



\$2.00

# MONITORING TIMES

Volume 4-Number 5

BRASSTOWN, NORTH CAROLINA 28902

May, 1985

## EAVESDROPPING ON THE USAF

by Carl Wilkes

"Skybird, Skybird do not answer ... Foxtrot alpha kilo seven..." the loud-speaker blurts out--a call for all bombers aloft that a coded message is to follow. The crews aboard the B-1 bombers jot down the message and check these "go codes" against a matching set of sealed codes brought on board before the mission.

A look of concern crosses the aircraft commander's face as he contemplates these orders. Is this one the real thing? Could these encrypted messages be the one that starts the war to end all wars? Are these the go codes that herald global thermonuclear destruction? Or is it just one of the endless series of tests, war games and exercises to make sure the system is ready and working? To borrow a phrase from a recent movie, "Is it a game or is it real?"

Far below the ascending bombers in a cozy darkened den located in a normal living room in a normal house, a man sits in his easy chair listening to a shortwave receiver, overhearing the same coded messages that are intended for the ears of bomber crews on secret missions ordered by the powerful Strategic Air Command system of the United States Air Force.

This man does not depend on the newspaper or television to keep him up on what's going on in the struggle between the world's super powers; he hears it as it happens. A Navy air evacuation transport sends an important message to a hospital in Cyprus to stand by with emergency personnel and that they can expect a lot of casualties because the Marine compound in Beirut has been destroyed by a terrorist attack. An Army reconnaissance helicopter in Honduras urgently radios that he has strayed into enemy territory and is

caught in gunfire.

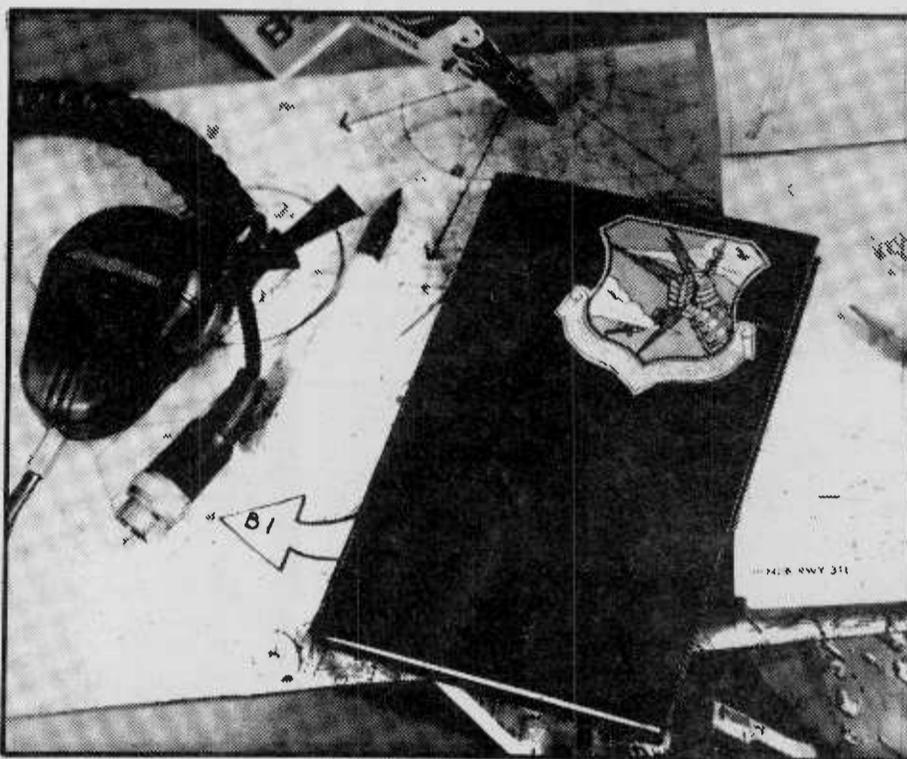
By monitoring the Strategic Air Command Worldwide Communications Network you can listen in on all this action and more. Eavesdrop on B-52 bombers on alert at 50,000 feet; a S.R. 71 spy plane gathering intelligence on Soviet air defenses over Russian waters; and even listen in on radiotelephone calls between Air Force One and the White House. You need only the right equipment and know which frequencies to monitor.

### EQUIPMENT

You don't need exotic military surplus gear to listen in; a good shortwave communications receiver, an outdoor antenna and a little time to spend listening are all that is required. While some old tube-type radios will do a respectable job of receiving, the newer rigs are easier to operate and are less susceptible to drifting off frequency. The receiver must be capable of receiving SSB (single sideband), otherwise all you will hear is a garbled transmission that sounds like Donald Duck!

To be sure your radio can receive SSB look for a BFO (beat frequency oscillator) control or a SSB (USB/LSB) switch. If you are not sure ask the salesman. If he doesn't know what you mean, go somewhere else.

The right antenna is as important as the radio. The Grove Skywire is an excellent choice for all-around shortwave listening, but good reception can be had from a home grown antenna. A long string of heavy gauge copper wire about sixty feet long strung horizontally between two high poles will do an excellent job of receiving. Feed it about 20 feet from one end with coaxial cable (any type) which runs to your radio. MAKE SURE YOUR RECEIVER IS PROPERLY GROUNDED! A lightning strike could not



only destroy your rig but you as well. An eight foot copper rod driven into the ground and attached with a heavy gauge wire to your radio will work nicely for nearby static discharges and noise reduction, but disconnect the antenna entirely when the receiver is left unattended during storm season.

### MONITORING

THE U.S.A.F. high frequency military network is set up and maintained by the Department of Defense to communicate with all military ground, sea and air stations of the United States armed forces. Short wave is often used for long distance communications; the ionosphere reflects short-wave radio waves easily so don't be surprised if you

hear stations from all over the world! Voice communications on the following frequencies are single sideband. The lower frequencies are better for night monitoring while the higher frequencies are best for daytime listening.

### FREQUENCIES

FREQ. MHz	STATION
3.144	Hickam AFB Hawaii
3.067	Croughton Fld Eng
3.081	Lajes Field Azores
4.402	Pacific Test Range
4.403	Vandenberg AFB CA
4.590	Scott AFB IL
4.721	Andrews AFB VIPS
4.725	SAC Victor Channel
4.746	Lajes Field Azores
5.680	Search and Rescue
5.688	MacDill AFB FL
5.700	SAC Bravo Channel
5.703	Mainsail 9/11/12/14
5.710	Albrook Field Pan.

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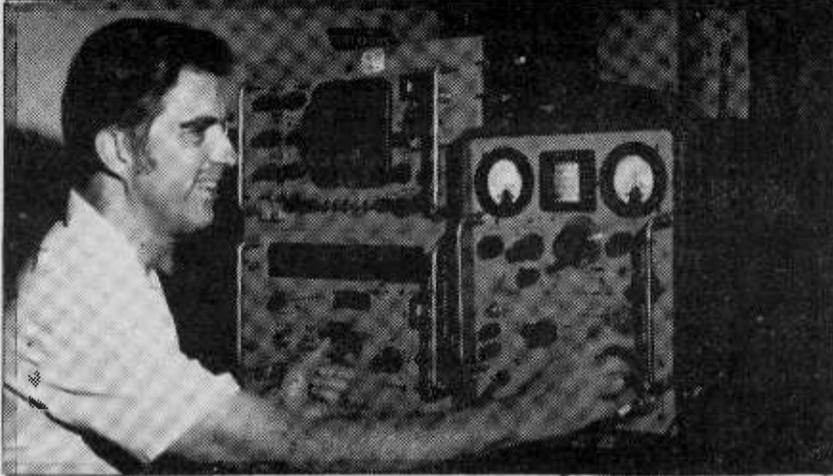


# MONITORING TIMES

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Monitoring Times is published by Grove Enterprises, Inc., 140 Dog Branch Road, Brasstown, NC 28902. Phone 704-837-9200. Copyright 1984. Subscription rate: \$12 for one year, \$22 for two years, \$31 for three years. Canada and Mexico add \$2 per year. Foreign subscribers: surface mail add \$11 per year or air mail add \$27 per year.

## FROM THE EDITOR



## FORUM

*We invite readers to share their thoughts on controversial issues. We reserve the right to edit for readability without changing the point of view.*

*Guest editorials will be printed as space permits and do not necessarily reflect the opinions of Monitoring Times or its staff.*

This writing is not intended to be an attack on existing regulatory agencies. These agencies can only do what congress or some other branch of government authorizes them to do. Nor can we be too critical of the lack of planning on the part of these agencies. No one 50 years ago could guess how great the expansion of the communications industry would be.

No matter what part of the frequency spectrum we examine, we'll find an unbelievable amount of inequality in the way frequencies are authorized. The legislation of 1934 authorized the government to control communications. It did not authorize them to keep the major part of the workable spectrum for themselves. The very government we entrust to allocate radio authorizations has become a hog.

Since we see nothing but a further growth of communications in the future, in order to avoid total jamming of the entire spectrum, someone is going to have to devise a means of allocating frequencies on the basis of legitimate

need. If it takes a super-agency of which government is only a member of the panel, then that agency should be created. I'm not trying to provide answers. I'm trying to do an honest analysis and hope we can stir up some thoughts on the subject.

Though the government makes some pretext of freeing up unused frequencies, the hard facts prove otherwise. If the department of defense ever gets hold of a band they'll be there forever. How, under the guise of national defense, can they issue blanket authority to jam any domestic frequency? Exactly what constitutes national security? Considering that almost all military communications are on satellite, why don't they free up the channels they moved from?

Two bands that are excellent examples of hogging are the 162-174 MHz land mobile and the 225-400 MHz air band. Judging from microfiche and searching with a very sensitive scanner, I'd estimate that there was less than 10% usage on the lower band and less than 5% usage on the air band. Though much usage shows in print, there are simply not people using the channels. Although Virginia (where my searching was done) is very heavy in government installations, most of the traffic is in the band split by the two-meter ham band: 138-144 and 148-151 MHz.

Since frequencies were allocated in the civilian



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



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

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

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

151-162 band in the late 40's no real attempt has been made to reallocate frequencies. At the time, railroads were everywhere. Very few locations had rescue squads. The railroads were allocated 90 channels, the rescue squads 8. Since then, the railroads have either gone out of business or merged. Rescue squads have sprung up everywhere. Has the allocation of frequencies been adjusted to meet this change? The balance remains as it was 35 years ago.

As for television, is broadcasting the way to go? With the growth of cable and satellite systems, can we justify tying up 6 MHz each for 8 television channels--virtually half of the first 1000 MHz of spectrum?

It's almost impossible to get any government agency to admit that a problem exists. Getting them to correct errors caused by their own mistakes or laxity is worse than impossible. Once a broadcast operation is installed, there are no rules forcing it to modernize their equipment. The hobby of DX'ing broadcast harmonics exists because of older stations' inability to suppress harmonics.

In spite of the fact that two watts may do as much as two million if conditions are right, the answer to all of shortwave broadcasting's problems has been to keep on adding power. People in very few countries in the world are affluent enough to afford receivers that are selective enough to pull out a weak station when a 500 kW operation is fired off just 5 kHz away.

If a hundred more shortwave frequencies became available, the "big boys" (VOA, BBC, DWelle, RMoscow, PRChina) would get 90 of them. This point was recently proven. There should be reasonable limits on the total number of frequencies a shortwave broad-



## Viewpoint

Ronald M. Coogan's article "Request Denied: The John Demmitt Case" in the April 1985 MT sure can make one's blood boil. But, instead of trying to win support for Demmitt's cause to have a shortwave receiver in his prison cell, Coogan's article has left me opposed to the idea.

My feelings have nothing to do with what Demmitt has done. I don't know what crime he committed. The fault lies with the way Coogan presented his case to the MT jury.

Basic to the story, but denied this reader, was the type of crime for which Demmitt is being incarcerated. Coogan says, "Since there are legal proceedings yet to be taken in John's behalf, neither he nor his lawyer wants the specifics of John's crime publicized."

With this statement, Coogan immediately shows his bias; a bias that should be relegated to the "Viewpoint" column of this newspaper, not to a column for general reading interest.

First, Demmitt has been convicted of a felony. Neither he nor his unnamed lawyer has any right to have information suppressed in the press about what he was convicted of and why. It is a matter of public record and fundamental to newspaper journalism. It could have been gotten readily by Coogan if he had taken the time



caster should be allowed to operate on. Any country which engages in willful jamming of another country's signal should be denied all rights to international broadcasting.

Should we have more or less regulation? Whatever is done, everyone's rights will have to be protected. We can't tolerate regulating authorities who think only of their own interests. We need planning. Why should a problem become a full-blown nightmare before regulating agencies even recognize its existence?

Think about it. Let's light a fire under some federal fannies!

John Dorsey  
 Quinton, VA

**VIEWPOINT cont'd**

to try. Evidently he didn't, and he wants us, the reader, to believe Demmitt's arguments.

Second, Demmitt appears to be a prison upstart, judging by the way Coogan portrays him. Demmitt was convicted of a crime, apparently a serious one in that he's being locked up in a state prison. And now that he is "in the process of paying his debt to society" (Coogan's words), he wants to change state statutes regarding what listening devices a prison inmate should be allowed to have with him. If Demmitt wins this one, one could easily imagine another inmate requesting a satellite dish and TVRO be hooked up to the TV in his cell!

Demmitt, who has an AM/FM radio and TV in his cell, claims that when he will be released from prison, he does not "want to come out culturally deprived and lacking in the basic information that affects our lives." Gee, what's he been listening to lately on his radio and TV--static? Is he trying to tell us that news reports do not provide basic information of events around the world? Would Radio Moscow provide him with that information?

Third, Coogan says that "authorities give a number of reasons why they won't allow prisoners to have shortwave radios." Who are these authorities? I see no sources mentioned in Coogan's article, not even "sources who asked to remain anonymous" or something similar. I take it then that Coogan talked to no authority, rather, he talked to himself. He appears to have asked himself for the reasons prisoners cannot have shortwave radios and gave us his own answers.

A good journalist is one who remains neutral in writing a news story, and presents both sides of an argument. Coogan doesn't do this. Instead, he names sources who only serve to back up his position in this article.

And because of Coogan's lack of journalistic standards, I find myself not able to support the cause he is championing. Sorry, Mr. Demmitt.

Robert Margolis,  
Skokie, IL

>>><<<

In the case of Demmitt in jail: there is no such person in jail in PA in a letter I got from its warden. Quit dooping your readers. You don't even mention his crime. B.S.!

Unsigned

N Suburban IL

(Larry: No one will be more surprised than long-term inmate John Demmitt to hear that he isn't really in jail).

>>><<<

I just finished reading the March 1985 issue and felt that a letter was definitely in order to compliment you on perhaps one of the best issues of MT that I have ever read.

Having read every single issue since MT first came out several years back, your front page article, SHIP TO SHORE TELEX MONITORING by Michiel Schaay, has to be perhaps the most well written, concise single article that has ever graced your pages.

I'd also like to take a moment to compliment you on the fine presentation of the Antenna Special segments by both B.D. Snell and Al Smith; certainly both articles give one food for thought when it comes to antenna construction in the coming good weather. The shorter articles by Ken Hand and Duncan Cameron were also of interest.

With regards to your article on Underground Antennas, I'd like to say that I have made one myself here and it works surprisingly well. I took 100 feet of #12 Copperweld wire, plastic covered, buried it approx 6-8 inches in a line running North/South. Termination at the point of entry into the house was made to a coax connector, leaving the braid of the RG-58U cable unconnected and ran the coax into my shack to an antenna switch. My prime intent was to use it for longwave monitoring and it works very well there. Much to my surprise, this antenna works very well from longwave up to and through 1 MHz and gets touchy at 12-13 MHz. I should mention that this is run through a Grove Minituner prior to the receiver (Kenwood R2000). Most I can say is that my underground antenna works just fine for me and man made noises are cut drastically.

John Henault  
Abington, MA

>>><<<

I have some information for the MT readers that have scanners that pick up aircraft frequencies.

I went to a small airport close to me and picked up a copy of "FLIGHT GUIDE" airport and frequency manual, volume 2, central and eastern U.S. for \$26. This manual is the same one all

pilots carry in their planes. It covers all airports, small and big. Volume 1 covers Western U.S. When an individual purchases a copy of "FLIGHT GUIDE", there is a blue card in the front of it to send in to: Airguide Publications, Inc., 1207 Pine Avenue, P.O. Box 1288, Long Beach, CA 90801, for a free one year update. The manual is small (6" wide, 5-1/2" long and 1-3/4" thick). To me it is well worth the money for a person that likes to listen to aircraft frequencies.

If anybody would like to know the frequencies for airports around the Dayton, OH area, I'll be glad to make a list and send them to the person if he encloses an SASE to cover postage.

Mike Day  
273 Willaiston Dr.  
Dayton, OH 45431

VIEWPOINT cont'd on p. 20

**Missed Us in Dayton?  
See Us in Atlanta!**

Each year Grove Enterprises and Monitoring Times prepares an exhibit at the Atlanta Hamfestival, and Bob Grove presents a special forum on listening throughout the spectrum.

This year's festivities will be held on July 6th and 7th at the Georgia World Congress Center. More details next month!

**THE FCC NEEDS OUR HELP**

They are springing up like weeds--unlicensed operations throughout the radio spectrum, polluting this valuable resource, and the Federal Communications Commission seems powerless to respond. Or so it would seem.

Take a listen some evening for single sideband operators in the 6000-6670 kHz range talking like hams or hobbyists.

One frequency in particular--6633 kHz LSB--was resplendent with bootleggers one evening. Check-ins included "Tony" in New York City and his entourage from Italy, the United Kingdom and other western European countries. Bogus ham-type call signs are occasionally used such as "W1USA" heard on 6630.

A network of reputed bootleggers is using a call sign series with a "BL" (bootlegger) prefix followed by a number of 3466 kHz, not to be confused with second harmonics of close-by cordless telephones near 1733 kHz.

High powered jamming stations obliterate portions of the broadcast spectrum with their raucous offense. Drug dealers--including the Mafia--utilize general coverage ham transceivers to conduct their illicit communications wherever they please.

**BUT THERE'S HOPE**

Recently, we contacted several top ranking spokesmen from the FCC to see whether MT could spearhead a movement to help clean up the airwaves--not a vigilante group, but an organized effort involving competent monitoring stations reporting their intercepts and

coordinating their findings through a central information point.

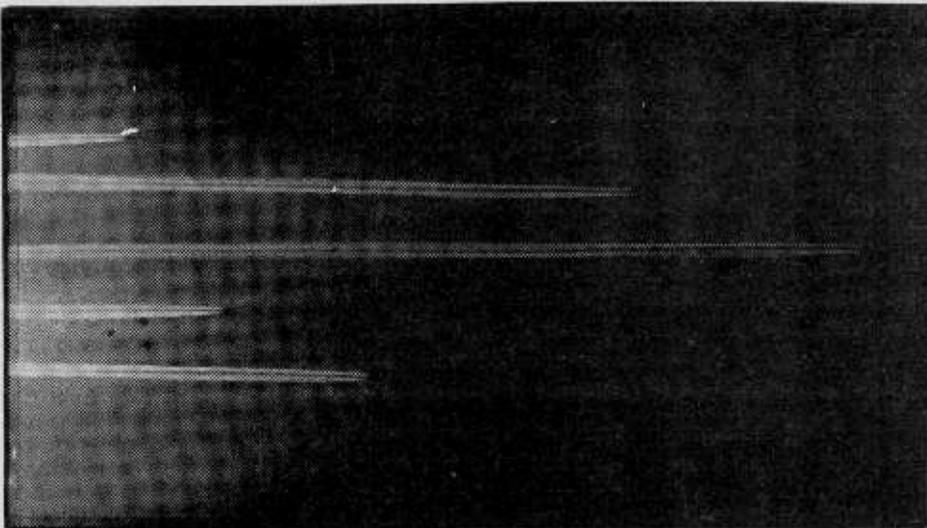
We are happy to report that the suggestion was well received. Several priorities may be in the offing including logging jammers in the international broadcast bands--a prime concern of the Voice of America and Radio Free Europe--and providing information on unlicensed pirate broadcasters who cause interference to legitimate services.

**BUT WHAT ABOUT SECTION 605?**

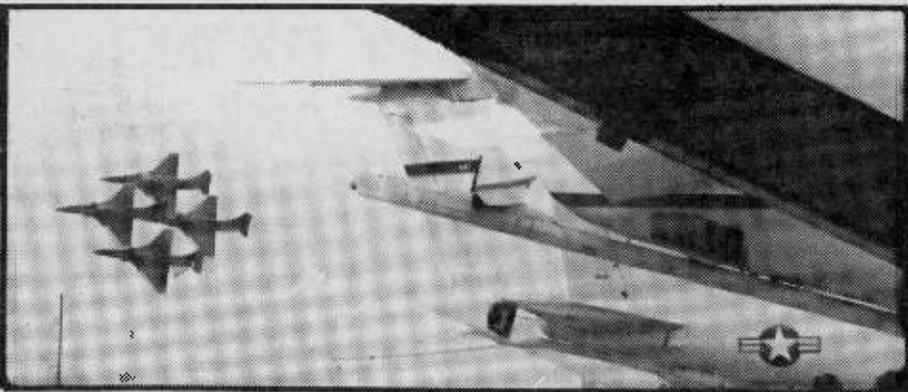
Since illegal, unlicensed operations are not protected by section 605 of the 1934 Communications Act regarding the non-disclosure of information intercepted by uninvited listeners, monitors would be free to report such logging data as frequency, time and date of intercept, names or identifiers used, type of traffic handled (if an illegal two-way communicator), and any patterns which would be useful for future identification.

The FCC maintains 13 monitoring stations as part of the Signal Analysis Branch; Monitoring Times would act as a liaison between these stations and our own monitors collecting, collating and verifying data from contributing stations of our network.

Now it's up to you. We would like to hear from serious, professionally-minded monitors who would be interested in becoming part of an effort to put pressure on the abusers of the radio spectrum, a grass roots movement with clout. Let's hear your ideas.



Wave of B-52 bombers on a practice bombing run during operation GLOBAL SHIELD. War games can be frequently heard on 13.205 MHz. Photo by author.



From huge transports to light fighters, aircraft depend upon radio communications for coordination. Photo by author.

**EAVESDROPPING cont'd**

6.727	Scott AFB IL	15.041	SAC Mike Channel
6.730	Raymond 7 Canon AB	15.091	Tactical Air Comm.
6.738	Mainsail 11/13/14	17.975	SAC Tango Channel
6.750	Mainsail 9/11/12/24	18.002	Andsn/Mnsl/1/2/3
6.753	Ascension S. Atl.	18.091	Tactical Air Comm
6.757	Croughton Fld Eng.	20.198	Cape Radio E Tst
6.761	SAC Quebec Channel	20.390	Space Shuttle Res
7.540	Bolling/Scott AFB	23.227	Clark AFB
8.893	Clark AFB		
8.964	Hickam AFB, HI		
8.967	Andersen/Hickam AFB		
8.989	Elmendorf/MacDill		
8.993	MacDill AFB, FL		
9.011	Croughton Fld Eng.		
9.014	Canon AFB, NM		
9.018	Andrews AFB VIPS		
9.027	SAC Romeo Channel		
10.780	Cape Radio E. test		
11.176	Albrook Fld Panama		
11.179	Albrook/And./Clark		
11.182	Scott/Mnsail 6/7/9		
11.226	Eldorf/Lajes/Thule		
11.228	Thule AFB Grnland		
11.236	Yakota Japan		
11.239	Maclellan AFB CA		
11.243	SAC Alpha Channel		
11.246	MacDill AFB, FL		
13.201	Mnsail 10/11/12/14		
13.205	SAC Special Ops		
13.210	MacDill AFB, FL		
13.215	Andrews AFB VIPS		
13.244	Andsen/Laj/McDill		
13.247	Andrews AFB VIPS		
13.993	Bolling AFB MD		
15.015	Albrook Field Pan.		
15.016	Mnsl 1/2/3/4/5/6/9		
15.031	Maclellan CA		
15.035	Croughton Fld Eng		

**MAINSAIL**

The tactical identifying code word "MAINSAIL" is a general callsign used by command control stations of the networks of the Air Force. The USAF Command Control Communication Network has divided global regions into a series of communication zones. Aircraft operating within these zones are required to keep in contact with the ground control center in charge of that theater of operations. The MAINSAIL zones and control center encharged with operations are as follows:

GROUND STA.	GEN. AREA
Zn1 Clark AFB	SE Asia/China
Zn2 Andersen	Pac/Australia
Zn3 Yakota Jap	NE China/Jap
Zn4 Hickam	Central Pac.
Zn5 Elmdorf.	Can./N.Pac.
Zn6 McClellan	Pac/Can/Mex
Zn7 Scott, IL	USA/Canada
Zn8 Albbrook	Pan/Car/S Pac
Zn9 MacDill	W/N Atl/Pac

Zn10 Thule	Grnld/E. Can	RAYMOND	Tac Air Comm
Zn11 Croughton	Eng E/N. Atl	RAYMOND 6	George AFB CA
Zn12 Lajes	Azores, East/Cent Atl, S. France/NW Africa, W. Med.	RAYMOND 7	Canon AFB NM
		RAYMOND 10	Hulburg AFB
		RAYMOND 14	Holloman AFB
Zn13 Ascension	NW Africa, Algeria/Libia, Egypt/Yemen, SE At., Ind Oc	RAYMOND 19	MacDill AFB FL
		RAYMOND 21	Myrtle Bch SC
		RAYMOND 22	Nellis AFB NV
		RAYMOND 24	Tinker AFB OK
Zn14 Incirlic	Turkey, Italy SE Europe, S. Libia/Iran, E. India, W.China	RAW HIDE	Pres. Reagan
		RINGMASTER	NORAD HQ CO
		SAM	Spec. Air Miss
			VIPS
		SKYKING	ATT Any SACSta
		SKYBIRD	Alert all
			bombers aloft
		SPAR	USN Spec Flt.
		SWAN	Weather Recon
		TIMBERWOLF	VP Bush
		TONIGHT	HI Def. Comm

**CODE NAMES**

Through the course of listening you will hear cryptic code names. For example, the NATIONAL EMERGENCY AIRBORNE COMMAND POST, the specially-outfitted Boeing 747 that the President, Secretary of Defense and the Joint Chiefs of Staff use to direct the armed forces from in case of nuclear attack, is code named "LOOKING GLASS". The Navy communication aircraft that relays information and go-codes to submarines via very low frequency radio is code named "TACOMO".

Here are the identities of some additional code names you may hear.

CODE NAME	STATION
Abnormal 10	Vnbg Msl Cm
AGAR	EC-35 Msl Trk
AIREVAC	Emerg EvacAir
BEHAVE	AL MAC Cont.
CAPSULE	Gen.Clsn.MAC
CAPE RADIO	NASA ops FL
CEMENT MIXER	White House
	Sit. Center
CROWN	W.H. CommAg.
DENALI	AL Air Def.
DISCARD	22nd MAC Op.
ELECTRIC	Ntl Emerg.
	Comm. Plane
FIRESIDE	Langley CIA
FORMAT	21st AF Ops.
FURIOUS	S.Am Def. Ctr
GULL	Hurricane Trk
GULL PHOTO	NASA Weather
HILDA	MAC Comm HQ
HORNPIPE	Canon AFB NM
HOTLIPS	Moody AFB GA
KING	Space Sh Res
LACTOSE	Shaw AFB SC
MAC	Military Air
MEDEVAC	Hosp. Aircrft
MIAMI MONITOR	Natl Hurr Ctr
PHANTOM	Euro Def Comm
RAT	USN Transport

**MONITORING AIR FORCE ONE**

Whenever the President is on the wing or there is a national crisis involving the USA, the following frequencies are the ones to monitor. The traffic on these frequencies usually consists of phone patches to and from Air Force One and Washington, DC.

The AIR FORCE doesn't mind your monitoring their communications as long as what you hear is kept to yourself; in fact, many stations welcome reception reports from monitors. Some radio monitors make it a hobby to obtain rare reception report replies from military stations--just be aware of the restrictions on talking about what you hear.

The following frequencies are the most up-to-date frequencies for monitoring AIR FORCE ONE; those underlined are the most active (frequencies MHz LSB):

6.680	6.683	6.713	6.716
6.760	7.730	7.735	8.893
9.004	9.007	9.018	9.023
9.958	9.941	<u>11.035</u>	<u>11.118</u>
11.178	11.180	11.226	<u>11.249</u>
11.466	<u>13.204</u>	13.212	<u>13.215</u>
<u>13.247</u>	15.048	17.972	17.994
18.0027	20.16	20.053	23.265
23.578	29.989		

With the right stuff--a good receiver, antenna and the frequencies--you can get in on the action on the STRATEGIC AIR COMMAND GLOBAL COMMUNICATIONS COMMAND SYSTEM.



This C-41 transport out of ALTUS AFB OKLAHOMA was practicing touch and go landings when someone noticed too late that the landing gear were not down. The huge plane belly flopped on the runway at Amarillo airport in Texas. The rescue and salvage crews could be heard on shortwave radio. Photo by author.

# SCA: UTILITY DX'ING THE FM BROADCAST BAND

by Bruce M. Boston, N9ETX

Remember all of the times you've been in the doctor's waiting room or on a crowded elevator and had to listen to background music whether you wanted to or not? Have you ever wondered where it was coming from?

What you were hearing was most likely an example of SCA--Subsidiary Communications Authorization, a special service found on hundreds of FM broadcasting stations all across the country. But don't be surprised if you haven't heard one yet. SCA is hidden inside the FM signal and it takes an SCA decoder on the radio to hear it.

SCA's--also known as subcarriers--were introduced to broadcasters over two decades ago along with an FCC restriction that the subcarrier program must be "of a broadcast nature." Waiting room and elevator background music, Muzak and talking books were routine, but now there are other uses for SCA.

## A NEW GAME IN TOWN

With the recent FCC policy revisions, the doors have now been opened to any type of SCA transmission: Music, data, voice, teletype, dispatching, facsimile, paging, slow-scan television--anything can now be sent via SCA. The subcarrier can be left on 24 hours a day even if the station's broadcasting ends at midnight.

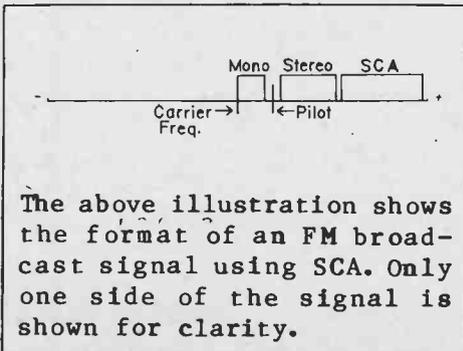
The new policy also allows any kind of modulation: AM, FM, phase modulation, frequency shift keying, even CW if they want to use it!

## HOW DOES IT WORK?

FM stations are assigned a carrier frequency between 88.1 and 107.9 MHz, each separated by 200 kHz. The outer 1 kHz of the chan-

nel is vacant and is used as a guard band, preventing interference from adjacent channels. Prior to the policy change, 25 kHz was used for the guard band.

