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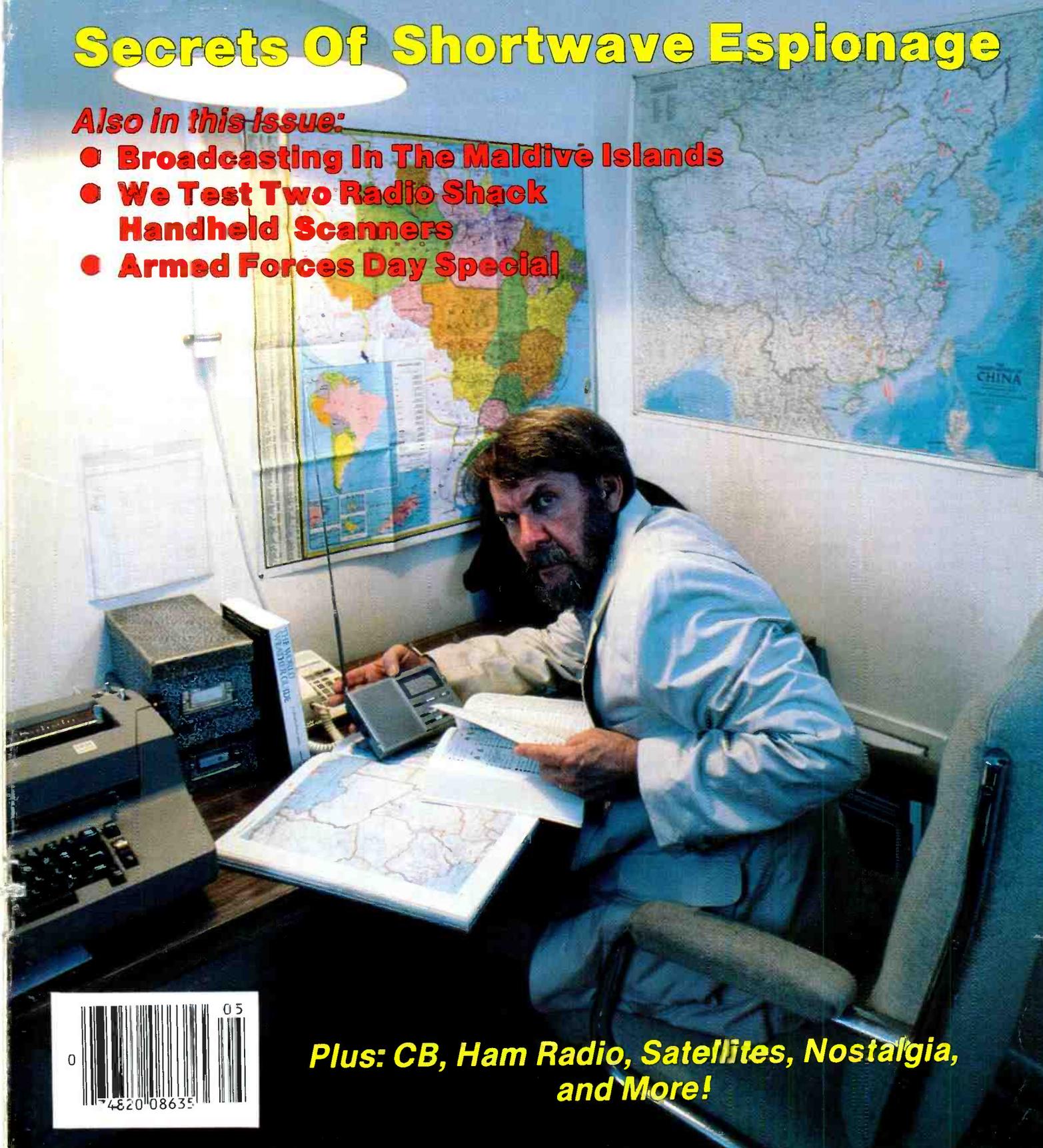
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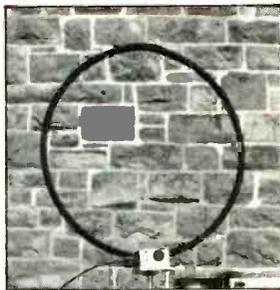
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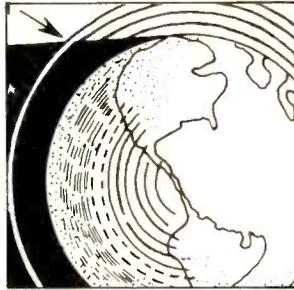
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*This month's cover: For 25 years mysterious numbers have been heard on the shortwave bands, presumably giving spy instructions. Read about it in this issue. Photo by Larry Mulvehill, WB2ZPI.*

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- EDITORIAL STAFF**  
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Editor  
George Doobinin  
Associate Editor
- CONTRIBUTING EDITORS**  
Gerry L. Dexter  
Shortwave Broadcast  
Robert Margolis  
RTTY Monitoring  
Gordon West, WB6NOA  
Emergency Communications  
Don Schimmel  
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Phototypographers  
Hal Keith  
Technical Illustrator  
Larry Mulvehill, WB2ZPI  
Contributing Photographer

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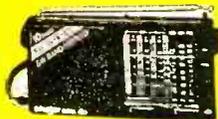
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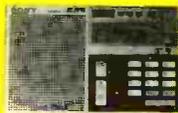
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## AN EDITORIAL

### Fanzines, Etcetera

**G**rass roots newsletters and fanzines are interesting entries in the various hobby fields where they exist. In the areas of sports and the arts, they abound. Some are really good, some totally awful. Although you don't often hear about such (essentially) non-commercial publications relating to radio and communications, they do exist and have recently shown some evidence of expanding.

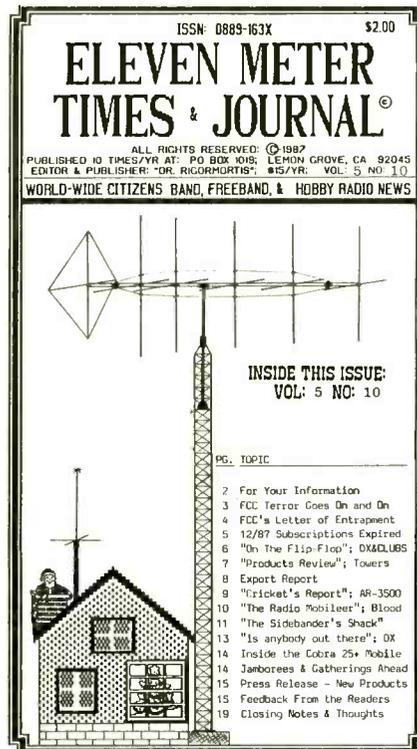
At their most basic level, for many years there have been several "closed circulation" privately issued newsletters that circulate only within relatively small cliques of hard-core enthusiasts such as shortwave broadcast listeners, "ute" monitors, scanner fans, pirate broadcasters, hackers, etc. You can't sign up to get any of these (there may not even be any charge for them); you get on the mailing list only if you're invited. Getting such an invitation is usually rather difficult, and may even involve being granted membership in a private organization that publishes the newsletter. However, from those I normally see, I'd say that some are excellent for coming up with the first inklings of industry and station information long before it actually comes to pass.

At the other end of the scale, we have the newsletters published by radio clubs devoted to the monitoring hobby. Such clubs welcome any and all members. Attempting to run an open membership club, while trying to produce a viable newsletter, is a big order that isn't always easily filled. Only a relative few in the DX and monitoring areas appear to do both jobs well. From the club newsletters we normally see here at POP'COMM, I'd say that the publications offered by the ASWLC, NASWA, ADXR, ACE, LWCA, ODXR, and SPEEDX do the best jobs.

Somewhere in between the "closed circulation" publications, and those put out by open membership clubs, yet another category has been emerging during the past couple of years. These are independent (non-club affiliated) newsletters that are available to all who wish to receive them.

For instance, the *FM Media* newsletter published by Dr. Bruce Elving of *FM Atlas* (Adolph, MN 55701-0024). It's a monthly publication for those who, like Bruce himself, are into all aspects of FM broadcasting — new stations, SCA, rumors, etc. *FM Media* is \$18 per year (it used to be \$45 per year.)

An exciting one to watch is the *Eleven Meter Times and Journal* (P.O. Box 1019, Lemon Grove, CA 92045). The EMTJ is a fiesty independent publication that's run by



The EMTJ is a fine publication.

Dr. Rigormortis. Its primary audience is more technically oriented 27 MHz operators. It's issued ten times per year (\$10 subscription).

The *North East Scanning News* (NESN) got off to a shaky start, but looks to have improved as it has gone along. From time to time it does give off vibes that lead us to believe that it may have aspirations of becoming a club; a move that would probably be counterproductive in the overall scheme of things. With the AOSC newsletter waning in its appeal, NESN could easily step in and fill the gap. NESN comes out monthly, covering scanner communications activities in the Northeastern and Mid-Atlantic states. It's \$2 per copy from Les Mattson, 212 West Broad Street, Paulsboro, NJ 08066.

*Radio Communication News* (RCN) is mainly concerned with scanner monitoring (especially military, public safety, government) in England. I can't quite get a grasp on whether RCN comes out on a regular, or sporadic basis, but it's always filled with good information. I don't think that there's any set charge for RCN, but I'm certain that a few dollars, or a stack of International Reply Coupons, would be gladly accepted in exchange for being placed on the mailing

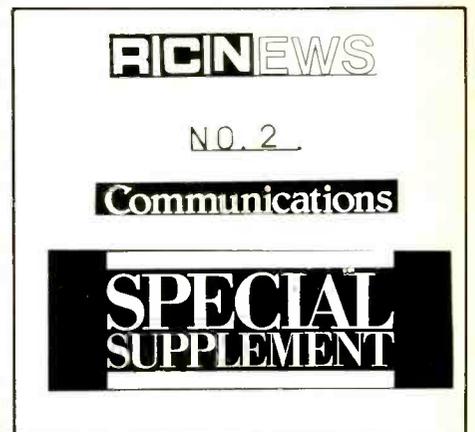
list. RCN comes from Peter T. Turner (G8TSY), 51 Weyland Road, Winesham, Ipswich, Suffolk, England IP5-9ET.

We've seen the first issue of yet another scanner fanzine that was put together by a monitoring enthusiast in New York State. It looked rather good and if it appears that additional issues will be forthcoming, we'll pass along the details. There is apparently a scanner newsletter relating to public safety agencies in Connecticut, but we haven't yet seen copies. There are others, too, from around the nation. Readers are invited to send along copies of any relevant communications or broadcast related newsletters so that we can share the information around.

Based upon my contacts with those who have produced newsletters and fanzines in electronics and other unrelated fields, I find that many seem to experience similar problems. These include maintaining a suitable circulation level because of lack of new subscribers and renewals from prior subscribers, also lack of sufficient information input from readers. Columnists (most of whom work without payment) frequently fail to meet their copy deadlines if they bother to send in a column at all. But, mostly the main burden is that only one or two people seem to end up carrying the bulk of the weight on their shoulders.

Fact is, turning out a regular publication of any size is a monumental task, and when you're dealing with a membership publication or one put out as a small independent effort, it's a lot more difficult than it may appear. Just because membership publications such as *QST*, *American Rifleman*, *Na-*

(Continued on page 72)



RCN comes from England and contains good information.

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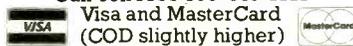
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# MAILBAG LETTERS TO THE EDITOR

The most interesting questions we receive will be answered here in each issue. Address your questions to: Tom Kneitel, Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801.

## Big Broadcast Memories

Regarding your January issue memories of the 1948 pirate station WISP, thanks for sharing old, and I am sure, precious memories with the rest of us. One of the reasons the story was so special was your references to David Thomas (DX'er and operator of pirate station WUMS). I really miss that guy, he was one of a kind. And he did treasure that WISP QSL you sent. I remember when Dave once showed me his fantastic, unbelievable QSL collection, among the very first he pulled from the files was the one you sent from WISP. He considered WISP one of his best catches ever, and this was the opinion of the man who had the Falkland Islands (when it was much more difficult than now), Manchuoko (a special station that operated only one day), and vintage 1930's TV stations. Yes, he truly appreciated his WISP QSL. Your editorial concluded with a valid point that I personally support. It is time for some legalization of pirate-type broadcasters. However, given the FCC's attitude towards Radio Newyork International, that seems most unlikely.

Dr. John Santosuosso,  
Lakeland, FL

Enjoyed your piece on WISP. Goes to show that the weird kid of today is tomorrow's mutant adult (hi). Your mention of Dave Thomas brought back memories. I got to meet him a few times in the early 1970's. Even though he was living in Florida, he still had those Ohio WUMS license plates on his car. Quite a character.

Harry Helms, AA6FW,  
San Diego, CA

In the December '84 issue of POP'COMM we ran a feature story about David Thomas, his strange pirate station (WUMS), and his long and rather controversial career as an ace DX'er. Every time his name comes up in our pages, we receive letters from readers who have anecdotes about Thomas; surely one of the most curious members ever to be a part of the hobby. In response to my mention of my 1948 short-lived pirate, WISP, no less than nine readers have now written imploring me to return it to the air for a 40th anniversary broadcast next New Year's Eve!

—Editor

## "Scan America" Directory: Caveat Emptor?

Regarding the "caveat emptor" review Slattery gave the "Scan America" directory

in the February issue; now you're cooking. Please include more reviews of this type in future issues.

Burton Fredericks,  
St. Louis, MO

As an owner of a "Scan America" directory, I would like to present my views. It was easy to understand . . . the "white space" has been handy to make notes . . . and if I were looking for accurate state maps I would have invested in a road atlas. A competent optometrist should fit R.L. Slattery with a pair of glasses that would allow him to see past the end of his nose.

Bob Jacobs,  
Dover, OH

Three cheers on your thumbs down for the "Scan America" directory.

Ed Jones, WB2DVL,  
Somerset, NJ

*We just knew that if (after many requests) we turned Slattery loose with his unbridled reviews, there'd be some fireworks. Quite a few comments were received, most either asking for more "caveat emptor" reviews or else specifically agreeing with his less-than-pleased observations regarding "Scan America." A couple of readers, like Bob Jacobs, seemed infuriated at Slattery, although even Jacobs' lengthy letter (which we didn't have the room to run in its entirety) still signed off (strangely) with "love and kisses." —Editor*

## RNI: Asleep In The Deep?

When I read in the December POP'COMM that Radio Newyork International was planning on returning to the airwaves that month, I was very pleased. I monitored their AM and SW frequencies with high hopes, but nothing was heard. What happened to RNI last December?

Maurice Shinn,  
Elkins, WV

*In late November, RNI's sponsors decided to forget about trying to put RNI back on the air during the dead of winter and, instead, plan on doing it in the springtime. It seemed the more practical approach, what with the severe weather expected and the fact that the M/V Sarah had to be moved several hundred miles to its operating position. In the mean time, the M/V Sarah got a paint job and had a new generator installed. Also, improvements were made to the transmitters and studio and, last we heard, everything is still in "go" mode.*

## Ship Shape Sarah

While on my way to a service call in East Boston, I noticed a radio tower normally found on land mounted aboard a ship. The tower had an FM antenna at the top. According to the name on the bow, this was the



famous Radio Newyork International broadcasting ship, M/V Sarah. Although it was raining, I snapped a photo to send to POP'COMM. The bridge in the background is the Mystic River Bridge between Boston and Chelsea. Nice magazine, keep up the good work.

Mark Foster, WA1PNW,  
North Shore Two Way,  
Beverly, MA

*We're always pleased to receive snapshots taken by our readers. The kind words are appreciated, too! —Editor*

## Sartre, Where Are You Now That We Need You?

What with violent crime in the New York City subways in the daily headlines, I have been monitoring the Transit Police frequencies of 160.305, 160.50, 160.905, and 160.965 MHz. Several times a day on each channel the dispatcher comes on to ask if all stations will check for an "open mike." I assume this means that someone on duty has a handheld transceiver stuck in the transmit mode. My question is, if the unit is stuck in transmit then how can the person causing the problem even hear the request?

Mike Heffler,  
Forest Hills, NY

*While I'd hardly rate this puzzling problem on a par with trying to find out where the razor blades go when you drop them in the medicine cabinet slot, it does pose a bit of a paradox. Let's put it this way, Mike, the officers who hear the request obviously know that they aren't the one with the open mike. The officer who doesn't hear the announcement, therefore, immediately realizes that he is the culprit. —Editor*

## Big Response

The excellent January issue NDXE pictorial of our new "Big Mac" transmitting station has excited your readers worldwide. Our office has been flooded with comments expressing genuine interest in our 600-thousand watt stereo shortwave facility. We appreciate this sincere outpouring very much.

D.D. Norman,  
Station NDXE,  
P.O. Box 569,  
Opelika, AL 36801

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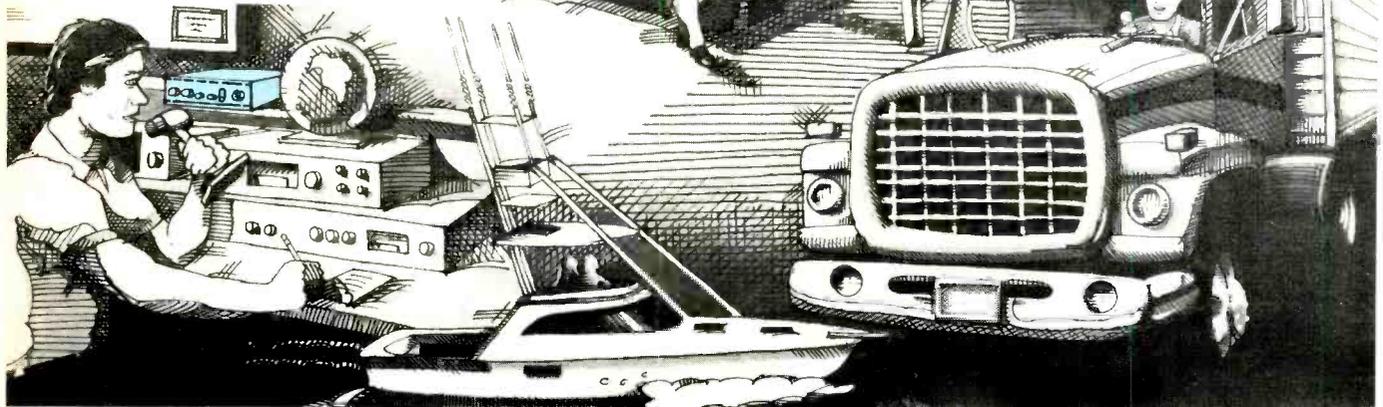
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## OFFICIAL NEWS COLUMN OF THE SCANNER ASSOCIATION OF NORTH AMERICA

**It's Here! The SCAN 6th Frequency Directory File Update.**

After an estimated 20,000-plus hours of work by SCAN volunteers, SCAN headquarters staff, plus computer programmers and typographers, the latest edition of the SCAN frequency directory file is finally here. For those of you who are not familiar with it, this is a very unique frequency directory file, unlike any other available. Because it is so unique, it is used by many government agencies, news gathering organizations, as well scanner enthusiasts. What makes it so special? One simple fact: The FCC records often do not reflect the true use of frequencies. There is the police agency that applied for, and was assigned new 800 MHz frequencies, for instance. The FCC says they are there. But the city didn't appropriate the funds for the expensive new 800 MHz equipment, so you'll still find them on 39.820. At the other extreme there is the volunteer fire department that always had Joe in charge of the licensing. He retired to Florida and their license expired. "Poof", they vanished from the FCC files! But listen to 155.760 any day of the week and you'll find they are still there. (With the current FCC budget they may never catch up to the fact that this "illegal" operation is there—and, in fact, they have so many more important things to worry about that this operation, which is doing no harm to anyone, is of little concern.) The bottom line is that if you can't trust the FCC data file for an accurate picture of the real world.

So what is the answer? It isn't simple, and it isn't easy. As we said, a very conservative number of hours spent on this 6th update is over 20,000. More likely it is closer to 25,000 hours. Over 600 SCAN members participated in the latest update, each contributing anywhere from 20 to over 100 hours of monitoring time each . . . because the only way to know if a frequency is active, and who is there, is to listen to it. Sometimes, for rarely used frequencies, it can take up to weeks of monitoring. Sometimes it takes a lot of detective work to find out who is there because they have forgotten the FCC rules that require identification.

In this edition, we also made a major effort to eliminate frequencies that are not in use. So while thousands of new listings were added, there were also many deletions. It takes days of monitoring to be sure that the frequency is not an occasional use channel, before it can be deleted.

Many volunteers used special recording devices, like automatic tape recorder activators, so that they could monitor 24-hours a day for several weeks. This time we also used a sophisticated software program written just for this project to alert us to unusual listings that needed double checking. It recognizes descriptions and frequencies by type of service, to identify those which might not be correct. Running on a high speed mainframe computer (a PC or a minicomputer can't efficiently handle a data base this large) it helped us correct the inevitable keyboarding errors that happen and pick up other errors as well. The end result of all this is the most accurate source yet for active frequency information. (For information on how to obtain your own copy of this latest directory, send a self-addressed stamped envelope to SCAN Frequency Directory, P.O. Box 414, Western Springs, IL 60558.)

**7th SCAN Frequency File Update To Get Underway**

We've finally learned our lesson about the amount of time it takes to get an update done, especially with the number of changes and the amount of data now involved. So we've decided not to wait, but immediately solicit applications for volunteers. Each update has a special focus all its own, and this time it will be on 800-900 MHz scanning. That doesn't mean that we don't need help on the other frequencies, or that you must have an 800 MHz

scanner to be selected. But we will be especially looking for those with experience monitoring the 800-900 MHz bands.

If you would like to apply for an appointment to this project (we select several from each area of the country), just drop us a note with the following information:

- a. How long have you been scanning?
- b. How many scanners do you own?
- c. Do you have the capability to monitor 800-900 MHz?
- d. Are you involved professionally in communications (such as a dispatcher, fireman, technician, etc.)?
- e. Do you have automatic monitoring capability (tape recorder activators, etc.)?
- f. Are you currently a SCAN member?

Plus anything else you'd like to tell us about yourself. Of course, be sure to clearly print your name and address so that we may contact you. Then send your application to: SCAN Frequency Project, P.O. Box 414, Western Springs, IL 60558. Please do not include any other correspondence to SCAN in the same envelope because these envelopes will be sent unopened to the Frequency Project selection committee.

**SCAN Technical Advisor Service To Be Revitalized**

During the first year of SCAN's operations, back in 1978, we received a very critical letter from a new member. He felt that we were less than a true club because we didn't answer questions from members individually. That was quite a challenge—and still is—because we only have a part time staff that can't begin to answer every question personally. However, the challenge was met with a creative idea for a SCAN Technical Advisor program using member volunteers. Letters are forwarded to the Technical Advisors who answer the questions, or request more information if needed, and respond directly to the person by return mail. The program is terrific and not only helps newer members who have questions, but also gives our Technical Advisors the satisfaction of being a helping hand to a fellow scanner enthusiast. Like any program, however, there are those who have dropped out for various reasons. We need to replace these people with some enthusiastic new volunteers.

When forwarding inquiries, we try to send them to Advisors with a particular interest or experience in that area. You don't need to be a rocket scientist to participate! Many of the questions are from beginners with questions that for you might be very easy to answer. On the other hand, we can also use the help of some technical savvy types to answer the more sophisticated questions about curing "intermod", etc. Many of the questions though are simple operating questions or confusion over some of the "lingo" heard on the air.

If being an official SCAN Technical Advisor sounds like it would be something you'd like to try your hand at for awhile, please write to us and tell us just a bit about your background: The number of years you've been scanning, special interests, any special technical background . . . things like that. Please address your letter to SCAN Technical Advisor, P.O. Box 414, Western Springs, IL 60558.

