



\$2.00

# MONITORING TIMES

Volume 4-Number 10

BRASSTOWN, NORTH CAROLINA 28902

November, 1985

## A VISIT TO HCJB: The Voice of the Andes

by Ed Soomre

A glance at the clock on the wall reveals 8:55 EST. It's Sunday evening May 19, 1985, and I am sitting in the chapel studio of HCJB in Quito, Ecuador. The musicians are getting their instruments and music ready and the technician is checking audio levels.

The host of the program, Dr. Ron Cline, president of World Radio Missionary Fellowship, Inc., parent organization of HCJB, is looking over his schedule of the program events. Dr. Cline states "60 seconds to go" and the air is filled with excitement.

At exactly 9:00 pm EST, the "ON THE AIR" light glows and the song "Great Is Thy Faithfulness" is played. The music fades and Dr. Cline states "From the chapel studio in Quito, Ecuador, this is the HCJB Hour."

Yes, I am really there, on vacation visiting my brother-in-law who works at HCJB. We are watching a live broadcast of the HCJB Hour. It's great seeing the various musicians and announcers stand at the microphone and do their part of the program.

Local news about happenings at HCJB (including the announcement of our visit to HCJB) is followed by music by students of the Alliance Academy (children of missionaries), guests' interviews, and reading of scripture. At 9:30 PM EST it's over; Dr. Cline thanks all of us for being there.

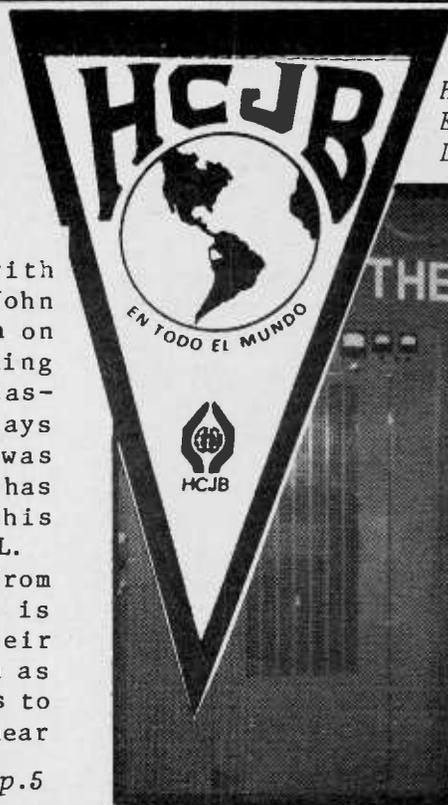
It was a joyful experience to work part time in the English Language Service editing tapes, filing listeners letters and stamping tracts. I even read listeners' letters on the "Musical Mailbag" and was interviewed on "Happiness Is." The staff of the English Language Service I worked with included Jan Anderson, Paul Bell, Dee Blaklenko, Carol Cathro, Linda Fluker, Chuck Howard, Sylvia Lopez, Mary McKean, Brian Seeley, Rowena Turner,

and Glen Volkhardt.

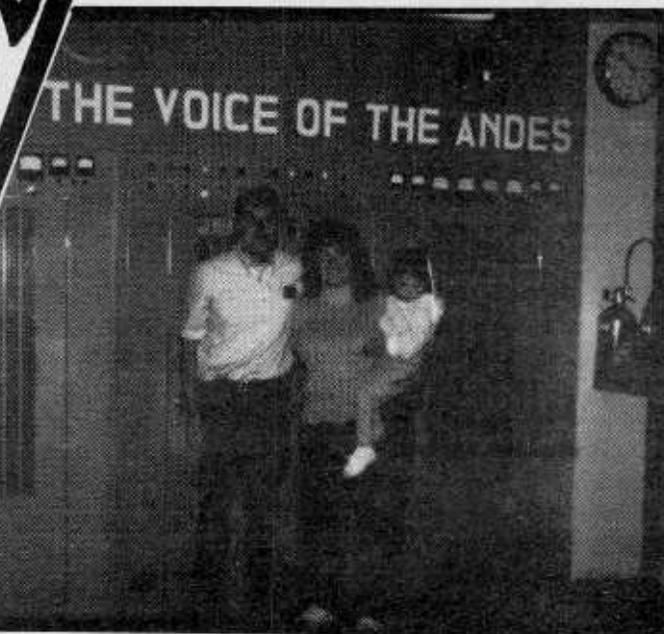
I had a long talk with "DX Party Line" host John Beck (HC1QH) and sat in on one of the DXPL recording sessions. John is a fantastic fellow (he even plays the harmonica!) and it was an honor to meet him. He has great enthusiasm for his work, especially the DXPL.

John wants to hear from all his listeners and is very interested in their comments on the program as well as their requests as to what they would like to hear on the DXPL.

Cont'd on p.5



HCJB transmitter site, Pifo, Ecuador, transmitters 4 and 5. Ed, Louise and Joscelyne Soomre.



## RADIO ASTRONOMY: Monitoring Signals from "Out of This World"

by W. Clem Small, KR6A

Radio monitoring has long held a fascination for mankind, even from the times before there were radio transmitting stations around which we could monitor! Hard to believe? Well, it's true. As this writer mentioned in a previous article, there were some old time scientists and inventors who were able to get "one-up" on history and utilize naturally occurring electromagnetic radiation to engage in the exciting pursuit of monitoring prior to the invention

of wireless or radio.<sup>1</sup>

Not only was this true, but the pursuit of monitoring naturally occurring radio waves has led to one of the most sophisticated and exciting fields of study yet discovered: radio astronomy. The saga of how this all came about is quite a tale; let's take a look at it.

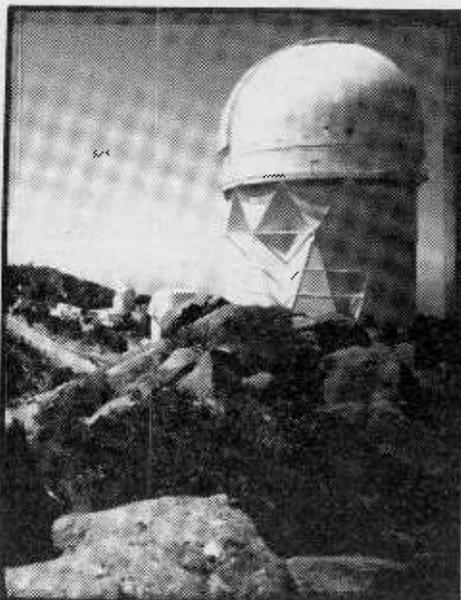
Back in the 1840's Joseph Henry was fascinated with things like electrical discharges from Leyden jars, how such discharges could be utilized in magnetizing steel needles, and what this all meant in terms of electrical theory. He actually

produced some extremely important findings in his researches, and one of the most interesting was the discovery that he could magnetize his needles when they were separated from the electrical discharge by a considerable distance.

Pursuing his finding, he was able to show that a needle could even be magnetized by a lightning bolt) which is essentially the equivalent of a gigantic Leyden jar discharge) some 20 miles away!<sup>2</sup> It would seem then that he could tell, by the condition of his needles, when there had been significant electromagnetic radiation received since he last checked those needles.

His "receiver," using the needle as a detector, was certainly very crude by

Cont'd on p.6



National Optical Astronomy Observatories; Kitt Peak

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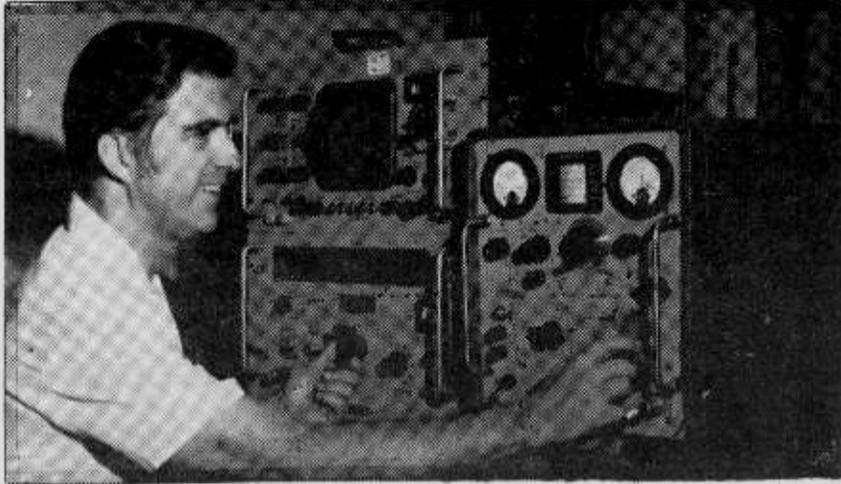


# MONITORING TIMES

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Monitoring Times is published by Grove Enterprises, Inc., PO Box 98, Brasstown, NC 28902. Phone 704-837-9200. Copyright 1985. 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



### NO SHORT WAVE LISTENING IN PRISONS ...an archaic myth persists

Most long-time MT readers recall that John Demmitt, an enthusiastic short wave fan, is a prison inmate in Pennsylvania and that he has attempted over the years to promote legislation which would overturn the prohibition against short wave radios in his institution.

Recently, in an effort to determine the extent of this restriction on a nationwide basis, we wrote to the departments of corrections at more than a dozen penal institutions; we received responses from ten of them.

In every case, short wave radios were prohibited (Arizona, Arkansas, California, Florida, Illinois, Massachusetts, Michigan, New Mexico, New York, and Pennsylvania). Additionally, Arkansas prohibits FM radios while both Arkansas and New York prohibit TV sets in the prison cells.

The prohibition against short wave receivers persists from a time decades ago when police communications were conducted in the 2 MHz portion of the radio spectrum; although the FCC no longer provides licensing for such operations and the use has been totally abandoned since the 1960's, prison reform obviously takes no interest in considering a change.

There also seems to be a common myth among prison officials that a short wave receiver can be modified to

permit reception of the VHF FM prison communications. In spite of the fact that this can be easily done with any FM broadcast receiver or TV set with a screwdriver, and cannot be done to a short wave receiver, there seems to be no interest in considering reason over policy among the institutions polled.

### It's Contest Time!

With the cold winter months rapidly snuggling us in, how about a worldwide listening contest? Monitoring Times would like to sponsor a contest with rules and regulations specified by our readers!

Are you into broadcast listening? Utilities? VLF or VHF? Voice or RTTY? Let's include specific target areas of the world, perhaps even at specific times to spice it up a bit.

But how shall we verify the claims of our contestants? Should they include a short verification heard on the air? Naturally, specific frequencies, times, modes, and other essentials will be required for corroboration.

Prizes? Books, Grove accessories, complimentary subscriptions to MT, and we invite our advertisers to get into the fun as well. We will issue advertising cost credit for donated merchandise to be awarded as prizes.

Sound like fun? Let's hear from you and start the contest!

## MT TO SPONSOR FIRST "LISTENFEST"

Amateur radio operators have their hamfests, but other than the annual ANARC convention and scattered club meetings, SWL's and scanner enthusiasts alike have no intensive conferences, especially with equipment demonstrations which would allow listeners to try firsthand the hardware of their dreams.

Monitoring Times hopes to remedy that by sponsoring the first exposition for radio monitoring, complete with receiving laboratories set up demonstrating top of the line equipment and accessories.

We will invite top names -- experts -- in the fields of radio monitoring and know that the experience will be well worth the effort.

A couple of years ago we polled our readers, then numbering only about 3000, as to what they would like to learn more about if they could attend a seminar on listening. The results were very informative, but now that we are actually planning such an ambitious event, we need to know more so that we can provide the information and experience you want.

If you would be interested in attending such a weekend experience, please let us know what you would like to learn, when you would like to come, and other details that will make our job easier and your experience more meaningful.

We have included below a form which you may wish to copy or remove and return to us with your responses. Remember, the more you want to learn and see, the more the preparation will cost.

While Brasstown is our preference, of course, there is no major air service (other than a local small airport) and very little for families or spouses to do. We could arrange special programs of culture (music, dance), horseback riding, sightseeing the mountains,

and so on, but it would be more likely that an individual would probably attend alone.

Larger cities have more for amusement and recreation, have direct air connections, but expenses will be greater to the attendees.

And how about a name? Radiofest '86? Comlab? Radio Expo? COMCON? Listenfest '86? Let's hear your suggestions. And above all, let's get going on the world's first symposium for radio listeners!



## Viewpoint

### SHUTTLE TRACKING

Bravo!!!...for having Jean Baker's aero band column in MT. Ditto for Larry Van Horn and his Signals from Space. Keep up the good work.

And speaking of Signals from Space, I was able to monitor the space shuttle Challenger direct on one of its UHF freqs during the recent mission (STS 51-F). I started listening to the comms via WA3NAN. When I realized Challenger would be in range for direct monitoring I started tracking it on my Commodore C-64 using the AMSAT-2064 tracking program. On the very next pass I heard Challenger calling Houston on 259.7 MHz using the Regency MX-5000 and a UHF ground plane antenna.

Challenger was making up to six passes a day over this area during the afternoon and early evening. As luck would have it I had some time off so I was able to follow Challenger during the final four days of its mission. The AMSAT tracking

SEASON: Spring \_\_\_ Summer \_\_\_ Fall \_\_\_  
 DURATION: One day \_\_\_ Two days \_\_\_  
 LODGING/MEALS: Arranged by MT \_\_\_ Arranged by participant \_\_\_  
 REGISTRATION FEE: \$0 \_\_\_ \$10 \_\_\_ \$25 \_\_\_ \$50 \_\_\_  
 LOCATION: Brasstown, NC \_\_\_ Large city \_\_\_ Unimportant \_\_\_  
 EQUIPMENT YOU WOULD LIKE TO SEE IN OPERATION: \_\_\_\_\_  
 \_\_\_\_\_  
 TOPICS YOU WOULD LIKE COVERED IN FORUMS: \_\_\_\_\_  
 \_\_\_\_\_  
 OTHER COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_

**VIEWPOINT cont'd**

program was "right on the money" all the way.

259.7 must be a backup to their S-band primary. I heard them on UHF during every pass within my range. I found that the best reception occurred when Challenger was between 15-45 degrees elevation. I also heard Challenger briefly with some SSTV signals on 145.55 MHz.

Roger Pettengill  
Mattawankeag, ME

**WDX PROGRAM: An Opposing View**

I do not make a habit of taking pot shots at various contributors to the SW publications, as I do some writing for them and can be a target myself. However, Hank Bennett is getting to be a caricature of himself in recent months. The trivia stuff I enjoy, the Pirate stuff is a bit rough (though I do agree with the basic precept). However, it is very difficult for me to have picked up the September issue of MT and read Hank's "fountain of disinformation" re the origins of the WDX program. Here's how it goes:

The program was started in 1958 (NOT the mid 60's) by a fellow by the name of Joe P. Morris from Ohio. The WRØ prefix was, in fact, sort of semi-authorized by the FCC. How a man who was very active in this period cannot remember these simple facts is beyond me.

It was true that Popular Electronics picked up the program, with Hank at its helm. What Hank forgot to mention is that (when he left) PE one of the deals was that he could continue the program as long as he changed the prefix, thus the WDX and KDX. Only after Hank took the program over were some of the esoteric calls made available; in the Joe Morris days you got what you got. Hank has been charging as much as \$5.00 for a "single letter" (KCX9Z) call. I still have my old "WRØ1AM" certificate, issued April 9, 1958, by Joe Morris.

What really fried me is the "unknown address" list at the end of Hank's column. Yes, some of the folks listed are long gone, but how in creation can a writer who is "with it" as far as the organized hobby goes not have a current QTH for Gerry Dexter?

John Kapinos  
Shrewsbury, MA

**RADIO AND TV NOSTALGIA**

Regarding the August issue...Mr. Small's article on a Radio Monitoring Time

Machine neglects to mention that in the 18th Century (1700s), all sorts of interesting noises would have been picked up in the vicinities of certain colleges and urban centers of intellectual attainment. These signals would have originated with the various types of static machines, like the Wilmhurst, which were then in vogue.

The snap-snap-snap, as the Leyden Jars discharged their potent energies, would have possibly been very startling to the uninformed SWL in the time machine. The machines were popular among the social sets of the times, and parties were given, where the guests linked arms to complete the discharge path and received their "kicks" quite literally!

Also, the massive telegraph networks found in Civil War era America in financial hubs like New York, Boston, and Philadelphia, were quite capable of putting out substantial RFI, if not readable signals, from their keying impulses. And when the electric trolley arrived, circa 1890, the discharges from motor brushes, controllers and trolley wheels really added to the "electrical signature" of that period.

By the way, in the photo of Mr. Edison on p.33, his cylinder phonograph appears to be powered by a Bichromate Cell. Grove Cells were around at that time, too!

Finally, enclosed are some page photocopies from the journal of the Antique Wireless Association. I expect to attend their convention around Sept. 26th and hope to finally see their outstanding museum. I think they are worth mentioning to your readers, if you have not already done so.

Frederick Chesson  
Waterbury, CT

>>>><<<<

I enjoyed reading your September issue of MT, especially the article by Ken Greenburg on the "older types" of TV.

He forgot to mention the metal picture tubes on the Zenith units. The entire metal shell was the high voltage and you took your life in your hands if you didn't wear a dry rubber diver's suit! I have a 11" long scar on the inside of my left arm when I suddenly withdrew from the inside of a 16" TV with that infernal metal shell.

In Ken's closing statement (p. 32) he says, "at the now-legendary Allied Radio Corporation...long

gone and sorely missed." He continues with a similar statement about Norelco.

Norelco was and still is the trade name for the Philips light bulb manufacturing plant at Eindhoven, the Netherlands. I retired from North American Philips in San Diego.

Allied Radio Corp. is also alive; at one time Tandy owned them. They have 12 branches in the U.S. Allied puts out a 100+ page yearly catalog with supplemental flyers during the year. Their nationwide WATS number is 1-800-228-6705 and I'm quite sure if Ken were to call that number they could direct him to his closest Allied outlet and he, too, could become the proud owner of one of their catalogs!

George Bidwell  
La Jolla, CA

>>>><<<<

Enjoyed your Railroad article in current (September) MT issue. Hope to see some more of them. I am a retired RR and commercial telegrapher. Also President of the local chapter of the Morse Telegraph club.

D.N. Coble  
Norfolk, VA

**GIVING OUT SECRETS**

For many years now, I have been interested in any and all forms of radio communications. I've especially enjoyed the recent glut of all types of information (books, magazines, etc.) including your own publication. Sometimes though, I feel that too much information is enough. Specifically I'm talking about all that has come out about the "Numbers Broadcasts" and other transmissions that supposedly comes from our government sites like Remington, Virginia, and so on.

I for one really believe that a free press is a corner stone to our great country. I'm sure you feel the same. I'm also sure you know that most of what is printed is already knowledge of many foreign powers, especially those countries that we are not on the best of terms with (say Russia, for example). I would even say that Russia knows better than you or I about what is broadcast from many U.S. transmitter sites. But one thing is for sure, we'll never know what they know and how they know it.

I know it sounds corny but I'd like to remind you of the saying, "loose lips sink ships." I know you know that intelligence is obtained by piecing together many small elements of information. It scares me to

think that damage might be caused by somebody publishing something that by putting this publication in the right place at the right time helped "the opposition" in some way, even if this information might have been totally unclassified...

Anyway, my question to you would be, how do you justify printing a juicy story that you know might help "sink a ship"? Who gains from these stories? Certainly no SWL'er I've ever heard of or met. I hope money is not your motivation!

(name withheld by request)

**Reply**

*I'm sorry you were offended by the appearance of information regarding the Warrenton, VA, sites as a source of numbers transmissions, but I feel that you're way off base suggesting that anything we printed would be of help to our enemies. First of all, information about the Warrenton and Remington sites has appeared before in print, both in book form (The Puzzle Palace) and in syndicated articles (The Washington Post 1984).*

*There has never been any attempt whatever to mask the transmissions, which, for years, were full carrier AM, often remaining on the the air without modulation well before and after the transmission, allowing for easy direction finding.*

*So far as the assertion that you are unaware of any SWL ever benefitting from information like this, I fail to see how answering a question regarding a location of a series of transmissions monitored for years by inquisitive listeners should not have provided some education to them. As you are well aware being a Warrenton resident, there is no attempt to hide the presence of the antennas nor to obscure the identity of the installation as attested to by the sign on the fence.*

*I agree with your concern about revealing insight and information which would*

**NEED TECHNICAL HELP?**

We are always pleased to offer assistance to our readers who need more information about our products and services. All we ask is that you include a self-addressed stamped envelope to help offset our cost of return postage.

If you would like to speak with Bob Grove directly, call 1-704-837-9200 Monday through Friday, 8am-5pm.

# BEHIND THE DIALS

## 50XL



## 145XL



### TWO NEW BEARCATS

#### BC-50XL

Finally, a low cost, high performance, programmable, hand-held scanner with good audio output!

The new BC-50XL's have arrived at Grove Enterprises and our bench test was most pleasantly revealing. Compact (2-5/8"W x 7"H x 1-3/4"D) and lightweight (10.5 oz.), the little programmable boasts ten non-volatile memory channels which can be scanned at a fast 15 per second.

A high performance flex antenna may be disconnected quickly to accommodate a mobile or fixed antenna system via a standard BNC connector. A rugged, metal, bright-finish belt clip is included.

Frequency coverage is 29-54, 136-174 and 406-512 MHz FM with a sensitivity of 0.4-0.7 microvolts; adjacent channel selectivity is -55dB @  $\pm 25$  kHz.

A keypad on/off switch prevents accidental reprogramming when worn; an automatic three second delay allows a brief waiting period to hear replies on a channel before the scanning

sequence resumes.

Any channel may be directly accessed manually and lockout may be selected for any combination of channels.

Strong audio from the internal speaker, pushed by 400 milliwatts of power, offers the loudest programmable hand-held on the market, adequate for mobile operation or use in a noisy environment.

No search or priority capability is present, and the display shows channel number only; however, the frequency is shown--digit by digit--both when the keyboard entry is first made and when the "REVIEW" key is pressed by the user.

Options available at extra cost from the manufacturer include rechargeable batteries and charger, carrying case and DC mobile cord.

Although advertised to retail at a bargain price of only \$189, the BC-50XL is now in stock at Grove Enterprises at a subscriber discount of \$149 plus \$5 UPS shipping.

#### BC-145XL

This new entry-level programmable scanner from Uniden offers quality performance at very low cost. Featuring 16 non-volatile memory channels and automatic weather scan (162.40-162.55 MHz), audio output is rich and full from the 800 milliwatt amplifier.

The keyboard has excellent tactile feel with rubber keys; the LED display shows channel being received and will read out frequency digit-by-digit with the pressing of the "REVIEW" key.

Scan rate is approximately 13 channels per second; sensitivity is 0.3-0.6 microvolts on all frequency ranges (29-54, 136-174, 406-512 MHz FM). Selectivity is -55dB @  $\pm 25$  kHz.

The 145 measures 9-1/2"W x 2-1/2"H x 7-1/8"D; it is powered by either 120 VAC from a wall adaptor or may be directly fed by 12 VDC. Rear apron connectors provide access for an external antenna and auxiliary speaker.

Lockout, priority and direct channel access are additional features. An attachable whip is included.

With a recommended retail of \$159.95, the BC 145XL is in stock now at Grove Enterprise at a subscriber discount price of only \$129 plus \$5 UPS shipping.

#### Grove Universal Whip Antenna

While the new pocket scanners come in very handy, the short flexible antennas provided with the units give compromise range capability.

Since most of the programmable hand-helds are now equipped with a standard

BNC antenna connector, it is possible to provide an add-on high performance antenna.

The Grove ANT-8 Universal Whip is just such an antenna, capable of custom length adjustment to suit the user. Extended to 18" the whip becomes a full quarter wavelength for high band and a gain antenna at UHF. Fully extended, the ANT-8 approaches a more suitable length at low band.

In actual use, the antenna was substituted for the manufacturer-provided "rubber ducky" on a Regency HX-1000 pocket programmable scanner. A weak high band signal was tuned in. The experiment was repeated at UHF. In every case, the Grove whip equalled or usually exceeded the signal level on the flex antenna.

(ANT-8, \$12.95 plus \$1.50 UPS shipping from Grove Enterprises, 140 Dog Branch Rd., Brasstown, NC 28902.)

#### Grove ANT-10 Mobile Scanner Antenna

The quest for a low profile, high performance antenna for wide-frequency-range reception in a mobile installation is not an easy one. Short antennas with their built-in decoupling coils are a compromise at best.

The new ANT-10 magnet-base mobile scanner antenna seems to have overcome most of the difficulties. While still short in terms of both physical and electrical length, it is capable of surprisingly good performance on low, high and UHF bands, especially near metropolitan areas.

Tested against a number of competitive models, the Grove ANT-8 put in a consistent good showing, often rivaling units much larger in size and more costly as well. It comes with 12 feet of coaxial cable and a standard Motorola connector.

(ANT-10, \$25 including free UPS shipping in the U.S.) Fifteen day unconditional warranty applies to all Grove products.

age of citizens band.

We need and want items, articles and yes, informative advertising of CB materials.

Gene Suchecki  
Milwaukee, WI

(We have an annual index in the December issue; articles which will be published in the MT anthology, "Best of MT," are starred. So far as the CB issue is concerned, the vast majority of MT readers are vigorously opposed to its coverage. Bob)

#### VIEWPOINT cont'd

be of help to foreign adversaries; these articles didn't do it.

Bob

>>>><<<<<

I feel "The Interceptor" is infringing ever-so-slightly on the security of Pantex--as well as Oak Ridge, etc.--by supplying frequencies on the D.O.E. Pantex and "Eclipse" net (Aug. '85 MT).

Granted, the freqs are there for everyone to listen to, but I would think it would be easier for the two Amarillo "nuns" as well as the hordes of leftist fanatics to keep track of and possibly cause damage to the facilities of the D.O.E.!

I think that on your part, Bob, you should take responsibility for the freq's being published in MT.

As far as "The Interceptor" is concerned, why does he require secrecy? Is that him in the pick-up truck with the mask? What is he trying to hide?

Jim Buscher

Washington, DC

#### STRANGE NOISES

Your article in a recent [Oct] MT about 1090 MHz was somewhat inaccurate.

1090 MHz is not a DME frequency. There are DME frequencies near 1090 MHz associated with various navigational aids; however, 1090 MHz is a ATCRBS frequency.

In the ATCRBS system, besides its radar frequency, radars transmit a second frequency (1030 MHz) called the interrogator frequency. When the 1030 MHz signal is received by an aircraft that is transponder equipped, the transponder replies on 1090 MHz as described in your

article. Listeners that are very close to ATC radars may wish to try to hear the 1030 MHz frequency. It will sound like a noise pulse about every 10 seconds.

DME signals use 962-1213 MHz. (Aircraft interrogators use 1025-1150 MHz. Ground transponders use 962-1024 and 1151-1213 MHz.) They sound very different from the 1030 MHz and 1090 MHz frequencies. They transmit continuously when activated and within range. (The sound is similar to the now de-activated LORAN A.)

David Wilson

#### MT INDEX?

There is a need for an annual index; it's a shame to waste so much good material without an "index." Please consider it.

Millions of people operate on the CB bands, yet you have very limited cover-

VISIT TO HCJB from p.1

The visit would not be complete without a visit to Pifo, the HCJB transmitter site, about 15 miles north of Quito. It was a real high for me--a ham's dream amidst the towers and miles of wire. There I was greeted by engineer Tim Roberts who started my tour, a complex of 11 transmitters and 26 antennas.

I had the pleasure to meet John Stanley, former HCJB chief engineer (HC1JX), and his lovely wife Ruth (HC1RN) who ran the HCJB DX Club "ANDEX." John completed my personal tour of the transmitter building and antenna site.

The transmitters are interesting technically since no two are alike--a great challenge for the engineering crew! The site has an antenna for each area served plus the famous "steerable antenna" designed by HCJB engineers. This antenna can be directed to many target areas and is usually used with the 500 kw transmitter.

The site includes transmitters and antennas for all short-wave broadcast bands and dedicated units for the local Spanish/Quechua service on 3220 kHz as well as a backup transmitter for 690 kHz medium wave.

Many of the engineers live at the transmitter site in brick houses provided by the station. The radio frequency energy is so great at times that the engineers can hear radio broadcasts through their house wiring! The antenna switching room



Musical Mailbag Program being recorded with Brian Seeley, Carol Cathro, Helen ?, and Ed Soomre



HCJB transmitter building with North American antenna system.

in the transmitter building contains so much energy that you can light up a light bulb by holding it in your hand!