The amount of space allocated to the broadcaster for an FM signal (its bandwidth) is 200 kHz (100 kHz above and below the center carrier frequency). Mono audio on the broadcast signal will extend it +15 kHz. If the broadcast signal is being sent in stereo, there will be a stereo pilot tone at 19 kHz to let your receiver know it's a stereo transmission and a second audio channel, 23 to 53 kHz, is added. The range 53 to 99 kHz (20 to 90 kHz during monophonic transmission) is not used for broadcasting; this is where SCA programs are added.



The above illustration shows the format of an FM broadcast signal using SCA. Only one side of the signal is shown for clarity.

In the past, stations placed the SCA subcarrier at 67 kHz (an industry standard, not an FCC rule), and all stations used frequency modulation. The bandwidth of the subcarrier program was limited to 5 kHz to keep it from interfering with the main broadcast signal.

Broadcasters are no longer confined to using a 5 kHz bandwidth or just one SCA; they can have as many subcarriers and use any size bandwidth that will fit into the bandwidth.

McMartin Industries, a supplier of SCA equipment, has a system that can place five subcarriers in the space allocated to SCA. Another manufacturer has a system that will allow 24 data channels to be used on



McMartin Industries has been a supplier of SCA receivers for many years. This older unit will allow the user to select between the broadcast signal and the subcarrier.



The SCA 1000 is a high capacity tone alert radio pager for use on FM broadcast subcarriers in the 88-108 MHz frequency range. The pager is activated by using Binary Digital Signaling. Photo courtesy Motorola.

one subcarrier.

In spite of all the changes to the old policy, one restriction remains: Any station formerly providing reading services for the visually impaired must continue to do so or find another outlet for the service in the same geographical area.

## TUNING IN

Now that you know something about SCA radio and that you can expect to hear almost anything on it, it may be helpful to know where to look. One likely user of SCA is a college or university radio station for reading services. Some National Public Radio affiliates may soon use their subcarriers for a nationwide paging network; you'll find these stations in the 88 to 92 MHz portion of the FM band.

Living in a rural community of only 6,000 I thought finding a station

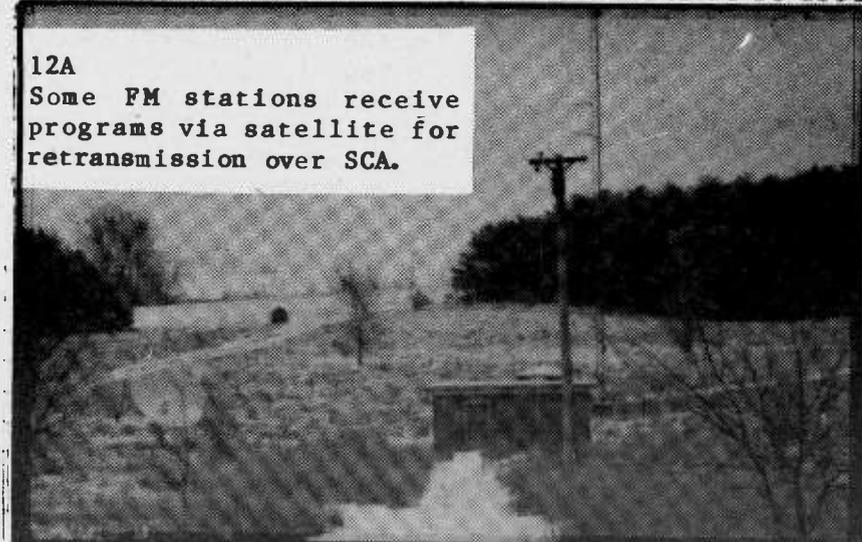
SCA monitors, such as this one, are pre-set by the manufacturer to receive a single station and subcarrier. These dedicated units are generally available only from the SCA program supplier. Photo by Kevin Sager.

using SCA would be quite a task, but it turned out that even the radio station in this small town has one! It's used to send agricultural news to farm bureaus in the surrounding area. Leave no stone unturned, even small ones!

A book which lists all of the FM stations in North America and, among other things, tells which of them use SCA, is the FM ATLAS AND STATION DIRECTORY. It sells for \$7.50 and may be ordered from FM Atlas, P.O. Box 24, Adolph, Minnesota 55701.

A decoder kit is available (model K-713) for \$23.50 + \$2.00 shipping from Capri Electronics, Route 2M, Canon, GA 30520.

The FM broadcast band has become popular over the



12A  
Some FM stations receive programs via satellite for retransmission over SCA.

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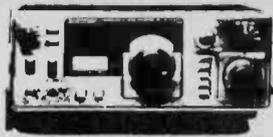
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by  
**Don Schimmel**  
516 Kingsley Rd SW  
Vienna, VA 22180

Several readers have asked me what I use for printout when copying transmissions. I believe I have found a very practical form for use in connection with shortwave listening—a continuous type form, 9-1/2" x 11", 20# blank white with 1/2" pinfeed perforations on the left and right margins. Horizontal perforations at 3 2/3", thus, for every 11", there are three forms.

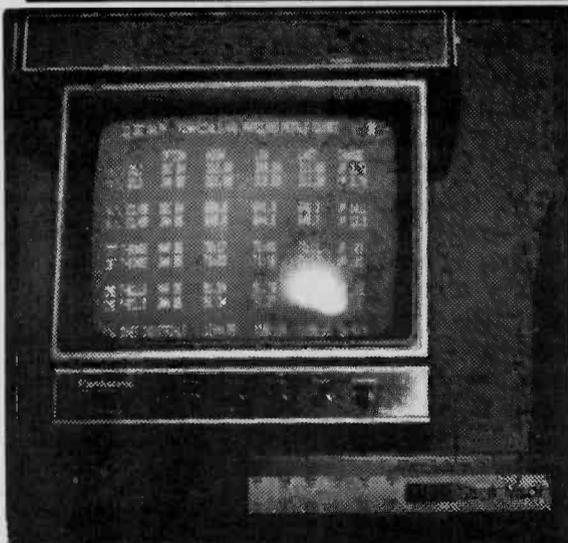
I log frequency, mode, date/time of intercept (DIOI), and month equally spaced across the top close to the perforation. I drop down a couple of lines and place the callup, leaving a few lines after the call sign for identification data which is most often inserted later after my listening session.

If there are no calls I start in with copy of the textual material or chatter as the case may be. There is sufficient space in the body of the form to copy ten lines to text, double spaced between lines. This leaves sufficient room at the bottom for any comments that might be appropriate.

Upon completion of monitoring I remove the pinfeed margins and then tear the sheets apart for sorting as desired. I sort by frequency because that is the way I prepare the items for the column each month. I use a large binder clip to hold the sheets together, readily removable for insertion of additional sheets in their proper places.

If you are investigating a particular activity this is an ideal form to put your data on because you can then sort in a variety of ways for your traffic analysis purposes. I can also use this form with my sprocket feed computer printer.

One source which claims to have the paper in stock at all times is "FORMS FOR YOU", PO Drawer 3360, Poughkeepsie, NY 12603. Send for their catalog. Their catalog number for this form is ITEM NO: 930-HB. You must specify which



**SCA cont'd**

years by providing a wide variety of programming to the general public. Now, with SCA, it's sure to become a popular band to



This terminal-like receiver demodulates subcarriers using FSK. Photo by Kevin Sager.

monitor as well. But remember to keep what you hear confidential.

The SCA station monitor (the black center unit) allows broadcasters to operate their subcarrier and monitor its program.

**UTILITY INTRIGUE cont'd**

of the following three quantities you desire. HANDY-PAK (1500 sheets) for \$13.00; HALF-PAK (4500 sheets) for \$22.00; or FULL CARTN (9000 sheets) for \$36.00. They pay UPS surface delivery charges; NY residents must include state sales tax.

A request for an assist in identification of some intercepts came from reader G. Raiford. WKM is the callsign of a coastal station in New Orleans. The

8362 kHz intercept of "OBY2 DE 7KNZ" is somewhat like some past intercepts I have logged. "In May 1983, 092351Z on 6643 kHz, "FW2U DE 6NKP" and "WVIG DE 6 NKP" were observed passing 5F (five figure) groups. Then in January 1984 I had T9VS on 2870 kHz at 110234Z with mixed letter/number traffic. In April 1984 my logs show 13446/13454 kHz at 141246Z and call sign N29V. Finally, in August 1984 on 13438.6 kHz at 210003Z, I

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
13631.6	132343	RTTY 50-170/DE KB(?) /5L GRPS, SENDS EACH MSG TWICE THEN ASKS FOR QSL. WHEN OTHER END QSL'S, KB RESUMES SENDING TFC.
13638	101403	CW/IM (OR UT) SENT OVER AND OVER, ECHO
13657	191910	CW/DE IDR5 (ROME NAVAL RDO, ITALY)
13715.5	062048	CW/NO CS/SPANISH PT MSGS
13726.8	071733	RTTY 50-170/PRESS IN FRENCH
13768.9	091237	RTTY 75-170/PRESS IN FRENCH
13878.4	191859	RTTY 50-170/HAVANA SENDING TFC TO EMBACUBA INDIA, CIPHER & PT MSGS.
14631	171321	RTTY 50-170/PRESS IN ENGLISH (RE MIDDLE EAST AREA)
15970.4	140051	CW/DE WPD (TAMPA, FLORIDA)
15975.8	081806	RTTY 50-170/DE FTJ-39A FTK-61/H3 (PARIS (ST ASSISE), FRANCE) RY'S
16116.2	081801	RTTY 50-170/PRESS IN ENGLISH
16201	062216	CW/NO CS/5L GRPS, 6 GRPS IN MSG.
16830	031234	CW/DE PIC (DUTCH ALLOC)
16889.5	081749	CW/NO CS/SPANISH PT, FISHING BOAT SENDS WX & COMMENTS RE TYPES OF FISH CAUGHT.
16975	081747	CW/DE NMN (COMMSTA FORTSMOUTH, VIRGINIA)
16984	081745	CW/DE NMR (COMMSTA SAN JUAN, PR)
17141	081614	CW/DE YVG (LA GUAIRA, VENEZUELA)
17149	081617	CW/DE TIM (LIMON, COSTA RICA)
17184	011814	CW/DE KFS (SAN FRANCISCO, CALIFORNIA)
17189	081619	CW/DE D3E51-62-71-81 (LUANDA, ANGOLA)
17190	021456	CW/DE LSA (BOCA, ARGENTINA)
18696.4	171246	RTTY 50-170/PRESS IN ENGLISH
18989.6	011803	VOICE USB/CONVERSATION IN SPANISH
19615.6	021247	RTTY 75-170/DE NBA (US NAVY PANAMA) RY'S
20349	021244	RTTY 75-170/DE NBA (US NAVY PANAMA) RY'S
20470.6	191840	RTTY 75-170/PWZ DE CXR (RIO DE JANEIRO NAVAL RDO, BRAZIL FROM MONTEVIDEO URUG.)
20518.6	191836	RTTY 75-170/DE CXR (MONTEVIDEO, URUGUAY), TESTING WITH RY'S.
22389	061948	CW/DE FUF (FORT DE FRANCE NAVAL RDO, MARTINIQUE)
22412	081625	CW/DE HPN60 (CANAL (PTO ARMUELLES), REP OF PANAMA)
22418.8	061947	CW/DE LHD91-34 (GEN PACHECO, ARGENTINA)
22425	191827	CW/DE KFS (SAN FRANCISCO, CALIFORNIA)

LOGGED MARCH 1985		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
2258	090142	CW/DE CFH (MARITIME CMD, HALIFAX NS)
3234.1	130256	RTTY 75-170/CODED WX
3485	090211	VOICE USB/WX IN ENGLISH (CANADA & US)
4060.6	090216	RTTY 75-170/CODED WX
4200	090223	CW/PT ENGLISH, SHIPPING TFC RE CARGOS
4328	130243	CW/DE FFL2-FFL3 (ST LYS, FRANCE)
5440	130314	CW/8BM DE 1FR (POSS TACTICAL CALLS)
5455.9	130334	RTTY 50-170/NO IDENT/CONTINUOUS RY'S
5458.5	130320	RTTY 75-425/DE VOA TANGIER/RYS
5738.8	130326	RTTY 50-170/CODED WX
6286	190021	CW/FCH DE FGVM (SCHEVENINGEN, NETHERLANDS FROM UNIDEN DUTCH SHIP
6311.7	020420	CW/MSGs APPEAR BE PT POLISH
6411	020417	CW/DE WOE (LATANA, FLORIDA)
6415.6	020415	RTTY 50-170/DE CCS (SANTIAGO NAVAL RADIO CHILE) RY'S
6434.5	020406	CW/DE CIQ (HAVANA (COJIMAR), CUBA)
6446.1	021241	CW/DE WLO2 (MOBILE, ALABAMA)
6467	020338	CW/DE HPN60 (CANAL (PTO ARMUELLES, REP. OF PANAMA)
6490.5	020410	CW/PHS DE CCN (DUTCH CALL FROM CHILEAN CALL)
6491.4	020408	CW/DE VCS (HALIFAX CG RADIO, NS CANADA)
6854.8	020344	CW/NO CS/5F GRPS & PT SPANISH
9209.4	050019	CW/PTP DE ? (BRAZILIAN ALLOC)
10041.1	142332	RTTY 50-170/DE Z8V/PT SPANISH MSGS, NAVY TYPE TEXTS.
10536	171317	FAX/NO IDENT
11008.5	190017	RTTY 50-170/PRESS IN SPANISH, USES # TO REPRESENT THE SPANISH LTR NYEH.
1114.1	190005	RTTY 50-170/WX IN SPANISH FOR INTERIOR AND COASTAL AREAS VENEZUELA.
11333.5	192015	CW/NO CS/4F GRPS
12835.5	180050	CW/NO CS/SPANISH PT MSGS
12869.5	180045	CW/DE CIQ (HAVANA (COJIMAR), CUBA)
13254.8	022209	CW/NO CS/SPANISH PT MSGS, MIL TYPE TEXTS
13316.5	161949	CW/DE CLA (HAVANA (COJIMAR), CUBA)/PT SPANISH, BLIGHT INFO RE 2 PERSONS.
13322	062218	CW/NO CS/5L GRPS-CUT NBRS, SPANISH PT OPR CHATTER.
13369.1	132328	CW/NO CS/5L GRPS-CUT NBRS
13383.5	180033	CW/UMAL DE UUT (RUSSIAN CALLS) 5F GRPS
13394.5	091310	CW/CLP55 DE CLP1 (EMBACUBA GEORGETOWN, GUYANA FROM HAVANA) SHIFTS TO 13388.6 KHZ
13405	131925	RTTY 50-170, SENDS TFC TO CLP55
13415.6	091244	CW/NO CS/2L 3L 4L GRPS
13434.6	021412	RTTY 50-170/NO CS/5F GRPS
		RTTY 50-170/NO CS/5L GRPS, GERMAN WORDS IN HEADINGS, FREQ PREV NOTED IN USE BY EAST GERMAN STN.
13438.7	021411	RTTY 50-170/NO CS/PRESS IN ENGLISH
13450	091327	CW/62 DE 27 (?) / (SEE NEXT ITEM)
13450	171308	CW/26 DE 0A (?) / KEEPS SENDING ZBO O
13480.9	171314	RTTY 50-170/PRESS IN ENGLISH
13482.8	022214	RTTY 50-170/DE CLN405 (HAVANA, CUBA) RYS
13509	171536	RTTY 75-170/CODED WX & WX IN ENGLISH FOR NEWFOUNDLAND AREA.
13514.7	022215	RTTY 50-170/DE CLN405 (HAVANA, CUBA) RY'S
13529.2	091241	RTTY 50-170/CODED WX
13555	071722	CW/FOSS 5L GRPS (FOOR SPACING) SPEC CHARACTERS AA AND OT NOTED.
13596.3	021406	RTTY 50-170/CTK NEWS SERVICE/RYS
13623	071736	RTTY 75-170/CODED WX

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73: Amateur Radio's Technical Journal, P.O. Box 931, Farmingdale, NY 11737

**UTILITY INTRIGUE cont'd**

copied "PSC4 DE GN5N" and "74GJ DE GN5N". If this is all the same activity it would appear that both a frequency rotation and a call sign rotation are being utilized.

I have been trying to track down a book which is an excellent language reference guide: "LANGUAGES OF THE WORLD" by Kenneth Katzner. I have just received word from the publisher that the book is out of stock and there is no due in-stock date. If any readers do know of a source for this book I would certainly appreciate being informed.

I know that many of you utility buffs are also own-

ers of Commodore computer equipment. I think you may be interested in a few comments about two programs for the Commodore 1541 disk drive. I recently used both of these programs and I was favorably impressed. My 1541 was out of alignment so I used "1541 Physical Exam" which provides a means of checking the proper operation of the drive. In addition, this program includes a spring-wire device as a replacement for the drive stop.

If you have been concerned when making backup copies because your drive sounds like it is beating itself to death, this device will solve the problem. It

is a very effective modification for the 1541 which will reduce the possibility of your drive becoming out of alignment.

The other program is called "DITTO" and I use it for making backup copies. It is quite a bit faster than another copying program I used to use. Both programs are put out by Cardinal Software which is located at 13646 Jefferson Davis Highway, Woodbridge, VA 22191. The cost is \$39.95 each and the price does not include shipping. Virginia residents would have to include state sales tax.

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**SCANNING****THE INAUGURATION REVISITED**

Some additional notes on frequencies used, contributed by "Radiocommunications Liberation Front".

The VIP transport service reported by Lark Spur in the March MT as being on 164.725 was actually on 143.125. Note that his freq is 21.6 MHz higher--an image. The true frequency is assigned to a nearby Army base motor pool and the drivers were soliders on chauffeur duty. The base station, identified as "Station T-1" (or "Station 1", for short), was DVPed to conceal the destination and passenger assignments while the mobile units, numbered from T-3 to at least T-40, responded in open voice. As Spur said, this was a very active channel, but not that different from taxi-dispatch comms, except that the drivers got lost and delayed more often.

The Inauguration Committee itself was active on 150.510 and 150.650, with both open voice and DVP. Reference was made to a third channel that we never found (probably unrepeated). The two known channels were probably repeated through an unmarked military communications van parked at Pennsylvania and 3rd St. NW. These channels were used independently from each other, and for such a wide variety of purposes it's hard to characterize their separate functions, but 150.650 ("Channel 3") seems to have been used by higher-ups, while 150.510 was used for field coordination - moving performers from lounge-vans to the outdoor stage, checking to see if someone who had a free pass though their name wasn't on the admit-list was really entitled to be admitted to a ball, etc. These channels gave us the most insight into what was going on.

Another active transport operation, this one just for military brass, was on 142.000. This was run by the Navy, and is still being used for the same purpose. The base station IDs as "Central", the mobile as "Unit 15", "Unit 80", etc. This freq was "Channel 1" and we suspect "Channel 2" was 142.100.

The US Park Police had a major role in coordinating



by James R. Hay

It is time to catch up on a few corrections which have been sent in to me over the past few months and also reply to some of the letters which I have received.

It has been brought to my attention that WMH Baltimore has ceased its operations on 2400 kHz. John B. Hill has advised me that WPA is now off the air and that there are no plans to revive the station; KLC presumably will have picked up the

#### SCANNING cont'd

movement by car, and keeping track of the small number of demonstrators. They were active on 165.925 and 162.610.

The news media, of course, were active, especially around 450 and 455 MHz. Some of the more heavily used channels for remotes, engineering coordination, etc.:

450.2875 CBS-TV  
450.350 CBS & WTOP  
450.4125 ABC-TV  
450.450 NBC-TV  
450.4875 CBS-TV  
450.6125 CBS-TV  
450.800 CBS Radio  
450.875 ABC-TV  
455.150 NBC-TV  
455.2125 WMAL-ABC rad)  
455.4125 NBC Radio  
455.5875 ABC-TV

One of the high-points of the whole event occurred on the afternoon of 20 January when the CBS-TV news team (Rather, Stahl, Rooney, Pierpoint, etc.) rehearsed their coverage of the outdoor swearing-in and the parade that were supposed to occur the following day, but were later cancelled due to the fierce, cold weather.

Since the main point of the rehearsal was to make sure all the temporary remotes and control-circuits were working, as they switched from one site to another they just made up hilarious "filler" commentary: about Chief Justice Burger looking for a room to take off his woolen underwear after the ceremony, about Sam Donaldson being given a short microphone cord and a far-away seat to keep him away from Reagan, etc. This went on for most of the afternoon, on 450.6125. Sam Donaldson enjoyed the dub we sent him of the part where he was being razed!

former WPA traffic.

While I have not heard them for some time, Phillip Nash of Kitchener, Ontario, wrote to say that WLC Rogers City is apparently still using channel 405 and channel 826 on hf and channel 57 (2514 Coast/2118 ship), all in SSB, in addition to their VHF facilities. In theory only VHF is being used on the Great Lakes, but apparently United States Steel's fleet is still using these frequencies and possibly some other ships as well. If anyone else has heard WLC on these channels recently please let me know.

Phillip also reports that WMI in Lorain, Ohio also still retains SSB frequencies in conjunction with Lorain Electronics repair business. Channels 405 and 409 are good bets to try and they may still use channel 57 occasionally. In all likelihood use of SSB channels is related more to the repair business than needs for communications.

Recently Robert Margolis of Skokie, Illinois wrote to say that he recently monitored WKM in West Haven, Connecticut and mentioned that their marker transmission lists the cw frequencies as 442, 8502, and 12948 kHz. He also mentioned that on January 15 he had been monitoring a call for help from the Asian Beauty to NMI, and that later that day while watching the evening news on television saw a story about seven men being killed in an attempt to airlift an injured crewmember from the ship. A comprehensive list of coast and ship channels is contained in Bob Grove's SHORTWAVE DIRECTORY.

Robert sent me a list of low frequency telegraphy stations and mentioned that he would like to see another column on the subject. If any other readers would also like to see another column on low frequency, and if you have logged any stations which you have monitored recently and are unusual, please let me know; other readers would also be interested.

Finally two letters arrived recently, coincidentally in the same week. The first suggested that perhaps information about the equipment used might be of interest to readers, and the second giving some information about the SS Norway's radio room and equipment. The SS Norway may also be remembered by many readers as the SS France III.

David Conman sent photocopies of the Norway's radio room which gives a good idea of what it is



like. The first picture gives a view of the main operating position. When at sea the ship will have two operators on duty; only one is on duty when the ship is in harbour.

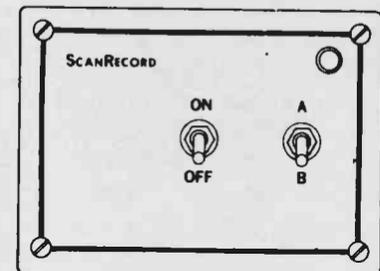
Directly in front of the right hand operator (#3) can be seen controls for selecting equipment. Above that (#2) is the main receiver, a Racal RA1772, and to the left of that is the VHF Radiotelephone (#1). On the right hand side of the picture (#5 and 6) are the remote controls for the ship's transmitter (#2), and ITT Marine ST 1610A; the remote controls (#4) is the secondary receiver, a Scanti R 5001.

The second picture shows the emergency equipment and the MF CW transmitter. To the left of the picture (#8) is a battery powered emergency system consisting of a Skanti TRP 5001 with the transmitter on top and the receiver on the bottom. In the middle of the picture (#9) is another emergency system.

The left hand panel contains the emergency transmitter for MF CW and 2182 SSB. In the center panel on top is an STR 65 VHF radiotelephone; in the middle is a Skanti receiver; on the bottom is another operating control panel (one of three).

## While you were out... SOMETHING HAPPENED!

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



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

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

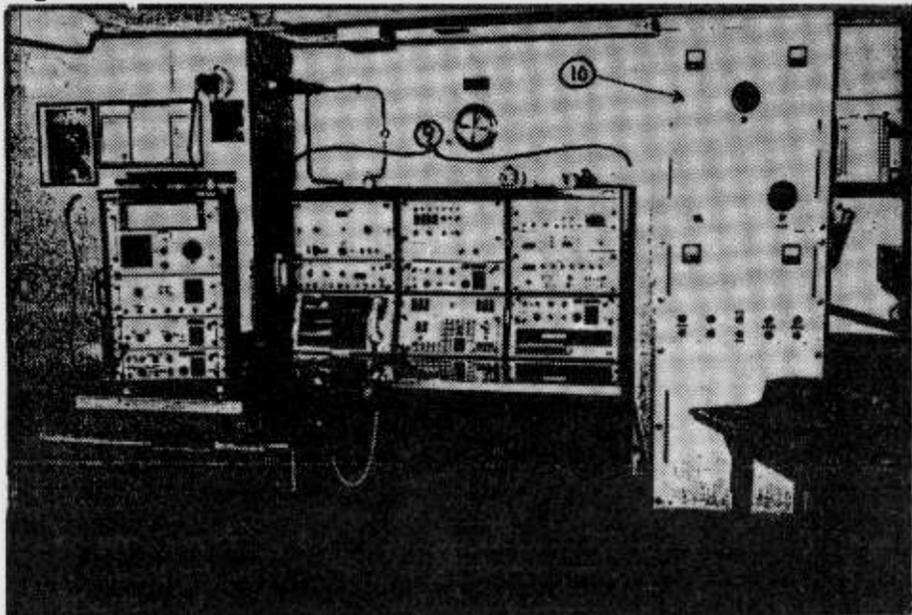
All you'll need in addition to your scanner and the ScanRecord is a tape recorder with a microphone jack and a remote control jack. The ScanRecord comes complete with all connecting cables.

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

Mail and phone orders are welcome. Send check or money order or we can ship via UPS COD. We also accept VISA and MASTERCARD. Please include your card number and expiration date.

FREE CATALOG featuring scanner accessories, carrier/subcarrier detectors, voice scramblers and unusual kits sent on request.

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Canon, GA 30520  
(404) 376-3712



**HIGH SEAS cont'd**

On the right is an AA734 auto alarm, the remote control for another ITT ST 1610A transmitter, and another Skanti receiver. On the right (#10) is the MF CW transmitter which was originally used on the SS France III.

If you would like to see information about other ships radio installations

please write, and if you have information which you would be willing to share please send it along. Your correspondence is always welcome; suggestions and ideas for future columns are particularly welcome! Please direct any correspondence to: James R. Hay, 141 St. John's Blvd., Pointe Claire, P.Q., Canada, H9S 4Z2. ●

# SIGNALS FROM SPACE



by Larry Van Horn

As most space hobbyists know, the shuttle is now using the TDRSS satellite system to relay communications when the shuttle is out of ground range. But what about the Russian manned space program? It would appear that they are going to follow the lead set by the US and launch a TDRSSsky type satellite in the future.

According to documents files with the ITU in Geneva, Switzerland, the Russian system is called SDRN. Locations in the Clark geostationary belt for their three satellite system will include: 16 degrees west, 160 degrees west, and 95 degrees east.

The only frequency information that I currently have on these satellites is that they will utilize downlinks around 11, 14, and 15 GHz. It would appear that once these satellites are launched the Soviets will finally get the world-wide coverage for manned space flights they have long wanted.

\*\*\*

AMSAT Executive Vice President, John J. Champa (K8OCL), recently dropped

Bob Grove an interesting letter that Bob forwarded to me. AMSAT now has a launch opportunity for AMSAT Phase III-C in mid-1986. Phase III-C will have similar operational capabilities to OSCAR 10 now in orbit. Phase III-C will contain the following communications packages:

Mode B transponder (435 MHz uplink/146 MHz downlink)

Improved Mode L transponder (1269 MHz uplink/436 MHz downlink)

A digital mode L transponder

A S-band beacon (2.3 GHz)

Several months after launch, the Phase III-C on-board propulsion system will place the spacecraft in a Molniya orbit, which John says they hope will allow amateurs to work through the satellite with 12-hour orbital periods.

Thanks, John, for the information and MT readers will be looking forward to future updates on Phase III-C as they become available.

\*\*\*

CNN will be seen in Europe very soon according

to Turner Broadcasting System, Inc. CNN will be broadcast to Europe beginning on or about September 15, 1985 through the INTEL-SAT satellite system. The live feed will provide European Broadcasting Union (EBU) members with 24-hours of world news per day.

The agreement calls for a seven-year lease on a 36 MHz (1/2 transponder) bandwidth on the INTELSAT V-Atlantic Ocean region satellite located at 332.5 degrees east. The agreement further includes TBS reservation for the other half of the transponder. The service will be a "cross-strapped" transmission uplink in Atlanta at C-band and downlink in Europe at Ku-band.

The signal will be downlinked in the U.K. by British Telecom International (BTI) and made available to European customers. CNN should be visible to European MT readers by dishes as small as three meters in diameter.

The CNN service marks the 5th full-period television service that INTELSAT provides over the Atlantic Ocean and there are four full-period TV services going to the Pacific Ocean region.

\*\*\*

The next ham-in-space venture is currently scheduled for launch on July 9, 1985 aboard STS 51-F. WOORE, Tony England, is expected to carry a sophisticated equipment suite in orbit during the seven day mission of Spacelab 2. The crew will consist of seven people. More information on this opportunity as it becomes available.

\*\*\*

Speaking of the Shuttle this is the current schedule as I have it at deadline.

STS51-B Launch 4/30/85  
Crew: 7 Duration: 7 days

Mission: Spacelab 3  
Orbiter: Challenger

STS51-G Launch 5/30/85  
Crew: 5 Duration 7 days

Mission: Spartan-1(MPESS)  
Telestar 3-D(PAM-D)  
Morelos-A (PAM-D)  
Arsbsat-A (PAM-D)

Orbiter: Discovery

STS51-F Launch 7/9/85  
Crew: 7 Duration 7 days

Mission: Spacelab 2  
Orbiter: Challenger

\*\*\*

Weather satellite watchers should know by now that NOAA-9 was launched at 1042 UTC on December 12, 1984 and as of this writing is scheduled to enter weather picture taking duties on February 1, 1985.

\*\*\*

Last month I discussed the Leasat satellites; this month I now have some reports from MT readers on military satellite activity currently being monitored from the new bird. For those of you with copies of my new book, COMMUNICATIONS SATELLITES, this information will amplify what is presented in the mil satellite section.

Testing of the Leasat (Syncom IV-2) has now been completed and this satellite will replace part, if not all, of the 100 deg. west FLEETSATCOM communications capability. Syncom IV-2 appears to be using Leasat frequency plan Whiskey described in COMMUNICATIONS SATELLITES. Transmissions are now being monitored on 253.550 and 256.850 MHz from what is apparently Syncom IV-2. More reports are needed and monitors should realize that the UHF mil satellite situation is in a period of transition for a while and should note changes in all previously monitored frequencies carefully.

\*\*\*

A friend in the St. Louis area recently got 225-400 MHz capability and is sharing the following information with MT readers.

260.825 MHz RTTY-Satellite (Atlantic Fleetsatcom, wideband channel 20-LVH)

283.250 MHz Hillsboro, MO., Ground Station (possible satellite uplink)

291.895 MHz Air refueling channel near Missouri

293.950 Mhz Heard a phone patch (via satellite (LVH?))

295.400 MHz Air-to-air communications (possibly the Illinois State National Guard)

314.600 MHz Ground and air communications (possibly from McDonnell Test center at Lambert)

356.995 MHz Possible satellite communications channel

369.400 Mhz Possible satellite communications channel

371.200 Mhz Possible satellite communications channel

382.350 MHz Aircraft to ground station at Hillsboro, MO

Nice list of frequencies; I hope the satellite channels



SIGNALS FROM SPACE cont'd

can be ID'ed as they are new to me!

