good idea to send a PFC to all, as their QSL supply might just run out!

Except for SSV and CHU, reply postage should be included with all reports. International Reply Coupons (IRC's) are fine, except for South African stations. Since South Africa is no longer a member of the Universal Postal Union, that nation's post offices cannot accept IRC's.

Remember that reporting the contents of two-way messages heard is a no-no! You can report on calls of stations in contact, or report the marker in its entirety.

For further information on utility stations, the following may be of interest:

"SPEEDX Reference Guide to the Utilities" write for price to SPEEDX, 7738 E. Hampton St., Tucson, AZ 85715-4212). This loose-leaf publication contains sections on writing reports; Morse code, commercial aero, including addresses of aeronautical radio and airliners; U.S. Coast Guard, with mailing addresses for all cutters and shore facilities; and maritime stations.

SPEEDX is also known for its utility coverage in its monthly club bulletin. A sample bulletin is $1.50 from the address above.

"Shortwave Directory" by Bob Grove ($12.95 plus $1.50 postage from Grove Enterprises). This book is a good source of information not covered in the SPEEDX or Klingenfuss books, including information on military and government stations.

Another club with outstanding ute coverage is the Association of DX Reporters. A sample bulletin is $1.00 from ADXR, 7008 Plymouth Rd., Baltimore, MD 21208. ADXR also publishes many ute QSL routes in the QSL column.

If you haven't tried ute DX'ing, take a shot at it! Some of the stations heard are the only way to add some countries to you log. After all, utilities take up the largest part of the radio spectrum! ■

CB Mobile Radiotelephone?

The FCC is considering a proposal from a county emergency management director and a CB communications specialist to permit the 27 MHz citizens band, in frequency-modified form, to be used for mobile telephone service.

The applicants envision personal communicators and belt-worn devices operating in the present 40-channel 27 MHz band, while the FCC seems more likely to promote the service as part of the reconstructed 450 MHz GMRS (General Mobile Radio Service).

At present, the petition is only at the Notice of Inquiry stage; a full FCC hearing would be scheduled after questions are answered, including: technical specifications, range, mode, geographical limitations, power for bases, and marketing ramifications.

We would like to thank MT reader James Moore of Leesburg, Florida, for alerting us to this newly proposed legislation.

On Hearing the Chimes of BIG BEN

by Henry E. Johnson, K4IPY

As I sit here listening to the World Service of the BBC on my dependable Hammarlund HQ-140-XA, the chimes of Big Ben sound at 2330 GMT. And thus come the goose bumps.

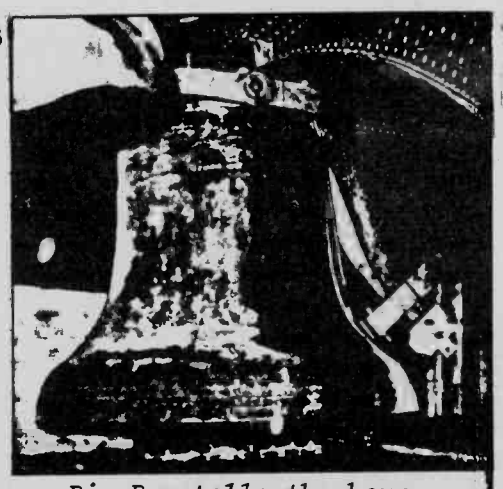
Why does Big Ben do this to me? Well, I can only assume that it goes back to 1939 (or was it 1940?) when I was an impressionable youth who heard his first shortwave radio station. In those days the signals were direct, not relayed from close-by relay stations. And it all started on a make-shift radio. Indeed, I was but a wee lad who had become addicted to wireless.

At the time I had a Philco table radio, model 38-12...I still have it and it works great. It is strictly a BC receiver and I was always messing around with the wiring and the adjustments. One day I had the chassis out of the cabinet and upside down on my desk when I carelessly dropped a coil and capacitor assembly into the works (and I still have that assembly, too!) that made the set go dead. What had I done? I changed the tuning knob a little and lo, there was a different signal, one I had not heard before.

The voice wasn't from the local BC outlet, WMFD at Wilmington, North Carolina, where I was living at the time. A man's voice was reading the news in that precise English manner of speaking. It was the BBC...and a whole new world opened. The war was on and the news reports dealt with action on several fronts and on the U-boat attacks in the Atlantic.

Later on I thrilled at "The British Family Robinson," a story in serial form about a typical family in England during those troubled times. There was J.B. Priestly with his commentary and news. Indeed there was a French outlet... "Ici Londres," and, of course, the chimes of Big Ben. I used to drive my parents nuts by turning the audio gain up very high when the chimes of Big Ben came on. They resounded through the house like thunder.

Changing frequency on that memorable day brought in Radio Berlin with an English language broadcast.. "Here is the news from the Fuhrer's headquarters." When the German language program came on it started with "Hier ist Der Grosse Deutscher Rundfunk mit nachrichten"--Whooeee! I was on the edge of world events and dazzled all the kids at school with my dramatic stories of things going on and heard direct by shortwave radio.



Big Ben tolls the hour

But I soon got to craving a real shortwave set. I worked at the Carolina Theatre in Wilmington after school and on weekends at 25¢ an hour. It took all my net pay for about two weeks to accumulate the price of a Hallicrafters Sky Buddy, model S-19-R. I bought it from the French Radio store across the street from New Hanover High School.

Gosh, I even remember the movie that played a full week at the Carolina. It was "Gone With The Wind," and I'll bet I saw it 28 times while ushering there. Anyway, I hooked the Sky Buddy to an inverted "L" and a ground..and the world around me was never the same.

One station heard loud and clear every day was OTC, the Belgian National Radio Station in Leopoldville, the Belgian Congo. Its signature tune still runs through my mind as I work in the yard around my house here in McLean. There was another African station, Brazzaville in French West Africa.

But back to the present. The BBC has just played one of its interval signal selections, the march, "Lili Bolero." That's a piece they have used, it seems, forever. The announcer has advised that in a few minutes will will hear Radio Newsreel, and I called the shot on that one. The introductory music was to be the march, "Imperial Echoes." And it was, as always.

"Ah, well," as Sir Harry Lauder used to intone in some of his songs. All of this dreaming was inspired by hearing right now, January 26, 1986, the stuff I grew up on over 40 years ago. Formats do change and the BBC has had its share of changes. But BBC still has a flavor that tastes as good today as I remember it years ago.

There are all kinds of overseas broadcasts emanating from every corner of the globe, mostly sloshing the news and commentary around like so much stew. There is, for us old timers, anyway, still an acquaintance with things as they used to be. Big Ben and the BBC has always been a lighthouse to the world.

"It is now midnite 30. This is the BBC World Service. Next we will hear `All About Britain.'" BBC, please carry on. I remember a popular wartime song, "There'll Always Be an England." Yes, and let's hope there will always be BBC and...Big Ben. ■

Unique WW2 German Radio Locator

by D. K. deNeuf

Somewhere in a military file there must rest a technical treatise on a relatively simple radiolocation system operated very efficiently by the Germans during WW2. Our recollection is that it was designed for use primarily for submarines, but vessels, aircraft or even life rafts could utilize it.

Only a stopwatch and a conventional short-wave receiver were needed. These were used in conjunction with a special group of land radio transmitters which operated continuously. One group was located in Germany and, if memory serves, the other was in occupied Norway.

These transmitters emitted a steady signal, each on a different frequency. The feature of the system was that each transmitter fed a huge, highly directional beam antenna array which rotated in a complete circle exactly once every sixty seconds. This was accomplished by the array being constructed on a framework equipped with electrically-driven wheels which rolled over a circular track. When the array pointed exactly north, its transmission was interrupted for one second (see sketch).

Listening on the first frequency, an observer knew when the carrier break of one second took place, the array at that moment pointing north, and that it would rotate through 360° before again reaching the break

RADIO LOCATOR cont'd

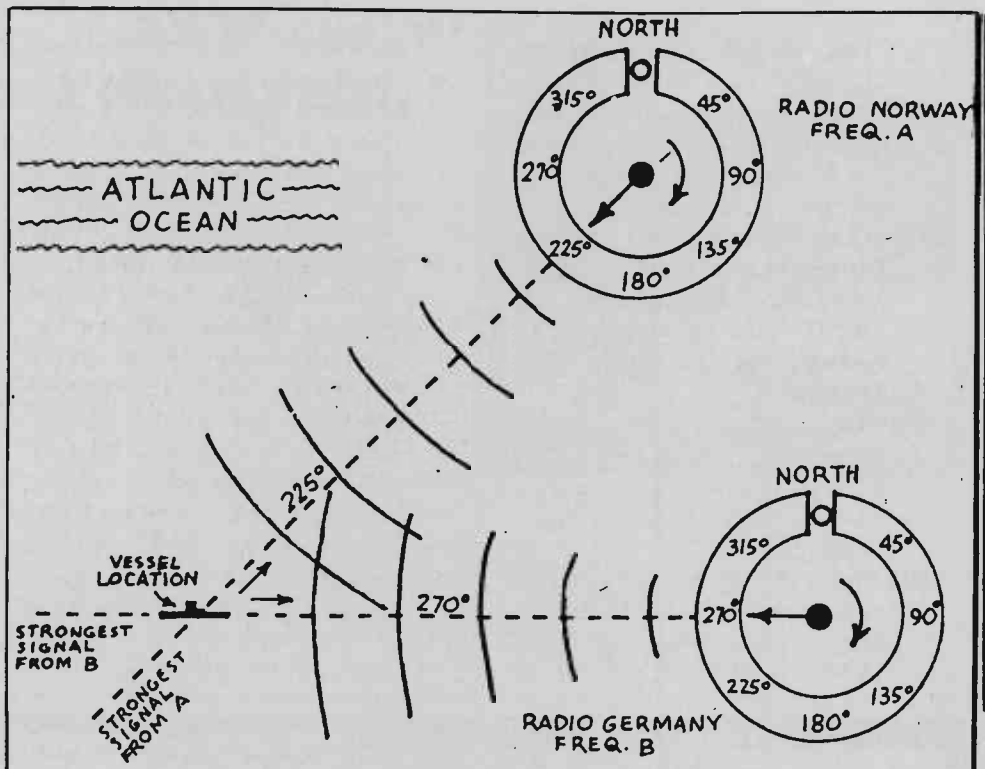
point. The observer would start his stopwatch at the moment of the signal break, then listen carefully for the sudden surge in signal strength as the beam swept by him.

At that instant he would stop his watch, and the time reading in seconds would be converted to the compass direction given in degrees. Drawing a straight line on a map at the angle of degree from the transmitter location indicated the observer's bearing from the transmitter.

In exactly the same way, using the frequency of the second (or third) station, he would obtain the bearing for a second (or third) line. The position of the observer was thus determined by the intersection of the lines.

Pinpoint accuracy of the position was dependent, of course, on several factors including the radio wave characteristics and the skill of the operator in detecting the peak or surge of the signal. The average accuracy was reported to be more than adequate for the purpose.

My recollection is that three different frequencies, probably 5, 9 and 15 MHz, were used simultaneously to bracket the conditions of propagation. ■



CORRELATION TABLE
(simplified)

STOP WATCH FACE SECONDS	EQUIVALENT COMPASS DEGREES
0.0	0° (North)
7.5	45°
15	90° (East)
22.5	135°
30	180° (South)
37.5	225°
45	270° (West)
52.5	315°
60	360° (North)

CIA INCREASES ELECTRONIC SURVEILLANCE

An anonymous tip sent in by a reader states that the Central Intelligence Agency has been stepping up their electronic surveillance program around the globe. Large numbers of Hy-Gain 3-30 MHz log periodic antennas, complete with towers and heavy duty rotators, are being shipped to various foreign outposts through their installation at Homestead Air Force Base in Florida.

BROADCASTING. . .

Reflections on Radio

by Hank Bennett

Me? A Bootlegger?

CONCLUSION

And now for the exciting completion of the story that began last month on how to be a pirate without being in Pittsburgh.

You'll recall that we left off last month by telling you that I had found a way to communicate with another person without using telephone lines or any other visible means of contact other than an outside antenna and some secret equipment in the dark corner of my radio shack.

My buddy, Bill, who lived a few hundred feet up the street, and I visited a few of the local radio shops in Camden and Philadelphia and found a high-frequency buzzer with a tunable coil. The thing only weighed a couple of ounces and could be screwed to a table top or anything handy. We hooked up a #6 drycell battery to the buzzer and a telegraph key and..Presto! Instant transmitter!

A teeny screwdriver was all that was needed to adjust the tuning screw on the buzzer to any desired pitch, from an almost clean T9X note to something closely resembling the old spark gap transmitters heard on many Portuguese ships.

Even with no antenna near it this buzzer could be heard virtually all over the house wherever a radio happened to be playing. But WOW, with an antenna, I could work DX! Even if it was only 500 feet away!!

Somehow we got around to finding out that our buzzer sounds could be picked up on our receivers; I had a Hallicrafter S-20R Sky Champion and Bill had, I believe, the S-19 Sky Buddy. Both of them had tuning ranges that went up to around 40 megahertz and we found that we could set our buzzers near our receivers and pick up the sound of the keyed buzzer on our receivers just about anywhere on the high end of the dial.

One of us got the bright idea to link-couple an antenna to the buzzer. I tried once making an actual contact with the antenna to the buzzer and derned near blew my ears off. Besides, we didn't want our signals to get out very far because that would be bootlegging and that was sort of frowned on by those whose duty it was to frown on such things.

Half way between Bill's house and mine was the office of the local law enforcement agency and they did quite a bit of operating on 33,500 kHz, creating interference to our signals! We simply retuned our receivers to about 33,400 kHz without thought of moving our transmitting frequency. As you can expect, at the local PD we were still coming in loud and clear!

Bill and I would be on the air at every opportunity; the rest of the time our receivers would be left on with the gain turned up high so that either of us could signal the other simply by keying the buzzer.

In due time I guess the local police officers couldn't put up with the constant interference and someone called in the FCC. One day during one of our transmissions, I spotted the FCC van moving slowly up Atlantic Avenue and I sent Bill a prearranged message of extreme urgency: "WW DE HB FCC SK." Translated: his callsign (his initials), from my callsign (my initials), FCC in the area, end of message and sign-off.

We didn't get caught but that cured us. In time Bill became W2PML and I became W2PNA. W2PML has since passed away, W3BWI (George Leck--see the beginning of the story) subsequently moved to Grovers Mill, New Jersey, and one of the police officers involved at the time is now a security officer in our apartment building. W2PNA? I'm still here...

UNFINISHED BUSINESS

I've been reminded by my secretary that I failed to give my readers the balance of the answers in the nostalgia quiz that we conducted a few months ago. We had completed the replies to all questions up to #134 so we shall continue and complete the balance.

135-"That Wonderful Year" was a part of the Garry Moore Show, seen on TV, evenings.

136-The orchestra leader that featured "Is Everybody Happy?" was, of course, Ted Lewis. Mr. Lewis produced the recording of "Good Night" which was used for years as a sign-off theme for station HRN in Tegucigalpa, Honduras.

137-Very few of our readers knew that "King Jack and the Jesters" later became more well-known as "The Ink Spots."

John Nagle of Herndon, Virginia, had submitted a few questions which we used, and the answers for them are as follows:

138-The station that "covers Dixie like the Dew" is WSB, Atlanta, Georgia. I

***HANK BENNETT** cont'd*

believe they still use that slogan.