**Why Would Anyone Volunteer For This Project?**

When you hear about how much work was involved, including late nights, the early mornings, plus the many weekends it took to complete this project—all without pay—you may wonder why in the world anyone would be crazy enough to do it. Volunteers do

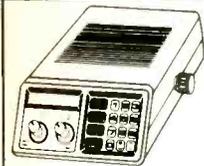
(Continued on page 72)

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# Secrets of Shortwave Espionage

***Those Mysterious “Numbers” Transmissions  
Have Been Around For 30 Years! What Do They  
Mean – And Who Are They For?***

## Part One

BY DON SCHIMMEL

Suppose you were going to set up a clandestine system of communications with your agents in the field. It seems logical that the overall traffic would be composed of three main categories: First, there would certainly be some practice traffic. This would be required to accustom the trainees to listening for and tuning-in their respective broadcasts so as to receive traffic addressed to him/her. This practice traffic would provide valuable experience and improve their proficiency in copying messages as well as in decryption or decoding, as the case may be.

Now a second type of traffic could very well be deception traffic. What better way to confuse opposition traffic analysis and cryptanalysis efforts than by throwing in traffic that was nonsense? Dummy messages could be made up with normal headings but with texts of purely random digits as just one of the ways of generating non-valid traffic. The absence of a pre-specified indicator group would tip off the agent that the traffic was bogus and he need not finish copying it. Eventually the overall plan should probably include a phasing out of the practice messages after a suitable breaking-in period of the agent and replace those messages with dummy traffic and then blending in the live traffic.

The third type of traffic would of course be valid messages. I doubt that every message would be of the “BLOW UP THE DAM” class. Instead there would probably be the myriad of details to be accomplished such as selection of secure meeting places, instructions regarding financial arrangements, notification of mailing addresses, crypto matters, directions concerning meeting schedules and means of recognition/identification of the agent handler. Any of the thousand and one real-life concerns of a spy organization and its clandestine personnel in place overseas. This getting settled-in may require many months, and in some cases, perhaps years, before all of the necessary



**Spanish-Female Announcer  
AM Mode 4F Groups**

FREQUENCY	SCHEDULE	DAY	ADDRESSEE(S)
4670	0200	SAT	868
4670	0200	THU	046
4670	0300	SAT	210
4670	1000	THU	585
5238	1200	THU	760
5812	0200	THU	868
6802	0100	SAT	779
6802	0300	MON	—
6802	0400	MON	250
6802	2300	THU	364
8075	0400	SAT	658
8418	2300	MON	258
8420	2300	TUE	436
9072	0000	TUE	660
9074	0000	TUE	662
9074	0200	TUE	705
9074	1200	WED	120
9074	1200	THU	262

**Spanish-Female Announcer  
AM Mode 5F Groups**

FREQUENCY	SCHEDULE	DAY	ADDRESSEE(S)
4661	0200	WED	869
4785	1100	WED	186
4787	1200	TUE	—
4787	1200	WED	—
7343	1200	TUE	621
7888	1030	MON	—
8047	1300	SAT	926
8874	0700	WED	753
9345	1230	TUE	621
13729	2130	SUN	—



preliminary assignments have been carried out. I would suspect that only then would the agent be activated to provide reporting on a regular basis. Bear in mind that it stands to reason that all the time he is carrying on his clandestine activities, it would seem imperative he must also maintain a normal profile with some type of work plus engaging in other appropriate daily activities that "fit in" thus assisting in building and maintaining his cover.

A possible reason for so many one-way voice broadcasts is that perhaps it's just simply not a good idea from a security standpoint for these agents to possess transmitting equipment. The solution, therefore, is to provide a common type radio, one with SW bands, which would certainly not arouse any suspicion when viewed by agent acquaintances.

When not permitted to use radio for agent to headquarters traffic, a possible reply channel could be via mail where an innocent appearing text serves as a means of conveying secret writing or a message in an open code system.

Lastly, let's consider the cryptographic system to be employed. It goes without saying that not only do we want a good secure

system, but one which is also not too complex to use. In going through the multitude of press accounts regarding arrested spies, there are so many references to the use of the one-time pad system. Doesn't it make sense that any spy outfit worth its salt is not going to use some rinky-dinky system?

During past years I have seen frequent boo-boos occurring during the transmission of "Spy Numbers" messages and I want to mention several that were particularly amusing or unusual.

While searching the 13 MHz band one evening I came upon a very weird sounding voice transmission on 13640.6 kHz. After listening to it for several minutes, I finally realized it was a Spanish female announcing 5-figure groups, but the reason it sounded so strange was because the tape was being played backwards. The entire message was transmitted this way and then repeated the same way. Apparently the operational personnel were not monitoring their own signal and consequently they did not catch the error.

Another messed up transmission took place on 13390 kHz with cut number (5-character groups) traffic being sent in CW which looked like the format of Cuban For-

eign Ministry traffic. Right underneath that station another CW carrier was feeding through with another cut number (4-character groups) message.

On 13429 kHz, a Spanish female was sending 5-figure groups, but the audio was very distorted. The signal abruptly shifted up approximately 20 kHz, and then shifted back down to 13429, back up to 13448 again, and back down to 13428, and ultimately back up to 13448 again. The voice transmission terminated but it sounded as if the loose end of a tape was flopping. This finally stopped and they gave up for that night. There was a high hum level on the carrier which seems to be a very common characteristic of broadcasts suspected of coming out of Cuba.

Then there was the time a Spanish speaking female was transmitting on AM with a 5-figure groups message and shortly after the "Final Final" phrase the carrier came back on the air carrying the musical theme introduction for Radio Havana. After a few minutes of this music, a Spanish male identified the station as "Radio Havana Cuba" and a Shortwave Broadcast program commenced. This program was only broadcast for a very few moments when the carrier

was abruptly taken off the air.

I have already described one of the double-header intercepts I made but I also had a triple-header. I had tuned in a CW station on 16446.8 kHz which was sending a callup indicating a message was forthcoming. After sending the text twice, another message was sent and it was also repeated. During the repeat of the second message, I became aware of another CW transmission underneath the first, and it was also in 5-figure groups. In tuning off to the side of the second signal by just a hair, I detected yet another signal under the other two, this one was a voice transmission with a Spanish female giving a 5-figure groups message. The CW carriers went off the air as each completed the traffic and finally the voice signal went off the air. I wonder if this triple transmission was the result of some kind of coupling between control lines carrying the signals from their source to the transmitter building?

### Schedules Of Numbers Transmissions

The charts which follow have been compiled from intercepts of the two types of Spanish language "Numbers" transmissions. These schedules represent only a small fraction of the total of such broadcasts. All times in this series are UTC.

In addition to material which I gathered, data from two other monitors was incorporated into the listings. I want to thank these individuals for their efforts, David Bush of Ohio and a person who wished to remain anonymous.

### 4F Groups

The first type to be looked at is the SS/YL 4F broadcast. Although the mode was initially thought to be AM, many of the 4F schedules are actually reduced carrier USB, broadcast on 2 frequencies simultaneously.

The callup includes a trinome (probably an addressee indicator) which is repeated 3 times followed by digits 1-0 and the entire sequence is repeated over and over for about 8-10 minutes. Ten tones are then sent followed by the group count (usually repeated twice) and then into the text. At the end of the message the group count is given again and the message is repeated. At the completion of the repeat "FIN" is sent and the station goes off the air. Sometimes the "FIN" does not appear.

EXAMPLE: 662 662 662 1234567890  
GRUPO 56 GRUPO 56  
(TEXT IN 4F GROUPS)  
REPITO GRUPO 56  
(TEXT REPEATED)  
FIN

Some of these transmissions are reportedly coming from a Virginia location, a US Army installation which also is supposed to house the transmitters for the US State Department.

## Spanish-Male Announcer AM Mode 5F Groups

FREQUENCY	SCHEDULE	DAY	ADDRESSEE(S)
4029	0600	WED	910
4443	0330	TUE	—
4786	0700	WED	—
4786	1100	WED	—
5082	1100	FRI	—
5772	1000	SUN	—
6768	0700	WED	—
6778	0300	SAT	—
6778	0530	TUE	—
6785	0400	FRI	328
6804	0430	TUE	594
6825	0600	SUN	—
6882	1100	FRI	—
6882	0630	TUE	815
6892	0500	SAT	—
7829	1300	TUE	990
8047	1300	MON	980, 807
8057	0100	WED	—
8057	0530	SAT	845
8057	0700	TUE	684
8057	1200	MON	826, 876, 997
8112	0200	TUE	—
8112	0200	SUN	—
8112	0330	SAT	822
8112	0500	SAT	—
8112	1400	MON	—
8230	0230	MON	162
8569	0430	TUE	—
8873	1015(?)	THU	—
8875	1200	THU	997
8956	0500	SAT	328
9030	1230	FRI	179
9063	1330	TUE	990
9083	1100	FRI	693, 698
9112	1030	TUE	790
9124	0200	THU	—
9124	0600	TUE	—
9124	2200	SAT	322
9245	1230	MON	876
10244	2100	SAT	—
12231	1900	MON	548
12236	1800	THU	—
12236	2000	SAT	—
12236	2100	WED	866
12236	2200	TUE	975
13378	1830	THU	593
13412	1400	SAT	870
13740	1600	THU	472
14300	1900	WED	—
18236	2000	WED	—

### 5F Groups

The airwaves are full of this next type which has both SS/OM and SS/YL announcers sending 5F groups. The normal callup consists of the Spanish word for Attention followed by a trinome (probably an addressee indicator) and then the group count. This sequence is repeated for several minutes and then into the text. At the end of the message, FINAL FINAL is sent indicating the message has been completed. The message is usually repeated on a subse-

quent schedule on a different frequency.

EXAMPLE: ATENCION 123 56  
(TEXT IN 5F GROUPS)  
FINAL FINAL

The 5F transmissions are reportedly from a location near Havana, Cuba but there is also some evidence that certain of these broadcasts are from other locations.

Next month Part 2 of "Secrets of Short-wave Espionage" will cover transmissions and schedules in languages other than Spanish.

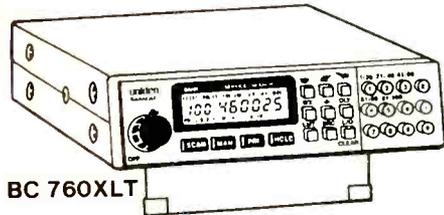


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BC 760XLT

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List price \$349.95/CE price \$159.95/CLOSEOUT  
**9-Band, 16 Channel • Priority • Scan Delay Search • Limit • Hold • Lockout • AC/DC**  
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Uniden has authorized CEI to closeout the famous Bearcat 100XL to make room for new models. This scanner has a full 16 channels with frequency coverage that includes all public service bands. Wow... what a scanner! Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA Ni-cad batteries and flexible antenna. Since this is a special closeout price on our last 200 pieces, you must order your Bearcat today to take advantage of this excellent scanner opportunity.

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**12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout**  
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List price \$499.95/CE price \$259.95/SPECIAL  
**12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC**  
Bands: 29-54, 118-174, 406-512, 806-912 MHz.  
The Uniden 800XL T receives 40 channels in two banks. Scans 15 channels per second. Size 9 1/4" x 4 1/2" x 1 1/2". If you do not need the 800 MHz. band, a similar model called the BC 210XLT-SA is available for \$196.95.

## Bearcat® 145XL-SA

List price \$189.95/CE price \$98.95/SPECIAL  
**10-Band, 16 Channel • No-crystal scanner Priority control • Weather search • AC/DC**  
Bands: 29-54, 136-174, 406-512 MHz.  
The Bearcat 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions.

## Bearcat® 175XL-SA

List price \$279.95/CE price \$156.95/SPECIAL  
**11-Band, 16 Channel • Weather Search Priority control • Search/Scan • AC/DC**  
Bands: 29-54, 118-174, 406-512 MHz.  
The Bearcat 175XL has an automatic search feature to locate new frequencies. Priority, lock out, delay and scan speed are all included.

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**11-Band, 55 Channel • Handheld/Portable Search • Lockout • Priority • Bank Select Sidelit liquid crystal display • EAROM Memory Direct Channel Access Feature • Scan delay**  
Bands: 29-54, 118-136, 144-174, 406-420, 440-512 MHz.  
The new handheld Regency HX1500 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 55 channels at the same time including the AM aircraft band. The LCD display is even sidelit for night use. Includes belt clip, flexible antenna and earphone. Operates on 8 1.2 Volt rechargeable Ni-cad batteries (not included). Be sure to order batteries and battery charger from the accessory list in this ad.

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A major consumer magazine did a comparison study on cordless phones. The check points included clarity, efficiency and price. Uniden was rated best buy.

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XE700-SA Uniden Cordless Phone with speaker... \$114.95

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BY DR. ADRIAN M. PETERSON



Laughing Woman FM station, Male.

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# Radio Broadcasting In The Maldiv Islands

*“A DX'er Visits One of the Rarest  
Nations in Radioland”*

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The Maldives are a fascinating group of tropical islands way out in the Indian Ocean. They are almost unknown to the American tourist, though hordes of Europeans flock to these islands in charter aircraft to escape the harsh realities of the long northern winter. Here they swim in the limpid, clear waters and bask in the tropical sun, and return to their homeland with a suntan that is the envy of their less fortunate neighbors in the nations of Europe.

I well remember my first visit to the Maldiv Islands, some twelve years ago. At the time, I was on the air regularly with the DX program “Radio Monitors International” from Colombo, Sri Lanka, and I flew to Male the capital city island for a visit to the radio station. In those days, the Maldiv Islands Broadcasting Service was on the air throughout the broadcast day on several shortwave bands, and this exotic station was listed by American DX'ers as one of the world's ten most wanted stations.

My first breathtaking view of the exotic Maldiv Islands is still a vivid memory. As the plane came down out of the clear blue sky, I could see small tropical islands covered with lush green coconut plantations, the clean white coral sand surrounding each island, and the shallow green waters at the shoreline blending into the dark blue of the deep water.

The plane maneuvered near the capital city island, Male, so that we could all see it plainly, and such a strange, and yet fascinating, capital city I have never seen anywhere else in the world. Male is a city, and the city covers the entire small island. In those days, no building was higher than two stories, the straight streets were not paved, and the only cars there were owned by the government.

As I viewed this remarkable, clean little city for the first time, I picked out the antennas of the MIBS on the NW edge of the island. Nearby was the neat white two storied building housing the offices, studios, and transmitters. By this time, our plane was making the final approach for landing on the nearby island airport, and it looked for awhile as though we would be landing in the ocean. The long runway commences on the island of Hulule, and flirts dangerously close to the ocean. Only when the plane has touched down on the runway, can the passengers actually see it from the side windows of the plane.

These Maldiv Islands are situated some 400 miles slightly Southwest of Sri Lanka and about 300 miles from the nearest coast of India. This long chain of tropical islands stretches for more than 1,000 miles, and contains 2,000 coral atolls with a total land area of only 115 square miles. About 200 of these islands are occupied with a total population of 100,000 people. Most of the inhabitants are Moslem, though there are still a few animists in far distant atolls. Christianity is non-existent in the Maldiv Islands.



MIBS.

The capital city of these little-known islands, Male, covers the entire one square mile of Male island, with a population of 17,000. All islands are about 6 ft. above sea level and they fit the best descriptions of any beautiful tropical islands anywhere in the entire world.

The Maldivian people have a heritage dating back many hundreds of years. Their ancestors migrated from Sri Lanka, or Ceylon, as it was known earlier, from India and also from several Arabian and African countries. They speak a language akin to the Sinhalese of Sri Lanka, and they write in their own script which is derived from Arabic.

A short trip in a motor launch, and a long walk carrying my luggage brought me to the two-storied wooden building which was my usual accommodation in the Maldives. Next day, a constitutional walk around the capital city island before breakfast, and then my first visit to this exotic, isolated fascinating radio station.

Radio broadcasting in the Maldivian Islands began in 1960 from a location on the other side of the island. It was a small AM facility, and it was on the air for just a few hours daily. Loudspeakers were erected in the three public parks on the island, and citizens who did not own a radio could go out and listen to the programming. This is reminiscent of similar systems that were in operation in Germany and elsewhere prior to WW II.

The station that I was visiting was constructed a couple of years after the original temporary station, in 1962. This neat and functional two story building, guarded by army personnel, housed the studios, offices and transmitters of MIBS, the Maldivian Broadcasting Service. The first transmitter on the air from this location was a 5 kW AM unit tuned to 1507 kHz. The chief engineer at the time, Mr. Q. A. Wickremasinghe of Sri Lanka, constructed all of the first transmitters used by MIBS. He was one of the very few amateur radio operators that have ever been licensed in the Maldives.

Over a period of sixteen years, Wickremasinghe constructed six more transmitters, all for use in the shortwave bands. Each transmitter was labeled "Made in the Maldivian Islands" and each was fixed tuned. Throughout the broadcast day, the various shortwave transmitters operating in the tropical and international shortwave bands were switched into service according to propagational needs.

The power output on shortwave ranged from 7 kW to 30 kW and the fixed-tuned transmitters radiated in the 90, 60, 49, 41 and 31 meter bands. The broadcast day began in the morning at sunrise on AM, and two hours later, this home service was switched to 7225 kHz. Then, two hours later again, programming was switched to 6150 kHz, and then to 9538 kHz. In the afternoon, the broadcast service was switched back through the same channels to AM, again, for the local evening. Only one outlet was used for a commercial and external service and this operated on 4740 kHz, with an output power sometimes of 30

kW, but more frequently with only about 4 kW. It was this commercial service, on the air each evening, which was logged and reported from mainland Asia, and sometimes from as far away as New Zealand and USA.

Two studios with simple production equipment were used for the day long live programming. One studio was in regular usage throughout the day for the local service in Divehi, the national language, and the other was used in the evenings for the commercial and external service in which English was also used.

The antenna farm was erected on land which was actually reclaimed from the ocean, and on my first visit, schoolboys were playing football among the masts and stays. Each single-channel transmitter was connected to its own antenna, and the area contained a bevy of antenna structures. Some masts were erected on private property nearby, and the radiating wires were slung crisscross in many directions.

During my visit, I was fascinated to watch one of the office secretaries writing out script material in Divehi. Her writing was beautifully neat, and she had the page turned sideways, so that she was writing downhill, Chinese style. Each character, a consonant had a vowel above it, so that each line of writing appears to be in two lines.

### **DX'ing in the Maldives**

On many occasions while in the Maldives, I have scanned across the AM, FM and shortwave bands, to discover what can be heard. Among the best DX catches have been the Seychelles Islands and Diego Garcia on AM. The best ever though, was Radio Paradise, in the Caribbean with 50 kW on 1265 kHz. I was amazed one morning, near daylight, to hear this exotic station half a world away. The station staff at Radio Paradise on St. Kitts had difficulty though in be-

lieving my report, and a QSL was issued only after several reports and a couple of telegrams were sent.

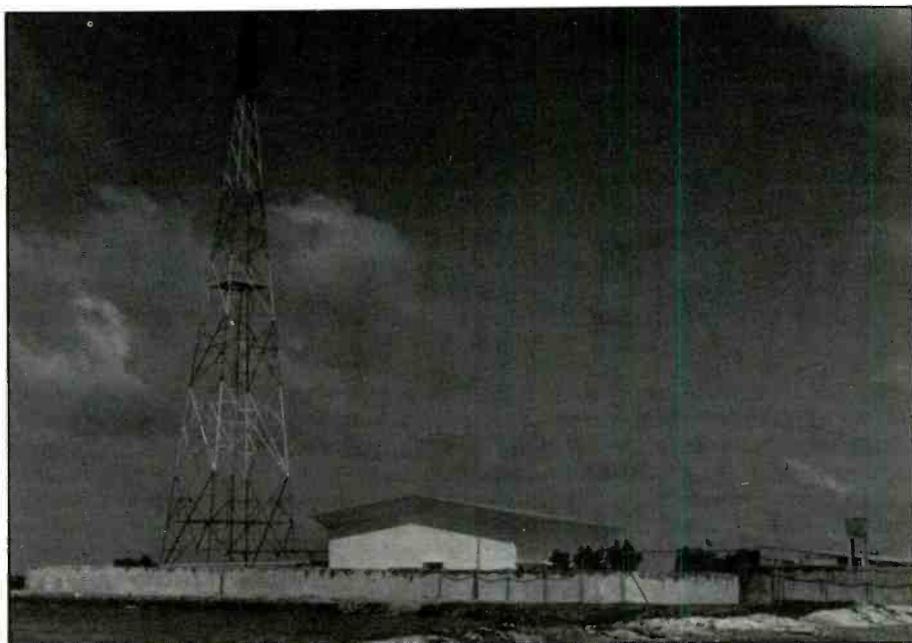
### **BFBS Gan**

Down south, 400 miles away by boat, was the British Air Force Base on the island of Gan Addu. For a period of four years, a BFBS radio station was on the air at this location, via twin AM and FM outlets. The FM outlet radiated 25 watts on 88 MHz and the AM outlet 250 watts on 1561 kHz. This station was quite hard to hear, in spite of its 250 watts, though I did log it on several occasions in Colombo and also in Male. This station was even harder to QSL, but, after several attempts, I did ultimately receive a prepared QSL card.

When the British Base on Gan was closed in 1977, five Racal communication transmitters were donated to MIBS in Male. These were all installed in the radio building; three, at 7½ kW for AM coverage, and two at 30 kW for shortwave coverage. Test transmissions were conducted on shortwave with a 30 kW unit, but, when feeder lines burned out, one of the 7½ kW units was substituted. After a few weeks, the project was abandoned.

A few years later, again in 1982 to be exact, Australian engineers installed two AM transmitters of 5 kW each, and also a new radiator system. The two SM transmitters emit a beautifully clean signal and are on the air on alternate days. This modern equipment now enables the station to give wider coverage on AM, than was achieved earlier with the higher powered shortwave units. On many occasions, particularly in a winter evening, I have heard Radio Maldives on 1458 kHz, at my home near Bombay, India. A remarkably good signal for a 5 kW transmitter 1,000 miles away.

The Australian engineers removed the



TV Maldives.

multitude of old antennas and erected a new AM radiator system. The two tall guyed masts provide a N-S coverage pattern so that all of the Maldivé Islands are covered, particularly at night. In addition, two tropical shortwave antennas were slung from the main masts, and it is intended that these will be used some time in the future for a revived shortwave service.

When the new AM transmitters were inaugurated, the shortwave service was abandoned, and programming was restricted to a few hours daily, morning, midday and evening.

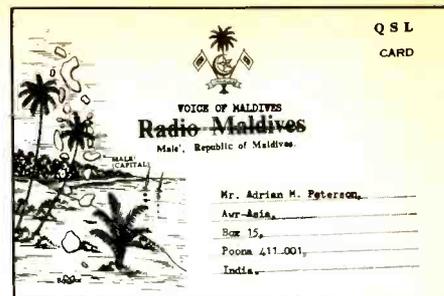
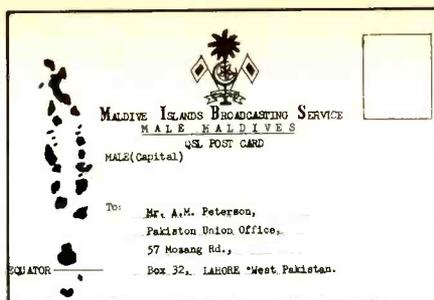
A new two story building on the southern edge of the island is under construction, rather close to where the very first station was located, and this new complex will house the studios and offices for Radio Maldives. Programming will be cabled to the present building, which will then house only the transmitters.

### TV Maldives

For the first time, in 1978, a TV station was erected in the Maldivé Islands. Japanese NEC equipment was installed in a new building, again on reclaimed land, on the western edge of Male Island. This station emits 10 kW video and 1 kW audio on channel 7. Programming consists of imported films, generally in Hindi from India, or in English, from USA and England. The station is on the air for a few hours daily each afternoon with schools broadcasts and each evening with entertainment. Every evening, news in Divehi is presented, and this includes local footage, with an emphasis on political events and school sports.

### The Laughing Woman FM Station

Back in the mid 1970's, the station engineer at MIBS planned on constructing an FM transmitter to give coverage for the tour-



ists on the hotel islands. That project was shelved, but in 1980, another venturing electronics engineer took up the challenge.

A license was granted to a private company in the Maldivé Islands, to broadcast a music service for coverage of the capital city island and nearby hotel islands. The station, known as MBC, the Music Broadcasting Centre, was operated by Maizan Electronics in Male. The owner of the station was Mr. Maizan Ahmed Manik, who was also the chief engineer at MIBS. This little FM station commenced broadcasting with 5 watts output on August 18, 1980, officially on 104 MHz. The station came on the air during the off times of MIBS and the local TV station; mid-morning, mid-afternoon, and late evening. The equipment at MBC consisted solely of various types of cassette players, and a very small transmitter, which I never did locate. The operators simply interrupted their radio and TV repair work when the music ceased, and either turned the cassette over or inserted another one. Very few announcements were broadcast from MBC, and these were all pre-recorded on cassette.