\*\*\*

To help my friend in St. Louis and others starting out in mil aircraft monitoring the following is a selection of Bob Grove's famous mil aircraft list that was packed with each Scanverter. Readers are also invited to review last month's column for FAA ATC military aircraft frequencies.

- 230.400 DOE aircraft
236.600 AF Control towers
237.900 CG Search & Rescue
239.800 Air metro weather
240.600 CG rescue beacon
241.000 Army/Nat'l Guard
243.000 Emergency, all ag.
250.800 Navy Blue Angels
252.100 AF refueling squad
252.800 AF tactical train.
255.400 FAA Flight Service
257.800 Mil. Air to FAA
264.800 Space Shuttle chase aircraft
272.700 FAA Flight Service
273.500 AF Thunderbirds
275.100 CG rescue beacon
275.200 Mil. Contractors
282.000 CG search & rescue
283.500 AF Thunderbirds
295.700 AF Thunderbirds
300.6 Favorite air-to-air used by USN fighter crews during exercises
304.800 Hurricane hunter
305.400 AF DF freq.
311.000 SAC primary
314.600 Mil. Contractor
321.000 SAC secondary
322.600 AF Thunderbirds
329.335 Glide slope bea.
340.200 US Navy Towers
342.500 Weather Info
344.600 AF Weather Info
345.400 Mil. Contractor
348.600 Mil. air to FAA
349.400 AF Control Tow.
360.200 Navy control tow
372.200 Strategic Air Com.
375.200 Weather Info
375.700 SAC refuel
381.300 TAC Air "Golden"
381.700 CG Air
381.800 CG Air Primary
382.600 Mil. Contractor
382.900 AF Thunderbirds
383.900 CG air
385.250 Navy air-to-air
378.900 AF Tactical

Signals from Space would like to see your 225-400 MHz military aircraft and satellite intercepts. You can send them to Signals from Space, c/o Grove Enterprises, PO Box 98, Brass-town, NC 28902. Hopefully next month I will have my new address in Jacksonville, Fl so that mail can return directly to me instead of any delays incurred now by forwarding through Bob and the gang. I thank you for your patience.

LOW BAND SKIP: A Special Report

by Chuck Robertson

Late winter skip predictions for spring highlight this special report.

The approach and passing of the "Alberta Clipper" in mid January permitted several Canadian paging stations to be monitored around 2100 EST as this frigid air mass began moving in the U.S. from Canada on January 17th (see Figure 1) the paging stations heard included; 30.22, 30.42, 31.42, 31.92 and 32.42.

I knew some exceptional air movements had to be occurring to account for this late evening Es skip. But I wasn't prepared for the record breaking, sub-zero temperatures this approaching cold front would bring to much of the U.S!

By the 19th the Alberta Clipper had blustered its way to the Gulf States where marine traffic was logged in the evening hours on such frequencies as 30.70 (Ocean Drilling & Exploring Co.) and 31.48 (Gulf Fleet Marine Corporation).

On the 21st the Clipper was bringing sub-freezing temperatures to Florida. Radio communications regarding irrigating citrus groves to give them a coating of ice for protection against the record cold, delivery of fuel oil, and non-stop talk about the ever dropping temperatures were frequently heard.

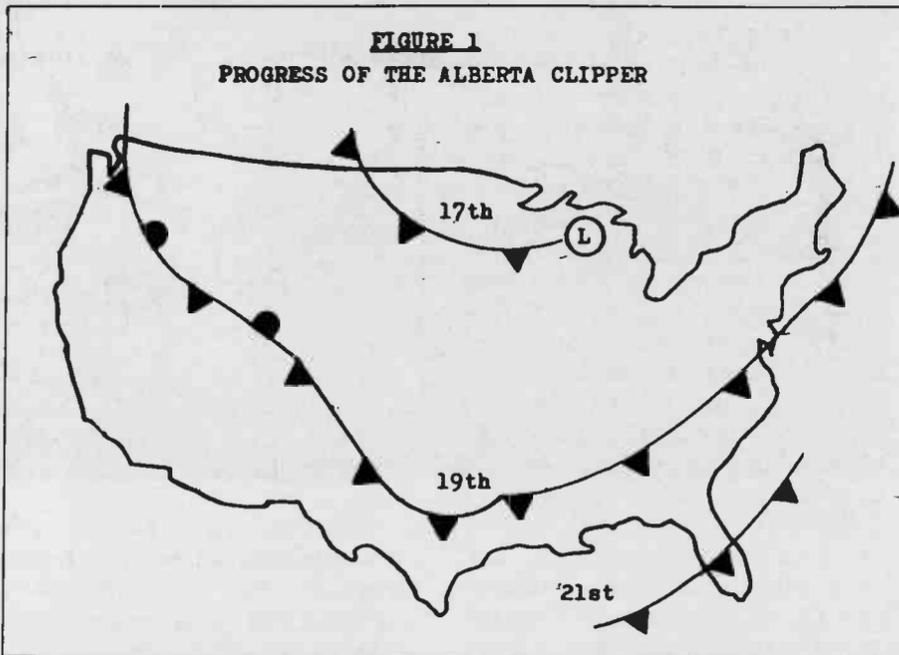
Some of the Florida skip heard on the 21st from 2000 to 2100 CST included: 30.64 Fuel oil delivery, Orlando
30.94 South Florida Water District
31.40 KIL 774 Oakley Brothers, Inc., Dade City, Citrus irrigations
31.80 Pasco Country; "temperature down around 28 degrees"

31.96 KQV525, M.L. Daves, Inc., Wauchula
33.65 U.S. Military - probably Florida
35.82 Miles Groves and Ranch, Inc., bases in Plant City and Mulbury

Skip associated with the movement of weather fronts like the Alberta Clipper is a good example of Es ionization produced by rapid wind movements, or wind sheer.

Weather fronts containing snow, rain or thunderstorms usually have high winds; but "dry" fronts can also produce sporadic E layer ionization.

On February 5th, the ionospheric propagation con-



ditions were above normal, resulting in a fair amount of long haul F2 skip. This is daytime skip and will usually be heard from around 9 AM to 4 PM, with noon the best bet. On days of exceptional ionospheric conditions, F2 skip may be heard an hour or two after dark.

F2 skip season extends from fall to spring, with summer the low point.

Here's what I logged on the 5th from 1130 to 1330 CST.

29.66 repeater St. Thomas, Virgin Islands amateur repeater. First time heard

in a couple of months. Band conditions have been noticeably poorer this year than last due to the decreased sunspot activity as we enter the low point in the 21st solar cycle. "Whistler" radio telephones, Spanish language, half-duplex were also monitored on 29.76, 29.85, 31.50, 31.53, 31.605 and 31.62.

30.24 and 31.35 Argentina paging stations.

30.475 Guatemala security service.

31.37 repeater in Dominican Republic construction

Advertisement for Universal Shortwave Radio Catalog. Features include: 'HUGE 70 PAGE', 'SHORTWAVE CATALOG', 'HUGE 70 PAGE', 'Send \$1.00 (or 3 IRCs) - RE FUNDABLE.', 'UNIVERSAL SHORTWAVE RADIO', '1280 Aida Drive Reynoldsburg, Ohio 43068 Phone: 614-866-4267'. The central image shows various radio catalog covers for different countries like ZME, RADIO CANADA, RADIO NEW ZEALAND, and RADIO TASHERNT.

**LOW BAND SKIP cont'd**

company. The repeater output frequency (37.19 MHz) could not be heard because the MUF (Maximum Useable Frequency) was below 36 MHz this day.

34.06 Honduran business. Second channel on 34.66.

By evening the long haul F2 was long gone; however, a massive weather system in Central Mexico and the U.S. Gulf states was kicking up short haul Es skip (See figure 2). Here's the weather related skip I logged from about 1600 to 1945 CST.

29.70 "Whistler" radio-telephone, half-duplex Spanish language, Mexico; rotary type dial tones.

29.845 Radio-telephone, full-duplex, (not a whistler). Spanish language; Mexico, push-button dialing tones.

30.78 "Planta La Tres"; Mexico

31.10 Georgia state conservation officers and bases.

31.48 Gulf Fleet Marine Corp; vessels and base at Harvey, LA, were heard switching from FM to SSB to avoid skip from other FM businesses on frequency.

32.35 and 32.40 tone bursts followed by guard tone; could be scrambling or telemetry.

33.25 English and Hispanic soldiers; English language. Probably Texas or New Mexico.

44.35 Repeater; possibly Mexican oil operations. One base is on the Gulf, another may be at Queretaro in Central Mexico. The repeater was rebroadcasting U.S. skip from one of the U.S. radio-telephone channels on its input frequency.

45.22 Oklahoma State Police

48.60 Repeater; Mexican plant operations

49.50 Spanish language petroleum operations; probably Mexico, possibly Texas

49.68 Spanish radio-telephone, full-duplex, Mexico; rotary type dialing

49.70 Spanish radio-telephone, full-duplex; Mexico, push-button dialing

49.80 Spanish radio-telephone, full-duplex; guard tone and push-button dialing

The following day, the 6th, solar flux intensities were still good and more F2 skip was logged in the morning from 1030 to 1200 CST.

30.04 Argentina, possibly port operations

30.06 Argentina; "Santa Fe", "Santiago"

31.35, 32.68, 32.82,



32.96, 35.22, 35.28 and 35.32 Argentina paging stations

32.18 Costa Rica  
32.20 and 33.40 Spanish military

33.475 repeater; Central America business

By evening the Es skip was flooding in from several areas! An East Coast storm dropped 7 inches of snow on La Guardia Airport and resulted in skip from New York heard from 1745 to 1830 CST.

31.04 Taxi  
33.16 Taxi  
37.18 Local government, Spanish and English languages used.

A line of showers in Louisiana and Georgia at the same time resulted in Es skip from the Gulf Coast.

31.18 Georgia state conservation, Atlanta

31.48 Gulf Fleet Marine Corporation, Harvey, LA

At 6:20 PM, Central America made an entrance via multi hop Es skip! The Guatemalan security service on 30.475 was heard as a result of the previous day's weather front from Mexico having moved south to Central America. The line of showers in the U.S. Gulf states may have provided the right conditions for the second hop!

It's theoretically possible that a 3rd hop off the Es clouds in the New York area could have brought skip from Central America to northern Canada!

Multi-hop Es skip tends to be short lived, with rapid signal fading. It may be strong for 5 seconds or 5 minutes and then suddenly fade out only to resume again a few minutes later, sometimes stronger than ever.

Those living on the West Coast may be fortunate enough to catch a period of multi-hop Es from the Pacific-it does happen! Trans-Atlantic Es skip from Europe to the East Coast is also a possibility.

The following list of new catches made this winter are extracted from my book, "Low Band Skip Directory" (\$5.95 including book rate

shipping from Grove Enterprises, Inc.).

29.70 "Whistler" radio-telephone, Mexico

30.00, 30.05, 30.10, 30.20, 30.35, 30.50 and 30.55 Spanish military, Central America

30.00 U.S. military, "Tiger Base"

30.05 U.S. military, "Oceanside Range Control", "Tabletop"

30.30 and 30.35 Peruvian military?

30.30 Canadian paging station (AM)

30.54 Canadian radio-telephone, full-duplex

30.61 Spanish radio-telephone, full-duplex

31.30 Trucking business, New York area. This is a "pirate" frequency (should be state conservation!)

31.30 Spanish military, Central America

31.59 "Whistler" radio-telephone; Acapulco, Mexico

31.80 and 35.20 maybe petroleum (Honduran or Mexico)

31.95 and 32.25 Spanish military, Central America; "Generalissimo"

32.15, 32.30 and 33.10 Spanish military, Central America

32.75 U.S. military "Dragon Base"

32.50 repeater, Central American business

32.78 and 33.20 Spanish business, bases in Mexico and Nicaragua.

33.825 repeater, Central American financial business-39.825 probably input

34.85 video recordings being made of missile launch; Holloman AFB, White Sands, New Mexico

36.63, 36.69 and 36.91 Security and taxi service, Washington, D.C.

36.71 Pentagon security officers

37.00 Coast Guard law enforcement, Gulf of Mexico

37.75 Oil; Mexico

40.03 Bureau of Indian Affairs? Native American Indians heard; Arizona or New Mexico.

40.15 U.S. military "Blackwell-05" range control

41.70 Range control; Plattsburg AFB, New York

41.90 Missile launch, probably White Sands

41.99 Time domain scrambling (origin unknown)

47.83 English duplex radio-telephone, Florida, pirate operation.

48.80 Spanish duplex radio-telephone - Cuba?

By the time you read this spring skip report we should be experiencing some very intense Es skip in the Northern hemisphere; June is usually the peak month although it may occur any-

**LOW BAND SKIP**

**DIRECTORY:**

**An Update**

Chuck Robertson's excellent comprehensive directory of 30-50 MHz skip stations is now in distribution and providing unprecedented access to frequency listings for this unusual band.

With everything from military maneuvers to maritime, police to pirates, and telemetry to telephones, the new directory has the most commonly reported skip worldwide--and some uncommon as well!

As with all publications, a few omissions and transpositions slip in; we are pleased to include herein a comprehensive errata list for our readers; please make the corrections in your edition.

All volumes now being made have the correction sheets inserted.

PAGE 2: Third column; in list 38.10, 38.50, 46.70, add 41.10 (Medevac)

PAGE 3: First column; delete 41.10 Medevac listing

PAGE 3: Second column; frequency 39.75 should read 29.75

PAGE 4: Third column: Delete NEW PLAN (submitted in error; never valid)

PAGE 4: Third column; 45.18 and 45.82 listing should be placed in column one, just above CHIPS

PAGE 5: The actual pairing of the cordless phone channels is as follows:

- (1) 46.61/49.67
- (2) 46.63/49.845
- (3) 46.67/49.86
- (4) 46.71/49.77
- (5) 46.73/49.875
- (6) 46.77/49.83
- (7) 46.83/49.89
- (8) 46.87/49.93
- (9) 46.93/49.99
- (10) 46.97/49.97

PAGE 6: Second column; frequency 35.66 should read 35.26

Third column; frequency 36.54 should read 35.66 and frequency 43.56 should read 43.66

PAGE 9: Second column; frequency 30.00 should read 31.00

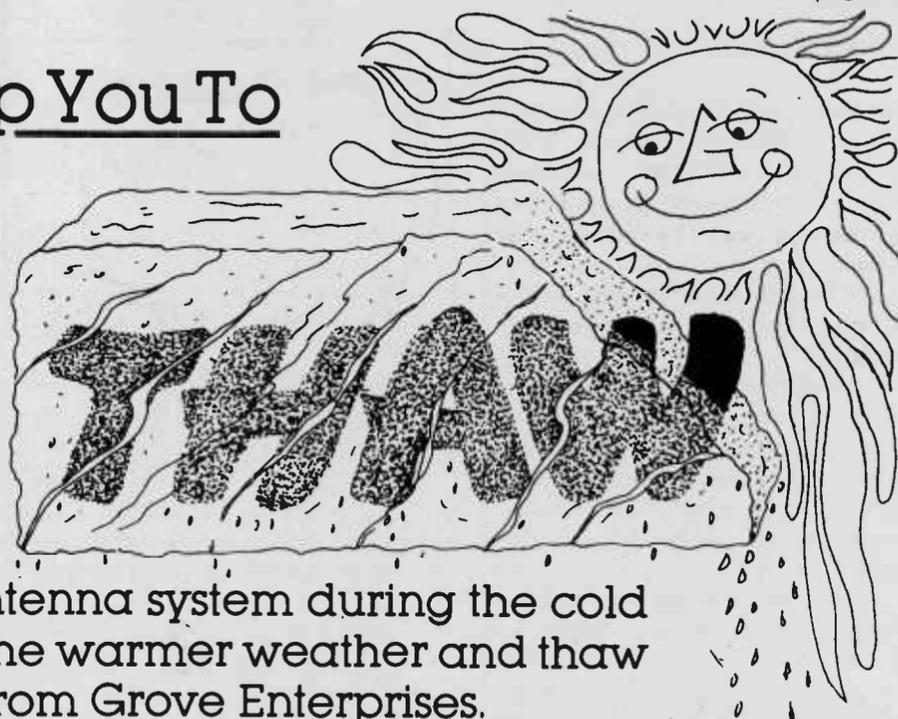
PAGE 14: Third column; delete all frequencies except 48.00, 48.04, 48.42, 48.96 (deleted listings appear correctly elsewhere)

time of the year, day or night. Morning and evening hours are often the best times to listen.



Let Grove Enterprises Help You To

# Accelerate The Spring...



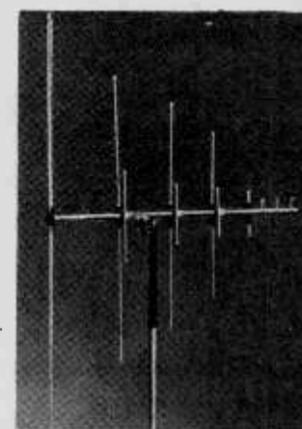
If you have tolerated an inadequate antenna system during the cold winter months, then take advantage of the warmer weather and thaw out your reception with these hot items from Grove Enterprises.



## Scanner Beam

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

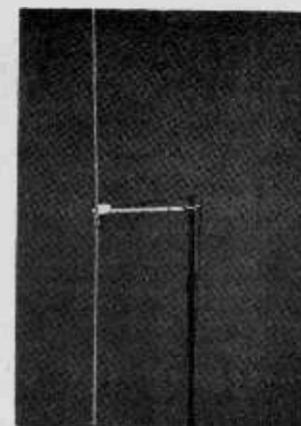
**ANT-1B — ONLY \$40<sup>00</sup> (plus \$3.00 UPS; \$6.00 U.S. Mail)**



## OMNI

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

**ANT-5B — ONLY \$19<sup>00</sup> (plus \$3.00 UPS; \$6.00 U.S. Mail)**



## Cable and Accessories

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

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

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



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**GUARANTEE:** All equipment manufactured by Grove is warranted against manufacturing defects for a period of one year under normal use by the purchaser, providing that no field repairs have been attempted. If any equipment should fail during the warranty period, Grove shall repair or replace that defective equipment upon its postpaid return. You must be 100% satisfied!

It's a good idea to program a few prime low band frequencies into your monitor and scan them continuously. You never know when the skies will open to distant lands and exotic communications. Be prepared and waiting. You will be rewarded!

Send your exceptional low band catches to the author, and your material may appear in a future skip report. Point-to-point and 2-way radio operations in the 29.70 to 76 MHz band will be considered for print. Be sure to state whether you wish anonymity or credit by name for your contribution.

# BEHIND THE DIALS

## THE GROVE SPECTRUM PROBE

### ACTIVE ANTENNA

It is always a challenge to be fair and objective when critiquing one's own products; nonetheless, the following review of the new Grove Spectrum Probe active antenna will be both critical and honest.

At the present time, several active antennas are offered for sale by consumer-oriented manufacturers like Sony, MFJ, Datong and others. All of these competitors frame their designs around the typical 100 kHz-30 MHz range of general-coverage short wave radio

receivers.

Grove Enterprises now offers an active antenna for virtually the entire monitoring spectrum: 10 kHz through 1000 MHz, inclusive—no gaps. How well does it work? Let's take a look.

### DEVELOPMENTAL TESTING:

One of the most serious shortcomings of all active antennas is intermodulation ("intermod"), the internal generation of bogus signals which can interfere with legitimate reception. It is caused by strong signals mixing and producing sum and difference frequencies which are then detected by the attached receivers on frequencies vastly different



from those causing interference.

For example, two local broadcasters on 900 and 1200 kHz could be heard not only on their two legitimate frequencies, but on 2100 and 300 kHz (their sum and difference) as well. Similar intermod is often suffered by lower-priced receivers as well as active antennas; the cause is the same—mixing in the amplifier stage(s).

The Grove Spectrum Probe was compared with a 135 foot dipole reference—admittedly a tough test since the Probe is only two feet high with whip fully extended! Signal reception throughout the long and short wave bands (100 kHz-30 MHz) was excellent, certainly comparable to the dipole. An internal 30 dB signal amplifier sees to that. In fact, signals all the way down to 20 kHz or less were receivable long after they disappeared from the dipole.

Intermod? Yes, it's there; especially when the bands are cluttered with extremely strong signals. Provisions were made to attenuate signals in the 550-1600 kHz AM broadcast band, so that's not much of a problem. But there will be some intermod present at certain spots in the short wave bands as could be expected with a high gain active antenna.

A gain control on the control unit allows the user to attenuate incoming signals but in actual practice, intermod rejection is best with the control fully on. A series of three jacks on the rear panel accommodate 10 kHz-30 MHz, or full spectrum reception.

Some AC hum was observed behind the signals of strong broadcasters; it was readily reduced—or eliminated in some cases—by connecting a good ground wire

## NEW!

**uniden**  
**Bearcat**

**Regency**

## Scanners

Communications Electronics, the world's largest distributor of radio scanners, introduces new scanners and scanner accessories from J.I.L., Regency and Uniden/Bearcat. Chances are the police, fire and weather emergencies you'll read about in tomorrow's paper are coming through on a scanner today.

**NEW! Regency® MX7000-H**  
List price \$699.95/CE price \$449.00  
10-Band, 20 Channel • Crystalless • AC/DC  
Frequency range: 25-550 MHz, continuous coverage and 800 MHz to 1.2 GHz, continuous coverage  
In addition to normal scanner listening, the MX7000 offers CB, VHF, and UHF TV audio, FM Broadcast, all aircraft bands (civil and military), 800 MHz communications, cellular telephone, and when connected to a printer or CRT, satellite weather pictures.

**NEW! Regency® MX5000-H**  
List price \$599.95/CE price \$354.00  
Multi-Band, 20 Channel • No-crystal scanner  
Search • Lockout • Priority • AC/DC  
Selectable AM-FM modes • LCD display  
World's first continuous coverage scanner  
Frequency range: 25-550 MHz, continuous coverage  
Never before have so many features come in such a small package. The Regency MX5000 mobile or home scanner has continuous coverage from 25 to 550 MHz. That means you can hear CB, Television audio, FM broadcast stations, all aircraft bands including military and the normal scanner bands, all on your choice of 20 programmable channels.

**NEW! Regency® MX4000-H**  
List price \$629.95/CE price \$394.00  
Multi-Band, 20 Channel • No-crystal scanner  
Search • Lockout • Priority • AC/DC  
Selectable AM-FM modes • LCD display  
Bands: 30-50, 118-136, 144-174, 440-512, 800-950 MHz  
The Regency MX4000 gives coverage in the standard VHF and UHF ranges with the important addition of the 800 MHz, and aircraft bands. It features keyboard entry, multifunction liquid crystal display and variable search increments.

**NEW! Regency® Z60-H**  
List price \$379.95/CE price \$249.00  
8-Band, 60 Channel • No-crystal scanner  
Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz  
Cover your choice of over 15,000 frequencies on 60 channels at the touch of your finger.

## NEW! JIL SX-400-H

List price \$799.95/CE price \$499.00  
Multi-Band, 20 Channel • No-crystal Scanner  
Search • Lockout • Priority • AC/DC  
Frequency range: 26-520 MHz, continuous coverage  
With optionally equipped RF converters 150KHz-3.7 GHz  
The JIL SX-400 synthesized scanner is designed for commercial and professional monitor users that demand features not found in ordinary scanners. The SX-400 will cover from 150 KHz to 3.7 GHz, with RF converters. Order the following RF converters for your SX-400 scanner. RF-1030-H at \$259.00 each for frequency range 150 KHz - 30 MHz. USB, LSB, CW and AM. (CW filter required for CW signal reception). RF-5080-H at \$199.00 each for 500-800 MHz. RF-8014-H at \$199.00 each for 800 MHz-1.4 GHz. Be sure to also order ACB-300-H at \$99.00 each which is an antenna control box for connection of the RF converters. Add \$3.00 shipping for each RF converter or antenna control box. If you need further information on the JIL scanners, contact JIL directly at 213-926-6727 or write JIL at 17120 Edwards Road, Cerritos, California 90701.

## SPECIAL! JIL SX-200-H

List price \$499.95/CE special price \$189.00  
Multi-Band - 16 Channel • No-Crystal Scanner  
Frequency range 26-88, 108-180, 380-514 MHz  
The JIL SX-200 scanner tunes military, F.B.I., Space Satellites, Police and Fire, Drug Enforcement Agencies, Defense Department, Aeronautical AM band, Aero Navigation Band, Fish & Game, Immigration, Paramedics, Amateur Radio, Justice Department, State Department, plus other thousands of radio frequencies most other scanners can't pick up. The SX-200 has selectable AM/FM receiver circuits, tri-switch squelch settings—signal, audio and signal & audio, outboard AC power supply - DC at 12 volts built-in, quartz clock - bright vacuum fluorescent blue readouts and dimmer, dual level search speeds, tri-level scan delay switches, 16 memory channels in two channels banks, receive fine tune (RT) ± 2KHz, dual level RF gain settings - 20 db pad, AGC test points for optional signal strength meters. All in all, the JIL SX-200 gives you more features for the money than any other scanner currently on sale. Order your JIL SX-200 scanner at this special price today.

## Regency® HX1000-H

List price \$329.95/CE price \$209.00  
8-Band, 30 Channel • No Crystal scanner  
Search • Lockout • Priority • Scan delay  
Sidelit liquid crystal display • Digital Clock  
Frequency range: 30-50, 144-174, 440-512 MHz  
The new handheld Regency HX1000 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 30 channels at the same time. When you activate the priority control, you automatically override all other calls to listen to your favorite frequency. The LCD display is even sidelit for night use. A die-cast aluminum chassis makes this the most rugged and durable hand-held scanner available. There is even a backup lithium battery to maintain memory for two years. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery. Order your Regency HX1000 now.

## Bearcat® 100-H

The first no-crystal programmable handheld scanner.  
List price \$449.95/CE price \$229.00  
8-Band, 16 Channel • Liquid Crystal Display  
Search • Limit • Hold • Lockout • AC/DC  
Frequency range: 30-50, 138-174, 406-512 MHz  
The world's first no-crystal handheld scanner has compressed into a 3" x 7" x 1 1/4" case more scanning power than is found in many base or mobile scanners. The Bearcat 100 has a full 16 channels with frequency coverage that includes all public service bands (Low, High, UHF and "T" bands), the 2-Meter and 70 cm. Amateur bands, plus Military and Federal Government frequencies. Wow...what a scanner!  
Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. Order your scanner now.

**QUANTITY DISCOUNTS AVAILABLE**  
Order two scanners at the same time and deduct 1%, for three scanners deduct 2%, four scanners deduct 3%, five scanners deduct 4% and six or more scanners purchased at the same time earns you a 5% discount off our super low single unit price.

## NEW! Regency® HX2000-H

The World's First 800 MHz. Handheld Scanner  
List price \$569.95/CE price \$359.00  
7-Band, 20 Channel • No-crystal scanner  
Priority control • Search/Scan • AC/DC  
Sidelit liquid crystal display • Memory backup  
Bands: 118-136, 144-174, 440-512, 800-950 MHz  
The HX2000 scanner operates on 120V AC or 6 VDC. Scans 15 channels per second. Size 3" x 7" x 1 1/2". Includes wall charger, carrying case, belt clip, flexible antenna and nicad batteries. Selectable AM/FM modes.

### OTHER RADIOS AND ACCESSORIES

- RD55-H Uniden Visor mount Radar Detector ..... \$119.00
  - RD95-H Uniden Remote mount Radar Detector ..... \$139.00
  - BC 300-H Bearcat 50 channel scanner ..... \$344.00
  - BC 20/20-H Bearcat 40 channel scanner ..... \$274.00
  - BC 210XL-H Bearcat 18 channel scanner ..... \$209.00
  - BC 260-H Bearcat 16 channel mobile scanner ..... \$274.00
  - BC 201-H Bearcat 16 channel scanner ..... \$189.00
  - BC 180-H Bearcat 16 channel scanner ..... \$164.00
  - BC-WA-H Bearcat Weather Alert ..... \$39.00
  - DX1000-H Bearcat shortwave receiver ..... \$499.00
  - PC22-H Uniden remote mount CB transceiver ..... \$99.00
  - PC55-H Uniden mobile mount CB transceiver ..... \$59.00
  - Z10-H Regency 10 channel scanner ..... \$149.00
  - Z30-H Regency 30 channel scanner ..... \$169.00
  - Z45-H Regency 45 channel scanner ..... \$199.00
  - MX3000-H Regency 30 channel scanner ..... \$219.00
  - C403-H Regency 4 channel scanner ..... \$69.00
  - R108-H Regency 10 channel scanner ..... \$99.00
  - HX650-H Regency 6 channel handheld scanner ..... \$99.00
  - HX-650P-HX650 with batt., case, crystal certs. .... \$124.00
  - RH250B-H Regency 10 channel VHF transceiver ..... \$379.00
  - RPH410-H 10 ch. handheld no-crystal transceiver ..... \$399.00
  - EC10-H Battery charger for Regency RPH410 ..... \$79.00
  - EC10-H Programming tool for Regency RPH410 ..... \$20.00
  - SMRH250-H Service man. for Regency RH250 ..... \$20.00
  - SMRU150-H Service man. for Regency RU150 ..... \$20.00
  - SMRPH410-H Service man. for Regency RPH410 ..... \$20.00
  - B-4-H 1.2 V AAA Ni-Cad batteries (set of four) ..... \$9.00
  - A-135C-H Crystal certificate ..... \$3.00
  - FB-E-H Frequency Directory for Eastern U.S.A. .... \$12.00
  - FB-W-H Frequency Directory for Western U.S.A. .... \$12.00
  - A60-H Magnet mount mobile antenna ..... \$35.00
  - A70-H Base station antenna ..... \$35.00
- Add \$3.00 shipping for all accessories ordered at the same time.  
Add \$12.00 shipping per shortwave receiver.  
Add \$7.00 shipping per scanner and \$3.00 per antenna.

### BUY WITH CONFIDENCE

To get the fastest delivery from CE of any scanner, send or phone your order directly to our Scanner Distribution Center. Be sure to calculate your price using the CE prices in this ad. Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. All sales on accessories are final. Prices, terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on back-order automatically unless CE is instructed differently. A \$5.00 additional handling fee will be charged for all orders with a merchandise total under \$50.00. Shipments are F.O.B. Ann Arbor, Michigan. No COD's. Most products that we sell have a manufacturer's warranty. Free copies of warranties on these products are available prior to purchase by writing to CE. Non-certified checks require bank clearance.

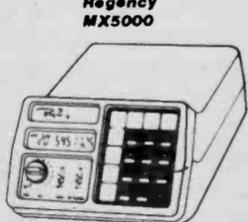
**Mail orders to:** Communications Electronics, Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$7.00 per scanner for U.P.S. ground shipping and handling in the continental U.S.A. For Canada, Puerto Rico, Hawaii, Alaska, or APO/FPO delivery, shipping charges are three times continental U.S. rates. If you have a Visa or Master Card, you may call and place a credit card order. Order toll-free in the U.S. Dial 800-USA-SCAN. In Canada, order toll-free by calling 800-221-3475. WUI Telex CE anytime, dial 671-0155. If you are outside the U.S. or in Michigan dial 313-973-8888. Order today.

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**BEHIND THE DIAL cont'd**

between the Spectrum Probe control unit, the receiver, and actual earth ground (or the ground return on the third wire AC outlet).