139-"The Victory Parade of Spotlight Bands" as aired during World War II was sponsored by Coca-Cola, and showed up at 9:00 P.M. EST on the Blue Network of the National Broadcasting Company.

140-The band leader that once had a harpist in his band was Richard Himber. I don't believe we received any replies as to the name of the harpist.

And to conclude this session of quizzers are these as furnished by good friend Patrick O'Connor of Hinsdale, New Hampshire:

141-A famous rotund comedian once hosted a game show on TV that was allegedly so bad that it was cancelled after one showing and the host spent the following episode apologizing for the show. The show was "You're In The Picture" and the host was Jackie Gleason.

142-"The Sentimental Gentleman Of Swing" was Tommy Dorsey. We had many correct answers on this one.

143-Another easy one was the name of the band using "Moonlight Serenade" as a theme--Glenn Miller.

144-A toughie - The TV series "Man From UNCLE" - the men of UNCLE were always fighting a group called THRUSH. What did UNCLE and THRUSH stand for?

UNCLE - United Network Command for Law and Enforcement.

THRUSH - Technological Hierarchy for the Removal of Undesirables and the Subjugation of Humanity.

145-Sheriff Andy Taylor's address was 14 Maple Street, Mayberry, North Carolina.

146-The famous female trio that once sang with the Leon Belasco band was The Andrews Sisters. Again, no score by anyone on this one.

147-The first transmission by voice was achieved on December 24, 1906, by Reginald Fessenden. Where did it occur? Brant Rock, Massachusetts, according to Mr. O'Connor. I cannot personally verify the answer to this one although I have no reason to doubt it.

148-Three other shows in which Jack Webb starred, other than "Dragnet": "Pat Novak, For Hire" (ABC, West Coast, 1946); "Johnny Madero, Pier 23" (Mutual, 1947); and "Jeff Regan, Investigator" (CBS, 1948).

149-What station began as five-watter 6ADZ in Hollywood, California, in 1920? Still operating today, it is KNX, Los Angeles.

150-In 1922, WWL, New Orleans, Louisiana, began operating; it was licensed to Loyola University.

151-This lengthy question concerned a radio drama that was on the air from 1943 to 1956. The title character was billed as "Defender of Human Rights, Champion of all Those Who Seek Justice." The story was much more soap opera than courtroom fiction for which the creator was noted.

In 1956 it first appeared on TV as a daytime soap opera with all names and locations changed but still using much of the same radio cast. The mystery show using the original characters and names began in 1957 and ran until 1963 and was one of the highest rated series of its time.

The name of the radio version and the mystery show was "Perry Mason"; the name of the soap opera was "The Edge of Night."

BACK TALK

One question that appeared in the May issue brought about a flood of mail telling me that I was wrong with my reply. Number 109 asked for the names of two of the stars of the old "National Barn Dance" from WLS, Chicago. My answer: Lulu Belle and Highland Scotty. I stand corrected - it was Skyland Scotty. ■

Looking for Drama and Challenge? Why not...

MONITOR THE HAM BANDS

by Charles Loftis WDX4KEF
(Rt 1 Box 72, Landrum, SC 29356)

Many SWL´s state they do not do any monitoring on the ham bands because it is so dull listening to hams work each other. I have been SWL´ing the ham bands since 1970 and do not find it dull at all.

In the past 15 years I have made many friends among the ham operators. Maybe a few stories will encourage more SWL´s to listen in.

Most of my SWL´ing is what is known as county hunting. The purpose is to confirm all 3076 counties in the U.S. including Alaska and Hawaii. There are two nets where mobile hams provide different counties. Some make trips across the U.S. crossing counties along the way.

During the day the County Hunters´ Net is on 14.336 MHz and at night after 2400Z at 3.965 MHz. Many times there is activity nearly 24 hours a day.

It has been over a year now since one of the mobile county hunters, Mike KØØE, was on a trip from Colorado to Texas putting out counties. He entered a county in New Mexico and was supposed to cross over into Texas and continue. He never made it.

After many members on the net spent some time calling him they began to get concerned. By the next day, the concern became more intense. Some of his friends on the net in Colorado contacted Texas and New Mexico authorities and explained the situation.

Within a few minutes the sad news was broadcast to the net: Mike had been murdered. It seems that Mike had picked up two teenage boy hitchhikers in New Mexico and after traveling some miles Mike decided he would not take them any farther. They beat him more than a dozen times on the head with a metal pipe.

The teenagers took his van but were stopped by a Border Patrol checkpoint near Sierra Blanca, Texas. Since they could not produce vehicle identification on the van they were detained and questioned.

Mike´s body was found behind an abandoned restaurant near Carlsbad, New Mexico; the two were charged with first degree murder, conspiracy and theft of an auto.

Fortunately, this is not a normal occurrence on the net, but there are other incidents such as the mobiles being stranded in a snow storm, or coming across an accident scene. At times there is real action on the net.

QSL´S

My QSL return is about 99% with those on the net. You cannot find a better return anywhere on the ham bands. I began county hunting in 1970 and got my last county in June 1985. It took me 15 years to get all 3076 counties confirmed.

When I had fewer than 100 counties to finish I wrote to hams in those areas to tell them what I needed. Many made special mobile trips to counties in their area that I lacked.

After I received all the QSL´s I got two licensed hams to confirm my application. On July 11, 1985, I heard Dorothy, WB9RCY, the USA-CA custodian, announce to the net that I had been issued USA-CA #496. After 15 years I had officially confirmed all USA counties and been awarded all counties certificate #496, issued by CQ Magazine. Of this number 492 are hams and 4 are SWL´s. This was the highlight of my SWL´ing!

The following November I went to the Southeastern County Hunters Convention in Manchester, Tennessee. There were 133 present and I met many of the hams I´d heard for 15 years. I did not know how an SWL would be accepted at a convention of hams, but I can assure you, you are welcomed as much as the hams are; maybe more! Many were waiting to meet me, including Arnie, K9DCJ, who had confirmed counties for me for 15 years, and also his wife, Lorraine.

Lorraine is also an SWL - WDX9DCJ. I helped Lorraine get her call from Hank Bennett, and she had finished all counties just a month before I did.

The county hunters have an annual convention in July of each year and mini-conventions like the one at Manchester throughout the year. In July, 1986, the annual convention will be held in Asheville, North Carolina, and I look forward to attending and meeting several hundred more county hunters.

WHAT DO YOU DO FOR AN ENCORE?

I´m now working on all counties for the second time! There are about 50 hams who have done this, but no SWL´s.

If any SWL would like more information on SWL´ing the ham bands or county hunting, just drop me a line. ■

SWL WORLD WATCH

by Ken Wood

The "New Station March" continues to play on and on, every month it seems. Bolivia sports a couple of new outlets on shortwave: Radio Corazon de Libertad at Santa Fe in the province of Oruro is on 4.810 from 1000 sign-on to 0300 sign-off; and Radio Cosmos from Cochabamba is appearing on 4.925 variable. Best opportunity for that one would seem to be around 1000. Watch all the other Latins operating in these areas, though.

Some months from now we can look for much better signals from Radio Exterior de Espana. Spain reached an agreement with Costa Rica which allows Madrid to build a 500 kilowatt relay station there. The new station will devote part of its transmitter time to the programming of "Radio Costa Rica Internacional" which, I guess, will probably amount to a government-produced program service.

Zanzibar´s long-awaited, new 50 kilowatt station has appeared on 11.735, so now there´s an opportunity aside from the 3.339 headache so many DX´ers have battled. The broadcast is in Swahili and runs to sign off at 1815. A few U.S. listeners have heard it, but reception is apparently quite weak.

Details are still skimpy as I write this, but there are reports that a new station is on the air from the Dominican Republic--at least briefly. It´s called Radio Caribe Mundial and was active around the first of March although, when we checked a few days later, Jeeves and I found nothing. The evening frequency, at least at the outset, was 6.245 and during the days the station was or is on 15.045.

Think of the announcer from the Dominican Republic who is best known to U.S. listeners and you´ve got the name of at least one of the main men behind this new station!

Some other moves - Radio Conakry in Guinea has switched from 4.910 to 4.900. Africa Number One has jumped from 4.810 to 4.830 and Radio Pyongyang is now occupying 13.650.

Conditions continue to be spotty but seem to be slowly improving overall. Early mornings continue to provide the best reception of the difficult Latins and late evenings can bring in some fine reception from Africa.

Let´s move on to the loggings, since Jeeves has them all sorted out now. Times are UTC.

AFRICA

CAMEROON -Radio Garoua, 5.010 at 0543 with music, talk in French.

EGYPT - Radio Cairo, 12.050 in Arabic at 1925 with Arabic music followed by time signal and ID in Arabic.

LIBERIA - Liberian Broadcasting System, 3.255 in English after 0700 with news, music, commercials.

MOZAMBIQUE - Radio Mozambique often heard on 4.734 with 0300 sign-on in Portuguese. Usually fair levels.

NIGER - ORTN at Niamey on 5.020 with music and Koran at 0540 tune-in. Good, but usually so-so or not at all.

NIGERIA - FRCN at Ibadan, 6.050 with English news at 2300, sign-off at 2305.

TUNISIA - RTT on 7.125 at 2200 with Arabic and Middle Eastern music.

ASIA - NEAR EAST - OCEANA

CHINA - Radio Beijing in English at 0010 on 9.820 (for North America) ending news with headlines repeat and "News About China."

INDONESIA - Radio Republik Indonesia, Ujung Pandang on 4.719 with end of news from Jakarta and into local programming from 1200 tune-in.

JAPAN - NSB at 0740 on 6.055 in Japanese. Seemed a drama. No ID, so mark it tentative.

NORTHERN MARIANAS - KFBS, Saipan on 6.025 1320 in Russian with religious program. ID at 1330 in Russian.

PAPUA NEW GUINEA - Radio Manus on Admiralty Island noted at 1220 in Pidgin with talk, variety of music on 3.315.

QATAR - Qatar Broadcasting Service in Arabic at 1835 tune on 9.905. Arabic music, one ID in Arabic.

SAUDI ARABIA - BSKSA in Arabic at 1730 on 9.870.

SOUTH KOREA - Radio Korea on 7.550 in English at 2250 with talks. Into Korean at 2300.

SWL WORLD WATCH cont'd

EUROPE

ITALY - RAI in Italian at 1840 on 11.800. Think sign-on is at 1830.

MONACO - Trans World Radio, Monte Carlo on 9.670 in (I believe) Turkish at 1520. English language ID at 1530 and back into Turkish.

NORWAY - Radio Norway International on 11.850 at 1659 with interval signal, ID in Norwegian and English, into Norwegian.

PORTUGAL - Radiodifusao Portuguesa, 11.910 in Portuguese at 1950, apparently beamed to Africa.

USSR - Radio Moscow in Spanish to Latin America on 9.490 at 2348, talks, mentions of Radio Moscow.

NORTH AMERICA

ALASKA - KNLS on 6.095 at 0805 in English following scheduled 0800 sign-on here. Big band music.

CLANDESTINE - Radio Caiman now on 7.470 in evenings. Seems now to include anti-Nicaraguan material as well as talks against Cuban involvement in Angola. Extremely strong.

COSTA RICA - TIFC, Faro del Caribe on 5.055 in Spanish with religious programming at 0510 tune.

GREENLAND - Gronland's Radio heard at 1158 on 3.999 in presumed Greenlandic, pop music, ID at 1200.

HAITI - 4VEH on 4.930 in French at 0251, religious talks, hymns. Had been off for some time during the days before Baby Doc's departure.

HONDURAS - La Voz de Mosquitia at Puerto Lempira now active again on 4.910. Noted, all Spanish, past 0230.

MEXICO - Radio Huayacocotla on 2.390 heard at 0034 in Spanish with popular Mexican music, several IDs. News in Spanish at 0045.

SOUTH AMERICA

ARGENTINA - Radio Nacional, 6.060 at 0602 in Spanish, talks, music, ID. Alas, WYFR got it when they signed on at 0610.

BRAZIL - Many Brazilian loggings here this month:

Radio Liberal, Belem on 3.325 at 0630 in Portuguese with lots of Brazilian music.

Radio Cultura do Para, Belem on 5.045 at 0240 with sambas, ID, utility station QRM.

Radio Globo, Rio, 6.030 at 0820 in Portuguese, several IDs.

Radio Bandeirantes, Sao Paulo, 11.925 at 0020 in Portuguese; man announcer, carnival tunes.

Radio Record, 15.135 at 2245 with sports play-by-play and some advertisements.

Radio Gaucha, Porto Alegre, 11.915 at 0000 with ID, telephone calls, ads.

Radio Educadora de Cariri, 3.255 may be on late for carnival at 0615. Weak, lots of high spirited music, Portuguese talk.

COLOMBIA - Radio Melodia back on the air on 6.045 heard with Latin pops and IDs at 0343 tune-in.

La Voz de los Centauros, 5.955 at 0501 with ID, closing announcements, mention of CARACOL network etc. Long process, and not off 'til 0508.

ECUADOR - La Voz del Rio Carrizal, 3.260 at 0145 with talk in Spanish, ID.

PERU - Radio Norandian, 4.460 at 0125 with Andean tunes. Poor to fair.

Radio Ancash, 4.990 good in Spanish with Andean music at 0245.

VENEZUELA - Radio Tachira, 4.830 at 0323 many Tachira mentions, music. QRM from Radio Reloj, 4.832.

JEEVES SAYS -

Still no sign of KVOH in California. The initial tests, first scheduled for December, then February, are now delayed until the end of May.

Most of the new stations Ken mentioned at the top of the show haven't been heard here yet, probably because we manage to pick the wrong days to check. But we keep trying and that has always been the ticket to success in shortwave broadcast DX'ing - or any other form of DX'ing for that matter. Ya gotta keep tryin'!

I hope we do log some of them pretty soon or Ken may get the idea that all of the antennas need reworking. Guess who'd be elected to do that job? Maybe I can hold him off by convincing him that the sunspot count really is about to head upwards again.

Meantime, we'd like to encourage you to let us know what you're hearing. Our mailman complains about the size of the bag he has to drop off here every day so maybe you'd better send your reports to us in care of Monitoring Times.

That's it for now. 'Til next month, 73 from Ken and me. ■

ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

Greetings to all our readers. This month we will take a look at some topics of international shortwave programming, starting with..

SCIENCE

It´s rather strange, I feel, that such an obvious subject for programming over a technical medium (radio) should be so sparsely available to the listener; however, there are several interesting programs on the air:

WEST GERMANY: Deutsche Welle has the weekly "Science and Technology" section on Mondays at the end of the English language program to North America.

U.S.S.R.: Radio Moscow has only one regular program at 0345 on Thursdays, entitled "Science and Engineering."

AUSTRALIA: Radio Australia has "The Week in Science" on Sundays at 1410, 1910, and again at 0110, 0730 on Mondays.

U.S.A.: The venerable Voice of America has a more fertile offering with two regular programs, "New Horizons" at 0110 Sundays, and Magazine Show at 0230 Monday through Friday (this one is a mixed bag, with arts and science included). Also in the mixed category is "VOA Morning" which may include scientific material.