As I was saying farewell to this small and unique radio station, I asked the owner to play the recorded announcement 20 minutes later, so that I could tune in at the hotel and record it. True to his word, he played the identification tape at the appointed time. I was amazed to hear the identification signal from MBC Male. It was a laughing wo-

man, with a brief identification announcement in English, similar in style to what is heard from stations on the shortwave bands.

On my return to Poona in India, I recorded a series of identification tapes in our studio there, and sent them to MBC Male. These were used on air many times, up until the station was closed at government request last year.

### Shipwreck at the station

On my last nostalgic visit to the Maldives last year I discovered that the laughing woman FM station is now no more. The government owned Voice of the Maldives, as the station is now known, installed an FM transmitter, with 100 watts on 104.2 MHz. This station broadcasts under the slogan Radio Eke, Radio One, and the owner of the previous "laughing woman" FM station is the chief engineer.

On the way in to Male, during the two hour flight from Colombo, I killed 200 flies which were attracted to the sunlight and warmth at my window. I know, I counted them.

When the plane neared the capital city island, I was amazed to see a ship, apparently at anchor right against the sea wall at the station. A visit a few hours later, produced a fascinating set of information. A new cargo ship, constructed in Korea, was bought by a Japanese company, and registered in Singapore. On its maiden voyage to the Maldives, the ships steamed too close to the shore and became wedged on the coral reef. It was simply abandoned. Maybe the captain was also an ardent DX'er, and maybe he too wanted to see the exotic Maldivé Islands radio station!

During the two hour flight out from Male, I killed 200 cockroaches, which were forced out of the woodwork by the lower air pressure in the flight cabin. I know, I counted them. (Maybe Paul Harvey should tell them about Roach Prufe!)

In its day MIBS shortwave was an exotic and elusive DX catch. Today, the station is on the air only on FM and AM. Tomorrow? Perhaps, as the station director hopes, those tropical shortwave antennas which are already in place may yet be hooked up to the output of a shortwave transmitter. When that happens, then you too might be able to hear the exotic tuning signal from the distant radio station over there in the limpid blue waters of the Indian Ocean. It is the shrill call of a local island bird. **PC**

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By Bob Grove  
WA4PYQ

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## Passerby Helps Save State Trooper

It was the kind of newspaper story that grabbed your attention.

A state trooper approaches a car to question its occupants after they slammed into the wall of a building. One of the men in the car shoots the trooper, who is critically wounded but is able to keep the two men at bay. The trooper, who is about to pass out, gives a gun to a passerby who is able to keep it on the two men until the police arrive.

It was more than a story for Victor Guzman, who was driving by a service station on the Northwest Side of Chicago one Saturday night and saw the wounded trooper holding two guns on the two men.

### SCAN PUBLIC SERVICE AWARD

It all started when Illinois State Trooper Dennis Galle had pulled into the station to replace a spotlight on his patrol car. Another car drove into the station and hit the wall, and Galle went over to the car to investigate.

The car's passenger, Vincent Williams of Gary, Indiana, was arguing with the driver, another Gary man, and threatening him with a gun, according to an account of the

incident in the *Chicago Sun-Times*.

When Galle walked over to the car, Williams fired at the trooper. Galle was hit in the abdomen, just below his bulletproof vest.

The driver of the car wrestled the gun from Williams and handed it to Galle, who ordered both men out of the car and onto the ground, according to Jill Allen, Illinois State Police spokeswoman.

That's when Guzman drove by with his 17-year old daughter and 14-year old son. They were returning home after seeing the movie "RoboCop."

Guzman saw the wounded trooper and knew something was wrong. "All I knew was he was in trouble, and somebody had to do something," he told the *Sun-Times*.

Guzman told his two children to stay in the car and went to the aid of the wounded Galle. "He glanced at me, saw I was a friendly person, and gave me a revolver," Guzman said.

Galle kept his own service gun, and told Guzman not to let the two men get away.

According to the *Sun-Times*, Galle was barely able to make it back to his patrol car and radio for help before he passed out.

Guzman stood with his foot on the neck of one suspect, hitting him with the revolver and making sure it was loaded because the man claimed to have another gun.

"I just knew that (the trooper) was in trouble, and he was a very brave man," Guzman said. "My thoughts were of him as I was holding the gun."

A service station cashier called police, who reportedly arrived quickly, although Guzman said that it "seemed forever" as he held the suspects. Police cautiously approached Guzman, asked if he was an officer, and then took the gun from his hand.

Galle was taken to the hospital, and was reported to be in critical but stable condition after surgery. Williams was charged with attempted murder, and the driver of the car was held pending questioning.

"We believe he is in large measure responsible for saving Trooper Galle's life," Margolis said.

"In my opinion, the real hero was the trooper," Guzman later said. "He had every reason to shoot them, and he didn't do that, and I had so much admiration for him that I could do no less than not let them get away."

Guzman did something that many people would not have done, and he just may have saved a life in the process. For his unselfish actions, he will receive the SCAN Public Service Award, which consists of a special commendation plaque and a cash prize. Congratulations to you, Mr. Guzman.

### Best Appearing

Bradford Smith of Carpinteria, California, writes that he is a "firm believer" in Realistic scanners. He is also, as this photo proves, a believer in a tidy listening post.

Bradford purchased his first scanner three years ago when he started doing freelance photography for the local paper. Since that time, scanning has turned into a full-fledged hobby.

His Realistic Pro-2004 scanner is primarily used as a UHF military aircraft radio communications receiver, and is connected to a Diamond D-130 discone antenna. A Pro-2020 is used with an Antenna Specialists ASP-7A aerial mounted in the attic. The



### SCAN PHOTO CONTEST WINNERS

Pro-12 is a four-channel VHF crystal receiver, and the Comp-100 uses binary code for programming. He also has a Pro-30 handheld programmable scanner.

Oh, by the way, Bradford happens to work for Radio Shack, but he says that isn't why he prefers the Realistic equipment. He says he likes this brand of scanner because he's never had a problem with any of them.

### Best Equipped

Frank Abbato of Peach Bottom, Pennsylvania, writes that he has been a scanner enthusiast for six years.

His complete radio shack includes a Bearcat 20/20 scanner, Yaesu FRG-7700 receiver, Hallicrafters SX-100 with digital readout, Radio Shack DX-400 and DX-302 receivers, and Radio Shack TRC 431 citizens band radio.

Frank also has a Commodore 64 computer with computer patch and SWL text for RTTY and CW reception. A Scott stereo

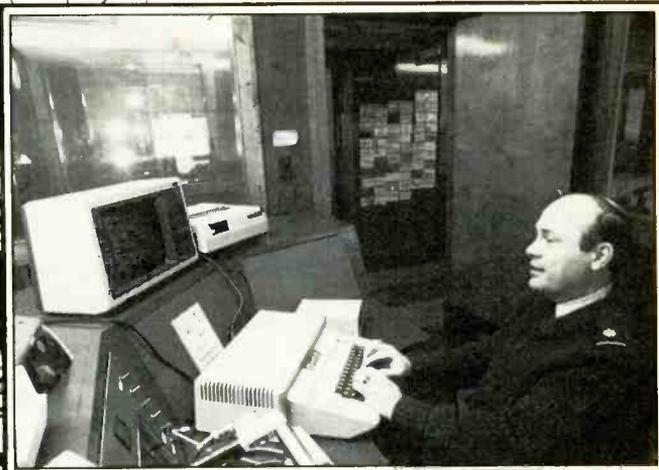


and Ampex reel-to-reel tape recorder round out the equipment list.

An avid POP'COMM reader, Frank writes that he enjoys seeing the SCAN articles in the magazine every month.

Winners in the Photo Contest this month receive the BMI "Nitelogger" tape recorder activator. Plugged into a cassette recorder and a scanner, it gives a complete record of all communications with no "dead time" on the tape. If you would like to enter the contest, just send a sharp black/white print to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558.

Packet radio is a recent addition to the MARS networks. (U.S. Army photo)



# ARMED FORCES DAY 1988

*A Chance For Special QSL's!*

The annual Armed Forces Day Communications Test is set for Saturday 21 May 1988 and marks the 39th anniversary of this event which emphasizes a continuing climate of mutual assistance and warm esteem between the military and amateur radio communities. The traditional military-to-amateur cross band operation and broadcast of the Secretary of Defense message are the featured highlights and include operations in CW, SSB, RTTY and Packet radio.

These tests give both amateur radio operators and short wave listeners (SWL) the opportunity to demonstrate their individual technical skills. Special commemorative acknowledgement (QSL) cards will be awarded to those amateur radio operators achieving a verified two-way radio contact with any of the participating military radio stations. Interception of these contacts by SWL's are not acknowledged by QSL cards, however, anyone who receives and accurately copies

## MILITARY STATIONS PARTICIPATING IN CROSS BAND OPERATIONS

**AAE**  
HF/MARS Radio Facility  
Fort Sam Houston, TX

**AAG**  
Army HF/MARS Radio Facility  
Presidio of San Francisco, CA

**AIR**  
2045th Communications Group  
Andrews Air Force Base  
Washington, DC

**NAM**  
Naval Communications Area  
Master Station LANT  
Norfolk, VA

**NAV**  
HQ Navy-Marine Corps  
MARS Radio Station  
Cheltenham, MD

**NPG**  
Naval Communication Station  
Stockton, CA

**NPL**  
Naval Communication Station  
San Diego, CA

**NMH**  
Coast Guard Radio Station  
Alexandria, VA

**NMN**  
Coast Guard Communication Station  
Portsmouth, VA

**NZJ**  
Marine Corps Air Station  
El Toro, CA

**WAR**  
HQ Army MARS Radio Station  
Fort Meade, MD

FREQ (kHz)	EMISSION	STATION	FREQ (kHz)	EMISSION	STATION
4001.5	LSB	NPG	13927.5	RTTY	NPG
4010	CW	NPG	13975.5	CW	NPG
4015	CW	NMH	13986.5	RTTY	AIR
4018.5	LSB	WAR	13992.5	RTTY/CW	WAR
4025	LSB	AIR	13994.5	USB	AAE
4028.5	LSB	AAE	13997.5	CW	AIR
4033.5	LSB	AAG	14375	USB	NPG
6970	CW	NPG	14385	USB	NPL
6988	RTTY/CW	AAG	14389.5	USB	NAV
6995.5	CW	AIR	14400	USB/RTTY/CW	NAM
6997.5	CW	WAR	14403.5	USB	WAR
7301.5	LSB	NPG	14408	USB	AIR
7315	LSB	AIR	14440	RTTY	NMH
7346.5	LSB	NMH	14480	USB	NZJ
7358.5	LSB	AAE	14488.5	USB	AAG
7365	CW	NPG	14665	RTTY/CW	AAE
7372.5	RTTY	NAV	20937.5	USB	NMH
7375	RTTY	NZJ	20992.5	PACKET	AAE
7382.5	RTTY	NPL	20994.5	USB	WAR
7393	USB/RTTY/CW	NMN	20998.5	CW	NPG
10259.5	CW	NPG	21460	USB	NPG
			27992.5	USB	AAE

the Armed Forces Day CW and/or RTTY message from the Secretary of Defense can qualify to receive a special commemorative certificate from the Secretary.

**CROSS BAND CONTACTS** - The military-to-amateur cross band operations will be conducted from 21/1300 UTC (Universal Time) to 22/0245 UTC May 1988.

Military stations will transmit on the listed frequencies and announce the specific amateur band frequency being monitored.

**RECEIVING TEST** - The CW and the RTTY broadcast will be special Armed Forces Day messages from the Secretary of Defense to any amateur radio operator or SWL desiring to participate. A 10-minute

tuning call will precede each transmission. The CW Broadcast will be transmitted at 25 WPM beginning at 22/0300 UTC May 1988. The RTTY broadcast will begin at 22/0345 UTC May 1988 and transmitted 60 WPM using 170 HZ shift. Both the CW and RTTY broadcast will be transmitted from the stations on the listed frequencies.

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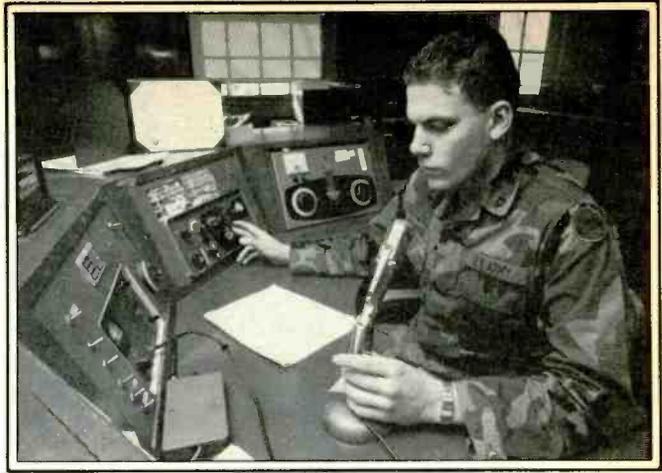
Name (Please Print) Age

Address

City/State/Zip 76-038



Colonel Thompson sends some CW over an Army MARS circuit from the station at Ft. Monmouth, NJ. (U.S. Army photo)



The Army MARS station at Ft. Monmouth uses the call signs K2USA and K2OUSA when operating within the ham bands. (U.S. Army photo)

**SUBMISSION OF TEST ENTRIES** - Transcriptions of the CW and/or RTTY receiving tests should be submitted "as received." No attempt should be made to correct possible transmission errors. The time, frequency and call sign of the military station copied as well as the name, call sign and address of the individual submitting the entry must be indicated on the page containing the test message. Entries must be postmarked no later than 28 May 1988 and submitted to the respective military commands. **PC**

**TRANSMITTING STATION**

**FREQUENCY (kHz)**

AAE HF/MARS RADIO FACILITY FORT SAM HOUSTON, TX	4018.5, 6988, 9990
AAG HF/MARS RADIO FACILITY PRESIDIO OF SAN FRANCISCO, CA	4021.5, 7309.5, 13994.5
AIR 2045th COMMUNICATIONS GROUP ANDREWS AIR FORCE BASE WASHINGTON, DC	6995.5, 13997.5
NAM NAVAL COMMUNICATION AREA MASTER STATION LANT NORFOLK, VA	4005, 7393, 14400
NAV HQ NAVY-MARINE CORPS MARS RADIO STATION CHELTENHAM, MD	7372.5, 14389.5
NPG NAVAL COMMUNICATION STATION STOCKTON, CA	4010, 7365, 13975.5
WAR HQ ARMY MARS RADIO STATION FORT MEADE, MD	4028.5, 6997.5, 14403.5

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Gain: 14.5 DB  
Front to Back Ratio:  
40 DB True  
Side Rejection:  
40-45 DB True  
Back Rejection:  
40 DB True  
Weight: 28 Pounds  
Length: 8 Feet  
SWR: 1:1  
Horz. to Vert. Separation:  
20-25 DB  
Wind Survival: 100 MPH  
Power Multiplication: 40X  
Audio Gain: 18 DB  
Wind Load: 2.8

**AMATEUR RADIO  
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**Specifications**  
Gain: Horizontal-5.25 DB  
Vertical - 4.75 DB  
Multiplication Factors:  
Horizontal - 17 Times  
Vertical - 15 Times  
Horz. to Vert. Separation:  
20-25 DB  
Power Rating: 2000 CW,  
4000 PEP  
Height: 11 Feet  
Weight: 10 Lbs.  
Materials: Anodized  
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Aluminum Tubing  
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**STATION COPIED**

AIR

AAE, AAG, WAR

NAM, NAV, NPG

**ADDRESS**

Armed Forces Day Test  
2045CG/DOJM  
Andrews AFB  
Washington, DC 20331-6345

Armed Forces Day Test  
Commander, USAISC  
ATTN: AS-OPS-OA  
Fort Huachuca, AZ 85613-5000

Armed Forces Day Test  
Naval Communication Unit  
Washington, DC 20397-5161

## Equipment Reports:

# Two Radio Shack Handheld Scanners

**E**xternally, they look quite similar, even their model numbers aren't all that different—PRO-31A and PRO-32A. They do, however, differ from one another in several major aspects, not the least of which is a price differential of \$100 between the two handheld scanners.

The lower priced unit is the PRO-31A. Offered in the Radio Shack catalog at just under \$200, the PRO-31A covers the frequency bands 30 to 54 MHz, 138 to 174 MHz, and 380 to 512 MHz. That means a total of more than 22,000 frequencies that can be programmed into the scanner via the front panel keyboard. Any ten of these you like can be programmed in and scanned, or you can scan less than all ten, by using the lockout feature.

The unit operates from six AA-size batteries (you can use rechargeable ones if you like), from a vehicle's cigarette lighter (with optional adapter), or from an optional AC adapter. The circuitry includes a crystal filter for the 1st IF (at 10.7 MHz) and also a ceramic filter for the 2nd IF (455 kHz). These features add sharpness to the set's selectivity.

Information is presented to the user via multi-purpose LCD readout that displays the channel status and reads out the frequencies being scanned, monitored or programmed. Other features include a keyboard-lock button, a circuit that saves the frequency memory for an hour when the batteries are removed, a display light button, an earphone jack, and a removable rubberized whip antenna (BNC type connector). The PRO-31A weighs about 1 lb., and measures about 7½" high, 3" wide, and 3" deep.

Sensitivity (at 20 dB S/N at 3 kHz deviation) on the VHF low band is rated at 0.6 uv; on the VHF high and UHF bands at 1 uv. Selectivity is ± 9 kHz at -6dB; ± 15 kHz at -50 dB. IF rejection is 50 dB (at 154 MHz).

While the PRO-31A has a black case with silver trim, the PRO-32A has a brushed silver case with black trim. At a shade under \$300, the PRO-32A also costs \$100 more than the PRO-31A. The higher price reflects the additional features included in the unit.

For starters, the PRO-32A not only has all of the PRO-31A's frequency coverage, it adds the 108 to 136 MHz VHF aero band and gives the scanner a potential of receiving many hundreds of additional channels. More importantly, the PRO-32A has the ability to memorize and scan 200 channels



The Radio Shack PRO-31A ten channel scanner.

in ten selectable "banks." Furthermore, it adds a search/scan feature that lets the user look for undiscovered active frequencies. There's also a priority channel feature, as well as selectable fast/slow (8/4 channels per second) scanning.

These are the major differences between the PRO-31A and PRO-32A, the other features, and physical/performance specs are either exactly or virtually identical. That's what makes it such an interesting comparison.

Let me point out that in the field, both units performed well, and were equally uncomplicated to use and program. They had an admirable receiving range, relatively few birdies, and offered uncomplicated programming and general operation. If a fault were to be selected, I'd say that the coverage of 50 to 54 MHz is wasted since this is a ham band where most of the communications are in SSB mode and therefore can not be copied on either unit. Coverage in both units for frequencies between 380 and 406 MHz is also of little value since no FM transmissions take place there.



Two hundred channels are included in the PRO-32A scanner.

The PRO-31A appears to be aimed at somewhat of a different type of user than the candidate for the PRO-32A. While the PRO-32A is a full-featured deluxe unit designed with the hobby user in mind, the PRO-31A seems to be primarily geared towards the non-hobby user who need monitor only several specific known frequencies. A friend of mine has a PRO-31A. He's a deputy sheriff who has the scanner programmed with the local police and fire frequencies of the several communities within his patrol sector. Since the two-way radio in his patrol car has only the county sheriff's frequencies, the PRO-31A provides him with closer contact to his responsibilities. This is a typical and excellent application of this type of scanner.

My feelings are that the \$100 more for the fancier PRO-32A is well worth the outlay for the additional coverage and features it contains, even for a person (such as my friend, the deputy sheriff) who does not have an immediate requirement for all of the extra goodies; you never know when additional channels, plus search/scan capabilities will come in handy.

See both of these scanners at any Radio Shack store, both are well worth your serious consideration.

PC

Reviewed by F. X. F., North Dakota

# Clear The Airwaves!

## Don't Touch That Dial! It's Time For The Romance of Radio!

BY ALICE BRANNIGAN

**T**he race to be the first broadcasting station in a community became a matter of prestige for many theatres, newspapers, and stores back in the early 1920's. And so it was in Quincy, IL when the city's two newspapers decided to get into radio. After all, there were plenty of receiving sets in town, and both newspapers were constantly running plans for building receivers for \$10.

Both the Quincy Herald and the Quincy Whig-Journal managed to put stations on the air in early May, 1922. The Herald broadcasts were via WCAW, the station owned by the Vesta Battery Service Station at 1033 Maine (a former livery stable.) This was station WCAW on 830 kHz, which managed to begin testing at 10 p.m. on May 3rd. The Quincy Herald announced that it was the first to have a station in Quincy.

However, the Whig-Journal newspaper had worked out a deal with the Illinois Battery and Electric Co., 316 Maine, to have Bob Compton quickly move his station, WTAD, down from Carthage, IL (where it ran 50 watts originally on 1305 kHz, then 1270 kHz) and hurriedly install it at the Illinois Battery site. The new station prepared for operation on 1440 kHz, but since the government hadn't approved the move from Carthage, the self-awarded callsign WJ (for Whig-Journal) was used. WJ was in full operation by May 14th after a brief talk by a local minister. The following day, music and basketball scores were sent out and the Whig-Journal claimed its station was the first in Quincy since WCAW was still only testing; even though it would be years before the government went through the process of approving WTAD's moving from Carthage to Quincy.

WCAW broadcast its first program on May 18th; music and baseball scores. WCAW seems to have faded away, but WTAD endured under several owners on 900, and 930 kHz (its present frequency, where it runs 5 kW.) Today, both newspapers have combined into one, and the great 1922 race is just a vague postscript to history. Thanks to E. Doran, KA9ROB, of Barry, IL for reminding us.

### CAP Radio

The Civil Air Patrol (CAP) communications network has evolved into a huge emergency system. Let's get a peek at the CAP



A little hard to see in this faded 1922 photo, but this was the Quincy, IL home on Maine Street of station WCAW; possibly the first broadcaster in town.

system more than thirty years ago in 1957. CAP Channels 1 through 5 were 2374, 2394, 4235, 4507.5, and 4585 kHz. Stations at Wing (state) level ran 400 watts, those at Group level used 150 watts, and Squadron stations ran 75 watts. Channel 6 was 5500 kHz but for 1 watt operation. Channel 7 was for 50 watts AM on frequency 148.14 MHz.

We have a photo of a typical CAP communications station of that era, being licensed as KOB786, and located in the area of Benson, AZ. At the far left we see a mil surplus BC-375E transmitter which ran 100 watts on either CW or AM 'phone. The equipment in the center is a Johnson Viking ham transmitter capable of running 130 watts 'phone and 180 watts on CW. At the far right is a Hammarlund Super-Pro SP-400 communications receiver (about 1946 vintage). Looks like everything is being powered from cords plugged into the goose-neck lamp.

### The Good News

Telling *The Good News Abroad* was the English version of the slogan *Transmitiendo Gratas Nuevas Alegres*. That's the slogan of station TGNA, and (not by coincidence) the meaning of the callsign of this religious shortwave and mediumwave station in Guatemala City, Guatemala.

A 1952 QSL card from TGNA, as received by Walt Schivo, KB6BKW, of Novato, CA displays the Quetzal bird, national emblem of Guatemala. At that time, TGNA was operating on 1180, 5952, 9665, 11850 kHz (15100 and 17870 kHz were authorized but inactive.) The transmitters ran 5 kW on each frequency (they used Eimac 4-1000 tubes) fed into three rotary stacked Quad type antennas.

Being a non-commercial station, the flip side of this TGNA QSL reminded listeners that the station was financed by "voluntary contributions of interested friends." Spanish language programming went out six hours a day, with a half hour of English every evening at 0300 UTC.

Present-day listeners will recognize this station as *Radio Cultural*, still an active missionary station on the mediumwave and shortwave bands.