**SCANNER RECEPTION**

The Spectrum Probe is also useful for receiving VHF and UHF signals for use as a scanner antenna. In actual use, however, signal strengths can be expected a little lower than when compared with a dedicated high performance scanner antenna like the Grove Omni or Scanner Beam. Think of the scanner reception feature as a plus rather than a primary design feature of the Spectrum Probe.

**THE BOTTOM LINE**

The new Grove Spectrum Probe active antenna represents a significant step in monitoring; for the first time the entire 10 kHz-1000 MHz range may be received using one tiny antenna.

The Probe worked best mounted outside on a rooftop pipe (50 feet of low loss coax and attached connectors are included), although it is possible to locate the unit in an attic crawl space, closet, or even in the corner of the listening table if necessary--with somewhat reduced pickup.

If you have room to put up an outside dipole like the Grove Skywire and appropriate scanner antennas, do it; if space or zoning restrictions prohibit that, then the Grove Spectrum Probe will provide worldwide short wave and long wave reception and local scanner coverage as well.

ANT-9 Spectrum Probe, \$99.95 including AC adaptor, coaxial cable, mounting bracket, and accessory plugs from Grove Enterprises, 140 Dog Branch Road, Brasstown, NC 28902.

**BUTTERNUT SCANNER ANTENNA**

This patented "trombone" design from Butternut has created a wave of interest among MT readers and we decided to have a closer look at this unique scanner monitoring antenna.

As shown in the accompanying illustration, the SC3000 includes a number of phasing sections to decouple certain elements while adding others for gain at various frequencies.

Designed for 30-50, 14-174 and 440-512 MHz, the Butternut measures 11 feet in total height and functions as a 1/4 wavelength

monopole with approximately the same gain as a vertical half-wave dipole on VHF low band. At VHF high and UHF the configuration becomes a collinear array with 3 dB and 7 dB gain respectively.

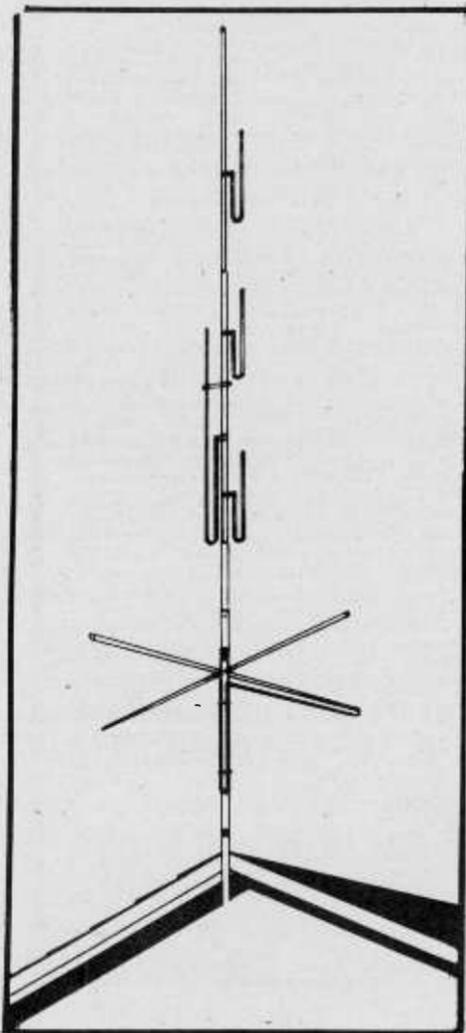
The main antenna is very sturdy, built around 1-1/8" aluminum tubing, tapering to 5/8" at the top. Trombone sections of 3/16" alloy rod are supported by aluminum brackets which are undependable when tightened. We would recommend the addition of a 3/8" or so flat washer under the bracket screw heads for additional grip when it's time to tighten them up.

**HOW WELL DOES IT WORK?**

The SC3000 was mounted roof-high, separated approximately 20 feet from a reference Grove OMNI antenna. Grove CBL coax was used to feed signals from both antennas down to an antenna switch, and from there into a Regency MX-5000 scanner.

Little difference in signal strength could be noted on high band and UHF, but reception on low band was significantly stronger on the Butternut. This was expected due to the larger capture area of the antenna by design. In fact, the Butternut worked reasonably well for local CB coverage at 27 MHz!

It is conceivable that the SC3000 could be used for amateur 50, 144 and 432 MHz communications as well as scanner reception. Due to the periodic design of the antenna, however, it does not work as well as the OMNI for those "out of band"



applications like 225-400 MHz military aircraft monitoring, nor is it designed for 800 MHz cellular band reception.

In a pinch, the Butternut could also be used for short wave reception, although performance is considerably lower than the reception heard on our reference Grove ANT-2 Skywire. But the signals are there and are a little stronger at the lower frequencies than those heard on the reference Grove OMNI.

We were favorably impressed with the antenna on the frequency bands for which it was designed and have mounted it permanently for scanner use here at MT headquarters.

The SC3000 lists for \$62.50 plus \$2.50 shipping and is available from Butternut Electronics Co., 405 E. Market Street, Lockhart, TX 78644.

**SWL RTTY/MORSE CARTRIDGES****FROM MICROLOG**

Two new cartridges for the Commodore 64 home computer have been released from Microlog (18713 Mooney Drive, Gaithersburg, MD 20879); both are of great interest to the short wave utilities listener.

**SWL**

For automatic Morse code and radioteletype display, the Microlog SWL cartridge is the least expensive to date. For only \$64 your C-64 becomes a Morse/RTTY reader when connected to a general coverage receiver.

ROM and interface are both self-contained and a few simple keyboard commands offers considerable flexibility: unshift on space, all speeds and shifts for copy, word wrap-around, real time clock, printer control for hard copy, normal/invert sense, screen/text color commands, split screen, tuning "meter" display, ASCII copy, 12 message, ID/selective print memories, and Morse speed synchronization.

The SWL cartridge can also be used for transmitting applications with various memory functions such as "CQ", call sign identification, and other messages.

**OUR TEST**

It was hard to believe that such a small cartridge at such a low cost could produce so much listening power. Installed and operating in seconds, the unit was producing excellent text from far-less-than-perfect

amateur CW. The built in tone generator allows audible tuning of the receiver for optimum filter matching when used with the Commodore color monitor.

A wide choice of field, border and character colors may be selected for easiest viewing. The powerful ROM does everything; no tape recorder, cassette or disc drive is needed--only a variety of simple keyboard commands will bring up your choice of speeds, modes and other functions.

**MORSE COACH**

Interested in learning the Morse code? Morse Coach does a great job of tutoring! With absolutely no previous knowledge of the

**HEAR THE NEW BANDS ON YOUR SCANNER**

Converts out-of-band signals to vhf or uhf scanner bands. Cables provided. Simply plug into scanner.

**5 MODELS AVAILABLE:**

806-894 MHz New Land Mobile Band  
400-420 MHz Federal Government & FBI  
240-270 MHz Navy/Air Force Satellites  
135-144 MHz Weather Satellites  
72-76 MHz Industrial & Radio Control

ONLY \$88 + \$3 S & H

**DIG OUT WEAK SIGNALS**

Get clearer distant reception using ACT-1 POWER ANTENNA instead of scanner's built-in whip. This compact 21 - inch antenna has integral preamplifier, gives up to 15 dB gain (30 times as strong), plus all the advantages of a high antenna away from noise pickup. Often outperforms much larger indoor antennas! Easy to install on any vertical surface indoors or out. No mast required. Covers all bands: 30 - 900 MHz. Complete with 50 ft. cable, ready to plug into scanner.



ACT-1 POWER ANTENNA  
ONLY \$79 + \$3.40 S&H

**REJECT SCANNER INTERFERENCE BOOST DESIRED SIGNALS**

Do away with i-f feedthrough, images, cross-modulation, and other interference. Tunable 3-band VHF trap plus fixed i-f trap eliminate undesired signals. Low-noise preamp digs weak signals out of the noise. Adjustable-gain preamp can be used alone or with traps, giving you complete signal control freedom for 110-960 MHz bands.

SA-1 SCANNER AMPLIFIER  
ONLY \$79 + \$3.00 S&H

• Order by phone or mail. Use VISA or MC, check, COD. Or send \$1 for complete catalog by return mail.

**hamtronics, inc.**

65-K MOUL ROAD  
HILTON NY 14468-9535  
Phone: 716-392-9430

**BEHIND THE DIALS cont'd**

code, Morse Coach can take you from level to level at your own rate of speed to teach code proficiency.

Built-in tests--complete with automatic grading--let you know how you are progressing. And since it is designed to utilize the Commodore 64 keyboard, you develop excellent typing skills as well!

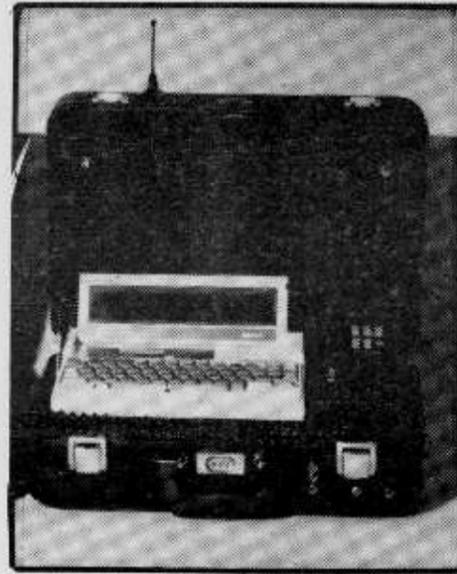
We were surprised at just how much we had forgotten about Morse code when we tested the little coach; and were impressed at how fast it enabled us to build our speed back up again.

The Morse Coach is available for \$49.95 from Microlog.

**THE PORTABLE OFFICE**

How would you like a suitcase communications system with cellular telephone, computer with flip-up data screen and datalink modem, and rechargeable three-way power system?

It's not cheap, but it's not a toy, either. It's the new "Portable Office" from Comm88 (3750 Texas Avenue S., Minneapolis, MN 55426). Price, depending upon options, averages about \$4000.

**NEW ARRIVALS****NEW 900 MHz CONVERTER FROM HAMTRONICS**

Hamtronics, prominent manufacturer of amateur kits and accessories, has announced the release of their CVR-900 converter which covers the 880-960 MHz portion of the 806-960 MHz cellular land mobile band. The new converter complements the previous CVR-800, intended for 806-896 MHz reception when used with a scanner capable of receiving 430-150 MHz.

Other converters are available for extending the limited frequency range of older scanners to 72-76, 135-144, 240-270, and 400-420 MHz. All cost \$88 plus \$3 shipping and handling.

For additional information write Hamtronics, Inc., 65 Moul Road, Hilton, NY 14468-9535.

## SWR? FORGET IT! And You Don't Need a Tuner!

by Bob Grove

One of the most misunderstood phenomena of communications is "SWR," or VSWR (voltage standing wave ratio) as it is more correctly described.

The measurement compares the natural impedance (radio frequency resistance) of the antenna with that of the transmission line. Recently, The AMRAD newsletter excerpted from an article originally appearing in *WORLD RADIO*. With some editing, we present the salient features herein.

\* \* \* \* \*

It all started with my statement that an 80 meter antenna would work on ten meters. We know it works because we've done it. Theoretical arguments against it are in the same league as those that say the bumblebee can't fly.

One stated that such an antenna would have a feedpoint resistance of 140 ohms. All I can say is, "So what?" There would be, yes, an SWR of 2:1. And that condition gets another great big, "So what?" and "Who cares?"

While it is true many feel that an SWR of 2:1 will allow the Republic to fall, let's look at reality.

Assuming a 100 ft. run of RG-8/V foam is being used at 14 MHz, here's what really happens at 2:1. There is a loss of .15 dB. Yes that's right--.15 of a dB.

On some SWR bridges at 3:1, the panel is painted the color red. Condition red results in a loss of .35 dB. Yep, one third of a dB.

Do you know just how meaningless a third of a dB is?

Well, an "S" unit is

6(six) dB, so a loss of .35 dB is only 1/17 of an "S" unit. Instead of being S-9, your report will only be "S-8.94."

And what is 1(one) dB? If you were listening on a pair of earphones to a single tone, and you were told to raise your hand when you detected the slightest increase in volume, you would do so at an increase of 1 dB. Right, it is the barest perceptible change in level--and that is on a single continuous tone.

In order to throw away that 1 dB, you must have an SWR of 6:1. Such a condition (neglecting, for a moment, normal line loss) would be a 50 ohm transmitter, a 50 ohm feedline, and a 300 ohm antenna.

To make the point extreme, we are now going to throw away 1/2(one-half) of an "S" unit. This is the 3 dB point, or half your power. That requires an SWR of 20:1. The condition is: 50 ohm transmitter, 50 ohm line, 1,000 (one thousand) ohm antenna. Your signal has dropped from "S-9" all the way down to "S-8 1/2".

Chuck Phillips  
N4EZV

\* \* \* \* \*

To lend a little perspective, there are instances in which VSWR is a consideration. For example, if you are using a high power transmitter you want to be sure that the high voltages which may build up on the line from excessive VSWR won't damage the feedline or the associated equipment.

For receiving application, the preoccupation with VSWR is even more absurd. We are talking about microvolts

of power, certainly not much of a threat to coaxial cable designed to handle hundreds, or even thousands, of volts!

Some early earth satellites had VSWR measurements in excess of 12:1! And yet reliable communications were no problem.

Not only that, but the receiver and antenna have not yet been made that maintain a constant impedance over a wide tuning range, so why worry about matching a non-existent fixed impedance?

**"ANTENNA TUNERS"**

Properly used, the term "antenna tuner" refers to a coil and capacitor combination located at the antenna for the purpose of providing a unity (1:1 VSWR) match to the feedline; thus, an antenna with a 300 ohm characteristic feedpoint impedance could be matched to a 50 ohm line with no reflected power (VSWR).

The tuning device which is located at the operating position is correctly called a "transmatch"; it provides the same function for the transmitter and/or receiver, matching it to the transmission line.

**PRESELECTORS**

For receivers, antenna tuners and matchers are next for worthless; but preselectors--tunable circuits which provide an extra measure of signal selectivity--may be beneficial.

A passive preselector contains no amplifier and requires no power; its sole purpose is to narrow the swath of signal frequencies being presented to the receiver. This additional RF selectivity reduces the penalties of receiver "front end overload": images, intermodulation, dynamic compression, desensitization, crossmodulation, and audio distortion.



Some receivers offer inherent immunity to these effects through careful design and selection of components; ICOM, JRC and amateur transceivers are good examples. Nearly all other general coverage receivers suffer from these maladies, some more than others.

**PREAMPLIFIERS**

Boosting signal levels before they reach the receiver is a mixed blessing; extremely weak signals may be lifted out of the background noise, but strong signals will also be amplified, aggravating all of the aforementioned maladies. One dB of preamplification increases intermod three dB!

If the preamplifier is tuned, that is, part of an active preselector, it can be useful for weak signal enhancement; but broadband (untuned) preamplifiers should not be used in metropolitan areas or in situations where there are many strong signals.

Next time you are worrying about your antenna system, be concerned with the design of the antenna and the characteristic losses of the feedline, but don't be concerned with the VSWR!

# Correction of a Correction

## Installment IV of a Continuing Saga!

("What we have here is a failure to communicate"; or, "A funny thing happened on the way to the printer"!)

In an effort to extend the frequency coverage on the Radio Shack PRO-30 hand-held scanner, MT presented a short article in the February issue (p.19); unfortunately, the formula submitted by Bob Parnass did not work and has been subsequently corrected below. In the meantime, another reader pointed out an error in another formula (see March p.17, April p.12, and May p.15). So let's try to get it right this time!

Will the REAL formula intended for February's "512-647 MHZ RECEPTION ON YOUR SCANNER" (p.19) please stand up?

$$\frac{3(U) + 7(IF)}{4}$$

where

U = the desired UHF frequency

IF = the scanner's intermediate frequency.

The last paragraph in the section entitled "Technical Explanation" should read:

"One may think of this 7th harmonic as being the sum of the 3rd harmonic, the signal the circuit was designed to produce, and

the unexpected 4th harmonic, described in the previous article."

A decimal point was inadvertently omitted in the third paragraph under "Poor Sensitivity", the IF of the Regency HX1000 being 21.6 MHz, not 216 MHz.

Bob Parnass goes on to explain that while we would like to think the oscillator in our scanner is "clean" (develops no additional unwanted signals), the fact of the matter is that many harmonics are present, any one of which can produce phantom signals right along with those we wish to hear.

In some cases we can use those "undesirable" oscillator harmonics to pick up signals outside of the advertised frequency ranges of the scanners.

### Tuning in on

## The World's Hot Spots

The newspapers and TV newscasts broadcast it daily -- wars, guerilla attacks, assassinations, civil unrest, revolutions -- to such a degree that we become saturated.

But when we listen to worldwide shortwave voices, wouldn't it be nice to have a convenient, comprehensive global reference to pinpoint the action? There is one

source which provides monthly updates on war zones and danger areas for travelers as well as short wave observers: The World Status Map, available by subscription (\$24 for six month trial; \$36 per year) by writing the publisher at Box 466, Merrifield, VA 22116 or phoning toll free 1-800-345-1301.

Excerpts from the March 1985 status map reprinted below show the major hot spots along with comments to better acquaint the reader with the problems.

**AFGHANISTAN** Feb 80 SD Indef. WARNING  
In view of continuing turmoil and insecurity, all American citizens are urged to avoid travel to Afghanistan until further notice.

**ANGOLA** Jan 85  
22 foreign workers at a diamond mine including 2 American crewmen of a supply aircraft were taken hostage during the last week of Dec. Over 200 civilians were reported killed during the attack. 11 foreigners including Americans reported taken during an attack that killed over 200 in the town of Quibela in June. Angola rebels reported having killed 108 soldiers and Cubans, many near Luanda in Aug.

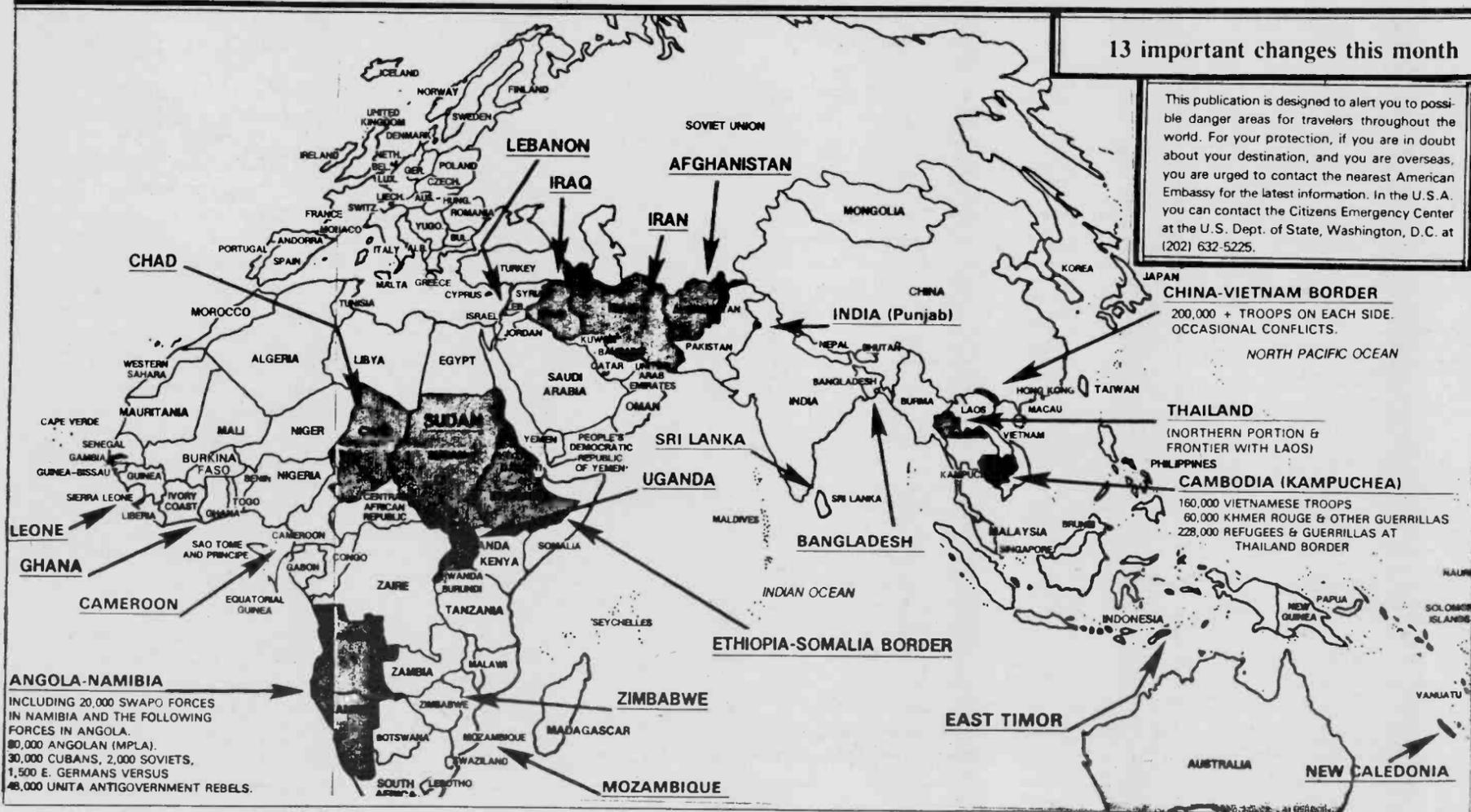
**CAMEROON** May 84 SD 84 24A  
Although the SD advisory remains in effect, the Ambassador of Cameroon informed the World Status Map that conditions have returned to normal in his country. The Dept. of State advises that due to several incidents involving tourist and police or army units, travelers should use caution in Cameroon. Road blocks and checkpoints are numerous, and actions taken by security personnel are at times arbitrary. Young male Americans traveling alone or in groups are particularly at risk because of rumors of mercenary involvement in the coup attempt of April 6. A clean and well groomed appearance might lessen the likelihood of arbitrary treatment.

Vol. 3 No. 3

## Monthly WORLD STATUS MAP for March 15, 1985

### 13 important changes this month

This publication is designed to alert you to possible danger areas for travelers throughout the world. For your protection, if you are in doubt about your destination, if you are overseas, you are urged to contact the nearest American Embassy for the latest information. In the U.S.A. you can contact the Citizens Emergency Center at the U.S. Dept. of State, Washington, D.C. at (202) 632-5225.



**HOT SPOTS cont'd**

**CENTRAL AFRICAN REPUBLIC 5-10-83 SD 83-36A**  
Thefts, purse snatchings, and pickpocketing common especially at the airport. Do not give your luggage to young boys to carry, and never leave your luggage unattended. 5-83 83-31A

**CHAD Nov 84 SD 84-66A Indef.**  
Recommend restrict travel to essential. Sporadic terrorist activity. Check with U.S. Embassy in Ndjamena for latest advisories on travel within country on arrival: 1-2 thousand persons are dying a month due to starvation with as many as 250,000 wandering the drought-parched country in search of food.

**ETHIOPIA Nov 84 SD 84-64A**  
U.S. Citizens may enter Ethiopia only at Bole Int'l AP in Addis Ababa. All tvl outside of Addis Ababa must be approved in advance by the Nat'l Tourism Organization NTO. Tvl within Ethiopia, even with permission, may be difficult and dangerous even though you must be accompanied by an NTO guide. Midnight to 5 am curfew remains in effect in Addis Ababa. Most other areas of the country maintain curfews that vary. It is forbidden to photograph certain govt. bldgs., residences and public places. The need for binoculars must be explained on arrival. All Americans should register with the U.S. Embassy as soon as possible after their arrival in Ethiopia.

**GHANA Sep 84 SD 84-44A**  
U.S. citizens advised not to travel to Ghana except for essential reasons. The chances are great for considerable inconveniences, including strict security checks and other travel restrictions for arriving and departing passengers.

**GREECE Dec 84**  
Three Protestant missionaries were sentenced to 3 1/2 years in jail for proselytizing.

**INDIA Nov 84 SD 84-63A**  
Violence due to the assassination of Prime Minister Indira Gandhi has subsided. However, Americans in India are encouraged to register with the Amer. Embassy in New Delhi or with the Amer. Consulate in Bombay, Calcutta or Madras. Non-Indians planning to tvl to or through the Punjab must obtain a special permit from the ministry of home affairs in New Delhi. Permission is likely to be difficult or impossible to obtain.

**IRAN IRAQ WARNING**  
State of War exists between both countries with air attacks to the capitals of each country.

**ISRAEL Nov 83 SD 83-83A Indef**  
Tourists crossing from Israel and occupied territories into Jordan via the Allenby/King Hussein Bridge must return to Israel via a third country.

**JERUSALEM 3-29-82 SD 82-25A Indef.**  
American citizens planning visits outside Jerusalem to sites on the West Bank should be aware that conditions affecting the safety of travelers can change with little warning.

**KUWAIT 4-19-83 SD 83-28A Indef.**  
No alcoholic beverages to be brought. If inadvertent declare immediately to customs inspector to prevent a charge of smuggling.

**MOZAMBIQUE Apr 84 Indef.**  
U.N. reports deaths due to starvation has reached an extraordinary magnitude.

**PHILIPPINES Dec 84**  
Besides demonstrations in Manila against Govt. of Marcos, the Filipino Communist New People's Army is reported active on 45 fronts in Luzon, Mindanao and other islands. Estimates of up to 10,000 communist guerrillas active in Mindanao. As many as 3500 persons were killed in clashes with govt. troops in 1984.

**SIERRA LEONE Nov 83 SD 83-81A Indef.**  
State Dept. advises that continuing violence and civil disorder in the Pujehun Region of extreme southeast Sierra Leone, affecting road travel between Liberia and Sierra Leone.

**SOMALIA 2-24-83 Indef.**  
State Dept. advises travelers that currency controls are strictly enforced. All foreign currency must be declared on arrival and no one should attempt to leave the country with more foreign currency than declared originally. Offenders are subject to confiscation of all hard currency, significant fines and time in jail.

**SOUTH AFRICA Nov 84**  
All black townships around Johannesburg considered unsafe at this time.

**SUDAN 4-29-84**  
An indefinite state of emergency throughout country declared by President Nimer. Most foreigners have left the Southern region. Three priests, including an American, were kidnapped in Bentiu Sept. 4, 1984.

**SUDAN Jan 85 SD 85-4A**  
For security reasons tourists should not travel in the two southern regions of Upper Nile and Bahr El-Ghazal. Visitors must get permission from the police to change residence from hotel to hotel or city to city. All tvls must register with the police at their residence, within 3 days of their arrival. Arrival in Sudan with ANY liquor result in immediate arrest.

**SURINAME Aug 84 SD 83-55A & 84-53A Indef.**  
Curfew in effect Sun-Thur, midnight to 4 am. Must exchange \$280 on arrival for each adult and \$140 for each child.

**THAILAND Jan 85**  
Artillery exchanges between Vietnamese troops and Thai forces along Cambodian border.

**UGANDA Oct 84 SD 84-56A**  
Dept. of State advises due to poor security conditions only essential tvl is recommended. Casual overland travel is particularly discouraged. Expect official and unofficial roadblocks. Exercise extreme caution if stopped. Any American citizen who plans to tvl to Uganda should make his whereabouts known to the Amer. Embassy in Kampala Tel. 59791.

**UGANDA Aug 84**  
State Dept. describes killing and intentional starvation by army units as "horrendous." Between 100,000 and 200,000 Ugandans have been reported killed in last three years by private refugee monitoring groups.

**USSR 8-25-82 SD 82-50A Indef.**  
Obtain an entry and exit visa before arrival.

**VIETNAM-CHINA Jan 85**  
Occasional conflict between 200,000 + troops on each side of border. In Apr 84, several hundred Vietnamese soldiers were killed or wounded. Heavy shelling late July and Dec. 84.

**ZAIRES Nov 84**  
Town of Moba, on the shore of Lake Tanganyika, taken by 100 rebels and freed by govt. troops in early Nov. At least 10 civilians including a Canadian priest were killed by the rebels.

**ZIMBABWE Nov 84 SD 84-68A**  
Due to uncertain security throughout the country only air travel is recommended. If visa, reason for visit, itinerary, sufficient funds and onward ticket cannot be demonstrated, traveler must leave on next flight out.

# TUNE IN Canada's "Bush Telephone"

The vast Canadian expanse offers an unusual challenge for personal communications. The northern territories in particular extend for enormous distances without readily-accessible telephones.

A provision of the Canadian government allows many frequencies in the short wave spectrum to be used for single sideband voice communications. Many

of these are listed in the SHORTWAVE DIRECTORY from Grove Enterprises.

Let's take a look at one particular network--the Northwest VHF and HF-SSB radiotelephone service operating out of Whitehorse, Yukon.

On the map below we see

the zones served by the VHF-FM service; channel identifiers are shown in the box at the lower right.

HF-SSB terminals in Whitehorse, Ft. Nelson and Hay River utilize the following table (all frequencies in kHz, upper sideband mode):

LOCATION	CALL SIGN	BASE	MOBILE	CHANNEL
Ft. Nelson	CFY79	5222.5	5009	1
Hay River	CHB615	5396	5856	3
Whitehorse	CFY82	5215	4950	4

We would like to thank MT reader Ron Tull for sharing this information with fellow monitoring enthusiasts.



## VEHICLE THEFT ALERT TRANSMITTERS

A new series of vehicle theft transmitters being released by the Archer home electronics division of Radio Shack utilizes frequencies in between CB channel allocations.

The tone encoded signals operated at a power of one-half watt and may be heard at distances in excess of one-half mile on 26.995, 27.045, 27.095 and 27.195 MHz.

The transmitters may be custom coded by the owner to

alert a companion receiver carried by the user if the vehicle is entered by an unauthorized person.

### SPIDER MATH

Mark this as truly awesome,  
How does the spider work  
it--

Spins his geometric web  
Without a printed circuit?

...John F. Keefe

## Looking Back...

### Little Known Facts

#### On The Origins Of Wireless Signalling

Excerpted from  
The W5YI Report  
by Paul Maia

The electric telegraph has a complex and disputed ancestry. America, Russia, Germany and England have approximately equal claim to its origin. While Samuel Morse is remembered above most of his rivals, he was very far from being the first man to transmit information by electricity!

The history of the electric telegraph is generally considered to have begun on February 13, 1753, thirty-eight years before Samuel Finley Breeze Morse was even born! It was then that a remarkable letter, signed by a certain "C.M." (whose identity has never been established) was published in "Scots Magazine."

He proposed that a "set of wires, equal in number to the letters of the alphabet, be extended horizontally between two given places, parallel to one another and each of them about an inch distant from the next to it."

The letter goes on to explain in detail how the wires are to be connected to the conductor of an electrostatic machine when it is desired to signal a particular letter. It was, of course, known since early times that electrostatic forces would attract small pieces of paper and "C.M." had bits of paper under metal balls suspended from the alphabet wires. The idea was to use electricity from the machine, channel it through one of his wires and

let it attract the corresponding pieces of paper with its letter of the alphabet on the receiving side.

All of the principal elements of the electric telegraph were present -- a source of electricity, its manipulation to handle the information to be transmitted, the wire conductors and the mechanism on the receiving end to read the information sent.