Then there is "New Products" available in the marketplace, on air at the same time as New Horizons. In general there is a good variety of information available on the VOA programming, including some good material on medical matters.

BRITAIN: Once again a somewhat scanty selection of regular programs; there is "Science in Action" Fridays at 1615, 2030, Sunday 0915 and Monday 0230. Also you can hear "New Ideas" at the following times: Saturday 2230, Tuesday 1530, Wednesday 1730 and Thursday 1115. The latter is a kind of "plug" for recent British products of special interest to the small businessman and householder.

The sparseness of programs here is made up for by the quality of the information, some really excellent new data and ideas being presented. The same is true for the VOA material.

Of course we have only been considering special programs on this subject, but scientific news may turn up on many stations in odd corners; and, even more important, especially from the U.S. and Britain there are from time to time some truly outstanding special broadcasts. For example, the BBC had a good special program last November on Halley´s Comet, with reference to its history and the journey of the Giotto (European spacecraft) toward the comet.

In February VOA scheduled an interesting three-part program on learning disabilities of intelligent children. These and many other specials are all evidence of high-quality programming.

On a more restricted basis, do not forget the Radio Nederland "Media Network" program on Thursdays present by Jonathan Marks. This is NOT simply a radio fan´s DX guide--far from it. The programs present all the latest ideas and happenings in the field of communications, and some of the presentations on computers have been truly fascinating. If you want to keep up-to-date in this area, this is a "must"!

Let´s move on now to consider cultural information. We have considered music of different kinds in previous articles; however, there are many offerings of background and explanatory programs which can be very interesting indeed. Here are some suggestions for you to try out:

THE ARTS

RADIO NEDERLAND: has the weekly arts magazine "Images" on Tuesdays.

RADIO MOSCOW: Three programs of interest: "Culture and the Arts" (Tuesday/ Thursday), "Audio Book Club" (Saturday/Sunday) - the best of Russian Classic and Soviet literature, "Front Seat and Backstage" (Monday/ Saturday/Sunday)-`go backstage´ and get to know something of outstanding Soviet performers. On the average, these programs are aired four times on the scheduled day.

VOICE OF TURKEY: Ankara has the Sunday segment of its English broadcast--after the news--devoted to Turkish Culture and Art. (This should be followed by examples of Turkish music.)

RADIO BEIJING: It´s really very difficult to pin down the programming from this station in respect to cultural items, since they may turn up anywhere! However, they have a regular Saturday broadcast of "Chinese Sayings and Stories" which you might find intriguing!

BRITAIN: The BBC has a good weekly "diet" about the world of arts, in fact three programs. First at 0630 Saturday/ Wednesday/ Friday; second at 1130 on the same days, and the third on Sunday/ Tuesday/ Thursday at 1715. The program is entitled "Meridian."

Also, there are two special programs about books and authors which can enlarge your horizons and enjoyment of reading (if you haven´t forgotten how to read since the age of television!!). These are: "Book Choice" Sunday 2245/ Monday 1709, 2225/ Tuesday 0540, 2110/ Wednesday 0440, 1740/ Thursday 0140, 2100/ Friday 0145. Included in these transmission times are four different editions of the program; "Good Books" on Monday 0315, 1915/ Wednesday 1945, 2315.

RADIO AUSTRALIA: "Books and Publishing" on Sunday at 0330/Saturday at 0730, 1430, 1730...(the contemporary Australian scene); and "Art News" Monday 1412, 2112/Tuesday 0330, 0730 (events in the Australian art arena). Finally, there´s "Adams at Large," in which Phillip Adams-- writer, film maker, arts patron--looks at life in Australia, Monday at 1130/ Saturday at 0510, 1910 hours. ■

SELECTED FREQUENCIES

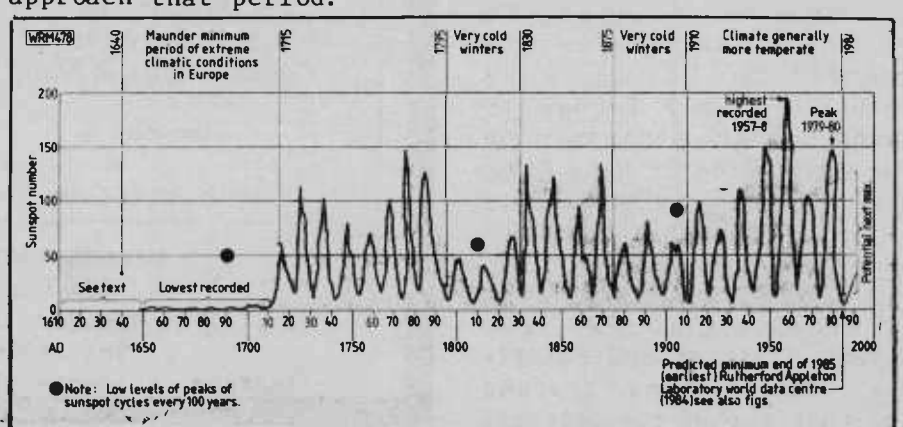
RADIO AUSTRALIA
5995 6060 9580
RADIO NEDERLAND
6020 6165 9590 9715 9895
RADIO MOSCOW
6020 7115 7150 7185 7290 11840 15150 15475
RADIO BEIJING
9820 11685
BBC LONDON
5975 6175 7325 9510 9515 11775 15070 15260 15400
DEUTSCHE WELLE
5960 6040 6085 6120 6130 6145
VOICE OF TURKEY
7215 9560
VOICE OF AMERICA
5995 6130 9455 9650 9690 11580 11675 15185 15205 15315 15415 17740 17765 17865 21545

Sunspots Still at Minimum

Our closest star, the sun, emits radiation which has profound effects on the earth. One of these effects is the electrical charging of our upper atmosphere, the ionosphere, chief source of long-distance "skip" reception on the short wave bands.

The eleven-year sunspot cycle has a direct relationship with skip; when the sunspot count is at maximum, so is the distance heard from worldwide stations. Unfortunately, we are presently in a minimum and the upper frequency ranges of short wave reception are dismal.

The sunspot minimum is likely to continue for another year or two, gradually building toward a maximum after 1990. Long distance reception will steadily improve as we approach that period.



(Graph courtesy Practical Wireless, Apr 1986)

"Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon

(EDITOR'S NOTE: Although Los Numeros will no longer be carried on a regular basis, Havana Moon has agreed to remain an occasional contributor.)

LOS NUMEROS cont'd

IN MEMORIAM
C. M. STANBURY

"One everlasting whisper day
and night repeated
Something hidden go and find
it
Go and look beyond the
ranges
Something lost beyond the
ranges
Lost and waiting for you."
GO

Kipling

SCREAMERS AND CRYPTS

I would hope that the following explanation is not more obscure than the thing being explained.

Date: 3/31/86
Time: 0600Z
Freq: 4030 kHz (repeated on 3090 kHz at 30 past)

"Atencion 356 120 105 120 120 120
...XXXXX XXXXX 43480 XXXXX
... XXXXX XXXXX 46258 XXXXX
... Final Final"

A DIFFERENT voice was utilized for groups 43480 and 46258 when this tape was first computer-generated. Groups that are emphasized by such techniques are sometimes referred to as "screamers." This would possibly indicate that these groups were to be acted upon in a different manner than the other portions of the crypts.

Group 43480 was the 98th group of the 120 group crypt.

Group 46258 was the 68th group of the 106 group crypt.

I'm sure that NSA and KGB Eighth Directorate readers know of what I speak.

Obscurum per obscurius.

ENGLISH NUMBERS

An unusual, live, 5-digit English transmission by a male announcer was intercepted on March 30th at 0630Z on a frequency of 4044 kHz. Transmission mode was USB and the crypt was lengthy. This is a common 5-digit Spanish frequency. Note my "screamer" in the paragraph above.

ANOTHER AMATEUR FREQUENCY

Another 5-digit Spanish transmission by our favorite YL was intercepted on 3778 kHz at 0700Z on March 31st. This 115 group crypt with the identifier of "513" was repeated at half past the hour on 4047 kHz.

I continue to wonder if the ARRL or the FCC has had any complaints.

TESTOSTERONE AND NUMBERS

The voice had a peculiar sound and I'm not sure if it was a male or a female. The transmission, however, was another of those non-computer-generated 5-digit Spanish transmissions.

This "could-have-been-live" transmission was noted on 4047 kHz at 0300Z on March 30th. The identifier was 001 and group count was 80. This same YL, OM--or whatever--was also noted on 5250 kHz at 0100Z on March 31st. This peculiar voice could best be described as a combination Tammy Faye/Tiny Tim sound.

Too much or too little testosterone? Whatever happened to the MACHO image of intrigue? I just can't comprehend the DGI (Cuban intelligence) employing a genetic aberrant of this magnitude. Eric Conners says that possibly the DGI is an Equal Opportunity Employer. Nice try, Eric.

Transmission format for the above type 5-digit Spanish transmissions:

"Atencion (3X)
255 60
57766 83324 26099...
Final (3X)"

PSSST! WANTA BUY SOME SPY PHOTOS?

The New York Times News Service says that a new era has dawned in which civilians are using satellite cameras to take a look at military targets, including missiles, ships and submarines.

It is said that given the latitude and longitude of a place anywhere on the globe, the commercially owned Landsat can supply photos for a cost of $80 to $500.

GOING OUT OF BUSINESS?

The British press indicates that Britain's top secret Hong Kong spy station days may be numbered--Said station is coming under intense scrutiny in the House of Commons.

This installation, called the Composite Signals Organization Station, Hong Kong, is one of the top electronic - intelligence (ELINT) gathering sites run by GCHQ, the British Government Communications Headquarters, Cheltenham.

This installation is located behind heavily guarded (an UZI is heavy enough for me) fences on Chung Hom Kok peninsula on the south side of Hong Kong. This site is very similar to spy stations in Turkey and on Ascension Island.

The Hong Kong station intercepts Chinese and Soviet military and political communications. Sources say that two of the antennas are always pointed towards the Soviet North Pacific, Vladivostok Naval Headquarters and the strategic rocket forces bases on Sakhalin Island.

You do remember Sakhalin Island and KAL007, don't you? It was from this Chung Hom Kok site that some of the United States information on the Soviet downing of KAL007 originated.

The British and their U.S. counterparts are most anxious about where to continue their intercept work once Hong Kong has reverted to Chinese rule (The Philippines is one option).

It is the understatement of the decade to say that the loss of this Hong Kong station is going to be a major blow for Western intelligence.

EVER WONDER?

Don't you find it curious that many 5-digit Spanish frequencies are also used by phonetic-alphabet stations, beacons, 4-digit Spanish, and Slavic numbers stations? Why, just the other evening I heard a 5-digit Slavic transmission on 4030 kHz!

Then there's 3880 kHz and German numbers at 0500Z! There they go on amateur frequencies again.

READING LIST

The Shadow War: German espionage and United States counterespionage in Latin America during World War II. By Leslie Route, Jr. and John N. Bratzel ($29.50)

History of the Military Intelligence Division, Department of the Army General Staff: 1775-1941. By Col. Bruce W. Bidwell, USA (Ret.) ($29.50) The above available from: University Publications of America, Inc., 44 North Market Street, Frederick, MD 21701.

SPEEDX

A big THANK YOU to SPEEDX and the TIPS 'N TOPICS editor John Demmitt for the nice mention. Your kind comments are much appreciated, John.

If "Los Numeros" readers don't belong to SPEEDX they really don't know what they're missing.

THANKS TO

John Santosuosso, Zel Eaton, the nearly-famous Eric Conners, John Demmitt, Sharon B and Philip Marlowe.

YOU

"Los Numeros" welcomes letters from you, the readers of Monitoring Times, describing your numbers intercepts or other related material. Letters may be edited for space. Letters may also be commented upon editorially. All letters become the property of Monitoring Times. Requests for anonymity will be honored. Let us know what you hear and what you want to read about.

Have a safe and sane July 4th. Until next time...

Goodnight, Tammy Faye and AAILL CAIAE ALCIA AICIC LCLLA AICEE

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 MT management, staff or readers. ■

PIRATE RADIO

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

C. M. STANBURY: A TRIBUTE

Word has been received here that Canadian C. M. Stanbury died February 4. Victimized by cerebral palsy since birth, Stanbury was one of the most controversial figures in the field of radio monitoring. His feuds with several well-known DXers certainly were no secret.

However, if Stanbury could be caustic he also was brilliant. He had an extensive knowledge of most areas of monitoring, and there were few who could match his ability to cover the clandestine broadcasting scene.

Undoubtedly, Stanbury was most proud of his book "Anti-Matter," published by Dust Books, P.O. Box 1056, Paradise, CA 95969. Hidden in random biographical notes, fantasies and other literary side trips is his analysis of the legendary clandestine Radio Swan. Stanbury makes a solid case that Radio Swan was far more than a CIA-run station broadcasting to the people of Cuba; rather, he argues the CIA connection was from the start a front for Radio Swan's military connections and its eventual participation in the Bay of Pigs operation.

Although "Anti-Matter's" treatment of Radio Swan will always make it must reading for clandestine researchers, the book contains elusive hints of something far more startling, perhaps something rather sinister. One wonders what Stanbury may really have come across and whether he was reluctant or even cautioned not to say more.

Good-bye, my friend. May the next world be kinder to you than this one was. And Stan, wherever you are, I hope Euridice is there with you.

RADIO TRUTH:

If you are one of those people who avoids clandestines because they broadcast in Spanish or some other language you do not understand, then here is one you might want to hear. It is Radio Truth, broadcasting from inside South Africa, with apparent backing from the government of South Africa. You will find its programming is in English. Radio Truth's target is the government of South Africa's neighbor to the North, Zimbabwe.

In addition to political commentary, the station also broadcasts a considerable amount of music. It was last heard here April 6 with a program of classical music and a rather solid signal.

Radio Truth has been widely reported throughout North America; look for it and its distinctive bird call interval signal on 5015 at 0430. Programs usually run about 30 to 45 minutes. Reception reports can be sent to J. Brown, P.O. Box 4, Stockbridge, Hants SO20 6LB, England. Verifications have been received, but you may experience quite a wait before a reply.

RADIO MOUSER:

From Michigan Tom Hansen reports reception of what is apparently a new pirate. On March 27 and several other days, Tom heard this station IDing as Radio Mouser International with a transmission at 0100 on 7490 kilohertz. He remarks that the DJ goes by the name of Bill X and that he plays a variety of music including country and jazz. Bill X urges reports be sent to radio publications. Well, Bill, here's Tom's.

CUBAN INTERFERENCE:

John Demmitt of Pennsylvania reports that under Section 7 of the Radio Broadcasting to Cuba Act and Part 1, Subpart M of the FCC Rules, AM radio stations are allowed to seek relief of expenses incurred in mitigating the effects of Cuban interference.

John indicates the following stations have already sought such relief: WSUN St. Petersburg, WVCG Coral Gables, WINZ Miami, WEAT West Palm Beach, WKAT Miami Beach, WQBA Miami (Castro does make deliberate, but half-hearted attempts to jam this one), WIOD Miami, and WNWS South Miami.

WOR New York filed an interference report with the FCC on December 9, 1985, along with 18 listeners' complaints, but did not provide any engineering exhibits to support its claim. WOR's problems are, of course, the result of the Radio Rebelde jamming of WAQI Radio Mambi Miami.