### Who's On First

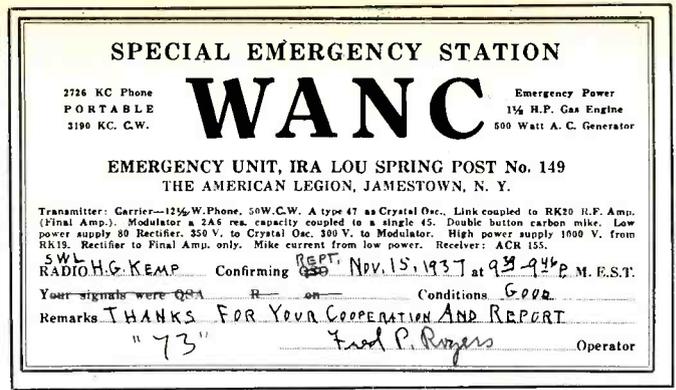
From time to time we mention stations that are contenders for being the first broadcasting station. This month, we'll look at Canadian station XWA, established in Montre-



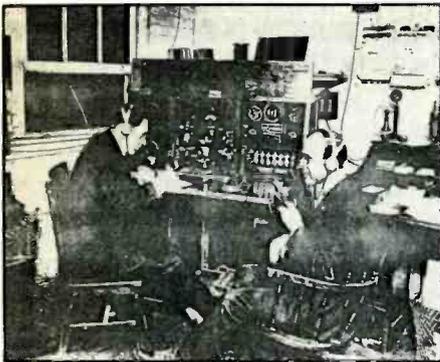
KOB786 was a CAP communications station of the 1950's. I don't vouch for the wisdom of powering such a station from a "spider" emerging from a desk lamp.



A 1952 QSL from TGNA, presently known as Radio Cultural.



A ham-type QSL from a two-way portable emergency communications station of the 1930's, WANC. Howard Kemp heard this flood station in 1937.



Some folks claim that Canadian Marconi station XWA in Montreal was the world's first broadcast station. Here's a view of this pioneer station, still on the air as CFCF (with some newer equipment).

al, Quebec in 1918 by Marconi in the Canada Cement Building, Phillips Square. This station was on 730 kHz, and by the early 1920's, was running 7.5 kW and had changed its callsign to CFCF.

CFCF presently runs 5 kW on 600 kHz. It was ahead of other early Canadian broadcasters such as CKAC, CJCA, CJOR and CKCK. Canada had fifty one broadcasters by 1924. The CBC was officially started in 1936, however, it actually harks back to the old Canadian National Railways (CNR) network that inaugurated its original station, CNRO, in Ottawa in 1924. In 1932, the government established the Canadian Broadcasting Commission, which was an embryonic stage of the Canadian Broadcasting Corporation. This organization took over the operation of those stations which had been originated by the CNR.

We appreciate this information from Eric Earl, VE6CRM, of Calgary, Alta.

### A Helping Hand

Howard Kemp, of Laconia, NH gives us a memory of WANC. This was a portable emergency station operated by Post 149 of the American Legion of Jamestown, NY. WANC was licensed on 2726 kHz 'phone (12.5 watts), as well as 3190 kHz CW (50

watts). Howard's QSL is a ham-type card which goes into a complete description of the transmitter (RK-20 final amp.) and lists the receiver as an ACR-155. The station operated from a 1.5 h.p. gasoline engine running a 500 watt AC generator.

Howard's QSL is from 1937; this station was licensed into the late 1940's. During the 1930's and 1940's there were a myriad of emergency two-way stations licensed on 2726 and 3190 kHz. These were usually intended to coordinate relief efforts relating to storms and floods, as well as public utility service interruptions. Although many of these stations would verify reception reports upon receipt of a prepared reply card, WANC's QSL is the only one we have yet seen that was printed up by the station itself. They must have received many reports from ute DX'ers to warrant such an approach.

### Battle Cry

In the months that I've been penning this section, I've gotten some great stuff in the mail, including several complete collections of old QSL cards from persons who said that they wanted to be certain that their valuable pasteboards would always have a good home. A number of wonderful old radio books, directories, and magazines have also been received and placed in our reference

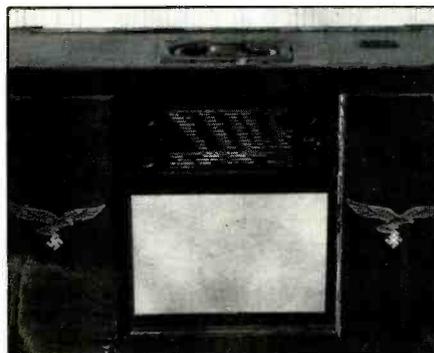
archives. All such items are always welcomed. This month, however, marks a first for us. A reader (who asks that I not mention his name) from Nebraska sent in a WWII German military radio receiver!

The set is housed in a khaki wooden carrying case with a metal suitcase type handle. Two spring-loaded hinged doors on one side of the case pop open at the touch of a button and reveal the control panel. With the doors opened, army emblems (eagle and swastika) are located on the doors.

The other side of the case is also hinged and opens to reveal the chassis. There is a large army eagle/swastika emblem on the other side of the case.

The receiver, which is marked as a Siemens K32 GWB type, is intended for broadcast station reception, and designed for line current and battery operation. The three tuning ranges are 150 to 375 MHz, 545 to 1500 kHz, and 6 to 15 kHz. The circuit was designed around six tubes (which weren't in the set.) While I doubt that it would be in working condition even if it had tubes, cosmetically it looks quite good. It weighs in at 15.5 lbs. (minus the tubes and batteries.) It's 12.5" high, 18" wide, 7.5" deep.

As with many European receivers, the tuning indicator shows the names of numerous cities such as Berlin, Oslo, Linz, Riga, Sofia, Hamburg, Memel, etc. Several pho-



The WWII Siemens receiver shown with its two spring-loaded doors open revealing the control panel above the speaker grille.



A closer look at the Siemens receiver's tuning indicator, showing city names within the realm of Axis control. Anybody remember Danzig and Memel?



Would you look at this absolutely bizarre TV set from the early 1950's? Even Uncle Miltie wouldn't have been funny if you had to watch him on this little monstrosity.

tos of this receiver will give you a chance to see this most unusual war relic.

Writing this section of POP'COMM never ceases to be an interesting experience!

### TV or Not TV

While we're looking at novel electronic hardware, we have a photo of a curious old TV receiver of American manufacture. It's none other than the custom built Lewis Uni-Matic, once offered by the Lewis Tel-Rad Distributing Corp., Hollywood, CA. The "distinctive" cabinet design is courtesy of Mario Design Studios. Our photo shows the Bel-Aire model.

The tuner, channel switch, and audio sections are in the pedestal portion of the receiver. Sitting atop the pedestal base is a

planter, and that supports the small viewing screen and sound/picture controls. This has got to be one of the most grotesque looking TV set ever to come out of the early 1950's. It's so ugly that it's actually exquisite. Wonder if anybody ever bought one.

### G'day, Mate!

Don't suppose many DX'ers get too many chances to toss an eyeball on a mediumwave QSL from Australia. Here's our chance, thanks to Dr. Adrian M. Peterson, KA9YPQ, of Marion, IN. This is a QSL from broadcaster 5RM, owned by the River Murray Broadcasters, Ltd., located at Renmark, South Australia.

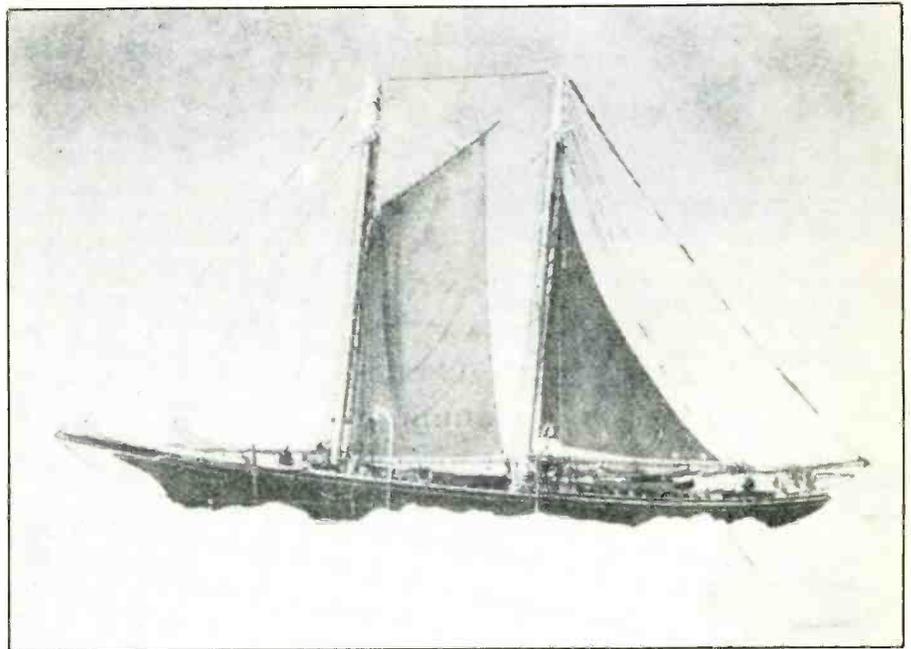
The photo on the QSL shows the transmitter building in the 1940's. At one time the station operated on 850 kHz with 1 kW, but by the time this QSL was issued in the 1940's, it was running 2 kW on 810 kHz and

was relaying the programming of 5DN in Adelaide (same owner).

Station 5RM is still licensed, operating on 801 kHz with 2 kW from Berri—not far from Renmark, its earlier site. Presently, it relays some of the programs of station 5KA in Adelaide.

### Calling Paul J. Barron!

In our ramblings last November, we mentioned hearing from reader Paul J. Barron of Fort Worth, TX. Paul had sent us some historical information on station WGAY in Silver Spring, MD and its two founders Joseph L. Brechner and John Kluge. We just recently received an extremely pleasant letter from WGAY's Mr. Brechner who told us that he is still in broadcasting and owns two TV stations, and a radio station. Also, he enjoys reading our scribbings. Furthermore, he'd very much like to get in touch with Paul



The picturesque schooner Morrissey under sail in Arctic waters.

<b>5 R M</b>	<b>RIVER MURRAY BROADCASTERS LTD.</b> Registered Office: 29 Rundle Street, Adelaide, South Australia	<b>POWER</b> 2,000 Watts in Aerial 3,000 Watts Final stage
		<b>Frequency</b> 810 850 Kilo- cycles 353 Metres
<p>STUDIO AND PLANT: "MURRAY HEIGHTS" Between Berri, Renmark, Barmera, Waikerie IN THE HEART OF THE FERTILE MURRAY VALLEY</p> <p>Many thanks for your report of _____ on our transmission. We will be pleased to hear further regarding comparative strength of stations received in your locality.</p> <p style="text-align: right;">RIVER MURRAY BROADCASTERS LTD.</p> <p>REMARKS:</p>		

Not too many stateside DX'ers have latched on to a mediumwave QSL from Australia. This card from station 5RM gives you a hint of what you're missing.

	<b>W 10 XDA</b>
<p>ABOARD THE SCHOONER MORRISSEY ON THE 1936 BARTLETT EXPEDITION TO NORTHEAST GREENLAND</p> <p>W2HCE I am very pleased to acknowledge our contacts of JULY AND SEPT 1936 your report FOR THE QSL'S K7 Our position was SOUTH OF GREENLAND</p> <p style="text-align: right;">Transmitter 100 watt Radiophone Receiver Hammerlund Crystal Pro. 73 Clifton Foss W20J Operator</p>	

The year 1936 saw QSL's from W10DXA, aboard a schooner in the Arctic, giving out QSL's to hams and SWL's.



The radio shack aboard the *Morrissey* in 1933. At the left is Bob Moe, the "sparks." The chap at the right is Lew Winner, a journalist.



Bob Moe (left) presents a Greenland resident with a rare treat, music from New York via shortwave. Cab Calloway always brought joy.

J. Barron, who sent in the WGAY historical information. Unfortunately, I can't locate that information handily, so Paul, if you're reading this, please get in contact with Mr. Joseph L. Brechner, Brechner Management Company, P.O. Box 531103, Orlando, FL 32853-1103.

### DX'pedition

The schooner *Effie M. Morrissey* made a number of highly publicized cruises to the Arctic areas under the command of R.A. (Bob) Bartlett. This was a picturesque 100-foot vessel that ventured into the Davis Straits and Baffin Bay, touching Greenland. For radio fans, the best thing about these cruises related to the fact that they provided 1930's radio fans with QSL's.

The ship had the callsign VOQH for operation on 6425, 8655, 12862, 17310, 23100, and 27100 kHz. On the ham bands, the ship used the callsign W10XDA as it op-

erated on 7500 and 14128 kHz with 100 watts. The main transmitter consisted of a pair of push-pull 204A tubes. Power came from a bank of 110 volt batteries that turned a generator and fed a step-up transformer to supply 3,000 volts to the tubes. The ship's antenna was a 75-ft. Zepp. Receiving honors belonged to a Hammarlund Crystal Pro.

The operator ("sparks") on the early cruises was Bob Moe, W2UN. Later cruises

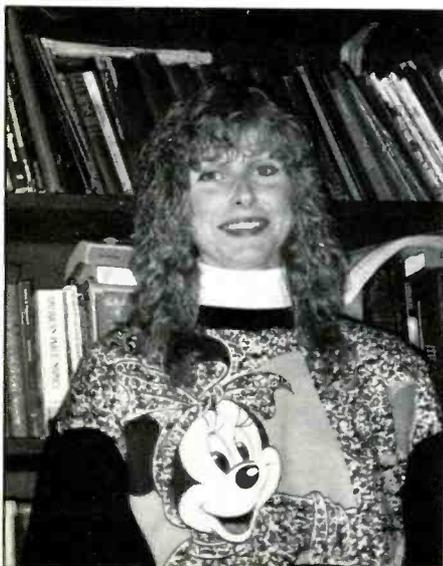
carried Cliff Foss, W2OJ as radio operator. Both operators were very earnest in sending out QSL's for all ham and SWL reports regarding the considerable amount of communications activity from VOQH/W10XDA.

Some of the most exciting comms were while the station was in contact with W8XK, the shortwave relay station of broadcaster KDKA in Pittsburgh, PA.

We were fortunate in being able to get a look at a genuine W10XDA QSL from the 1936 expedition that went to northeastern Greenland. Thanks to Bill Orr, W6SAI, for furnishing us with this great QSL which confirms several ham contacts he (as W2HCE) had with the *Morrissey* in 1936. From my own files, we have several photos of the 1933 cruise.

The *Morrissey*, built in 1894, was eventually renamed the *Ernestina* and is presently under restoration at a museum in New Bedford, MA.

Hope you sign on for another cruise into radio's (almost) forgotten past. We sail again next month, same time, same magazine. In the meantime, we look forward to receiving your comments, clippings, old QSL's and photos (or copies thereof), and other material relating to radio the way it was.



Mickey Mouse and I posing in front of some of the many old radio books, directories, callbooks, and magazines sent in by our readers for reference here. All are very useful and appreciated.

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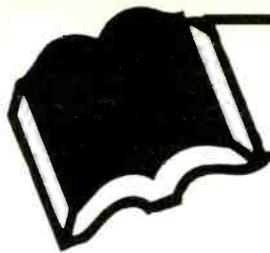
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# BOOKS YOU'LL LIKE!

BY R. L. SLATTERY

**E**merson, Sparton, Fada, Garod, Majestic, Arvin—the names sum up images of little table radios of the 1930's and 1940's that originally sold in the price range of \$19 to \$25. Their cabinets were made from many hues of plastic compounds such as phenolic, urea, casein; inside the cabinet was a five or six tube superhet that could operate from either AC or DC. The sets were flooded onto the market with the hopes that there would be a radio in every room of the home.

Indeed, there were millions of such radios in the hands of the public, especially after manufacturing giants such as G.E., Zenith, Crosley, Westinghouse, and RCA contributed their efforts to this mass merchandising effort.

That was decades ago, and today these colorful little radios are highly collectible and worth many times their original cost. That is, if you can find any that haven't already been snapped up by collectors. Collector Philip Collins has rounded up almost 130 different sets from his own shelves and those of other collectors, photographed them, and put them in a stunning 119-page book entitled *Radios, The Golden Age*. The photos are in beautiful color and are supplemented with additional photos of some antique tubes and other ephemera.

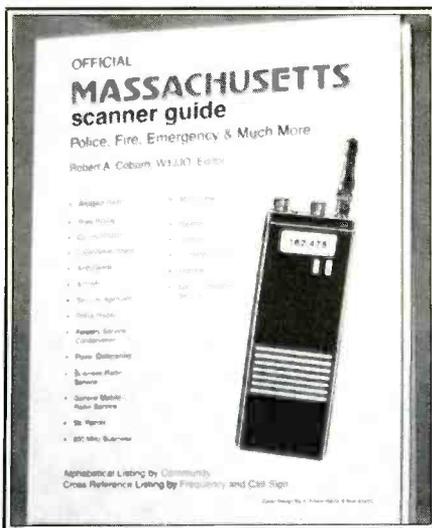


There is the briefest description of each set (make/model/date) in the rear of the book. In the front of the book there is only a page and a half of general commentary by the author, which is probably just as well, since a collector doesn't necessarily an author make. Collins' commentary is irrelevant and superficial. Further than that, he commits the unpardonable sin of defining AM radio as "Alternating Modulation." But it's the many glorious photos that are the meat of the book, and the only reason you'd want to own a copy. If you can ignore everything other than the photos, you'll find this to be quite a nice addition to your library.

The book is \$14.95, and it's published by Chronicle Books, San Francisco, CA. Seems to be carried by many bookstores.

## Mass Interest

*The Official Massachusetts Scanner Guide*, by Bob Coburn, is a gigantic (374 page) large 8½" by 11" format book containing more than 12,700 listings for scanner users in and around the Bay State.

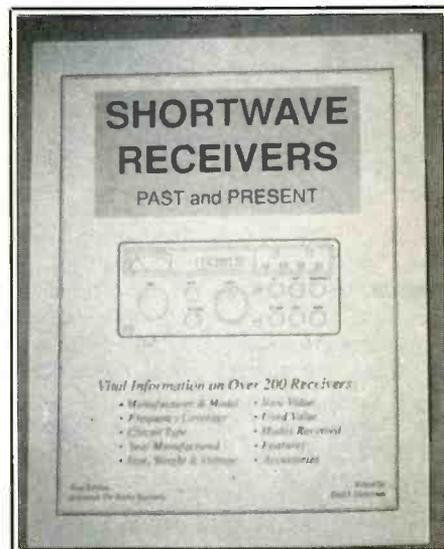


This is a most comprehensive guide to the entire state that includes community coverage from Abington to Yarmouth and all points between. Detailed sections include extensive system descriptions, codes and maps, frequency usage information, etc. The directory includes state, county, and local public safety agencies, medics, security companies, forestry conservation, GMRS, business and industrial licensees, ski patrols, transportation facilities, highway maintenance, weather, ham repeaters, even the new 800 MHz business band, and lots more. Listings are alphabetical by community, cross indexed by frequency and also by callsign.

It's the First Edition of this big directory, and Bob has done a noble job of collecting and assembling an enormous amount of data, and arranging it in a most convenient, useful, and appealing manner. This compendium is available at \$17.95, plus \$2 shipping to addresses in USA/Canada/APO/FPO from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. N.Y. State residents add appropriate sales tax.

## Shortwave Receiver Guide

*Shortwave Receivers Past and Present*, by Fred J. Osterman, is a handy directory of



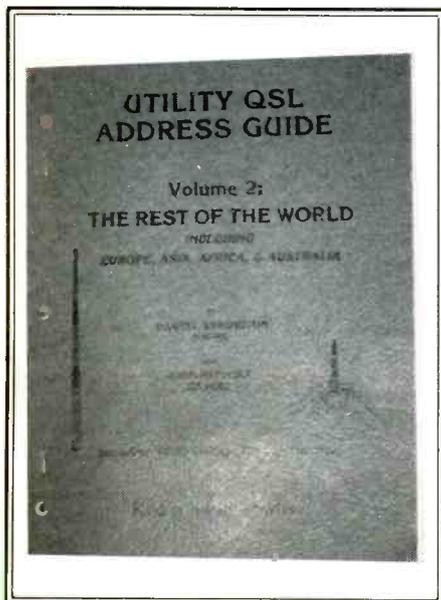
the vital statistics of more than 200 communications receivers produced within the past twenty years by many different American and overseas manufacturers. There are photos of most of the sets listed, as well as the dates of manufacture, physical dimensions, general circuit information and specs, frequency coverage and modes received, accessories available, etc. At the back of the 104-page book there's a handy chart showing the new and used cost of each set covered in the book.

This is a reference guide that should find a niche on the bookshelf of many SWL's and hams. It's well researched and concise. The book is \$5.95 plus \$1 shipping from Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, OH 43068.

## Utility Address Guide, Part 2

The second volume of the Symington/Henault *Utility QSL Address Guide* has been issued. Volume 1 of the set covered the Americas, while the new Volume 2 relates to the rest of the world, including Europe, Asia, Africa, and Australia. This is a 96-page book that provides the mailing addresses of stations in the maritime, aero, weather, press, military, time signal, and several other shortwave services. It covers 160 nations. At the back of the book there's a callsign cross-reference covering 4,000 listings from both volumes. Scattered throughout are reproductions of many DX QSL's the authors have received from *ute* stations.

This is a useful address directory for those who are pursuing QSL'ing aspects of utility station DX'ing. Lots of good info here from authors who know their onions.



The book is \$12.95 from Radio InfoSystems, P.O. Box 399, Holland, OH 43528.

### Whose World Is It, Anyway?

*The World Is Yours*, is a fact of life when you own a shortwave radio receiver. So says author Samuel R. Alcorn (KB2BXH) in the revised Second Edition of his interesting book, *The World Is Yours*. Here's a well thought out and pleasantly written non-technical book prepared with the idea of being an aid to the newcomer entering the shortwave hobby.

Because so many newcomers are heading for this exciting hobby at the present time, there have been several books of late that seek to lead the newcomer gently into the mysteries of monitoring. All things considered, Alcorn's book has an edge on the others because it contains more information and is more professional looking in its general appearance.

Chock full of photos, the text covers basic equipment and antenna considerations, thoughts on DX'ing the various bands, QSL's and how to send reception reports; computer-assisted DX'ing, plus a fold-out 'round-the-clock SWBC schedule. The author discusses "ute" monitoring too, although the main thrust of his text is shortwave broadcast listening since that's the route by which most people first enter the hobby. While many stick with SWBC stations, others may eventually branch out into other aspects and specialties.

The heart of the book is an excellent section giving detailed instructions on logging twenty different nations. This goes through

each nation, one at a time, tells about when/where to listen, describes the programming, tells where to write for a QSL. By the time a newcomer tiptoes through these tulips, the guy or gal is certainly going to look for more. Presto, the DX hobby has a new member!

This is a fine book to read if you're just get-

ting started, or are thinking about the possibilities. It's also a good gift to give that friend or relative you suspect would just love DX if only they knew something more of its joys and challenges. Good gift for the spouse. This book is from the folks at Gilfer Shortwave, 52 Park Avenue, Park Ridge, NJ 07656. The cost is \$5.95 per copy. **PC**



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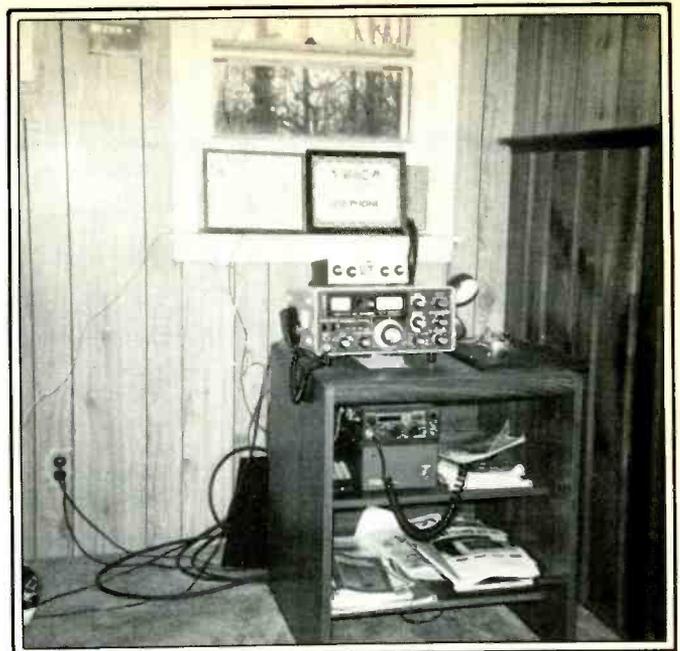
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My operating position. If you counted five scanners, you're right. The QSL cards are for Hamming activities.