Eighty years later (during the 1830s), Samuel Morse, who mistakenly thought his was a new idea, devised his telegraph using the newly discovered electromagnet. He was 41 at the time. His original dot/dash device sent only numbers which had to be cross referenced to a number-word dictionary!

Morse dispensed with the dictionary in 1838 when he discovered the human brain could transcribe the telegraph clicks directly into letters. (Telegraphy tones didn't make their debut until the 1900s!)

Another Morse myth is that the first message sent by telegraph was "What Hath God Wrought!". Actually that biblical quotation (selected by his secretary) merely signalled the opening of the first intercity line between Washington, D.C. (Capitol Building) and Baltimore. It took place six years after Morse perfected his dot/dash code. It did, however, mark the first commercial use of telegraphy.

Strangely, Morse's greatest skills were in the

art rather than the electronics world. Had he died in 1832, he would have been remembered today as a major influence in American art. After completing college at Yale, he studied painting in England and was a world reknown portrait artist! Morse even ran for mayor of New York, and for the Congress, but was defeated. He died at age 80 on April 2, 1872.

It was customary for the early telegraphers to use number codes, the early ancestor to today's "Q" signals. I am at a loss to explain how anyone would feel "Q" (and the later "Z" signals used by the military) were an improvement on them since they take longer to send.

We all know that "73" means "Best Regards" -- but do you know some of the others that were widely used during the early days? You have probably seen "30" (meaning "End of story - no more") and "44" (for "Answer immediately"), but did you know some of the others such as "1" (Please wait); "3" (What is the time?); "5" (Have you anything for me?); "7" (I have traffic for you); "9" (Priority mes-

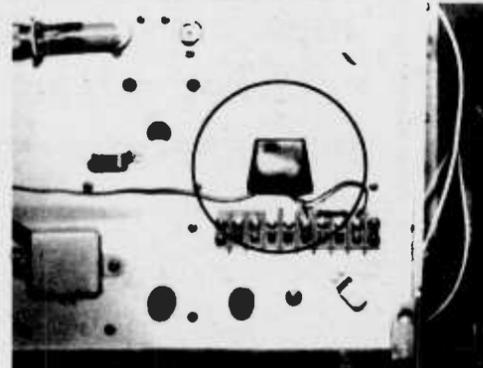
sage); "22" (Unable to copy, please adjust your equipment); "25" (I am busy on another circuit); "77" (Are you ready to start?); -- or "92" (Deliver immediately)? There were many, many more.

And while we are discussing early non-verbal communication, I researched the forerunner of electric code signalling. Before electricity was discovered, "semaphore" (from the Greek "sema" and "phore" meaning sign bearer) flag signalling was used. Interestingly, semaphore got started in France as result of a prank with schoolboys devising a system so that they could send messages back and forth between two schools!

The French government immediately applied semaphore to military signalling. Later, semaphore was widely used by sailors holding flags in different positions to signal oncoming ships. Even today, the railroad industry uses a variation.

Signalling has come a long way... from jungle drums, signal fires and reflective mirrors to space communication through satellites. I wonder what is next!?

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**VIEWPOINT cont'd from p.3**

Thank you for the information on how to QRT the processor noise in the MX5000. Cut mine down by about 95%. The information was worth at least a years subscription. Also enjoy KBlF Dave's writings. Keep up the good work.

David Montgomery  
Little Rock, AR

>>><<<

Re your article on page 8 of MT March 1985, I punched up the 3466 kHz mentioned on my R71 and immediately found that the signals on this band were second harmonic of the FM wireless telephone signals in the 1700-1800 kHz band, rather than bootleggers.

Frank Decker  
Syracuse, NY

(Nice sleuthing!...Bob)

>>><<<

Any chance that the addresses could be included over the author's article? That way readers would or could write direct to the source.

Howard Ragan  
Cornelius, OR

(Mailing addresses of our columnists and writers are included when authorized, otherwise we forward correspondence to them if accompanied by an SASE. This way the authors know they won't be deluged with mail with no prepaid postal relief. We urge writers to advise if they would like their addresses published with their bylines...ed.)

>>><<<

When will the industry wake up? We all, no doubt, have our "dream scanners", but my "dream scanner" has features currently in use; however, not on the same unit:

Feature:	Found on:
50 ch memory	BC300
service search	BC300
fast srch & scan	BC300
Search & store	BC250
Hold, step, resume on search	BC300
Wide Freq. Cov	MX4000
	MX5000
AM/FM each ch.	MX5000
Delay each ch.	BC300
Direct ch. access	BC300
24 hour clock	MX5000
3 watts audio	BC260
front mounted speak	BC260
Internal battery for portability	MX4000
Bright backlight for LCD readout	PRO30
BHC ant. conn	MX5000
programmable search increments	MX5000
Belt clip	PRO30

I would buy a base and a handheld with the above features. Thanks for listening.

Lewis Harvey  
Savannah, GA

>>><<<

This morning I called Senator Sasser's Nashville contact office to say that there is no need for this nation's constantly putting our military and foreign service personnel on the spot, and in danger of losing their lives by sending them into areas to photograph antennae fields to determine operating frequencies when any signals transmitted via radio are always being monitored, and in fact, published and available to the public.

I did not intend to cast any ill feeling upon you or Grove Enterprises, but informed him of your MT and other of your publications.

I hope that you can do an article soon on this subject!

I only want to help in some way to bring the present, war-maddened administration to its senses before we all get what's coming to us, and get shot by the Soviets! How much more can they take? MX of late is rubbing their nose in Reagan's you know what!

Malcolm P. Nichols  
Franklin, TN

(For years it has been common practice for FCC mobile vans to measure remotely the output of nearby transmitters simply by monitoring the intensity of the signal at a known distance...ed.)

# WGU20: A FEMA UPDATE

by Bob Grove

Many low frequency listeners have reported hearing strange voice broadcasts of time signals at 179 kHz, inquiring of MT as to the source of these unusual transmissions. We presented an update in an earlier issue, but new developments are worth reporting.

At one time WGU20 was a prototype transmitter built as part of the Emergency Broadcast System (EBS) to provide early attack warning information to federal, state and local government agencies.

Located at Chase, Maryland, just across the Gunpowder River from Edgewood Arsenal and 14 miles down-range from Aberdeen weapons testing center, WGU20 is often bathed in a barrage of artillery sounds booming from both neighboring installations.

Capable of up to 50 kilowatts of RF power, WGU20 will resume its transmissions sometime in the near future, possibly as early as this month, in full carrier AM (pulse width modulated), although it is capable of frequency shift keying radioteletype.

Part of the Federal Emergency Management Agency (FEMA), newer systems in the EBS network are also capable of single sideband emission.

The present equipment shutdown was a necessary

part of the complete equipment overhaul; thousands of bipolar transistors are used in the transmitter, each requiring precise current balancing, and less vulnerable power N-FETs are not available for replacement.

The block building itself is EMP (electromagnetic pulse) hardened to survive the electrically destructive effects of a nearby nuclear detonation as are similar modern enclosures for survivable communications centers in the FEMA network.

At this writing there is still no word on how the 160-190 kHz band will be apportioned between FEMA and GWEN (Ground Wave Emergency Network) installations.

## Ten-Ten International: A Follow-up

In a recent issue we published a response to a question about the amateur Ten-Ten International Net which had only partial information. Licensed amateurs who wish to inquire about Ten-Ten may send an SASE to Robert Hartley, W6WPY, Secretary, 10-10 International Net, 16808 Ardath Ave., Torrance, CA 90504.



## NEW SHIPS ASSIST COAST GUARD DRUG ENFORCEMENT

In October 1982 Bell Halter, Inc., delivered two 110 foot, 150 ton surface effect ships (SES) to the United States Coast Guard for drug interdiction duties in the Gulf of Mexico and Caribbean. Three SEABIRD class SES are now operating for the Coast Guard.

The interception of drug-running vessels from Central and South America has become a joint effort among the Coast Guard, military services, and the departments of Treasury and Justice.

Short range communications are often conducted on VHF and UHF frequencies, while long range coordination is often heard on short wave (HF) single sideband. A comprehensive list of Coast Guard and military frequencies is found in Bob Grove's SHORTWAVE DIRECTORY (\$12.95 postpaid from Grove Enterprises, P.O. Box 98, Brass-town, NC 28902).

## What Do the Abbreviations Mean?

As with all radio communicators, the Coast Guard has shortcuts to convey maximum information in a minimum of time. MT reader and Coast Guard monitor Herb Depke fills us in on a few.	PF	Personal flotation device	
Herb Depke Westminster, MD	PIW	Person in water	
	POB	People on board	
	POD	Probability of detection (given during SAR as a percent based on target being searched for and conditions)	
SAR	Search and rescue	RCC	Rescue control center
DMB	Datum marker buoy (VHF transmitter dropped into water for search and rescue.)	SCN	Systems coordination net
		"NO JOY"	Unable to make radio contact



First operational surface effect ships in U. S. service: USCGC SEA HAWK (WSES-2) and USCGC SHEARWATER (WSES-3).

## MARITIME MOBILE STATIONS OFFER INTERESTING LISTENING

A recent article by Gordon West in *WORLD RADIO* is worth sharing with our readers who may be looking for something different. The amateur networks constantly relay personal messages and safety communications, while other channels carry similar traffic from non-hams.

Considerable debate continues to reign over the international amateur maritime nets; some critics claim that the nets are used to handle non-amateur or safety communications, while others assert that many of the check-ins are from unlicensed "pirates" with bogus call signs.

In any case the frequencies listed below are found to provide intrigue. A comprehensive list of ship

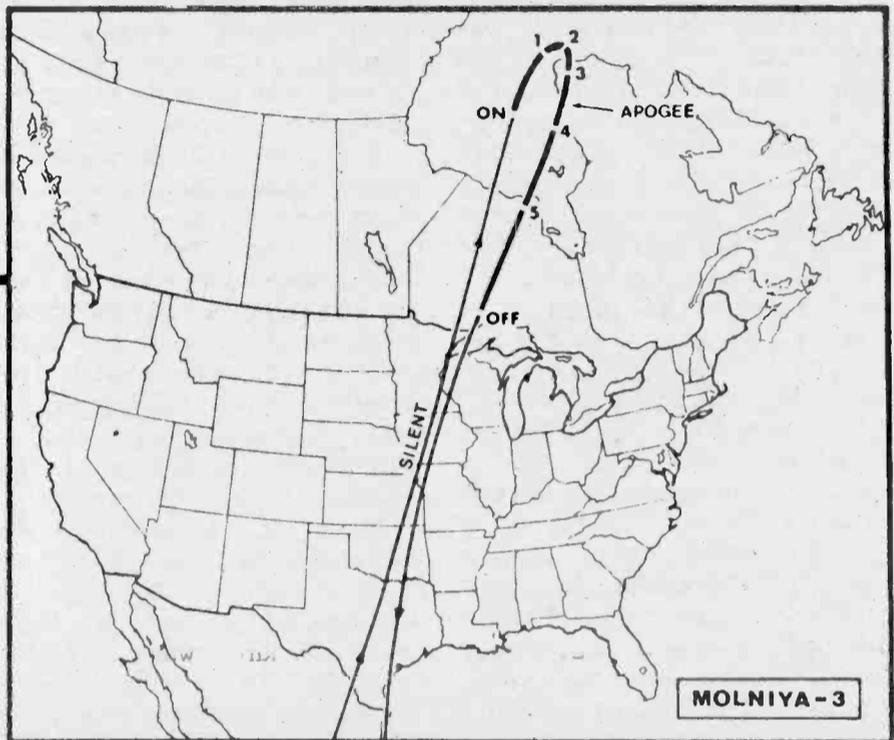
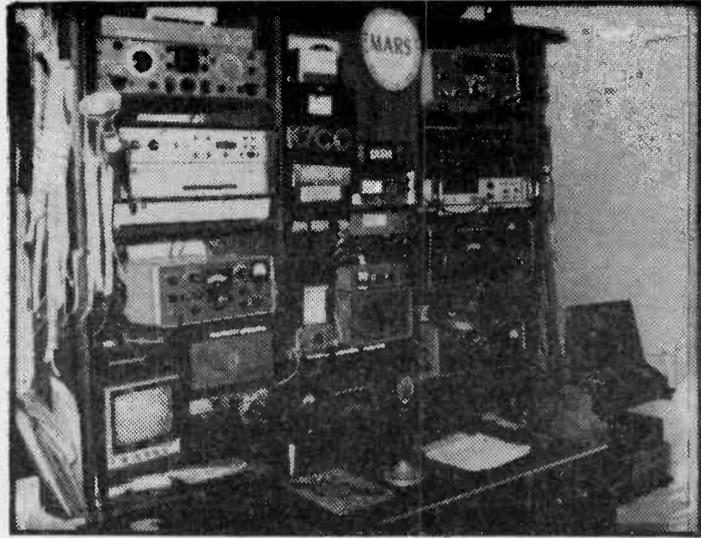
# PROFILES

MT reader Bart Paine of Tucson, Arizona is enjoying a very active retirement. Bart has enclosed a photo of a portion of his monitoring post and enjoys just about every aspect of monitoring the spectrum one could imagine.

Bart included a satellite path map of the Russian Molniya satellite (see MT January, 1985) for reference.

The equipment in use at Bart's listening position includes three scanners, a Collins UHF receiver, a VLF receiver, and several Grove antennas, preamps, and a Scanverter for 225-400 MHz reception.

to shore frequencies is found in Bob Grove's *SHORT-WAVE DIRECTORY*, available for \$12.95 postpaid from Grove Enterprises.



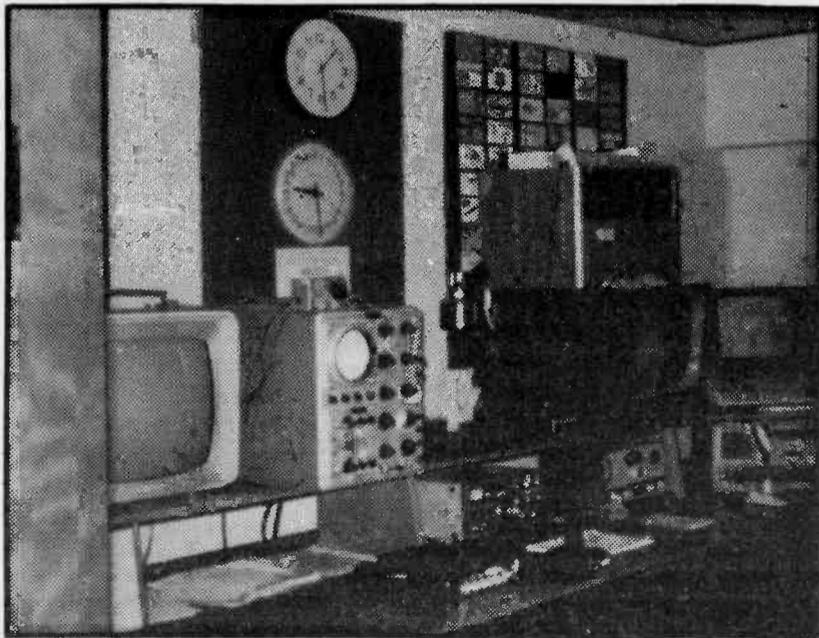
MOLNIYA SATELLITE PATH OVER U.S.

### Maritime Mobile Frequency Directory

Services	TX	RX
Ham — Local nets	7.235 MHz	Simplex
Ham — Local nets	7.285 MHz	Simplex
Ham — Pacific nets	14.313 MHz	Simplex
Ham — Pacific nets	14.340 MHz	Simplex
Ham — Worldwide nets	21.404 MHz	Simplex
Ham — Marine nets	28.500 MHz	Simplex
Marine — Emergency, Coast Guard	2.182 MHz	Simplex
Marine — Ship to ship local	2.096.5 MHz	Simplex
Marine — Races, 4A	4.125 MHz	Simplex
Marine — Races, 8A	8.291.1 MHz	Simplex
Marine — Worldwide, 12A	12.429.2 MHz	Simplex
Marine — Worldwide, 16A	16.587.1 MHz	Simplex
Marine — Worldwide, 22A	22.124.0 MHz	Simplex
Marine phone — KMI local	4.063.0 MHz	4.357.4 MHz
Marine phone — KMI local	4.109.5 MHz	4.403.9 MHz
Marine phone — Mexico, KMI	8.204.3 MHz	8.728.2 MHz
Marine phone — Mexico, KMI	8.219.8 MHz	8.743.7 MHz
Marine phone — Mexico day, KMI	12.330.0 MHz	13.100.8 MHz
Marine phone — Worldwide, KMI	16.463.1 MHz	17.236.0 MHz
Marine phone — Worldwide day, KMI	22.040.3 MHz	22.636.3 MHz
Marine — Coast Guard, local	4.134.3 MHz	4.428.7 MHz
Marine — Coast Guard, Mexico	8.241.5 MHz	8.765.4 MHz
Marine — Coast Guard, worldwide	12.342.4 MHz	13.113.2 MHz
Marine — CG, worldwide, day	16.534.4 MHz	17.307.3 MHz

**WEATHER:** Weather broadcasts from KMI phone station at 0000, 0600 and 1500 GMT on 4.357.4, 8.728.2, 13.100.8 and 17.236.0. Traffic lists every three hours beginning 0000 GMT.

## MONITORING POST



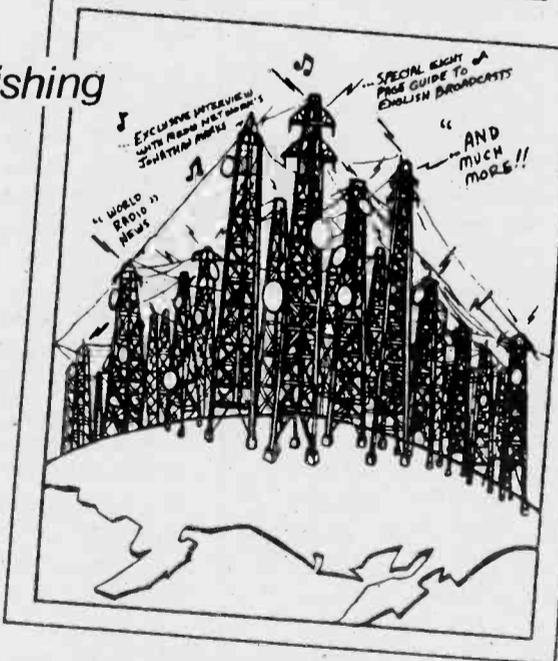
Baltimore Radio Amateur Television Society (BRATS) operating position at the Maryland Science Center (1983 photo). (See Club Corner, p. 24)

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# RX4M-- Anatomy of a Pirate Bust

by  
William J. Martin

1980 was a vintage year for pirate radio enthusiasts--listeners were regularly treated to broadcasts from such well known stations as Radio Confusion, the Voice of Syncom, and KVHF from California. As the popularity of these and other U.S. pirates grew, the Federal Communications Commission's Field Operations Bureau (FOB) launched a nationwide campaign to shut down as many of the pirates as possible in order to publicize its willingness to commit the manpower needed to combat what it saw as an alarming trend towards unlicensed broadcasting in this country.

One of the pirate stations that was included on the FOB's "hit list" was a west coast station using the enigmatic callsign, "RX4M--The Voice of Clipperton," which first appeared on the scene in the latter part of 1979 with test transmissions. During the next twelve months RX4M would regularly take to the air on frequencies in the 41 and 13 meter bands, attracting listeners all across North America and overseas. Inevitably, however, the station's popularity and adherence to a regular schedule of transmissions enabled the FOB to locate and close the pirate transmitter.

This is the story of the events leading to the closing of RX4M by FOB engineers on the night of October 25, 1980. In many ways the story is illustrative of the methods still used by the Field Operations Bureau to DF, gather evidence against, and close down pirate radio stations in this country.

## BACKGROUND

The first DX report of RX4M was broadcast via Radio Sweden's popular listeners program, "Sweden Calling DX'ers" in April, 1980. The information sent to SCDX'ers, supposedly from a listener in California, stated that a new pirate, using the callsign of RX4M, would soon begin transmissions from the Seattle, Washington area on frequencies in the 41 meter band from 0500 to 0530 GMT every

evening but Sundays.

Numerous DX'ers logged the station during the following months on a variety of shortwave frequencies, including 7370 kHz, 7374 kHz, and 7390 kHz. Each transmission began with RX4M's interval signal, after which the station often included a brief news program before airing their feature programming--usually tape recordings of classic radio shows from the 1930's and 1940's. Favorites such as "Gangbusters," "Fibber McGee and Molly," and "Amos and Andy" were heard over The Voice of Clipperton.

To further publicize its operations, the station issued a press release in August of 1980 which was subsequently reprinted in FRENDEX--the monthly journal of the North American Short Wave Association (NASWA), read by over 2000 shortwave listeners. Unfortunately for the operators of RX4M, FRENDEX was at that time also read by the engineers at the FCC's Field Operations Bureau!

In part, the press release stated that "The Voice of Clipperton, RX4M, is privately owned and managed by a group of young men interested in shortwave listening, and who are avid promoters of free broadcasting without government supervision...(in addition to classic radio programs) the departments of the station include--P.O. Box 80 (our mailbag program with Aaron Richardson), News (with Tony Giles), Let's Talk Technical (with Larry Adams), and the Good Morning Show (with Jerry Nelson)."

Not content merely to announce the existence of their station, RX4M's press release went further and advised listeners to watch three frequencies--4810 kHz, 7390 kHz and 9620 kHz, the first two frequencies to be used by a 100 watt transmitter and the latter frequency to be used with only 20 watts. Listeners were advised again to look for the Voice of Clipperton every evening except Sunday from 0550 to 0630 GMT.

The press release was issued by one "Arthur Johnstone," claiming to be the Vice President of RX4M, and

included a return address in Alameda, California. The envelope sent to NASWA, however, was actually postmarked from Yakima, Washington--a fact that was noted immediately after the publication of the press release in the NASWA bulletin.

## THE FCC SCRAMBLES ITS FORCES

Contemporaneous with the station's "successful" publicity campaign, RX4M began using frequencies in the 13 meter band and owing to the relatively high level of sunspot activity was being heard at great distances. Overseas listeners reported the station on 21750 kHz, and the station was logged on October 23, 1980 by well known pirate listener, John Santosuosso in Florida--at a distance of 3000 miles from the station--with fair signals.

On the evening of October 23, 1980, however, the SWL's were not the only ones tuned to RX4M's distinctive brand of programming; the FCC's monitoring network had been alerted by Washington to look for RX4M as a result of the FRENDEX press release and obtained a "Class A" direction finding fix on the transmitter. As a result of the DF, the FCC Monitoring Bureau triangulated the location of the RX4M transmitter to be at the coordinates of 47.44 North and 122.11 West...in other words, just north of Seattle, near Bothell, Washington.

On October 24, 1980, Acting Chief Ralph A. Haller of the FOB's Enforcement Division contacted the Seattle FCC field office to request that they conduct a "close-in" DF of the station, gather evidence against RX4M, and shut the station down. Haller further advised the Seattle office that RX4M was at that time maintaining a fairly consistent broadcast schedule which included one transmission each night at 0035 GMT on the 21750 kHz frequency, then again at approximately 0445 GMT on 7355 kHz.

It was agreed within the FCC that the investigation and close-in DF of RX4M would be a cooperative

effort between the Seattle field office and the FCC's nationwide monitoring network. Inasmuch as the shortwave radio propagation could result in RX4M's signals "skipping over" the Seattle office's mobile units, it was agreed that the monitoring network would have primary responsibility for confirming when the station was on the air, alerting the field units, and providing the field units with additional direction finding information.

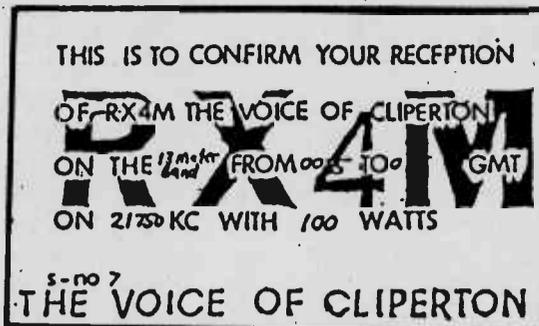
## THE SEATTLE FIELD OFFICE CLOSES IN

The Seattle field office assigned two mobile units to be on alert for RX4M during the night of October 24, 1980. Seattle Engineer-in-Charge (EIC) Gary P. Soulsby took one of the office's MADF vehicles and positioned himself on high ground at a major intersection southeast of Bothell, Washington. The other engineer assigned to the case, Dennis Anderson, used one of the office's CB investigative vehicles and parked northwest of Bothell.

At approximately 0035 GMT, the monitoring network advised Soulsby and Anderson that the station had started its transmission on 21750 kHz, and both of the engineers in the mobile units detected weak signals apparently coming from a location to the south of their vehicles. Soulsby traveled south on Interstate 405 and then turned east in search of the station; however, he was hindered in his efforts to DF the station by a torrential rainstorm and rush hour traffic.

Anderson also turned south, but had better luck in DF'ing the station. Taking Interstate 5 west of Lake Washington, Anderson traced the signal to a suburban area in northern Seattle. By the time RX4M ended its early evening broadcast at 0115 GMT, Anderson had pinpointed the station's location as being one of several houses on a cul-de-sac at N.E. 96th and 42nd Avenue, N.W. within the city.

At 0120 GMT, RX4M resumed transmission on 21750 kHz and for the next 9 minutes transmitted an unmodulated carrier. During this apparent test, Anderson was able to positively locate the site of the transmitter by using his investigative vehicle's "left/right" and "front/back" DF bearing indicators.



RX4M cont'd

When RX4M's test was completed and the station closed at 0129 GMT, Anderson first made a note of the DMV license plate numbers for all automobiles parked in front of the subject's house, then departed to meet Soulsby at a prearranged rendezvous point.

The two engineers returned to the house at approximately 0400 GMT to prepare for the anticipated broadcast on 7355 kHz at 0445. When the engineers arrived, they noted that one of the automobiles previously parked in front of the house was gone. Soulsby parked his vehicle in the cul-de-sac so as to have a good view of the front of the house, while Anderson parked two blocks away and also awaited the start of the 0445 GMT broadcast.

At 0445 GMT, the automobile that had previously been noted by Anderson returned to the house and Soulsby observed three adults go inside. Approximately three minutes later, RX4M took to the air and began broadcasting music over 7355 kHz. Soulsby and Anderson heard a deep male voice identify the station as "RX4M, The Voice of Clipperton" and after a short news bulletin, the station began to air a Sherlock Holmes radio mystery.

Soulsby used the mobile direction finding gear in his vehicle to confirm the location of the transmitter, then went out on foot with a Mason receiver and one of the FCC's RF sniffer to obtain additional evidence. By 0500 GMT, both engineers were convinced that the transmitter was located in the house that Anderson has initially suspected. Anderson used the cassette tape recorder in his vehicle to make a monitoring tape for use as evidence against the station's operators and for voice correlation.

At 0502 GMT, Soulsby and Anderson agreed to attempt an inspection of the station. Anderson continued to let the tape recorder in his vehicle run, while the two engineers went to the front door of the house and requested permission to enter and inspect the station.

According to FCC sources, the transmission on 7355 abruptly ceased once the engineers announced the purpose of their visit. A few minutes later the engineers were met by a young man whose voice he immediately recognized as the announcer with the deep voice of RX4M.

Although the FCC engineers did not have a search warrant, the station's operator, identified in subsequent news reports as 23 year old James T. Dolan, granted them permission to enter his parent's home and inspect his station. When asked, Dolan admitted operating the station and reportedly told the FCC engineers he knew it was illegal.

The station's transmitters included a crystal controlled Globe Scout Deluxe, which the FCC engineers inspected and measured the RF output to be 46 watts, and a surplus TC-8 Navy transmitter of indeterminate RF output. The VFO of the TC-8 was set at 7355 kHz and the FCC agents noted that the RF output tube for that transmitter was still warm to the touch.

During the inspection, the engineers completed an FCC Form 835 "Warning Letter" and delivered it to Dolan. In addition, the engineers advised Mr. Dolan that the case would be referred to the FCC's legal department for consideration of further action against him for the unlicensed operation on the short wave bands.

By 0530 GMT, EIC Soulsby notified the FCC Watch Officer in Washington, DC that the station had been located, inspected, and a written warning issued to the operator.

Shortly thereafter, the following message was sent from Ralph Haller of the FCC Enforcement Division to each of the thirteen monitoring station supervisors via the FCC's internal teletype network:

"Re: RX4M Voice of Clipperton--As a result of {the DF bearings provided by the monitoring net}...the Seattle office was assigned the task of locating the subject. We are very pleased to be able to inform you that based on your HF DF fixes the Seattle office located the subject in 20 minutes from the time he next came on the air...both {DF} fixes were within 5.5 nautical miles of the subject. Please extend my personal congratulations and thanks to our staff for a job well done."

THE ENDGAME

On November 6, 1980, RX4M wrote to Listeners Notebook editor Glenn Hauser of NASWA and advised him that "after 1 year and 2

months of continuous broadcasting, RX4M has been forced off the air by the FCC...We feel that our termination was premature, as we were left with enough half hour, unused, old-time radio programs to last for the next eight years...Thank you for your interest in our station--we shall return!"

Despite the upbeat reaction of the station to its closing by the FCC, to my knowledge RX4M was never again heard by any shortwave listeners.

On November 10, 1980, the Seattle field office of the FCC issued a "Notice of Apparent Liability" (NAL) to James T. Dolan, ordering him to pay a monetary forfeiture of \$750 under Section 503 (b) of the Communications Act of 1934, as amended. No criminal charges were ever filed against Dolan.

The FCC had fined and silenced the operator of RX4M for good, just as it had been successful in shutting down several of the other popular pirates in late 1980 such as Jolly Roger Radio and KVHF. Still, as is usually the case in the world of pirate and clandestine radio, other stations came along to fill the void left by their passing.

## FEDERAL COMMUNICATIONS COMMISSION

FIELD OPERATIONS BUREAU

November 10, 1980

315,3501-001

ALBUQUERQUE FIELD OFFICE

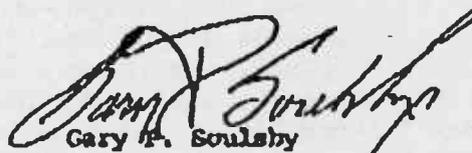
3256 Federal Building  
915 Second Avenue  
Seattle, WA. 98174CERTIFIED MAIL #9761872  
RETURN RECEIPT REQUESTEDMr. James T. Dolan  
[REDACTED]  
Seattle, Washington [REDACTED]RE: Restricted Radiotelephone  
Operator Permit issued  
September 12, 1975

Dear Mr. Dolan:

This is a Notice of Apparent Liability to Forfeiture. You appear to have willfully violated Section 301 of the Communications Act of 1934. Specifically on October 24, 1980, you operated a radio station on 7355 kHz and 21750 kHz without having a license to do so.

You are therefore apparently liable under Section 503(b) of the Communications Act of 1934, as amended, to a monetary forfeiture of \$750. You are required to reply to this notice within 30 days of your receipt of this letter. Use the enclosed Form 793-R. Instructions are on the form.