NEW ANTI-SANDINISTA CLANDESTINE:

Writing in the April 8 issue of "DX South Florida," Steve Reinstein reports reception of a new anti-Nicaraguan government clandestine station. IDing as La Voz de la Uno, the station appears to be broadcasting on a variable schedule between 0200 to 0300 and from 1100 to 1200. The frequency is 5039.

UNO stands from Unidad Nicaraguense Opositora (United Nicaraguan Opposition), and the station is run by the Contra FDN organization. At present most other active anti-Sandinista clandestines appear to be FDN sponsored.

WORLD STATUS MAP:

A sample copy of the intriguing "World Status Map" was received here recently. Based on State Department traveler advisories and other information, the map is very useful for identifying current world danger areas. While such information is of course vital to travelers, it can also be useful to those monitoring and searching for clandestine broadcasters.

A 12-month subscription is $36.00 and a 6-month trial subscription is $24.00. Orders should be sent to WSM Publishing Co., Box 466, Merrifield, VA 22116. This same company also publishes embassy address directories and travel information on various countries.

ODDS AND ENDS:

Minnesota's Marty Croze writes to report that Radio Caiman seems to be running a longer program now during their morning transmission. Look for them on 9960 between 1200 and 1400. Evenings you can find them on 7470.

We recently received a very nice QSL and newsletter from Radio Nova International. It is interesting that this pirate was first heard in Europe in December 1984 with a relay via England's Radio Apollo. In June 1985 they began direct broadcasting from North America.

If you wish information about the station or have a reception report, "Mon T. Python" and the rest of the Nova gang would be happy to hear from you. Their address is Box 5074, Hilo, HI 96720.

"Raunchy" Rick Forester of Tangerine Radio informs us that his station hopes to add Spanish and Esperanto programs in the future. This would be most unusual for a North American pirate, although a few have tried some brief excerpts in foreign languages. Our thanks to Tangerine Radio for airing an interview they did with us a few months ago.

ITALY:

In the February column we published a partial list of unlicensed Italian shortwave stations furnished to us by well-known Italian DXer Dario Monferini. Now with apologies for the delay, here is the promised remainder of the list:

Radio Time, using the facilities of the Italian Broadcasting Corporation in Scandicci, and a power of one kilowatt, can be heard on 7105 between 0700 and 1700. It uses 7100 between 1700 and 700 UTC.

Radio Spoleto International, from Spoleto, runs 500 watts on 7140. Its schedule is 0700 to 1700 and 2100 to 2300.

Finally, if you want something really rough to hear, try Radio Calabria International from Giojosa Jonica. It transmits on 13630 with only 200 watts. The schedule is 0900 to 1330 and 2200 to 2300.

While not easy, the unlicensed Italians are sometimes heard at various times throughout the year. If you log any of the above or in the February list, I can supply an address for your report. An SASE would be appreciated.

When is the FCC not the FCC?

Several independent commercial opportunists are taking advantage of radio licensees who may be unaware that there is no fee for processing their applications.

One such firm, Federal Licensing, J.V. of Gettysburg, Pennsylvania and Washington, D.C., sends out official-looking forms with actual license photocopies to their prospective clients, along with directions on how to reply to their notification and a solicitation for a $145 payment. The FCC does not charge a fee for such applications.

Federal Licensing began operations in June, 1982, according to an FCC spokesman and generated numerous complaints from their customers. After an investigation by the U.S. Postal Service, they agreed to stop sending out license forms and to add to their literature that they are not affiliated with the FCC.

PIRATE RADIO cont'd

CARD SWAPPING:

If you enjoy the hobby of card swapping, or would like more information about it, the Irish Rover International DX Group would like to hear from you. You can write them at Irish Rover 01, Mooncoin, County Kilkenny, Republic of Ireland.

IRELAND:

Our good friend in Ireland, Tony Donlon, has sent a great deal of information on the always interesting extensive Irish pirate radio situation. Space does not permit using most of it. However, here are a few brief items.

Competition among the commercial pirates of the Dublin area remains fierce. Q102, now a little over one year old, continues to gain on its rival, the old established Radio Nova (not to be confused with the North American pirate mentioned above). Q102 was even running "Eye in the Sky" traffic reports, which irritated not only Nova but the government-run RTE. Sunshine Radio, always popular, has now been on the air five years.

Elsewhere in the country there is also considerable competition. In Galway WLS Music Radio set up shop directly across the street from the older Atlantic Sound Radio and put it out of business in several weeks. In the northern part of the country several stations have opened near the border with the obvious intent of reaching an audience in Ulster.

ADIOS AMIGOS:

This will be my last column for Monitoring Times for at least several months. My thanks to all of you who have contributed to this effort and to all you faithful readers. You are what made it all worthwhile. Box 1116 remains open, and if I can be of help or if you just wish to say hello, please feel free to write.

Next month, as Monitoring Times merges with International Radio, look for a most informative column by my good friend Scott McClellan. Scott is one of the country's foremost experts on pirate radio, and you are certain to enjoy his writing. He would welcome contributions on either pirates or clandestines. You can send them to him at Box 982, Battle Creek, MI 49016.

Thanks, everybody and hey, Havana Moon, how about a tecate?! ■

TUNE IN WITH Ed Noll

Learn Morse the Easy Way

LONGWAVE DXing: PART I

Longwave DXing is exciting and provides an easy way to learn the code. Call signs are repeated over and over giving you plenty of time to ID each station. Time after time you can listen to individual letters and numbers and they soon are loaded into your mind's memory bank.

If you are skeptical, just give it a try for one evening, one morning or one afternoon. Spaced across this country and Canada are hundreds of airport and flyway beacon stations endlessly repeating their call signs in code as a navigation aid.

Copying these beacons is an unusual form of DXing and it is amazing just how far these very low frequency signals travel. There are marine, weather, military, and government agency stations as well. Yes, there is overseas DX, too, along with island stations and ships at sea.

Sending speed is slow, clean and deliberate and what a fun way to improve your code proficiency and DX at the same time. I'll repeat the easy-learning code table just one more time and I hope you will join all the other longwavers. There are some who enjoy this form of DXing above all others.

FIRST CODE "HEARING" TABLE

LETTER	CODE	LETTER	CODE
E	.	K	-.-
I	..	R	.-.
S	...		
H	....	C	-.-.
		Y	-.--
T	-	X	-..-
M	--		
O	---	L	.-..
		P	.--.
A	.-	F	..-.
U	..-	Q	--.-
V	...-		
		1	.----
N	-.	2	..---
D	-..	3	...--
B	-...	4	....-
		5	.....
W	.--	6	-....
J	.---	7	--...
G	--.	8	---..
Z	--..	9	----.
		0	-----

We would like to thank John Santosuosso for his tireless dedication and his insights into free radio while writing for MT over the past years.

We wish John continued success in his responsibilities and look forward to future contributions...Bob

Here are three tips to get you started:

1. Send for a copy of "The Aero/Marine Beacon Guide" by Ken Stryker, 6350 N. Hoyne Avenue, Chicago, Illinois 60659 ($10.00 postpaid). Station ID's are listed by frequencies with call sign location and a variety of additional useful information.

2. A tuner, such as the Grove TUN-3 Minituner helps in two ways. A tuner can peak the weaker signals when the antenna is so short in comparison to the signal wavelength. A second special benefit of a tuner is the reduction of interference from distortion components that results from the overloading of a receiver by the very strong medium wave broadcast signals that appear at the receiver input when there is no tuner in the line to attenuate their levels.

Various other heterodynes and electrical interference are also cut back when a tuner is in the circuit.

3. Use a long antenna, as long as your site permits. If you don't have abundant space double it back on itself or spread it out on other angles. I do very well with 250' of #20 hook-up wire wound in ladder manner, rafter to rafter, from one end of the bungalow crawl space to the other.

The above tips provide an inexpensive way of getting started. Of course there are loops, costly filters and pre-amplifiers to which you may graduate when you become a more avid longwaver. But let's get started first with learning the code as you enjoy DXing.

Your antenna is likely to be a single-wire type that you will connect to the single-wire input of your receiver. If you use the Grove TUN-3 tuner, first, attach a banana plug (supplied) on the end of the antenna wire. This can be plugged into the center of the coaxial input receptacle of the tuner. Now connect the tuner output to the receiver input and you are ready to go.

Listening Around

Several essentials at the operating table are a

ED NOLL cont'd

beacon guide, a lined writing tablet, appropriate maps and, if you are just learning, a code chart. In tuning over the band it's best not to take on the whole spectrum in detail initially; rather, tune in random fashion from the lowest frequency your radio can receive up to about 250 kHz.

Pay attention only to the strongest signals first, listening to the dots and dashes as you refer to your code table to make sense out of the characters. For each beacon you need not identify more than three letters and they are repeated endlessly. You have lots of time to catch it.

After you have made the ID refer to the beacon guide section that presents the calls alphabetically. This will guide you to its exact frequency. Next refer to the section of the guide that lists stations by frequency and you can determine its location and all about its characteristics, power, ownership, etc. You may wish to spot the station on a map. After you have made about a dozen ID's you should be well on your way.

One of the tricks of longwave DXing is to listen for more than one beacon on the same frequency. Don't forget to listen to the one you hear in the background after you have ID'd the strong signal on frequency. Often marine beacons take turns in using the same frequency, an aid for operating automatic direction finding equipment.

Some time ago on 306 kHz I tried to record the sequence of transmission. After a few complete cycles it came out to be WH-HP-CL-J-HP and, after a somewhat longer quiet period back to WH to start a new cycle. Don't forget that quiet period.

Stryker's guide identified the four signals as marine beacons -- WH (Watch Hill, RI, only 10 watts), HP (Horton Point, NY, 25 watts), CL (Clinton Harbor, CT, 25 watts), and J (Little Gull Island Light Station, 25 watts). Light stations have a single letter call that is repeated a number of times.

It was interesting to pick up their geographical locations on a map. The set I found was along both the New England and New York sides of Long Island Sound, serving a definite aid to mariners. I could not find the precise location of Little Gull Island on my map.

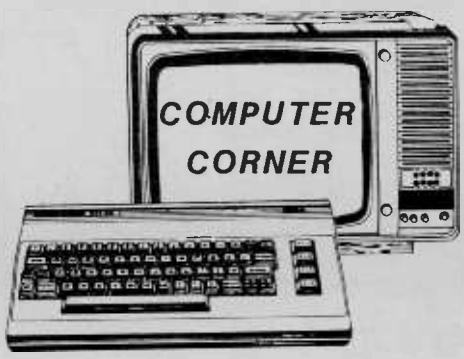
Listening in the Silence

Back to that empty slot of the sequence--did I miss one beacon signal? I heard a series of R's faintly in the background which turned out to be a bit of DX in the form of St. John's Light station down in Florida, a 200 watter. It is a continuous beacon and not likely a part of the Long Island Sound sequence.

After a period of random tuning over the entire band, it is beneficial and more revealing to work on individual 50 kHz segments in great detail. The region between 350-400 kHz may be a good start. There are numerous FAA aerostations plus a variety of weather, military, airport, municipal, and private beacons.

If you plan to do any experiments with longwave loops and antennas, the FAA stations can often provide useful bearings from your location. From my location I have Reading (RD) on 356 kHz to the west, Allentown (AB) 400 to the north, and Trenton (TT) to the east. All are FAA stations. My south bearing is Millville (RNB) 363, a municipal beacon and weather station.

Do you have similar capabilities in your area? Try some scanning and DXing in the 350-400 kHz segment over the next month. We will make some comparisons next month. ■



by
C.W. Ellis
P.O. Box 202
Ulster, PA 18850

Data Recovery from the Challenger

By the time this column gets to print, NASA will have expended many of the taxpayers' dollars in an attempt to recover as much data as possible from the recovered shuttle flight recorders and computers. I am going to crystal-gaze a little, and predict that the data recovery effort will substantially aid in the understanding of what went wrong. By the time you see this, you will also know if it did or not.

The reason I believe that valuable data will be recovered is that there are many techniques for data recovery unknown to the average citizen. Let's review some of the things that might be done to some of the devices recovered from the shuttle.

The various news services reported that the devices recovered from the ocean were being kept in cool water. The reaction to this on the part of many was - "What, more water?" Everyone knows that electronic devices and water don't mix, right? Well, not really. The chances are that one or more circuit boards in any of the myriad electronic machines in your house saw some water at one time or another.

Distilled and deionized water is used in some processes to remove impurities, wash away solder flux, and other tasks in the production cycle of many electronic printed circuit boards. So, the submerging of recovered components in water has some basis to start with.

What else is to be considered? Well, there are two obvious and immediate concerns. One is the moderating effect the pure water will have on the salt and other chemicals present in seawater. Bathing a circuit board or a mylar data tape will tend to wash away salt and other contaminants.

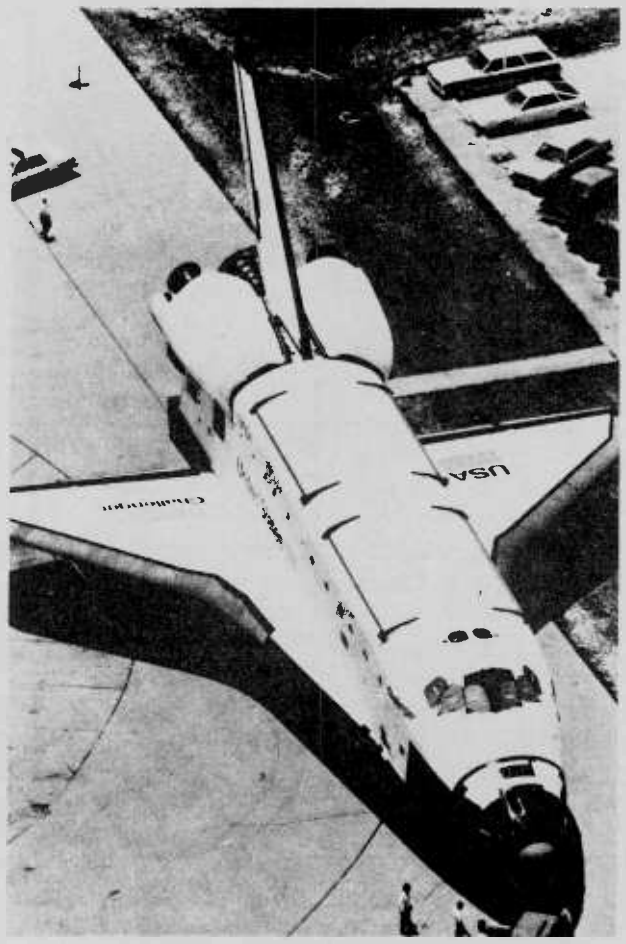
If the component is a circuit board, however, you hope that there are no modules which have any microscopic leaks in the body where the pins exit. This is the primary path for moisture and other nasties to get to the actual electronic circuits of the chip itself. This is one of the reasons the government pays such high prices for those modules and everything else associated with the space program. It is an attempt to get the best possible and most reliable part they can.

GETTING THE DATA BACK

OK, let's assume you have a tape, for instance, that may have valuable data on it, and your job is to recover it. Assuming it has been immersed in sea water, perhaps a pure water bath isn't such a bad idea after all. Followed by a gentle drying, your tape may hold up to being wound around a hub once more.