When Ed wants to talk, as well as listen, he turns to his two Ham rigs. Note the "Worked All States" and "Worked All Continents" Awards.

# Getting Hooked On Scanners

## *An Odyssey: From Ham Radio To The Ownership Of Four Scanners. Who Says Scanner Listening Isn't Addictive?*

BY EDWARD D. HESSE, WB2RVA

**T**here should be a warning label on the first scanner you buy, something like the one on a pack of cigarettes. It should warn you, that continued use can be addictive, and can lead to varying, and unusual, expenditures. Perhaps a kindly sales person should just take you aside and say, "Listen pal, lemme give you a word of advice: *one scanner won't make you happy.*" Had this happened to me, this article probably wouldn't have been written.

My experience with scanners began in a very simple way. I had decided to change careers, to leave corporate life and become a full-time writer. I set up my office in a room in my house—where I had my computer—and began to write. Writing tends to be a lonely life-style, so I brought my two-meter Ham radio rig into the office to keep me company. It was fun to peck away on the keyboard of my word-processor while listening to the conversations of local Hams.

But it soon became apparent that there were two problems with this arrangement. First, when one frequency became quiet, I would have to stop writing and twist knobs until another signal appeared. Naturally, this took time. The second problem was that the local Ham band transmissions tend to die out once the commuter rush hour is over. Hours went by without my hearing a human voice. It was obvious that the Ham rig wouldn't be suitable for "keeping me company."

As a Ham radio operator, I knew little about scanners—very little. Oh yes, I'd seen one or two in electronics stores, generally tuned to police calls, but they were of little interest. However, one day I happened to be browsing in such a store and spotted a scanner. It was attractive, covered the two-meter Ham band, and, best of all, was inexpensive (less than \$90!).

The scanner left the store with me, and

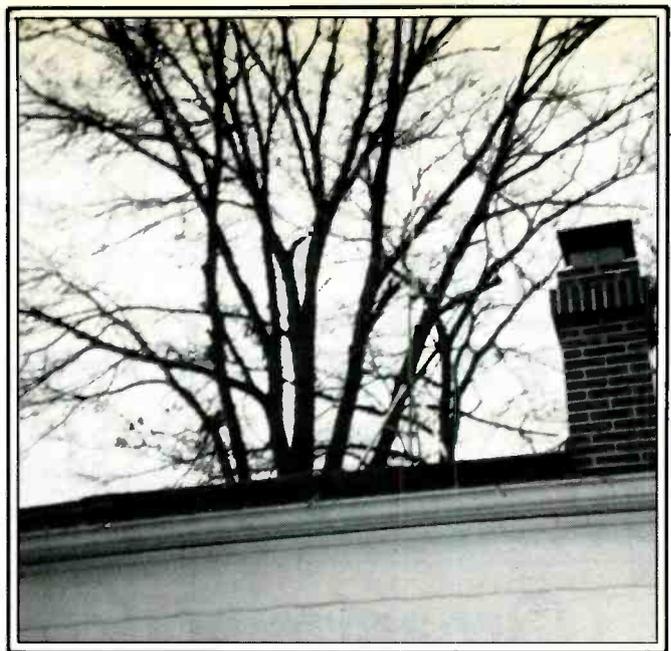
my plans for it were modest. I'd put 10 Ham radio frequencies into its memory and let it roll. No need to turn dials or twist knobs; just let the scanner do the work. My problem had been solved.

Almost. There was still the matter of the "quiet" frequencies from time to time. But a new interest was sparked. At times during my work day, I'd hear the volunteer fire horn and begin to wonder what was happening in town. Whose house was on fire, or who needed medical assistance? I had the same curiosity when I heard police sirens. What was up? What perpetrator was causing mischief—and where?

The scanner was right there to help me. Simply devote one channel to the fire frequency and one to the police frequency (other Hams gave me the details of these frequencies.) That still left eight channels for my Ham radio interests. What versatility! I had accomplished everything I had set out



A closeup of three scanning radios, as well as a nice assortment of QSL's.



Having trouble spotting the antenna? Hard-to-spot antennas make for good neighbors.

to do, and my problems were over.

Well, not quite. It was interesting to listen to the fire and police calls when plain English was used, but what did the fire dispatcher mean when he said that all units were "13?" And what did the volunteer firemen mean when they said, "23, Chief?" And why did a police officer sound so crestfallen when his request for a "10-7" was denied?

Life is a learning experience. I soon learned that you could buy books which provide information—lots of information—on scanners and their uses. For a few dollars, I could buy these books and learn all the number codes used by police and fire-fighters. This seemed innocent enough, and so I acquired a book. Now I had a better grasp of the everyday drama I was hearing.

But the book presented another problem. It contained listings of thousands of frequencies I could listen to. Why limit myself to Ham, police, and fire? I started to look for other frequencies I could put into the scanner. A natural was the 24-hour weather report provided by the government's weather service. Another was the State police who patrol the local parkways (a great way to keep tabs on traffic tie-ups in case I had to drive somewhere, I told myself.) Another frequency was the local commuter railroad, usually quiet but a good way to see if trains were running on time—or at all.

At this point, I should have been a happy and contented scanner listener. But I wasn't. Deep within every Ham radio operator, there is a yearning to expand his or her listening ability, a need to know what's going on "out there." My increasing research had shown me that a scanner should be able to find interesting frequencies. That is, I should be able to have the scanner search for transmissions within a certain frequency

range, without my having to actually "plug in" specific frequencies. My scanner didn't have this feature, and so it became obvious that I would need another scanner.

I had little trouble justifying the second scanner. When my writing day was over, I'd leave my office feeling a slight twinge, knowing that I would be out of touch with what was going on in the world my scanner had introduced me to. An additional scanner would let me stay in touch with this world, and I could easily find a place for it in the den.

The scanner was like a new toy. All I had to do was push the "search" button and let it go. Unknown sources of scanner signals appeared: "confidential" police frequencies, the cordless telephone of a neighbor down the block, government agencies, people talking from their pleasure boats, and hundreds more. My world was expanding.

One day I passed a newsstand which offered a magazine dealing with scanners (yes—POP'COMM). Looking back, I realize that this was a fateful day. One reading convinced me that I was ready to graduate from the status of an amateur scanner operator to a professional level. It would take some money and a good deal of time—but the goal was attainable. If I was ready to make sacrifices, I could enter the realm of world-class scanner operators.

The first thing I would have to do was replace the little antennas that came with scanners, those little pieces of metal that extend to a length of about 18 inches. To get all the signals that were out there, I'd need outdoor antennas, professionally-designed arrays of horizontal and vertical elements that could capture every signal flying by my house. And I'd have to mount the antennas right up there with my Ham radio antennas.

By this point, I should have been satisfied. But another problem surfaced. Two problems, actually. First, I realized that my scanner set-up was lacking in a very important way: I was scanning only a small percentage of the radio spectrum. There were many, many frequencies that my present scanners just wouldn't cover, things like commercial and private aircraft, cellular mobile telephones, the 220 MHz Ham band, and more. The second problem: Each of my two scanners had only ten memory channels. How could I possibly cover all my new interests with only twenty channels of memory?

By now you know the answer. I bought another scanner. This one covered some 900 MHz and offered 100 channels of memory. It covered a wide variety of modes: FM wide and narrow, AM wide and narrow, SSB, and CW. I could put 100 frequencies (and modes) into the scanner; I could search hundreds of Mhz for elusive transmissions. And when it was time for a respite from the chase, the scanner—with its wide band FM—would provide me with music of my choice from broadcast stations near or far (thanks to the new antenna devoted exclusively to this piece of equipment.)

Was I happy? Yes, for awhile, until I realized that my scanner listening was one-sided. I could listen to VHF and UHF, but I could do nothing with HR. Oh, yes, I had my low-band ham equipment, but what about all that other good DX that was available? My scanners would let me listen to pilots approaching or departing from the local airports, but what about when they got over the Atlantic? Or at night, when the local frequencies close down, what about those interesting broadcasts from BBC, Radio Moscow, or Voice of America? What about

those ships and military aircraft a thousand miles away? What interesting things might they be doing and saying? What was I missing?

I wanted to know. I had come this far, it would be foolish not to take that one extra

step. Yes, I bought another scanner, one which covers the spectrum from 10 kHz all the way to 30 MHz, in AM, SSB, CW, and FM. I can enter frequencies by push button, or I can spin a rotary dial to my heart's content. And the antenna it uses is a real bar-

gain: just a long piece of copper wire that stretches from the house to the trees in the back.

This scanner resides in my bedroom (with special permission granted by my wife.) If I'm restless at night, I can listen to Hams on 80 meters. Or I can listen to BBC on 5975 kHz or slide up the dial to VOA and on to Radio Moscow. It wakes me up in the morning to our local AM all-news station. I can even use the scanner with my Ham equipment when a DX station is working "split."

I'm getting close to my goal of being a world-class scanner listener. I'm ready for anyone, anywhere, transmitting in any mode. They can't elude me, day or night. Of course, my writing business has slowed down somewhat, but that's understandable. You can't write all day long and monitor all those scanners. Something has to give.

Thanks to the portability of my first scanner, it generally accompanies me into the garden and front-yard when I work in those areas. And, of course, all the scanners have DC power cables so that I can take one along in the car whenever I'm out for a drive. I've been thinking, though, that it's a little fuss and bother to disconnect and connect power cords and antenna cables whenever I leave the house and still want to listen to a scanner. I think there's a simple answer for this, though.

Those hand-held portable scanners look pretty nice. There was this ad in a recent issue of POP'COMM . . .

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CIRCLE 10 ON READER SERVICE CARD

# Behind The Broadcast Mike

## A Few Basic Radio Formats

BY PETER HUNN

Last year, an engineer friend of mine decided to enter the ranks of broadcast ownership, and acquired a small, Southern daytimer.

"For only 250 watts, it's got a pretty good signal," noted the new station owner. "There is one thing," my compatriot continued. "I could really use your help with the program format. It just doesn't sound right."

As I headed down South to investigate, I recalled that this fellow was a stickler for perfection, and that, as a result, was probably underestimating the positive points of his facility's air product. I wondered if the format would be off-key enough to warrant even a few suggestions. When I got within the little station's signal range, however, it became clear that my friend's concerns were not unfounded. In fact, while taking copious notes (about what was coming from the small daytimer's antenna), I practically lost control of my car and headed into a guard-rail!

After going over those notes, I discovered that the shortcomings of my associate's radio programming fall into a few problem areas that tend to water-down the format at many a small broadcast station.

The following paragraphs seek to indentify some of these sensitive program areas, and offer guidelines for their correction.

### Call Letters

The call letters serve as a station's given name. Without a callsign (or some dial position identification), audience members may not know who they are hearing. Unfortunately, it is not uncommon to listen to some small market stations for twenty to thirty minutes without hearing a single set of call letter, or generic ID. For years, even folks who really wanted a *Pepsi*, would ask for a *Coke*, simply because the name *Coke* was so often promoted. The same may be true of radio stations. Obviously, when people in your marketing area are surveyed (whether formally or informally), you want them to come up with your station's callsign. Guideline: Mention the station's call letters directly after each record. For example, "WZZZ with James Taylor's latest song . . ." "WZZZ and a tune for you by James Taylor . . ." Noting the call letters twice, in each break, will not hurt either.

### Time Checks

There are lots of people who turn on a radio for the sole purpose of getting the cor-



rect time. Again, it is all too possible to listen to a station for upwards of half an hour without hearing mention of this important element. Guideline: Give a time check after each record (and/or long spot break.) I've never heard a single listener complain about stations that give too much time information.

It is also important to say the time in a natural way. If someone were to stop a person on the street in order to ask for the correct time, few individuals would respond by saying, "It's 20 minutes after the hour of 2 o'clock." And yet, many new announcers needlessly draw out a time check in such a fashion. Just say, "It's 20 after 2."

Station policy needs to dictate whether digital or analog time checks should be rendered during the second half of an hour. There are those who, arguably, feel that the recent digital watch proliferation makes it difficult for the younger crowd to relate to,

"It's a quarter past 4, as opposed to, it is 4:15.

### The "I Can't Wait To Get Out Of Here" Syndrome

Although one might not get a station ID, or a time check, he'll probably be sure to hear the radio announcer say, "I'm Joe Blow, and I'll be with you until 7 tonite, and then John Smith will be in." If someone kept telling you when he was going to leave, and exactly when his replacement was expected, wouldn't you get the impression that he was rather anxious to do something a bit more enjoyable? Guideline: De-emphasize the constant mention of when the next DJ is taking over the controls.

### Weather Forecasts

Recent surveys have shown that many people no longer put much stock into wea-

ther forecasts. Undoubtedly, this is due to the forecasting business' high margin of error. Some radio programming consultants have suggested that a station, wanting to avoid looking bad because of inaccurate weather reports, limit its forecasts to: \_\_\_\_\_ Today, and \_\_\_\_\_ Tonite; or \_\_\_\_\_ Tonite, and \_\_\_\_\_ Tomorrow, outlooks.

It is the author's opinion, however, that radio listeners like to hear a longer range forecast; even if it is subject to change. While the super-detailed "high pressure over the Plain States" type outlooks should probably be left to the TV weathercasters,

radio broadcasters might utilize a weather forecast form that looks like this:

Rainy today, high 40. Partly cloudy tonite, low 28. Sunny tomorrow, high 53. The extended outlook; partly sunny through the weekend. It's 37 degrees at WZZZ. Guideline: Give mention of the weather outlook (in your station's choice of forecast formats) at least once every fifteen minutes. When reporting temperatures/conditions observed via the studio window, note them as such. All too often, an announcer might ramble on about the assumed ubiquitous downpour or blizzard without considering that the reported conditions are prob-

ably not occurring in every corner of the station's coverage area.

### **Familiar/Melody Oriented Music**

The other morning, I was tuned to an AM/FM simulcast operation that is well known for its hard working sales staff. After listening for an hour, it became obvious that, had that station aired some recognizable music, its sales department wouldn't have to work so hard. The radio station aired such a mish-mash of obscure, forgettable album cuts by relatively unknown artists, that it was difficult to identify with any of the musical programming. Local radio stations are supposed to serve as friends to their audiences. When a friend does little to which its friend can relate, the friendship becomes strained. Guideline: Concentrate on music that is basically familiar to your desired audience. That is not to say that you have to play the same Top-20 songs over and over again. Variety is essential (a library of 1,000 cuts is adequate.) A variety, however, should not forsake songs that have a basic tie to a safe degree of listener recognition. In selecting any tune for airplay, the primary criterion should be melody. Typically, if folks can not hum it, forget it.

It is also important to remember that even if you know that the very familiar instrumental you're playing is the *Theme from Dallas*, there are probably audience members who can't, for the life of them, recall the name of the catchy tune. As a result, it can't hurt to briefly mention the selection's title and performer each time a song is aired.

### **Record Rotation**

No station owner would suggest that his DJ's should speak in a monotonous voice. Similarly, broadcast management should seek an interesting variety with regard to its format and related record rotation.

Ideally, the records played (within a station's format) should vary from each other just enough to make the programming interesting, while not shifting dramatically enough to make the listener to wonder what type of music format that the station typically offers.

A good record rotation within a radio format might be compared to a good menu plan. Many foods are used to make an interesting meal. The foods must, however, be presented in acceptable or familiar combinations. A radio outlet that featured a poor record rotation could be likened to a hostess who serves her Thanksgiving dinner guests a small slice of turkey and a plateful of cranberry sauce.

Guideline: In a generic pop format (for example), try not to play two or more female vocals, strong country, or soul based records back to back. If you are playing records in sets (two or more cuts) present them in a flow series. Here you might begin with a slow tune, and via subsequent records (each with a little more energy), work up to a fast selection. Do not slam-seque records of

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drastically diverse tempos. A four record set containing two ballads and a pair of quicker songs can be joined together nicely with a simple station ID/slogan . . . "Music for you from WZZZ."

Don't feel bad if it takes you a while to cut the rough edges off of the above "tempo flow" suggestion. Consistency in this area is seldom as easy as it sounds on the air.

### Commercial Spot Breaks

Have you ever noticed that, like records on the Top-40, commercials vary in tempo and intensity? A polished radio format should include commercial spots that are aired in an order which is related to their energy levels. Extreme up-down-up-down sequences should be avoided in commercial spot rotation.

Guideline: Live spots are generally the most sedate and should have the first position in a spot break. These announcements might be followed by more up tempo spots containing a music bed or jingle. Without creating an over cluttered sound, all spot breaks should end with some mention of the station's callsign/ID slogan. Frequently, this is contained in a station promo (to be run last in a spot break) or jingle. In lieu of such material, it is acceptable to briefly mention the callsign over the introduction of the first song played after the spot break. All commercials that contain music beds should have the music out by the final syllable of the

commercial's last word so that no music trail might interfere with (or serve to protract) a subsequent event.

### Contests

Back in the early 1970s, when KCBQ (AM) was a high energy, San Diego rocker, it featured a terrific promotion called *The Last Contest*. During this promotion, KCBQ offered prizes like: dinner for you and 1,000 of your closest friends! And, yacht cruises to exotic locales and after your happy return, you could keep the boat! Today, large stations continue the KCBQ tradition and give away big prizes such as cars, homes, \$50,000, etc. Is it possible for a small station, with few available promotional dollars, to come up with a worthwhile contest? Fortunately, if you responded "yes," you win.

Guideline: People seem to enjoy simple contests (like trivia questions) where they are able to play along even if they are not able (or likely) to call in for a prize. One tried and true promotion is the: "Guess the first date, this winter, on which it will snow an inch or more (as measured outside our studios.\*)" An appropriate prize would be a gallon of antifreeze, a snow shovel, ice scraper, etc.

Some parsimonious programmers develop a music trivia contest around a mystery singer/group. A song (usually an oldie) is

played and listeners are asked to identify the artist, and/or year the tune was released, etc. Here, the winner was allowed to pick a dozen records to be played during the next hour. This promotion was conducted at night (when the commercial content had dropped off and when the audience is younger) and the kids seemed to love it—even though this contest did not cost the station a cent. (Note: during these music sweeps, promote the fact that you're airing, say, sixteen records in a row. For some reason, announcing: "WZZZ with number five of sixteen songs in a row," has more impact than: "WZZZ in the middle of 50 minutes of continuous music.")

In any event, if your station can afford a music, or general trivia book, and is able to get the local fast food restaurant to give you a couple of hamburger gift certificates, your broadcast facility is well on its way to getting into the contest business.

Finally, it is true that, in addition to the areas covered in this article, there are other radio format guidelines that might require consideration. However, when the call letters, time checks, weather forecasts, record selection/rotation, and station promotions begin to get straightened out, a very listenable radio format is well within reach.

Peter Hunn is a former station owner, *Billboard* magazine air personality of the year, and holds a Masters degree in Mass Communication from Central Missouri State University. He has written several previous features for *POP'COMM*.



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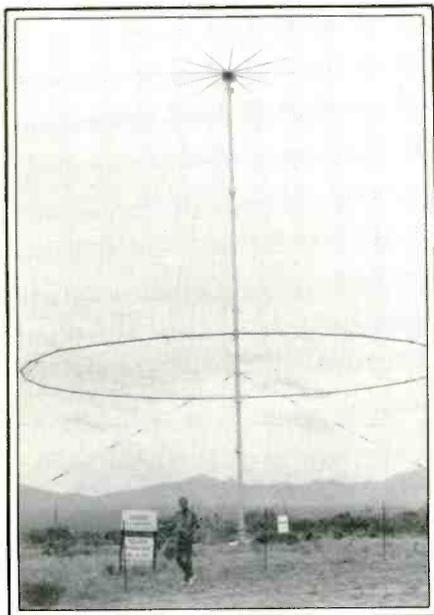
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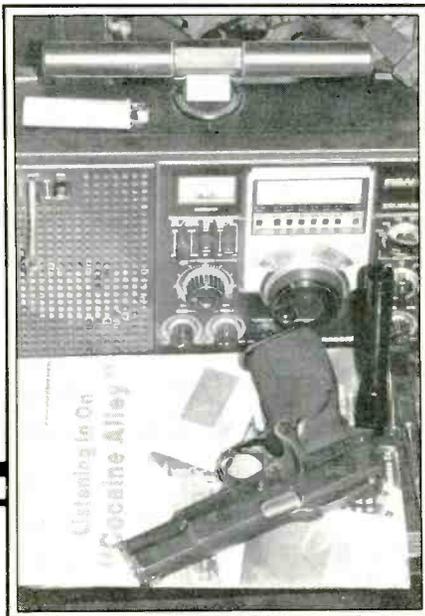
## Interesting Views of Communications Caught by the Camera Lens

If you come across any broadcasting or communications facilities that you'd like to share with other POP'COMM readers, send your snapshots to: Foto File, Popular Communications Magazine, 76 North Broadway, Hicksville, NY 11801.

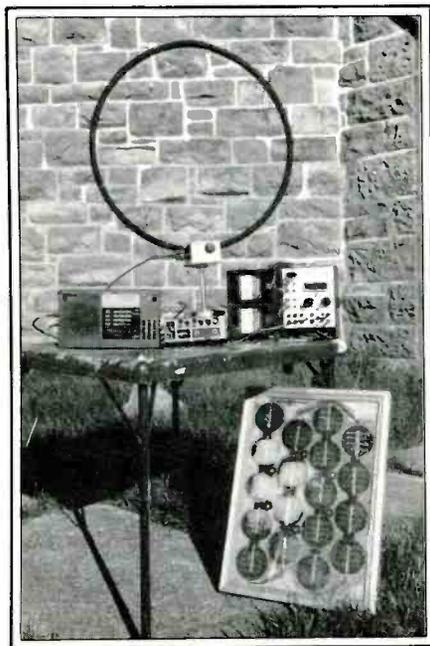


This discone type antenna located at a deactivated SAC Titan II missile site was spotted by reader Lawrence K. Johnson of Arizona. This place, 25 miles south of Tucson, is the site of the Pima Air Museum. Larry wonders if this antenna once served an SAC function, and what frequency range this discone has. To get a perspective on its size, note the man standing to the left next to the sign. The sign reads "Danger RF Radiation."

Terry O'Laughlin, WA9GVB, spent part of his summer vacation at the Sand Island Lighthouse (built in 1881) in Lake Superior. His entire listening post was solar powered, as can be seen in the photo. Terry says that a good frequency to monitor there was the 164.175 MHz repeater (164.80 MHz input) of the Apostle Islands National Lakeshore. The lighthouse has a wireless intrusion alarm operating on 303.5 MHz, by the way.



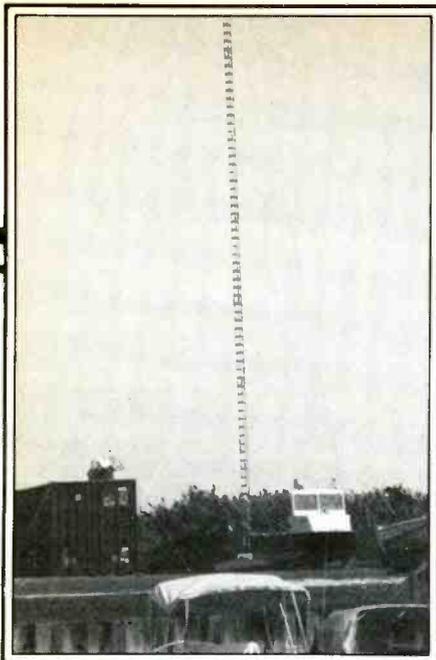
Joe Goetz of Ohio sent in a photo that he says makes a statement. Posed in front of the RF-2200 receiver is a flashlight, some \$50 bills, a 9 m.m. automatic pistol, and a copy of Popular Communications. The statement Joe says he's making is that the ECPA is as restrictive as was the Gun Control Act of 1968. He says it took 20 years to get the Gun Control Act largely repealed, so there's always hope to repeal the ECPA.