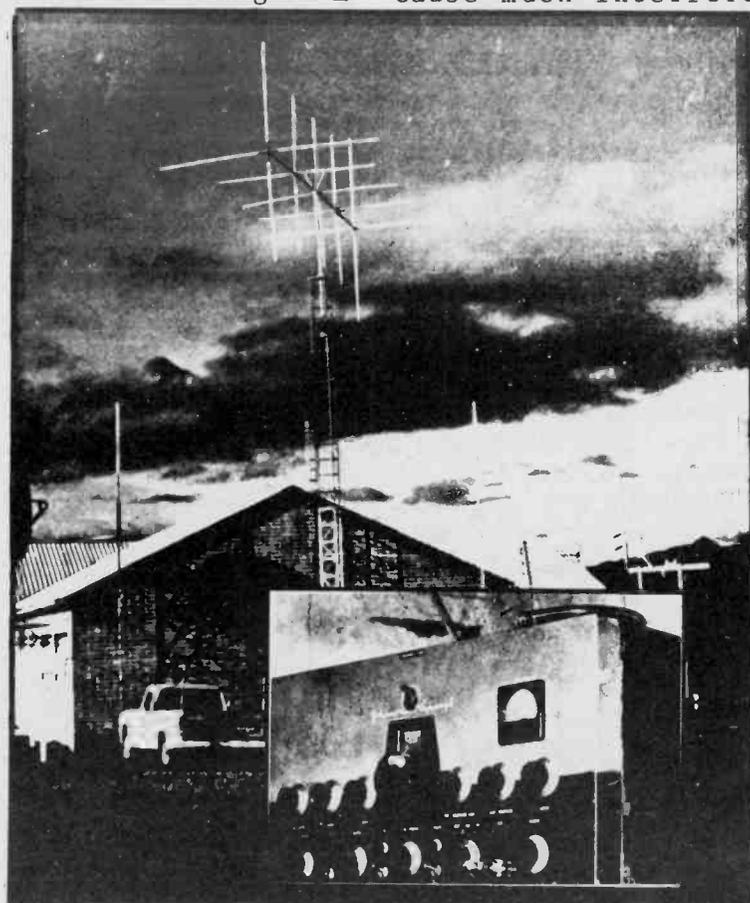
I also had the pleasure of meeting Robert Stube (HC1RT), director of the communications division and frequency coordinator for HCJB. He said they are having many problems finding clear frequencies as Radio Havana Cuba and Radio Moscow cause much interference.

It's hard to change frequencies because of band overcrowding. An FM broadcast network is planned for the



future to cover a good part of Ecuador.

Roger mentioned that the FM broadcast service (89.3 MHz) and medium wave services (690 kHz) of HCJB are transmitted from Mt. Pichincha in Quito. This mountain also has a passive reflector for the microwave link between Quito and Pifo (900 MHz and 6 GHz). A two way radio repeater system on 161 MHz FM is used for communications by the



Five-element steerable Qubical Quad. Insert shows Johnson Viking II (100 watts input) transmitter for 26020 kHz.



35th ANNIVERSARY QSL SERIES VI -- TRANSMITTERS (Then - Original "Sheep Shed" Transmitter Building. (Now - Console and 50 kw. Transmitters.



Some members of the HCJB English language staff. Left to right: Sylvia Lopez, Rowena Turner, Brian Seeley, Dee Baklenko, Paul Bell

**VISIT TO HCJB cont'd**

engineering department. Some remote broadcast pickup operations take place on 455 MHz FM.

We also visited the town of Papallacta (25 miles east of Pifo) home of the hydroelectric power generating station for HCJB. Electric power is generated by Andes mountain water and is sent via transmission lines to Pifo. The 24 kV power is then distributed to the transmitters and transmitter complex.

Other HCJB engineering folk I met were Jim Heck (HC1JH), engineering director of traffic and operations, and Orba Bliss (HC1BW), and engineer working on the studio equipment in Quito as well as equipment at Mt. Pichincha and Pifo.

I picked up some DX while there using a Sony ICF-7600--Poland, Sweden, Australia, USSR, USA, Switzerland, Germany, Cuba plus a few regional stations in Ecuador and Mexico. Too bad I lost my DX log while in transit back to the USA!

HCJB's future plans include a low power (QRP) 15 watt transmitter on 26020 kHz, a set of 1986 QSL cards which will show Ecuadorian birds, and more use of the steerable antenna which was used by amateur radio station HC1JB during HCJB's 50th Anniversary on June 11 and 12th, 1983.

Now, when I listen to HCJB, I can see the people behind the scenes who make it happen. Give HCJB a

listen; I am sure you will enjoy their programs as I do.



**RADIO ASTRONOMY from p-1**

today's standards and his technology was anything but "high-tech." Yet he was monitoring the first kind of radio waves known to man and, coincidentally, was the world's first monitoring buff. A tip of the hat, Joseph; you started a fine field, indeed!

Of course there were other early scientists such as Popov who monitored natural radio waves before there were man-made radio waves to detect. In 1887, however, Heinrich Hertz discovered how to transmit electromagnetic waves; from that time on, man had the ability to produce radio waves as well as to detect them.

The trouble was the Hertz's "communication" was limited to a distance of a few meters at best, not much of a thrill in such "DX"! Even after Hertz's dis-

covery, it was necessary to stick with natural radio waves like Henry and Popov had if we wanted to cover any distance with our monitoring!

Around this point in time, Oliver Lodge, who was a well-known scientist responsible for much of the early work in radio, tried something which, at the time, must have seemed an arrogant presumption: he attempted to monitor the natural electromagnetic radiation which he suspected might come from the sun!

One must admire his intuition and enthusiasm, for he was correct in speculating that the sun gives off radiation, but with the relatively crude monitoring equipment available at that time he didn't succeed in detecting it. Today it is relatively easy to monitor the sun's radio emissions by means of the sophisticated antennas and receivers which are available within current radio astronomy technology.

Radio astronomy deals with monitoring of naturally occurring radio signals from the heavens, just as traditional (optical) astronomy deals with visual signals (images) of natural phenomena in the heavens. Many objects in the universe give off natural radio emissions and, in fact, the most distant known objects in the universe were discovered by radio astronomy.

The really crucial discovery which led to the establishment of the field of radio astronomy came about in 1930 when Karl Jansky, a young radio engineer who worked for Bell Telephone Labs, was involved in a project of monitoring the static which interfered with transoceanic radio communications.

He obtained a highly directional antenna (see fig. 1) with which he could determine the direction of the static to which he listened, got his receiver in readiness, and monitored this static in earnest. Whoever heard of listening to static intentionally?

Engineers and scientists (and also some radio nuts!) tend to study odd things at times, often with surprising and interesting results. In the case of Jansky's static, he carefully recorded the levels of static he received, its direction from his monitoring station and the time of day at which it was observed.

Much of what he heard could be traced to thunder-



From the Daniker collection courtesy of WT Farmerie.

## Copy Worldwide Short-wave Radio Signals on Your Computer

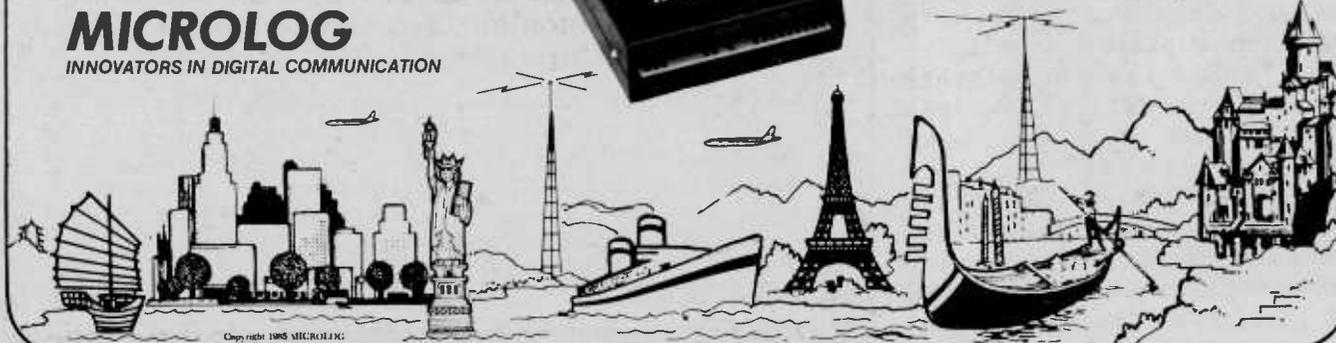
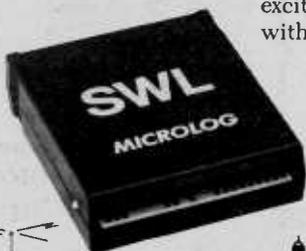
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**RADIO ASTRONOMY cont'd**

storms on this continent or somewhere else on our planet Earth. However there was one continual puzzling problem which he encountered in this research: No matter how he tried to account for his static by thunderstorms and lightning on this planet, there was always a small residuum of static which he could not blame on any known source. This was a problem he could not solve easily.

His antenna was highly directional and he could tell from which point of the compass his static had originated. After much thought and study, he realized that the direction of this unaccountable static was consistent with a line from his location pointing to the center of our galaxy: he was monitoring extra terrestrial radio wave!

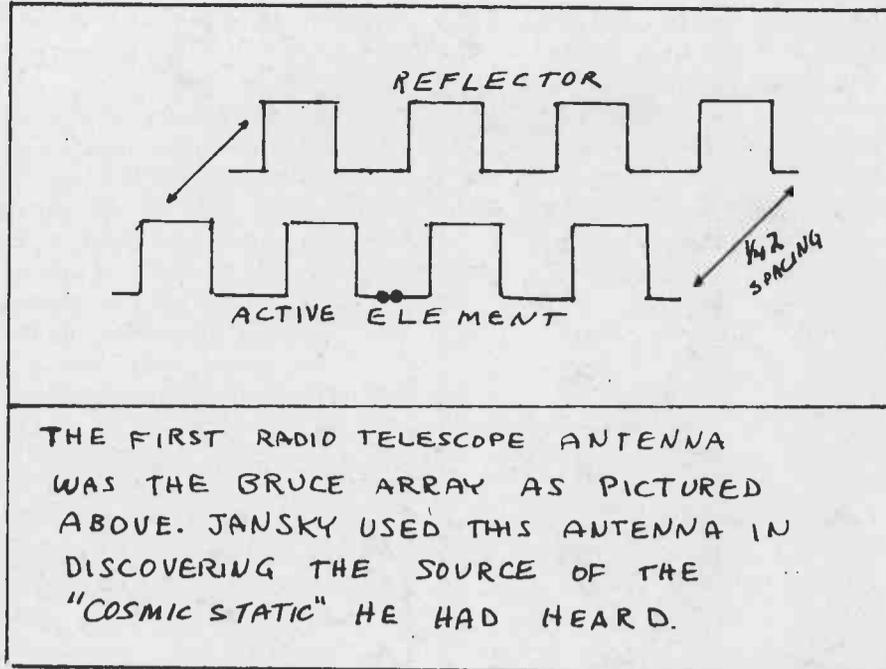
This was an extremely exciting finding to those with imagination enough to believe it; however, his report was not accepted readily by many scientists and engineers of the day. Even Bell Labs assigned Jansky to other tasks and let this landmark discovery lie fallow for years!

It remained for a young radio engineer, Grote Reber, later in the 1930's, to construct his own homemade parabolic dish antenna and pursue Jansky's finding on his own time, at his own expense, and thereby bring radio astronomy to the fore.

By this remarkable accomplishment Reber also became the world's second radio astronomer; Jansky was, of course, the first. George Southworth, a well-known radio pioneer in his own right, wrote of Reber's work that he "...literally drew a radio picture of the Milky Way."

○ The first two persons to be involved in the discovery of radio astronomy, Jansky and Reber, were involved in the field of radio engineering. This is typical of those who developed the field of radio astronomy--workers in this new field needed their "telescopes" to "gaze" into the heavens, and these telescopes came directly from the field of radio.

The antenna which Jasky used to "look for" static, and the parabolic dish antenna which Reber used to search the sky for new heavenly bodies, were the "lenses" of the first two radio telescopes. The successful development of this new discipline depended upon the directivity of the



radiotelescope antennas utilized, and no one but radio engineers or physicists involved in research on radio communication were really trained in the design of antennas.

One of these early workers was John Kraus, a physicist and radio engineer well known to other radio engineers and amateur radio operators for his many contributions to antenna design.<sup>8</sup> Among the antennas which he has invented is the well-known end-fire helical antenna and the legendary W8JK beam antenna named for Kraus's amateur radio operator call sign.

Kraus went on to develop many other antennas including a very large and useful radio astronomy antenna dubbed "The Big Ear." This antenna was given its name by a newspaper reporter who was impressed with the fact that the antenna was designed to monitor radio signals from deep space many, many light years away from our planet.

Kraus, in the autobiography referenced above, tells an interesting tale about the newspaper reporter's story on the "Big Ear." The news story indicated that the signals ("cosmic static") which were heard with this radiotelescope had a "frying sound." Kraus relates how a religious journal of the day took exception to such a report, implying that perhaps one might hear heavenly music from the heavens, but that a frying sound was what one would expect from a very different place!

There have been other very large radio telescopes constructed since that time. The 1000 foot diameter spherical-dish reflector radiotelescope in Arecibo, Puerto Rico has been used not only for searching the heavens in astronomical research, but also has been utilized for that ultimate monitoring dream: searching

for possible transmissions from extraterrestrial beings.<sup>9</sup>

While science-fiction writers only dream of visiting other worlds, radio-astronomers are busy sorting out the myriad signals which bombard us daily from beyond our own solar system. With their giant antennas and extremely sensitive receivers, radioastronomers are probably the most sophisticated monitoring buffs around.

And if someday we discover that some of these signals were devised by intelligent beings who may wish to contact us, it is almost certain that a radio-astronomer will be the first to know!

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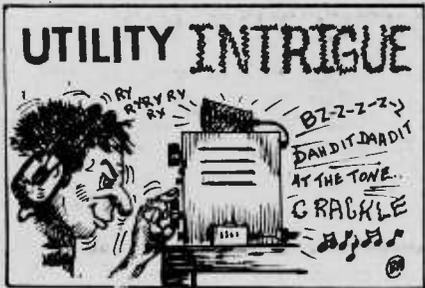
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by  
**Don Schimmel**  
 516 Kingsley Rd SW  
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The following activity has been observed intermittently over the past couple of years. My guess is that it is part of a world-wide Vietnamese diplomatic network. Holders of the Grove SHORTWAVE DIRECTORY (2nd Edition) can use this data to supplement the data on page 89.

The traffic usually consists of five-letter groups and some Vietnamese plaintext. At times it appears the plaintext may have some coded groups intermixed. One instance was noted where cut numbers were used in sending a message. The addressee indicator was GEM which was in the heading and the text was cut numbers using the following equivalent letters:

1 2 3 4 5 6 7 8 9 0  
 A N D U W R I G M T

Here is what a typical heading looks like:

AGL NR79146 CK70 BT

A sample of the plaintext follows for recognition purposes:

(IN HERE) DOANF KEETS SAWNX  
 COSGI WAX ND HAI NWOCS DAN  
 HAI DANGR EVF CESINHI PSUR  
 CHUNGS TANGAYF CANGU.ARUNGR  
 COOS VAF PHATS TRIENR MANSJ  
 MEX A ALI XINGWIR CACS D/C  
 LOWIF CHAOF TRAA N TRONGJ AAA  
 ALI LUANDA, NGAYF 4 OANGS 9  
 NAM 1984 ALI TSW KYS THWS.WI  
 JS CA BT DI etc etc. I may not have copied this 100% correct because the guy's fist left a little to be desired in the way of smoothness!

Some of the following indicators have been seen in use as call signs as well as being used as addressee indicators:

LV6 AFQ HPU ORS LHA GEM AGL  
 NCG MDC MZB

This theory may be incorrect but I can't help wonder if some of the indicators might not equate like this:

GEM - GERMANY  
 MZB - MOZAMBIQUE  
 MDC - MADAGASCAR  
 NCG - NICARAGUA  
 AGL - ANGOLA

Twice I observed relay instructions included in the heading of a message. In a message sent to LV6 the

heading contained VIA AGL and in a message sent to AFQ the heading had VIA GEM.

The following list presents the frequencies I have observed along with the time(s) the activity was intercepted:

kHz	Z TIME
13240	1230
13248	1247
13251	1311
13279	1957 2032 2059
	2130
13281	2150
13909	1219
13965.5	1650
16447	1915 2228
16457	1503
18947	1648
18950	1425 1550 1623
	1658 1715

A few QSY designators have been seen and they were: QSY PH1 QSY 19 QSY 23 and QSY 16. When establishing a QRX, it has been sent as QRX 21R00. The letter O was sent in place of the zeros.

Fred Osterman of Universal Shortwave kindly responded to our request to check out a transmission I had recorded (see UTILITY INTRIGUE July 1985). I mentioned in that column some strange tone signals I had observed on various frequencies. Contrary to what I had thought, Fred believed the signal was PICCOLO.

Fred advised us "Unlike regular RTTY it [PICCOLO] has more than one tone. Tones (or tone combinations) of different frequencies are used to represent each character. It thusly has a very 'musical' quality to it. The prime user of this format is the British Foreign Ministry." Many thanks to Fred for his comments.

At first I thought I had run across some weird type of encrypted text which consisted of mixed letters, numbers and punctuation. The CW signal was intercepted on 17127.3 kHz 9 Sept. at 1250Z. After copying a few lines I realized that the station had the tape running backwards and thus the strange appearance of the transmission. The foul-up was on the part of station HPN60 in Calan (Puerto Armuelles) Panama and here is a sample of what I heard when I tuned into the frequency: "17E 17E 17E (K RA TB CTU RUOH NEVE YREVE ENOHP TSIL CFT CTU RUOH DDO RYEVE WC TSIL CTF POIW ((-8))" etc.

The tape ran this way for a considerable period of time and then the operator on duty must have detected the error because the trans-

mission stopped and when it returned it was running correctly.

By the way, the technical note contained in the transmission indicated that HPN60 was going to cease operations and all recipients were notified to route their traffic through HPP (Panama IntelMar Radio).

To amend your maritime information, note that HPP can be heard on 4275, 6423.5 and 8589 kHz. The CW traffic list is run every odd UTC hour followed by the RTTY traffic list. The phone traffic list is sent every even UTC hour.

Regarding the crypto system described in our September column, some additional texts were worked on resulting in the correction of errors and filling in the blanks that were contained in the original presentation of the system. Here are the reworked alphabets:

CIPHER	A	B	C	D	E	F	G	H	I	J	K
PLAIN	Z	I	A	M	Y	D	O	Q	K	V	R
	L	M	N	O	P	Q	R	S	T	U	V
	S	J	B	G	P	U	T	C	F	H	L
	W	X	Y	Z							
	W	X	N	E							

The September/October issue of COMMODORE MICRO-COMPUTERS magazine has an article which may be of interest to some MT readers. The article was written by Mel Granick, KS2G and is entitled "BECOME RADIO-ACTIVE WITH YOUR 64." In the article Mel details the various uses of the Commodore 64 computer in connection with amateur radio and, of course, many of these uses are suitable for short wave listening applications as well.

A unique way of requesting repeats of groups was noticed on 14456 kHz 10 Sept at 2027Z. This CW station (call sign not recovered) would ask for repeats in the following manner: RGE5 REI8 GR7, PGE4 REI4 GR5 etc. The station apparently did not have the transmitter tuned properly because he was putting out a signal every few kHz.

RTTY testing was logged on 20138 kHz, 3 August at 1241Z when MAP (MAGHREB ARABE PRESSE-Rabat, Morocco) carried RY's and frequency scheduling information and then went into English language press items. A dual transmission was noted on 19068.4 kHz. The RTTY was 50-425.

Three different types of tone transmissions were intercepted during September --unfortunately, my tape

recorder was inoperative and I was unable to capture the signals on tape for analysis. The first one (13853.2 kHz, 6 September, 1249Z) was a repeating MCW transmission that sounded like five different tones with the first and last tone the same with four different tones in between.

The next logging (18140 kHz, 13 September, 1951Z) seemed to be composed of many tones in a constant repetitive pattern as if it were in an idle status. The carrier went off the air briefly and then came back on with the same sounding pattern.

The last CW tone transmission was completely different from either of the other two; it was on 13163 kHz, 14 September at 1225Z.

The additions to my bookshelf this month include "RADIO BEACON HANDBOOK" and "TIME SIGNAL STATIONS." The first title is by Wilhelm Herbst Verlag and is a very complete compilation of long and medium wave radio beacons. The book contains more than 9000 such stations and is an excellent operator aid to have at your position for identification of beacon transmissions.

The second title is authored by Gerd Klawitter and the current edition, the 10th, contains data for the 30 countries which transmit Time Signals. The books are available from Gilfer Shortwave and some MT advertisers.

To wind up the column this month here are several more out-of-the-ordinary transmissions. On 2 September at 1515Z, a CW station was observed on 13212 kHz sending five figure groups, each group twice, followed by the letter "R". Zero was cut as letter "T".

Digit groups of varying lengths were intercepted on 6650 kHz on 8 September at 0010Z. This CW station separated some groups with AA and others with AAA.

A very short cut numbers broadcast appeared on 13462 kHz 18 September at 2118Z. The transmission was CW and consisted of three groups of text, MND NMDAW AMRGN, repeated over and over. This brief message perhaps broke out to 923 29315 19682. At 2119Z the transmission stopped and nothing further was heard.

\*\*\*\*\*  
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 COLUMNIST WITH YOUR  
 QUESTIONS AND IDEAS!  
 \*\*\*\*\*

LOGGED SEPTEMBER 1985		
KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
4275	151105	CW/DE HPP (PANAMA) FREQS & SCHEDULES
4868	080033	CW/DE FDY (ORLEANS AIR, FRANCE)
5890	122024	CW/5L GRPS, SPEC CHAR IM AA OE OT
6400	142048	CW/CQ DE EAD-EAD2-EDZ2 (ARANJUEZ, SPAIN)
6470	132358	CW/DE 4XO (HAIFA, ISRAEL)
6605	141416	USB VOICE/MIAMI WX STN GIVING WX FOR FLORIDA & BERMUDA AREAS
6624	080004	RTTY 75-850/PBC22-24-26-28-212-217-222 FNFLN, RY'S (GOEREE NAVAL RDC, NETH.)
6702	080021	CW/D MARKER
6803	142056	CW/D MARKER
6810	080023	USB VOICE/SS-OM & YL IN CRYPTIC CONVERSATION.
6970	141240	CW/(POSS CUBAN) WX IN SPANISH RE TROPICAL STORM SOUTHEAST OF HAITI.
7534	020049	USB VOICE/GG-YL WITH 5F GRPS
8450	132356	CW/DE VRT (BERMUDA(HAMILTON) BERMUDA)
10103	112316	RTTY 50-425/DE FDY (ORLEANS AIR, FRANCE)
10766	141546	CW/DE CYS22 (OTTAWA, ONT., CANADA)
11113	101234	CW/5F GRPS, SPEC CHAR IM OE OT AA
13044	021149	CW/DE PJC (CURACAO(WILLEMSTAD) CURACAO)
13075	111338	CW/DE UFN (NOVOROSSIYSK, USSR)
13081	021154	CW/DE EAD (ARANJUEZ, SPAIN) CALLTAPE
13207	151243	CW/4F GRPS, CUTS ZERO AS T, HAND SENT
13252	151249	USB VOICE/FISHING BOATS CONVERSING
13330	061646	CW/UNIDEN STN CALLS CLP1 (HAVANA, CUBA) SENT QSY 13940 & 14440. NOTE: THESE ARE MINREX FREQUENCIES.
13372	131732	CW/POSS CODED WX.
13377	141154	USB VOICE/ANNOUNCEMENT IN GERMAN & ENG. "TEST FOR CIRCUIT ADJUSTMENT PURPOSES FROM A STATION IN BERLIN, GDR"
13382	141733	MCW/382 1(NERS BRDCST UPCOMING), INTO 5F GRPS, CUTS ZERO AS T
13392	111247	RTTY 75-425/7L1 (CZECH EMB HAVANA CUBA) SENT 5F GRPS & PT CZECH MESSAGES
13416.6	111231	CW/? DE UUS (RUSSIAN ALLOC) 5F GRPS
13418	102054	RTTY 50-425/DE STK (SUDANESE ALLOC) RY'S
13422	151106	USB VOICE/GG-YL, GERMAN NERS BRDCST
13478	151254	CW/948 1, THEN INTO 5F GRPS
13635	151258	CW/C MARKER
13978	101738	CW/945 2, NERS BRDCST UPCOMING
13979.9	111703	CW/DE 4ZBU (ISRAEL ALLOC)
14407	141542	CW/5L GRPS, SPEC CHAR AA IM OE OT
14415	061700	RTTY 50-425/PRESS ITEMS IN ENGLISH
14456.1	172235	RTTY 50-425/CLN565 (HAVANA, CUBA) RY'S
14494.2	172237	RTTY 50-425/CLN565 (DUALING WITH ABOVE)
14508	121832	CW/? DE RIW (KHIVA NAVAL RDO, UZBEK, 5L GRPS, SPEC CHAR AA IM OT OE
14572	111643	RTTY 50-425/ARABIC TEXT
14800	061723	RTTY 50-425/PRESS IN ENGLISH, TASS, RUSSIAN PRESS SERVICE
16324	101540	RTTY 50-425/PRESS IN ENGLISH, "ADN" (ALLGEMEINER DEUTSCHER NACHRICHTENDIENST BERLIN, GDR)
16450	101729	CW/POSS CLA (HAVANA, CUBA) COMMERCIAL TELEGRAMS WITH HAVANA AS ORIGINATION CITY
16849	021209	CW/LFT DE DZSO (ROGALAND, NORWAY FROM PHILIPPINE SHIP)
16951	131955	CW/DE 6WW (DAKAR NAVAL RDO, SENEGAL)
17045	141537	CW/DE LPD46-25 (GEN PACHECO, ARG)
17143	121854	CW/DE DAN (NORDDEICH, GFR)
17149	101536	CW/DE TIM (LIMON, COSTA RICA)
17195	021334	CW/DE SVB8/SVB5 (ATHENS, GREECE)
18123	141908	LSB VOICE/GG-YL GIVING LENGTHY STATEMENT
18159	131946	CW/5F GRPS, CUT NERS WITH 3 4 5 6 SENT FULL & 1 2 7 8 9 0 AS A U S D N T.
18951	141533	CW/5L GRPS (POSS VIETNAMESE DIPLOMATIC)
20248	121845	CW/5L GRPS, SENDS GRP THEN AA AND RPTS GROUP THEN INTO NEXT GRP AND FOLLOWS SAME PROCEDURE.
22233	122043	CW/CLA DE COJK (HAVANA, CUBA FROM CUBAN SHIP)
22329	121843	CW/DE D3E51-61-71-81 (LUANDA, ANGOLA)
22390	122045	CW/DE FUF (FORT DE FRANCE NAVAL RADIO, MARTINIQUE)

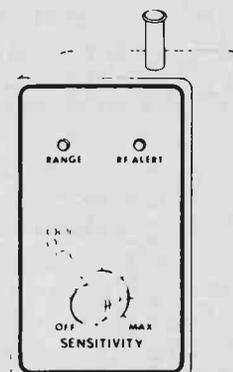
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### LOGGED AUGUST 1985

KHZ	DTOI	MODE/IDENTIFICATION/COMMENTS
12556	311152	CW/URD DE UFJK (LENINGRAD, USSR FROM RUSSIAN SHIP.
12674	311155	CW/? DE CIA (HAVANA, CUBA) CALL TAPE
12700	311157	CW/DE NMR (COMSTA SAN JUAN, PR) CALLTAPE
13750	212253	RTTY 50-425/DE HZJ (JEDDA, SAUDI ARABIA)
13768	212243	RTTY 75-425/PRESS IN ENGLISH (POSS USIA)
13783	181437	RTTY 50-425/DE SQ221 16210 KCS AND SON278 13785 KCS (POLISH PRESS AGENCY PAP WARSAW)
13935	212237	CW/5F GRPS, SENDS "R" AT END OF EACH 10 GRPS, CUTS ZERO AS LETTER T.
14470	211154	RTTY 50-425/TASS (SOVIET NEWS SERVICE WITH PRESS ITEMS IN ENGLISH)
14495	212306	RTTY 50-850/DE CSY(SANTA MARIA, AZORES)
16210	211200	RTTY 50-850/UNIDEN STN WITH RY'S AND 1-0. ZCZC VHA891 VA IIT LR HVA0336 LS VHA089.
16794	311510	CW/? DE PHUF (UNIDEN STN FROM DUTCH SHIP)
18168	311519	CW/5L GRPS, 4 SPEC CHAR AA IM OE OT

## SCANNING

### Scan/Search Hold for the MX5000/7000

by Greg Doerschler

I recently stumbled upon a "trick" that provides the Regency MX7000 and MX5000 with a stop-and-hold function while in the scan or search modes, which I thought you might like to share with your readers.

Using the following procedure, the scanner will scan or search until a signal is received. Once it

receives a signal, it will remain on that frequency until scanning or search is re-started manually.

The scanner seems to rely on the clock function to time the scan delay; thus, if the clock is stopped and delay activated, the unit will wait indefinitely.

- 1) Press (MANUAL, CLK SET)
- 2) Press up to six numeric digits; then (SCAN). If you shut off the scanner or press (MANUAL-CLOCK), you will note that the digits you entered are displayed

but the clock is not running.