But was that tape exposed to excessive heat or is it physically damaged? You might wind up with several thousand 6-inch pieces and several weeks' work with an optical comparator looking at the severed ends of the various pieces to determine which little piece was cut from where.

Assuming you can still handle the tape and it wasn't somehow erased and you managed to get all the little pieces spliced back in order, what next? If possible, you make a copy of the spliced original and work with the copy. It helps to know where the tape came from, what type of data would normally be present and so on. You obviously wouldn't analyze a telemetry tape in the same manner as you would a cockpit voice



COMPUTER CORNER cont'd

recorder tape.

At any rate, if you know your job there is a whole raft of electronic and mechanical devices to help ease the job. Electronic filters separate the contents of the tape according to frequency, duration, type of field change, determine average signal strength for a given section of tape, and on and on. You can vary the tape speed, its tension, and try various levels of amplification; in short you vary every parameter that has any effect on the tape.

You will probably wind up with more data on the data that was on the tape than you had data itself!

If you are really interested in how sound can be recovered from a garbled media, you might read a novel called "The Hunt for Red October," a fictional account about a Russian submarine whose captain is determined to defect to the USA. While no data recovery is involved, the type of filtering and enhancing of audio I am talking about is quite well covered in the descriptions of the signal processing done to the sub's sonar signals.

The book is written by Tom Clancy and published by Berkely Books. Interestingly enough, this book is quite factual as regards the information about computers and such technical stuff, and sets me to wondering if there is any connection between the technical accuracy and the fact that the United States Naval Institute holds the copyright.

Getting back to our data recovery, some of the shuttle computers may have used magnetic core memory and, if so, perhaps portions of that memory survived intact. How would you like the job of re-stringing thousands and thousands of tiny doughnut shaped cores on new sense and select wires? These doughnuts are tiny, indeed, and the wires threaded through them are so small as to be almost invisible.

On top of all that, you also have to get them back on the wires in the correct order! Each core only held one binary bit, and it was either magnetized in one direction or the other. All the cores magnetized in one direction are identical. The only way a given core has any meaning as a 1 or a Ø is by where it was located in the memory.

Perhaps you were lucky --the memory came through intact, and you were able to install it in a new processor identical to the original. Now you can read out the data in the memory. Or can you? Perhaps an electrical surge caused the original processor to "wipe" the memory completely. So you loose a lot of data, but the mere fact that the memory was wiped may be significant.

Such information would be pieced in with all the other data (or lack of data) and may be the very piece of the puzzle needed to answer some other question. It's the kind of thing that gives meaning to the old saw: "It's not what he said; it's what he didn't say."

Given the chance, a flight computer could yield all kinds of data that might be invaluable in tracing the events that led to the catastrophic explosion. A lot of telemetry was transmitting a lot of data to ground based recorders. But there are bound to be instances where the telemetry transmitter quit before the data recording devices did, data such as which valve was open at the time thrust started dropping, and how was the gizmo positioned in relation to the ratchet snubber 300 milliseconds before the zigger fired?

Questions like this will be asked thousands of times during the course of the investigation. Only the names of the devices will change. Computers of all types will be called upon to help answer these questions and to further track the answers once they are found. Out of the answers, computers will draw conclusions and present data in more ways than ever before possible. All this in search of a working explanation of what went wrong.

The more control systems, computers, tapes, etc. are recovered, the more work to recover what data is salvageable. Every piece has a story to tell, and NASA will leave no stone unturned to gather the whole story.

I have only touched the surface of a vast and fascinating world where one must be equal parts Sherlock Holmes, Merlin and Werner von Braun. A little training in electronics, physics, and math help a lot, too! ■

Making Silicon Chips

by D. K. deNeuf, WA1SPM

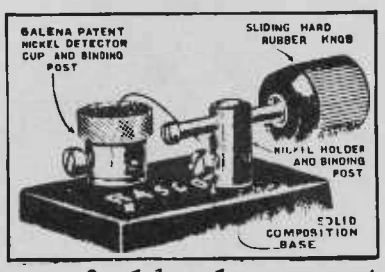
In the June '85 issue of MT John Avery had a fine article on the electrical aspects of solid state devices. Before vacuum tubes and transistors were developed, radio receivers, Avery says, used "crystal detectors" which actually operated as a rectifier.

As early as 1874 physicist Braun noted that certain pairs of crystals, arranged so that only a small area of surface was in contact, offered high electrical resistance to the passage of currents in one direction, while permitting them to readily pass in the other direction.

A number of minerals in crystal form will act as detectors, among them galena, iron pyrite, silicon, molybdenum, bornite, and chalcopyrite. Some operate with a wire or other metallic contact and others require a combination of two crystals--one in contact with the other.

Probably the most popular and widely used crystal was galena (PbS), also called lead sulphide, sulphur of lead or lead ore (Incidentally, the word "sulphur" is allegedly derived from Sanscrit meaning "enemy of copper").

Galena as a detector required a very light, stiff and clean wire of copper, brass or platinum for contact (nicknamed "cat's whisker" because of its similarity in size and appearance).



Type of old galena crystal detector.

Very little pressure of the cat's whisker on the crystal was required; any sort of mechanical jar on the crystal required resetting the "whisker." Manually finding the best "spot" (strongest signal) on the crystal required some degree of dexterity and patience. The best "spots" were often near the edges of the crystal, probably where most impurities existed.

Avery mentions that today among the most common semiconductors used is silicon, and that we've been smart enough to fool Mother Nature and create our own semiconductors with chemical impurities (Silicon is a non-metallic element).

How does silicon dioxide (beach sand) become an integrated circuit, one of man's most intricate and finely crafted devices? The most critical part of the process is "growing" silicon crystal ingots from a single "seed" crystal. This takes place in a furnace chamber that is heated to 1,450 degrees centigrade.

A "crucible" in the furnace contains molten silicon that has been "doped" with a secondary element like boron or phosphorous. A single seed crystal is fixed on the end of a rod and slowly dipped into the molten material; it is then gradually turned and withdrawn, much like candles are made by dipping in hot wax.

As the molten material solidifies on the seed it takes on the same atomic structure as the seed. This property of molecular symmetry is what distinguishes a single crystal from amorphous or polycrystalline materials.

But not all wafers are exactly the same; each semiconductor manufacturer has his own specifications for the crystal uses. The dopings, thickness and backside surface finish of the completed wafer are all variable.

Even so, when the finished crystal cylinder is withdrawn from the furnace, it is four inches in diameter and about three feet long. the bar is very brittle--like glass. The cooled cylinder is then sliced laterally into wafers, similar to the way a loaf of bread is cut into slices. The slicing machine uses a highspeed saw with a diamond edge.

Conversion of wafers into integrated circuits takes about 40 steps. The final step is crosscutting the wafer into many small circuit chips. The product has somewhat the same lead-grey metallic luster appearance as galena, but does not form into cubical or octrahedral crystals as does galena. ■

Galena crystals formed on dolomite.

GETTING STARTED

by

IKE KERSCHNER N3IK

Rd 1 Box 181A

Kunkletown, PA 18058

VHF EQUIPMENT

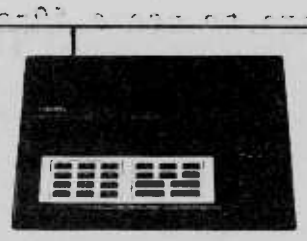
Our discussion last month focused on the VHF/UHF bands and what can be heard there. Now let's take a look at the kind of equipment we will need for these bands.

On the VHF/UHF bands the average listener will use some kind of monitor receiver or scanner. Some receivers are crystal controlled; this means that for each channel you wish to hear you must buy a new crystal. At five bucks per crystal this can be expensive!

A more practical approach is to use a programmable scanner which can receive a very wide range of frequencies by simply dialing in the frequency you want to listen to on a keypad. Prices for programmable scanners vary from about $100.00 to $500.00 while crystal monitors are available from about $40.00 to $100.00.

The majority of scanners or monitor receivers are designed for the FM mode; some models also include the AM aeronautical bands.

Tunable receivers that cover all modes are available but are very expensive. A better choice for the listener who wants to hear AM, SSB or CW is to buy or build a converter for the frequencies he wants to receive. Similar to the low frequency converter, it converts incoming VHF/UHF signals into lower frequencies that can be received on a general coverage receiver.



The BC 145XL--one of the inexpensive programmables

Some converters can be obtained from Hamtronics, 65 Moul Road, Hilton, NY 14468-9535. Most converters only cover about a 2 MHz range, so be sure to specify which frequency range you want to receive when you order. It is also necessary to specify the IF frequency range required; this is the frequency on the general coverage receiver that the VHF/UHF signals will be converted to. 28 to 30 MHz is a good IF range to specify if the receiver gives satisfactory performance there.

ANTENNAS

At VHF/UHF frequencies it is important to use an antenna of the correct polarization. Generally there are two types of polarization in use on these bands--vertical and horizontal. A vertical antenna must be used to receive vertically polarized signals and a horizontal antenna for horizontally polarized signals.

Vertical antennas have their element(s) at right angles to the earth. That is they stick straight up in the air. Horizontal antenna elements are parallel to the earth.

Inverting the antenna polarization will produce at least a 20dB circuit loss. If you are listening to a loud and clear vertically polarized signal on a vertical antenna and then switch to a horizontal antenna, it is possible that you would not hear that station at all.

CHOOSING THE CORRECT ANTENNA

Almost all two-way FM communications such as public service and business radios use vertically-polarized signals because the base station wants to communicate with mobile stations which may be scattered 360 degrees around the base and the vertical does an excellent job of radiating in all directions. In addition it is easy to install a simple vertical whip antenna on the roof of a mobile unit and handi-talkies are a natural for the vertical.

Simple quarter wave vertical antennas will give good coverage in all directions out to about 20 miles if you live in a good location. You can expand the range of reception by using a vertical gain antenna.

Gain antennas increase the strength of received signals and can easily double your normal receiving range. Popular omnidirectional gain antennas include the Butternut SC 3000 and the Grove Omni; both of these antennas are usable from low band VHF through UHF.

Sometimes reception of a distant station is desired and the omnidirectional vertical antenna simply won't reach out far enough. In this case, consider using a directional antenna. Unidirectional antennas are called beams because they focus the signal in only one direction and provide high gain in that direction.

If your interest is in only one station you can purchase or construct a beam antenna designed for optimum results on that particular frequency and fix the beam in the desired direction.

Normally, most of us want to receive signals from many directions and on many frequencies; hence, a wideband or multiband beam is the most practical type of antenna. Beams are designed to be turned by an antenna rotator so the operator can point the antenna in any direction he desires.

One such multiband beam is the Grove Scanner Beam which works on 25 to 54 MHz, 108 to 512 MHz and 806 to 960 MHz with excellent gain. The cost is only $40.00 and it is available from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902.

Amateur radio CW and SSB operators and some military and point-to-point commercial stations use horizontally-polarized antennas because they are communicating with stations that are further away and require large high gain multi-element arrays. Horizontal arrays of this size are easier to build than vertical antennas of similar gain. In addition it is generally thought horizontal polarization has a slight edge over vertical for long range work.

Horizontal beam antennas are available from many sources; a look through any radio magazine will turn up several different types. Because CW and SSB operation is confined to narrow bands it is best to choose an antenna designed specifically for the band of interest. Multiband arrays can be obtained but are not very satisfactory.

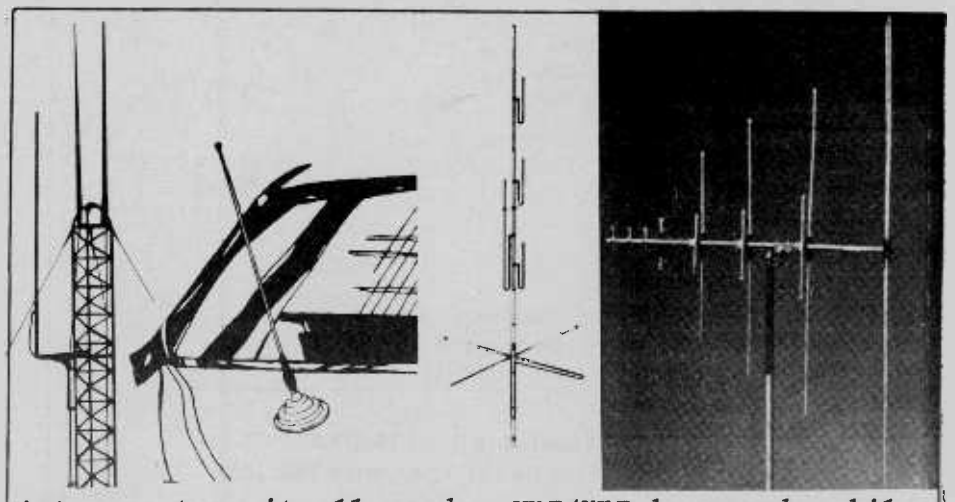
Satellite and space communications utilize cross polarized and circular polarized antennas. I suggest that if you are interested in this field purchase the ARRL Satellite Experimenters Handbook at a cost of $11.00. Their address is 225 Main Street, Newington, CT 06111.

When erecting VHF/UHF antennas there are several things to keep in mind. First is height; at these frequencies the higher the antenna the better, sometimes just a few feet will make a world of difference in what you can hear.

Keep the antenna in the clear; at these short wavelengths buildings, hills, poles, and even automobiles can block the incoming signals. Often it is possible to improve reception by simply moving the antenna a few inches right or left of its present location. It pays to experiment!

Use the best feedline obtainable. VHF signals are easily attenuated by poorly constructed coax cable. If the antenna is no more than 15 to 20 feet from the receiver cheap coax can be tolerated to some extent; however, if you take the time to erect a good antenna by all means spend the extra money for low loss feedline. Any reputable dealer will tell you what kind of feedline is best to use.

That concludes this month's discussion, folks. Keep the letters coming; it's always good to hear from you. ■



Antennas to suit all needs: VHF/UHF base and mobile antennas, Butternut SC 3000, and Grove Scanner Beam.

Add-on Digital Readout

Torrestronics, Inc. (4850 Hollywreath Court, Dayton, OH 45425) still manufactures frequency readouts to be used with analog dial receivers. The readouts contain adjustable offsets to accommodate a wide variety of receiver conversion schemes. Enclose an SASE with your inquiry for additional information from the manufacturer.

ANTENNA TALK

W. Clem Small KR6A

Connecting the Antenna to the Radio

or,

ARE YOU FEEDING ME A LINE?

In recent months this column has been concerned with topics such as antennas and propagation of signals between antennas. Let's now consider a third factor in the circuit between you and the stations which you monitor or with which you communicate: the pathway between your receiver, transmitter or transceiver and your antenna.

The ideas which we need to cover, in order to understand how this pathway functions, are generally the same for transmission or reception. So, as our basic example, we'll examine how the signal picked up by the antenna is routed to your receiver.

TRANSMISSION LINES

When an antenna is energized by a radio signal, the antenna can then be considered a signal source. That is, if we want to hear the signal with which the antenna is energized, we must get it from the antenna and into our receiver somehow. An obvious way of doing this is to connect the antenna directly to the receiver. This is the way it is done in many hand-held scanning monitors, hand-held transceivers and AM broadcast receiving sets.

In most serious communication setups, however, it becomes necessary to locate the antenna at a distance from the receiver and there is then a need to route the antenna's signal to the receiver. You will not likely find it surprising that we call this device, which guides or transmits energy from the antenna to the receiver, a "transmission line."