Sincerely,

  
Gary F. Soulsby  
Engineer in Charge

## CLUB CORNER

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

With increasing numbers of DX'ers using computers to aid them in their hobby (and the receivers which directly use a computer, either out-board or built-in), it's worth mentioning again that ANARC has a computer committee whose task it is to compile public domain DX computer programs and pass them along to hobbyists. They're happy to send you a list of their library of programs for an SASE.

As might be expected, there are more programs for the Commodore 64/VIC20 than for others, but you'll find Apple II, TRS-80, Timex/Sinclair, and Microsoft Basic programs, too. They're always happy to add programs that you've written to their library. Send your SASE to ANARC Computer Information Committee - 6700 153rd Lane NW, Anoka, MN 55303.

While we're on the subject of ANARC, we'll remind you to make plans for their convention in Milwaukee July 19-21. Send an SASE for information to ANARCON '85 - c/o Mike Knitter, P.O. Box 24, Cambridge, WI 53523. I hope I'll see you there.

Finally, the "ANARC Newsletter" (now a monthly 12-pager) has expanded Harold Sellers' "Marketplace Report" column to include receiver reviews, a most welcome addition, especially since the untimely end of IDXCSD's bulletin, which always contained incisive reviews of receivers and other equipment.

Although most clubs include occasional reviews of receivers in their bulletins, coverage is spotty; the expansion of "Marketplace Report" should correct this problem. If you'd like to start receiving the "ANARC Newsletter" (and why aren't you receiving it now, may I ask?) the annual subscription price is \$7.50 in North America, \$10.00 elsewhere: 1500 Bunbury Drive, North Whittier, CA 90601 USA.

SCADS is going to college again...yep, the next Southern California Area DX'ers meeting will be at Golden West College May 11, from 9:30 AM to 3:30 PM, at Golden West St., Edinger Avenue, Huntington Beach, CA. Send an SASE to Director Don R. Schmidt if you need more information: 3809 Rose Avenue, Long Beach, CA 90807-4334. The June 15 meeting will feature Bill Pasternak, WA6ITF, of the "Westlink Report", by the way. They always have a nice display of equipment;

at the February meeting, for example, we were able to preview the J.I.L. SX-400 receiver and the Yaesu FRG-8800, both hot new rx's.

ADXR's "DX REPORTER" mentions that the Old Dominion DX Association is a "loose group" (sounds like my kind of people, hi!) of about 12 DX'ers in the Norfolk-Newport News area who are trying to make contact with DX'ers and SWL's in Tidewater. If you live in this area and would like to know more, contact Lynn Burke at 703-877-9015, Ray Gilley at 703-838-6494, or David Jones at 703-420-9015.

If you own a Sony ICF-6800W, you should consider joining Douglas Hopkinson's group which exchanges information about this fine rx. They'll be publishing a monthly bulletin on a "shoe-string" budget, so they'll appreciate your SASE. Contact Doug at Suite 1012, 1360 York Mills Road, Don Mills, Ontario, Canada M3A2A2. If you live outside of Canada, include an IRC with your self-addressed envelope.

When I was teaching high school, I had my fill of brats, but when these "BRATS" get together, good things happen: The Baltimore Radio Amateur Television Society is planning their Eighth Annual Maryland Hamfest and Computertfest Sunday, July 28, 1985, at the Howard County Fairgrounds, 15 miles west of Baltimore (off I-70 at Rt. 32 on Rt. 144).

Last year they stuffed the exhibit hall there with 175 tables of exhibits, and if you'd like to join them this year as an exhibitor or just a spectator, send an SASE to Mayer D. Zimmerman, W3GXX, P. O. Box 5915, Baltimore, MD 21208, specifying whether or not you need a request form for table reservations. They even have hook-ups available for RV's...what more could you ask for?

Let's move a little further west for another ham/computer swapfest/exposition. Gary C. Hart sends us notice that the North Area Repeater Association will sponsor Minnesota's largest swapfest and exposition for amateur radio operators on Saturday, June 1, at the Minnesota State Fairgrounds in St. Paul (free overnight parking of self-contained campers is also provided). For more information, send an SASE to Amateur Fair, P.O. Box 857,

Hopkins, MN 55353, or call 612-566-4000.

If you are a ham and have ever served with or been assigned to an armored unit of the U.S. armed forces or its allies, you're eligible for membership in the AFAR NET, the Armored Force Amateur Radio Nationwide Emergency Team, which provides an emergency capability for use in the event of a national emergency. And what better way to get acquainted than to attend their "Eyeball Bivouac" at Fort Knox, KY June 7-9, 1985?

If you'd like membership information, send an SASE to Harry B. Thomsen, W2PJH, 348 Jefferson Avenue, #15, Canandaigua, NY 11424. For Bivouac info, send a second SASE to Carl Quickmire, WB4UBS, 6341 Cloverdale Drive, Columbia, SC 29209. Their net runs daily schedules and uses both SSB and CW modes.

Canada's largest open SW club has--until now--escaped coverage in "Club Corner", but club secretary Don Moman has reminded us of our omission of CIDX, the Canadian International DX Club. An ANARC member, CIDX (through its monthly bulletin, the "CIDX Messenger") stresses SWL but also covers LW, MW, TV, and FM DX. Their unique "Arctic DX" column covers both Arctic and Antarctic DX, "QSX" covers utility topics, and a dozen or so other columns cover DX, equipment, veries, schedules, opinions, technical topics, etc...in other words, a complete coverage in one bulletin.

If you'd like more information about this international club, send a self-addressed envelope and two IRC's to CIDX, 6815 12th Avenue, Edmonton, Alberta, Canada T6K 3J6. Better yet, send \$19 (Canadian, or \$18 US) to join up right away.

Another new DX group is the Capitol DX'ers, who already have published seven newsletters. Their base of operations is in Sacramento, but they're interested in attracting DX'ers interested in the SW and BCB bands from the western US. For a sample bulletin, send an SASE (39 cents) to Philip D. Reefer, 2021 Wright St., #19, Sacramento, CA 95825.

### THINGS I LIKE

I like NASWA's depth of coverage in all topics in their monthly bulletin, FRENDX. There's no dearth of details about loggings, technical topics, feature items, or anything else here. You'd expect to find a lot of information in a 58-page bulletin, and NASWA

provides it.

A few more convention reminders...The National Radio Club, in Rhode Island Aug. 30-Sept. 2 (Craig Healy-66 Cove St., Pawtucket, RI 02861)...International Radio Club of America, Portland, OR (P.O. Box 26254, San Francisco, CA 94126)...Worldwide TV-FM DX Assn., New Orleans (P. O. Box 514, Buffalo, NY 142050. Some of the times are not firm as I type this in early March, so be sure to check with the groups first before nailing down your vacation plans. And that's it for this edition of "Club Corner"..remember to get things to me by the tenth of each month..our next deadline, May 10 will be for the July issue. 73.

### INTERESTED IN JOINING A REGIONAL SCANNER CLUB?

The ALL OHIO SCANNER CLUB is in the process of expanding its area of coverage to include the states of Indiana, Kentucky, Michigan, Pennsylvania, Tennessee, West Virginia, and Ontario, Canada. Members are welcomed from all areas. A sample newsletter is available for \$1.00 plus a \$.39 stamp. Membership information is available for a \$.22 stamp. No envelope required. Send to: ALL OHIO SCANNER CLUB, 1043 Princeswood Avenue, Dayton, OH 45429-5863. Tell them you saw this ad in MT.

### LIBRARY SHELF



UPDATE: FREQUENCY MANUAL FOR RADIO SCANNERS by J. Patrick McDonald (revised 5th edition--California; 8-1/2" x 11", 159 pages, paper-bound)

An unabashed monitor of the scanner bands, author McDonald prides himself in comprehensiveness and accuracy in his frequency files. His new frequency directory reflects that obsession with information; it is loaded with frequencies, call signs, identifications, and channel designators from 27 to 850 MHz with a few AM broadcasters thrown in for good measure.

The handy directory is conveniently laid out in easy to read large print, and is cross-indexed by service and frequency. An

**LIBRARY SHELF cont'd**

extensive alphabetized call sign list is also included.

Considerable text is provided to better acquaint the newcomer with systems heard and techniques to hear them. The thrust of the publication is for monitoring various services in the San Diego and Imperial County region, although the U.S. government section is broad enough in scope to be applied nationwide.

A few of the major service categories covered extensively include public safety, U.S. government conservation, military, marine, aircraft, business and industrial, amateur repeaters, railroads, and amusement parks.

Over 1350 non-repeated frequency entries are listed along with many radio codes used by agencies listed. Available from the author for \$16.85 including tax and shipping: UPDATE/Frequency Manual, P.O. Box 393, Vista, CA 92083.

**ADXR LIST OF LIMITED COASTAL STATIONS** (35 pages, 5-1/4" x 8-1/2", paperbound; \$3 post-paid in the USA from the Association of DX Reporters, 7008 Plymouth Road, Baltimore, MD 21208).

This handy booklet for serious ship-to-shore listeners of the shortwave spectrum contains some 2000 station listings in the 2, 4, 6, 8, 12, 16 and 22 MHz maritime bands.

Conveniently cross referenced by location and call sign, the list is a comprehensive collection of those private ship-to-shore users--steamship lines, off-shore oil drillers, ferries and harbor pilots, fishing fleets, oceanographic institutions--who can be heard intercommunicating on the discrete frequencies listed in the introduction.

**SPEC-COMP**

This new title reflects better the specialized communications coverage of A5 ATV Magazine, now retitled. Editor Mike Stone alludes to the fact that many prospective readers, upon seeing the old title, assume that slow and fast scan television are the only topics covered in the monthly magazine.

The basic premise of SPEC-COM provides for the following pages of contents: (5) editorial topics; (18) amateur fast scan, medium scan, narrow band, microwave and cable TV; (6) slow scan TV; (3) facsimile; (4) satellite TV; (3) UHF single sideband and moonbounce; (3) amateur satellite, RTTY and

laser coms; and (4) packet/AMTOR radioteletype.

SPEC-COM is expertly written and edited and provides state of the art insight into a variety of specialized communications modes. Send \$2 for a sample to SPEC-COM Communications, Inc., P.O. Box H, Lowden, IA 52255-0408.

**THE SATELLITE EXPERIMENTER'S HANDBOOK** by Martin R. Davidoff (207 pages, 8-1/2" x 11", paperbound; \$10 plus shipping from ARRL, 225 Main St., Newington, CT 06111).

As with all ARRL books, the satellite handbook is well laid out, profusely illustrated, highly informative, and has become a standard of reference.

Concentrating on amateur radio, weather and TV broadcast satellites, the book is divided into three major parts and includes a variety of informative appendices.

The introductory chapters provide insight into the history of satellites, then leads into a few hints as to what the future will

bring. Part II provides orientation of the reader--especially the newcomer--to the equipment required for basic reception of satellites. Here we learn the fundamentals of tracking, site and antenna planning, receiving and transmitting formats and procedures.

Part III, the advanced techniques portion, allows the newcomer and old hand alike to develop further into satellite experimentation: weatherbirds, satellite links, optical communications, and other topics of interest.

**FOREIGN INTELLIGENCE LITERARY SCENE** edited by Thomas F. Troy (12 page monthly newsletter, 8-1/2" x 11"; \$25 subscription from University Publications of America, 44 N. Market St., Frederick, MD 21701).

Interested in the espionage game? FILS may be for you. Featuring timely topics in covert operations and publications, University also has a line of discount books on the subject as well, and at a discount.

Many subscribers are members of the intelligence community, or AFIO (Association of Former Intelligence Officers) and comments in the newsletter are interesting to read.

A new cloth-bound book, **CAREERS IN SECRET OPERATIONS..How to Be a Federal Intelligence Officer**, by David Atlee Phillips is among the books available from this source.

**DXER'S DIRECTORY: 1985 Edition** by Fred Osterman (85 pages, 5-1/4" x 8-1/2", paperbound, \$4.95 from Universal Shortwave Radio Research, 1280 Aida Drive, Reynoldsburg, OH 43068).

Compiled with the premise that communications among listeners is an important vehicle for exchanging information, Osterman's directory is a social directory of worldwide shortwave listeners.

Cross referenced by location and alphabetical name, the directory contains listening preferences of some 900 active monitoring enthusiasts.



**Why Do We Call Wireless "Radio"? or What's In a Name?**

W. Clem Small, KR6A

As a radio monitoring buff or radio operator, have you ever wondered just how we came to use the term "radio" rather than "wireless" or some other term to describe communication by electromagnetic waves? "Radio" might seem to be the obvious name to give a communication system which utilizes electromagnetic radiation. We find at least one modern communications dictionary which would support such a supposition: "Radio: From the Latin radius, a ray..."(1).

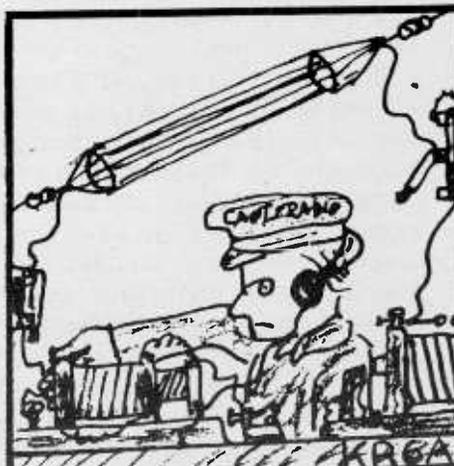
But is it all that simple? Definitely not! The evolution of the term "radio" just may be lost in the obscurity of history, but there are some interesting tales which we can tell that shed a little light on the question.

As early as 1898, we

find E. F. Goodenough of Marconi's Wireless Telegraph Co. Ltd. writing to The Electrician as follows: "Sir: Wireless Telegraphy is not a bad technical term; but if a more specific name be desirable, would not Radiotelegraphy be preferable to Space Telegraphy, which Dr. Lodge employs in his interesting lectures? Perhaps someone will suggest a good term. Yours etc"(2).

So you see, it wasn't so obvious tha radio should be called "radio" and, as a matter of fact, not only were the terms indicated above (wireless telegraphy, radiotelegraphy, ray telegraphy, and space technology) contenders for the chosen name of our favorite hobby or occupation, but as time passed there were also several other interesting names considered.

For instance, in the



"Hmmm, with all these wires around, maybe 'wireless' isn't quite the appropriate name for the system!"

very early 1900's lexicologists thought "wireless" to be an "unsatisfactory term," and suggested "aerography" to replace it(3). From a different perspective, Collins(4) uses the term "cableless" rather than "wireless" in referring to the first trans-Atlantic wireless communications.

Probably the analogy to be made here is that, since "wireless" refers to communication over-land without the intervening wires used in ordinary telegraphy, "cableless" was to mean communication across the Atlantic Ocean without the need to use the under-ocean cable which was developed and used prior to the advent of the first trans-Atlantic wireless communication.

J.A. Fleming, the famous scientific consultant to Marconi, authored a book published in 1906 titled Electric Wave Telegraphy(5). These "electric waves" were called "Hertzian waves" at times in honor of their discovery by Heinrich Hertz (6). Thus we see that "electric wave telegraphy" and "Hertzian wave telegraphy" were also terms to consider in the naming of what was to be ultimately called "radio".

The index to Fleming's 1906 text just mentioned doesn't contain a single reference to the term "radio" or to any word using "radio" as a prefix. Two years later, however, the

**RADIO NOSTALGIA cont'd**

1908 revision of this book used such terms as "radiotelegraphy" and radiogoniometer". On the other hand, we know that the old-time scientist, Branley, called his coherer a "radioconductor" as early as 1897.(7)

It is interesting to note that Germany called an unsuccessful "International Conference on Wireless Telegraphy" in 1903, but that the "International Radiotelegraphic Conference" called in Berlin in 1906 was a success. At this conference the term "radio" was suggested as the "mark" of a wireless telegram (which would then be called a "radiotelegram" it would seem)(5). Contrast this to the suggestion of using the name "aerography", which would have meant that a radiotelegram would be called an "aerogram".

The term "aerogram" was actually used in the early 1900's by, among other persons, no less than the great Dr. Lee deForest, America's own "father of radio"(8). Also, let's not forget that, at one time, the British called the theory or practice of radio "Marconism" in honor of their "father of radio", and a radio telegram was a "Marconigram"(9).

Of all the terms suggested to describe what we now call radio, the term "wireless" was the most popular in the early days; however, the term "radio" gradually came to replace it. How and when did this happen?

In the biography of Major Edwin Armstrong, one of radio's greatest inventors of all time, we find the statement that "Radio was a word that came into vogue about 1910 to distinguish continuous-wave wireless for voice transmission from the spark-gap type using code..."(10).

The term "radio" is not found in Everyman's Encyclopedia, a general reference work published in 1912, although one does find the older term "wireless"(11). The 1913 third edition of the Manual of Wireless Telegraphy and Telephone, written by the well-known radio pioneer Fredrick Collins, does not have the term "radio" in its index (12).

Degna Marconi, in her biography, My Father, Marconi, tells us that "radio" began to displace "wireless" as a term in 1915(13). This is consistent with Dunlap's statement in Marconi, the Man and his Wireless, to the effect

that..."after World War I wireless changed its name to radio! The idea of using radiated energy...inspired scientists to recommend the change in nomenclature"(3). "But," he added, "it would always be wireless to Marconi."

In 1913, it was proposed by a committee on standardization from the Institute of Radio Engineers: "...that the term "wireless" shall be entirely eliminated, as it is inaccurate and inappropriate"(5). Just why that term is inaccurate and inappropriate in regards to this means of transmission is difficult for me to understand. Nevertheless, the advice of the IRE committee took root, and the following definition is consistent with the content of most dictionaries of electronics or communication today.

"Radio. Generic term applied to methods of signaling through space, without connecting wires, by means of high frequency alternating currents. Supercedes the obsolete wireless" (14).

On the other hand, the term "wireless" has enjoyed greater longevity in Britain. Aitken tells us, in reference to "radio," that "...it first came into American usage before World War I; in the United Kingdom it never supplanted the term "wireless." (15). And, although its use is on the decline in Great Britain, we find that just last year, in 1984, the tenth edition of Foundations of Wireless and Electronics was published in England (16).

In general, we might say that, although it is somewhat archaic, the term "wireless" is still used now and then in the United States, and to a somewhat greater extent abroad. "Radio" is now the accepted "generic" term for communication by electromagnetic waves.

So the next time you use the term "radio," perhaps it will cross your mind that it is a word with a long and interesting past as well as an exciting present. "Radio", as a term, covers an extremely broad spectrum of electromagnetic radiation, and all modes of signal generation (17). Therefore, whether you operate or monitor long-wave, medium wave, shortwave, AM, FM, SSB, RTTY, Packet radio, Spread spectrum, satellites, or whatever, you're engaging in the pursuit of "radio", and a proud and worthy pursuit it is!

(MT readers: Would you like more interesting historical insights into the development of radio? Let us know here at MT headquarters...Ed.)

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# BROADCASTING...

## HANK BENNETT ON SHORTWAVE

### MY ANSWER TO THE PIRATE PROBLEM

by Hank Bennett

Last month your editor started a column on the subject of the pirate and bootleg stations that are operating on our airwaves. I'm referring, of course, only to those illegal stations that are operating within the borders of the United States. I tried to make a few points very clear:

(1) All stations operating without FCC licensing should be tracked down and put off the air without question.

(2) This column has not and will not give any publicity to any pirate station operating within our borders.

(3) I have no objection to other writers giving publicity to unlicensed sta-

tions.

(4) If the FCC rules cannot or will not be enforced, then the rules governing operations or pirate stations should be repealed.

OK. Let's go from this point. I'm well aware that my suggestions might not be widely accepted, especially by those hundreds of thousands of people who had to work hard for their licenses, but please give this column a moment or two of your time: read it carefully, then give me your opinion and comment.

How would it be if our government actually gave their consent to the operation of semi-legal pirates? We see no reason why this could not be done in such a manner as to offend no one. It could permit prospective broadcasters to become more fully involved in the broad-

**HANK BENNETT cont'd**

casting spectrum of the hobby--to learn how to construct, operate, and maintain a radio station; to become thoroughly familiar with procedures, laws, practices, and the inherent problems. Let's see...

(1) Open up a small band of frequencies somewhere near the existing broadcast band--something like a 20-30 kHz segment--so that technical problems and procedures would be virtually the same as operating in the broadcast band. The best bet might be somewhere between 1640 and 1800 kHz, or possibly somewhere in the old 2360-2490 kHz police band.

(2) Permit the pirates to operate with a top power limit of 100 watts during hours of local sunrise to local sunset, and 50 watts during nighttime hours.

(3) They could have complete run of the operation (except as noted in paragraph 5) including music, home-made newscasts, commercials of a strictly local nature (and on a strictly free basis), and local public service announcements (again on a free basis). Not permitted would be suggestive music or any news or announcements copied from local newspapers. Weather would be permitted but only using verbatim National Weather Service broadcasts.

(4) The operator would have permission to use some sort of personalized call-sign or station name or slogan of his own choosing but it would have to be in good taste. He would be permitted to give his location on the air as well as his telephone number and address, and could request reception reports. He could NOT use the facilities to solicit funds unless such requests were a legitimate public service (church dinners, school candy sales, etc.). He could not charge anyone for any airtime publicity nor could he request or accept postage payment for QSL cards. In short, all financial problems would be his alone.

(5) Have the entire operation watched over by a licensed radio amateur operator (general class or higher) or a professional broadcast engineer who would act as a sort of "big brother" or technical advisor.

The amateur operator or engineer would have to obtain a special FCC permit to cover this pirate operation

for the main purpose of showing that the operation of the station was being done in a semi-legal manner. Further, the ham operator or engineer would be responsible for the program content to assure that nothing would go out over the air that would not be in good taste.

So now we have any number of more-or-less legal pirates operating in a very small segment of frequencies. How to avoid QRM? Encourage the pirates to form their own association of sorts, to set up operating schedules in order that they may all be heard. If several operate in an area where QRM would be a problem, they could take turns of an hour or so, then turn the airwaves over to the next guy.

With the power limits as suggested above in paragraph 2 - and those limits are only suggestions - there shouldn't be too much likelihood of interference with each other unless far more stations opened up than are currently operating. And with a good antenna system, some of these kids just might get in some reception reports from surprising distances.

Everything considered, including the present outlandish operation of the citizens band, seriously interested prospective broadcasters should be given every opportunity to pursue their part of the hobby in a way that will give them the chance to really learn the whys and wherefores of broadcasting, still in a way that will protect them from operating in any illegal manner.

I believe that this is well worth considering and I'd like to know YOUR views on the subject. Can we get something going? My address is P.O. Box 3333, Cherry Hill, NJ 08034.

>>><<<<

Mr. John Sink of Dillsburg, PA, had a belated entry into our nostalgia quiz of recent times and he was the only person to correctly identify Eugene Orowitz as being Little Joe Cartwright of "Bonanza" fame. Seems Mr. Sink was a neighbor of mine many years ago who also knew Orowitz; however, to my knowledge, none of us have ever actually met any of the others.

We were shocked recently to receive a piece of mail back from the post office that we had written to George Greenwood, Editor of "Global Flashes," in Ithaca, NY. It was endorsed "deceased" and we have no further details (see "Memor-

iam" on page 3 April issue...ed.)

And to complete this column on a happy note, we're very pleased to congratulate Alta Dunlap of Malibu, CA, on (1st) receiving her novice amateur license and (2nd) on passing the examination for her technician license. Now

she's going after the amateur general ticket. No mean feat, either; the lady is already past retirement age for most of us. Some of our West Coast readers can tune for KB6CGP on the two-meter band. She's using a Kenwood 7600 rig with a Kenwood 1000 receiver and is having "an exciting time!"

**SWL WORLD WATCH**

by Ken Wood

Here we are with another edition of SWL WORLD WATCH, our monthly look at what's happening in and on the shortwave broadcasting bands. All times listed are UTC; frequencies are in megahertz.

**TOP 'O THE LINE**

One of the flood of low-power Peruvians, Radio Grau, has settled down on 4.004 and it appears as though this one should be hearable, although success has not yet smiled on this shack's efforts. Try early mornings around 0900, possibly into the evenings, too, although the exact schedule is unknown.

The Bolivian, Radio San Jose, from Oruro is active again on 5.985 from sign-on around 0900. Catch it before WYFR comes on the frequency. Radio Kara, Togo, is being heard occasionally on 3.222 from sign-on with interval signal at 0526. And RRI Kendari is noted some mornings around 1200, all Indonesian, on 4.000. Also Radio Manus, Lorengau, Papua New Guinea on 3.315 around 1300.

AFRICA - Angola - Radio Nacional, Luanda, formerly on 5.334 (variable) is now really varying - as far up as the 5.5 range at times. Heard local evenings, also scheduled from 2100 to 2300 on 9.535 and 7.245, partly in English. Two Angolan regionals currently being noted are Moxico on 5.191 and Lobito, 7.172, both around the 0400 - 0500 time period, all in Portuguese.

Clandestines South African - based clandestines have been coming in well in the Eastern USA of late. The anti-Angola UNITA station, A Voz de Verdade is heard after 0300 in Portuguese with clear IDs, African and pop/rock music. The anti-Zimbabwe Radio Truth noted with excellent signals as it signs on with a bird call interval signal at 0430

on 5.015. Less often heard is Voice of the Mozambique National Resistance on 4.772 around 0400. And the "no name" station opposing Cuban involvement in Angola is noted at 0530 sign on in Spanish on 6.045.

Djibouti Radio Djibouti is scheduled for an 0300 sign-on on 4.780 but that frequency is usually QRM'd by Latins. A good African night will occasionally bring this one through the interference.

Kenya Look for the Voice of Kenya to show up on the international bands using new 250 kilowatt transmitters. It's registered for 1230 to 1530 on 6.050 and 7.220, 1530 to 1930 on 9.635 and 11.745, and 1930 to 2130 on 6.050 and 7.220. So far, though, several checks haven't turned it up.

Madagascar - Radio Madagasikara is still noted from 0300 sign-on in Malagasy on 5.010, parallel to 3.288 - the latter less often noted.

Mali - Radio National, Bamako heard again on 4.783 up till sign off at 0000.

Somalia - Radio Mogadishu is heard from 0300 sign-on on 7.200. The frequency varies a bit and endures QRM from other broadcasters. All Somali with Koran readings and such.

South Africa - Capital Radio at Transkei is also being heard at an 0300 sign-on in English on 3.930.

Sudan - Try Omdurman on 5.039 around 0400 in Arabic. This one tends to disappear for long periods so if you need Sudan, try them now.

Swaziland - Trans World Radio can sometimes be logged on 5.055 with an English sign on announcement at 0355, followed by religious programming.

Zaire - Lubumbashi is still holding forth 7.205 with sign-on varying around 0400. This seems a better frequency than parallel 4.751.

Zanzibar - Radio Tanzania, Zanzibar, is worth trying now on 3.339; sign-on is at 0300. This one is always a tough log but there have been some reception reports in recent weeks so it's another one to act on now.



## THE ARAB WORLD

Iraq - Radio Baghdad is on 6.190 at 2200 with strong signals and parallel with a number of other frequencies including 7.120, 9.635, 9.690, 11.700, and 11.770 according to Steven Reinstein in the Frendx bulletin.

Kuwait - Radio Kuwait is being noted around 0430 on 7.100 which suffers from Moscow QRM, and in parallel to 9.880, all Arabic.

Qatar - The Qatar Broadcasting Service is now on 9.905 until 2130 sign off, all in Arabic.

Syria - Damascus is being heard in English around 2000 or 2005 after French language programs end on 11.685.

ASIA - Indonesia - The Voice of Indonesia noted with an hour of English programming in its foreign service beginning at 1500 on 9.880, 11.790 and 15.150.

Philippines - A recent FEBC schedule shows English in use as follows: 0100 - 0500 on 11.815 to India and Southeast Asia; 0500 - 1000 on 11.890 to Australia and New Zealand; 1400 to 1600 on 11.905 to India and Southeast Asia; 0000 to 0100 to India and Southeast Asia on 11.915; 1300 to 1400 on 11.920 to Indian and Southeast Asia; 0000 to 0500 on 15.445 to India and Southeast Asia; 2300 to 0000 on 15.445 to Malaysia, 2300 to 0500 on 21.515 to Papua New Guinea and 0500 to 1000 on 21.610 to India and Southeast Asia.

EUROPE - Italy - Radio Netherlands Media Network reports that Adventist World Radio - Europe has been testing from a transmitter located somewhere between Bologna and Rimini, Italy using 6.010 from 1500 to 1800.

Malta - The IBRA Radio transmission over Radio Mediterranean on 6.110 has been heard at 0700 while Radio Mediterranean can be found with an English program at 2230 on the same frequency.

Portugal - Radio Portugal's revamped and reduced English-to-America schedule is now Monday through Friday only--to the east coast at 0030 on 6.095 and to the west coast at 0300.

Sweden - Radio Sweden International has been putting in excellent signals of late with its 1400 English transmission on 15.345.

NORTH AMERICA - Canada - Financial restrictions have forced Radio Canada International to drop its mailbag program.

Cuba - Radio Rebelde programming continues to be heard on 5.025 and there are reports of them also being on 7.035, although that frequency has not been heard here. All Spanish; quite strong in local US evenings.

Honduras - One of the less frequently noted stations from this country is La Voz del Junco, currently noted around 1200 and occasionally in local evenings as well on 6.075.

Mexico - You'll hear IDs for "Q" and "XEQ" on 9.680, but XEQ is the medium wave outlet being relayed on shortwave by XEQQ. Try around 1400. All in Spanish.

United States - United Nations Radio, via Voice of America facilities, normally has been active only during the weekends when the UN is not in session. As an experiment, UN Radio is running a Monday through Friday schedule until August 3. It's scheduled in English and French from 1900 to 20000 on 10.454 (lower sideband), 15.120, 15.330, 15.360, 15.650 (LSB), 18.782.5 (LSB) and 21.710. Other languages are used on the weekends.

OCEANA - Cook Islands - Radio Cook Islands has adopted a 24 hour per day schedule on 11.760. It should be audible in the late evenings, US time, as 25 meters begins to stay open into the evenings, assuming a clear channel.

SOUTH AMERICA - Bolivia - The tough Radio Juan XXIII at San Ignacio de Velasco is being heard occasionally now around its variable 1000 sign-on; frequency is 4.965. This is one of the many stations run by the Catholic church in South America. Radio Santa Cruz on 6.138 is noted in Spanish with sign on around 0900; this is a tricky spot as Radio Colonial in Peru is on 6.137, although usually with a later sign-on, around 1000. Be sure of your IDs here.

Brazil - Radio Bandeirantes is a new station from Cachoeira. Paulista on 3.238 - not the same as the Radio Bandeirantes on higher frequencies. Another new one is Radio Verdes Florestas on 4.865.

Falklands - Falklands Island Broadcasting Station continues to be noted often at its 0900 sign on on 3.958. Also sometimes in the evenings to sign off just before 0530. Lotsa ham QRM potential here.

Peru - A fresh crop of the rarer Peruvians is being logged of late, including Radio Celendin in Celendin on 7.054 (variable) to sign-off at 0400. Also a new one, Radio Frecuencia Siete

on 7.010, also in Celendin, around 0200 and Radio Gran Pajaten on 4.485. Also Radio Santa Cruz on 6.656 to 0300 sign off.

Surinam - Radio Apintie has been reactivated; look for it in Dutch and local languages on 5.006 around 0100 and later. Meantime, the anti-government broadcasts of Radio Free Surinam have found a home on the Cuba Independiente y Democratica transmitters. Try for this segment around 2030 on 9.940 and 11.680. It may not, however, be a daily feature.