Ken Bale, W7VCB, was in his van DF'ing radiobeacons as he drove through his home state of Washington. Eventually his efforts took him to a location near Westport, Wash., on the south side of Grays Harbor. This was the site of Beacon "U" on 325 kHz. Looked so good that he snapped a photo of his van parked in front of the beacon.



Another beacon tuned in by Ken Bale, W7VCB, of Raymond, Wash., was ID'ing as "UT" and operating on 304 kHz. This one is in the North Cove area of Washington, on the north side of Willapa Bay in the southwest part of the state.



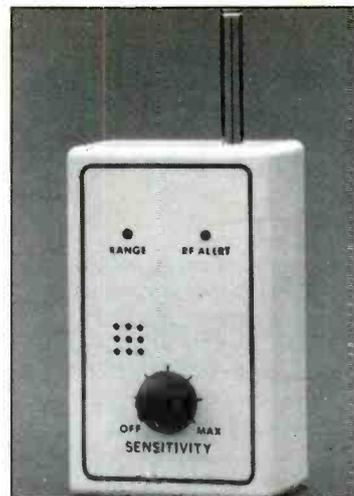
This tall transmitting tower was spotted at a location in East Moriches, New York known for many years as Radio Point. To the left of the tower is the transmitter building, consisting of a locked steel container with three small satellite dishes on the roof. No information available as to what all of this is for, although it is possible that it is part of the USCG's station in East Moriches. The photo was taken by Tony Earll, Registered Monitor KNY2AE. **PC**

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## ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

### Ham Tuners For SWL Listening With Indoor Antenna

The ham radio tuner is not out-of-place ahead of a shortwave receiver on a shortwave listener's operating table, Fig. 1. Such a tuner is designed for efficient transfer of power from transmitter to the antenna system of a ham station. However, it operates just as effectively in conveying an incoming signal to a receiver input. A typical tuner covers over the ham bands that extend between 10 and 160 meters. The shortwave broadcast bands 11 through 120 meters fall within this range along with the many HF UTE frequencies.

You don't need a tuner with an SWR/POWER meter and the other refinements often associated with them to do an effective job on receive. However, a ham operator, if he has such a tuner, can use it to advantage in his shortwave listening activities. Also the versatile switching arrangement and multiple antenna inputs can be useful in testing out how well a tuner performs with various types of receiving antennas.

Most important to the shortwave listener, is the fact that a very basic ham tuner works out just as well, although the results cannot be evaluated precisely. They sell at low-cost new, and, can often be purchased used, for a whistle, at a hamfest. A typical basic tuner, Fig. 2, consists of a variable input capacitor (input side of tuner), tapped coil and variable capacitor output side that is connected to the receiver antenna input (actually the transmitter output side of a ham tuner.) Usually there are about 12 taps on the coil, providing the possibility for high-Q tuning over the shortwave broadcast band from 1.8 MHz to 30 MHz.

Initially, comparisons were made with a more elaborate tuner to prove out the capability of ham tuners for peaking SWL signals. Then a simple tuner was put through its paces. Special emphasis is placed on using tuners with a short indoor antenna.

In the test set-up, one end of a stretched out single 24' length of #18 hook-up wire was connected to the inner conductor of one of the switchable coaxial inputs of the tuner. This was done by folding over the ends of the wire so it could be inserted, and stay there firmly, for the duration of the test. It could also be attached to a banana plug which can be inserted efficiently into the inner conductor of a SO-239 coaxial receptacle. A switch on the tuner can be used to connect this wire either to the tuner input part of the tuner or, it can be by-passed around the tuner. No other cable, or wire whatsoever, is connected to any input of the tuner to prevent interaction with the measurements.



Fig. 1. Set-up for checking out ham tuner on shortwave receiver. Cassette recorder may be useful for clarity evaluation.

In tuning in a signal on a given band, it is common practice to set both input and output capacitors to mid-scale. Now switch the inductor to a setting that delivers maximum signal to the receiver as indicated by the S-meter reading. Adjust the variable capacitors back and forth until the very maximum signal is indicated. Next, switch back and forth between tuner in, and tuner by-passed positions, and note the level of improvement the tuner can offer. Try each of the tuner inductor positions on each side of the selected switch position. Readjust capacitors. On occasion one of these other inductor positions may turn up better than the first one selected. After you have found the one that offers the most improvement, record the information in a table, as per Fig. 3. Later as you change bands you will know where to set the tuner for best results on each band.

Another way to get good results is by listening to the background noise level of the receiver and make the adjustments. In this

plan, the S-meter is not necessary in the tuning plan and preparation of the table. Set the receiver to near the center of the chosen band, to a position where no signal can be heard, and then increase the radio-frequency gain of the receiver until the background atmospheric, or other noise, can be heard. Now set the inductor tap for maximum background noise level as you hear it, possibly with your headset on. Vary capacitors for highest possible background noise level. Record the settings. Now you can try the settings on several signals. Results will usually be as good or better than those obtained using the signal and S-meter procedure. One of the problems with using a signal is that fading causes it to vary up and down making it difficult to obtain a precise measure of improvement. However, the background noise level is pretty much a constant.

Above all, do record your results so you can return to the best setting quickly when you come back to this band the next time. You must be patient and careful in preparing your table for any outdoor or indoor antenna. Remember, too, your readings apply only to the antenna you used to compile the table.

The last column of the table shows improvement on each SWR band as well as WWV and CHU frequencies. These latter time signals are fine for test comparisons. Many fall in the shortwave broadcast bands, or are rather near to them in frequency.

The improvement that a properly adjusted tuner can give you is quite significant, especially on a very weak signal, it may be the difference between an identification, or no identification. In one of our tests on the 20 MHz WWV frequency, the tones could be heard with the tuner in, and no signal whatsoever with the tuner bypassed. Similar results were heard on very weak broadcast signals, too. However, they are not as easy to distinguish because of fade conditions.

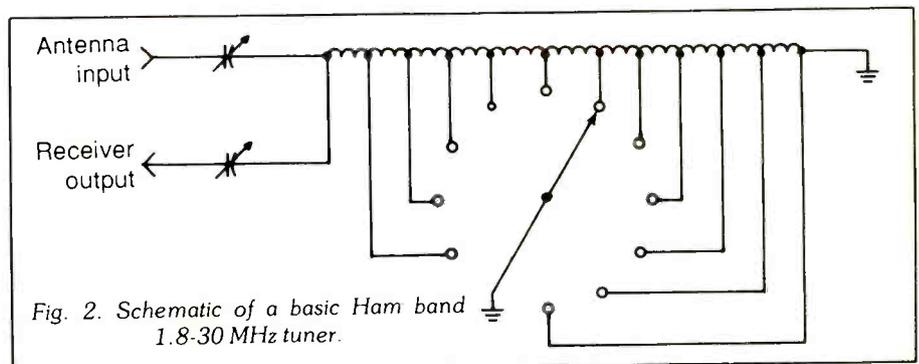


Fig. 2. Schematic of a basic Ham band 1.8-30 MHz tuner.

BAND	TRANSMITTER SIDE CAPACITOR	COIL SWITCH	ANTENNA SIDE CAPACITOR	S-METER RISE ( $\pm 1$ )
120	4.25	L	4.75	5
90	3.5	K	3	4.5
75	3.25	I	5.25	3.5
60	3	H	5.75	3.5
49	3	G	3.75	2
41	6	E	4	0.5
31	3.75	F	5	2.75
25	2.25	E	5.75	3
22	2.25	D	4.75	2.5
19	2.75	D	4.5	2
16	2.25	C	4	2.5
13	2	B	5.25	1.5
11	3	A	4	-
WWV 20 MHz	3	B	5	-
WWV 15 MHz	2.5	D	4.75	2
WWV 10 MHz	4.5	E	4.25	3
CHU 7.335 M	6	E	5	0.5
WWV 5 MHz	3	H	5.75	3
CHU 3.330 M	3.5	I	5.5	4
WWV 2.5 MHz	4.25	L	4.75	5

Fig. 3. Peak settings and S-Meter improvement with tuner on SWB band and time frequencies.

By checking the chart readings, you will notice that in the 41 meter spectrum there was little or no difference between tuner in and tuner out, suggesting the overall length of the wire and the by-pass arrangement in the tuner presented a direct low-impedance match to the receiver antenna input. In this case, the tuner was of little or no help. Readings taken on received signals generally have approximately a  $\pm 1$  S-meter accuracy as a result of fade conditions. The table

of Fig. 2 shows no S-meter reading for shortwave broadcast band 11. The tuner settings were established definitively by listening to the background noise level. The change in that level was quite significant, suggesting a similar performance on a received signal, if any such were present on the now inactive 11 meter broadcast band.

When using a low-cost and non-complicated ham tuner, Figs. 2 and 4, similar results are obtained. Usually there is no easy

way of making a rapid changeover between tuner-in, and tuner by-pass, to make a direct comparison. However, you can verify results by watching your S-meter reading and listening to the sound output rise as you tune up on a specific band. The increase in the sound output is more apparent when working with a weak signal, or with your receiver set for maximum signal attenuation. Again, you can use the reliable background noise level rise when the receiver is tuned to some unused frequency on the particular band. Vary the capacitors and coil positions for maximum background level reception. Don't forget to record the settings when you find that peak on a given band.

The results for the small tuner and the same short 24' length of wire are given in Fig. 5. In the frequency bands about the quarter-wavelength resonant length of the wire it was often difficult to find the best coil setting because there was little difference in signal level for as many as three adjacent switch positions. Capacitor tuning was also broad but nevertheless important in finding the right switch position. This region for our set-up occurred on bands 22 through 41. Don't worry about this situation because the length of the wire itself was doing a good job on these bands.

In finding the ideal settings for a tuner it can be helpful if a ham band is near in frequency to the particular band of concern. When you tune in a sideband signal you can get a better clue because the influence of tuning is more obvious as you watch the S-meter deflection for a sideband modulated signal. For example, I got a good setting for the 41 and 75 meter shortwave broadcast band easily by tuning in some of the radio ham sideband signals that also occupy these two bands. In a future column, we will take a closer look into the tuner situation for improving both indoor and outdoor antenna performance in listening all over the shortwave spectrum. The single wire antenna can be particularly well adapted to the use of a tuner. More later. **PC**



Fig. 4. Simple no-frills ham tuner can perk-up short indoor antenna wire results.

BAND	A	L	T
120	1.5	K	1
90	3.5	J	2.75
75	4	I	3.75
60	3.75	H	4
49	3.5	G	4
41	3	F	2.5
31	4.5	F	3.75
25	5	E	4.5
22	2	E	5.25
19	4	D	5
16	4	C	5
13	3.5	C	4
11	4	B	5

Fig. 5. Peak settings for small ham tuner and 24' indoor antenna wire.

## THE EXCITING WORLD OF RADIOTELETYPE MONITORING

Some interesting RTTY intercepts came across my skywire antenna.

MFA, Madrid, Spain, was discovered lurking on 17421.5 kHz for a good many days. It was a first-time logging for me and one I never came across before in readers' loggings.

WWD, the NOAA station at La Jolla, Calif., was a three-mode reception just a couple of turns of the tuning knob away from the Spanish foreign ministry. RTTY traffic was found on 17412; USB voice on 17408.5; and FAX weather charts on 17410.5. All this while WWD was in touch with a ship.

The Syrian Arab News Agency (SANA) from Damascus, was another station entered for the first time in my logbook. It was found on 11080 kHz. I've never spotted this one either in reader contributions.

Three diplomatic stations utilized 13375 within a half hour's time. KNY23, the Czech embassy at Washington, DC, came first, followed by RCF, MFA, Moscow, USSR, and then the Czech embassy at Mexico City, Mexico. It must have been a time-sharing plan Soviet block style.

Many hours before I would watch the evening news on television I was getting up-to-the minute news flashes by monitoring an AFRTS transmission on 11006.9. The news copy came fast and furious with "bulletins" and "urgents".

SVU, Athinai Radio, Greece, which doesn't seem to be monitored that often in the United States, was found on 8462 with Telexes to a cargo ship. Also tuned in from Greece was Voice of America's RTTY station at Kavalla, with news in English on 6816.2.

GNK1, Norwick Radio, England, was on 2832.7 with an ARQ phase signal and a CW ID marker. This shows that the lower bands are opening up to DX'ing and are well worth your efforts during the wee hours of the morning.

On 2844.4 kHz appeared what I believe to be a U.S. Navy station with a usual type of test tape with RY's. The current Zulu time (UTC) was included with the RY's and changed every minute. Three different styles of the test tape ran consecutively. Two of them contained some sort of data (see figure 1). The data would change every three minutes after the three test patterns were run.

There were many more interesting intercepts. You'll find those in the loggings section.

Just after I finished last month's column, there came a knocking on my front door. It was a parcel delivery service dropping off the FAX converter I had ordered. Within two hours after unpacking the carton I was

receiving my first FAX chart quite clearly despite admonishments in the accompanying manual that the learning time would take several hours of "trial and error."

Many of the weather charts I copied were quite interesting as were the press photos. If you've never tried FAX monitoring you might consider giving it a try. Then you can tell the rest of us about your accomplishments by sending your loggings to me at POP'COMM, 76 N. Broadway, Hicksville, NY 11801.

The logs should include the published frequency (not the USB or LSB frequency), time, description of the material, the LPM/IOC settings, and your name and home state or country.

A selection of what I received in the first few days I had the converter will be found following the RTTY loggings.

Radio Australia reported that media magnate, Rupert Murdoch, wanted to buy the Australian Associated Press (AAP). He planned to purchase 80 percent of its stock, thereby gaining control of the agency. With a little luck you can monitor AAP RTTY copy from 1100 to 1200 UTC on either 11434.5 or 7979 kHz.

For a long time I have been puzzled as to why most contributors of RTTY loggings were not sending in items that showed long-

distance reception. Those in the United States and Canada were sending reports monitored from stations in North America and from ships close to the continental shoreline. Europeans reported mostly European RTTY stations and very few from Asia. Asian monitors tended to stay in their neighborhood.

Going back over your reports sent to me since September 1985, which I had filed away, I compared the equipment you said you owned with the loggings reports. I came to the conclusion that those who used microcomputers to aid in the monitoring process were the ones *least* likely to pick up the most distant stations. Conversely, terrific DX'ing was garnered by those who used just a RTTY decoder and video monitor in their work.

I can only guess that computer-generated noise was preventing the monitoring of weaker distant signals. Please tell me your thoughts on this matter and we'll discuss them in an upcoming column.

Still wondering what to buy Mom for Mother's Day? How about a shortwave receiver, some RTTY gear, and a POP' COMM subscription? Then she could have fun tuning in the following readers' loggings and maybe even send us some of her own intercepts.

```

TM RYRYRYRYRY...
1052 (also at 1055, 1058, 1101, etc.)
AFHE
W 2477 027 020

TM RYRYRYRYRY...
1053 (also at 1056, 1059, 1102, etc.)

TM RYRYRYRYRY...
1054 (also at 1057, 1100, 1103, etc.)
DP
2175
AFHE
SUEV
W 2474 028 015 01
W 2464 029 018 00
W 2462 038 003 00
B 2465 027 003 00
    
```

*This is a reproduction of a test tape found on 2844.4 kHz at 1042, 850/75R. The numbers on the lines beneath TM RYRYRYRYRY changed every minute and were in actual time Zulu. The data portion after the W's and B's would change every three minutes. The text in the parentheses are the editor's notations and were not part of the original tape. In the United States the frequency is shared by many Navy bases and ships. What meaning has the data?*

**Abbreviations Used in The RTTY Column**

AA	Arabic
ARQ	SITOR mode
BC	Broadcast
EE	English
FEC	Forward Error Connection mode
FF	French
foxes	"Quick brown fox..." test tape
GG	German
ID	Identification/led
MFA	Ministry of Foreign Affairs
nx	news
PP	Portuguese
RYRY	"RYRY..." test tape
SS	Spanish
tfc	traffic
w/	with
wx	weather

**RTTY Intercepts**  
(Settings: Hz/Baud/Polarity)  
(All Times Are UTC)

2070.5: WE6279, Great Lakes freighter Henry Ford II w/msg in ARQ at 0956; WE8990, the Great Lakes steamer William Clay Ford w/msg in ARQ at 1016. One guess who owns these; it's not Chrysler or GM-- Ed.

2197: 960QZ of the Spanish Navy w/RYRY to 970MR, 850/75R at 0130 (Fred Hetherington, FL).

2223.3: Un-ID w/FEC xmsn at 1127. Text was garbled by QRN (Ed.)

2311.7: KC5L, a Brown & Root Co. barge, the L.B. Meaders w/wx for the Gulf of Mexico. Was 170/50N at 1138 (Ed.).

2832.7: CNKI, Norwick R., England w/ARQ phasing sig & CW ID marker at 0844 (Ed.).

2844.3: TM (un-ID sta) w/RYRY & data that changes every 3 mins (see Fig. 1). Was 850/75R at 1042 (Ed.).

2137.5: WLC, Rogers City R., MI w/notices to mariners in FEC at 0136 (Ed.).

4489: Coded wx possibly from Bracknell, England at 1730, 425/50R (SP4 Dave Love, US Army, FRG). Welcome to the column. It is Bracknell, & the call here is GFL26-- Ed.

4813.1: LZAB, Sofia Meteo, Bulgaria w/coded wx at 0141, 425/50N (Ed.).

5017: RPT1, Portuguese Navrad, Ponta Delgada, Azores with RYRY/SGSG & foxes at 0553, 850/50R (J.M., KY).

5020: Un-ID w/coded wx at 1745, 850/50N (Love, FRG). This was RWW74, Moscow Meteo-- Ed.

5140: Un-ID w/coded wx at 1740, 850/50R (Love, FRG). It's Moscow Meteo's RWW73-- Ed.

5195.3: Un-ID w/RYRY & "Oeiras Crypto" at 0058, 850/50R (Kenneth Roberts, FL). This sta is Oeiras Navrad, Portugal. Sometimes ID's as RXF1-- Ed.

5455: Coded wx may be Sofia Meteo, Bulgaria, 425/50N at 1755 (Love, FRG). Right! Call is LZF4-- Ed.

5848.2: TUH, Abidjan, Ivory Coast w/msg re aircraft brake inspection, was 425/50R at 0659 (Ed.).

5854.2//5855.2//5856.2: Foxes & test w/o ID, 170/75R at 0342. This xmsn was from VDD, Canadian Forces, Debert, NS on its circuit to Ottawa, Ont. (Ed.).

6251: 781JU of Spanish Navy w/RYRY & SGSG to 75RQA at 0103, 850/75R (J.M., KY).

6256.5: Soviet research vessel Mikhail Lomonosov w/tfc at 0340, usual 170/50N (Ed.).

6266: C6BJ8, Finnish cargo ship Finnrose ordering spare parts in ARQ at 0151 (J.M., KY).

6288: 71HGE of the Spanish Navy sending RYRY & SGSG at 0533, 850/75R (J.M., KY).

6416: CCS, Santiago Navrad, Chile w/RYRY & EAUX DE CCS at 0432, 850/100R (Anonymous). If this was the French Navy, I'd say that it was trying to reach water (since "water" in FF is "eaux"). In this case, however, EAUX is the call sign of a Spanish merchant ship-- Ed.

6501.4: NMF, USCG Boston, MA w/freq list in FEC at 0220 (Roberts, FL).

6736.2: ETD3, Addis Ababa Aero, Ethiopia w/svc msg saying that it couldn't communicate (nil QSO) w/HKNA (Joma Kenyatta Int'l. Airport, Nairobi, Kenya). Was 850/50R at 0150 (Ed.).

6795: LZM7, Sofia Meteo, Bulgaria w/coded wx at 1825, 425/50R (Love, FRG); I logged it too, but at 0249-- Ed.

6816.2: VOA, Kavalla, Greece w/nx in EE at 0054, 75R (Ed.).

6941.5: TRK, ASECNA Libreville, Gabon w/aero wx at 0548, TDM 425/96A&B, on circuits to Brazzaville, Congo (Ed.).

6942: TRK w/RYRY - ID, 425/50N at 0524 (Brian Webb, CA). It's not unusual to find RTTY stas using several xmsn modes-- Ed.

6960.2: BTA Sofia, Bulgaria w/nx in EE at 1915, 425/50R at 0804 (Ed.).

6978.5: CCS, Santiago Navrad, Chile w/5L tfc & RYRY, 850/50R at 0804 (Ed.).

7489.6: MKD, RAF Akrotiri, Cyprus w/RYI's & foxes at 2056, 170/50R (Ed.).

7524.1: TYE41, ASECNA Cotonou, Benin w/"CH DE TYE" in TDM 425/96B at 2040 (Hetherington)

7542: ZEN33 w/RYRY at 1358, then into nx in FF, 50R (Webb, CA). That's AFP in Cape D'aguliar, Hong Kong. See 9071.1 kHz for similar-- Ed.

7920: VJM, Macquarie Island, Australia w/wx from AMMQ (Macquarie Isl.-- Ed.) to New Zealand, TDM 337/96A at 1123 (Hetherington, FL).

7950: Y2V6, ADN Berlin, GDR w/nx in FF & SS after 2315, 425/50N (Ed.).

7980: Y3K7, Potsdam Meteo, GFR w/coded wx at 0200, 850/100R (Brian Alexander, PA).

8132: Un-ID sta ID'ing as UPO w/RYRY & foxes at 0125, 425/50N. In the past, the Egyptian embassy in Washington, DC found here at this time using ARQ. Who's UPO? (Hetherington, FL). Doubt it's a Russian because they've never before xmitted tests w/foxes. Similar logging on 19550 kHz-- Ed.

8165: Un-ID w/RYRY at 1437, 850/75R (Ed.).

8457.5: EBA, Madrid Navrad, Spain w/nx in SS to ships at 0044.0051, 850/75R (Ed.).

8459: Plaintext wx from the NWS office at Anchorage, AK, 170/75R at 0608 (Robert Anderson, BC). Welcome aboard. Just a guess, but this may be NOJ, the USCG Kodiak, AK-- Ed.

8462: SVU, Athinai R., Greece w/Telex to J4VI, the Greek cargo ship Anthos. Was ARQ at 2119 (Ed.).

8530.3: Un-ID USN w/very quick brown foxes at 0642, 850/75R (Ed.).

8552: UXX, Arkhangelsk R., USSR idling in ARQ w/CW ID at 1304 (Ed.).

8581.7: NBTM, USCGC Polar Star (WAGB-10) w/unclass tfc at 0650 to COMPACAREACOGARD (Commander, Pacific Area Coast Guard), 170/75R. This is an icebreaker stationed in Seattle (Ed.).

8592.5: CCS, Santiago Navrad, Chile w/5L tfc at 0702, 850/100R (Ed.).

8683.5: LFB2, Rogaland R., Norway w/ARQ phasing sig & CW ID marker at 1254 (Ed.).

9044: GHH, Jamestown Meteo, St. Helena w/RYRY & wx at 0240, 425/50N (Hetherington, FL).

9050.3: Un-ID USN w/very quick brown foxes at 0332, 850/75R (Ed.).

9072.1: ZEN40, AFP Cape D'aguliar, Hong Kong w/RYRY & nx in FF at 1100, 425/50R (Hetherington, FL).

9124: 3WM38, VNA Hanoi, Vietnam w/RYRY + 3WM38/9124.0 KHS ZHC?. Was 520/45R at 1045, w/nx 1100-1200. Hanoi has finally adopted a standard ITU call sign! (Hetherington, FL). Or they got rid of the op who couldn't remember what the ITU call sign was-- Ed.

9154: D4B, Sal Aero, Cape Verde w/coded wx at 0155, 850/50N (Alexander, PA).

9193: RPITH, Portuguese Navrad, Horta, Azores w/RYRY & foxes at 1100, 850/50N (Hetherington).

9230: VHM, Darwin Navrad, Australia w/"RYR standard test de Navcommsta Darwin/VHM" & foxes at 2100, 850/75R (Hetherington, FL).

9252: ELRB, Monrovia Aero, Liberia w/RYRY at 0725, 50R (Webb, CA). The RB in ELRB stands for Roberts Field at Monrovia-- Ed.

10120: RG124, TASS Moscow, USSR w/RYRY at 1717, 425/50R (Ed.).