3) Use the scanner as you normally would in the scan or search mode if the delay function is not activated. Activating the delay function will cause the unit to stop when it receives a signal and remain on that frequency. Pressing almost any key after the completion of the transmission will resume the scan or search activity. Press a key that would normally produce an "error beep" while scanning or searching; I use the (ENTER) key.

If you wish to resume scan or search while the signal is still present, simply press (SCAN) followed by (ENTER) if in the scan mode or (UP) followed by (ENTER) if in the search mode.

4) To resume normal operation of the scanner, reset the clock using the standard clock set procedure.

Stop-and-hold can come in handy when searching "empty" portions of the band, especially since there is no other search-hold function except opening the squelch. You need not worry about racing back to the scanner to see what frequency "chirped" before the display clears.

ONE ADDITIONAL HINT

While in the normal two second delay mode, pressing any key which causes an error beep immediately after a transmission is complete will cause the unit to resume scanning and not wait the two seconds for the delay.

CQ Ronald McDonald

MT reader Randal Strayer of Barberton, Ohio, shares with us an interesting item this month. It seems that while tuning his scanner to 35.02 MHz he came across some activity.

Upon closer attention, it turned out that he was hearing food orders from the drive-in window of his local McDonald's restaurant nearly two miles away!

There is a constant carrier on the frequency until a car drives up to the order board, then an alerting tone is transmitted to the indoor order-taker and both sides of the conversation may be monitored.

Nothing is shown in the 1984 microfiche for this assignment in Barberton, but

the allocation is for low power (under 2 watts) communications.

Any of our readers have additional information on this system for McDonald's, Wendy's, Burger King, or other remotely-operated order placement boards?

**Motorola's Automatic Vehicle Location System**

The Automatic Vehicle Location System (AVL) is a mobile-to-fixed-end information gathering system designed to provide vehicle location accuracy of up to 1/8 of a mile.

The AVL system uses the Federal Government's LORAN-C (Long Range Navigation), a low frequency (100 kHz) high powered transmitter network whose signals are capable of covering more than 3/4 of the U.S. land area.

The AVL system database accommodates up to 2000 street intersections and 200 user defined sites. The dispatcher can identify the closest units to a specific intersection, site or vehicle within the fleet. In the event of an emergency, the vehicle operator can activate a hidden switch, automatically alerting the dispatcher with his location. This special signal is sent even when the mobile radio and vehicles are turned off.

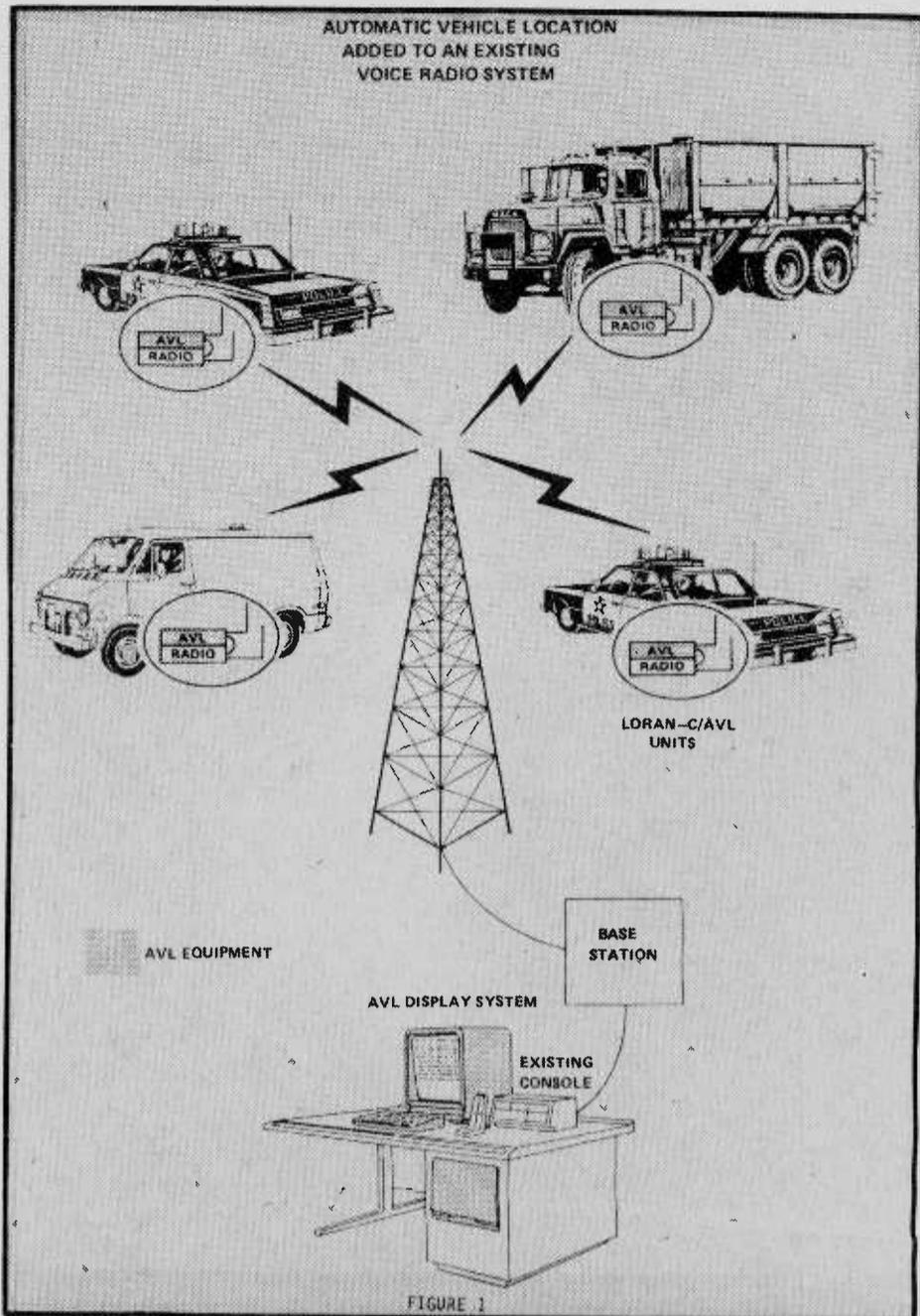


FIGURE 1

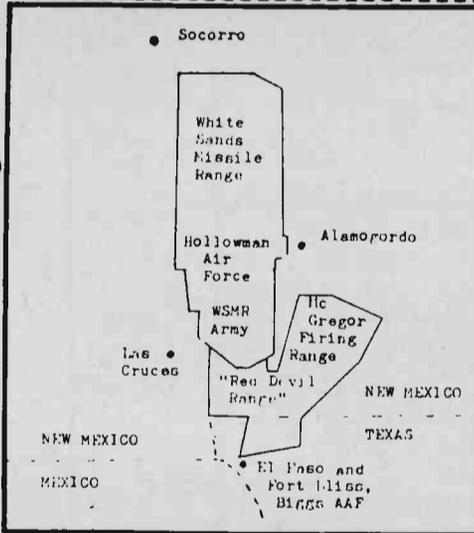
**VHF SKIP REPORT**  
by  
**Chuck Robertson**  
RR 2 Box 850  
Creal Springs, IL 62922

**White Sands Missile Range**

White Sands evokes many images. The first atomic bomb test site is cloistered in this desert expanse, surrounded by empty instrument bunkers and a circle of green glass fused out of the desert sand by the blast.

Today White Sands is America's key testing ground for small missile weapons, averaging 2,000 test firings per year. When the skip is coming in from White Sands you'll almost certainly hear several missile launches!

The range is located in southern New Mexico and measures 40 by 120 miles. In the vastness of this desert sand and sagebrush the Navy has a test area which contains a simulated ship, designated LLS-1. It's even



equipped to simulate the roll of waves for realistic missile test launches!

The Air Force has a test facility located at Holloman AFB on the east side of the range near the city of Alamogordo. This is a very active test site with lots of communications.

The heart of White Sands is located near Las Cruces at the southern tip of the range. This is "White Sands," and is operated by the Army.

**GUNSIGHT**

Some of the most revealing comms can be found on 34.31 repeater out, 34.85 repeater in, narrowband FM. This repeater is used by camera vans, fixed camera stations and the control

room called "Queen Control." Both TV and film cameras are used to record the missile tests.

There are over 640 stations for optical instrumentation, radar, telemetry, electronic trajectory equipment, communications, and control facilities at White Sands. Cameramen frequently operate at an area called "Gunsight" (Gun Site?)

You can listen to launch countdown, missile progress reports and post impact statements, all from the comfort of your living room or radio shack! What's more, the repertoire among the personnel is very upbeat and spontaneous. Unlike most "military" communications, these guys are always making jokes, talking in falsetto and having an all-around good time!

During a missile launch from a Cobra helicopter, one of the camera vans mentioned he didn't think he could get a clear view of the impact area. Queen Control asked if it was because of the terrain. The camera van replied that there weren't any trains, it was because of the mountains!

Camera technicians working on outside and inside security cameras have been found on 36.51 repeater



**VHF SKIP REPORT cont'd**

out, 36.91 repeater in, narrowband FM. Guard shacks, aircraft and mobile patrols can also be heard.

A main activity seems to be keeping an eye on spectators and trespassers. U.S. highway 70 runs directly through White Sands and the missiles passing overhead apparently draw a crowd!

The White Sands Missile Recovery Net (RECON) is on 41.10 MHz, wideband FM. Aircraft and land mobiles can be heard retrieving spent missiles.

"Holloman Recovery" uses 41.90 MHz, WBFM. Missile launches and intercommunication with other bases like McGregor, Firing Range (Ft. Bliss) and White Sands (Las Cruces) has been noted.

**RED DEVIL RANGE**

McGregor Firing Range is located in the Fort Bliss Military Reservation directly south of White Sands. One site is called "Red Devil Range." Base is called Red Devil Range Control, and mobiles also use the Red Devil designator. You'll also hear McGregor Control, South McGregor, McGregor Air (Tower) and aircraft all on 41.70 MHz WBFM.

Missiles are developed and tested for the Air Force on the 3,000 square mile range. Occasionally missiles are launched from McGregor to White Sands.

Ft. Bliss, located in El Paso, Texas, was established in 1848 to protect the frontier and wagon trains heading for California. Nowadays the main activity is training of personnel in missile and anti-aircraft artillery at the U.S. Army Air Defense Center. Base operations are heard on 41.50 MHz WBFM.

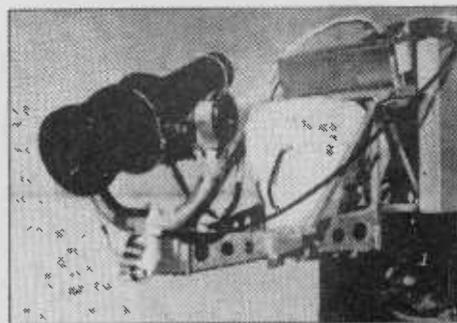
**MONITORING WHITE SANDS**

Here's an extensive list of White Sands VHF-low band frequencies. For the most part they were compiled from the IRAC frequency files. Unless otherwise stated all channels are allocated to White Sands (Las Cruces).

- 30.09 Base 250 watts, mobile 100 watts
- 30.29 Base 100 watts, mobile 60 watts
- 30.45 Medevac, Ft. Bliss/McGregor/White Sands Bases 100 watts, aircraft and mobiles 35 watts
- 30.49 Remote transmitter and base 100 watts, mobile 60 watts
- 30.50 Mobile 35 watts
- 32.05 Same as 30.45 MHz
- 32.65 Mobile 35 watts
- 32.71 Tower and aircraft 35 watts
- 32.89 Same as 32.71 MHz
- 34.09 Base and mobile 100 watts
- 34.31 Repeater out 100 watts Visual recording personnel. Input is 34.85 MHz
- 34.50 Ft. Bliss/Biggs AAF, Tower 50 watts, aircraft 30 watt
- 34.55 Remote transmitter & mobiles, 100 watts
- 34.70 Mobile 35 watts
- 34.85 Repeater in to 34.31 MHz. Base 100 watts, mobiles 60 watts
- 36.10 Tower 35 watts, aircraft 35 and 10 watts
- 36.51 Rptr out 100 W security. Input is 36.91
- 36.70 Ft. Bliss/Biggs AAF Tower 35 watts, aircraft 30 watts
- 36.91 Security Base, mobiles and aircraft 100 watts
- 38.45 Rptr out 100 watts "NOAA Site"
- 38.50 Mobiles 35 watts
- 38.65 Base and mobile 100-W
- 38.71 Rptr out 100 watts
- 38.85 Ft. Bliss, mobiles 20 watts
- 38.89 El Paso, Army Corps of Engineers, base and mobile 35 watts, WUI 505
- 38.95 Base and mobile 100-W
- 40.10 Tower 100 watts, aircraft 10 watts
- 40.15 Holloman AFB and White Sands, mobiles 35 & 20W
- 40.35 Holloman AFB, flight telemetering mobile station, 5 watts
- 40.90 Tower 10 watts, aircraft 100 watts
- 41.10 RECON, Base 100 watts, aircraft & mobiles 35W
- 41.25 Repeater out 100 watts
- 41.43 Telecommand land station, 60 watts
- 41.50 Ft. Bliss operations
- 41.59 Base and mobiles, 100 W
- 41.70 McGregor Firing Range, Tower, aircraft & mobiles
- 41.90 Holloman Recovery, Base



Telecommand Mobile Station: used to control Remote Piloted Vehicles (RPV's)



Automated camera package for remote viewing on RPV's

- 100 watts, mobiles & aircraft 35 watts. Also used at McGregor & White Sands
- 47.90 Holloman AFB, National Guard aircraft
- 49.60 Experimental Testing Station, 0.3 watt
- 49.80 Socorro and WSMR, non-government experimental station, KF2XHZ, 0.3 watt
- 49.93 Telecommand mobile station, 0.3 watt
- 75.64 Telecommand mobile station, 0.5 watt



Missile recovery operations. This is a RPV being recovered.

**NEVADA TEST SITE**

I was unable to find the location of the Navy site in White Sands Missile Range. The IRAC government frequency list shows several 148 to 150 MHz channels allocated to the Navy at Socorro, so maybe the Navy site is at the northern end of the range. As always, I'd like to hear from our knowledgeable readers regarding such questions.

The Department of Energy maintains an extensive repeater system in Nevada dedicated to missile development and underground nuclear test communications. The main area of activity is located at the Nevada Test Site (NTS) inside the Nellis Nuclear Testing Range. Listen for locations like Mt. Rainier Mesa, Mormon

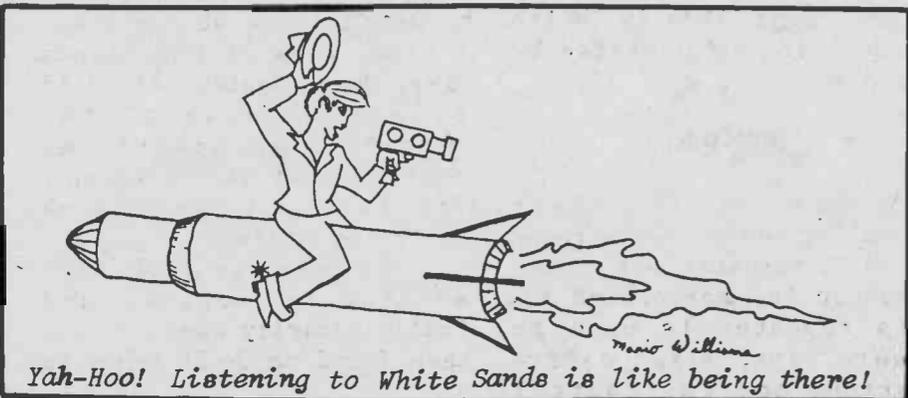
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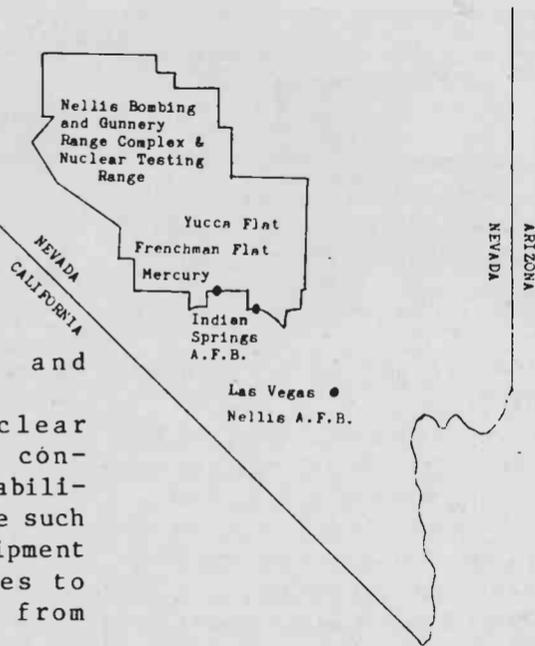
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VHF SKIP cont'd



Mesa, Yucca Flat, and Frenchman Flat.

Underground nuclear tests are primarily conducted to measure the ability of military hardware such as communications equipment and missile nose cones to withstand radiation from nuclear blasts.

The test equipment is located at one end of a tunnel drilled into the side of a mesa or under the desert floor. Detonation of the nuclear device takes place at the other end of the tunnel, perhaps a mile away.

Information gained from these tests helps in development of "hardened" military equipment capable of withstanding all-out nuclear war. Comforting, isn't it, to know our machines will go on working long after we're dust blowing in the nuclear wind!

The two main repeater channels are 36.33 and 36.39 MHz, NBFM. There are several repeaters on both frequencies and transmissions are often parallel (identical on both frequencies). This occurs because the input frequency is the same for all the repeaters: 41.31 MHz.

A unique "multi-crunch" sound is heard after each transmission. This could be the result of several repeaters unkeying one after another! Whatever the reason for the crunch, it makes identifying the repeaters easy.

I hear these "radio active" repeaters are regularly heard here in Illinois during the sporadic-E seasons. That's a skip distance of about 1400 miles-- not bad for sporadic-E! The mountain top locations of the repeaters no doubt help propagate the signals. Power output is 250 watts per repeater and the call sign for all repeaters is KMT317.

Some of the identifiers and locations heard over the repeaters include Montgomery Facility, Las Vegas Base, Station 10, Indian Springs, Cave Mountain, DOE-4, DOE-Echo, DOE Operations, Net 12, Red Butte Junction.

Communications regarding installation and maintenance of missiles and missile systems like the MX can be found on 36.05 NBFM. There are at least two

repeaters on this frequency, 250 watts and 50 watts. Simplex comms between base and mobiles are on 41.03, 100 watts, NBFM.

Some of the identifiers heard include Shoshone Receiving Site, MX site, Mercury, Frenchman Flat, Net 7, Valley Tower, North Creek.

"KMT317, North Creek, Nevada" has been heard ID'ing on 36.05 several times. The call sign KMT 317 is allocated to the 36.33 and 36.39 repeaters, so what's it doing on 36.05 MHz? Perhaps the input frequency to the 36.05 repeater is also 41.31 MHz, the same as for the 36.33 and 36.39 MHz repeaters!

Another Nevada DOE frequency to watch for is 34.99 MHz. This is a car-to-car channel, 80 watts, call sign KA8277. Also try 30.00 MHz, MX Missile Radio Net, channel 48.

Here's a list of other interesting DOE channels:

- 30.37 Rptr out, 250 watts. Listed to the United States and its possessions. There's also a DOE Telecommand mobile station allocated to this frequency at Amarillo, TX, for 0.1 watt.
- 34.03 Base and mobiles; 250 watts; United States and possessions.
- 40.47 Nationwide allocation; there are several bases across the country, all licensed for 1,000 watts. Emissions are 16F9, so telemetry or scrambling are probably transmitted.

**NELLIS NUCLEAR TESTING RANGE**

Nellis AFB is located at Las Vegas, Nevada. The Nellis Bombing and Gunnery Complex and Nuclear Testing Range is about 35 miles northwest of there. Base and aircraft comms concerning impact areas, hot areas, cold areas, etc., can be



by James R. Hay

**U.S. COAST GUARD  
HF EMERGENCY NETWORK**

**PART II**

Last month we looked at the proposed High Frequency Emergency Network; this month we will take a look not so much at the system, but now at the cost estimates and the implementation of the network.

The Coast Guard is considering four different approaches to equipment using two different lines of equipment: the Collins HF-80 with a transmitter power of 1 kilowatt, or the Sunair GSB 900 with an output power of 100 or 1000 watts.

The four approaches

are:

- 1) To install Collins equipment at all district and area headquarters;
- 2) To install Sunair 1 kW equipment at all district and area headquarters;
- 3) To install Sunair 100 watt equipment at those districts close to either Atlantic, Pacific, or USCG headquarters, and 1 kW Sunair equipment at the others;
- 4) To install nothing at districts which have VHF links to communications or radio stations, and a mixture of Sunair 100 watt and 1 kW equipment at the remaining districts.

It should be noted that the Coast Guard's estimate of the initial purchase costs of the equipment is:

Collins	\$60,000
Sunair 1 kW	\$30,000
Sunair 100 W	\$12,000



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

heard on the Air Space Control channel 34.60 MHz, WBFM.

Here's a list of Nellis AFB frequencies from the IRAC files:

- 30.15, 32.35, 34.60, 36.85  
Tower 10 watts, aircraft 20 watts
- 32.45, 32.65, 40.15, 49.95  
Aircraft 10 watts
- 34.33, 34.73, 36.45, 40.65  
Mobiles 60 watts

**RED HAT**

Western brush-fire-fighting comms were monitored on several days during late June and early July. The channels were 36.50 and 42.00 WBFM.

Arizona, Nevada or Utah are the best bets for the location of these fires. Unusually dry weather over the last two years left the West's valleys and steep ridges parched and wide open for brush fires. Lightning strikes from marauding thunderstorms started most

of the fires.

Here are some of the identifiers used: Red Hat, Red Head, Lightning Rod, DZ Lightning, Ridgerunner. These were probably National Guard operations.

**SKIP FOR CHRISTMAS**

VHF'ers take heart-- The second sporadic-E season is on its way! By mid-November there should be a noticeable increase in E<sub>s</sub> activity, with the peak coming in December.

By mid-January, it will all be history in the log books, so don't let this Christmas skip pass you by! Program your scanner for the skip zone and catch the action!

**NEXT MONTH:**

Hop in! We're taking a taxi to the Pentagon. Then it's across the Potomac to Washington, D.C. for a visit to the White House Communications Center. Bring your own jelly beans!

HIGH SEAS cont'd

TABLE I

Facility	1	2	3	4
Headquarters	\$60	\$30	\$30	\$30
District 1	\$60	\$30	\$12	\$30
District 2	\$60	\$30	\$30	\$30
District 3/Atlantic	\$60	\$30	\$30	---
District 5	\$60	\$30	\$12	---
District 7	\$60	\$30	\$12	---
District 9	\$60	\$30	\$30	\$30
District 11	\$60	\$30	\$12	---
District 12/Pacific	\$60	\$30	\$30	---
District 13	\$60	\$30	\$30	\$30
District 14	\$60	\$30	\$12	---
District 17	\$60	\$30	\$30	\$30
Total	\$720	\$360	\$270	\$180

These costs include the transmitting/ receiving equipment, antennas, cables, etc. for each set.

The total cost estimate for the purchase of equipment for the four approaches is according to Table 1. District 8 will receive no equipment as there is already installed a Sunair 100 watt set. Figures represent thousands of dollars.

Along with the purchase of the necessary equipment, the cost estimates include the purchase of an initial inventory of spare parts. It is assumed for the estimate that spare parts will be needed for three of every four sets purchased and that the cost will be from 65% to 85% of the cost of one set. Thus, estimates for initial spare parts inventory range from \$90,000 to \$460,000.

Estimates for the purchase of equipment and spare parts range from \$270,000 to \$1,180,000. The Coast Guard has assumed that the initial purchase cost would make up 20% of the cost of the system over an estimated ten year life cycle, the other 80% being the operational and maintenance costs which would range from \$720,000 to \$2,880,000.

Factors which are worth noting are among the following:

**Personnel** - No additional personnel will be required for the operation or maintenance of the equipment as personnel from the communications center will be available.

**Training** - Since Collins and Sunair equipment is already being used by the Coast Guard, no new training programs will be required; however, the Collins equipment will require specialized training for the technicians assigned to work on the equipment.

**Maintenance** - Service agreements already exist with both manufacturers for the repair of the equipment. One consideration will be the strain placed on the

support systems by the additional equipment. Currently, only 75 Collins HF-80 sets are in use by the Coast Guard, while between 500 and

TABLE II

	1	2	3	4
	Thousands			
Equipment	\$720	\$360	\$270	\$180
Spare parts (max.)	\$460	\$230	\$170	\$115
Installation	\$ 24	\$ 24	\$ 24	\$ 12
Operation & Maint.	\$2880	\$1440	\$1080	\$720
Total	\$4084	\$2054	\$1544	\$1027

1000 Sunair sets are being used.

Table II shows the total estimated cost of the system over its lifetime.

The actual implementation of the system is expected to be carried out over a several year period. Implementation of the system will include all of the field and lab tests, any prototyping needed for special interfaces, determining transmitter powers

needed, evaluating radio equipment, etc. Purchasing, installation and ultimate operation are also considered in the implementation of the HFEN.

The currently proposed schedule anticipates most of the administrative planning to be completed by February of 1986. By the end of 1986 it is anticipated that equipment for evaluation will have been ordered and

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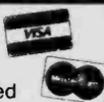
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**HIGH SEAS cont'd**

the necessary field tests will have been completed. By the end of 1986 the necessary designs for the installations and interfacing should be completed and by February of 1987 installation procedures will have been reviewed.

Presumably, by 1988 the network will be coming into operation and at that time readers will have the potential for some interesting monitoring on the HF maritime frequencies and the frequencies used by the P18 circuits should become more interesting. We can now look forward to some interesting new communications, and the Coast Guard can look forward to more efficient operations during emergencies.

Listed below are some of the more active U.S.

Coast Guard voice (USB) channels. They are extracted from a much larger comprehensive list in Bob Grove's SHORTWAVE DIRECTORY. ●

**U.S. COAST GUARD  
AIR TO GROUND PRIMARY USB**

Frequency	Use
2141	Alaska only
2261	U.S. only
3120	Helicopter
3123	
5692	Helicopter
5696	
8980	Helicopter
8984	
11195	
11198	Helicopter
11201	
15081	
15084	Helicopter
15087	
SEARCH AND RESCUE	
3023	SSB
5680	Aeronautical

**"PLANE TALK"**  
by Jean Baker



213 West Troy Ave  
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Indianapolis, IN 46225

**MONITORING THE HF  
AERO BANDS**

**PART II**

In part two of "Monitoring the HF Aero Bands," we will take a look at the largest (and oldest) contractor for aeronautical enroute communications - ARINC (Aeronautical Radio, Incorporated). Many thanks to Richard Covell, Manager - Air/Ground Operations of ARINC, for providing all of the material including charts, pictures and even some of the text featured herein.

Although ARINC provides many different areas of service in regard to communications (and other services) including a large, domestic VHF network, we will concentrate on their HF communications in this installment.

ARINC was organized in 1929 when the early airline pioneers were encouraged by the Federal Radio Commission (now the FCC) to form a specialized communications company to serve their particular needs. This company, whose growth has more than kept pace with that of the aviation industry in conjunction with the airlines, operates the largest non-government communications system in the world today.

While airline companies are its principal users, ARINC's services are extended to aircraft operators of all categories, domestic as well as non-domestic, scheduled, supplemental, private, and government world-wide. All are served on a not-for-profit basis what charges for services based on cost distributed in proportion to use, each user determining just how much of ARINC's services that it wants.

In part one of this feature it was explained how and why the ground station aeronautical enroute operators relay messages between aircraft and Air Traffic Control, also between aircraft and their companies. ARINC assigns "A", "B", and "C" ratings to each message passed according to their content and bills accordingly. An "A" message, one that would contain position, time, altitude, and route, is totally charged to the FAA (for Air Traffic Control Purposes).

A "B" message would be information that both the FAA and the airline involved would want to know and the cost is split between them. A "C" message, such as the airline wanting a wheelchair to meet an arriving flight, is one that would be fully chargeable to the airline concerned.

A quarterly audit and adjustment of billing is made with airline representatives and FAA logistics personnel to ensure that ARINC is within bounds of its contracts and doesn't generate a profit.

TABLE I is a listing of frequencies which are licensed to ARINC for operation at the designated

**TABLE I  
HF SSB LDOCF FREQUENCIES GUARDED (kHz)**

ARINC Comm. Center Loc	3013	3494	5529	6640	10075	11342	13330	13348	17925	21964	General Geographic Areas Served
HONOLULU	X			X	X	X	X	X	X	X	Central, West & South Pacific
HOUSTON			X	X	X	X	X	X	X	X	Caribbean, Central & South America
NEW YORK	X		X	X	X	X	X	X	X	X	North Atlantic, South Atlantic & Caribbean
SAN FRANCISCO	X		X	X	X	X	X	X	X	X	Central & East Pacific
SAN JUAN	X		X	X	X	X	X	X	X	X	Caribbean, Central & South America

Communications Centers. Many of these frequencies are shared with other countries' aeronautical enroute communications facilities as part of world-wide planning and coordination by the International Civil Aviation Organization (ICAO).