Uruguay - SODRE in Montevideo is now reported to be carrying some English, specifically at 2330 on 15.275 variable. We are still searing for the reported Radio Monte Carlo around this same time on 11.735.

Venezuela - Radio Rumbos in Caracas continues to be heard well during the daytime on 9.660--all Spanish with Latin pops, commercials and sometimes sports.

CHALLENGER - The Mozambique regional outlet at Beira, now known as Emissora Provincial de Sofala, is noted--rarely--at 0255 sign-on around 9.667 in Swahili and local languages. Reports go to C.P. 1781, Beira.

A second regional at

Nampula is listed for the same sign on time on 7.320 but this one has not been reliably reported in the U.S. since it used a 60 meter band frequency some years ago. Even then it was rare. None of the several other regional Mozambique outlets have, to my knowledge, ever been heard in the United States.

## WHAT HAVE YOU FOUND?

Let me have your loggings and I'll be happy to include them in World Watch. Let me know if you have any countries which are particularly nettlesome and I'll try to provide some tips on how to add them to your log. General shortwave broadcasting news and information is also welcome. Send everything in care of MT.

JEEVES SAYS - Despite the steadily falling sunspots (one fell near the mansion just the other day) there continues to be a lot of activity and a large list of good things to go after. Seven megahertz, in particular, seems alive with a mixed bag of stations ranging from long term users to new Africans, high power Middle East stations, and a large assortment of pirates and clandestines. Almost a fulltime job keeping them all sorted out.

Til next time, 73's from Ken and me.

## ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

## SPRING IS HERE!...

Well, almost! As if to encourage the onset of a new season, several international broadcasters have made significant changes--in part at any rate--related to the seasonal events.

Most welcome has been the reappearance of some long-lost friends! So let's take a look at the dial.

## BRASIL

Too long absent from my dial, Radio Nacional Brasilia, which used to be on 15290, has finally switched to the lower frequency of 11745 (altho' 25 meters is still not an optimal nighttime channel.) However, dependent upon the individual night, they are putting out a good signal in English at 0200 to North America. The programs are always interesting, with local news and weather followed by various informative talks on history, music, geographical items (often with a tourist appeal) and, of course, Brazilian popular music.

That last feature may not be your favorite fare, but at least they are dif-

ferent from other nations in their pop music culture; the songs and styles are unique to Brasil. Try them some time. By the way, the male announcer usually heard must have the best "radio voice" of anyone I know; he comes through loud and clear even in bad fading conditions.

## INDIA

Now here's a real surprise! I had all but given up on A.I.R. except for an occasional catch on 11620 kHz..but NEVER good reception for me! Now, of all things, they are coming through in the mornings on 9545 kHz around 1300-1400 U.T.C. in English with talks, interviews, news, and the unique Eastern music of the continent. About 1330 the signal is quite a powerhouse, but after 1400 it starts to fade out.

Intelligibility is something of a problem, not I think due to bad modulation, but due to the peculiar intonation and "rhythm" of Indians speaking the English language; also their voices tend to be soft and gentle, which is not so

**ENGLISH LANGUAGE cont'd**

conducive to short wave reception as a harder type of voice (how difficult the English language is for other nations, especially due to our pronunciation without rules!).

**NETHERLANDS**

Some of you have, no doubt, heard the experimental transmissions from the new site at Flevoland. They have been testing this one on 6020 kHz with fair signals and 9895 (this latter one almost inaudible for me). The Flevoland site utilizes four 500 kW transmitters with a 100 kW reserve. The following services are now beamed to North America:

0130-6020; 9895 Flevoland  
0230-9590; 6165 Bonair relay  
0530-9715; 6165 Bonair relay  
So we have the old service as before, PLUS a new segment from Flevoland. I presume these will all be the usual 50 minute periods. They say this is the start of a new era, not just a seasonal change.

There are also changes in broadcasts to other regions, so if you wish these you may write to Radio Nederland, English Section, P.O. Box 222, 1200 JG, Hilversum, Holland, for a program guide:

**BRITAIN**

Not a change in schedules, but just to draw your attention to a change in quality of transmissions! In recent weeks the "old faithful" channel of 6175 kHz, so vital for evening reception of the BBC, has shown a marked improvement in quality. This is due to the use of the Madley Heath - Intelsat V satellite relay path which now sends the program from Bush House London, to the Caribbean relay station at Antigua. This relay is also in use to the relay at Ascension Island, Singapore, Cyprus, and Masira. If you have two receivers, you can hear the difference in time for the signal to reach you directly from London, or via the longer route to satellite and relay station!

**TURKEY**

Difficult to know what is what with this one! However I have noted much stronger signals lately on 9560 kHz. This is in English from 2300-0000 and they have a later broadcast, on same channel, 0400-0500 for Western North America (presumably!). This frequency is the only one beamed to North America according to their program bulletin. However, they have also been heard on 5960 at 2300, and 7215 kHz at 2100 time slots.

All broadcasts are listed as one hour's duration. Program interest is variable; if you want to know all about Armenian terrorists this is your station! But they also have some nice music and cultural programs.

**SYRIA**

A surprising appearance on the dial lately has been an English program from Damascus. Reception is variable, but try to hear them on 11685 kHz between 2000-21000 with news, music and identification mentioning Broadcasting Service of Syrian Arab Republic. Like Brasil, however, this band varies in its ability to allow propagation of signals, so it may be an "in-and-outer".

**UNITED ARAB EMIRATES**

This is just an antici-

patory note! Watch out for possible English language service from ABU DHABI! Not to be confused with the other one for Dubai, which has been on the air quite a long time. Abu Dhabi has been heard with test transmissions on 4800 kHz in the tropical 60 meter band; so anything may appear--anywhere, anytime--from this one!

**AFRICA UPDATE**

A selection of possibilities exist for reception of English broadcasts from this continent; the only truly reliable service is from South Africa, however.

Algeria	2000-2030	17745
Angola	2000-2200?	9535
Cameroun	2100-2300	9745
Egypt	0200-0300	9475
Ghana	2130-?	4915
Libya	2200-0000	11815

Nigeria	1800-1900	15120
S. Africa	0200-0256	9615, 6010, 5980
Uganda	2030-0400	5032

(This list does not include religious broadcasters, many of whom offer recorded programs - mainly from the U.S.A. as part of their multi-lingual programming.)

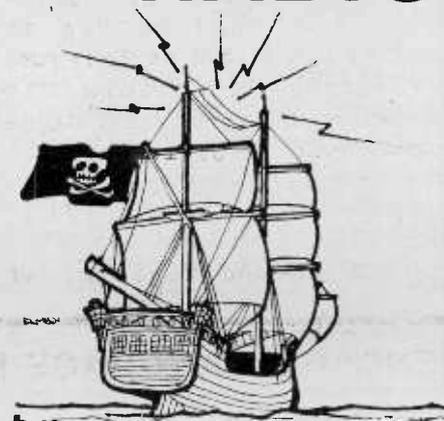
**UPDATE - BBC LONDON**

Considerable difficulty has been noted with London recently, so here are my observations on the best signals:

1200-1515: 17785;17790;11775  
1500-2100: 15400;15070  
2100-0400: 15260;9515;6175; 5975

Not all these frequencies are on for the full time slot. Further complete data will follow after spring season is established. ●

# PIRATE RADIO



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

**KPF-941:** We are extremely happy to report it is back! A confidential source informed us that KPG-941 returned to the air at 9:00 p.m. EST on March 4. The frequency, as in the past, is 1622 kHz. From the station staff has come word that KPF-941 has returned as "production tool". For details on this most intriguing operation see the February and March issues of this column. And it is great to welcome aboard the gang at KPF-941 as regular readers of MONITORING TIMES.

**VIETNAM:** From Alexis Muellner in Massachusetts comes one of the most bizarre pirate tales we have run across in a long time. In the course of doing research for a college thesis, she acquired a tape of a pirate broadcaster known as "Radio First Termer". The show was actually broadcast from Saigon in 1970. Host "Dave Rabbit" plays acid-rock music and furnishes anti-war commentary. If you have any infor-

mation about this station or other pirate and clandestine radio broadcasts during the Vietnam conflict, Alexis would greatly appreciate it if you would get in touch with her. Your help could be vital to the success of her project. Her address is P.O. Box 776, Hampshire College, Amherst, MA 01002. The telephone is 413-549-4600, extension 279. In addition to Alexis, I would also like to hear from you.

**TANGERINE RADIO:** Our good friend Raunchy Rick of Tangerine Radio sent us the current Tangerine Radio schedule. They transmit the first and third weekend of each month at 0400 GMT between 7380 and 7480 and/or at 20000 GMT around 21500 kHz. The station uses USB more often than AM and is most easily heard in the Northeast and Midwest.

Rick also passes along some information about other stations, KNBS, also known as Cannabis 41, is allegedly operated by the California Marijuana Cooperative. It offers high-quality music and pro-pot commentary. Another station west of the Rockies is Union City Radio. It features humor and an eclectic music format.

According to Rick, the French anarchist station Radio Libertaire has been ordered to cease operations. The station tried to avoid this situation by merging with Radio Pays, a community station for national minorities, but government authorities rejected this plan. Radio Libertaire is asking for help. Letters of protest can be sent to the French Embassy at 2535 Belmont Road NW, Washington, DC 20008.

**RADIO MACCABEE:** On January 3 Florida Senator Paula Hawkins introduced a bill to establish a special

program in the Russian language for the Jewish population of the Soviet Union. The program known as Radio Maccabee would be transmitted via the facilities of Radio Free Europe/Radio Liberty, and that organization would be required to appoint a special director for the new service. This program would include "broadcasts of items of general cultural, intellectual, political, and religious interest" along with Hebrew education courses. The bill would authorize an appropriation of \$3,000,000 for fiscal year 1986 along with an identical sum the following year for the new service.

**PROGRAMMING PERSPECTIVE**

**BY JOHN T. ARTHUR:** "From a lonely mountaintop somewhere in North America, this is Doctor X on KQRP broadcasting in the 41 meter band." This station was heard throughout the US (including Hawaii) and Canada with their nondescript programming. Doctor X had an advantage over most operators--altitude, so his 100 watts was audible everywhere.

Typical shows featured complete album sides, with dead air; but the albums ranged from current rock to early Elvis to old radio shows like the Shadow. KQRP operated on many bands, and popped up on 31 meters last September just before the "Goodbye Marathon" broadcast September 27. Although some listeners said the programming bored them, almost everyone was saddened by the abrupt farewell.

Doctor X has always been good about verifying correct reports if accompanied by three mint first-class stamps; he has sent hand-drawn "parrot at mike"

**PIRATE RADIO cont'd**

cards and full data sheets at times. If you have heard them and would like a QSL, write to KQRP, Box 982, Battle Creek, MI 49016.

John does not have complete results yet on the favorite station survey, but so far it appears that the Voice of Laryngitis is well out in front. If you still want to cast your ballot, send the name of your favorite and least favorite pirates to John at Box 5074, Hilo, HI 96720.

**QSL DIRECTORY:** Here are some more station addresses from John's directory. Radio Sound Wave, Box 393, East Moline, IL 61244; FPRC (1616, 91.5, and shortwave), Box 542, Exeter, NH 03433; Radio Lost Angeles, Box 747, Paso Robles, CA 93446; and KST-Arctic Radio, Box 852, Anchorage, AK 99506.

The following can all be reached via Box 982, Battle Creek, MI 49016: WIMP, KLS, KNBS, KQRP, KTGR (1615 and shortwave), Radio America, Radio Clandestine, Radio Ganymede, Radio Paradise International, Samurai Radio, Voice of Laryngitis, and Voice of Revolutionary Vinco.

**LOGGINGS:** Our apologies to an anonymous contributor from Massachusetts who sent us some loggings in January which were accidentally overlooked. He reports a bootleggers' network operating on 3466 kHz with activity usually beginning around 0030 GMT. Locations appear to be mostly in the southern part of the country from the Carolinas to Utah, but stations as far north as Maine have taken part. The operators appear to be disenchanted CB sidebanders who have relocated to this frequency. Some use a call with a prefix BL, standing for bootlegger, followed by a number.

Our Massachusetts contributor also reports 5-digit Spanish numbers on 4050 January 7 at 0730, and the anti-Castro CID clandestine Radio Camilio Cienfuegos January 6 at 2300 on 9940.

We have a correction to make. In last month's column we reported that Indiana's Rex Whetzel had bagged an FM pirate Christmas Day from 0547 to 0652. Actually this was a station on 3880 kHz relaying various FM stations. The pirate never did identify himself.

Down Louisiana way David Cutter heard KRZY on 7433, February 5 at 2338 GMT. The show was hosted by Captin Crazy and his sidekick Joe Cool. David had signals peaking at up to S9

until the station left the air at 0032 GMT.

In Florida Steve Reinstein logged a new Arkansas operation which IDs as Razorback Radio. The station was heard February 17 from 2322 to 2331 on 7435.

From Ohio Jeff Everetts reports in again. Jeff had an unidentified February 21 from 1630 to 1730. With his portable receiver, he must estimate the frequency as 9660. The station gave a California post office box and played rock by Prince and Styx. Jeff, based on the frequency and time, this one may be either a receiver image or an international broadcaster. Can anyone help?

On February 24 on the announced frequency of 7435 Jeff heard a "test transmission from the Humpty Dumpty Broadcasting Corporation" from 2311 to 2333 GMT. Does anybody know more about this one?

For previous reception Jeff received QSL number 138 from KQSB. That classic pirate has been around since 1982 and claims to have received reports from 30 states, all parts of Canada, and South Africa. It has a power of 25 watts. According to the station, how long KQSB sticks around will depend on listener response.

In Hawaii our own John Arthur heard KNBS 0200 to 0245 February 17 on 7425 with a Radio Woodland relay. He also notes that Union City Radio continues to be heard sporadically in the 41 meter band and has received reports from California, Oklahoma, and Alabama.

The record this month has to go to George Zeller of Ohio, who has been logging just about every pirate around. Unfortunately space limitations make it necessary to heavily condense George's careful and detailed reports. However, you can still get an idea of the tremendous success he has been having. KR0K was logged on 7427 February 17 from 2126 to 2205 with rock music. George reports several loggings of the most active pirate around: KRZY, which has been heard on 6275, 7430, 7373, 7246, and 7435. After a long absence he notes Radio USA returned to the air with its second anniversary program February 24 from 2236 to 2251.

Tangerine Radio, with its anarchist commentary, made its way to Ohio February 18 from 0310 to 0327 on 7390, while WKUE with Mr. Koffee arrived February 24 from 2300 to 2330 on 7435. WPBR, Pig Boy Radio, was logged February

## "Los Numeros"

32444 69213 88816 52196 63811 94216

Havana Moon



### THE NERDS, JERKS AND COURT JESTERS OF THE SPECTRUM

(A tale of phony-?-international intrigue)

JIM BECKETT of New York was kind enough to write a few classic lines to this column a few days ago. I would be most remiss in my duties if I did not share Jim's thoughts with MT readers. Thanks for the letter, Jim. Your unique style made my day. Here are a few of the things that Jim had to say:

"I was sitting here listening to the gal with the neat accent on 4670 with her chant of 'Victor Lima Bravo Two'. However, earlier I caught her sending 'Yankee Hotel Foxtrot' at 0434 UTC this date (2 March 1985). She then sent a 40 group message (5 letters in each group - each pronounced phonetically). Then she went through the repeat-repeat bit - Group 40...Started through again and abruptly cut off after the 19th group. After a

minute or so she started her 'VLB2' bit - with its usual 'glitch in the tape' in the middle of it."

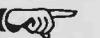
I'm very familiar with this "glitch", Jim. Here's a bit more of what Jim has to say:

"Now, I really can't start taking this whole thing very seriously. I cannot imagine any 'spy' operation being run so ineptly.

Band conditions were poor--lots of static--and I missed a few letters here and there. And I would imagine anyone listening would. Her stopping in the middle of a repeat is highly unprofessional--wouldn't you say? Obviously the whole thing is on tape - and some nerd just runs them.

All of the frequencies this gal shows up on are carrier with USB.

The only way to get a feel for these stations is to sit and listen for 'goofs' and mixups - or unusual happenings. Then you get an insight as to how



25 from 0100 to 0156 on frequencies 7425, 7430 and 7435.

Also monitored by George was Zeppelin Radio Worldwide on 7426, February 17 from 2137 to 2154. In addition to rock this one sometimes features German brass band music. February 9 WHMR, which also identifies as Heavy Metal Radio, came in on 7400 from 2100 to 2109.

Back in January George also had considerable success, including loggings of several of the stations mentioned above. In addition to these he heard Radio Sound Wave January 13 from 0018 to 0036 and the Voice of Venus January 27 from 0000 GMT to 0029 on 7397 kHz.

Keep those cards and letters coming folks, It's always great to hear from you.

**ODDS AND ENDS:** From Wyoming Al Smith commenting on KPF-941 notes it is not the first pirate which operated from the Yonkers, New York area; several years ago King Kong Radio was heard in suburban New York. That area usually is a pirate fan's delight.

A source also remarks that a few years ago the

legendary Radio Clandestine put in such a solid signal on 6030 kHz into the Northeast that it attracted the attention of a major intelligence agency.

Another legend, C. M. Stanbury, has been back in print for awhile. Stanbury writes reviews for the Small Press Review, an intriguing periodical published monthly by Dustbooks, Box 100, Paradise, CA 95969. While sometimes controversial, Stanbury has also been interesting and informative, especially in the area of clandestine broadcasting. He still stands by his May 1983 article for Small Press Review that the Argentine clandestine "liberty", which transmitted to the British troops during the Falklands war, made claims to be broadcasting from Canada, while he notes she almost certainly was in Argentina. In the January 1985 issue he reviews an article on the BBC's "Calling the Falklands" program which this writer did for Miller Publishing's Shortwave Guide.

That's it for this month. Next month we will be back with among other things a review of a most unusual publication by John T. Arthur.

LOS NUMEROS cont'd

jerky the operation is. Now comes our other gal in Spanish on 6802 kHz. These two gals really get around, don't they? 4670, 6802, 6840 and 5812...sometimes simulcast.

I knew this last channel would be active because the carrier was sitting there. The other (4670) went off. So, that's an easy way to know they will be on soon. There is a FSK CW beacon ('U') on 3636.5-3635.5 kHz. Also heard a Spanish numbers station on 3638 kHz (21 Feb. 1985 at 0432 UTC). Don't particularly like it when they sneak into the amateur bands."

Have you ever filed a complaint with the FCC or ARRL, Jim?

Jim concludes with: "The CW beacons..the only thing they could be is propagation beacons. No big mystery there. Anyway, that little gal's voice 'gets to me'..wonder if she looks anything like my vision of her?"

I'm -- in many areas -- in total agreement with some of the things you have to say, Jim.

I, for the most part, feel that many of these "numbers" transmissions ARE NOT spy related. Just too darn sloppy. I would also be of the opinion that a spy would strive to communicate in a more covert manner.

Perhaps the CIA, NSA, KGB, GRU and Mossad are having a bit of a problem in finding good help.

Thanks very much for

your comments, Jim.

**A GUIDE TO THE INTELLIGENCE PROFESSION**

At long last there is just such a publication for the layman. This very worthy publication is ably penned by David Atlee Phillips. Careers in Secret Operations: How To Be A Federal Intelligence Officer is published by Stone Trail Press of Bethesda, MD (paper, \$9).

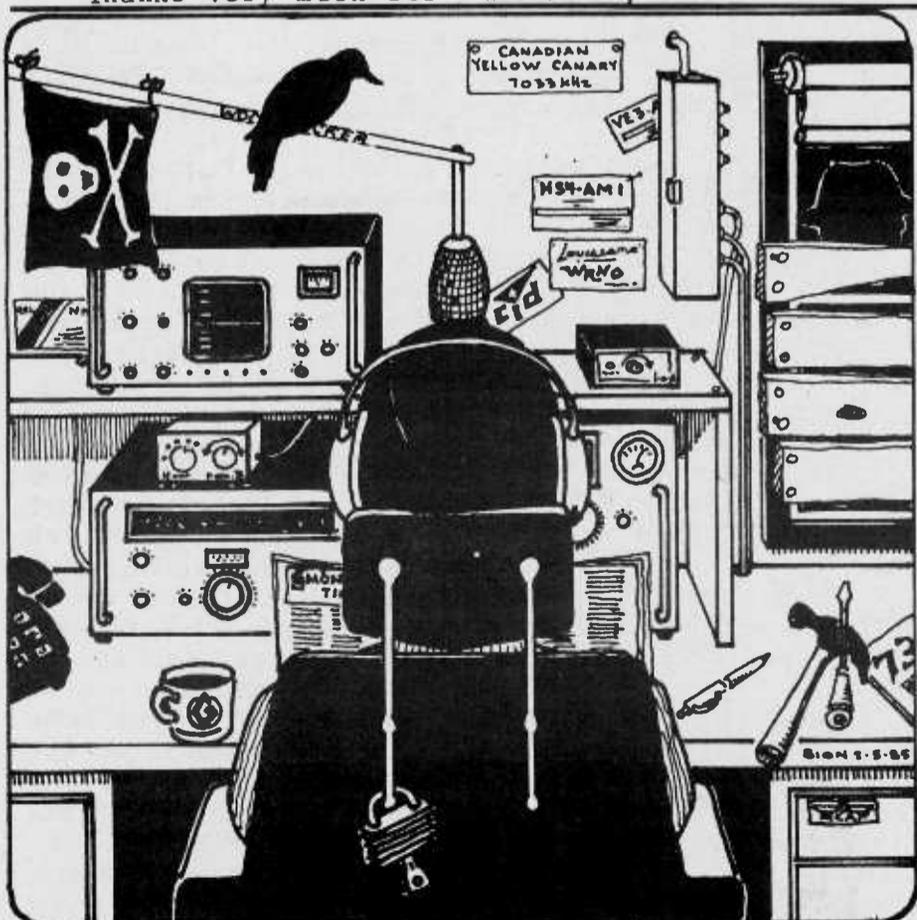
I highly recommend this excellent work to potential intelligence officer applicants.

**HAVANA MOON'S MAILBAG**

The desk overflows with all sorts of letters and cards this month. David Cutter of Louisiana wants to know -- among other things -- just what the numbers in the logo mean. This is a question that rises to the surface every few months or so, David. You might try the obscure technique of adding, subtracting, multiplying and so on. That's the approach a certain California group once took. Said group shall remain nameless. Their results will also not be published.

Watch for the next issue of MT David. Perhaps some of your questions will be answered at that time. A very special article is in the works on the "numbers".

Don LeFevre of Massachusetts forwards a page from one of John Barron's books on the KGB. Seems that on page 288 of KGB there is mention of the KGB once taking an interest in a transmitter being erected at Warrenton, VA.



So Bob says, "No, I don't know; how many F.C.C. inspectors does it take to break down an unlocked door?" (Gerald W. Ripley Acid(o))

KGB (Is that the correct title, Don?) is published in paperback by Bantam. Thanks so very much, Don. Let's hear from you more often.

Another letter "drips" with intrigue! This unsigned one-pager on high quality bond contains some very startling revelations in regards the "numbers". I'm not going to make further mention of the contents. My only reason for mentioning this letter is so that the sender -- if he or she is reading this column -- knows that I DO DESIRE further contact. The method outlined in the letter is not exactly to my liking. I'd hate to find out that my cloak is tattered and my dagger rusty, Larry. There are also other houses, Larry!

Zel Eaton of Missouri checks in with some very interesting intercepts this month. Here's what Zel has been hearing:  
20,838kHz 1708Z 1/20/85  
5 digit Spanish

4670 kHz 0323Z 1/20/85  
4 digit Spanish

Zel says that this 4670 kHz transmission was 40 over S9! VLB2 (phonetically) is often noted on this frequency just before 4-digit Spanish sign-on, Zel. Let me know if you can hear this "phonetic alphabet" station in Missouri.

Zel's other loggings include:  
6844 kHz 0239Z 2/1/85  
4 digit Spanish

6228 kHz 0500Z 2/2/85  
5 digit Spanish (20 over 9)

6836 kHz 0300Z 2/5/85  
Sounded like 5 digit Spanish but very distorted. (Maybe you are on top of one of them, Zel)

6840 kHz 0330Z 1/28/85  
Very weak and very slow CW. Very nice report, Zel. Keep up on the good work.

**UNUSUAL INCIDENT**

A tip of the Havana Moon Hat to Zel Eaton for this month's unusual incident report. Zel heard some rather strange traffic on 6222 kHz USB at about 0350Z on 2/23/85. Tactical calls of F4U, OQO, 8AT and 3MF with many references to alligators and alligator playgrounds! Zel is also confident that he has heard this same net on 3130 kHz USB.

Anyone have any ideas on this one?

Zel also reports 4-digit Spanish on 4309 kHz at 0335Z on 1/25/85. Also noted on 10,666 kHz at 1826Z on 1/25/85.

Anyone have any ideas about the sudden(?) increase of 4-digit Spanish traffic?

**OTHER INTERCEPTS**

Beacon activity in the form of "P" noted as recently as 2/21/85 on 4043 kHz at 0200Z and many other dates and times. Very possibly a "propagation beacon" as Jim Beckett mentioned at the start of this column.

More "propagation beacons" (?) on 6802 kHz. "D" and "G" beacons often monitored at about 0200Z. These beacons usually noted just before the start of 4-digit Spanish transmissions! Wonder if they're related?

It would appear that the majority of 6 MHz frequencies are rapidly replacing the 7 MHz frequencies for strangeness. German, 4 and 5 digit Spanish, 3-digit Spanish and English and just about every type of "numbers" transmission can be heard during evening hours on many 6 MHz frequencies.

**RADIO MARTI**

Usually reliable sources indicate that late spring is the latest target date for the long awaited Radio Marti to take to the air. Insiders say that it is the desire of our administration to give the Cuban people at least fourteen or so hours a day of quality programs. Anything less would be unthinkable. Don't hold your breath.

**RDF ANYONE?**

Although simple loops are not ideal when the LEAST AMOUNT of Sky-wave is mixed with ground-wave, it's all that most of us have. This column would be most interested on your thoughts, applications or findings with simple loops. Let's hear from you.

**HOW MANY TIMES**

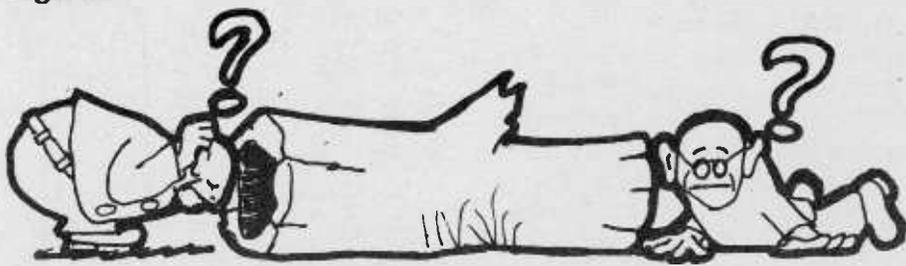
How many times have you asked yourself: "What -- after hundreds of column inches by countless authors -- has really been learned about "numbers" transmissions?" "Do all 5-digit Spanish transmissions originate from Cuba?"

These are just a few of the thought provoking questions that will be addressed in the next issue of MT.

WATCH FOR: PRESCRIPTION FOR INTRIGUE

**ATTENCION!**

MT readers are cordially invited to share their "numbers" ideas and findings with this column and the upcoming Prescription for Intrigue.



# Listener's log

**BOISE, IDAHO SCANNING**  
 Contributed by J. Mortimer  
Boise City Police  
 453.300 Dispatch  
 453.350 Information  
 453.425 Car to car  
 453.475 Car to car

Ada County Sheriff  
 460.450 Dispatch  
 460.225 Information  
 460.275 Car to Car  
 460.025 Valley All-Call

Ada County EMS  
 155.265 Dispatch  
 155.340 Ambulance to hospital ch.1  
 155.280 Channel 2  
 155.085 Channel Purple

Fire Department  
 154.430 Boise City & Ada County units  
 154.370 Boise City Disp.  
 154.250 Ada County Disp.

Miscellaneous  
 171.450 Boise Nat'l Forest Net 1  
 172.260 Net 2  
 415.550 Mobile to Base  
 159.390 Idaho Fish & Game -Boise

**LOS NUMEROS cont'd**

**A REMINDER**

All correspondence directed to this column will be assumed to be intended for publication unless otherwise indicated.

**THANKS TO**

David Cutter, Zel Eaton, Donald LeFevre and those sources that wish to remain anonymous.

A very special thanks to Jim Beckett. Some very thought provoking observations, Jim.

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

Time now for Actifed, Afrin, Amoxil 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.