10125: OLG3, PTT Prague, Czechoslovakia w/OLG3 Praha testing for Tirona & RYRY, 425/50R at 1459. Short while later sent FF tfc re xmsns between Tirona & Barcelona (Ed.).

10213: CNM29, MAP Rabat, Morocco w/nx in FF at 1725, 425/50R (Ed.).

10225.7: KNY29, Egyptian embassy, Washington, DC w/5L tfc in ARQ at 1914 (Ed.).

10440: Y3A5, Berlin R., GDR w/Telexes to Damascus, Syria. ID's itself in Telexes as BNDM, while circuit ID for Damascus (which isn't on this freq) is DMBN. Another ID used here was DAMAS DE BLN (Damascus this is Berlin). Was 425/50N at 1410 (Ed.).

10584: RFFAB, French defense ministry, Paris w/"non pratege" tfc in FF at 0217, 425/50N (Ed.).

10880: REM50, TASS Moscow, USSR w/nx in EE at 1649, 425/50R (Ed.).

10919.5: Y2V22B, ADN Berlin, GDR w/nx in AA at 1710, 425/50N (Ed.).

10920.5: Y2V22A, ADN Berlin, GDR w/nx in EE at 1709, 425/50N (Ed.).

11006.9: AP & UPI nx in EE from AFRTS, FDM 85/50R at 1843 (Ed.).

11010.9-11012.9: ZLO, Iritangi Navrad, New Zealand sending foxes w/o ID, xmsn on 8 freqs, all 170/75N at 1308. At 1315 an 11012.3 began clog CKN (Ed.).

11014.5: SUU, Cairo Meteo, Egypt w/coded wx at 1917, 425/50R (Ed.).

11023.1: A9C, an un-ID French mil unit w/tfc in FF or 5L grps at 1353, 425/75N. Shuts down xmt between msgs (Ed.).

11027.5: 9PL, Kinshasa Aero, Zaire w/coded wx at 2336, 425/50N (Ed.).

11069.8: LOR, Puerto Belgrano Navrad, Argentina w/notices to mariners at 2208, 170/75N (Ed.).

11080: SANA Damascus, Syria w/nx in AA at 1257 & 1419, 700/50R (Ed.).

11110: LZG2, BTA Sofia, Bulgaria w/nx in FF at 1332, 425/50R (Ed.).

11423.5: SPW, Warsaw R., Poland w/telegrams in

# HAM RADIO IS FUN!

It's even more fun for beginners now that they can operate voice and link computers just as soon as they obtain their Novice license. You can talk to hams all over the world when conditions permit, then switch to a repeater for local coverage, perhaps using a transceiver in your car or handheld unit.



Your passport to ham radio adventure is TUNE-IN THE WORLD WITH HAM RADIO. The book tells what you need to know in order to pass your Novice exam. Two cassettes teach the code quickly and easily.

Enclosed is my check or money order for \$15.00 or charge my  
 VISA  Mastercard  Am. Express  
 Signature \_\_\_\_\_  
 Acct. No. \_\_\_\_\_  
 Good from \_\_\_\_\_ Expires \_\_\_\_\_  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 \_\_\_\_\_  
 City State Zip

**THE AMERICAN RADIO RELAY LEAGUE**  
 225 MAIN ST.  
 NEWINGTON, CT 06111

Polish to ships at 1314, ARQ. Paired freq was 12521.5 kHz (Ed.).

11459: Test tape was YRYR & "RT-U6 OR-U6 ARQ" at 2010, 425/50N. Had tape not been running in reverse it would have read Y7A49 Y7A58 RYRY. Was Y7A49, MFA Berlin, GDR (Ed.).

11520.3: RCR77, Khabarovsk Meteo, USSR w/coded wx at 0030, 1050/50N (Ed.).

11608.5: CCS, Santiago Navrad, Chile w/msg in SS to a warship, TDM 170/96A at 2344 (Ed.).

12079: JANA, Tripoli, Lybia w/nx in AA at 1335, 425/50N (Ed.).

12509.5: UEWE, a Soviet general cargo ship, Gamal Abdel Nasser w/telegrams in ARQ at 2220 (Ed.).

13075: HPP, Panama R., Panama w/Telexes in ARQ to ships (Ed.).

13375: KNY23, Czech embassy, Washington, DC w/nx in Czech at 1623-1627. At 1635-1640 sent RYRY w/o ID, then CQ CQ DE RCF (MFA Moscow) w/RYRY, then QRU SK at 1643. Czech embassy at Mexico City came on at 1657 w/5F tfc to Prague & 2 rpts before going off at 1704. All stations used 425/50N (Ed.).

13648: OLI5, CTK Prague, Czechoslovakia w/nx in FF at 1537, 425/50R (Ed.).

13673: 6VU73, Dakar Meteo, Senegal w/coded wx at 2009 & 2044, 425/50N. A FAX chart was sent between the 2 RTTY xmsns (Ed.).

13737: 5YD, Nairobi Aero, Kenya w/aero wx at 1925, 425/50N (Ed.).

14638: Nx in EE at 2041, 425/75N (Anderson, BC). It's WFK54, USIA in New York-- Ed.

14642.9: CLP1, MFA Havana, Cuba w/Prensaminex nx in SS at 1614, 425/50N (Ed.).

14719: OST58, Oostende R., Belgium w/OST Mailbox in FEC at 1913. Was //7776.5 & 19013.5 kHz (Ed.).

14813: Un-ID w/5F tfc 1343-1346, 500/75N. May be MFA Havana (Dallas Williams, CO). How about a photo of your remodelled station?-- Ed.

14938: Un-ID w/very quick brown foxes, 850/75R at 2042 (Anderson, BC). It's a USN star-- Ed.

15550: RFLI, French Navrad, Fort de France, Martinique w/"contrôle de voie" at 2142, TDM 850/76A (Ed.).

15602: KNY23, Czech embassy, Washington, DC w/5F msg, then tfc & CTK nx in Serbo-Croat at 1648, 425/75N. Logged the following day at 1557 on 16704 (Williams, CO).

15873: RFFA, Defense Ministry, Paris, France w/"non protege" mgs in FF at 1540, 425/75R (Ed.).

15967: CLP1, MFA Havana, Cuba w/"relacion esp para Angola" followed by ZZZZZ & crypto, 425/50N at 1544 (Ed.).

16090: NMN, USCG Boston, MA telling ZRH "comms no joy today an either 18 or 15 mcs..." Was 850/75R at 1314 (Williams, CO).

16117: 6VK317, PANA Dakar, Senegal w/nx pooled from SHIHATA in EE at 1351, 425/50R (Williams, CO). SHIHATA is the nx center in Tanzania-- Ed.

16132: RBI72, APN Moscow, USSR w/nx in PP at 1948, 425/50N (Alexander, PA).

16666: NJAX, USNS Redstone (T-AGM 20) w/Unclos Milstrip Document to DAAS Dayton via

NMF in ARQ at 1902. DAAS means Defense Automatic Addressing System. The Redstone is a tongue instrumentation ship (Ed.).

17201: FFT81, St. Lys R., France w/tfc list in FEC at 1500 (Ed.).

17398: OMZ, MFA Prague, Czechoslovakia w/msg in EE from the Int'l. Union of Students in Prague, also mgs in Czech at 1450, 425/75N (Ed.).

17412: WWD, NOAA LaJolla, CA sending RYRY w/o ID at 1652. Gave ID when sta shifted to USB mode at 1656 on 17408.5. Then sent FAX wx charts at 1659 on 17410.5 (Ed.).

17414.3: Un-ID w/RYRY & short crypto msg after VCV... was 630/75N at 1613 (Ed.).

17415: ADN Berlin, GDR w/nx in GG at 1443, 425/50N (Ed.).

17421.5: MFA Madrid, Spain w/nx & spots in SS at 1527, ARQ. Switches to 210/50R RTTY for business nx. Signs copy either MAEXT or Madrid Exteriores. Sends 5L tfc at 1448 to the Spanish embassy at Managua, Nicaragua (Ed.).

17426: CPA6, Portishead R., England idling in ARQ at 1609, ID in CW (Ed.).

17472: RPFN, Lisbon Navrad, Portugal w/RYRY & foxes, 850/50R at 1506 (Ed.).

17498.5: Un-ID idling in ARQ, 1418-1422, then sent SRI HAI FINITO?? OK HR AS. Then at 1438 sent QSL FIND AT 47 QRU KAPPA CIAO before leaving the air. Any guesses? (Ed.).

17504.1: Un-ID w/5F tfc & one in RR at 1520, 425/75N (Ed.).

17548.4: CSY, Santa Maria Aero, Azores w/aero wx for Tunisia towns at 1648, 50R (Ed.).

17585.1: ZPK, Asuncion R., Paraguay sending RYRY/SGSG to NBA at 1900, 75R (Ed.).

17921.5: MFA Madrid, Spain using this aero mobile freq to send circulars in SS via ARQ mode to embassies in Nicaragua & Mozambique at 1526 (Ed.).

18047: Possibly MFA Belgrade, Yugoslavia (logged around here previously) w/crypto after XYXY... also 3F mgs. Was 425/75N at 1503 (Ed.).

18124: A Polish diplo post somewhere ending nx xmsn in Polish at 1451, was 425/50N. S/off w/"OK tks fon 2230 GMT QSS 18 OK tks QRX hijuro SK OK 66/557 tks SK" (Ed.).

18164.6: STK, Khartoum Aero, Sudan w/this msg in 425/50R at 1507: "Overflit perm granted for BKT244/45/L1011 CAI/MBA and VV or days 3/4." L1011 is the a/c type, CAI/MBA means Cairo/Mombasa, while VV means vice versa (Ed.).

18215: Nx in SS at 1823, 425/75N (Anderson, BC). This one's the VOA in Greenville, NC (Ed.).

18221: CNM76X9, MAP Rabat, Morocco w/RYRY & lang/freq sked at 1518, 425/50R (Ed.).

18230: GFL25, Bracknell Meteo, England w/coded wx at 1526, 425/50R (Ed.).

18263.2: HBD20, MFA Berne, Switzerland w/nx in FF, ARQ at 1435 (Ed.).

18270.5: HBD20, (ditto) giving s/off at 1512 in ARQ (Ed.).

19641: Un-ID w/RYRY at 1813, 425/45N (J.M., KY). Because of the 45 baud, I'd guess this is MFA Havana-- Ed.

19550: Un-ID w/UPO call + RYRY & foxes, 425/50N at 0905 (Love, FRG). Similar logging on 8132 kHz-- Ed.

20724.1: CLP1, MFA Havana, Cuba w/crypto after ZZZZZ, a msg in SS & RYRY, 425/50R at 1718 (Ed.).

20828.1: CLP1, (ditto) w/crypto after ZZZZZ, 425/50N at 1853 (Ed.).

22197.5: CBRB, the Chilean cargo ship Rubens giving s/off to CBV, Valparaiso R., Chile at 1545, ARQ (Ed.).

#### FAX Loggings

(All FAX loggings by the RTTY columnist.)

2122: NPM, USN Pearl Harbor, HI w/wx charts at 0950, 120/576.

4202.5: RAT21, Moscow Meteo, USSR at 2221. Reception too poor for copy.

5785: NGR, USN Kato Sali, Greece w/500MB wx chart at 0405, 120/576.

9157.5: WLO, Mobile R., AL caught at s/off of FAX at 0925.

10117: BAF4, Beijing Meteo, PRC w/wx chart at 2035, 120/576.

10535: CFH, Canadian Forces, Halifax, NS w/wx charts at 2015, 120/576. Now we know why they called the city HaliFAX!

10682: LRN2, DyN Buenos Aires, Argentina w/nx pix at 2246, 60/288.

11030: AXM34, Canberra Meteo, Australia w/wx charts at 1434, 120/576.

11087: GFA24, Bracknell Meteo, England w/wx charts at 1616, 120/576.

11476: No chance to ID this one because it gets blasted by the CW marker of KKN44 at 11474. Was sending something in FAX 0040-0058 then s/off.

11480: RNT70, Irkutsk Meteo, USSR w/wx charts at 0200, 120/576.

13510: CFH, Canadian Forces, Halifax, NS w/wx charts at 1421, 120/576.

14692.5: JM14, Tokyo Meteo, Japan w/wx charts at 2105, 120/576.

17585: AOK, USN Rota, Spain w/wx charts at 1639, 120/576.

18261: GFE24, Bracknell Meteo, England w/wx chart at 1545, 120/576.

## THE SHORTWAVE PROPAGATION HANDBOOK Second Edition

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and  
Theodore J. Cohen, N4XX

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## "Digitized Weather Consoles"

**T**ornados, droughts, hurricanes, wind-storms, and blizzards—these severe weather conditions will always create a need for emergency communications. If you are involved in civil defense, the amateur radio ARES service, REACT, or head up an emergency communications center, you could use all the warning you could get in order to mobilize your emergency communications teams. A reliable and accurate weather console should be an integral part of your emergency communications station.

Recent developments in sophisticated weather station instrumentation now give us digitized weather consoles within our price range. In the past, an elaborate weather station console could run as much as \$10,000—but now they are well below \$1,000!

Here is what the modern weather console should read out in one large simultaneous display:

- Wind speed
- Wind direction
- Indoor temperature
- Wind chill
- Outdoor temperature
- Barometric pressure
- Rising/falling indicator for temp and pressure
- Time
- Humidity
- Rainfall amount
- Wind speed/temp/pressure min/max alarms
- Wind gusts

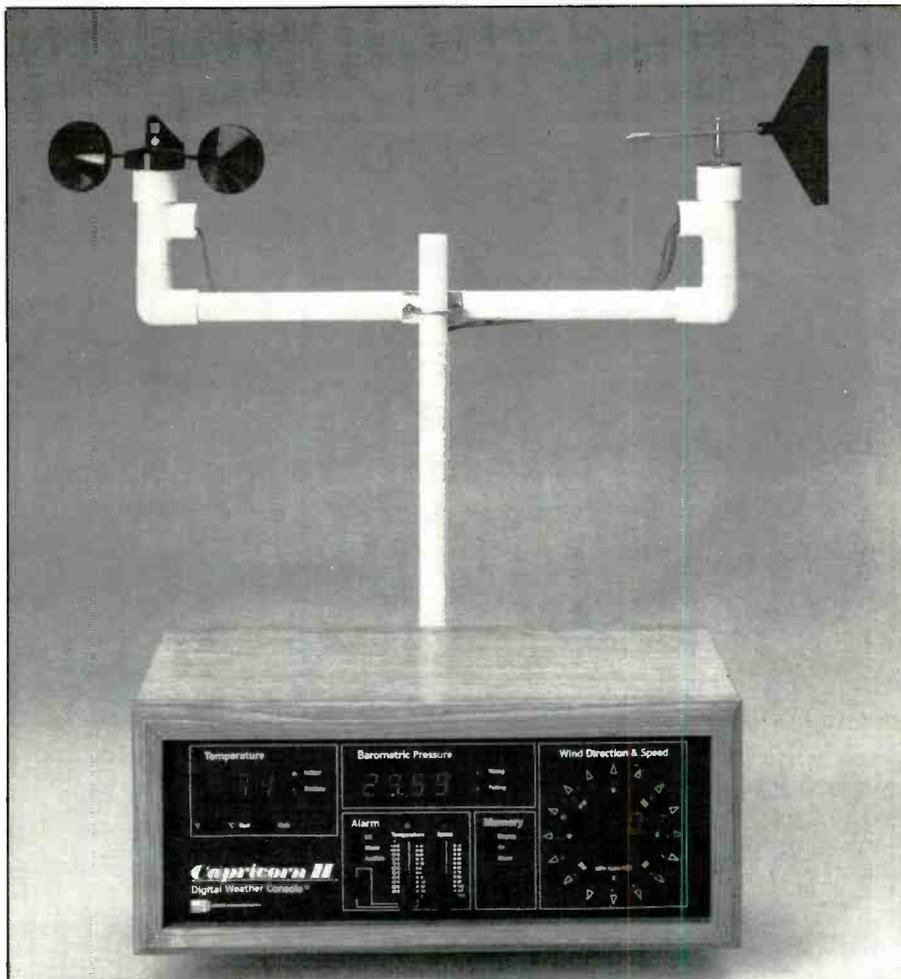
Two systems that I have reviewed have many of these features. The Heathkit digital weather computer, Model 4001, is probably best known for its capabilities and ruby red readouts. (Heathkit, Heath Company, Benton Harbor, Michigan 49022) In kit form, their weather console is \$400, and requires about a month's worth of evenings to assemble. Instructions are straight-forward.

Heathkit also offers the following "separates" in kit form for about \$100 each:

- Digital rain gauge
- Air moisture
- Wind speed and wind direction
- Inside and outside thermometer

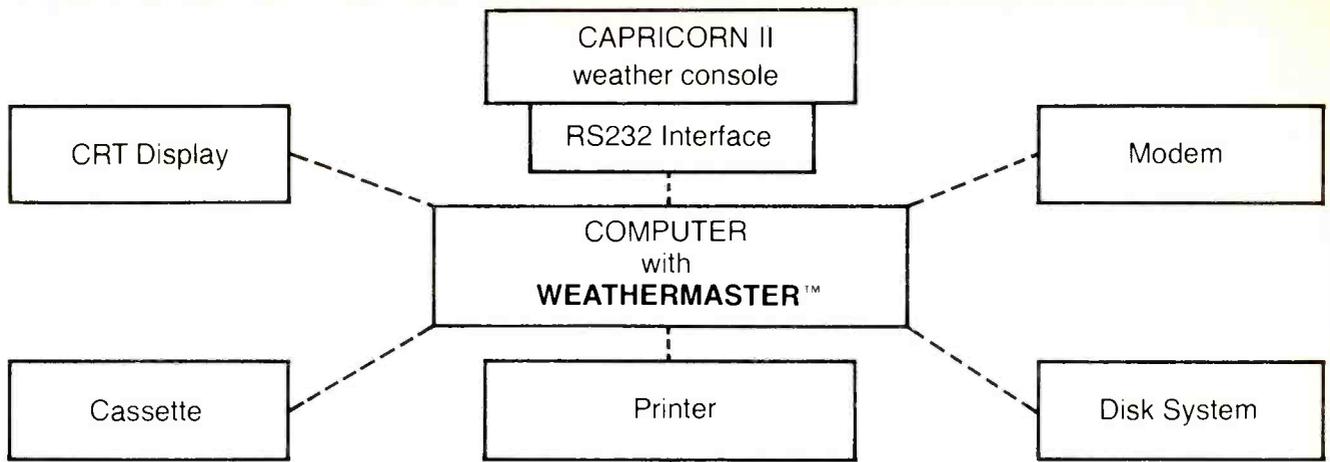
Heathkit also offers a dial-type of weather console that sells for about \$170 in kit form, Model IDA-1290. It's functional, but looks like the instrumentation of a 1954 T-Bird.

Heath's latest entry is their new ID-5001 futuristic LCD advanced weather computer



```

CAPRICORN II WEATHER REPORT    11-02-1986    22:05:35
Indoor Temperature..... 71.4 DEG F
Outdoor Temperature..... 72.6 DEG F
Wind Chill Temperature..... 69.4 DEG F
High Temperature..... 73.0 DEG F
Low Temperature..... 71.6 DEG F
Wind Direction..... WNW
Wind Speed..... 10 MPH
High Wind Speed..... 16 MPH
Peak Wind Gust..... 18 MPH
Barometric Pressure..... 30.04 IN
High Barometric Pressure... 30.04 IN
Low Barometric Pressure... 30.03 IN
Wind Alarm Status..... *OFF* > 70 MPH
Temperature Alarm Status... *OFF* < 45 DEG F
    
```



### CAPRICORN II Weather Report

```

CAPRICORN II WEATHER REPORT
 02/11/85 10:16:41
TEMPERATURE (DEG F)
  INSIDE..... 75.7
  OUTSIDE..... 60.0
  WIND CHILL..... 58.4
  HIGH..... 60.4
  LOW..... 59.5
WIND (MPH)
  DIRECTION..... SE
  CURRENT SPEED..... 10
  HIGHEST SUSTAINED... 18
  PEAK GUST..... 22
BAROMETRIC PRESSURE (IN)
  CURRENT..... 30.28
  HIGHEST..... 30.38
  LOWEST..... 30.26
--ALARM STATUS--
  WIND *AUDIBLE* > 60 MPH
  TEMP *AUDIBLE* < 32 DEG F
  
```

1355. Their system is called CAPRICORN II, and it's fully assembled, tested, calibrated, and ready to plug in. The massive display is about the largest I've ever seen—and everything reads out simultaneously. Almost all functions are front-panel adjustable, so you can easily set the wind speed alarm, the low temperature alarm, and the low barometric pressure alarm. Outputs on the back also allow these alarms to trigger remote bells, whistles, and even transmitters. The RS-232 output could also drive a computer system, too.

Their \$900 price tag is a bit steep; but when you see the quality of work in their instrument, you can appreciate the fine machine you have. Their outside sensors all operate digitally, which is a refinement over older-style systems requiring micromagnetic relays and miniature wind speed generators that develop microamps of current to drive an analog display.

We also tested the Magnaphase Industries (1502 Pike Street, N.W., Auburn, Washington 98001) weather station, Model TW-2, that reads out single screens of information on a very tiny LCD cube. I found this unit complicated to operate, definitely not user-friendly, and an instruction manual obviously written by an engineer eminently familiar with only his own system.

I also don't like having to scroll through a tiny readout to see the different weather conditions—I would rather take a glance at a big console and see everything. This we have in the Heathkit and Capricorn units.

If you are looking just for wind direction and wind speed, or maybe just inside and outside temperatures with alarms, there are many units on the market under \$100—that will do just this. Computemp (PO Box 944, Columbus, NE 68601) is a dandy little device for time and temperature, and I recently saw they have a new unit that will separately read barometric pressure.



that sells for about \$600 in kit form. Its LCD readout makes it an attractive desk-top weather monitor. An RS-232C serial interface output also allows this system to be integrated into a computer for multiple readouts throughout your emergency commu-

nications facility. You could also microwave this digitized information to other radio stations several miles away.

My latest discovery in weather consoles is from Hinds International, PO Box 929, Hillsborough, Oregon 97123; 503/648-

# PRODUCTS

You can also go to a marine electronics store and purchase sailboat instrumentation that reads out wind speed and wind direction.

But it's only the Heath and Capricorn units that give you that simultaneous read-out of all weather parameters plus a powerful computer to memorize passing weather conditions. Unfortunately, their computers generate RFI, so make sure to keep your communications equipment away from the weather readout console. Same thing with their outside sensors—when the system is playing, a small amount of radio frequency interference is piped up the line and could interfere with a radio receiver antenna mounted on the same cross-arm as the weather sensors. It's also wise to keep transmitting antennas at least 5 feet away from the wind vane and spinning cups because RF from your transmitter could also interfere with the digital readouts down below.

Rising and falling barometric pressure, related to wind direction and wind speed abrupt changes, can tell a trained weather observer a potential life-threatening storm is on the approach. An emergency communications station can transmit valuable weather information to surrounding stations if it has a way of receiving this information on the rooftop. The big weather consoles do this job well, and they should be an integral part of your entire emergency communications command post.

PC



## JG - Wizard Mobile CB Antenna

Jo Gunn Enterprises has designed a new 5 ft. mobile called the Wizard that is the top of its class in mobile antennas. With a power-handling capability of 5000 plus watts, the Wizard can also be co-phased.

This top-loaded, coil-wound mobile has a 3/4" X 24 threaded (standard) and will work in various locations on all types of vehicles.

The Wizard will stand alone in modulation power and performance when tested against the "Top of the Line" mobile antennas on the market.

With a retail price of \$74.00, you may purchase a Wizard through your local Jo Gunn dealer or direct from the company. For more information about the Wizard and other Jo Gunn Products, write: Jo Gunn Enterprises, Rt. 1 - Box 383, Ethelsville, AL 35461 or call (205) 658-2229, or circle number 104 on our reader's service card.

The VR-50 is powered by a rechargeable battery which is maintained at full charge by a photovoltaic solar panel on top of its waterproof floating case. The high-visibility impact-proof case is made of touch plastic with scuba-type "O" rings. It takes up a mere 1/2 cubic foot and measures only 14" x 11" x 6" with a weight of but 16 pounds. The 8-foot telescoping whip antenna stores inside the case when not in use. An internal antenna-tuner which matches the antenna is built into the set. The VR-50 may be used with a wide range of auxiliary antennas.