ARINC's Operators come from various backgrounds. Some received their communications training while in the various branches of the military service while others worked for airlines when flights carried radio operators as part of their flight crews. Still others are former ground radio operators or dispatchers for various airlines.

There are over 450 employees within the Enroute Communications divisions of ARINC including those who work at Corporate HQ in Annapolis, Maryland, as well as those employees scattered throughout the country at the various Communications Centers and Maintenance Work Centers.

In addition to its other HF operations, ARINC also provides Long Distance Operational Control Facilities (LDOCF). These frequencies are authorized for worldwide usage (see TABLE 2). The higher frequencies are used during daylight hours and lower frequencies are used during the hours of darkness.

These facilities are equipped to provide phone patch voice communication

between flight crews and operational control offices. The ground radio operator may also accept messages from the aircraft for relay via normal air-ground delivery channels.

The frequencies in this service may be used from an aircraft at any location; the only limiting factor is the actual propagation of the radio signals which vary depending upon the frequency, the time of day, latitude, local atmospheric noise level, and sunspot activity.

**SELCAL**

In 1958 ARINC was designated by ICAO as registrar of the SELECTIVE CALLING (SELCAL) Codes, and ARINC maintains the Master Register (on a world-wide basis) of Selective Calling Codes' assignments to all users - both U.S. and non-U.S. registered aircraft.

If you've spent any time at all monitoring the HF aero bands, you've more than likely heard pilots asking for a "SELCAL" check or enroute operators using a tone code by which an individual flight is contacted.

Each aircraft equipped with a SELCAL unit is assigned a 4-letter SELCAL code so that ground operators are able to contact a particular aircraft by using this code to set off a chime which sounds on the flight deck receiving unit. This



ARINC operations at work: Honolulu ARINC Communications Center

**PLANE TALK cont'd**

tells the flight crew that a ground station operator is calling them and that they should reply by radio immediately.

■ ARINC is involved in many aviation industry activities. Among these are Frequency Committees, Electronics Engineering Committees, Aviation Maintenance Conferences, and others. In the area of radio spectrum regulatory coordination, ARINC is one of the predominant interfaces between the civil aviation community and many government and international bodies.

In addition to the above activities, ARINC participates actively in the United States preparatory work in connection with international conferences of the International Civil Aviation Organization (ICAO) and the International Telecommunication Union (ITU). As required, ARINC employees serve on the U.S. delegations to such conferences.

If your interest has been piqued by this capsule version of ARINC's HF operations, and you would be interested in learning more about these and their other divisions, you may write to ARINC at

2551 Riva Road,  
Annapolis, MD 21401  
Attn: Richard Dovell,  
Manager  
Air/Ground Operations



NY ARINC Communications Center

Please be as patient as possible since responding to such requests from the general public rates a low priority at ARINC. Also, remember to be courteous in regard to your requests for information!

I want to publicly thank all of the readers who have written to me voicing their enthusiastic support of this column. However, please understand that I cannot advise as to your selection of one brand of receiver over another. As for your preference in regard to column subject matter, that's another story.

Feel free to advise me if there's something (in regard to aviation communications) in particular which you'd like to see covered here and I'll be happy to

feature it. UHF aero band monitoring, however, is already amply and very professionally taken care of by Larry Van Horn within his column, "Signals from Space."

**NEXT MONTH:**

Speaking of requests for subject matter, one of our readers had asked for a column devoted to the Air Traffic Control System--and that's exactly what we have coming up next! To take it one step further, it will be in two parts, with the first installment being about Air Traffic Control as it used to be when it was all manual systems.

Another reader of "Plane Talk," Mark Murphy of Lockport, NY, was an Air Traffic Controller back then, and he will co-author this first part with me. He's sent a lot of pictures of equipment, ATC facilities and controllers at work to me - some of which will be used to illustrate this segment.

For the second part - Air Traffic Control as it is today - I'll be going out to the Indianapolis Air Route Traffic Control Center to interview one of the controllers who works with the system in its present state-of-the-art. I think that everyone will enjoy this up-coming series.

Another book to which I'd like to draw your attention is AIR-SCAN, by Tom Kneitel. It is published by CRB Research, P.O. Box 56, Commack, New York 11725. The price is about \$10.00. It is chock full of VHF & HF frequency listings and lots of aeronautical communications information. Write to CRB Research at the above address for info regarding this book and their other aviation-related books.

Just received the GUIDE TO FEDERAL AVIATION ADMINISTRATION PUBLICATIONS. It contains all of the

printed material - pamphlets and books - that the U.S. Government Agency makes available to the public. Some of these are free, and some aren't - but those for which there is a charge are really worth the cost. You can obtain a free copy of this guide by writing to the U.S. Department of Transportation, M-442.32, Washington, D.C. 20590. Order FAA-APA-PG-6.

Until next time, 73s' and out.

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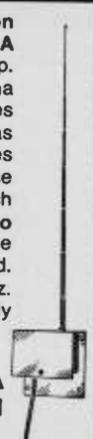


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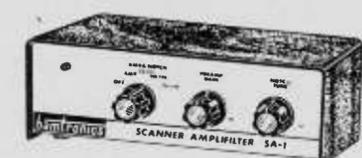
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Phone: 716-392-9430

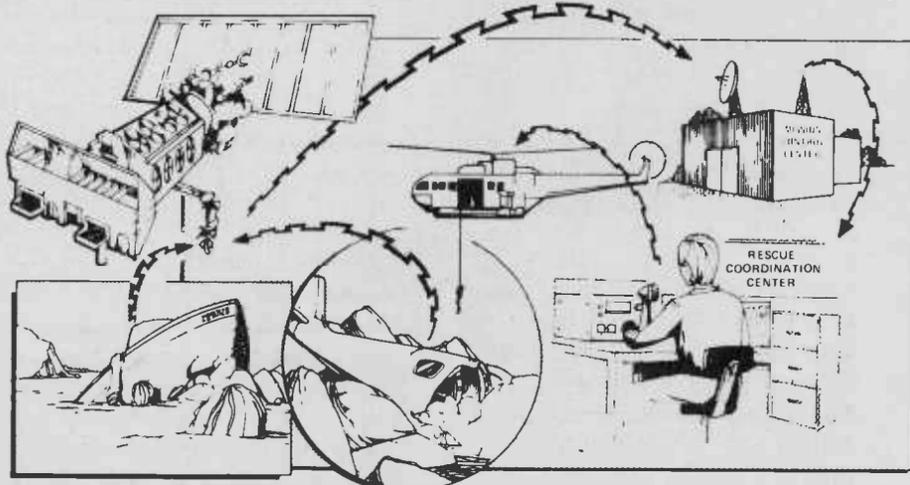
TABLE II		
Location	Frequencies kHz	Area Served
HONOLULU	3413, 5547, 5574, 8843, 11282, 13261, 13354, 17904	Central East Pacific
	2998, 6532, 8903, 11384, 13300, 17904	Central West Pacific
	2932, 5628, 10048, 13294, 17904	North Pacific
	3467, 5643, 8867, 13273, 17904	South Pacific
NEW YORK	3016, 5598, 8825, 13306, 17946	North Atlantic
SAN FRANCISCO	2899, 5616, 8864, 13291, 17946	North Atlantic
	2887, 5550, 6577, 8846, 8918, 11396, 13297, 17907	Caribbean
SAN JUAN	2869, 3413, 5547, 5574, 8843, 11282, 13261, 13354, 17904	Central East Pacific
	3016, 5598, 8825, 13306	North Atlantic
	2887, 5550, 6577, 8846, 8918, 11396, 13297, 17907	Caribbean

# SIGNALS FROM SPACE

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



## SARSAT Search and Rescue Satellite-Aided Tracking



### Space-age technology for rescue with minimal search

In July of this year, an 11 nation international conference announced an agreement to institute an improved satellite search and rescue system to locate and relay distress calls worldwide.

The international conference has approved the use of 406 MHz for Emergency Locator Beacons. Payloads carried by American NOAA and Soviet Cosmos navigational satellites will now be able to detect emergency beacons anywhere on earth and then relay encoded distress information when the satellite comes within range of ground stations.

"The old system sends a beep; the new system sends a coded message," said Hal Alabaster, spokesman for the NOAA, coordinating agency for search and rescue operations in the United States and host of the eleven nation conference.

"The coded signal can tell ground stations who or what is in trouble and provide additional details about location in many cases," said Jim Bailey, chairman of the group's steering committee.

The search and rescue system is called SARSAT and consists of space and ground components. The key elements are:

A satellite-borne receiver and frequency translation repeater for Emergency Location Transmitter (ELT)/Emergency Position Indicating Radio Beacons (EPIRB) bands (121.5, 243 and 406 MHz). This system is used for regional coverage/alerting.

Local user terminal (LUT) which receives the

relayed ELT/EPIRB signals and processes the doppler data to earth to aid in locating the transmitting platform.

Operational and experimental ELT and EPIRB systems.

A satellite-borne receiver and processor for the experimental 406 MHz ELT/EPIRB transmissions (provided by Centre National d'Etudes Spatiales--CNES--France). The unit is analogous to and in many ways equivalent to the Data Collection System (DCS) also provided by CNES now flown on all NOAA weather satellites.

Mission Control Centers for coordinating activities, processing global experimental data and coordinating search activity support.

When an emergency occurs to a vehicle carrying a typical ELT for private aircraft.



A typical Emergency Position-Indicating Radio Beacon (EPIRB) for ocean-going ships such as tankers and passenger vessels.

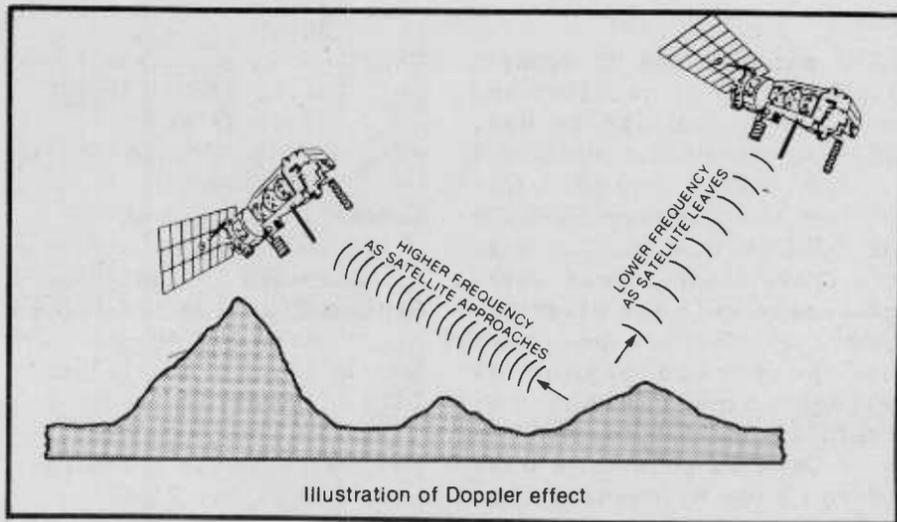


Illustration of Doppler effect

ELT or EPIRB, the unit is activated either automatically or manually. The weak (100 mW) signal, used for homing by search forces, is amplified and amplitude modulated so that it can be recognized by listening to an aircraft band receiver. With the SARSAT system, the signal is received by the satellite when within range of the transmitter, then translated and rebroadcast to any LUT within view of the satellite. Because of the relative velocity difference between satellite and platform, the signals received at the satellite are Doppler shifted.

At the LUT, special processing of the received signals after time tagging allows the weak transmission of the doppler shifted signal to be processed to determine the position of the transmitter. This information is then provided to a Rescue Coordination Center for their use in locating the stricken vessel or aircraft.

The new 406 MHz system will work in the same manner as the DCS system. The relatively strong (5 watts) signal is transmitted on a periodic basis. The Doppler shifted frequency received on the satellite is measured and time tagged. This information is both transmitted

in real time at 1544.5 MHz and stored on board the satellite so that regional and global coverage are obtained.

The data received either at the LUT or, through the NOAA ground complex, at the Mission Control Center is processed to determine platform location and, through its coded transmission, platform identification. This information is then sent to the Rescue Coordination Center for their operations.

During the conference, officials reported the SARSAT system recorded the distress beacon signals of the Air India jetliner that crashed off the Irish coast killing all 329 people aboard earlier this year. Coordinates of the disaster were relayed to a ground station in France within minutes of the disaster.

Many thanks to Bob Grove, David Alpert and NOAA for information in this article.

One of the many questions I get asked by both

An ELT is usually mounted in the tail of an aircraft and is activated by the crash.



**SIGNALS FROM SPACE cont'd**

RCMA members and MT readers is what kind of receiver and antenna do you use to hear 225-400 MHz milsat activity?

I have found that either the Regency MX-5000 or 7000 in combination with the Grove Scanner Beam works extremely well for Fleetsat-com use. The scanner beam has performed beyond my wildest expectations for overall satellite work.

Case in point: As most of you know by reading this column, Salyut 7 has been occupied by two Soviet cosmonauts in recent months. Back in August of this year, Salyut 7 orbits did not favor normal hours listening, so I put the 7000 next to the bed along with my portable cassette recorder and aimed the antenna towards the direction I would receive AOS (Acquisition of Signal). I then settled into bed with the 7000 on 142.415 MHz NBFM on the night stand.

At around 3:00 a.m. Gayle, my XYL, woke me up all excited that some strange sounding men were in the house. By the time the cobwebs had cleared I realized that it was Victor and Vladimir in the Salyut 7 overhead! Needless to say, the tape recorder went on and the early morning cosmonauts were taped.

During the August shuttle mission, I could hear the chase aircraft and weather aircraft from the Cape some 108 miles away. Unfortunately, Hurricane Elena precluded listening to the rest of the mission.

For the newcomer to satellite listening, I highly recommend the Regency MX-5000 or 7000 and the Grove Scanner beam antenna for satellite listening. They make an almost unbeatable pair.

● The following list of satellite frequencies (all in MHz) has been gathered by Robert Tull of Whitehorse, Yukon, in Canada.

FLTSATCOM 172°E...252.050  
253.75 255.45 257.05  
258.55 265.45 266.95  
268.35 269.85

NOAA 5 wx sat...136.77  
137.14(?-Ed) 137.5

NOAA6 wx sat...137.50 1698.0

NOAA 7 wx sat...137.00  
137.62 137.77 1707.0

NOAA 8 wx sat...136.77  
137.50 1698.0

NOAA 9 wx sat...137.62  
137.77 1707.0

SMS-1, 2...136.38 468.825  
Transit 2A-ETA 1...54.000  
162.00 216.0

Transit 4A,4b,5A...54.00  
149.988 150.0 324.0  
399.068 136.8 400.0

Allouette 1,2...136.078  
136.591 136.98 136.08  
136.41

ESSA 1-9 wx sat...136.23  
136.92 235.0 136.77  
137.5 137.62

ATS...137.59 135.575 135.580  
135.6 435.025

Landsat 2,3...137.86  
Solar Rad 1/2A/2B...136.8  
136.886 137.801 136.52

Syncom 2/3...136.408 136.98  
136.47 137.98

Syncom IV-2...253.55 256.85  
ISIS 1/2...136.08 136.41  
136.59 137.95 401.75

Marisat F2...249.1 254.15  
257.55 261.75

Marisat ATS 1-3 (?-Ed)...  
261.925 261.95  
1537.0 1541.1

NAVSAT USA...133.85 (?-Ed)  
137.3 150.0

Tiros 1/Beta 2...107.997  
235.0 237.8

Tiros 3/Rho 1...108.0 108.03  
235.0 237.8

Tiros 4/Beta 1...136.23  
136.92 235.0 237.8

Tiros 7...136.233 136.922  
235.0 237.8

Tiros 8...136.233 136.924  
235.0 237.8

Tiros 9...136.235 136.918  
235.0 237.8

Tiros 10...136.232

Tiros 12/N...136.77 137.5  
137.62 137.77 235.0  
237.8

ESA-COMSAT...136.44  
COS-B...136.95

Meteor/Meteor 36 Russian...  
137.15 137.5(?-Ed)  
137.4 461.5 464.0 466.5

Russian manned voice/data...  
142.4 142.417(Salyut 7)  
142.42 142.6 143.144  
143.625(Common Soyuz  
voice)

Thanks, Ron, for the nice list and I would appreciate it if you would contact me via this column. I'm curious about your source of information.

● Speaking of Canada, next month I will feature some material that has been sent concerning M-sat (MX-7000 owners sharpen your pencils), Geosat and a nice list of mil aircraft frequencies sent by Ron Tull. If you would like to contribute your mil aircraft/satellite frequencies send them to Signals from Space, c/o Larry Van Horn, 160 Lester Drive, Orange Park, FL 32073.

**SPACE LAUNCH REPORT**

And now on with this month's MT Space launch report.

Information for this monthly feature is courtesy of the Spacewarn Bulletin, NASA Thirty Day Special Bulletins-Goddard Space Flight center, "Communications Satellites" authored by the editor, and the editor's monitoring during the 30 day period covered by this

report: June 30, 1985 to July 31, 1985. Numbers in parentheses are NORAD catalog numbers.

1985-55A (15873) Intelsat VA-11 was launched from the Cape on June 30, 1985, by the ITSO. Orbital elements were indicative of a geostationary satellite. Mission: International geostationary comsat. See "Communications Satellites" for complete details on the satellite's frequencies.

1985-55B (15874) Intelsat VA-11 Rocket Body

1985-56A (15876) ESA's Giotto satellite was launched from French Guiana on July 2, 1985, onboard an Ariane rocket. This satellite is enroute to a rendezvous with Halley's comet on March 13, 1986, and will pass within 310 miles of the nucleus. No frequency information is known at this time. Inputs are requested.

1985-57A (15877) Cosmos 1665 was launched from Plesetsk aboard an A-2 rocket on July 3, 1985, by USSR. Orbital elements are period 89.32 min, apogee 308 km, perigee 207.8 km, and inclination 72.9°. Mission: military imaging photo recon. Decayed on July 17, 1985.

1985-57B (15878) Cosmos 1665 Rocket Body, Decayed on July 10, 1985

1985-57C (15879) Cosmos 1665 Debris

1985-57D (15912) " " "

185-57E (15913) " " "

Decayed on July 25, 1985

1985-57F (15914) " " "

Decayed on July 22, 1985

1985-57G (15915) " " "

1985-57H (15917) " " "

Decayed on July 25, 1985

1985-58A (15889) Cosmos 1666 was launched from Plesetsk aboard a F-2 rocket on July 9, 1985. Orbital elements were period 97.6 min., apogee 677 km, perigee 640 km, and inclination 82.5°. Mission: Elint/Oceanographic satellite.

1985-58B (15890) Cosmos 1666 Rocket Body

1985-59A (15891) Cosmos 1667 was launched from Plesetsk on an A-2 rocket on July 10, 1985, by the USSR. Orbital elements were period 89.3 min, apogee 294 km, perigee 223 km, and inclination 82.3°. Mission: Biological spacecraft carrying two monkeys and one was implanted with sensors provided by the U.S. Decayed on July 17, 1985.

1985-59B (15892) Cosmos 1667 Rocket Body. Decayed July

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19, 1985  
 1985-59C (15920) Cosmos 1667  
 Debris  
 1985-60A (15906) Cosmos 1668  
 was launched from Plesetsk  
 on an A-2 rocket on July  
 15, 1985 by the USSR.  
 Orbital elements were  
 period 89.3, apogee 296  
 km, perigee 215 km, incli-  
 nation 70.3°. Mission:  
 Military photo recon.  
 Decay July 29, 1985  
 1985-60B (15907) Cosmos 1668  
 Rocket Body. Decayed July  
 24, 1985  
 1985-60C (15908) Cosmos 1668  
 Debris. Decayed July 16,  
 1985.  
 1985-60D (15921) Cosmos 1668  
 Debris  
 1985-60E (15922) " " "  
 1985-60F (15923) " " "  
 1985-60G (15924) " " "  
 1985-60H (15926) " " "  
 1985-60J (15927) " " "  
 1985-60K (15928) " " "  
 1985-61A (15909) Molniya 3-  
 25 was launched from  
 Plesetsk on an A-2-e  
 rocket on July 19, 1985,  
 by the USSR. Orbital ele-  
 ments were 40,606 km  
 apogee, perigee 469 km,  
 period 736 min, and incli-  
 nation 62.8°. Mission:  
 high eccentric orbit  
 domestic comsat. Frequen-  
 cies: 3658-3692, 3758-  
 3792, and 3858-3892 MHz.  
 1985-61B (15910) Molniya 3-  
 25 Rocket Body  
 1985-61C (15911) Molniya 3-  
 25 Platform #1  
 1985-61D (15916) Molniya 3-  
 25 Platform #2  
 1985-62A (15918) Cosmos 1669  
 was launched from Tyuratam  
 on an A-2 rocket on July  
 19, 1985, by the USSR.  
 Orbital elements were  
 period 88.7, apogee 259  
 km, perigee 191 km, incli-  
 nation 51.6°. Mission:  
 This free-flying unmanned  
 platform docked with the  
 Salyut 7 on July 21, 1985.  
 It is similar in appear-  
 ance to a Progress tanker/  
 supply vehicle. It probab-  
 ly carries internal modi-  
 fications and solar arrays  
 to enable it to carry out  
 research independent of  
 all electrical power sup-  
 plied by Salyut.  
 The Soviets said,  
 "...carries on-board  
 equipment to conduct  
 scientific research in  
 autonomous flight and is  
 part of an orbital com-  
 plex." Frequencies:  
 922.750 MHz, possibly  
 others, but no HF like  
 earlier Cosmos tugs that  
 have docked with Salyuts.  
 1985-62B (15919) Cosmos 1669  
 Rocket Body. Decayed July  
 23, 1985  
 1985-63A (15925) STS-51F  
 with a Plasma Diagnostic  
 Package was launched using  
 the Challenger spacecraft  
 from the Kennedy Space

## ELT ALERT:

## Aircraft Accident or Accidental Bump?

by David Wilson

Recently I had an unusual opportunity to evaluate my UHF aircraft band receiving system.

I use a MX5000, Grove Power Ant and a Radio Shack scanner ground-plane cut for the band.

One day I had 243.0 MHz in one of the channels that I was scanning. Suddenly the scanner stopped on 243 MHz and I immediately recognized the sound of an ELT (Emergency Location Transmitter).

I recognized the sound as I had heard one previously on 121.5 MHz. These transmitters are on aircraft and boats to aid in locating in the case of an accident. The frequencies are monitored by civilian groups (FAA and CAPO, military agencies, and even satellites.

Some of the aircraft ELT's are rigged to go off on impact. Most ELT's heard are the result of such an ELT being accidentally set off--such was the case with my earlier 121.5 MHz logging. (The best description I have for the sound on an ELT is a "whooping siren.")

When I heard the ELT on 243 MHz, I called the nearest airport (about 3-1/2

Center on July 29, 1985, by the U.S. Orbital elements were period 90.9 min, inclination 49.5°, apogee 321 km, and perigee 312 km. On board were C.G. Fullerton, R.D. Bridges, F.S. Musgrave, A.W. (Tony) England (WØORE), K.G. Henize, L.W. Acton, and J.D. Bartoe.

Spacelab-2 on board the Challenger consisted of an igloo (pressurized cylinder), three pallets and a special experiment structure. Experiments were performed in infrared and x-ray astronomy; high energy, solar, and atmospheric physics; life sciences; and fluid properties. A plasma physics experiment was conducted with the free-flying Plasma Diagnostics Package, which was deployed and retrieved using the remote manipulator system.

Frequencies: 259.7 279.0 243.0 296.8 2106.4 2105.406 2205.0 2215.0 2217.5 2250.0 2287.5 15000.85 MHz. Also used was 145.55 MHz (Voice/CW/SSTV) by WØORE.

1985-63B (15929) Plasma Diagnostics Package. Frequency: 400.680 MHz

miles away). They took my name and phone number and said that they would "check it out."

A few minutes later they called back and said they could hear nothing on 243 MHz and had contacted New York Center (who covers this FAA area). New York Center informed them that no one in the area was hearing an ELT on 243 MHz.

They requested that I put the phone near the speaker, which I did; they confirmed that, indeed, my weak signal was an ELT--apparently too weak for their equipment. They requested that I notify them when it ceased. It faded-out about one hour later.

I suspect the signal was an ELT accidentally set off on a trans-Atlantic flight. I heard nothing further. I was happy to know that my simple set-up was more sensitive than that of the nearby FAA facility!

## CLUB CORNER

As the weather cools down, the DX heats up...and welcome to another "hot" Club Corner! Good news and bad news time...the good news is that new clubs are coming into being faster than I can keep up with them; the bad news is that I'm developing a backlog of contributions here.

I'm trying not to hold anything over a month; remember, this column is being typed in September just after my deadline of the 10th of the month. I'm still receiving notices of club activities for the following month--a month after I mailed out the column. So...remember to allow two month's lead time for this column.

Better yet, do as SCADS director Don Schmidt and ASWLC's Stewart MacKenzie did and send me a list of your 1986 meeting dates... four months ahead of the deadline!

ODXA's Harold Sellers sent me a clarification of ODXA's new policy of paying for contributions to DX Ontario, which I covered in the September column. First, the offer is only for ODXA members, as the club does not really want to compete with other clubs or publications; secondly, the payments continue every six months to the authors.

## Hi-Tech Drug Busters

## Join the Battle

U.S. Customs officials acknowledge the odds: Only one percent of the 18,000 drug-laden aircraft and six percent of the boats are intercepted each year coming into the country. But that may change.

An elite squad of P-3 Orion surveillance aircraft traveling in excess of 400 miles per hour will soon be joining Blackhawk helicopters, intercept boats, conventional air raft and radar picket boats.

The first P-3 Orion aircraft are slated for use in New Orleans, New York, and other areas as well. Three additional planes will be assigned during fiscal 1985 with two more due the following year.

Long-distance drug surveillance missions are frequently heard by short-wave listeners in the upper sideband mode; reported intercepts include administrative traffic as well as coordinates of suspected vessels and aircraft.

Paul Swearingen  
 P.O. Box 4812

Panorama City, CA 91412

It's a great idea, along with the club's promotion of SWL through the efforts of Ralph Shepherd. Harold feels that their promotion ideas have paid off as their Ontario membership has passed 300, doubling in two years.

More information? Send Harold a self-addressed envelope and a couple of IRC's: 3 Camrose Crescent, Scarborough, Ontario M1L 2B5 Canada.

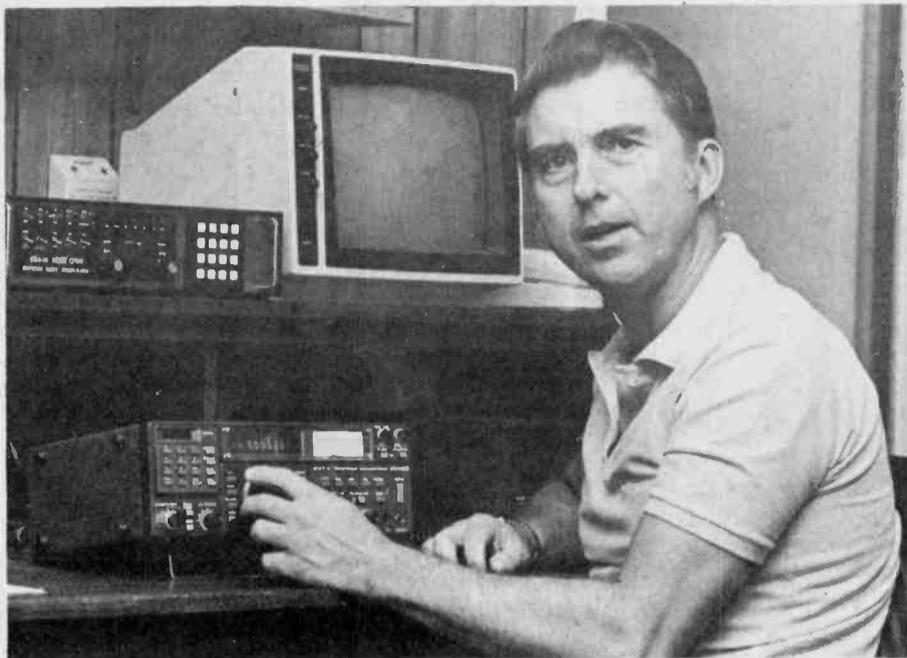
The ROCKY MOUNTAIN LISTENERS is another organization, besides ODXA, which is able to include advertising in its bulletin. According to Wayne Heinen, this sponsorship allows RMRL to be a NON-club, meaning that none of the active participants wanted to have dues or elections. They just wanted to get together to exchange tips and ideas.

Having been included in a bull session or two with a few of the members of RMRL, I can imagine just what goes on...Their first two newsletters included notice of local DX'ers leaving town, too.