Examples of commonly encountered transmission lines are coaxial cable (fig. 1a); open-wire transmission line (fig. 1b); and a relative of the open-wire type, twin-lead line (fig. 1c). Now, in order to do a respectable job of discussing transmission lines, we need to explain a bit about two important factors: attenuation and impedance matching.

ATTENUATION

Attenuation is the reducing of a signal in amplitude. If we have a signal level of 100 microvolts, and somehow we reduce it to 10 microvolts, we have attenuated the signal. The less loss or attenuation we have, the more signal we have left and the better we hear the signals we monitor, the happier we feel, and so on. So, just keep in mind that we usually want to keep attenuation in our transmission lines as low as possible.

IMPEDANCE MATCHING

Impedance matching is necessary for optimum power transfer from antenna to line, or from line to receiver, etc. This means that you must use a 300-ohm line with a 300-ohm antenna (or a 50-ohm line with a 50-ohm antenna, and so on) to get the maximum signal out of the antenna and onto the line. This provides an efficient transfer of signal power from the antenna to the line.

Once the signal is transferred to the transmission line, you may then consider the transmission line as a source of signal. You now want to get the maximum signal from the line and into your receiver. How to do that? You guessed it! You must also have a match between the line and the receiver. In other words, if you are to use a 50-ohm line, it must connect to a 50-ohm input terminal at the receiver if you are to get the optimum signal from the line into the receiver. So remember, for best power transfer, both the input end and the output end of a line should be connected to an impedance similar in value to the line's own impedance.

SELECTING THE APPROPRIATE TRANSMISSION LINE

Most of us want to get the best signal possible into our receivers at the minimum expense necessary--that's just common sense. In order to accomplish this goal, we will need a line which will match our antenna impedance and also our receiver, transceiver or transmitter impedance requirements as discussed above.

We also want to get a good-quality line with the lowest attenuation for which we can afford to pay. Some low-loss transmission line is expensive, and we may have to weigh its added cost against the increase in performance.

Occasionally, impedance mismatch may be tolerated in exchange for low loss, as when RG-6/U (72 ohm) low loss cable TV coax is used in preference to lossy RG-58/U (50 ohm) cable.

Take a look at table one now, and note the variety of impedances available. There are more types of transmission line available than are listed; the table gives you an idea of the most common ones, however. Look at the column labeled "loss in dB per 100 feet." As you can see, there is considerable variation in loss between various types of line. Also, for any one line type, loss increases as frequency increases.

Comparing the types of lines shown, open-wire line has the lowest losses of any line; twin-lead line is low-loss compared to the coaxial cables (the RG prefixes are coaxial cable). For the coaxial cables and twinlead types, there are foam-filled versions available which have lower losses than their solid-dielectric counterparts. So you can see that there is a wide difference in losses sustained with various types of lines.

The low losses of the open-wire and twin-lead types look very good on this table. Why, then, do these two types not dominate the field in practical applications? One reason is that they suffer more from weather-related losses than do coaxial cables. Another is that they are not convenient to install.

On the other hand, the coaxial lines with their moderate losses are unaffected by weather and are very easy to install; you can lay them under or over objects and even bury them with no ill effects. The open and twin-lead lines cannot be mounted near metal or the earth, and certainly cannot be buried!

Because of the symmetrical nature of their conductors with respect to ground, open-line and twin-lead are what is called "balanced" lines, whereas coaxial cables are "unbalanced" lines. Most modern equipment has unbalanced line input or output circuits which match commonly available coaxial cable impedances. During receiving, the balanced lines may pick up local interference on the feedline.

As you can see from figure 1a, the unbalanced coaxial line is shielded from such interference by its outside conductor. Also, if you're transmitting, there is likely to be radiation from the open-wire lines, causing distortion of the antenna-radiation pattern. Again, the outer conductor on the coax prevents this problem.

You can also see from the table that line-losses at HF are lower than at VHF and above. This means that choice of line is not so critical at HF and below as it is at the higher frequencies. Most any type of cable, if of good quality, will perform well at HF, especially below 10 MHz. As we increase in operating frequency, the foam-dielectric types of coax become more necessary.

All things considered, coaxial cable is the favorite choice for most installations today. Even where losses must be kept low, short runs can be handled by the foam coax cables. Where

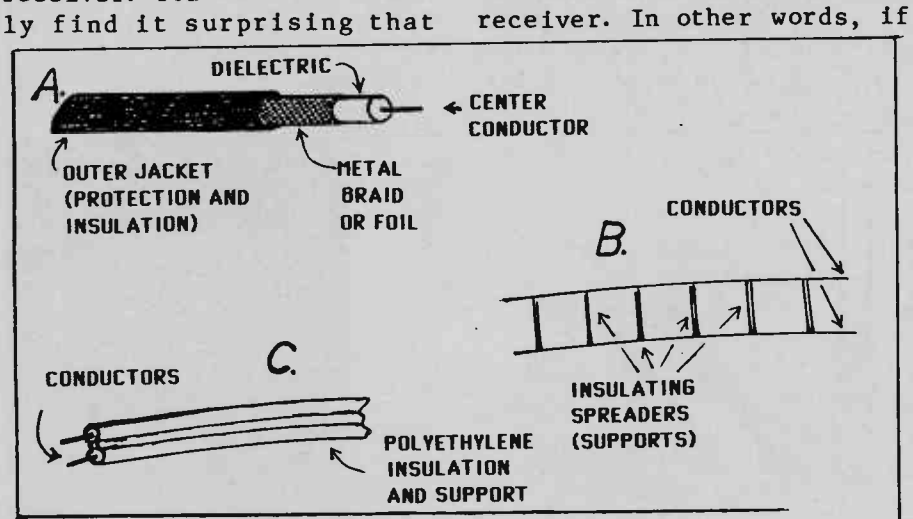


Figure 1. The three most commonly used types of transmission lines: coaxial cable (a); open-wire line (b); and twin-lead (c).

TABLE 1

SOME COMMONLY USED TYPES OF TRANSMISSION LINE

TYPE of LINE	NOMINAL IMPEDANCE	LOSS IN dB PER 100 FEET		
		1 mHz	10 mHz	100 mHz
OPEN-WIRE	400-600	<.01	.07	.40
TWIN-LEAD	300	.09	.30	1.2
RG 8/U	53	.17	.60	1.9
RG 58/U	53	.33	1.25	4.6
RG 59/U	73	.33	1.10	3.4

***ANTENNA TALK** cont'd*

losses must be kept to an absolute minimum, as in long line runs, open-wire line or twinlead are frequently lines of choice.

If you'd like to dig into the topic of transmission lines more deeply, check the references below. Sources one through three are good communications-technician level treatments from a broad perspective: references four through seven are oriented toward amateur radio.

LAST MONTH'S RIDDLE:

Last month's riddle asked you to identify a mode of propagation which utilizes the troposphere rather than the ionosphere. In utilizing this mode, high-power microwave signals are beamed at the troposphere at a point between the two communication sites involved. By a mechanism not yet clearly understood, these signals are scattered in all directions, somewhat as though a non-directional antenna were radiating them from the troposphere.

High-gain directional antennas and state-of-the-art sensitivity in receivers are necessary for success using this technique. Even with all this expense, the high reliability of the tropospheric scatter mode makes it all worthwhile.

THIS MONTH'S RADIO RIDDLE AND A CONUNDRUM YET!

"For coaxial cables, what does the RG, as in RG-59/U, stand for?" If you think over the function of coaxial cable, you may be able to guess this one.

Conundrum: Maybe we shouldn't call this a conundrum, as it has a realistic answer. Nevertheless, here goes: "When is a transmission line like a transformer?" The answer to this next month just might help you solve a pesky antenna matching problem someday.

And don't forget to drop me a line indicating your preference in topics for future articles. See you next month! ■

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5. The Radio Communication Handbook. Radio Society of Great Britain, London, Any edition.
6. Radio Handbook, Orr, W., Editor. Editors and Engineers, New Agusta, IN, Any edition.
7. The Radio Amateur's Handbook. American Radio Relay League, Newington, CT, Any edition.

The real-life drama behind

WHY OUR POWER LINES ARE GROUNDED

by W. Clem Small, KR6A

At some point in the past, I seem to recall that a Monitoring Times reader wrote in to ask the history on: "Why one connection of our AC house-wiring is grounded to the earth." Well, we need wonder no longer! A book on the life of the great Elihu Thomson--scientist, inventor, wireless pioneer, and electrical-power pioneer--gives us some interesting information on that question. Let's see just what it has to say.

As you may know, back around the 1890's, Thomas Edison was the king of electrical power-distribution systems and that power was all DC. There were no AC distribution systems and Edison, who had developed the DC system then in common use, fought desperately to prevent the public's acceptance of the more economical and efficient AC power.

Although the initial idea of the AC power system is the brainchild of that remarkable genius Nikola Tesla, other persons and groups as well had worked on the idea of AC in those early days. The "Big Three" in competition to usher in AC power development were the Westinghouse Company, General Electric and the Thomson-Houston Company.

Pertinent to our story is the fact that the scientific and engineering development for the latter company was under the direction of Elihu Thomson. We will say more on this shortly, but first a little background information.

As you know, at high potentials either AC or DC can be very dangerous. When a person contacts high voltage directly through carelessness or due to equipment malfunction, either of these types of current can be lethal. Nevertheless, Edison and his colleagues in the DC systems disseminated a great deal of false information trying to convince consumers that the AC power system was much more dangerous than DC.

Discussing this problem in her biography of Nikola Tesla, Cheney writes that, "Edison was paying schoolboys twenty-five cents a head for dogs and cats which he then electrocuted in deliberately crude experiments with alternating current." At the same time he issued scare leaflets with the word "WARNING" in red letters at the top. The gist of these messages: if the public were not alert, they might find themselves being terminally "Westinghoused."

Edison had been laying the groundwork for his vendetta for two years. He had written to E.F. Johnson, "Just as certain as death Westinghouse will kill a customer within six months after he puts in a system of any size." As a follow-up to the experiments in animal electrocution, a "Professor" Brown obtained the use of patents by subterfuge and used them to arrange the first electrocution of a condemned criminal.(2) It is easy to imagine the negative feelings toward AC which this little ploy engendered in the public's thinking.

Obviously, it was an up-hill battle that AC was to fight if it was to gain respect and commercial success. Nevertheless, we are told that Elihu Thomson was not so interested in the financial success of his power venture that he would rush into commercial exploitation of his system before it was as safe as he could make it.

Thus, when Thomson's AC system was, at last, technically ready to enter competition with the less efficient DC system, Thomson himself "...held back approval of commercialization of AC until he perfected a safe way to prevent shocks of the high voltage side of a (high-tension) transformer (should it become) shorted to the house-wiring side."(1) His concern was that the high-tension distribution lines, which often were at the tens-of-thousands-of-volts level, should not be a source of danger if they became accidentally short-circuited to the wiring which entered a consumer's residence.

Thomson's way of accomplishing this task was the "...absurdly simply expedient of connecting the secondary transformer winding by heavy wires to ground. This completely eliminated the danger of high voltage charging the wires inside buildings for, if a transformer's insulation failed, the current would pass directly to earth."(1)

So there you have it. If your high-tension power lines short-circuit to your house mains, that ground wire on your house wiring routes the otherwise lethal killer to the earth through the secondary of the power transformer. Also, without the ground, the capacitor action between the primary and secondary windings in a normal transformer could charge the secondary to the high-voltage level of the primary winding if it were not for the ground on the secondary winding (see fig. 1). Thomson had, indeed, found an elegantly simple solution to a very serious problem.

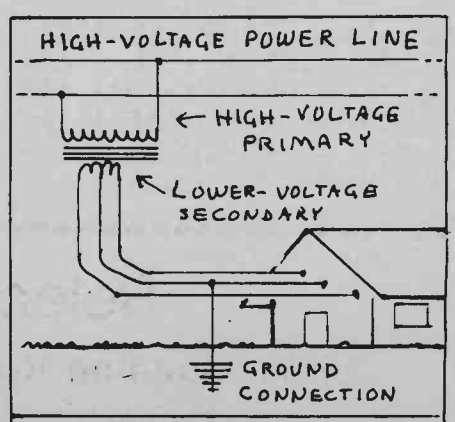

FIG. 1. Schematic diagram of a power line transformer (a "pole-pig") with grounded center-tap connection on the secondary winding.

It is interesting to note that so effective had been the early propaganda mills in bad-mouthing AC power, the Insurance Underwriters at first forbid use of Thomson's grounded secondary. Later, as its wisdom could no longer be denied, they permitted it. At last, they began to require it. And today, it is mandatory in all installations the nation over.(1)

Thus, because of the respect for human value held by a man whose name most people don't even know, we use our countless electrically-powered appliances and gadgets with much greater safety than might have otherwise been the case. Thanks, Elihu; we needed that! ■

REFERENCES

1. Woodbury, David O., Beloved Scientist: Elihu Thomson. New York, Whittlesey House, a Division of McGraw-Hill Book Company, 1944, pp. 169, 172-173.
2. Cheney, Margaret, Tesla: Man out of Time. Englewood Cliffs, Prentice-Hall 1981, pp. 43, 45.

TECHNICAL TOPICS *by Bob Grove*

Q *How would you rate the Grove OMNI, Butternut and Radio Shack scanner monitor antennas? (Andrew George, Centereach, NY)*

A All three antennas offer good scanner reception. I would rate the Butternut best for 30-50 MHz low band performance (it is bigger); the Radio Shack for general metropolitan low, high and UHF bands; and the OMNI for all-purpose scanner monitoring including the in-between ranges like 225-400 MHz military and shuttle.

One antenna you didn't mention is the Grove Scanner Beam which features the highest gain (up to 8 dB) and widest frequency coverage (30-1000 MHz) of any scanner monitoring antenna available.

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Q *My portable scanner calls for a 9.6 volt charger/adaptor, yet the unit that came with it is marked 12 volts. What gives? (Don Manke, Tacoma, WA)*

A Manufacturers of radios will find the closest (slightly higher) voltage in an available wall charger and protect their equipment with an internal voltage regulator. Sometimes the rate voltage of the charger is measured under no-load conditions and when it is connected, the voltage will drop to the needed value for charging the internal batteries or operating the radio.

◆◆◆◆◆

Q *Is there any way to increase the volume of a hand-held scanner? (David Berg, Minneapolis, MN)*

A Not without major circuit modifications. Instead, plan on plugging in an external speaker when you are in a noisy location such as a vehicle or office. The speaker plug simply inserts into the earphone jack and will properly match the impedance of the output amplifier.

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Q *What is the effect of aluminum siding on a house so far as radio reception is concerned? (Henry Johnson, McLean, VA)*

A All metals are impervious to radio frequency waves. Metallic surfaces reflect these waves in varying degrees depending upon the dimensions of the metallic surface and the frequencies of the signals involved.

An antenna located inside a metal-enclosed building is effectively shielded from incoming signals, responding only to those radio waves which "sneak through" windows, seams, cracks, non-metallic roofs, and so on.

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Q *How much wind can the Grove ANT-5B OMNI take? (James Maniscalco, Norristown, PA)*

A Frankly, I don't know. We have had no reports of failure due to wind loading and ours has been up for three years without any problems. I would suspect that it would be reasonable to expect it to withstand at least light hurricane-force winds.