41.5 Idaho Army Nat'l Guard aircraft  
 165.140 Idaho Air Guard Aircraft maint.  
 164.500 Idaho Air Guard Security

**ROANOKE, VIRGINIA SCANNING**

Contributed by Howard Weaver

Amateur Radio Repeaters  
 Roanoke 146.745, 146.94, 146.985  
 Salem 146.88  
 Bedford 147.105  
 Lexington/Cole Mtn 147.33  
 Lynchburg 146.61, 147.195, 147.375  
 Blacksburg 146.715

Roanoke Mobile Telephone  
 152.09, 152.63, 152.81

Roanoke-Boor Mtn.-Class A  
 CB 462.575

Woodrum Airport  
 Tower 118.3  
 Atis 118.65  
 Ground 121.9  
 Emergency 121.5  
 Flt Serv 122.2, 122.6  
 App/Dep 124.5, 126.0, 126.9  
 Unicom 122.95

Norfolk & Southern  
 161.07, 160.275, 161.19, 161.25, 161.28

Red Cross  
 47.42  
Roanoke City Police  
 155.13 (Ch.1); 155.49, 453.05 (Ch.2)

Roanoke City Fire  
 154.31  
Roanoke City Life  
 155.82

Blue Ridge Parkway  
 167.175

Roanoke Co. Police  
 39.36, (Tactical) 155.79

Roanoke Co. Fire & Rescue  
 46.48

Salem Police 453.225 (Ch.1) 453.325 (Ch.2)  
Salem Fire & Rescue  
 453.475

VA. State Police  
 158.985--Base--159.0  
 154.905--Car---154.935  
 154.665--TAC---154.665 Salem  
 39.54----SIRS--39.54(KID667)  
Vinton Police 154.875  
Botetourt Co. Police 39.42  
Botetourt Co. Fire & Rescue  
 45.40

Franklin Co. Police 39.40  
Franklin Co. Fire & Rescue  
 39.90  
Bedford Co. Fire 460.6

Bedford Co. Rescue 462.975  
Floyd Co. Police 39.72  
Floyd Co. Rescue 45.32  
Lynchburg Police 155.55 (CH1) 156.21 (CH2)  
Most Local VA CO. (SIRS)  
 39.54, 39.5

Cordless Phones 49.83, 49.845, 49.86, 49.875, 49.89  
CH.15 (WBRA) TV Audio  
 481.75 or 481762

EMS (Medical) 463.0 (Med1) 463.025 (2), 463.05 (3), 463.075 (4), 463.1 (5), 463.125 (6), 463.15 (7), 463.175 (8), 462.95 (9), 462.975 (10), 460.525 460.55

Roanoke Memorial Hospital  
 155.34, 463.175  
Community Hospital 155.4  
Lewis Gale Hospital 155.28  
Yellow Cab (Base) 152.27 (Car) 157.53  
Checker Cab (Base) 152.39 (Car) 157.65

Forest Service (Salem Dist)  
 159.36 (ch.1) 151.415 (ch.2)  
WFIR, WPVR 166.25, 161.7

Roanoke City Maintenance  
 158.82

Roanoke City Water 158.25  
K-92 Radio 455.800

Roanoke Cablevision 464.225  
Lynchburg Fire Dept 154.445

News Reporters 463.312  
Montgomery Fire & Rescue  
 45.32 (ch.1) 45.44 (ch.2)

Triple A Auto 172.530  
Patrick Co. Sheriff 39.680

VA Correction (Prisons)  
 39.120

United Amb. Serv. 155.220

(Ed. Note: Forest fires are a yearly threat in the lush mountain areas of the United States. We appreciate the following excellent list of scanner frequencies submitted by one of our active MT readers)

**FIRE SEASON MONITORING IN PISGAH NATIONAL FOREST**

Contributed by Jimmy Ward, Old Fort, NC

31.970 NC Forest Service  
 122.90 Air Support  
 122.92 Air Support  
 159.285 Wildlife Com.Reg.8  
 159.315 Wildlife Com.Reg.9  
 167.150 Smokies Nat'l Park  
 167.175 Blue Ridge Parkway  
 168.200 Forest Serv. Tac.  
 168.625 " Repeater  
 168.025 " Input  
 168.725 US Forest Service  
 169.125 US Link to NC  
 171.475 US Forest Service  
 173.3375 NC F.S. Repeater  
 415.375 US F.S. Repeater  
 169.900 Air to Air

County Volunteer FD's  
 37.180 Polk  
 45.320 Buncombe (F1)  
 45.360 Buncombe (F2)  
 39.100 Transylvania

154.085 Watagua  
 154.205 Rutherford  
 154.355 Burke  
 155.040 McDowell  
 155.100 Madison  
 154.430 Henderson  
 155.805 Mitchell/Yancey  
 154.445 Avery

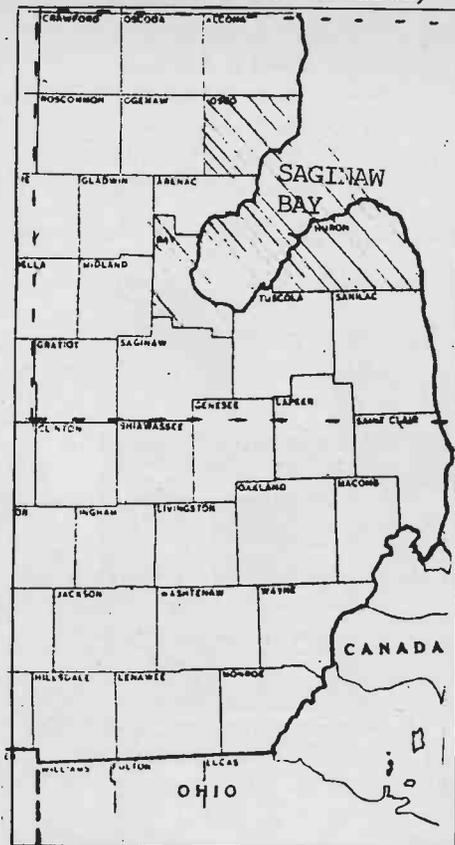
NC Forest Service units are equipped with state and federal frequencies and usually the county fire frequency(ies). Lookout towers are usually equipped with at least one each federal, state and county frequency. Aircraft are equipped with all state and federal frequencies.

Fire Towers	County
Bearwallow	Henderson
Biggerstaff	Rutherford
Ducky Top	?
Green Knob	Blue Ridge Parkway
Huntsville	McDowell
Pea Ridge	Rutherford
Phillip's Knob	Yancey
Spivey	Buncombe
Tryon Park	Polk

**SAGINAW BAY MICHIGAN MONITORING**

Contributed by Larry Smith

(Ed. Note: Larry Smith is no stranger to monitoring as RCMA members will readily attest. We appreciate his contribution this month and hope that the information will be of interest to scanner listeners in his area)



**VHF-MARINE**

FREQ.	CH.	USE
156.300	6	Comm & non-com.
156.400	8	"
156.450	9	State Docks & Marinas
156.500	10	Commercial
156.600	12	" & Coast Guard
156.800	16	Call & Distress
157.050	21	Coast Guard
157.100	22	" & Civilian (most common)



# TUNE IN CANADA

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

This month we will continue our look into frequencies below 30 MHz throughout the country, continuing from where we left off the last time. All frequencies are in kHz.

The stations in this first section do not show any call signs so I had to reprint the city abbreviations from the fiche.

42.5000	Ontario Hydro	Chrywdts, ON
42.5000	"	Frdstbts, ON
42.5000	"	Sisidits, ON
43.5000	"	"
44.0000	B.C. Hydro	Kellylss, BC
44.0000	"	Sooke ss, BC
44.0000	Ontario Hydro	Martindl, ON
44.0000	"	Widdifld, ON
44.0000	Quebec Hydro	Sjncystm, PQ
45.0000	Ontario Hydro	Otwhwnts, ON
45.5000	"	Minden, ON
46.0000	B.C. Hydro	Kellylss, BC
46.0000	Saskatchewan Power	Beatty, SK
46.0000	Manitoba Hydro	Ophnvmn, MN
46.0000	Manitoba Hydro	Rosser, MN
46.0000	Ontario Hydro	Atikkns, ON
46.0000	"	Kenorats, ON
46.0000	"	Martindl, ON
46.0000	"	Minden, ON
46.0000	"	Widdifld, ON
46.5000	"	Richview, ON
47.0000	"	Merivlts, ON
47.0000	"	Richview, ON
47.5000	Macmillan Bloedel, Ltd	Stillwater, BC
47.5000	Ontario Hydro	Chrywdts, ON
48.0000	B.C. Hydro	Kellylss, BC
48.0000	Saskatchewan Power	Boundrydm, SK
48.0000	"	Pasqua, SK
48.0000	Ontario Hydro	Mssgrs, ON
48.0000	"	Ottohldn, ON
48.0000	"	Widdifld, ON
48.0000	Quebec Hydro	Micoua, PQ
48.0000	"	Sjncystm, PQ
48.0000	Twin Falls Power Co.	Wabush, NFLD
49.0000	Ontario Hydro	Leasidts, ON
50.0000	B.C. Hydro	Portgmtn, BC
50.0000	Saskatchewan Power	Saskaton, SK
50.0000	Manitoba Hydro	Lettellir, MT
50.0000	"	Minitons, MT
50.0000	"	Whitshll, MT
50.0000	Ontario Hydro	Allanbrg, ON

The following are more locations for the Ravan Society of British Columbia. These stations are operating on 9115.500.

CJL 573	Kitimat, BC	VGC 867	Kitskus, BC
CJL 578	Kitkatla, BC	CJL 600	Kitsumkalum, BC
		VGC 876	Kitwanga, BC

### LISTENERS LOG cont'd

157.150 23	Coast Guard	342.500	" Weather (Pilot to metro)
161.900 26	Marine Phone (Paired with 157.300)	372.200	" Pilot to Disptch
		395.000	" Departure
162.000 28	" (with 157.400)	321.000	" Command Post (also SAC second)
156.42568	Noncom &marinas	351.900	Cleveland Center (Saginar Remote)
156.525 70	Noncommercial	327.100	Minneapolis Center (Pellston Remote)
156.625 72	"		

### VHF & UHF AIRCRAFT

122.000	FSS Weather	2-Meter Hams	
122.200	FSS Flight Plans	146.730	Pleasant Valley Rpt
122.700	Unicom	146.880	Bad Axe Repeater
122.800	"	146.940	West Branch Rptr.
122.900	" Air to Air (private aircraft)	D.N.R.	
123.100	Search & Rescue	44.640	Statewide
126.200	Wurtsmith AFB tower	44.720	"
128.600	" Radar approach	44.800	"
236.600	Wurtsmith Tower	44.840	"
289.600	" (Alpena Remote)	44.920	Port Austin
301.500	" Radar Approach		

CJL 579	Klemtu, BC	VGC 880	Prophet River, BC
VGC 868	Kluskus, BC	CJL 592	Prince Rupert, BC
VGC 854	Lillooet River BC	CJL 591	Port Elsa, BC
VGC 863	Little Harrison Lake, BC	CJL 605	Port Hardy, BC
CJL 601	Marktosis, BC	CJL 572	Port Simpson, BC
CJL 599	McCoy Creek, BC	CJL 236	Quailcum Bay, BC
CJL 586	Muchalat Inlet, BC	VGH 693	Quesnel, BC
CJL 575	Melakatla, BC	VGH 696	Restone Flat, BC
VGD 340	Mission City, BC	CJL 604	Nitinat Lake, BC
VGC 859	Moberly Lake, BC	CJL 580	Rivers Inlet, BC
VGC 888	Moricetown, BC	VGF 67	Sardis, BC
VGC 851	Mount Currie, BC	CJL 597	Sechlet, BC
VGC 860	Nanaimo, BC	VGC 887	Shelley, BC
VGC 879	Nancut, BC	VGC 870	Skeena River, BC
VGC 869	Nazko, BC	CJL 240	Skidegate, BC
VGH 388	Nemaia, BC	CJL 598	Sliammon, BC
VGH 915	Neskainlith, BC	CJL 609	Saanich Peninsula, BC
CJL 588	Nuchatlitz, BC	CJL 607	Sonora Island, BC
VGC 852	Nuiki Lake, BC	VGC 877	Squamish, BC
VGC 858	Ohamil, BC	VGH 694	Squnas, BC
CJL 581	Old Masset, BC	CJL 608	Squirrel Cove, BC
CJL 603	Opitsat, BC	VGH 695	Sugarcane, BC
VGC 875	Pavilion, BC	VGC 878	Tachie, BC
CJL 602	Penticon, BC	VGD 334	Tahltan, BC

Finally, mixed among all the Ravan Society frequencies and operating on the same frequency, was this entry:

XJL 970 Mowachant Band Council Thasis, BC

That's it for this time. Next month we will resume our look into scanner frequencies across Canada. Good monitoring.

169.925 Huron Nat'l Forest

Huron County Listings

39.140	Sheriff Boat
39.680	Huron County Sheriff
39.720	Huron County Sheriff
42.580	Mich. State Police
42.680	Mich. "
42.740	"
46.420	Fire Disp (pagers on 39.50)
39.820	Sheriff inter-system (most of N.Mich)
155.175	County Ambulance
155.340	Most Hospitals in Mich; Also amb disp
463.375	School buses (Elkton Pigeon, Bay Port)
464.900	Bay Port Fish Co.

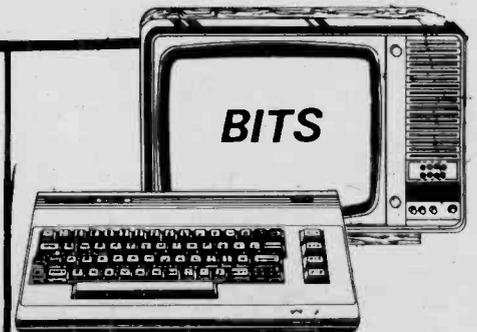
NOAA Weather

162.400	Flint
162.550	Alpena

Bay City/County Listings

151.120	Mobile Phones (RCC)
152.180	"
152.630*	" (Bell)
154.310	Bay County Fire
155.055	Bay Cty Shrf (Ch4)
155.160	" Ambulance
155.625	Bay City Police
155.790	Bay Cty Sheriff (CHI Cent.Disp)
454.200	Mobile Phones (RCC)

\*Out of Saginaw, very interesting during the Memorial Day, 4th of July and Labor Day weekends as AAA gives the traffic conditions over the phone to the Detroit office using telex. This way you get "first hand reports" on road conditions before they are put over the air to various radio and TV stations. These reports are heard in this part of the state only!!!



In reference to your article in the April edition entitled, "A Personal Eye In Space", the February edition of "Rainbow Magazine" (color computer magazine) the author describes an easy and cost efficient way to intercept weather facsimile signals.

The procedure incorporates the use of a short-wave receiver with a BFO (beat frequency oscillator), a 64k color computer and a public domain program. NO INTERFACE IS NEEDED!

The program is available from: Marty Goodman, 1633 Bayo Vista Avenue, San Pablo, CA 94806.

Of course you must include a disk, a mailer with return postage, and \$10 for handling.

The following are reliable FAX weather stations (kHz):  
NAM (Virginia) station 3357, 4975, 8027, 8080, 10865, 16410, 20015

NPM (Hawaii) station 14823

NMC (Pt. Reyes, California) station 4346, 8682, 12730, 17151, 8646, 17411.

Keep up the good work, MT.

Pat Eckenrode  
Ormond Beach, FL

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**GETTING STARTED**  
 ☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

by John Avery

**Wavelength and Frequency**

Sounds the human ear can hear range in frequency from about 15 to 15,000 hertz (vibrations per second). 15,000 hertz can be stated 15 kilohertz (kHz). We hear a drum beat or a car horn because their vibrations travel through the air and cause our eardrums to vibrate at the same frequency.

**AN ANALOGY**

Let's suppose our house is 200 feet from a plunger-type water pump. We would like to energize the pump from the house. Some take a garden hose and fill it with ball bearings. We could place a "ball bearing water wheel" at the pump end and force an endless supply of ball bearings through the hose; but I would get really tired of carrying the ball bearings back to the house!

Since the pump handle must be moved back and forth, we must move the ball bearings in the hose back and forth. We could do that with a second hose. First the ball bearings in the first hose are pushed forward, pushing the pump handle forward; then the ball bearings in the second hose are pushed forward, forcing the pump handle the other way and pushing the ball bearings in the first hose back to their original position.

We don't have to send a ball bearing the entire 200 feet from one end of the hose to the other; they only move a few inches back and forth. We'll view the push forward as the positive (+) side of the cycle and its 6 inch return stroke as the minus (-) side of the same cycle. One wavelength is the total of the two.

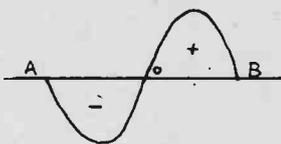
We can vary the length of the stroke and the number of complete strokes per second while the speed of the stroke itself remain constant. Think of the ball bearings as electrons. The speed of the electrons is a constant 186,000 miles per second (300,000,000 meters per second). If the time of the total stroke out and back is one (1) second, we know that it must travel one-half of 186,000 miles out and one-half of 186,000

miles back for a total of 186,000 miles. The frequency is 1 hertz and the wavelength is 186,000 miles. If the frequency of the motion is 2 hertz, then one full stroke in and out can take only 1/2 second; the forward stroke must take 1/4 second and so will the return stroke. Thus, 1/4 of 186,000 miles is 46,500 miles -- the distance forward and back again for a total stroke (wavelength) of 93,000 miles. We can all be glad there are no radio stations operating at 2 hertz, because a half wavelength antenna would take a lot of wire (and a lot of ball bearings!).

Since the speed is constant, the more round trips we have to make in one second, (higher frequency), the shorter the distance of each round trip (shorter wavelength). At 6 hertz, each trip can take only 1/6th of a second; at 15 megahertz, each trip can take only 1/15,000,000th of a second.

Since this is pretty simple, our non-radio friends will not be sufficiently impressed. Let's impress them.

Draw an "S"-curve with a straight line through the center of it like this:



We'll call this a sine wave. Above the line is positive and below the line is negative.

Now, let's think of the excursions up and down from the line as being the amount of positive and negative force to move the electrons in each direction. We begin in the resting state at point "A", slowly increase the force until it peaks, then decrease the force and start pushing back in the opposite direction past the base line (zero), then slow down and reverse once again back to the base line. This is one full cycle.

Now, let's look at radio frequencies: One cycle per second is 1 hertz (Hz); one thousand cycles per second is one kilohertz (kHz); one million cycles per second is one megahertz (MHz); and one billion cycles per second is one gigahertz (GHz).

The formula for finding the wavelength in meters, given the frequency in megahertz, is:

$$\frac{300}{\text{MHz}}$$

For example, the wavelength of

$$3.65 \text{ MHz} = \frac{300}{3.65} = 82.2 \text{ meters}$$

$$\text{The wavelength in feet} = \frac{984}{\text{MHz}}$$

Thus, in the example above,

$$\frac{984}{3.65} = 269.6 \text{ feet}$$

Since we normally measure antenna lengths in half wave or quarter wave sections, measured in feet or inches, two common formulas are:

$$\frac{468}{\text{MHz}} = \text{half wavelength in feet;}$$

and

$$\frac{2804}{\text{MHz}} = \text{quarter wavelength in inches}$$

In an antenna, the wavelength of the wire is shorter than the wavelength of energy in free space due to the thickness (diameter) of the antenna conductor as compared to its length. A correction factor, "k", has been already applied to the two antenna formulas above. Let's use an actual example. We wish to build a quarter wave antenna to pick up VHF mobile telephone transmissions at 152.81 MHz. Quarter wave in inches = 2804 divided by 152.81 = 18.35 inches. Now, let's learn to convert from one unit to another, all related by 1000 (three decimal places).

- 1,000 Hz = 1 kHz.
- 1,000 kHz = 1 MHz.
- 1,000 MHz = 1 GHz.

Conversely,

- 1 Hz = .001 kHz
- 1 kHz = .001 MHz
- 1 MHz = .001 GHz

As seen above, to convert from hertz to kilohertz, move the decimal place 3 positions to the left (divide by 1,000).

- For example
- 14,100 kHz = 14.100 MHz.
- Similarly,
- 460.450 MHz = .46045 GHz.

To go from kHz to GHz, move the decimal 6 places to the left (divide by one million). Conversely, 2.6 GHz = 2,600 MHz or 2,600,000 kHz. If any of this is not clear enough, please drop me a line care of MT and I will clarify it.

While I'm at it, readers, please suggest some topics for future columns. The hobby of radio is not a secret. We are here to help you learn and look forward to your questions.

To gain even greater understanding of the hobby of radio, go to your drug-store or newsstand and buy a ham radio magazine; it doesn't matter which one. The American Radio Relay League publishes a new handbook every year and it's available from the Grove catalog. This book is so good they will probably make it illegal!

Anytime I'm bored or just want to create something with a soldering iron, I take out one of those books and inside of 10 minutes I'm off on a new project. A person could spend 48 hours a week on radio and never get bored or run out of things to do.

NEXT MONTH: Resonant frequencies: Antennas, circuits and wave traps.

**HELPFUL HINTS**

**DIGITAL SCRAMBLING AND SCANNER SQUELCH**

An MT reader alerted us to an interesting phenomenon which occurs with some scanners when digital voice scrambling is encountered. There are basically two different types of squelch: audio and signal. If noise is present on a receiver equipped with audio squelch, the scanner assumes no signal is being heard and resumes its scan or search mode. If signal is present on a scanner designed to react in that manner, whether modulated or not, the scanner detects the signal voltage and stops the scan or search sequence.

Digitized speech has a "pseudo-random" noise characteristic, sensed by the scanner as background noise without modulation. If the scanner is of the audio (noise) squelch variety, it may not stop on the channel even though a signal is present.

This interesting anomaly is a mixed blessing; while the listener might not be alerted to the channel being in use, he wouldn't be able to understand it anyway!

## TECHNICAL TOPICS by Bob Grove

Q. Here in the Virgin Islands I have difficulty picking up distant stations on 560 and 720 kHz with my Uniden CR2021 receiver. Have you any suggestions?

A. While the CR2021 (no longer available) is a fine portable radio, it does lack selectivity. A step up to a Kenwood R-600 would help, as would the addition of a loop antenna like the Palomar Engineers unit (Box 455, Escondido, CA 92025) or the Radio West loops (3417 Purer Road, Escondido, CA 92025).

Additional receiver selectivity will allow you to pick out those "in-between" stations, while a directional loop antenna will permit you to null out interfering signals.

Q. Are there companies that sell used professional receivers like Racal, Cubic, Collins, etc? (Allan Bennett, 26 Prospect Terrace, Johnsonville, Wellington 4, New Zealand).

A. I have included your address so readers may inform you indirectly. You may wish to try some of the military surplus outlets like Slep Electronics, Otto, NC 28763 or Fair Radio Sales, P. O. Box 1105, Lima, OH 45802.

We would be happy to alert our readers of other dealers if they would care to contact us.

Q. I have a Kenwood R-1000 receiver and an MFJ 1024 active antenna, but I'm plagued with AM broadcast interference. Will the Grove TUN3 Minituner help? (Robert E. Hilton, Ft. Wayne, IN)

A. Yes. Your receiver is suffering from "intermodulation", the production of spurious signals resulting from severe signal overload. The situation is common on medium price receivers like Kenwood, Yaesu, Sony, Panasonic, Radio Shack and so on.

The Grove Minituner is designed to combat overload by sharply tuning the part of the spectrum you want to hear before the signal reaches the antenna, thus reducing the likelihood of off-frequency signals bombarding

your receiver and interacting to produce the interference.

Q. How can I hook my Sony ICF-2002 to the new Grove ANT9 Spectrum Probe active antenna? (D. Cameron, Pasadena, TX)

A. Your Sony came equipped with an interconnect plug consisting of an adaptor with two screws. The output cord from the Spectrum Probe would connect to those two screws, center wire to antenna screw and shield to ground screw.

Keep in mind that portable shortwave radios are easily overloaded by strong signals from efficient antennas like the Spectrum Probe and Grove Skywire; a preselector like the popular Grove TUN3 Minituner is strongly recommended between the antenna and receiver to avoid intermod and image interference problems.

Q. Can the microfiche by Grove Enterprises be read without a special machine? (Gene Perry, Kendrick, ID)

A. No unless your eyes are better than anyone I've ever known! The printing is reduced more than 40 times, requiring a magnifying device like the Grove microfiche reader. Theoretically, you could hold it up to the light and, with a powerful magnifying lens, see a few characters at a time.

Q. Is there any way the Grove Scanverter (no longer available) can be used with the Radio Shack PRO-30 hand-held scanner? (Mike Day, Dayton, OH)

A. Yes, although its sensitivity and stability will be less if you use a nine volt battery; it was designed to be operated from 12 volts, and that is how the stabilizing zener diodes work best.

Using a nine volt battery, you would probably have to recalibrate the oscillator trimmer. It would be better to make up a 12 volt battery pack with penlight cell (AA size) holders.

Q. Does Grove sell lightning arrestor attachments? Do the Radio Shack devices work well? (Michael Hatten, Huntington WV)

A. No, we don't at this time. I would recommend you contact an MT advertiser who specializes in amateur radio equipment; they invariably have lightning protection devices.

For modern solid state gear, I recommend the gas-discharge type protectors like the "Transi-Trap" and Alpha Delta" units from Design Electronics Ohio, (4925 S. Hamilton Road, Groveport, OH 43125) and from their amateur dealers nationwide.

Spark gap units like the "Blitz Bug" are dependable as to discharge voltage, and fire at such high voltages that solid state equipment would have already been damaged. Perhaps this is why they are no longer in the Radio Shack catalog.

## EXPERIMENTER'S



## WORKSHOP

### THIS ANTENNA HAS ROOTS

A recent article in Science 85 (March) brought back recollections of some interesting experiments with trees behaving as antennas. During past armed conflicts in Southeast Asia, allied forces attempted to use trees in lieu of communications antennas with varying degrees of success.

The moisture and dissolved mineral salts in the tree provide a resistive electrical conductor which is capable of intercepting a radio signal. By tapping into the tree with a conductor such as a long nail, the signal can be coupled to a transmission line and brought to a radio receiver.

Obviously, there are many variables such as the length of the tree, the resistance of the trunk and soil, the girth of the tree and limbs, the depth to which the tap is driven, and the point at which the tree is tapped.

Theoretically, it should be possible to choose a convenient point a few feet up the trunk, drive in a long spike, and attach a

feedwire to a universal transmatch (tuner) which is, in turn, adjusted for best signal.

For the rabid conservationist (like me), several turns of wire around the trunk could act as a coupling coil without having to drive a nail into the tree; the ends of the coil would be connected to the center conductor and braid of a coaxial transmission line. The coupling coil could be raised and lowered on the trunk for the best signal transfer.

It would seem that such a scheme would be primarily vertically polarized, relatively high impedance, and require frequent retuning depending upon the weather.

The mass of the tree would suggest that such an antenna would be quite broadbanded; the symmetry would mean that it would be omnidirectional; the height of the tree would determine the part of the spectrum on which it would be most effective.

How about it, inveterate experimenters? Anyone want to do a comprehensive article on this natural antenna?

## A CHALLENGE

### FOR THE ANTENNA DESIGNER

Wouldn't it be nice to have a direction-finding antenna for shortwave monitoring? A nice compact rooftop unit with a remote control indicator astride your receiver?

Next time that unknown station comes up on the air, simply consult the RDF (radio direction finder) and know within a degree or so its true bearing from you. A second unit could provide cross-bearings and give you the actual fix of the unknown transmitter.

Suppose we added the ability to electronically rotate the antenna so that interfering signals could be nulled out, permitting the desired station to stand out loud and strong. Sound even more enticing?

We would like to talk seriously with experienced antenna experimenters who might find undertaking such a project both challenging and rewarding. If such an antenna looks feasible, it just might become a future Grove Enterprises product!

Prospective designers should contact Bob Grove by writing to P. O. Box 98, Brasstown, NC 28902, or by calling 1-704-837-9200.

# STOCK EXCHANGE

## PERSONAL

NOTE: Monitoring Times assumes no responsibility for misrepresented merchandise.

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

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

ICOM R71A: Includes external speaker SP-10, 12 volt DC adaptor IC-CK70, remote controller RC-11, 455 kHz crystal filter 44A installed by Madison Electronics, Houston, TX. Purchased in May, 1984, no problems with radio. \$750 D. Cameron 713-477-7656.

Bearcat BC-250, excellent \$175; Drake FS-4 synthesizer \$250; Sony AN-1, used little \$55; Motorola S-1350C Wattmeter new \$100 Ken Diaz, VMFA 101 Radar, MCAS Yuma, AZ 85369 (602)726-2013 after midnight Mountain time.

RBL-1, RAK-7 (both 15-600 kHz); APR-4 w/tuning units (38-4000 MHz); PRO-2B (30-50/152-174 MHz); Atronics Code Reader. Best offer on any or all. Dave Glow, Box 490, Townsend, MA 01469. (617)597-8405 eves. No collect calls.

O'Keefe & Merritt PM-15 Radio Generators. 10-12.5 KW, 110/220 volt, single or three phase 400 cycle. Good condition, inside stored, with all instruments. Jeep engines and radiators are gone MVSS, Box 73, Flaxville, MT 59222. 406-487-2884.

PRO30, excellent condition, purchased 1/85. Reasonably priced. Will include nicads and adaptor. Keith Bucher, Route 20, Box 130, Reader, WV 26167 (304) 386-4332.

Bell and Howell microfiche reader model SR11 10"x12" screen. very good condition, \$85. Bearcat 250 scanner, \$200. Swap - new in the box MX5000 plus Antenna Specialists MONR-30 all band base antenna - for new MX4000 scanners. Money order only. No COD. R. Arenella, Route 11, Box 112, Mahopac, NY 10541

## COMMERCIAL

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

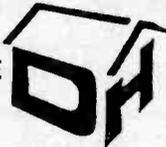
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A Regency dealer

Hammarlund SP-600 receiver (.54 to 54 MHz), nice, with extra SP-600 for parts and speaker - two receivers - \$250. Collins R-388, .15 to 30 MHz in 30 bands with cabinet - all mint, no dents - \$150. Hallicrafters S-85 receiver - nice with speaker - \$50. Lafayette HE-40 receiver - \$25. Realistic Dx-200 receiver - real nice - \$85. You ship on all. Money orders or certified only. Brad Hyde, 1106 Duvall, Killeen, TX 76541 (817)699-7817.

Wanted: drop in charger for Motorola HT-200 or Regency Aquacom I. Argil M. Nohe, 246 W. 6th Avenue, Huntington, WV 25701

Stinson Southwest Facsimile Interface for TRS80 CC computer plus software (Weather map 64; Super Gray Level; SWL-RTTY; SWL-FAX; and SWL-CW) \$290. Or all of above with TRS-80 CC Computer plus computer recorded, \$390. Phone 503-364-0445.

1000 feet teletypewriter paper, \$13.75 postpaid; 3M #795, four 8 1/2 x 250 feet rolls. Tracor 599H receiver 8-31.9 and 60.0 kHz, \$350. Stelma AN/GGM-1 teletype test set, \$350. Anixter twinax, 100 feet \$55. Twinax male connector, IBM/R390, new, \$14.50. Al Smith, Box 280, Wamsutter, WY 82336. Wanted: ESL or ESL/TRW; 5 GHz IP3 > 20 dBm; AN/Urr-66 components.

# INFORMATION PLEASE

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

NEEDED: Information on converting the drum speed of a XEROX TC400 facsimile telecopier to receiver weather satellite images. Philip Nash, 27 Highview Place, Kitchener, Ontario N2N 1W8 Canada

\*\*\*\*\*

WANTED: Photocopy of owners/operator manual for Hallicrafters model SX-110 and service information (schematics). Will reimburse your copying costs and postage. Michael Prosis, 48-F Ridge Road, Greenbelt, MD 20770.

\*\*\*\*\*

I am looking for the following upstate New York frequencies: Tompkins County Sheriff Department, Ithaca PD and FD, Tompkins County FD, New York State Police, associated emergency frequencies. Please contact: David Hall, 4242 East-West Hwy #420, Chevy Chase, MD 20815-5950.

\*\*\*\*\*

Need manual or schematic on LAVOIE LA800D WWV comparator receiver. Also interested in any other WWV type receivers. G.I. Barber, PO Box 31654, Aurora, CO 80041.

\*\*\*\*\*

WANTED: Manual & schematic for an ALLIED radio receiver Model A 2515. Will pay copying. Emilio Jurado, 1259 S. Eastman Ave., Los Angeles, CA 90023.

Prices are typically from \$3-\$7.50 with a ten dollar minimum per order. Send for their catalog if you anticipate a need for crystals; you won't be disappointed.

### SQUELCH-IT!

Add voice tuned squelch to any receiver! Comes with peak & notch filters, power supply, & amplifier...all in an attractive case!! Plugs into phone jack & your speaker. Intro price, \$59.95 kit, \$69.95 assem.



### STOP-SCAN!

For your T5-4305. Squelch activated! Internal! No mods! Automatic! Kit \$25, assem \$35, or SASE RI Box 386, Alexandria Indiana 46001

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### Need a Crystal? TRY MARDEN!

We frequently get requests here at MT headquarters for recommended sources of crystals for scanners; with more and more frequency synthesized receivers coming into the marketplace, discrete crystal sources seem to be drying up.

Recently we had the pleasure of ordering from a crystal specialty firm, Marden Electronics Company (PO Box 277, Dept MT, Burlington, WI 53105; telephone 1-414-763-6093).

Their service was prompt, their personnel were courteous, the prices were very competitive, and the crystals were high quality.

Marden specializes in discrete crystals for all applications: scanners, CB sets, ham gear, marine radios, commercial transmitters and receivers, and synthesizer elements.

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