Now, if you'd like to find out what REALLY goes on at those sessions, send an SASE to Wayne at 4131 S. Andes Way, Aurora, CO 80013 to get things rolling, and



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An effective noise blanker has adjustable controls for optimum reduction of a wide variety of impulse noises, from power line hash to the Russian woodpecker. An internal speaker produces good audio and a tone control adjusts sound to comfort.

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## R7000: In a Word, Superb.

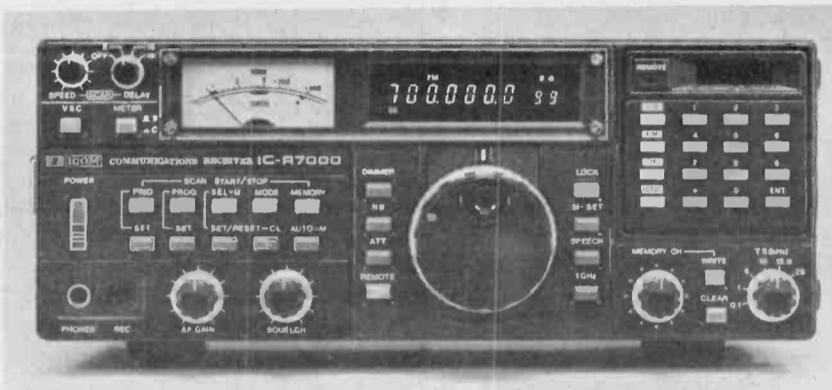
Yes, the new ICOM R7000 follows the reputation of its companion, the world-famous R-71A short wave receiver, but is fully compatible with that unit due to its total spectrum 25-1300 MHz frequency coverage (up to 2000 MHz with slightly degraded performance)!

Add to this enormous tuning range 99 memory channels with priority function, keyboard entry or dial tuning, FM/AM/SSB modes, five tuning speeds, S-meter/center tuning meter, narrow/wide filter selection, noise blanker, and adjustable scanning speed (1-5 channels/sec.) with selectable delay, and you have the most advanced scanning receiver ever designed for the serious VHF/UHF listener.

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### Specifications

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- Weight: 16.5 lbs.
- Typical sensitivity: 0.25  $\mu$ V.
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- Image rejection: better than 60 dB.
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- Dial lock.
- Noise blanker.
- Combined S-meter, center meter.
- Fluorescent display with dimmer switch.
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- AC or DC operated.
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- Audio output: 2.5 watts.
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**CLUB CORNER cont'd**

then attend their meetings at the Aurora Central Library (the address of which Wayne will forward) and the Bemis Public Library, 6014 S. Datura, Littleton.

The November 16 meeting will be in Littleton and the December 15 meeting will be in Aurora, both starting probably at 1 pm and running to 4 pm.

Another club formed around a receiver is under way...the 515 CLUB, an association of JRC NRD-515 owners, sent out its first newsletter in August. To get started with them, send Richard M. Oddie an SASE (#10) and perhaps some contributions concerning the NRD-515. His address is 857 Virginia Ct., Sonoma, CA 95476.

**THE UNITED NORTHWEST INLAND DX'ERS (UNID)** is so new that they haven't published their first bulletin yet. In fact, Gary Stone contacted me for help in getting DX'ers living in Washington, Oregon, Idaho, and Montana to send him loggings of SW broadcast and ute stations for the first bulletin, tentatively scheduled for early November, and following ones as well.

Send him the information listed by date/freq/station/time/language/quality of signal. UNID will commence on a newsletter basis and Gary asks that SWL's send him an SASE for each issue, as no dues will be charged. He'd especially be interested in European and African loggings and those areas pose the most difficulty for NW USA SWL's. Contact him at E. 603 Empire, Spokane, WA 99207.

What, another DX club headquartered in Washington? Sure...**THE CASCADE MOUNTAIN DX CLUB** has been rolling along for about a year now, and it emphasizes third world news and loggings from the SW bands, although their semi-monthly newsletter, **SW Monitor**, includes occasional RTTY, FAX, and clandestine station information.

Most of the club's 60 members hail from the Puget Sound region of Washington and Vancouver, BC, although others reside in Washington and Idaho. For information and a sample newsletter, send CMDXC an SASE: Craig Parsley, 9200-112th Ave. NE, Kirkland, WA 98033.

Another Washington-based club which I've neglected to mention is Phil Bytheway's **PNW & BC DX CLUB**. For information, send him an SASE at 9705 Mary Ave. NW, Seattle, WA 98117.

Phil also serves as president of the INTER-

**NATIONAL RADIO CLUB OF AMERICA**, which is devoted to broadcast band (AM) DX'ing, and he sleeps and eats in his spare time, hi!

And now, let's travel to the opposite corner of the 48 for a review of the BDXK. Co-founder Alan Bussie informs me that the **BANZAI DX KLUBE** came into being over two years ago through his and Phillip Marshall's efforts for the promotion of rare or unusual public AM or SSB DX on the shortwave bands.

For information and a sample copy of **Banzai DX**, send him an SASE at 219 Foxridge Road, Orange Park, FL 32073.

I'm going to add a caveat here...quoting from Alan's letter to me: "Club membership is kept low to keep out large bureaucracy and BS and keep in friendship, humor and maximum cooperation among all members. However, anyone is allowed to join the club on a trial basis until we reach our maximum membership number. We are mainly interested in up-and-coming and experienced listeners who tune the tropical bands, as you can tell by the bulletins."

Except for geographical restrictions, I normally take a dim view of "exclusive" or expensive club memberships, believing that the BS can be minimized by effective administration. I helped eliminate some problems from one of my favorite clubs by taking action about a year ago, and I would be happy to provide such suggestions to any club which may need it.

However, the price is right (an SASE) for **Banzai DX**, and its information is top-notch, so if you behave yourself no problems should ensue from your membership in BDXK!

**CARI News**, published bi-monthly by **CHESS AND AMATEUR RADIO INTERNATIONAL** and "dedicated to chess by amateur radio" is a nice combination of two hobbies. They are currently developing a new program for newcomers so that they will feel more comfortable playing chess over the air. Tournaments between clubs are also encouraged.

For more information, and a sample bulletin, send your SASE to CARI, P.O. Box 682, Cologne, NJ 08213.

Another group orients itself around two hobbies: the **ANTIQUÉ WIRELESS ASSOCIATION**, affiliated with ARRL, publishes a quarterly journal "dedicated to research and documentation of the history of wireless communications." And they've

been doing that since 1952! For more information, send an SASE to First VP Bruce Roloson, Box 212, Penn Yan, NY 14527; send him a check for \$8.00 if you'd like to join AWA right away.

Member Don deNeuf sends this list of AWA nets: SSB: Sunday, 7247 kHz at 12n and 3867 at 5 pm; Tuesday, 14274 at 2:30 pm and 3867 at 8 pm; Monday-Friday 3867 at 9:30 am; CW, daily 3584 at 4 pm, and the first Wednesday of the month 3584 at 8 pm.

One of the remaining ANARC clubs which I haven't reviewed is the **ASSOCIATION OF CLANDESTINE RADIO ENTHUSIASTS**, better known to MT readers as A\*C\*E. Clandestine/pirate stations in all bands are covered by this club through loggings and commentary columns plus in-depth articles. The ACE presents information to its members ranging from programming to technical and even how-to.

Pirate activity is on the increase right now, and if you'd like to follow activity of these station, contact A\*C\*E for more information, or send \$12 to cover a year's dues to A\*C\*E, P. O. Box 46139, Baton Rouge, LA 70895. A sample bulletin can be yours for \$1.00.

## LIBRARY SHELF



**CORRECTION:** In the October "Library Shelf," the address to write to obtain the **DALLAS/FT. WORTH FREQUENCY LIST** by Ken Winters should have read as follows: Basic Computer Services, P.O. Box 14193 Dept MT, Arlington, TX 76013.

**LANDMOBILE AND MARINE RADIO TECHNICAL HANDBOOK** by Edward M. Noll (#22427, 7-1/2" x 10-3/4", paperbound, 576 pages; \$24.95 from Howard W. Sams & Co., 4300 West 62nd St. Dept MT, Indianapolis, IN 46268)

Yes, MT's own Ed Noll has just published the definitive technical work on marine and land mobile two-way radio, and it's a honey! Loaded with photos, tables and illustrations, the handbook provides comprehensive discussions on solid state theory for radio communications, antenna systems, two-way radio circuitry, radar and satellites, repeaters, cellular radiotelephone, modulation systems, digital and microprocessor control,

## WE LIKE...

...the proliferation of new radio clubs, the birth of new publications dealing with radio, the rebirth of Radio Earth over R. Milan and KCBI-11790, the planned new shortwave stations in the U.S., and especially the cooperation between all facets of the industry/hobby. It's all part of the genesis of the Age of Information, and we hope it all continues exponentially.

As a card-carrying member of the ACLU (and former teacher), I am as much in favor of the dissemination of more information as I am against censorship in its many forms. I hope to see the trend expand into all areas, especially into the schools, whose "father-knows-best" attitude has hindered many students' educations.

Radio more and more these days is playing a large part in our continuing education, and I especially hope that this column is making young people aware of what's really happening around the world through their participation in club activities. And YOU can do the same by recruiting someone into your favorite club. Do your club a favor; attract new blood. 73. ●

test equipment, servicing equipment, and other aspects of communications as well.

While definitely for the technically-minded communicator, Noll's manner is easy to read and he patiently develops difficult concepts. Whether you are a ham, a communications technician, or in another field in which considerable technical insight into modern radio technology would be a benefit, this new handbook will provide an enormous step in the right direction.

**THE WORLD BELOW 500 KILOHERTZ** by L. Peter Carron, Jr. (64 pages, 5" x 8", paperbound; \$5.50 from L.P. Carron Publishers, 205 Ridgewood Road Dept MT, Easton, PA 18042)

A good introductory book on the low frequency spectrum is long overdue and Pete Carron's new entry is certainly welcome. Small but packed with information, the guide highlights major areas of interest to newcomers and veterans alike in the basement band--equipment, antennas, accessories, and techniques.

Included are tables of frequency allocations; service definitions, detection of strange sounds and noises at those frequencies, and a list of sources for equip-



HX1000

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**LIBRARY SHELF cont'd**

ment and publications pertaining to the lowest part of the radio spectrum.

**FOX SCANNER RADIO LISTINGS, LONG ISLAND EDITION** by Norman Schrein (129 pages, 8-1/2" x 11", paperbound; \$9.95 from Fox Marketing, 4518 Taylorsville Road Dept MT, Dayton, OH 45424)

Since we have given an inordinate amount of free promotion to Fox in the past, there is little point in describing this latest release from their publishing venture. Its format is identical to all the rest and concentrates on the communities which surround Long Island.

**From a reader:**

I would like to advise you and the readers of Monitoring Times of a book that might be of interest. It is titled **A HISTORY OF ENGINEERING AND SCIENCE IN THE BELL SYSTEM--National Service in War and Peace (1925-1975)** and is available only through Bell Labs.

The book is Vol. 2 of a six-volume series and 758 pages in length with many black and white illustrations of various types of radar, communications, and guidance equipment developed and manufactured by Bell for military use. It offers a very detailed and interesting review of the engineering considerations for long-distance radioteletypewriter equipment and concepts as well as land-line cable systems using Spiral-Four cable.

The book is not cheap; the price is \$47.00 and there is no discount so the appeal may be limited but for the detailed historical and engineering information it affords, many readers might want to add it to their libraries.

The book can be ordered only by calling 1-800-432-6600 and it carries the stock number of 500-468. Billing is done either by credit card or check.

Bill Neill  
San Antonio, TX

**Radio Database International**

A review by Derek Quinn

How many times have you tuned in a station, waited expectantly through noise and fading to hear an identification signal, then have it wiped out by a blast of static, or a fade into oblivion? **RADIO DATABASE INTERNATIONAL** can help end all that.

The DATABASE is a

listing of schedules of short-wave broadcasters by frequency in a graphic format. While similar to the stations-by-frequency list in the World Radio TV Handbook, the big difference is that the database also lists the time, language, power, and a number of other comments about the station you're listening to.

You'll know at a glance if the frequency is fixed or variable, the country the station is in, and its location within the country. You can tell when the signal fades in, its alternate frequency, whether its broadcasts are irregular and when they occur, and its broadcast mode if it isn't AM.

A glance will also give you network information such as whether you're listening to a domestic relay, what target area the broadcast is directed to, and when it normally fades out. The

graph also indicates what language the broadcast is in and whether the station is usually jammed. In brief, it's a lot of information in a short space.

RDI is easy to use. Just look at the guide to graphics format and lexicon at the front of the book--that's all there is to it. There are also lexicons in French, Spanish, German, and Japanese languages.

Symbols across the bottom of the pages indicate the major languages encountered on the short-wave bands; if you listen to a particular frequency and don't recognize the language, the legend at the bottom will tell you instantly what it is.

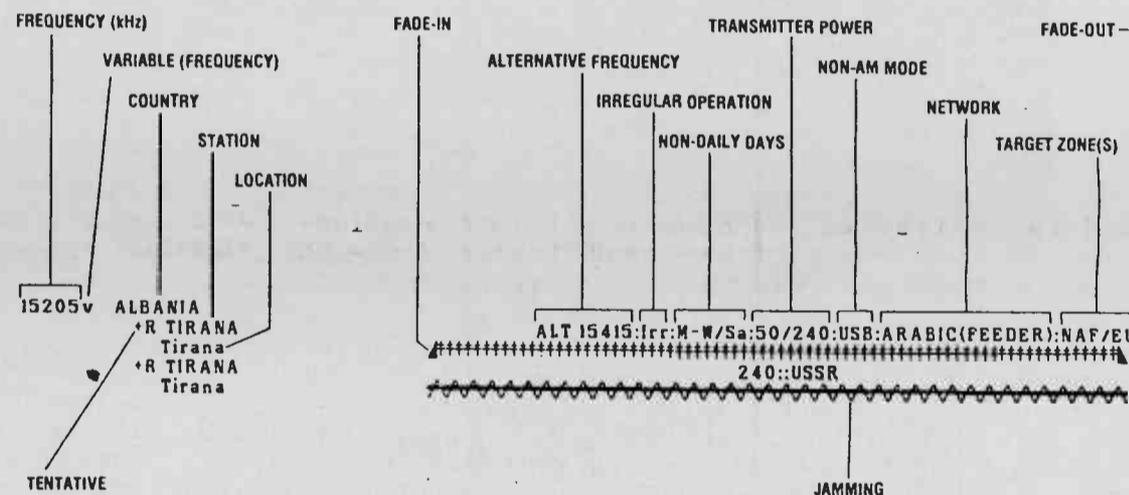
**RADIO DATABASE INTERNATIONAL** listings are not confined only to the international broadcast bands; it deals with broadcasters wherever they're found,

including pirate and clandestine stations. Since pirate and clandestine stations may be here today and gone tomorrow, and international broadcasters usually change their frequencies and/or schedules in the spring and fall, **Radio Database International** is updated and re-issued every six months.

The information comes from monitors all over the world, making the book worthwhile for a listener wherever he is. For example, 6135 kHz, in the 49 meter band, lists stations from Brazil, Bulgaria, West Germany, Korea, Madagascar, Poland, Tahiti, Swaziland, Switzerland, and Yemen plus three widely separated stations in the Soviet Union (Azerbaijani Radio, Radio Baku and Radio Moscow).

Part one of the **DATABASE** covers frequencies from 5.73 to 26.1 MHz and con-

**GUIDE TO GRAPHICS FORMAT**



Frequency (MHz)	COUNTRY	STATION	Location	Power (kW)	UTC	Network	Target
6135	BRAZIL	RADIO GAUCHA	Porto Alegre	7.5 kW	DS		
	BULGARIA	RADIO SOFIA	Rebrovo-Sofia	250 kW	ARABIC, ETC (D)		ME
	GERMANY (FR)	DEUTSCHE WELLE	Jülich		Irr::USB:	RAF/CAP	
	KOREA (REPUBLIC)	KOREAN BC SYSTEM	Suwon	10 kW	DS-EDUCATIONAL 2		
	KOREA (REPUBLIC)	RADIO KOREA	Suwon	30 kW	EAS		
	MADAGASCAR	R MADAGASIKARA	Antananarivo	100 kW	DS-FRENCH, ETC		
	POLAND	RADIO POLONIA	Warsaw	100 kW	RAF/ATL/SA		
	POLAND	RADIO POLONIA	Warsaw	100 kW	MEU/NAF		
	POLAND	RADIO POLONIA	Warsaw	100 kW	EU		
	SOCIETY ISLANDS	RFO-TAHITI	Papeete	4 kW	DS		
	SOCIETY ISLANDS	RFO-TAHITI	Papeete	4 kW	DS-FRENCH, ETC		
	SWAZILAND	TRANS WORLD RADIO	Manzini	25 kW	(D):SAF		
	SWITZERLAND	RED CROSS BC SVC	Schwarzenburg	150 kW	Tu/F:150kW::NA/CA		
	SWITZERLAND	SWISS RADIO INTL	Schwarzenburg	150 kW	NA/CA		
	USSR	AZERBAIJANI RADIO	Baku	100 kW	DS-2		
	USSR	RADIO BAKU	Baku	100 kW	ME		
	USSR	RADIO MOSCOW	Baku	100 kW	DS-2		
	YEMEN (REPUBLIC)	VO PALESTINE	San'a	50 kW	PLO:EAP		
	YEMEN (REPUBLIC)	VO PALESTINE	San'a	50 kW	PLO:EAP		
	YEMEN (REPUBLIC)	RADIO SAN'A	San'a	50 kW	DS		
	YEMEN (REPUBLIC)	RADIO SAN'A	San'a	50 kW	DS		

## LIBRARY SHELF cont'd

tains test reviews of 13 new receivers. I was especially impressed with the two-page technical supplement which sets out in clear terms just what those specifications mean that you often see in ads for shortwave equipment.

Part two covers the tropical bands--120 to 60 meters. It has the same format as part one but is quite a bit thinner.

There are some shortcomings. While seasoned listeners know you can't pick up anything you want whenever you want, a novice listener outside Europe, for example, who sees a listing like Sudwestfunk at 7265 kHz in the 41-meter band, is going to be disappointed when he sees it's on-the-air 24-hours a day and he can't hear it.

I'd suggest a paragraph or two to let new listeners know what bands are generally good at what time of day.

On another point, I compared the 1985 tropical edition to the original 1984 version which contained a four-page Guide to Reception Conditions for various parts of the world. I wondered why such a short section couldn't be updated and included in revised editions.

I also wondered why the DATABASE was divided into two parts. Whether a listener prefers tropical or higher frequencies, we all like to tune out of our favorite bands once in a while, so why not have both sections in one book? The database is a non-standard 6-1/2" x 10", but it's still an easily accessible handbook.

RADIO DATABASE INTERNATIONAL costs \$9.95 US and the Tropical edition costs \$4.95 US. If you compare this to the price of the World Radio-TV Handbook, you get, in my opinion, more for your money with the DATABASE. However, the value lessens dramatically if you must buy a revised edition every six months. Even though the WRTH gives listings by country and frequency, the graphics format of the DATABASE which relates frequency to time is a definite plus that enables you to find out quickly what you've tuned in to.

Despite these minor drawbacks, I give RADIO DATABASE INTERNATIONAL high marks. It is edited by Lawrence Magne and Tony Jones and it's available from International Broadcasting Services, Ltd, P.O. Box 300, Penn's Park, PA 18943 USA.

## TUNE IN WITH Ed Noll

### Using a Tuner with an Indoor Antenna

A tuner is seldom helpful as a signal peaker when you are blessed with a state-of-the-science sensitive receiver and a good antenna. However, such an accessory may help with interference present from strong images or an overloading local signal.

A tuner's ability to improve the antenna's match to the receiver can result in some useful signal peaking when using an older, less sensitive receiver or a short, make-do antenna.

The receiver used in our test was one of the first Drake R-4 series designs which dates back to the middle sixties. It is a ham band receiver but purchased with a set of crystals for use on the 13, 16, 19, 25, 31, 49, 60, and 120 meter short-wave broadcast bands as well as the medium-wave and lower (160-190 kHz) band. Sensitivity is not at its very best on a number of these bands.

The tuner I used is a Grove MiniTuner (TUN-3) which tunes very sharply (a sure indicator of a good high-Q performer) but you must tune very carefully to hit on the peak. A number of antennas were tried. Details follow.

#### TESTING RESULTS

The first antenna checked was a very convenient one but imposed difficult operating conditions on the tuner and receiver combination. It was an indoor CB antenna, 37 inches long when extended, that includes a base loading coil and a coaxial elbow that holds the antenna erect after it is inserted into the coaxial fitting of the tuner.

The tuner provided moderate to very substantial peaking on all bands except the high-frequency half of the MW band and on up to the lower-frequency portion of the 120 meter band. Over this latter region the antenna pickup was practically nil and the tuner could offer very little help.

It appears that each antenna is an individual

case with results varying from nil, through modest to very significant improvement depending upon frequency bands. This is very obvious when using a longer receiving antenna.

An indoor wire antenna with a length of 15 feet stretched out on the floor, or up the wall and along the ceiling, is a good compromise length for short wave listening despite its short span. The length corresponds to a quarter wave on the 19 meter band. In addition it performs well on 16 and 25 meters and is acceptable on 31.

What happens when a tuner is added? There is little difference on 25 and the higher frequency bands. Signal peaking on 31, 41 and 49 is limited but there is some improvement in stability and readability of weak signals. Quite significant signal peaking occurs on the 60, 75 and 90 meter tropical bands.

On the 120, MW and LW bands you can forget it; antenna pickup is so poor the tuner can contribute very little to reception. Very often the signal improvement offered by the tuner is best demonstrated on a weak signal because of AVC action on strong signals.

Are you able to add some additional length to your indoor antenna wire stretching it out to occupy three or four sides around the floor or ceiling? A length of 38 feet is a good compromise, corresponding to a quarter wave on 49. Improvement on lower-frequency bands results.

In our checks there was a modest signal peaking on the 41 and 49 meter bands with the results being slight to modest on the 31 meter band. The latter also applies for the 19 meter band.

Signals were quite weak on the 16 and 25 meter

bands; the tuner offered no improvement on these two bands indicating that antenna characteristics were such that the tuner was of little benefit. Signal peaking on the 60, 75 and 90 meter bands were nil to just a modest increase. However, antenna pickup was quite good and much improved over the 15 foot wire used previously.

The signal peaking offered on the medium wave band was limited to very good, with poor results at the high-frequency end. Results on the long wave band were from small to modest peaking. You must, of course, understand that a tuner is not an amplifier; rather, it can help to transfer a signal more efficiently from the receiver end of the antenna to the antenna input of the receiver.

The best peaking for the 240 foot attic long wire woven among the rafters occurred on the tropical bands and the long wave bands. Mixed and limited improvement was apparent on the higher-frequency short-wave bands. Peaking results on the medium wave band were nil to just a very slight rise. This is to be anticipated because the length corresponds to a quarter wave near the center of the MW band.

Here are some additional tips for using antennas and tuners indoors. As far as the tropical, MW and LW bands are concerned it helps to connect your antenna onto a large metallic surface.

In the twenties and thirties, if you were a youngster with a homemade crystal set in your bedroom, you would latch onto your bedspring as an antenna. This is when and where listening to a radio in bed began. Large metal desks, cases and ungrounded covers (sometimes associated with



MiniTuner atop R-4A. Clip-on alligator can be seen middle right.

# BROADCASTING...

## HANK BENNETT ON SHORTWAVE

About a year ago we ran a series of trivia and nostalgic questions covering radio activities of years past. According to our mail, this was a very popular couple of columns and now that vacation time has descended upon us, it is good time to work in a couple more columns of stumpers.

This column and the one for next month were prepared ahead of time for use in an emergency situation--as is the case at present. Your editor had a non-moving accident recently in which he smashed his hand in his post office truck door and he's in no condition to type columns. I'm going to try to use four weeks off to good advantage to get that hand back into shape.

As our steady readers will recall, our last series of questions ended at #55 so

### TUNE IN ED NOLL cont'd

baseboard heating) are an example. Keep away from electrical devices appliances because of noise pick-up and possible shock.

My own favorite radio room and indoor antenna for low frequencies (all bands 49 meters and above) is metal shelving that extends from floor to ceiling and about 3 feet wide and 1 foot deep. I positioned the radio on top of a wooden bookcase next to the shelf. The tuner did an excellent job of peaking over this spectra.

Both signal pickup and tuner peaking were poor on the high-frequency bands below 49 meters. The solution was a 15 foot length of antenna wire (insulated) for connection between the tuner and the shelf. An alligator clip was fastened to the opposite end of this wire which was draped around the back of the bookcase and then looped around one of the metal shelf posts. I can clip onto the post for receiving 49 meters and above; the clip is disconnected for listening to frequencies below 49 meters.

The arrangement functioned well for all frequencies below 49 meters with the clip disconnected and for frequencies 49 meters and above with the clip connected to the shelf. A tuner can be the answer to a trying situation. And what about those stormy nights when you want to listen with your outdoor antenna disconnected?

we shall continue from that point.

- 56 - You've probably seen the pianist/comedian on TV. Who is he?
- 57 - What radio station was said to be owned by "The World's Largest Newspaper?"
- 58 - What radio station was said to be owned by "The World's Largest Store?"
- 59 - On the previous question, what were the call letters and slogan of the same station before it became what it is now?
- 60 - Years ago, some of the stations operating in the 1510-1550 kilocycle portion of the standard AM broadcast band were known, at least partially, as "High Fidelity Stations." One was what is now WQXR in New York City. What was it before it was WQXR? One clue: the call sign was one of those "experimental" call signs that were in use at the time.
- 61 - For Philadelphia-area readers, who was "Uncle Wip"?
- 62 - What badge number appeared during the opening of the "Dragnet" series?
- 63 - "Car ... Where are You?" What was the car number and the names of the two officers?
- 64 - What was the real name of the person who played Tonto in the Lone Ranger series?
- 65 - On what show was Uncle Fester?
- 66 - What show featured three people of whom two were ghosts?
- 67 - What was the name of the six-foot tall invisible rabbit?
- 68 - Name the horse that talked.
- 69 - Who was the guy who once tied our car bumper around a tree to our fence and hoped we wouldn't notice it when we drove away? (We didn't!) [We've asked this one before!]
- 70 - Who tip-toed through the tulips? Where in New Jersey did he once live?
- 71 - What product once advertised "First he whispers, then he shouts"?
- 72 - Sunday afternoons of years past you could be entertained by "Cook's Travelog." Name their theme song.
- 73 - Who was the "Yowsuh, yowsuh" orchestra leader?
- 74 - Jim and Marion Jordan. Who were they?
- 75 - "And now to beat that red hand around the clock" can be attributed to what once well-known newsman?
- 76 - Who had the powerful little five-watter in Rosedale?
- 77 - "I have a lady in the balcony Doctor." On what show did you hear this?
- 78 - "And around and around she goes and where she stops nobody knows." Name the program and the master of ceremonies.
- 79 - On the above question, what "unknown" once appeared on that program and has been world famous virtually ever since. What did he do on the program and with whom did he do it? Name the group as they were known at the time.
- 80 - Barbasol shaving cream once sponsored what singer?
- 81 - Who was George Burns' female counterpart?
- 82 - You folks up there in the American northeast - Who was Captain Tim? Clue: He was on the 50,000 watt station WGY in Schenectady, New York, but I do not know if this was a network program or not.
- 83 - What product sponsored "Little Orphan Annie" for many years?
- 84 - "Music Fair, Music Foul, Music Played By ..." Who?
- 85 - Portland - city on both coasts - was the first name of a female counterpart to what famous comedian?
- 86 - On the old Jack Benny show - name the primary announcer and male singer.
- 87 - Name the cigar-smoking master of ceremonies of "You Bet Your Life."
- 88 - Pepsodent toothpaste sponsored what two well-known black-faced comedians?
- 89 - On the above question, can you give their real names?
- 90 - Who was instrumental in helping the Maguire Sisters and the Chordettes rise to fame?
- 91 - "Swing and Sway With ..." who?
- 92 - Who was the comedian who tried so hard to play the violin? He actually was an accomplished musician. Who was his female counterpart?
- 93 - The big band of ... and His Woodchoppers. Who was the chief woodchopper?
- 94 - In the days of late afternoon kids' shows, whom did Ralston sponsor?
- 95 - From the "I Love Lucy" show - what were the names of the two chief adults other than Lucy and her husband?
- 96 - In the very old days of radio, name the other half of the "Lum and ..." show.
- 97 - "I Love Irma." Who played Irma?
- 98 - Who played "Our Miss Brooks"?
- 99 - Who was the "All American Boy" and who was the sponsor?
- 100 - I know names of at least three people who played the part of "The Lone Ranger." Can you name them? How about the call letters of the station where the program originated?
- 101 - Another early evening "cowboy" show for the younger generation was sponsored by H-O Oats. Name the program.
- 102 - Name two people who played the part of Riley in "The Life of Riley."
- 103 - Who played Sergeant Bilko?
- 104 - The leader of the "Pennsylvanians" was also known as the inventor of a popular kitchen appliance. Name the person and the appliance.
- 105 - Another very old program on radio consisted of "Myrt and ..."
- 106 - That beloved blockhead Charlie McCarthy - who was responsible for him?
- 107 - For many listeners in the Middle Atlantic states, Joe Macauley (McCauley-?) of WIP in Philadelphia had a very distinctive feature on his all-night musical show during World War I years. Any guesses?
- 108 - "Kids Say the Darndest Things." Who made this program famous?
- . . . -
- We've had a request from Alta Dunlap, KB6CGP, for a few copies of a book called "The Magic of Ham Radio" by Jerrold Swank, W8HXR. Her copy was loaned and never returned and she'd like a few copies for use as gifts. Sadly, the author has passed away and we do not know of a source for these books. Can anyone help Mrs. Dunlap? Please write directly to her at 29500-57 Heathercliff Road, Malibu, California 90265.
- . . . -

## SWL WORLD WATCH



by Ken Wood

We stand with arms spread wide in a welcome to fall with its hopefully-quieter conditions. Despite a slackened activity on the part of many DXers, though, there have still been a number of interesting things pulled off the airwaves during the summer months.