Reagan Really Opens Doors

Radio-controlled garage doors by the thousands are going up and down all over the country--unattended. It seems that President Reagan's "doomsday plane," a modified Boeing 747 packed to the gills with electronic gear, sends out signals which interfere with the broadband garage door receivers.

Most of the remote door openers operate in the 300 MHz band, right smack in the middle of the 225-400 MHz military aeronautical band, a prime spot for all modes of military intercommunications and navigational signals.

Selectivity:

Understanding Receiver IF Filtering

by Greg Doerschler N1DEM

One day, as you're glancing through the owner's manual of your new receiver, you notice among the list of optional accessories such items as "CW filter" and "high grade 2.4 kHz SSB filter." You begin to wonder if you only bought half a receiver and become curious as to what improvements these filters might offer.

The most basic job of any receiver is to select one desired frequency while rejecting all unwanted frequencies. Since there are countless signals on different frequencies simultaneously entering the receiver through the antenna at any given instant, some means of singling out the desired frequency is needed.

After the "front end" (radio frequency amplifier, mixer and oscillator) of the receiver roughly adjusts the portion of the spectrum to be received, the signals are passed to the intermediate frequency amplifier (see figure 1).

Since the IF stages must pass only a very narrow band of frequencies, blocking adjacent-channel signals higher and lower in frequency, very sharp bandwidth filters can be employed. The IF bandwidth filters represent the backbone of receiver selectivity; without them, the user would often be subjected to an unintelligible barrage of signals.

For a general coverage receiver to function well in all of its operating modes, several different IF bandwidths are normally required; this is because different modes of transmissions occupy varying amounts of spectrum space.

A receiver bandwidth which is too "narrow" for a particular mode will not receive the entire signal; likewise, too "wide" a bandwidth will result in adjacent signals interfering with the desired signal.

FIGURE 1 - Simplified Receiver Block Diagram

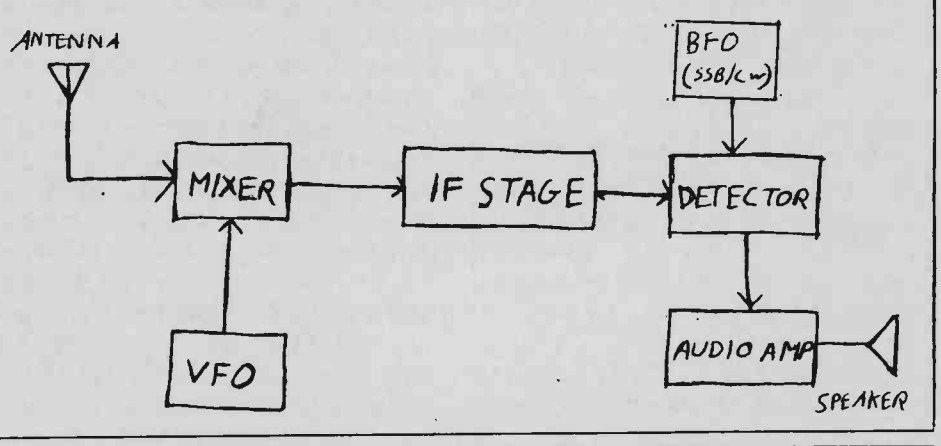


FIGURE 2 - Typical Signal Characteristics and Filter Bandwidths

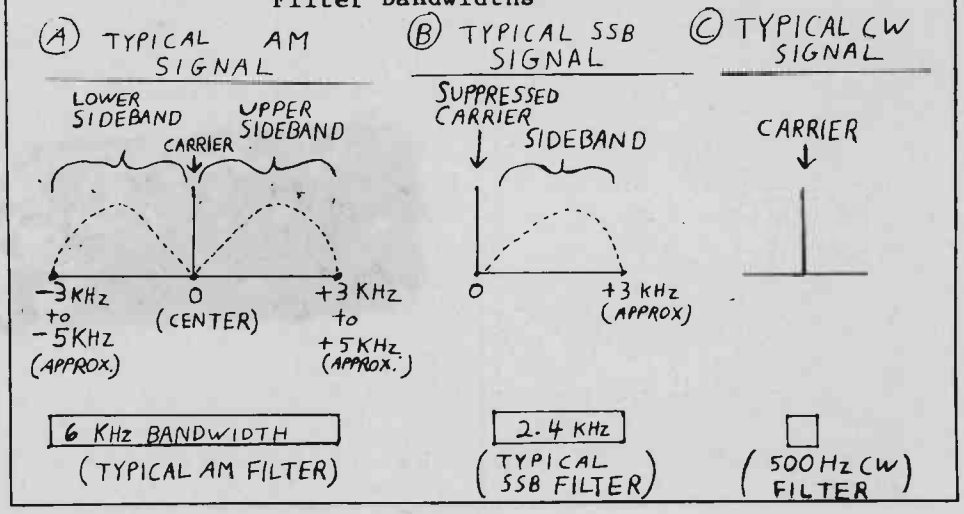


Figure 2 illustrates characteristics of some common transmission modes as well as the bandwidths of typical IF filters used to receive these modes.

CHOOSING THE RIGHT FILTER

While the bandwidth of a filter determines how "wide" a signal the filter will pass, skirt selectivity (shape factor) indicates how quickly signals just outside of the passband are attenuated.

Ideally, a signal just outside of the filter passband would not be heard at all; however, there is very little in the world which is ideal, and IF filters are no exception.

Signals just outside of the passband of an IF filter are attenuated, but do not disappear completely. The greater the attenuation of these signals, the better the skirt selectivity of the filter.

Selectivity of a filter is generally determined by measuring the bandwidth of the filter within which signals are attenuated less than 6 dB, and comparing it to the bandwidth at which signals are attenuated 60 dB. The shape factor of a filter is calculated by dividing its 6 dB bandwidth into its 60 dB bandwidth. For example, a 5 kHz-wide (-6 dB) bandwidth filter with 10 kHz wide -60 dB points has a shape factor of 10/5 or 2.

Figure 3 illustrates shape factors for three 2.4 kHz bandwidth filters. Figure 3A shows an ideal filter with a shape factor of 1. Such a filter could not exist in the real world, since its -6 dB and 60 dB points would have to be the

☞

SELECTIVITY cont'd

same. A typical high quality bandwidth filter has a shape factor of about 1.75, as shown in figure 3B. Figure 3C shows an inferior bandwidth filter with a shape factor of 3.

Many stock receivers utilize a 2.4 kHz SSB filter for CW reception as well. While this filter is good for wide-bandwidth SSB voice signals, serious CW listeners generally choose to install a sharper CW filter, either 500 Hz or 250 Hz, in order to reduce adjacent channel interference. The 250 Hz filter provides a narrower bandwidth than the 500 Hz filter, but also requires more careful tuning of the receiver and may be harsher sounding.

Some of the more expensive receivers have the capacity for the installation of optional bandwidth filters. For instance, an optional 4 kHz bandwidth filter would provide better selectivity in the AM mode than a stock 6 kHz filter. While the 4 kHz filter would also block some of the crispness of the AM signal, the reduction of adjacent channel interference in a crowded shortwave band would improve overall reception quality.

AM PASSBAND TUNING

Ideally, the width and position of an IF passband should be continually variable; this would allow the user to place a passband of proper width in the position where it would best reduce interference.

Figure 4 shows an AM broadcast signal with interference from an adjacent AM signal. The 6 kHz bandwidth filter in position 1 is centered on the desired signal, but would experience interference from an adjacent signal. If the filter could be shifted away from the interfering signal as shown in position 2, the interference would be reduced.

In position 2, the desired signal might become somewhat distorted since it is not centered properly in the passband; additionally, problems could arise if there were also signals below the desired station which the shifted passband would now receive. Note that, in the AM mode, shifting the passband is analogous to turning the main tuning knob.

Another solution to the selectivity problem is to use a narrower band-width filter as shown in position 3. Some of the fidelity of the desired signal would be lost as well, but overall intelligibility would likely improve by reducing the interference.

Alternatively, this AM signal could be tuned in using the lower sideband mode (exalted carrier single sideband--ECSS). Since both sidebands of an AM signal carry identical information and the interference is affecting only the upper sideband, a good quality signal would likely result from this method.

Figure 5A illustrates an upper sideband (USB) signal; position 1 beneath the SSB signal in figure 5A shows a 2.8 kHz bandwidth filter which will pass the entire SSB. Although the 2.5 kHz bandwidth filter in position 2 will partially clip off the high and low frequencies, it will likely perform better than the 2.8 kHz filter in a crowded band. In fact, many amateur radio operators use filters as narrow as 1.8 kHz for SSB use. Positions 3 and 4 in figure 5A indicate how the 2.4 kHz filter can be shifted in order to reduce interference from nearby signals.

Unlike the case of AM signals, shifting an SSB passband is not analogous to tuning the main tuning dial. The tuning dial must be set precisely on frequency during SSB reception in order to maintain the proper relationship between the BFO (beat frequency oscillator) carrier and the signal. If the tuning dial is moved, this relationship changes as well and the voice becomes unnaturally high or low pitched.

SSB PASSBAND TUNING

In the SSB mode, shifting the IF passband will also change the tone of the received signal. The result will be similar to adjusting the tone control on the receiver, but the effects of shifting the passband will be much more pronounced.

In figure 5A, shifting the passband to the left (position 3) increases the bass response, while shifting it to the right (position 4) increases the treble response. If the passband is shifted too far in either direction, the signal becomes unintelligible.

In figure 5B a wide SSB filter passes the entire desired signal and part of the interfering signal in position 1. Position 2 shows how the passband has been narrowed and shifted to reduce the interference.

The added effect of an IF notch filter is shown in position 3. The notch filter produces a sharp null in the IF passband which is useful for eliminating interference from CW signals.

High quality receivers often employ a number of methods for modifying the IF passband. While the bandwidth filters contained in the IF stages are fixed and cannot be tuned or altered, shifting the oscillators can produce the effect of shifting or narrowing the passband.

In the SSB/CW modes, changing the main tuning knob will result in an improper spacing between the desired signal and the BFO. Figure 6A shows a properly tuned SSB signal containing a 1 kHz audio tone. The 1 kHz tone must be spaced 1 kHz from the BFO for proper reception.

In figure 6B, the

FIGURE 3 - Shape Factors for 2.4 kHz Bandwidth Filters

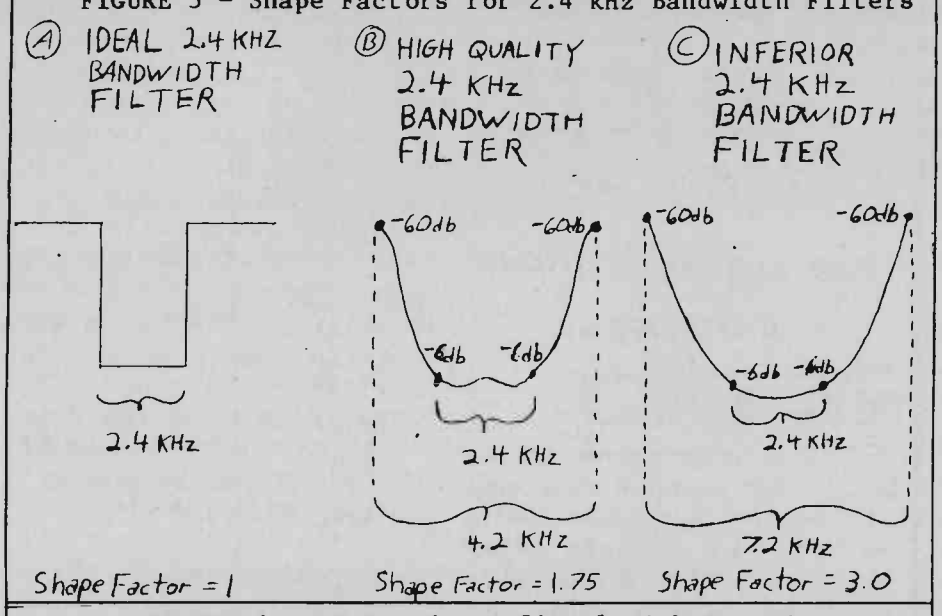


FIGURE 4 - AM Broadcast Signal with Interference

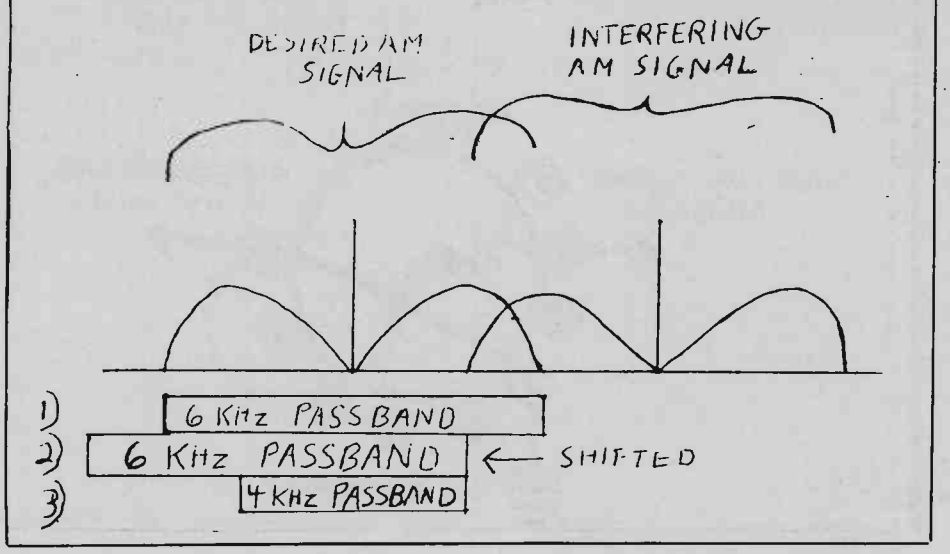


FIGURE 5 - Upper Sideband Signal

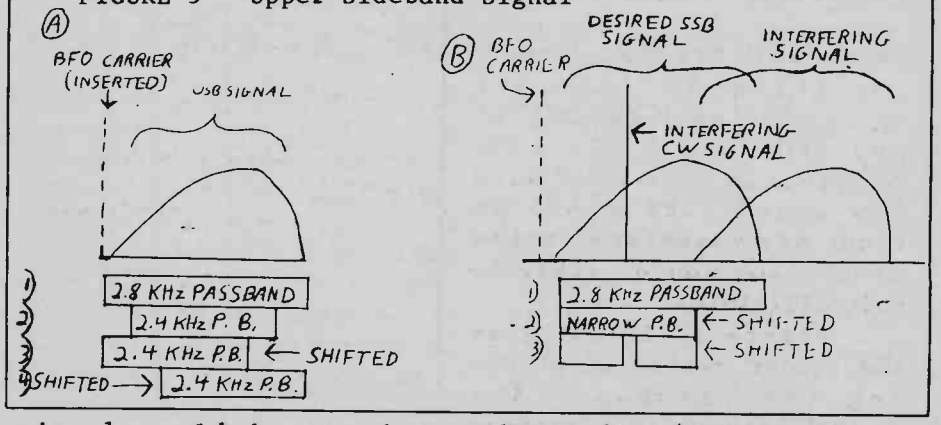
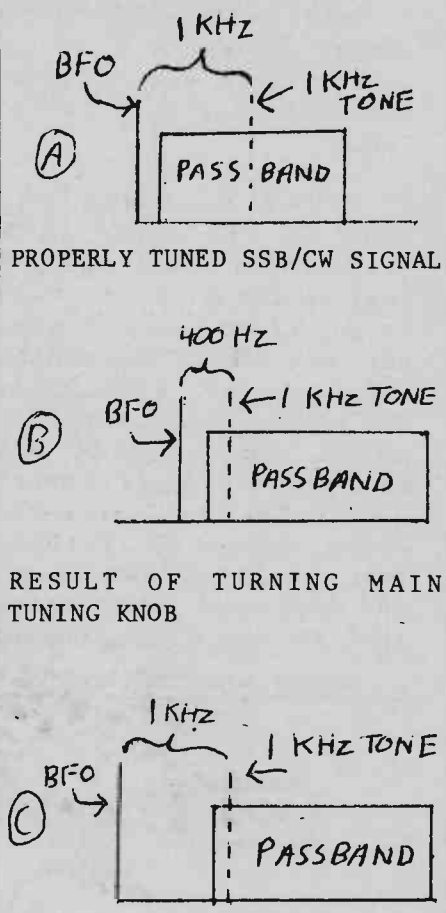


Figure 6A shows a properly tuned SSB signal containing a 1 kHz audio tone. The 1 kHz tone must be spaced 1 kHz from the BFO for proper reception.