Someone sent us a UPI story reporting that the main studios of the Voice of Indonesia were gutted by a fire on July 21. The fire reportedly spread through the nine story building, killing two people and putting the station off the air for two hours. Temporary studios were set up in Jakarta so broadcasting could be resumed.

Other commitments forced Jeeves and me to miss the 1985 edition of ANARCON in Milwaukee, Wisconsin, in July. From what we hear it was an excellent meeting, attended by some 250 enthusiasts. Hopefully we'll see you next year in Montreal where the convention will be hosted by Radio Canada International.

Don't forget to keep an ear open for the coming highpower transmissions from the Voice of Kenya. They should begin operating any time and will be using the international broadcasting bands.

AFRICA

**BURKINA FASO** - RTV Burkina is still putting in superb signals from its sign on just prior to 0530 on 4815. Some days sign on is at 0600, so check later if you don't catch them at 0530.

**CAMEROON** - Radio Bafoussam in French on 4000 at 0428 with interval signal, ID, anthem, and sign on. Fair to good.

Radio Yaounde on 9745 with English at 2109. News and sports to ID at 2114.

**EGYPT** - Voice of the Arabs service heard at 0035 in Arabic on 7150 at fair level.

**EQUATORIAL GUINEA** - Radio Nacional Malabo, 6250 at 0502 in Spanish just after sign on. Mostly music and fair at best.

**GABON** - African Number One, 15200 at 0605 with African songs, talks, IDs in French.

**LIBYA** - Voice of the

Greater Arab Homeland on 9890 at 2150 with anti-US stuff. Fair to good.

**NIGERIA** - Plateau Broadcasting Corporation, Jos, 5965 at 0515 in the midst of an English newscast.

**SUDAN** - Radio Omdurman on 5039 fairly good at 0400 in Arabic with Koran recitations.

**TUNISIA** - RTT, Tunis, noted with Arabic on 7225 from sign on at 0400. Now in parallel to 7280 with both received well.

**UGANDA** - Radio Uganda, 5026, heard at weak strength in English at 0400 with ID and news.

**ZAIRE** - La Voz du Zaire very poor on 15245 at 1310 in French with African high-life music.

**ZAMBIA** - New transmitter here? Zambian Broadcasting Service at Lusaka very good at 0432 on 3346.

ASIA AND MIDEAST

**AFGHANISTAN** - Radio Afghanistan via transmitters in the USSR noted with flute interval signal and sign on at 0130 on 4740. Poor.

**BANGLADESH** - The English service of Radio Bangladesh heard from 1230 to 1300 on 15570 but, as usual, quite weak and only about 30% readability.

**INDIA** - All India Radio on 11620 with a drama at 2140 but poor. News in English at 2200.

**IRAQ** - Voice of the Masses service on 9585 in Arabic at 0550 with fair to good strength. ID in Arabic at 0601.

**KAMPUCHEA** - Voice of the Kampuchean People with English from 1200 on 11938. Reception periodic and always poor.

**KUWAIT** - Radio Kuwait noted in Arabic at 0330 on 9840 talks and ID. Good strength.

**NORTH KOREA** - Radio Pyongyang with English at fair level on 9750, parallel 9977 at 1100.

**PHILIPPINES** - Radio Veritas noted on 9570 at 1500 in English with religious program. Weak to fair.

**SAUDI ARABIA** - Broadcasting Service of the Kingdom of Saudi Arabia noted in Arabic at 0315 with Koran recitations on 5875.

**SYRIA** - Radio Damascus with English news at 2003 on 12085.

EUROPE

**ICELAND** - Icelandic State Broadcasting Service heard on 13797 with talks in Icelandic.

**IRELAND** - Radio Dublin International on 6910 with English disc jockey, pop and rock music at 0440 tune in.

## ENGLISH LANGUAGE BROADCASTS

by Tom Williamson

Greetings to all readers, with a reminder that your comments, news and opinions on the topic of this column are most welcome at the Monitoring Times office. This month I acknowledge use of information sent in by Carl Smith of Fresno, California, and Dave Alpert of New York.

We will take a look now at some of the program trends for the near future and services of stations not previously covered in detail in this column. First to the Phillipines:

FAR EAST BROADCASTING CO.

This religious broadcaster is known to most short-wave listeners at least by name; not so often, however, by signal unless, perhaps, you are a west coast listener. Their program target area is Asia so

**MONACO** - Trans World Radio on 7160 at 0620 sign on with English and into religious program.

NORTH AMERICA

**COSTA RICA** - Radio Impacto, which was on 6140 for about ten days, has returned to nominal 6150 and remains loggable anytime the band is open.

**MEXICO** - La Hora Exacta, 9555 at 1403 with announcements and time checks every minute, all Spanish.

**NICARAGUA** - The Voice of Nicaragua heard back on 5950, although in parallel with usual 6015 during the 0100 English segment.

**UNITED STATES** - KCBI in Dallas is now on the air on a regular basis on 11790. Noted with local talk show at 1900. Now carrying Radio Earth on Sundays at 1800-2100.

SOUTH AMERICA

**BOLIVIA** - Radio Nuevo America on 4797 at 0220 with music, IDs, ads, echo effects, all in Spanish.

Radio Riberalta on 4697 with music at 0225 in Spanish. Poor to fair.

Radio Illimani on 6025, parallel 4945 at 0945. Good, with talks by man. 6025 almost always provides a better signal.

**BRAZIL** - Radio Araguaia on 4905 noted at 0932 with talk in Portuguese. Fair, with music; IDs and ads between selections.

Radio Capixaba on 4935 noted at 0940 with variety of music, man announcer, IDs.

they are not transmitting directly for us in North America. However, propagation being what it is (variable), we can sometimes get pleasant surprises with a good strength reception allowing entertainment level listening.

It's difficult to predict times and frequencies in such circumstances, but in the past FEBC's 19 meter channel has been good when conditions were favorable.

Currently they advise that they are on the air in English for 12 hours daily. These broadcasts are directed to India and S. Asia, Australia and New Zealand, Malaysia, and Papua New Guinea respectively, so you might find one or other of these beam directions getting through to your locality. 

**COLOMBIA** - Ondas del Meta, 4885 with all-Spanish programs, variety of music at 1015.

**ECUADOR** - La Voz del Rio Carrizal, 3260 heard with a talk in Spanish at 0350, ID and music at 0400.

La Voz del Napo on 3280 noted at 1015 in presumed Quechua (not Spanish, anyway) with talks and religious music.

**FRENCH GUYANA** - RFO Cayenne is back on 3385. Heard just before 0105 sign off in French, but not as strong as parallel 5055 since 90 meters barely open. Should improve soon.

**GUYANA** - Guyana Broadcasting Corporation, 5950 at 0900 with English talks, music.

**PARAGUAY** - Radio Nacional again on 9735 at 0010 in Spanish with a variety of music and good signal.

**PERU** - Radio Norandina, new, on 4460 on 0122 in Spanish with talks and music. ID 0129.

Radio Huanta 2000, 4755 at 0940 in Spanish with announcer and musical selections:

Radio Eco on 5010 at 0335 with ID, music, ads. Fairly good strength.

Radio Los Andes, 5030 with ads and Latin music at 0446. Gone an hour later.

Estacion C, 6323 variable, at 0150 with huaynos. Weak, but with "Estacion C" announcement heard on signal upswing.

**VENEZUELA** - Radio Tachira, 4830 with Latin music, time checks, frequent IDs at 0245 tune.

9540 Radio Nacional at 0010 in talk segment. 

ENGLISH LANGUAGE cont'd

The schedule reminds one very much of the Quito HCJB-style, a mixture of straight Christian Bible-oriented instruction and advice, together with general interest items on health, news, family guidance, science, and stamp-collecting ("Hobby of Kings" for example...one of my personal favorites when I can hear it!). I presume some of the programs are common to HCJB also, since I recognize such standard titles as "Unshackled," "Hour of Decision" and "Grace Worship Hour," among others. For schedule, see the tabulated summary below.

NETHERLANDS ANTILLES

Another religious broadcaster with segments of English programming is the powerful TRANS WORLD RADIO at Bonaire. They are on the air in the 25 and 31 meter bands daily, directed to the Americas, so you won't have

SWL WORLD WATCH cont'd

CHALLENGER

There's an unusual new Mexican on 6754. It announces as XEFAJ, Radio Consentida, and is heard from as early as 0030 to past 0300, although it is apparently not on the air every day. Lots of ranchera music.

WRTH lists XEFAJ, Radio Consentida on medium wave only--1560 kHz with a 24 hour a day schedule and an address of Paseo de la Reforma 322, Mexico, D.F.

JEEVES SAYS -

I've been restringing antennas this week in preparation for the fall listening season. It never hurts to be prepared, or however the Boy Scouts say it!

Ken's next task for me is to go through an eight inch stack of club bulletins looking for tuning targets. That's not a bad idea in making ready for a new season and something you might want to do as well.

If you'd like to see regular English language programs from Radio Denmark you can do your part in a campaign to achieve that end. Roger Atkinson (Gillesager 272, 5 tv., DK-2650 Hvidovre, Denmark) is soliciting letters from listeners which he hopes to use to convince Danish authorities to provide the funds to reinstate English on Radio Denmark. He would welcome your letter.

Let us have your reports and Ken and I will be back with you again next month.

too much difficulty in hearing them.

Their morning transmission used to be very reliable, but the congestion on 25 meters may render it impossible to get an enjoyable readable signal. Try for them; if you haven't heard them watch out for their famous interval signal --"Stand up for Jesus"--a few bars played on different instruments.

SOCIALIST REPUBLIC OF VIETNAM

The Voice of Vietnam advises that they are holding a new "listeners competition" between February (!) and November 1985--and that the results will be announced in early 1986. If you managed to catch any of this, or the column gets to you in time, you may be eligible for a prize or souvenir.

The topic (not surprisingly) is, "What do you know about Vietnam"--for which you need to listen to them!! The questions are available if you write to the station, but I'd guess the answers depend on hearing their broadcasts!

The address is 58 Quan Su Street, Hanoi. Transmissions in English are in the 19-25-31 meter bands with some "edge" frequencies that might make reception a little easier, but they are never easy for me to hear. See list below for times and frequencies.

TOPICAL TIPS

SOUTH AFRICA...In view of the current political

furor, why not hear the official point of view? Though current signals are not too strong, you will find them in the evening on 9615-6010-5980 kHz beamed to North America from 0200. Prior to this the well-known "Bokmakarie bird" interval signal identifies them on the dial.

RADIO NEDERLAND..."KEEP (DIRECTLY!) IN TOUCH WITH THE DUTCH"--an old slogan of theirs--now has new significance with their telephone answer line 31-35-18700 which is open to listeners 24 hours a day. Your question may be answered on the Saturday broadcast, "Short-wave Feedback."

BBC LONDON in a similar but different vein is continuing the open line type of program when you may be able to ask questions of famous people--such as Germaine Greer or Bishop Huddleston in October as an example.

COSTA RICA...Radio Casino at Puerto Limon on the Caribbean coast still advertises that they have an English language segment in their programming at 2300-0000 and 0400-0600 UTC. I had heard this from TIQ many years ago but have difficulty getting their signal these days; anyone able to hear them at present? An interesting part of the world these days, with Eden Pastora's guerilla group operating from the country until recently, and an area where we get virtually no English broadcasting.

NORWAY...a reminder that this difficult country

is only on the air in ENGLISH on SUNDAYS. A pity! However, on this once-a-week basis they have a program segment beamed to eastern North America between 13-1500, 17-1800, 19-2000, and to western coast 16-1700 and 04-0500 according to schedule.

AUSTRALIA...If you have problems with the 9580 channel of Radio Australia in the mornings, try the earlier service to PNG on 6060, 6080, 9580 which may provide readable signals.

PIRATE RADIO



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

CANADIAN PIRATE: CJRR, the "Power Station," has been heard by Alan Latval in British Columbia. Alan found it July 18 on 6210 kilohertz, signing on at 0555 GMT and broadcasting until abruptly leaving the air at 0720 GMT. The DJ was "Jumpin' Jim," who mentioned he had a "copilot" by the name of "Dave W. Diamond."

An unusual thing about this station was that its transmission included advertisements for a book store and a record store. Alan wonders if the store owners might have some connection with the station. In any case, if you happen to hear CJRR you can send your reception report to Box 2602, New Westminster, BC V3L 5L2. Alan remarks he has not heard the station since his initial reception. Has anyone else?

FLORIDA TV PIRATE: A pirate TV station has appeared here in Central Florida. On September 8 this writer received WRAT-TV on channel 4 from 2329 to 0013 GMT. Programming consisted of some sort of taped documentary on the history of rock and roll plus a brief excerpt from a James Bond movie. There were no video IDs, but several audio ones were transmitted.

In addition to the WRAT-TV IDs one was heard for "King Rat TV." The

STATION SCHEDULES - ENGLISH BROADCASTS

F.E.B.C. Manila	14-1600 00-0500 13-1400 05-1000 23-0000 23-0500 05-1000	9730 kHz 11725 11725 11890 15445 21475 21475	INDIA/ASIA beam INDIA/ASIA INDIA/ASIA AUSTRALIA/N.Z. MALAYSIA PAPUA, NEW GUINEA INDIA/ASIA
TRANS WORLD RADIO Bonaire	11-1405 05-0730	11815 9535	N.AMERICA N.AMERICA (time varies Sat/Sun)
VOICE OF VIETNAM Hanoi	18-1830 19-1930 2030-21 2330-00 10-1030 11-1130 1330-14 16-1630	15010 15010 15010 12035 12035 12035 15010 15010	12020 12020 12020 9840 9840 9840 12020 12020
			10040 10040 10040 10040 10040 10040 10040 10040

TOPICAL TIPS FREQUENCIES:

RADIO RSA	9615 6010 5980 kHz
RADIO NEDERLAND	9895 9715 9590 6165 6020
BBC LONDON	15400 15070 (1430 UTC) 11750 9915 7325 6175 6120 6075 5975 (0230 UTC)
COSTA RICA-TIQ	5954
RADIO NORWAY	15305 11850

PIRATE RADIO cont'd

station claimed to be coming from "way down South in Dixie." Usually, both video and audio were reasonably good; however, the station did have some technical problems with some of its audio IDs. I know of at least one other person who saw this broadcast.

**RADIO DEAD MAN:** Our September column included some information on Radio Dead Man and the remark that we knew of no loggings of this station. Well, that is no longer the case. From Illinois, Bill Coopman reports in with a fine logging. He came across the station on 7425 kilohertz signing on with an interval signal consisting of organ cords. Bill logged them on August 22 from 0200 to 0245 GMT.

Bill notes the signal was extremely powerful, "pinning" the S-meter on his FRG-7. He also says the programming was very professional, including some clever commercials and processed modulation sound. He thought one of the voices sounded familiar. Based on all of this, plus some preliminary direction finding he did, Bill is wondering if there just might be some connection between this operation and a licensed short-wave broadcaster.

If you have any facts, ideas, theories, or even just plain rumors, let us know! And if you happen to be fortunate enough to hear Radio Dead Man, Bill says you can send your reception report to Box 982, Battle Creek, MI 49016.

**KPF-941:** In our October column it was our sad duty to inform you that America's "licensed pirate," KPF-941, had been shut down by the FCC for the second time. Now there is at least a glimmer of hope. Owner Al Weiner informs us that on July 24 Congressman Mario Blaggi of New York did introduce a bill in the House of Representatives which, if enacted into law, would grant KPF-941 a license for seven years. Unlike its present license, this would enable it to serve the Yonkers, New York, area as a noncommercial, community broadcasting station. KPF-941 would retain its present frequency of 1622 kHz. Good luck, Al. You deserve it.

**SOME UNFINISHED BUSINESS:** Last month we were a bit too quick to report the disappearance of that mysterious all-music station which has popularly become known as Radio Nat King Cole because it plays the Spanish song "Ojos Negros" ("Dark

Eyes") by that artist on the hour as an identifier.

Radio Nat King Cole had been transmitting on 7400 and 9920, but disappeared from those frequencies. However, even before you read here that it was gone, we received word from Marty Croze in Minnesota that he was now logging it on 9960 kilohertz.

Sure enough, Radio Nat King Cole continues to put in powerful signals here in Florida both in the morning and evening. At present 9960 appears to be the only frequency in use. The schedule continues to be 0000 to 0200 GMT and 1300 to 1500. Be sure to listen for the identifying song on the hour.

By the way, Marty reports a drop in signal strength at his location after 1425 with near fade out by 1450. These were the conditions he observed the morning of August 25, when the station played selections by Julio Iglesias and a number of Spanish instrumentals. You will hear a good deal of music in English as well. Information of any kind on this station would be greatly appreciated.

Some more unfinished business includes **KGB**, the newsletter on Soviet intelligence we reviewed last month. While the normal subscription rate is \$100 per year, the editor, Ryan Quade Emerson, informs us that readers of this column can receive it at the special price of \$24.00 for 12 monthly issues. If interested, the address is KGB, P.O. Box 126, Purcellville, VA 22132.

Emerson also published another newsletter, **Terrorist Intelligence Report**, and has recently begun a computer bulletin board service on terrorism and intelligence. All of these materials may be of particular interest to those researching clandestine broadcasting. Inquiries can be sent to the address above.

**PARAGUAY:** From Bob Grove comes word that on August 9, Adolpho Stroessner, ruler of Paraguay, ordered Radio Nandutti off the air for ten days for alleged subversive activities. In 1983 the station received a similar thirty day suspension. Radio Nandutti has been criticized by the government for airing the views of opposition politicians. It broadcasts from Asuncion, the capital, on 1020 kHz with a power of 10 kW.

**RADIO MARTI:** In Alabama Eugene Munger reports

strong, clear reception of Radio Marti on 11815 kHz although he notes that at 1600 GMT both Radio Moscow and WYFR are not too far away. According to the schedule Eugene received, Radio Marti transmits on 11815 with a power of 500 kW from 1415 to 1730 GMT. Information on how well readers are receiving Radio Marti, both on short wave and 1180 medium wave, is always welcome here.

A current Radio Marti program is causing something of a controversy. Entitled "The Massacre of Canimar," it is a documentary on the sinking of a hijacked tour boat by Cuban naval vessels in 1980. A large number of the more than seventy people on board are supposed to have died, but no report on the tragedy was ever given to the Cuban people.

**PERU:** A favorite target of some of America's best DXers are the low power, sometimes irregular broadcasters operating in the remote towns and villages of Peru's interior. It appears that most of these "frontier broadcasters" transmit without benefit of any sort of license. Apparently the government lets them alone because they do provide a much needed service, seldom interfere with other radio operations and probably would be difficult to close down permanently anyway.

Most, but not all, of these stations use frequencies outside the regular bands allotted to short-wave broadcast stations. The best places to search are from about 5270 to 5800 kilohertz and from about 6230 to 7075 kilohertz. One of the easier (although all can be difficult) ones to hear is Radio Satellite transmitting around 6725 kHz from Santa Cruz. This station and a few others will occasionally verify reception reports. The address for Radio Satellite is Jr. Curtevo 570, Santa Cruz, Cajamarca, Peru.

Often simply the name of the station, the town, and if known the state, will be sufficient if a better address cannot be obtained. Programming will be in either Spanish or the Indian language Quechua. If you hear any of these real "DX challenges," let us know.

**IRELAND:** A wealth of information on the current Irish pirate situation has been received from Bob Grove and Ireland's Tony Donlon. Some of this we will have to save until future columns, but with the coming winter DX season now almost upon us, the following list of Irish pirates currently on short-wave should be of

special interest:

Skull and Bones Radio	6210
Westside Radio	6280
Radio Mi Amigo	6286
Premier Radio	6310
Radio Ireland Intl.	6310
Radio Shamrock Intl.	6319
Radio Valleri	6870
Radio Dublin	6910

In addition to the above, Rainbow Radio, Skyline Radio, and Orbit Radio are also active, although their frequencies are not known. Most likely they are operating in the same general area as the other Irish pirates. With the exception of Radio Dublin, which can often be heard evening hours in much of North America, these stations will be difficult to hear, especially now that sunspot activity is so low.

Westside Radio has made it to North America in the past, and some of the others could be possibilities on a good night. We have no current schedules, but probably the best time to try would be on a Sunday morning between about 0500 to 0800 or 0900 GMT. If you hear any of them Tony and I would love to know about it.

Although we will have more on this at a future date, Tony also informs us that, for the moment at least, the Irish pirates, who are operating legally through a loophole in an old law, appear safe from regulation. Disputes in the Irish Parliament forced the government to withdraw its proposed legislation which would have licensed and regulated local radio services. We will keep you posted on future developments.

**ODDS AND ENDS:** Pirate KROK was heard by this writer on August 18 from 0808 to sign off at 0820 GMT with its "Close Encounters" interval signal. The broadcast on 7420 kilohertz featured some real old oldies such as "Earth Angel." Signal strength was fair.

It is good to have Radio Earth back on the air again. In case you have missed it, the Radio Earth gang is now heard Sundays from 1800 to 2100 GMT via KCBI International on 11730. This is one of the most popular broadcasters on the short waves, and the programs remain the high quality productions they were back in the days Radio Earth was relayed by WRNO or Radio Clarin. It is unusual for a religious broadcaster such as KCBI to allot time for such programming. If you appreciate this, why not



# RADIO NAT KING COLE: The Mystery Partly Solved

by John Santosuosso

In March of 1985 a mysterious new station began transmitting on 7360 kHz. It soon switched to 7400 and 9920 for its evening and morning transmissions. Most recently 9960 kHz has been used.

Throughout all of this time the program format remained two hour blocks of music with no voice announcements. Only the Spanish song "Ojos Negros" ("Dark Eyes") by Nat King Cole and broadcast on the hour was used as an identifier.

But on September 28 a radical change took place. The station was heard at 1210 UTC, identifying itself as Radio Caiman (Radio Alligator) and transmitting a program of commentary to Cuba until 1215. On September 29 at 0000 UTC a program of popular music, brief comedy sketches and commentary was transmitted for one hour and fifteen minutes.

There can be little doubt that "Radio Nat King Cole" and Radio Caiman are the same station. The similarities in frequency, sign on times and signal strength all point to that. However, in its first two

transmissions Radio Caiman did not indicate who its sponsoring organization was.

In a brief letter received just a few days before the Radio Caiman transmissions began, the anti-Castro organization Pro Libertad de Cuba claimed that the station transmitting on 9960 kHz was theirs. This was the second letter in regard to the station which was received from Pro Libertad de Cuba.

In the first letter they did not declare the station was operated by them, but did offer some clarification on the identifying song and some comments on its purpose. They noted the frequency then in use was being kept busy with a schedule so that it would be free and ready when activity began in Nicaragua and possibly Cuba.

No mention was made at

that time of programs of the Radio Caiman type; however, that station obviously is an ideal vehicle for this kind of operation.

The two letters received from Pro Libertad de Cuba were each postmarked from a different city in the Northeast; unfortunately, neither included a return address. Although we were able to locate an office of this organization in another part of the country, it declined to give any information on the location of other offices or possible broadcasting activities.

So the mystery is only partly solved--we now know who has been sponsoring these transmissions, but it is still not possible to contact the sponsors. Pro Libertad de Cuba, we would love to hear from you again and, if at all possible, learn how we might contact you. Anything you request be held confidential will be treated in that manner.

XXXXX XXXXX ... (text or crypt)

Finál (repeated twice)

The figures 00, 01, 03 and 08 have been heard over the past several weeks and are an unknown factor.

**Type 3**  
Atención 133 00 30 (repeated for several minutes)  
30 (repeated for less than a minute)

XXXXX XXXXX ... (text or crypt)  
Finál (repeated twice)

The above transmission type is seldom heard.

**Type 4**  
Atención (repeated three times)  
342 30  
Atención (repeated three times)  
XXXXX XXXXX ... (text or crypt)  
Finál (repeated three times)

The above type has only been noted on live and/or non-computer generated tapes.

Twenty is the group count in Type 1; 105 is the group count in Type 2; 30 is the group count in Type 3 and 4.

The 5-digit Spanish transmissions no longer follow a definite pattern as in years or months past. Wonder why?

A format variation has also been noted over the past few weeks on a small portion of the Morse 5-character group transmissions. The variation is as follows:

MUW TT MJ (repeated several times)  
MJ MJ MJ MJ MJ BT BT BT  
XXXXX XXXXX ... (text or crypt)  
AR SK

This transmission format was last heard on August 2nd at 2330Z on 5080 kHz.

**OOPS!**  
I almost forgot to mention that one of the groups of the 5080 kHz transmission at 1330Z was 77777. This was on 11 September 1985.

**FREQUENCIES TO WATCH**  
Four-digit English noted on many dates at 0000Z on 5224 kHz. Format of the English transmissions is identical to 4-digit Spanish transmissions. Is this a Remington/Warrenton frequency, Mr. Heard?

Live and/or non-computer generated taped 5-digit Spanish often reported on 5250 kHz at 0100Z with repeat on 5070 kHz at 30

## "Los Numeros"

32444 69213 88816 52196 63811 94216  
Havana Moon



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\*\*\*\*\*  
Could it be that we are almost there?  
\*\*\*\*\*

### WHO HEARD WHAT

Zel Eaton heard the 10 August 5135 kHz "numbers" transmission during a Missouri electrical storm. My QTH was also besieged by a severe electrical storm during the transmission, Zel. Jim Beckett of New York couldn't monitor on the 10th because he was--and probably still is--receiverless. They just do not make receivers the way you and I think they should be, Jim.

Jim also says that his MT arrived one day before the 10th and considered this very short notice. I agree, Jim; I understand this happened to other readers.

John Santosuosso was somewhere in Georgia and was unable to listen.

And what about the rest of you? Where were you?

### A CURIOUS TRANSMISSION

SEPTEMBER 11, 1985. The

frequency was 5080 kHz when, at 1330Z, a very strong and badly distorted 5-digit Spanish transmission was heard. Two slightly weaker transmissions were also heard in the background!

At the end of the stronger transmission, a Spanish speaking male was heard with many references to Managua and Bauta. Readers are reminded that SOME 5-digit Spanish transmissions originate from the communications facility near Bauta, Cuba. Some, however, does not mean all.

### SUBTLE CHANGES

AT LEAST FOUR slightly different variations in 5-digit Spanish transmissions have been noted over the past several weeks. The variations are as follows:

**Type 1**  
Atención 975 20 (repeated several minutes)  
XXXXX XXXXX ... (text or crypt)  
Finál (repeated twice)

This is the most commonly monitored type. This was the same type that once terminated with "adios."

**Type 2**  
Atención 976 00 (repeated several minutes)  
00 105 (repeated for about one minute)

### PIRATE RADIO cont'd

send a brief note to KCBI International, Dallas, TX 75221, and thank them for their thoughtfulness.

It, of course, is not a pirate, but you might enjoy tuning in the African country of Burkina Faso (formerly Upper Volta) on 4815 kHz. Good signals are currently being received and the word is out that Burkina was given a new 50 kW transmitter by its friend Libya. Programming is normally in French or local tribal languages and features everything from pops to African highlife music. The best time to try is 2300 to sign off at 0000 GMT.

Burkina is not the best verifier, but if you want to try, send your report to Radiodiffusion-Television Burkina, B.P. 7029, Ougadougou, Burkina-Faso. It might be a good idea to enclose several International Reply Coupons which can be obtained from your local post office.

That is it for this month. We will be back in December, and with the DX season now upon us please fill Box 1116 to overflowing with logs and other information. Thanks.

**LOS NUMEROS cont'd**

past. Would you believe that 5-digit Spanish and related CW transmissions have been noted on 5135 kHz since 10 August? BELIEVE IT! CW noted at 0200Z on Wednesdays with 5-digit Spanish at 0600Z on various dates. VERY CURIOUS!

German 3/2-digit often noted on 5285 kHz with a female announcer at 0300Z.

Other 5-digit Spanish frequencies to watch: 3080 kHz at 0200, 0300, 0400 3445 kHz at 0230, 0330, 0430 4044 and 4057 kHz usually active after 0500Z.

**THE RUSSIAN ON YOUR RADIO**

Russian Navy CW transmissions often noted on 5250 kHz as well as several kHz up and down from this frequency. Call sign most often heard is CMU967. This station is located at the Santiago, Cuba Naval Base. This station often transmits at speeds near 35 WPM. Record at 2.4 cm and play back at 1.2 cm if you have trouble copying such high speeds. Five-digit Spanish also reported on this frequency!

**KEEN VISION**

Jim Beckett tells me that he noticed the frequency display on an ICOM transceiver on national TV news during the latest escapade in Central America. Said escapade being the kidnaping(?) of a highly misguided group of Americans. The frequency display was 3350 kHz.

**WE GOOFED**

Havana Moon goofed. Jim Beckett goofed. I darn well believe in equal blame-sharing, Jim. The goof was in the--by now--infamous Beckett Cipher that should have translated to BINARY instead of BINARZ. Me and Jim figure that if you came up with BINARY you is pretty darn smart!

The last set of numbers should have expressed 11001 (25=Y). However, it came out as 11010 (26=Z). Did we get it right this time, Jim?

**THE OBITUARY**

It all started, so to speak, with a death notice in the highly respected London Times. Seems that this paper printed a 33-word notice announcing the death of three "dearly beloved sons" of a Count and Countess. It just so happened that this death notice appeared just after Germany's latest spy escapade. For reasons that are not exactly clear, MI6 (British

Intelligence) and other authorities decided this must be a coded message to East German spies to head home as quickly as possible.

This pulp-novel escapade came to a rather quick end when the person placing the notice came forward with a rather strange explanation. Reports from London quote a woman who admitted taking out the notices as saying it was simply a "personal matter." No spies at all.

It has been reported that MI6 and Scotland Yard have paid their respects(?) to the woman that placed the notice that caused such a tizzy at MI6. It's also reported that the three sons are rather upset with mother.

And I once thought that the obituaries of the now-deceased Radio Free Grenada were strange. So much for obits. I'll take the personal ads of some S.E. United States newspapers any day.

**RADIO MARTI**

In addition to Esmeralda ("the story of a blind Cinderella's love of a millionaire") Radio Marti--ill-conceived at best--just might be getting down to some serious business. Seems that Marti has accused the Castro regime of covering up a "massacre" that reportedly occurred when Cuban military units fired upon a tour boat with about 70 people aboard in Matanzas harbor about five years back.

Would you believe that Radio Marti developed this story without the aid of the CIA?

**SAN FRANCISCO BAY**

Here's a thriller that was buried in the back of a few major newspapers. Reports have been circulating that a tiny Soviet submarine entered San Francisco Bay early this summer. The investigation began a few weeks back after reports that there were "submarine tracks" at the bottom of the bay.

It must have been difficult to discover "submarine tracks" under millions of discarded Anchor Steam bottles and Lucky Lager cans. I guess some people--submarine commanders included--will do just about anything to beat the Golden Gate Bridge rush hour traffic into Marin County.

**THE DEBUT**

There's a new "espionage kid" on the block and he's slick and very classy. He goes by the name of Top Secret and his address is Caruba Enterprises, P.O. Box

1146, Maplewood, New Jersey 07040. A year's subscription for this quarterly is \$14. Be sure and tell them you read about it in MT if you decide to subscribe.

**TERRORIST AND INTERNATIONAL INTELLIGENCE ELECTRONIC BULLETIN BOARD**

If you have a computer (doesn't everybody?) and telephone modem you are now able to stay up to date on what is happening on terrorist incidents around the world.

This unique concept is somewhat pricey at \$300 per year and \$17 per on line connect hour. However, if you are interested, address your inquiries for further information to: INTERNATIONAL INTELLIGENCE CENTER, P.O. Box 126, Purcellville, Virginia 22132.

The International Center publishes the Terrorist Intelligence Report twice monthly at \$100 per year and the KGB Newsletter monthly at \$100 per year.

A very special thanks to the nearly famous Eric Conners for the above information. Do you subscribe, Eric?

**NEW RELEASES**

University Publications of America announces two timely releases at the midpoint of this decade of terrorism. On Terrorism and Combating Terrorism as well as The Rationalization of Terrorism are available in softcover at \$8.00 each.

Direct all orders and inquiries to: UNIVERSITY PUBLICATIONS OF AMERICA, 44 North Market Street, Frederick, MD 21701.

When requesting a catalog or ordering, be sure and

tell them you read about them in MT.

**HELPFUL HINT**

Zel Eaton says that he uses a Motorola NSN6033A xL Lapel speaker on his Icom R71A. Zel clips it to his easy chair at home and uses it with his scanner while driving. This guy really knows how to live.

**COMING SOON**

MIAMI SITES. Watch for it.

**REMEMBER**

If you don't write I can't write.

**TRIVIA FOR HANK**

How about this one, Hank Bennett? During the barren days before MTV, radio listeners would often write their local disc jockeys with musical requests and dedications. The disc jockeys would often read the letters on-the-air and in many cases use the initials "YKW." What did these initials stand for?

Here's one more before Tecate time: What were the call letters of a southern powerhouse station that played "after-hours" music and employed a fantastic disc jockey by the name of Gene Nobles? This station sold records by mail.

Other readers are welcome to participate.

Time now for a Tecate and...

Adios, Havana Moon y Amigas

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



**listener's log**

**FREQUENCY PROFILES IN PRINT**

by Larry E. Williams

The following frequency profiles for various states have appeared in the three major hobby magazines, Monitoring Times, Popular Communications and SCAN. The list below reflects major frequency entries since 1982.

**FREQUENCY PROFILES**

MONITORING TIMES	ISSUE DATE
ALASKA	JAN '85
ALBUQUERQUE	NOV/DEC '83
AMARILLO	MAY '84
ARIZONA	APR '84
ATLANTA	MAY/JUNE '83
ATLANTA	JULY '84
ATLANTIC CITY	FEB '84
BALTIMORE	AUG '84
BOZEMAN, MONT	FEB '84
CALIFORNIA	DEC '84
CALIFORNIA/CHIPS	SEPT/OCT '83
CALIFORNIA/CHIPS	APR '84
CANADA	JULY/AUG '83
CANADA	NOV/DEC '83
CANADA/AIRCRAFT	JAN '84
CANADA/ALL ISSUES	AFTER/FEB '84
CONNECTICUT	MAY/JUNE '82
CHARLOTTE, NC	AUG '84
CHARLOTTE/VA	JAN '84
CHARLOTTE/VA	MAR '85

CHICAGO/AIRCRAFT	JAN/FEB '83
DALLAS	MAR/APR '83
DIST OF COLUMBIA	NOV/DEC '82
DIST OF COLUMBIA	JUNE '84
DIST/COLO-AIRCRAFT	MAR/APR '83
FLORIDA/NASA/KSC	JAN/FEB '83
FLORIDA/NASA/KSC	JULY '84
FLORIDA/NASA/KSC	FEB '85
FT. WAYNE	JAN '85
GULF/OIL	FEB '84
HARRISBURG, PA	FEB/AUG '85
IDAHO	APR '84
IDAHO	MAY '85
IOWA	DEC '84
KANSAS	MAY/JUNE '83
LOUISIANA	NOV/DEC '83
MARYLAND	APR '84
MIAMI, FLA	SEP/OCT '82
MICHIGAN	MAY '85
MILWAUKEE	APR '84
MINNEAPOLIS	FEB '84
MONTANA	APR '84
MONTGOMERY CO OH	FEB '84
MONTREAL, CN	SEP/OCT '82
NEVADA	APR '84
NEW JERSEY	MAR/APR '83
NEW JERSEY	AUG '84
NEW YORK	MAY/JUNE '83
NEW YORK/NASSAU	JULY/AUG '83
NEW YORK/UPSTATE	MAR '84
NORTH CAROLINA	NOV/DEC '83
NORTH CAROLINA	FEB '85
OHIO	DEC '84
ONTARIO, CN	MAY/JUNE '83
OREGON	APR '84
DWENSBORO, KY	OCT '85
PENNSYLVANIA	MAR/APR '83
PENNSYLVANIA	APR '84
PHILADELPHIA	NOV/DEC '83
PHILADELPHIA	SEP '84
PHILADELPHIA/NJ	MAY '84
PHILADELPHIA/NJ	JAN '85
PIGEON FORGE, TN	OCT '85
PISGAH FOREST, NC	MAY '85
PORTLAND, MA	MAY/JUNE '82
QUEBEC, CN	MAR/APR '83
ROANOKE, VA	NOV/DEC '83
ROANOKE, VA	MAY '85
ROCKINGHAM CO NC	FEB '84
SEATTLE, WA	JAN '85
SPORTS/MISC	NOV '84
SPRINGFIELD, MO	JAN '83
SPRINGFIELD, MO	JAN '84
TAMPA	NOV/DEC '83
TOLEDO	JAN '84
TORONTO, CN	JULY/AUG '82
UTAH	APR '84
VIRGINIA	APR '84
VIRGINIA	SEP '84
VIRGINIA	OCT '84
WASHINGTON	APR '84
WEST POINT	JAN '84
YUKON, CN	NOV/DEC '83

USA-  
Ronald McDonald is really getting with it; new stores are now using walkie talkies at the drive through on 35.02 and 154.600.

VIRGINIA-  
The state-wide service frequency 39.54 has been received in Virginia on 462.200 MHz. See if you can locate this repeater.

Bearcat users on 159.000 MHz complaining about beep-beep-beep on the state police should send their complaints to the people that put up the weather satellite on 137.400 MHz. You are hearing the image frequency (159-21.6=137.4).

SOUTH CAROLINA-  
The highway patrol has asked for use of 42.060 MHz. Guess they want to work Missouri and Canada when the skip opens next summer!

The SC Fireman's Association has a complete frequency list for 39 cents postage. Ask for the 1985 "Statistician's Report"; Suite 55, Village Park West,

Simpsonville, SC 29681 (List has a few errors).

MIAMI-  
There is a bi-sexual digi-talker on 452.475--give it a listen.

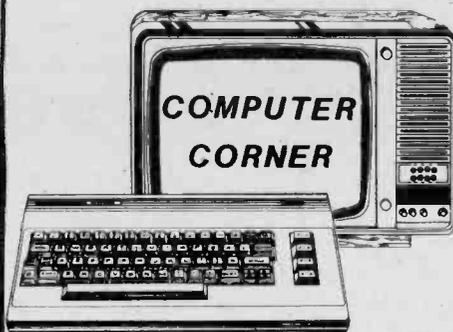
KNOXVILLE, TN-  
Aircraft radiotele-phones over the Carolinas are on 459.750 working Knoxville on 454.750 MHz.

FT MYERS, FLA-  
That's not a clock you hear on 161.670 but is the link from the AP satellite receiver to the radio station.

PENNSYLVANIA-  
Wow! Have you seen the antenna on I-81 at Midway? It's privately owned and homebrew. More on this later for SWL's.

COMING NEXT MONTH: Monitoring the Highway Patrol--Nationwide!

-----  
C. W. ELLIS  
P.O. BOX 202  
ULSTER, PA 18850  
-----



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

COMPUTERS IN AN ANALOG WORLD

Most people who are attracted to computers for whatever reason tend to think of the mystery or aura surrounding them as digital in nature. I guess it is for the most part. Ushered in by the advent of the digital hand held calculator, this aura is ever present in the new wave of digital consumer appliances. From microwave ovens to digital television to the new laser disk players, the buzzword is digital.

Pause for a moment, if you will, and consider how much of the real world is really all digital. You have a digital clock, but time is a linear value. You consult a digital thermometer when you want to know the temperature, but heat or ambient temperature is an analog event. Every subject that comes to mind in the natural

world is analog in nature. Strange, then, that the electronic devices we are becoming more and more dependent upon are digital.

Rather than join the Luddite movement (The Luddites, during the dawning of the machine age, didn't believe in machines) let's take a look at how we make the jump from an analog source to a digital value which any self-respecting computer would find acceptable.

Converting an analog signal to a digital value is easy; getting a digital value that is useful is not so easy. Let's start with an electrical voltage whose value changes slowly with time. For sake of simplicity assume the voltage is always between zero and one volt positive. An example of such a voltage might be the output of the signal strength meter on a receiver.

To convert such a signal to a digital value (digitize) requires a hardware device called an analog to digital converter, or A/D. There are many of these devices on the market, but all fall in two or three unique types. After we walk through the conversion theory, we can discuss the types and the advantages of each.

Before we can feed our analog signal to an A/D converter, we have to answer several questions. First, how accurately do we want to

read or convert our voltage? This has a direct bearing on the number of bits the converter must put out. If we choose a 2 bit converter, there are 4 possible output values, namely 00, 01, 10, and 11 in binary. Obviously, 00 must equal zero volts, and then 11 must equal one volt. The input voltage required to give an output of all 1's is known as the full scale voltage, in this case one volt.

However, with two of the output values defined, there are only two values left that our two-bit A/D can use for values other than zero or one volt. If we have a linear device, then 01 must equal 0.33333... volts, and 10 must be equivalent to 0.66666... volts. Then we can only read our input voltage to the nearest 0.333... volts. This is known as the "resolution" of the A/D converter. It is the smallest voltage change that can be detected and cause a bit change on the output of our A/D.

While our two-bit A/D will work, it isn't very practical. Most commercially available devices range from a minimum of six bits output to as high as 16. The six bit devices are cheaper and fairly easy to use. The 16 bit devices are expensive and much harder to work with, as noise signals tend to mix with the signal to be digitized and cause errors or inaccuracies.

So what does moving up to a six bit A/D do for us? For the most part, the improvement is in resolution. Six bits in the binary system of zeros and ones allow 64 steps instead of the four we originally started with. With zero as the first step, this leaves 63 steps to split the one volt signal by. This results in a .016 volt step or a resolution of 16 millivolts.

A bit output pattern of 000000 still equals zero volts, but the output of 000011 means .048 volts instead of 11 meaning one volt as with the two bit converter. One volt is now equivalent to 111111 in binary.

Now we have a way of converting our input signal to a digital value. Any computer can then process this input in any manner the programmer sees fit. For example, the program may be written such that the actual value is shown on the computer display just as the A/D converter gave it to the computer. Or the computer could calculate the actual voltage that was put in to the converter.

FREQUENCY PROFILES

SCAN MAGAZINE	ISSUE DATE
ALLENTOWN, PA	NOV/DEC '84
BALTIMORE	MAR/APR '82
BUFFALO	MAR/APR '83
BUFFALO	NOV/DEC '83
CHICAGO	JAN/FEB '85
CHICAGO/AIRCRAFT	MAY/JUNE '82
CHICAGO/FIRE	JULY/AUG '84
HONOLULU	MAR/APR '85
LOS ANGELES	SEPT/OCT '83
MILWAUKEE	MAY/JUNE '83
MILWAUKEE	MAR/APR '85
NEW YORK CITY	JULY/AUG '82
NEW YORK/NASSAU	JAN/FEB '84
OK CITY, OK	SEPT/OCT '84
ONTARIO, CN	NOV/DEC '82
PHILADELPHIA	MAY/JUNE '85
PITTSBURG	JAN/FEB '83
SAN DIEGO	MAY/JUNE '84
TAMPA/ST PETE	MAR/APR '84
UTAH(HWY PATROL)	JULY/AUG '83

FREQUENCY PROFILES

POPULAR COMM	ISSUE DATE
GEORGIA ST POLICE	JAN '83
HOLLYWOOD STUDIOS	AUG '84
INDIANA ST POLICE	AUG '83
KENNEDY SPACE CTR	MAY '83
MISSOURI HWY PTRL	APR '84
MONTANA HWY PTRL	MAR '84
NEW YORK CITY FIRE	NOV '82
NEW YORK CITY PD	SEP '83
OHIO HWY PATROL	MAY '83
ORLANDO	JULY '84
PENNSYLVANIA SP	JULY '83
SAN FRANCISCO	DEC '82
SAN JOSE, CA	JUNE '84
SOUTH CAROLINA HP	APR '83
SOUTH DAKOTA	APR '85
TORONTO, CN	JUNE '85
UTAH HWY PATROL	JUNE '84

**COMPUTER CORNER cont'd**

Bear in mind that the value calculated by the computer from the digital value given it will only be as accurate as the resolution of the A/D converter, or even a little less. For example, if our six bit converter gave the computer a binary value of 100000, the theoretical value is 0.5 volts. But is it exactly 0.5 volts? The true value can fall anywhere between 0.5 volts and 0.516 volts. This is the resolution we spoke about. The A/D can only resolve the actual voltage to within 0.016 volts of the actual value.

Note that every time we add a bit to the number of output bits the resolution is reduced by half. Adding a seventh bit to our six bit converter reduces each step to 0.008 volts. I leave it to the reader to calculate the resolution of a 16 bit converter (it is rather small).

Now that we have a handle on what an A/D converter does, let's see how it does it. There are two basic ways to convert an analog voltage to a digital equivalent. The first and fastest method is called flash conversion and consists of a stack of voltage comparators.

One input of each comparator is connected to the input voltage; each comparator has a reference voltage that is one step larger than the reference below it in the stack. The output of each comparator that has a reference voltage less than the input will turn on. The comparators with a reference voltage

greater than the input will not turn on. Obtaining the output is then a matter of determining how many comparators are on.

The disadvantage of the flash converter is the number of comparators required. Our simple two bit converter would require three comparators, and our six bit comparator a whopping 63 comparators! But the comparators can do the conversion rapidly, far faster than other methods.

The other basic method is called dual slope conversion, named after the technique used to convert the voltage. In the dual slope conversion, an external digital clock and counter are used to count pulses as the signal is integrated. In this method, the converter is set up so that a one volt signal will charge a capacitor to the full one volt level in a given number of clock pulses. For our six bit converter, we would choose 63 clock pulses.

In operation, we allow the input voltage to charge a capacitor for 63 clock pulses. If it were an input of one volt, the capacitor would charge to the full one volt level. If we then discharge the capacitor with a known one volt reference, it will again take 63 clock pulses to reach zero volts, and we count the number of pulses required. The number of pulses required to reach zero volts is the binary

output; in this case, 111111.

Now, let's put in a signal of exactly 0.5 volts. Again we charge the capacitor for a full 63 clock pulses, but this time the capacitor will only charge to 0.5 volts, no matter how long we hold the voltage on the capacitor. After the 63 clock pulses, we again discharge the capacitor with the one volt reference, and count the number of clock pulses until zero is again reached.

We should reach zero in 32 clock pulses this time, as we had only half as far to go to reach zero! Again the number of pulses counted is the binary equivalent of the input voltage. Here 32 pulses in binary is 100000.

There is a third type of conversion called successive approximation where a single comparator is used, and the reference voltage is supplied by a computer, and varied in a binary reduction method. In other words, the reference voltage would be set at 0.5 volts (half of the full scale value) and the comparator trips if the input voltage is greater than 0.5 volts. This tells the control computer whether the voltage is in the top half or the bottom half of the range.

The control computer then sets the reference voltage half way between the remaining range, either 0.25 volts if the previous com-

pare said less than 0.5 volts, or 0.75 volts if it was greater than 0.5 volts. Based on the results of the second comparison, the reference voltage is again adjusted to cut the range in half once more. This procedure continues until the range being split is sufficiently small.

For our six bit accuracy, the computer is programmed to continue until the reference voltage is being adjusted in 0.016 volt steps. At this point the input voltage is the same as the reference voltage within 0.016 volts.

The successive approximation converter is faster in general than the dual slope converter, and usually slower than the flash converter. It's chief disadvantage is that it requires a control computer or other such device to set the reference voltage.

At this point I have given you the basic theory behind A/D conversion--probably more than some readers really wanted! For others it will, I hope, be merely a stepping stone to further study on what I feel is a fascinating area of computers and the real world around us. Again, as in previous columns, I will attempt to answer any reader questions, provided they are accompanied by a stamped self addressed envelope. Please note, however, the new address above.

Next month we will take a look at some specific points not addressed in this issue such as how negative voltages are handled and, space permitting, a look at the Digital to Analog converter.

# PROFILES

## VIRGINIA STATE POLICE

We would like to thank MT reader Don Powers of Coeburn, Virginia, for his contribution this month of an excellent in-depth look at his state police communications system.

The beautiful scenery, friendly population and excellent highway system makes the Commonwealth of Virginia most inviting to tourists and north/south travelers during all seasons of the year. Don's fine scanner monitoring among visitors and residents alike more productive and enjoyable.



Monitoring police communications is the highest priority among scanner enthusiasts.

**EQUIPMENT:**

- 1 CB Radio (Channels 9 & 19 priority)
- 1 SIRS Radio 39.54 MHz (Connects trooper with all county seats, correctional facilities and vehicles, and most cities and towns)
- 1 Vehicular Repeater uses trooper's 453.35/458.35 handheld (5 watts to talk over state police radio up to one mile from car)
- 1 State Police Radio custom made for VSP by Aero-tron which combines

four frequency pairs with four PL tones to produce 13 dispatch channels. Position 14 selects a simplex frequency earmarked for special operations and surveillance. A car-to-car TAC frequency is interfaced with whichever channel is selected with a "priority scan" setup which enables the trooper to simultaneously monitor any of Channels 1-14 and TAC.

State Police stations in northern Virginia can talk on the DC Metro Area Mutual Aid System on 453.55, as well as Tidewater's T-CAP Mutual Aid Net on 453.80.

NOTE: For security around major bridges, tunnels, or turnpikes, tune in also on Highway Maintenance frequencies 453.85 and 154.025. To my knowledge, however, all troopers are dispatched according to the maps included.

**Other frequencies of interest:**

- 39.54 SIRS (Police Mutual Aid [Statewide])
- 155.205 Statewide Mut. Aid for Rescue Squads
- 39.12 Dept. of Corrections
- 453.800 T-CAP Mutual Aid (Tidewater)
- 453.550 Metro DC Mut. Aid (VA, DC & MD)

General 10 Code:

- |       |                     |       |                           |
|-------|---------------------|-------|---------------------------|
| 10-1  | Signal Weak         | 10-21 | Call ( ) by phone         |
| 10-2  | Signal Good         | 10-22 | Disregard                 |
| 10-3  | Stop transmitting   | 10-23 | On Scene                  |
| 10-4  | Affirmative (OK)    | 10-24 | Assignment completed      |
| 10-5  | Relay (to)          | 10-25 | Report to (Meet)          |
| 10-6  | Busy                | 10-26 | Estimated time of arrival |
| 10-7  | Out of service      | 10-27 | License/Permit Info       |
| 10-8  | In service          | 10-28 | Ownership Info            |
| 10-9  | Say again           | 10-29 | Records check             |
| 10-10 | Negative            | 10-30 | Danger/ Caution           |
| 10-11 | On Duty             | 10-31 | Pick up                   |
| 10-12 | Standby (Stop)      | 10-32 | units needed (Specify)    |
| 10-13 | Existing conditions | 10-33 | Help me Quick             |
| 10-14 | Message/Info        | 10-34 | Time                      |
| 10-15 | Message Delivered   | 10-35 | --Reserved--              |
| 10-16 | Reply to message    | 10-36 | --Reserved--              |
| 10-17 | En Route            | 10-37 | --Reserved--              |
| 10-18 | Urgent              | 10-38 | --Reserved--              |
| 10-19 | (In) Contact        | 10-39 | --Reserved--              |
| 10-20 | Location            |       |                           |

State Police Aural Brevity Code (Not To Be Used With Other Agencies)

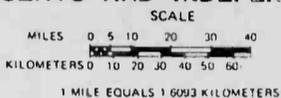
- |       |                             |       |                        |
|-------|-----------------------------|-------|------------------------|
| 10-40 | Bomb Threat                 | 10-50 | Accident (F,I,PD)      |
| 10-41 | Beginning tour of duty      | 10-51 | Wrecker needed         |
| 10-42 | Ending tour of duty         | 10-52 | Ambulance needed       |
| 10-43 | Suspicious vehicle          | 10-53 | Road blocked at        |
| 10-44 | Suspicious person           | 10-54 | Livestock on highway   |
| 10-45 | Stopping suspicious vehicle | 10-55 | Intoxicated driver     |
| 10-46 | Disabled vehicle            | 10-56 | Intoxicated pedestrian |
| 10-47 | Chase in progress           | 10-57 | Hit & Run (F,I,PD)     |
| 10-48 | Wanted indicated            | 10-58 | Direct traffic at      |
| 10-49 | --Reserved--                |       |                        |

State Police Signal Code (Not To Be Used With Other Agencies)

- |       |   |
|-------|---|
| 2     | Contact HQ by teletype                                  |
| 2-1   | Contact HQ by teletype NOW                              |
| 13    | Officer or trooper needs help - GO!                     |
| 13-1  | Trouble at station. Units in area GO -- Use caution     |
| 16    | Radar   |
| 17    | Checking detail   |
| 18    | Plane crash   |
| 21    | Transmit FCC call letters and unit no.                  |
| 22    | How is reception?                                       |
| 25    | Request mobile relay                                    |
| 26    | Cancel mobile relay                                     |
| 31    | Switch to surveillance channel                          |
| 52-20 | Subject likely to flee jurisdiction of the Commonwealth |

# COMMONWEALTH OF VIRGINIA

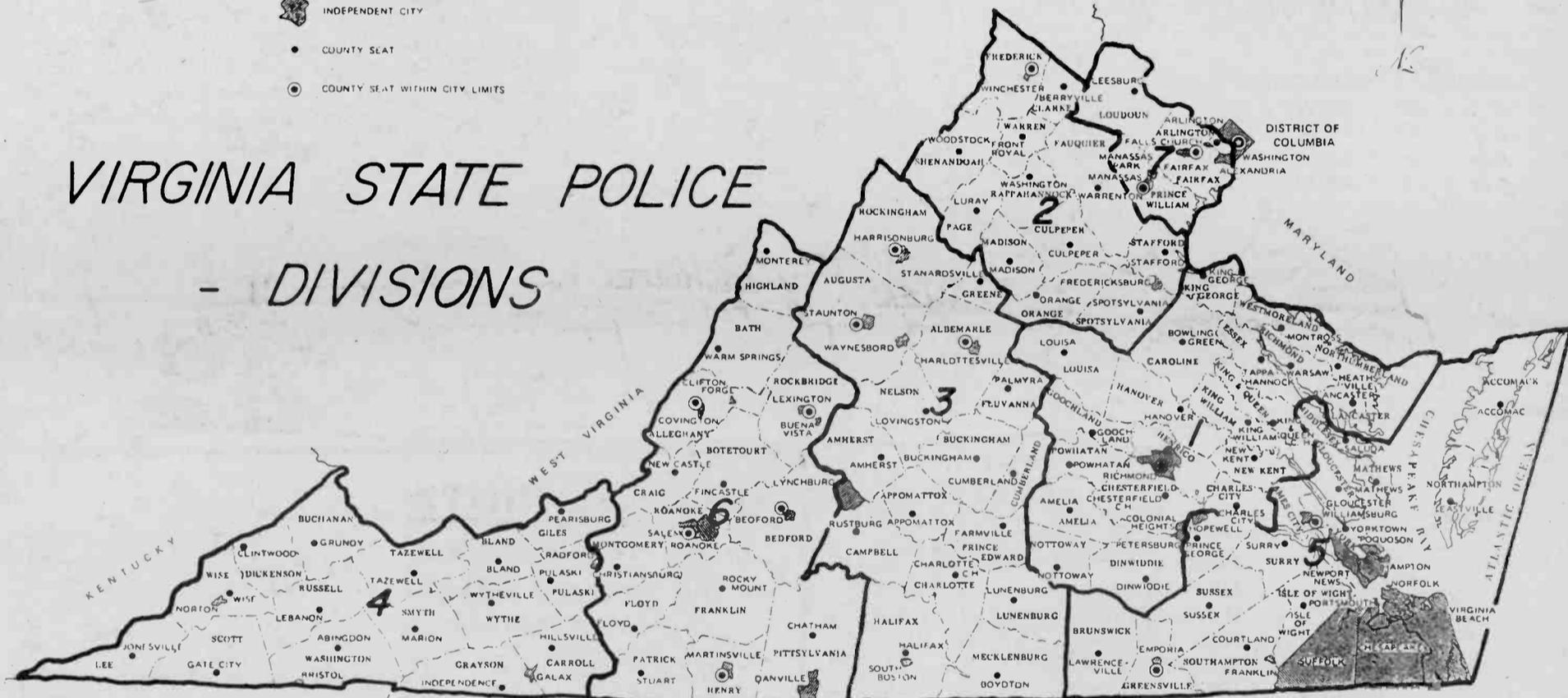
## DEPARTMENT OF HIGHWAYS AND TRANSPORTATION INFORMATION SERVICES DIVISION COUNTY SEATS AND INDEPENDENT CITIES