In figure 6B, the

FIGURE 6 - Tuning an SSB Signal



SELECTIVITY cont'd

tuning knob has been turned, resulting in improper spacing between the signal and BFO. Our 1 kHz tone contained in the signal will now sound like a 400 Hz tone. Any associated voice modulation would likely be unintelligible.

Figure 6C illustrates the proper method of shifting the passband. The "space" between the passband and BFO is increased to compensate for the shift. Note that as a result of this shift, only audio signals above about 900 Hz will be heard.

Many amateur transceivers perform the passband shift effect illustrated in figure 6C using a control commonly called "IF shift." Similar controls found on receivers and transceivers include "passband tuning" (PBT) and "variable bandwidth tuning" (VBT). As opposed to shifting the IF passband, these controls are capable of continually varying its width through the use of dual IF filtering.

Since receivers often employ several IF stages, each operating at a different IF frequency (double or triple conversion), bandwidth filters in different IF stages may be adjusted relative to each other in order to obtain a continually variable bandwidth.

FIGURE 7 - Dual IF Filtering

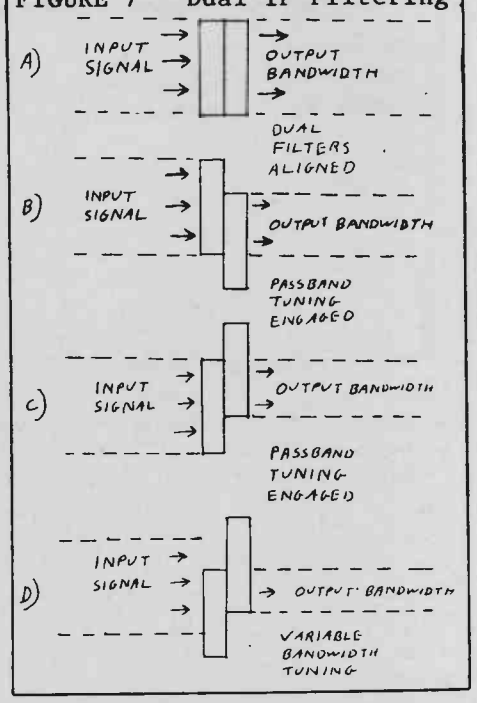


Figure 7 shows the effects of passband tuning and variable bandwidth tuning on the IF passband. In figure 7A, two IF filters of the same bandwidth are aligned with each other. The second filter provides no additional narrowing of the passband.

Figures 7B and 7C show how a passband tuning control is used to narrow the IF passband; the second filter is effectively "shifted" out of alignment with the first. Only the bandwidth common to both filters passes through.

The effects of a variable bandwidth tuning control on the IF passband are shown in figure 7D. With this control, both filters are shifted in opposite directions; as a result, the center of the passband remains the same, but the edges move in. Such a control can be a welcome alternative to purchasing numerous (expensive) IF bandwidth filters in order to obtain different bandwidths.

Terms such as "IF shift," "passband tuning" and "variable bandwidth tuning" are used extensively by manufacturers of receivers, but are not industry standards. An "IF shift" on one receiver might actually be a "passband tuning" on another.

Referring back to figure 7A, if the two filters are aligned to each other, it would not seem to make too much difference whether the second of the two filters was of inferior quality since the first would define the bandwidth; in figures 7B, 7C and 7D, however, the edges of both filters serve to define the bandwidth.

If the second filter is of lesser quality than the first, signals outside of its passband will not be attenuated as much. Thus, the effectiveness of passband tuning or variable bandwidth tuning in reducing the IF bandwidth would be limited.

In the case of the ICOM R71A, replacing the stock 2.4 kHz ceramic IF filter with an optional crystal or mechanical filter will significantly improve the performance of the passband tuning control in the SSB modes.

IN CONCLUSION

The proper selection of IF bandwidth filters and careful use of the controls which modify the IF bandwidth can drastically help reduce many interference problems. Remember that even the best filters cannot completely alleviate all forms of interference; however, an understanding of the theory behind the operation of these filters and controls will invariably help the user to utilize them effectively. ■

HELPFUL HINTS

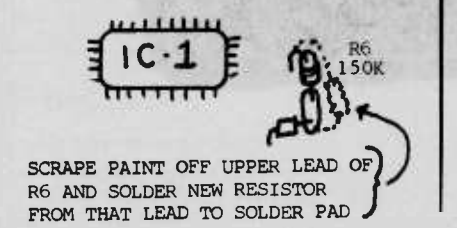
FASTER SCAN/SEARCH ON THE MX7000

PART II

David Cook of Oklahoma City was the reader who suggested the faster scan and search speed modification we mentioned on page 38 of our April 1986 issue. Several calls from MX7000 owners prompted a closer look at this mod. We quote the following from David's letter.

"The resistor that controls the speed is R6 (labeled on board) which is next to the microprocessor in the front panel. I would say that 27k is the minimum value to use, with 33k or 39k giving similar performance. Jumpering R6 with this resistor approximately quadruples the scan/search speed, raises the keyboard beep to almost inaudibility, and does some other things that are not quite so good.

REGENCY MX7000 CIRCUIT BOARD

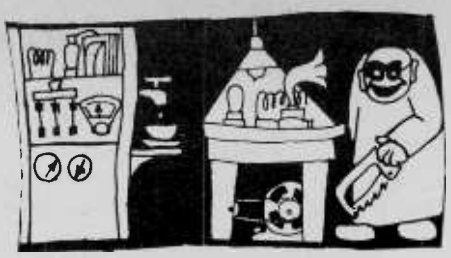


"One of these is the erasure of stored frequencies, since this part of the circuit operates continuously. Another minor problem is that any frequencies entered into scan memory in the 500 Hz resolution (like 500.2125) might be skipped when scanning, since the unit seems to scan these frequencies much faster than the 5 kHz resolution frequencies. This isn't really a problem, just enter 500.21 instead of 500.2125, for example, and the scanner will stop every time.

"The only other problem I noticed which could be serious for some users is that the length of time the unit will maintain memory after loss of power is drastically reduced. My unit would retain memory for about one minute after the plug is pulled. Too bad they don't use EAROM.

"Once the mod is made, up/down tuning is extremely fast using 12.5 kHz steps. Just enter a frequency, choose 12.5 kHz, press up or down, and, with your finger still on up or down, press speed. It goes so fast you can't read all the digits. If you pass an active channel, release up/down and press the opposite direction. The tuning speed will now be about 1/3 as fast so you can see what you're doing."

EXPERIMENTER'S WORKSHOP



CAR AIR CONDITIONER AUTO-DELAY

by Ezra Whitmore

The use of a delay relay will prevent your auto air conditioner from coming on until 15 seconds after the motor is started. This prevents overloading the starter and engine and is most beneficial to small automobiles.

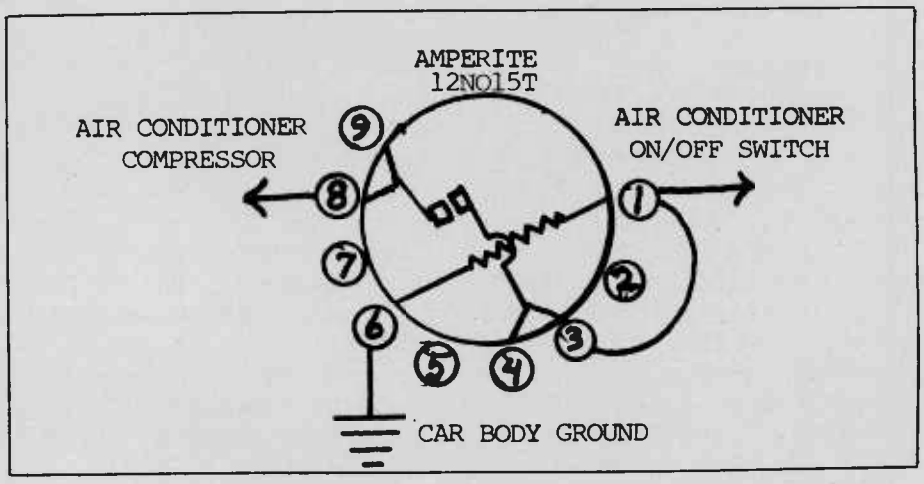
You won't even have to remember to turn off the air conditioner when you shut the engine off or before cranking; the motor will crank without the extra strain caused by the air conditioner compressor.

The relay is installed in the 12 volt line from the compressor; the relay filament is also powered by this line.

PARTS LIST

1-chassis box 4" x 2-1/8" x 1-5/8" (Radio Shack #270-231)
1-Amperite relay (NO) type 12NO15T (part #A16-003)*
1-9 pin miniature socket (part #K2001)*

*available from:
Mountain West
P.O. Box 10780
Phoenix, AZ 850641
1-800-528-6169



STOCK EXCHANGE

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

PERSONAL--SUBSCRIBER RATES: $.10 per word;NON-SUBSCRIBER RATES: $.25 per word. All ads must be 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.

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

For Sale: KENWOOD R2000, stock mint condition $325.00 no personal checks, money orders only. I pay UPS. 815-872-4271 Elwood Partain

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JOIN A RADIO LISTENING CLUB. Complete information on major North American clubs and sample Newsletter $1.00. Association of North American Radio Clubs, 1500 Bunbury Drive, Whittier, CA 90601.

For Sale: REGENCY MX5000 ($260) and REGENCY HX1000 ($170). Both in perfect condition with factory carton and accessories. Ralph 415-728-5204 nights and weekends

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For Sale: One GROVE SCAN-VERTER CVR-1B for $45.00. US Postal money order only. Free UPS in USA only. H. Josselyn, 620 Grove Ave., Zanesville, OH 43701.

TAPE SWAPPING: Send me a pop/disco C90 cassette tape of your local FM station and I send you a tape from Dutch radio pop programmes. Please also include newscasts, DJs and commercials. H.J.G. Meerman, P.O. Box 3099, 2001DB Haarlem, The NETHERLANDS.

WANTED: Originals or photocopies of "The Wavelength" (Free Radio Campaign USA) and bibliographies or other references to publications concerned with free/pirate radio. Please write first with lists and prices. Michal Kupka, 2700 Stafford Drive, Denison, TX 75020.

AMERICAN AUDIO AM/FM/Cass/TV CAR STEREO: Digital readout, clock, 2" Screen! Booster/Equalizer, Speakers. Retail $1500+. Best Offer. 919-756-0270.

For Sale: MCKAY-DYMEK DA5 530-1600 kHz loop and tuned preamp $70; MCKAY-DYMEK DA9 tuned preamp with 500-1900 kHz plugin loop, and with DW1 tuning box and 5 ft. whip for 200 kHz to 30 MHz (listed over $300 new) for $100; MARTEN amplified "wooden" loop for MW $40; FREDERICK 1500A RTTY receiver, 6 xtal channels 50 to 30 MHz. Has manual, complete c/o, 1.75" rack panel, Narrow shift, very high-quality TTY receiver $100; AR22 151-160 MHz synthesized pocket VHF-FM receiver with Nicads, charger, ducky ant, little used $40; Battery-powered BENDIX 555 portable radio direction finder 200 to 6000 kHz, excellent selectivity, $50; Repainted and restored MEISSNER EX Signal Shifter CW transmitter 160-10 meters $50; NATIONAL XCU-109 calibrator plugin for NC109 or similar receiver (free if you have a receiver it fits). Write Gerald L. Park W8QS, 5534 Lower Shore Drive, Harbor Springs, MI 49740.

Wanted: KENWOOD R-1000, no junk please! M. Hatten, 2809 Collis Ave., Huntington, WV 25702

Contents shack lists - SASE - Ken Hand WB2EUF, Box 708, East Hampton, NY 11937

The REAL Spies...

Guarding against a threat

by Bob Grove

Of the 2000 Soviet officials now stationed in the United States, some 600 are identified by the FBI as members of the KGB, the Soviet intelligence service. Others serve the Soviet military intelligence program, the GRU, and perhaps yet another 200 KGB agents freely roam under diplomatic cover as staff members of the United Nations. In contrast to the Soviet presence in the U.S., fewer than 200 of our officials are in the Soviet Union.

The FBI estimates that they would need the full time effort of 3200 field agents to keep tabs on the 800 known Soviet spies; the number of Bureau agents actually assigned is probably about 400, allowing the Soviet plants open access to weak points in the U.S. security system.

MAINTAINING SECURITY

Many officials openly criticize the present conservative administration for their classification zeal, citing that last year alone some 20 million documents were given a classified status.

Under Executive Order 12356, signed by President Reagan April 2, 1982, documents which may pose a threat to security by open dissemination may be classified Confidential, Secret, or Top Secret. For example, unclassified frequency files of federal government agencies maintained by the Interdepartment Radio Advisory Committee (IRAC) were classified "Confidental," even though those same records had been sold to the public for decades.

Even with these extraordinary security classification measures, the number of persons seeking and being granted clearance is as extraordinary, making a mockery out of the system. Over four million Americans --one in every 55--are cleared to handle Pentagon secrets alone!

Requests for Top Secret clearance are up 50 percent over the past decade, rising sharply with the Reagan administration. Background investigation requests are in such a backlog that it will take ten years to catch up.

ENCRYPTION

The National Security Agency (NSA) has been encharged with the responsibility to develop and oversee methods to safeguard the transactions between the federal government and the private sector. The $40 million project, expected to take five years to complete, is designed not only to protect internal communications, but the interfacing with industrial contractors as well.

The DATA NETWORK SECURITY PROJECT: Protection of common carrier lines like ATT, MCI and GTE as well as local office networks.

PROJECT BLACKER: A classified Defense Department project designed to encrypt worldwide military communications networks, thus protecting them from interception.

The DEVELOPMENT CENTER FOR EMBEDDED COMMUNICATIONS SECURITY PRODUCTS: Designed to develop low cost encryption devices for personal computers, cellular telephones and other small system components. ●

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