- INDEPENDENT CITY
- COUNTY SEAT
- COUNTY SEAT WITHIN CITY LIMITS

# VIRGINIA STATE POLICE

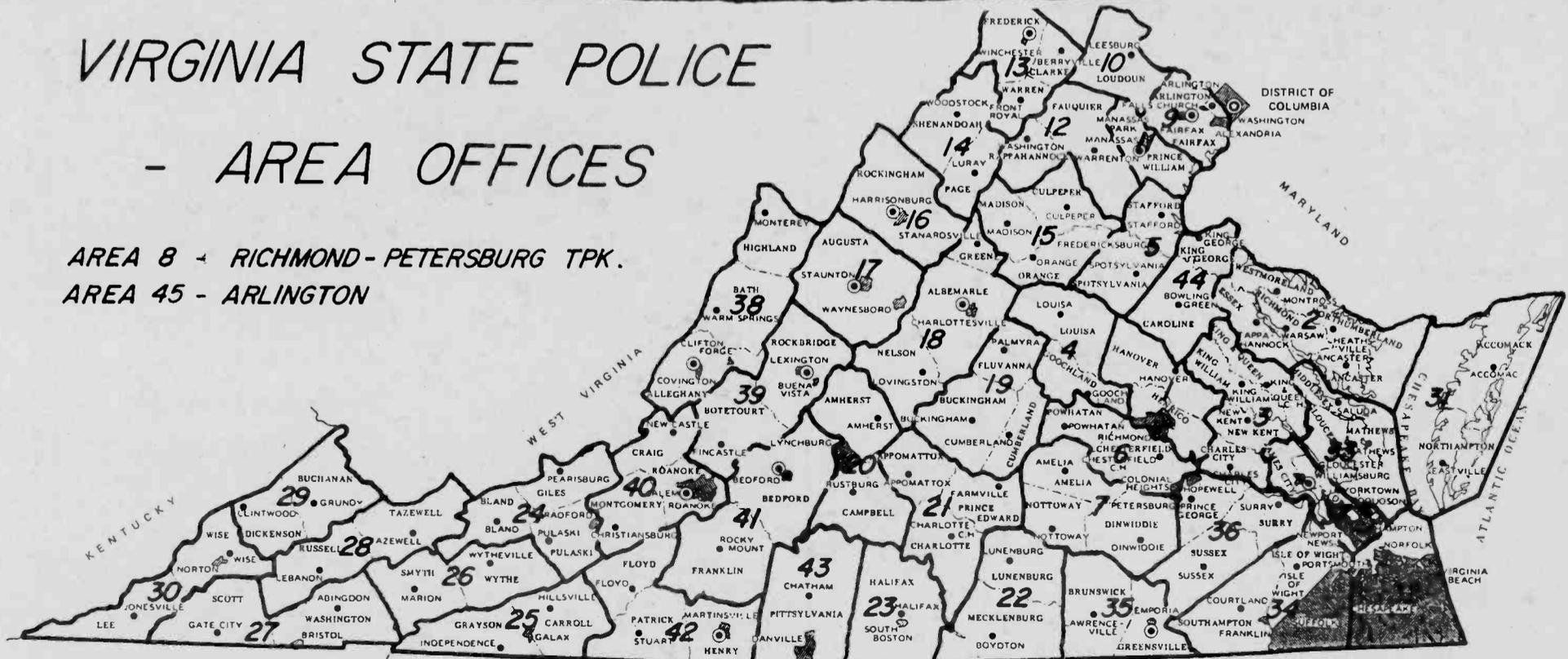
## - DIVISIONS



# VIRGINIA STATE POLICE

## - AREA OFFICES

- AREA 8 - RICHMOND - PETERSBURG TPK.
- AREA 45 - ARLINGTON



PROFILES cont'd

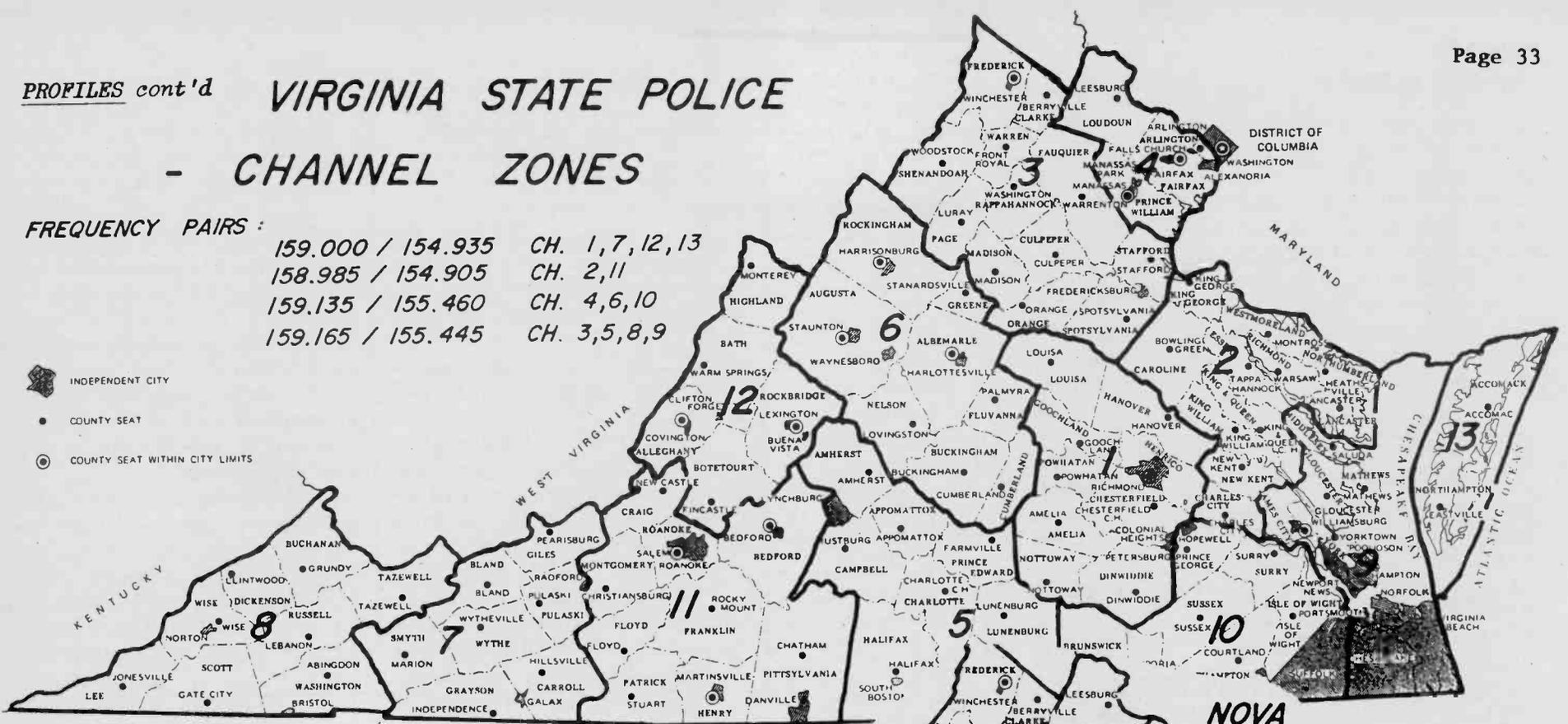
# VIRGINIA STATE POLICE

## - CHANNEL ZONES

FREQUENCY PAIRS :

- 159.000 / 154.935 CH. 1,7,12,13
- 158.985 / 154.905 CH. 2,11
- 159.135 / 155.460 CH. 4,6,10
- 159.165 / 155.445 CH. 3,5,8,9

- INDEPENDENT CITY
- COUNTY SEAT
- COUNTY SEAT WITHIN CITY LIMITS



## VIRGINIA HIGHWAY DEPT. - CHANNEL MAP

CHANNEL	FREQUENCY
F-1	47.22
F-2	47.34
F-3	47.28
F-4	47.30



Channel	Division	Base/Mobile	Areas
1	1-SW	159.000/154.935	1, 6, 7, 8, 4
2	1-NE	158.985/154.905	2, 3, 44
3	2	159.165/155.445	12, 13, 14, 15
4	7	159.135/155.460	9, 10, 11, 45
5	3-South	159.165/155.445	20, 21, 22, 23
6	3-North	159.135/155.460	16, 17, 18, 19
7	4-East	159.000/154.935	24, 25, 26
8	4-West	159.165/155.445	27, 28, 29, 30
9	5-NE	159.165/155.445	32, 33, 37
10	5-SW	159.135/155.460	34, 35, 36
11	6-South	158.985/154.905	40, 41, 42, 43
12	6-North	159.000/154.935	38, 39
13	5-Melfa	159.000/154.935	31
14	-----	-----/154.695	Special Ops
TAC	-----	-----/154.665	Car-to-Car

Division	Designator	Callsign
1	Richmond	KIC-365
2	Culpepper	KIC-367
3	Appomattox	KIC-701
4	Wytheville	KIC-368
5	Chesapeake	KIC-410
5-Melfa	Melfa	KIC-825
6	Salem	KID-667
7	Fairfax	KNAA-586

All Mobiles - KA-5367

### HELPFUL HINTS

#### A Few Helpful Kinks on the Infotech M600A and ICOM R71A

by Mike Hastings

#### INFO-TECH M600A

1. The model that I just received states in the owners manual that the Morse code speed range is now 4-120 WPM. The problems that some saw in the supposedly slow CW capabilities of the M600A should be laid to rest.

2. People who do not have a printer but still would like to have a "hard copy" of sorts may find that a VCR will do a good job of recording the M600A output, either through the direct video out of the M600A to the "video-in" of the VCR or through an RF modulator to the "RF-in" on the VCR (with the VCR set on the output channel of the RF modulator, of course).

3. People who are using

transformerless TV's may wish to go to Radio Shack and buy a few of the submini bat-handled toggle switches (cat. no. 275-324). (Note: the other switch that R.S. sells with plastic bat handle covers will NOT fit the bat handles of the M600A; they can be identified easily as they have a squared-off end to them while the ones that fit have somewhat pointed ends); each comes with four different colored plastic sleeves for the bare metal bat handle. This would provide electrical insulation for the switches and allow a color grouping for the controls; i.e., red for power, green for the three sel. switches, etc.

4. Another somewhat useful trick (at least in the beginning) is to get some self-adhesive labels and type appropriate abbreviations for the functions of the keypad buttons and stick them above each button.

One person took a clear sheet of the plastic trans-

**HELPFUL HINTS cont'd**

parency material used in overhead projectors and cut out holes for the buttons, then, using the smallest stencil I have seen, painted the names of the functions on the plastic and then put the plastic on the key pad with four very small, round, double-sided adhesive tape buttons.

**ICOM IC-R71A**

In playing with the method of extending down the freq. of the R71A as described in the July issue of *MT* I discovered how to extend the range UP (Apparently, however, the microprocessor will not allow reception above 30.999.9 MHz).

- 1) Put 0.000.0 in memory channel one as described in July issue
- 2) Place 0.500.0 in memory channel two.
- 3) Return to VFO A (push VFO-A button)
- 4) Place in VFO A 1.600.0 MHz
- 5) Push in the BAND switch (tuning rate switch)
- 6) Push SCAN switch

Very shortly you should see nine hundred MHz plus counting down. However, things are not as they seem. If you just watch the microprocessor count down it will soon appear to start over; it has NOT!

If you have the speech option installed this can be confirmed by pushing SCAN (to stop the scan operation) and then push the SPEECH button; what will be said in the beginning is 9999.& etc., not the 999.& etc. shown in the display. This quirk I had already discovered in playing with the speech option.

If you completely fill the display by putting 123.456.7 in it and push the SPEECH button it will say "123 point 4567 megahertz" as expected, but if you then try to add one more digit to an already full display by pushing, say the number 8 button, the "1" is apparently pushed off the left of the display which will now read 234.5678, as expected. But what is not expected is when the SPEECH button is now pressed it announces, "1234 point 5678 megahertz."

The display cannot show all the digits that the microprocessor and speech option can recognize and this is the problem with the apparent repeating of the counting-down digits. If you let the counting down display go through 900 megs five times (repeat five

times) and then stop the scan operation by punching the SCAN button, and then push the SPEECH button, the first digit announced will be a "4" then the rest of the display that you can see will be announced.

So you must wait for the countdown to get the digit that you cannot see down to zero, which will require 10 repeats of the counting down process (if you have the SPEECH option installed this is easy, just stop the scan countdown occasionally and check; if you do not have the SPEECH option you must carefully watch the display and count the number of apparent repeats).

Now you must let the first digit you can see on the extreme left of the display count down to zero. At this point you should slow the scan-down rate by pushing the BAND button and then choose the TS position (in or out) that you feel will give a scan down rate that will allow you time to STOP the scan action at a displayed frequency of 031.000.0 MHz (or you could just manually rotate the tuning knob CCW; if you move it clockwise it will jump back to the 0.0985 MHz).

If you should allow the scan-down process to continue at this point you will hear nothing--even though the display may read 010.000.0 MHz you will not hear WWV. For some reason, as long as the leading zero is present in the frequency display, no reception is possible.

REMOVAL of the leading zero from the frequency display:

- A: When the scanning has been stopped by pushing the SCAN button again, push the VFO/M button twice (any memory channel); this will take you into a memory channel, then back to the display with the leading zero, (or)
- B: When the scanning has been stopped as above, choose a memory channel and push WRITE. Push VFO/M twice. This is the BEST method as soon will be seen.

If you now manually rotate the tuning knob CCW the display frequency of 31.000.0 MHz will move to 30.999.9 MHz and the receiver will suddenly be receiving. Tuning clockwise will jump the display back to 0.098.5 and the entire process will have to be repeated unless you have stored 31.000.0 MHz in a memory.

## Preserving Magnetic Strength in Mobile Mounts

A trick used by scientists and experimenters for centuries to prolong the strength of magnets may be put to good use with magnetic mobile antenna mounts like the Grove ANT-10 as well.

Suppliers of horseshoe magnets ship their products with a "keeper," a strap of iron or steel bar, across the poles to concentrate the magnetic field. Over a period of time, magnetic intensity diminishes, a process which may accelerate without the keeper in place.

A good choice for a keeper for magnetic mobile mounts is the standard and inexpensive round cover plate sold in hardware stores' electrical departments for use with electrical outlet boxes. Snapped across the bottom of the magnetic mount, the plate makes sure that the magnetic lines of force are properly confined and routed between the poles.

Naturally, when the antenna is mounted on the steel roof of a vehicle the keeper is not used since the vehicle body conducts the magnetic field.

## "Priority"-- A Mixed Blessing on Your Scanner

The idea was a good one: Devise a feature which, when engaged, will force a scanner to monitor an important frequency entered into channel one whenever that channel becomes active, regardless of the function presently in use. But there was a problem.

In order to hear that frequency, the receiver had to switch to that channel to listen for a signal, thus interrupting whatever you happened to be listening to at the time. Most manufacturers tried to make the interruption as brief as possible and recur every three seconds or so.

Nonetheless, all scanners with a priority feature offer the same aggravation--constant interruption every few seconds to whatever you are listening to in order to sample channel one.

**A BETTER WAY**

There is an alternative: Load that important frequency into several channels spaced throughout the memory banks so that it will be scanned more frequently than the other frequencies. No more interruptions!

**EXPERIMENTER'S**

## WORKSHOP BUILD THIS HIGH PERFORMANCE INDOOR SCANNER ANTENNA

by Jim Dantin

A portable scanner like my Bearcat 100 offers convenience and flexibility of use, but is hampered by mediocre reception when used with its standard duckie antenna. I have installed a roof-mounted antenna to improve reception, but this limits the scanner's portability.

Normally, I listen to the scanner at night while in bed--the outside antenna is used for this application. On those occasions when I wanted to use the scanner in another room, I missed the fine reception of the rooftop array. I thought about wiring up another

feedpoint for the outside antenna, but soon decided that what I really needed was a better portable antenna.

My first attempt at an indoor antenna was based on modifying the rig I use in my car. I quickly determined that the whip needed a groundplane for decent performance--not very good for portable use! I then tried mounting the duckie on a coax extension so that it could be mounted higher--same problem of lack of groundplane!

About this time I purchased a replacement duckie from Centurion International, a model called the A-TRI. At 10-1/2" long, it gave a noticeable improvement over the standard issue from Bearcat. While this acquisition helped overcome most of my reception problems, it still couldn't match the pull of the rooftop monster.

I started thinking some more about what I wanted in a portable antenna. First, it had to offer far better performance than a duckie; second, it had to give performance on both VHF and UHF bands. In my area, the channels of interest are about

EX. WORKSHOP cont'd

evenly split between VHF-HI and UHF. I don't usually have problems with the VHF, but the UHF signals are from transmitters 30 to 40 miles away.

By definition, a portable antenna must be easily transported, I wanted something that I could carry to different rooms as well as fit into a suitcase for use on trips. I decided that the duckie was fine for temporary uses, or for use while I was moving around the house or yard. What I really wanted was something that could be set up in a few minutes for extended monitoring sessions of a few hours. It also had to be

unobtrusive enough to be acceptable to my better half!

Calling on the knowledge and libraries of some amateur radio buddies, I started experimenting with designs based on 300 ohm antenna feedline. These antennas all failed the performance requirements. Designs based on multiple wire elements proved too messy and hard to mount.

The winning design was found in a book on FM repeaters. It is constructed of standard coax and is called a "coaxial-collinear."

This design was developed by hams W2EWY and WB21CP. It offers gain over a standard 1/4 wave antenna by directing more of its sensitivity horizontally. This still gives an omnidirectional antenna--you theoretically give up reception overhead rather than in some compass direction like a Yagi beam. While primarily intended for single band use, I have found a way to combine both VHF and UHF coverage into one antenna.

The antenna is constructed of a series of 1/4 and 1/2 wave lengths of coax and is topped with a 1/4 wave length of wire or rod. For outdoor applications, many sections of coax can be combined to give a high gain. For my indoor use, I needed a length of around eight to ten feet.

Looking at figure 1, you can see that the antenna is a series of 1/2 wave sections with one 1/4 wave section on each end. Another 1/4 wave stub is added at the feedpoint to reduce feedline problems.

The length of each section must be calculated for your desired frequency by the formula:

$$1/2 \text{ wavelength} = 492/\text{freq.}$$

This gives a length in feet. An adjustment must then be made for the velocity factor of the coax. Solid-dielectric coax has a factor of 0.66 and foam-dielectric has a factor of 0.82. The solid type is recommended to give the shortest length antenna, and the foam type doesn't solder well, either.

For typical scanner applications, I chose 155 MHz and 455 MHz as the center design frequencies. The following chart shows the section lengths:

	155 MHz	455 MHz
1/2 wave		
in air	38"	13"
in coax	25-1/8"	8-1/2"

1/4 wave

in air	19"	6-1/2"
in coax	12-1/2"	4-1/4"

LET'S GET STARTED

To build the antenna, you will need a length of RG-58/U coax (11 feet for the antenna plus whatever you need for feedline), four feet of stiff wire like 14 or 16 ga. solid, and a connector to match your scanner. You can use RG-8/U if you are willing to put up with the extra bulk. Cut the coax to the following lengths:

- 2 pieces--14-1/2" long
- 2 pieces--27-1/8" long
- 2 pieces--6-1/4" long
- 2 pieces--10-1/2" long
- 1 piece--12-3/4" long

(this piece connects the UHF section to the VHF antenna)

- 1 piece for feedline to suit your needs

After preparing the ends, the coax pieces will end up two inches shorter as measured from the trimmed ends of the braid. For example, the 14-1/2" pieces trim out to 12-1/2", the 1/4

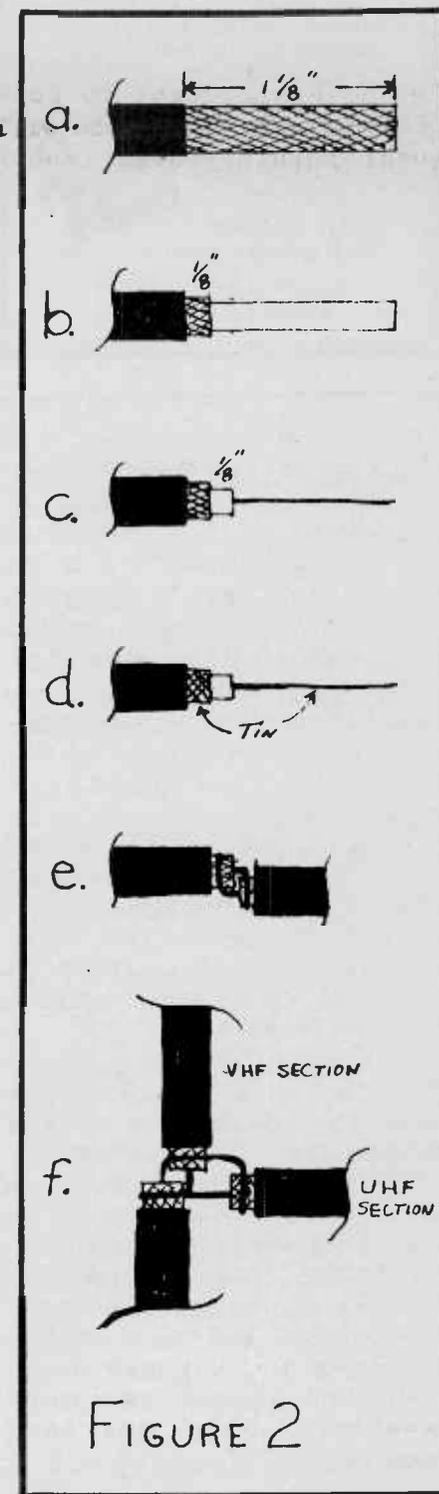


FIGURE 2

coax length for 155 MHz.

Cut the wire as follows:

- 1 piece--19" long
- 1 piece--19-1/2" long (bend end to form a loop and solder)
- 1 piece--7" long (make loop on end of this piece also)
- 1 piece--6-1/2" long

PREPARING THE COAX

Now look at figure 2 and prepare one end of the feedline and both ends of each of the other coax pieces. The coax pieces should match the 1/4 and 1/2 wavelength table when you measure end-to-end of the braid shield. Step by step coax preparation is as follows:

- a. Strip 1-1/8" of black insulation from coax.
- b. Trim braid to leave 1/8" exposed.
- c. Trim white dielectric insulator to leave 1/8" exposed.
- d. Tin the center lead and the braid; be careful that you don't melt the dielectric!
- e. Form the center lead to wrap around the braid of the adjacent coax piece.
- f. Solder the sections together as shown in figure 1. Note that the 1/4 wave wire section on the bottom of the antenna is connected to the braid of the feedline--just strip off a little of the black insulation to get to the braid.
- g. Install the connector.
- h. Insulate the connections with RTV sealant or tape.

I mount the antenna on a wall in the corner of whatever room I'm in. You can use the loop at the end of the antenna to hook over a nail or piece of string. For travel applications, the antenna can be rolled up into a loose circle to fit into a suitcase.

I determined the connection point for the UHF antenna through experimentation. Theoretically, it shouldn't work as well as it does! It would be interesting to make a UHF antenna with additional 1/2 wave sections for more gain and connect it to the VHF with a VHF-UHF mixer like Greg Doerschler's article in the September MT described.

I believe that the basic design of a coaxial-collinear could be the foundation of a custom antenna for your application. Antenna experimentation is a tradition in ham radio and should be in scanning also.

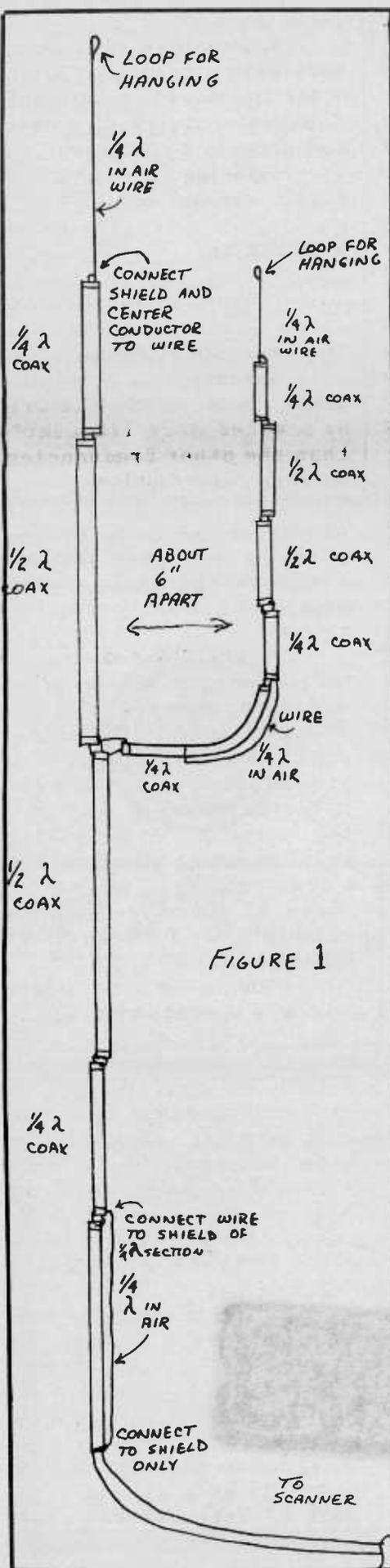


FIGURE 1

# 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.

HAMMARLUND HQ-180-C SW Receiver. 500 KC-30 MC. Triple Conversion. With matching speaker, 100 KC Calibrator, Clock Timer and manual. Sell for \$225. BEAR-CAT model 250 50 channel scanning receiver with manual. Sell for \$175. Both units in very good condition. You pay shipping. Call Ray Thompson (205)836-5211 after 6pm CST.

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## INFORMATION PLEASE

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

INFO WANTED: Frequencies for the RANCHO SECO Nuclear Power Facility located south of Sacramento, CA. Norman Alexander, 7504 Crystal Blvd., Diamond Springs, CA 95619.

\*\*\*\*\*

Need info on a GENERAL ELECTRIC Termet 300 teletype to receive RTTY. Also need tuning heads for a TMC AN/FRR49V or R5007A/FRR502 receiver. Dale Konyha, 1730 Wyoming, Dearborn, MI 48120.

\*\*\*\*\*

WANTED: "MT" issue April '85. Please advise cost and condition. L.E. Williams, 10 Elf Lane, Greenville, SC 29611. Local:246-3261.

\*\*\*\*\*

Anyone out there have a DATA GENERAL ONE PC? I would be interested in exchanging experiences, repair facilities, and locating software. Zel Eaton, 904 East Wall St., Kirksville, MO 63501. After 5pm 816-665-8776.

\*\*\*\*\*

I would like to know if anyone has a list of good railroad frequencies, like train to train or train to dispatcher, that could be monitored on a trip from Philadelphia, PA, to

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Want service info: PANASONIC RF-2800 (needs bandswitch); PANASONIC Color TV CT5377R GXLH; RADIO SHACK TRC424 CB; LAFAYETTE RK825 recorder; DRAKE R4B receiver; BRADFORD 505 Ranger TV; EICO 633 CRT Tester/Rejuvenator; SEMCOR RC115 Capacitor Analyzer; AKAI X100 D tape deck; MARANTZ 6270 Q turntable. Able TV & Electronics, 6333 Highway 2321, Panama City, FL 32404. (904) 785-7824.

\*\*\*\*\*

Wanted: Confirmed frequencies in the 806 to 912 MHz band for Boston, MA, area. Bob Studley, 200 Bedford Rd #25E, Woburn, MA 01801.

\*\*\*\*\*

WANTED: Monitoring Times for April 1985. I was out of the country and missed it. Will pay or accept free. Bernard Zuckerman, P.O. Box 480, Cathedral Station, New York, NY10025. I also need Jan-Feb, and March-April 1983.

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## FCC Closes in on Pirates

On August 19, 1985, U.S. Marshals in Boonesville, Arkansas, served a warrant on Russell E. Rieron and seized his transmitter. Rieron had been operating a pirate broadcasting station on various frequencies in the 6 and 7 megahertz region of the radio spectrum.

Rieron was located by close-in radio direction finding equipment while operating on 7440 kHz using the unauthorized call sign KBBR. Previously, Rieron had been arrested for similar violations using the call sign KRZY and identifying as "Captain Crazy"; he was fined \$1000.

If convicted again, Rieron faces a one-year prison sentence, a \$10,000 fine a forfeiture of all his radio equipment.

In another case, Liam P. Ryan was cited by the FCC for similar violations in the 7 MHz band and has been issued a \$1000 Notice of

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Apparent Liability for his pirate activities in Kirkwood, Missouri, a suburb of St. Louis.

The FCC has informed MT that it intends to enforce licensed radio broadcasting restrictions and is closing in on pirates in the following cities: Richmond, VA; Charlottesville, VA; Staunton, VA; Youngstown, OH; Miami, FL; Orlando, FL; Minneapolis, MN; Washington, DC; Louisville, KY; Waterbury, CT; Newark, DE; Grand Rapids, MI; Lansing, MI; San Francisco, CA; Arkansas City, KS; and Ft. Smith, AR.

The FCC has asked persons interested in assisting them in locating and closing down pirate stations to contact the Engineer in Charge, Federal Communications Commission, P.O. Box 1588, Grand Island, NE 68802-1588 (phone 308-382-4296).



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