The remarkable new "around-the-world" radio puts out 50 watts PEP (peak envelope power) on voice and 25 watts on CW (code). The set is crystal controlled for "on the money" tuning on a total of 24 channels in the 1.8 to 17 megahertz short, medium, and long distance bands.

The VR-50 is being offered as a super versatile amateur radio transceiver to transmit in the ham bands.

The VR-50 is manufactured by Vector Radio Company, 3207 Roymar Road, Oceanside, California 92054 and sells for \$1,295.

For more information call: John Duffett, Marketing Director, Vector Radio Company, 3207 Roymar Road, Oceanside, CA 92054, or circle number 107 on our readers' service card.



## For Your TVRO

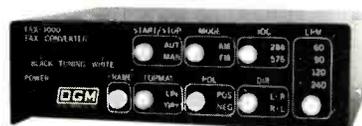
ISS Engineering of Menlo Park, California has announced the availability of Sub-Channel options for their GL2610XT Series II Frequency Agile Modulator and for the GL1000A Frequency Agile Demodulator. The addition of these features affords the user of the GL2610XT Series II the capability of full agility of T-7 through T-14 and 2 through WW, as well as other options offering standard, HRC or IRC. The standard features of the GL2610XT Series II are external pre-emphasis switching for added audio bandwidth for stereo and front panel selection for positive/negative offset.

The options now available for the GL1000A Agile Demodulator include the sub-channel capability, as well as options for separate audio/video outputs or a 4.5 MHz audio output.

For additional information, contact ISS Engineering, Inc., 104 Constitution Dr., #4, Menlo Park, CA 94025, or circle number 106 on our readers' service card.

PC

## Copy FAX Signals with the FAX-1000 Facsimile Converter



- Allows you to print out facsimile photos and weather charts on your Epson graphics compatible dot matrix printer.
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- Copies both AM (Satellite) and FM (HF) facsimile signals.
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## Radio For Sailors

Yachtsmen who are hams, long-distance sailors, cruisers, ocean racers, commercial fishermen, and boatmen who want guaranteed survival communications in the event of emergencies have been waiting decades for the appearance of something like the new VECTOR RADIO VR-50 transceiver.

More compact, powerful, and versatile than even the "spy radios" of World War II, the unit is capable of world-wide high-frequency, single-sideband communications in the amateur, marine, aircraft, and emergency rescue bands. The VR-50 is distinctly on the leading edge of self-contained portable high-frequency radio technology and boasts a long list of features that would make a sea-going James Bond envious.

## 27 MHz COMMUNICATIONS ACTIVITIES

**W**e were pleasantly surprised when the Parcel Post truck pulled up and the man carried out a large carton from Radio Shack. Inside the box was one of their TRC-453 AM/SSB transceivers for our perusal. Here's an attractive and sturdy unit that's got a full crew of desirable ingredients for AM/SSB operation.

I especially like the large LED channel display, and the well separated man-sized panel knobs, plus the fact that the clarifier control is at the end of a bank of front panel controls. Inasmuch as the clarifier control may require some amount of adjustment during SSB operation, it's good that in a mobile rig, that knob is easily locatable without requiring you to take your view from the road.

Another nice feature is the combo automatic noise limiter (ANL) and noise blanker (NB). The ANL is intended for reducing impulse type noise, while the NB does its best work on ignition noise. Some rigs have only one type of circuit, but with both types operating hand-in-hand in the TRC-453, the noise reduction is most effective.

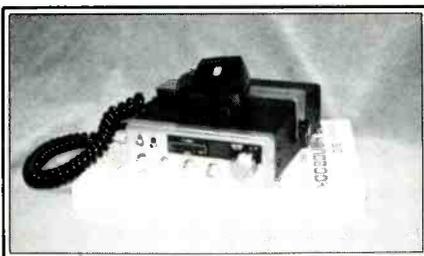
The other features are basic—built-in PA, external speaker jack, RF gain control, squelch, removable mike, combo transmit/receive power meter, 12 VDC operation. The receiver sensitivity is rated at 1/2- $\mu$ V on AM, 1/4- $\mu$ V for SSB. Sensitivity for 10 dB S/N is 1/2  $\mu$ V or better on AM, 1/4  $\mu$ V or better on SSB. Adjacent channel selectivity is 70 dB in both modes. The mike is a 600 ohm dynamic type. The set weighs 2 1/2 lbs; is about 6" by 2" by 7 1/2" in size. It comes packed with mounting brackets.

When mounted 'neath the dashboard, hooked to the center loaded whip on my pickup truck, the TRC-453 functioned well. Had good ears and adequate talk power. It's convenient to operate, and looks good to the bargain. An all-around winner in every respect.

### From The Mailbag

Nice station photo arrived from Eddy Methof of Dalhousie, New Brunswick. Eddy has been active on the band for ten years and he's running a Realistic TRC-30A Navajo. He monitors Channels 3 and 7 and uses the handle *Snowman*. Says he's in an area with a high noise level due to static electricity in the atmosphere. When not monitoring the channels, Eddy says he reads *POP COMM*. That's the kind of news we like!

A letter from Leonard M. Lykens, President of the Harrisburg Emergency League of Pennsylvania (HELP), advises that his group is an independent local Channel 9 monitoring activity. Leonard would like to see us provide continuing and expanded coverage of Channel 9 emergency monitor-



Radio Shack's exciting TRC-453 AM/SSB mobile transceiver.

ing efforts and groups. Right on, Leonard, we'll run as much as our readers furnish for publication in these pages. In the mean time, those in the Harrisburg (PA) area who might be interested in HELP, can contact the group at P.O. Box 4024, Harrisburg, PA 17111.

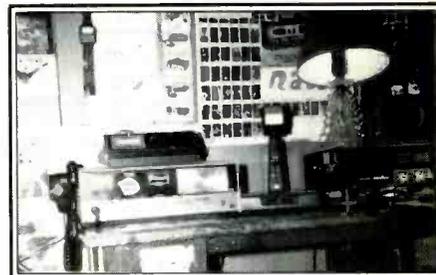
Christopher C. Rendenna, KB2BBW, of Rutherford, NJ writes to say that back in 1983, he was flipping through the SSB frequencies looking for some of his local area pals, when suddenly he hit on some chatter that he couldn't clarify. He realized that the stations weren't using the usual LSB mode, so he switched over to USB and was greeted with two very loud signals that sounded like they were from his hometown. Turned out to be a station in South Africa chatting with an operator in Qatar in the Persian Gulf! Chris sent them both reception reports, but only the station in South West Africa sent back a QSL.

Another nifty QSL was received from the Rhein Main Sidebanders (West Germany), via Pat (RMS-245 and SSB-349A) and Jerry (RMS-1 also SSB-0A81). Pat says that he's willing to swap QSL's with any of our readers. Write to Pat at 5330 Goshen Rd., Ft. Wayne, IN 46818.

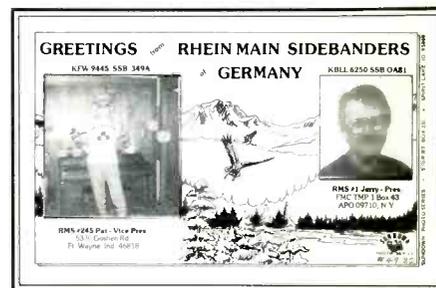
### Paperwork

Medicine Man CB, P.O. Box 37, Clarks-ville, AR 72830 forwarded a copy of their book *CB Tricks of The Trade* which they are now offering for \$19.95. This is an 88 page publication that covers a number of technical and semi-technical topics relating to CB equipment, but is primarily interesting for the information it offers on peaking the power output of various CB transceivers. Other similar modifications are also discussed and explained.

*The World of CB Radio* is a book by Mark Long, Albert Houston, and Jeffrey Keating; it's the recently issued rendition of their book that was previously titled *The Big Dummy's Guide to CB Radio*. It's a very basic introduction to CB, well written but a little too cutesy and glib in spots for some tastes. It seems to be written with the rank



Eddy, a/k/a Snowman, in New Brunswick operates this station.



Two ops belonging to the Rhein Mein Sidebanders, Pat (RMS-245/SSB-349A) and Jerry (RMS-1/SSB-0A81) send out this attractive QSL.

newcomer in mind, the guy who just can't wait to get on the air and call everybody a *cottonpicker*. This book is \$9.95. It comes from The Book Publishing Company, Summertown, TN.

### Advice Dept.

All too few operators seem to pay attention to microphone technique. When trying to speak to someone in person that's hearing impaired, the tendency is to continue to speak louder and louder until such time as the message is finally understood. I suppose that's why, when trying to get a message through during difficult radio conditions, many operators begin yelling and shouting in the hopes that the other station will finally understand the message. While the concept may be extremely effective when talking to Grandpa across the dinner table, it's not a great radio technique.

Just because you're speaking very loudly into a CB microphone, doesn't necessarily mean that the receiving station is going to copy your transmission with any greater ease. Most AM and SSB rigs are designed to offer maximum efficiency when the operator is speaking at a "normal" conversational level. While shouting into the mike may serve to distort the voice, there isn't any evidence that it results in any significant ability to get a message through a busy channel, to

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E. O. Robinson  
P.O. Box 602  
Tsumeb  
9260  
S.W.A./Namibia



Call sign ZRWW **3591** Handle **Goofy**

Confirming QSO date **9/1/83** Time **17:35** Chan **SA Time**

Mobile  Base  AM  LSB  USB

Readability \_\_\_\_\_ Signal strength \_\_\_\_\_

Power \_\_\_\_\_ watts My Box No. \_\_\_\_\_

My Rig \_\_\_\_\_ My Antenna **RUANT**

This QSL from South West Africa was received for DX reception by Chris Rendena, in New Jersey.

a station suffering from a high noise level, or to one that is out of range.

Jim, SSB-9, one of the SSB Network's HQ crew, passes along some helpful hints for getting that message through with maximum intelligence transfer (regardless of whether you're using AM or SSB mode):

1. Prior to keying up the mike, check the frequency to make certain that interference from other stations is either absent or at a minimum.
2. Speak with the microphone about an inch from your mouth.
3. Speak distinctly and clearly, using a normal conversational tone.
4. Speak at a rate of speech less than 100 words per minute. If you expect that the other operator is writing down what you're saying, speak slower and repeat important words or numbers.
5. Speak at a constant volume.
6. Use standard international phonetics to spell out uncommon words or names.
7. Pause slightly before and after all numbers in order to make them easier to copy.
8. Don't fill in the gaps with sounds such as "errr" or "ahhh."
9. If the other operator doesn't normally speak English, avoid CB lingo and jargon, or any colloquialisms. Use standard words and codes.

10. If you feel that you need more "talk power" than your rig offers, consider getting a speech compressor, and/or an antenna offering more gain than the one you are presently using. Even raising the height of your present antenna may help, so will switching from AM mode to SSB mode.

11. Avoid whistling or blowing into the mike. Don't use echo chambers or poorly adjusted power mikes.

Let's hear from you. Got a station photo or QSL card?

PC

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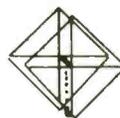
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CW break-in circuit board, with all mode power level control

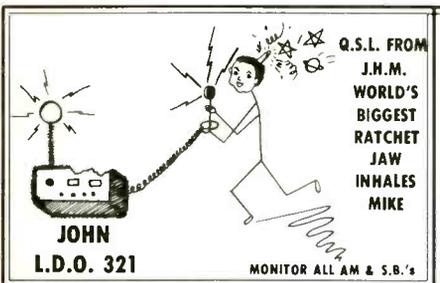
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John H. Miller, Sellersville, PA designed this clever personalized QSL card. He's known as SSB-321C in the SSB Network, also LDO-321.

# BROADCAST TOPIX

BY MARK MANUCY, W3GMG

## DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

A few months ago, we were talking about formats. From Radio City Music Hall Productions, I received a photocopy of the front page of a report produced by R&R Ratings Report listing the fifteen most popular formats in America. This company rates stations in markets across the country and then combines this information to arrive at national formats which are the favorites:

- Adult Contemporary 21.7% A/C
- Contemporary Hit Radio 18.8% CHR
- Country 12.9% Ctry
- Album Oriented Rock 11.8% AOR
- Beautiful Music/Easy Listening 10.0% BM/Easy
- Urban Contemporary 8.2% UC
- News/Talk 5.7% N/T
- Gold 4.7% (Oldies)
- Big Band 1.7% BBnd
- Spanish 1.4% Span
- Religious/Contemporary Christian .8% Rel/CC
- Classical .7% Clas
- Miscellaneous .6%
- Alternative Adult .2% AA
- Jazz .1%

The date of the report is Spring 1987, but that is not as important as the figures. I'm not a radio programmer, but, comparing the number of religious stations to the number of classical stations, for a one-tenth difference in audience, is very interesting. It would appear that regardless of the audience, the religious station is able to bring in money. As a matter of fact, I have heard advertisements on religious stations operating in the non-commercial part of the FM band. Jack Belck also sent a card saying the educational FM band has been wrecked by educators programming rock and bible, the same fare available on the commercial band. "Return it to educational and cultural programming," says Jack!

A lot of the educators operating in this band are church related schools and colleges, hence the overpopulation of bible outlets. Some may be using the radio to support the school by getting "donations" just as the public stations do several times a year. Not all, but I wouldn't be surprised to find some even charging the evangelists they have on for the airtime. It's a cheap format to run and the evangelists apparently are getting support from their listeners so why shouldn't the station get part of the take? Does it matter that they are licensed as an educational station? Is religious education what the FCC had in mind? What about other religions, why are they not represented on the air as much as the Christians, or are the "christians" using radio just to make money?



The ham shack and monitoring post of Bill Wolverton "K17F".

It amazes me the number of us that like the same things. A letter from Bill Wolverton reminded me of the things I have enjoyed over the years. He became involved with electronics as a teenager and got his novice license then. Operating with 75 watts and CW only station with an "WN" call. Having a ball DX'ing the AM band and building his station. Complaining he couldn't stay up all night to listen to the radio trying to log those evasive stations. The fun many of us have had over the years. Some frustration as well. I learned the hard way back in the early fifties that a lightning arrester designed to protect a receiver cannot be used with even a 50 watt transmitter. Many CQ's later, I said that the only thing I haven't tried is to remove that arrester . . . instant success! Bill's transmitting shack is currently at the University, but you can see a Sony ICF 2010 on the top shelf. He says it's the best little radio he's ever owned. I could argue that, Bill, but I also know you're not listening to it next to that video monitor!

### AM Stereo

David Evans is another AM DX'er that enjoys AM stereo. He says a few years ago in Montreal there were three stereo stations. CBF carried the Montreal Canadians from



The old "Westward Ho" Hotel, in Phoenix, AZ, at one time might have carried an old AM station. Now, it supports many utility and public service VHF and UHF antennas.

the Forum in stereo! "If one closed his eyes, he felt as if he was sitting right beside the rink", says David. "It was overwhelming—better than anything I have ever heard on FM." Things have gone downhill since the "good ol' days" and only CJAD is left, but they have a fabulous sound. David feels alone, not knowing anyone else who has an AM stereo receiver, or more disappointingly, having never heard it!

Leonard Kahn couldn't agree with you more David. Just when it appeared as the battle was over, Mr. Kahn had not yet begun to fight. He has filed with the patent office an apparent violation of one of his AM stereo patents by Motorola. He has also made note of this to the FCC. However, the big news for us is that he has made public a letter from



## Station Update

Call	Location	Freq	Pwr	Ant
<b>AM</b>				
KERI	Wasco, CA	1180	10/10	DA-2
WPGC	Morningside, MD	1580	50/.5	DA-2
<b>FM</b>				
NEW	Chevak, AK	88.1	.152	75'
KXMS	Joplin, MO	88.7	10	185'
NEW	Chillicothe, OH	89.3	2.5	350'
NEW	Salina, KS	89.5	100	825'
NEW	Lubbock, TX	90.1	.638	879'
NEW	Brainerd, MN	90.7	34.2	679'
NEW	Russellville, AR	91.9	.1	-92'
KATF	Dubuque, IA	92.9	100	1000'
KGLS	Pratt, KS	93.1	100	1040'
KSJM	Jamestown, ND	93.3	57	255'
WTPA	Mechanicsburg, PA	93.5	.83	623'
WXRZ	Corinth, MS	94.3	3.0	300'
KHCR	Paauiilo, HI	95.9	100	1211'
NEW	Oswego, NY	96.7	3.0	328'
KSHR-FM	Coquille, OR	97.3	61	857'
KVOQ	Lorenzo, TX	98.1	50	435'
NEW	Laurel, MS	98.1	3.0	328'
KLTD	Lampasas, TX	99.1	100	1500'
NEW	Van Buren, IN	99.3	3.0	328'
NEW	Coalinga, CA	100.1	3.0	-312'
NEW	Buckhannon, WV	101.3	50	1614'
KLTE	Oklahoma City, OK	101.9	100	1387'
KSDM	International Falls, MN		104.1	8.5158'
WHOB	Nashua, NH	106.3	3.0	328'
KGTW	Ketchikan, AK	106.7	4.0	-308'
WZMM-FM	Wheeling, WV	107.5	16	879'
NEW	Skowhegan, ME	107.9	1.4	416'

Key: D = Daytime, N = Nighttime, DA = Directional Antenna, DA1 = Same Pattern Day and Night, DA2 = Different Pattern/Power Day/Night, NDA = Omni Antenna Day and/or Night, \* = Special Operation or Critical Hours, N/C = No Change.

Motorola, to Sony of Japan, in which the council for Motorola tells Sony they cannot use a patent of theirs in the multimode receiver. This is what killed the multimode SRF-A100! The crazy thing is the patent Motorola referred to is apparently the same patent that Kahn says Motorola copied from him! Well, it's not over yet and Kahn keeps things interesting. In the meantime, of course, AM stereo seems to be going down the tubes! Let's hope not!

One last thing David says is CJFT, the Canadian on 530, comes into his QTH regularly and in excellent stereo. He says it's just like the old days when clear channels abounded! David is 450 miles from CJFT so

he hasn't lost his interest in DX'ing, or stereo. Right on, David!

A recent trip to Florida didn't leave me any time to do other than some cursory DX'ing, actually it was more like band scanning. That was in November, but I was back in January and although I haven't left yet, as I write this, I will have, or rather will take some time, to do some hunting around when I return. The company I'm with has recently purchased the Florida Network, a group of some fifty plus stations. In January, we have to move the network studios from WKIS, to a separate facility. We will be upgrading to a 1990's operation as we make this move so I should have what I hope will

be some very interesting reading for you this summer, some photos as well.

I'm sure some of the other editors of POP'COMM get letters from outside the states, I regularly receive mail from Australia, South America, Mexico, Europe and Africa is one of the most popular areas for POP'COMM AND Broadcast Topix. This month a letter comes from Bob Edwards who is a retired broadcaster still helping out part-time. Seems once it's in your blood... kinda like getting Florida sand in your shoes! And due to the uncertainty of my address in the months ahead I would like to direct my mail to the POP'COMM address so there will be as little delay in the mail as possible. They'll know where I'll be all along.

Other information seen elsewhere in the column this month comes from Tracy Sands. He wants to add his thoughts on the 1600-1700 kHz band to be opened in a few years. Let's hear it for low power broadcasters! With a maximum power of maybe 100 watts they would be true community broadcasters. Tracy wants ten more local channels, such as 1230, 1240, 1340, 1400, 1450 and 1490, only with one tenth the power. I don't know how I feel about that Tracy, I listen to our local channels now and realize at night 1000 watts has a radius of about five miles and yet the local FM (class A) channels may have a radius of twenty miles or four times as much and feel disappointment. The band is so chopped up now, why do we want to have many more cutting into the numbers. It is very difficult for the small operator to make a living now, to add more competition might cause excessive hardships and make the band even less viable. How many listeners would these community stations have. Is it a case of frustrated people wanting their own radio station? I enjoy a more polished sound from someone who knows what they're doing. There is already enough mediocrity in the world. Let's strive to make the best better! If I had a low power operation what would I do? How many people could I capture playing Bach fugues all day. I'd need a 500 kW station to reach people wanting to hear Bach. They all don't live in a five mile radius of one another.

I've had several experiences lately with certain digital radios that has brought to light some problems that you can experience with the operation of ones which are limited in their front-end performance. Several car units I have used recently have no front end tuning at all, just a wide band amplifier. This presents minimal problems if one is in a low signal area, but once the set is brought in the city high signal environment, then it is goodbye to any DX'ing of even moderately strong signals. This can also be true of expensive communications receivers as well. It is best to try a radio out before it is purchased. If you are purchasing the set from a radio dealer, then he probably has the experience with the BC band as well as the short-waves and can tell you of any problems that might exist between the various manufactu-



## Call Letter Changes

Location	Old	New	Kingston, TN Racine, WI	WBAV WHBT	WTTN WBZN
<b>AM Stations</b>			<b>FM Stations</b>		
Conway, AR	KTOD	KFCA	Troy, AL	WRJM	WALQ
Wray, CO	KRQZ	KRDZ	Twin Falls, ID	New	KAWZ
Pine Castle/Sky Lake, FL	WWLD	WAJL	Salina, KS	KICT	KFRM
Winter Park, FL	WAJL	WPRD	Bay Springs, MS	IY	WIZK-FM
Soperton, GA	WMPZ	WJHH	Aurora, NE	KKBB	KMTY
Bay Springs, MS	WHII	WIZK	Rotterdam, NY	WNYQ	WNYJ
Springfield, MO	KTTS	KGBX	Tulsa, OK	KCFO-FM	KUSO
Springfield, MO	KGBX	KTTS	Lancaster, SC	WPAJ-FM	WRHM
Berlin, NH	New	WIGW	WACO, TX	KHOO	WACO-FM
Nashville, TN	New	WJRR	Racine, WI	WHBT-FM	WBZN-FM

ers. However, when spending several hundreds of dollars on a car radio, the experience level of the dealer, or the radio dealer, is no guarantee a unit will perform in the manner you or I would expect. It has been my experience even in the high end car ra-

dio dealer showroom, that AM radio is a figment of my imagination, and even mention AM stereo, and they are sure to think you're from another world. A set with good FM specs, in this world, does not automatically insure a good AM section. With the anten-

nas the dealers have on these radios in the showroom, it is very difficult to compare the AM sections of the radios. Proceed with caution in spending big bucks on an AM DX'ing radio for the car. Ask some questions and maybe you should insist on a demonstration under more normal circumstances than a showroom rack. After all, there are still many of us that love AM radio and it is no reason we should be treated as an inferior consumer. Our cash is just as green as those who love boom-boxes!

Finally, in an attempt to gain visibility on television, an Ocean City, Maryland, radio station sponsored a scavenger hunt. Part of the requirements was for the listener to produce a video tape of oneself carrying a sign with the radio stations call letters appearing on one of the two local television stations. Great idea? Well, maybe not, it shut down the news operations of both TV stations as goofy listeners tried to get into every news story the stations did, even to the point of trying to break into the stations during newscasts. Many stories were ruined as the news operations had to edit out the crazy antics of people waving silly signs promoting the radio station. In desperation, one TV station announced that listeners could appear as a group at a specific time and all would be seen on the tube.

The radio station said the promotion was a success and had the desired impact. Even though the TV stations had conversations with the radio station expressing concern over the ethics of the contest, how it disrupted the news operation of the TV, they allowed the contest to continue. Maybe the TV station should sponsor a contest to get their call letters on radio. When requests are called in and the jock asked the caller what their favorite station is the caller should shout out, "TV 47!"

To maintain continuity of the mail over the next few months, since my home may be in transit, send all correspondence and photos to me in care of POP'COMM, 76 N. Broadway in Hicksville, NY, 11801. They will forward the material to me with a minimum delay to wherever I might be!

**PC**

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## NEW AND EXCITING TELEPHONE TECHNOLOGY

### *Saving On Those Phone Bills*

**T**here is no doubt about it, every month the phone bill seems to be getting bigger. Also true, is the fact that long distance charges have gone down. It is the local charges that have gone up. There are two components to the phone bill: Fixed costs and variable costs. The fixed costs cover standard monthly payments, such as equipment rental and optional features. Variable costs cover long distance charges, and per time charged services, such as information and repair visits.

The best way to start a program of telephone cost control is grab the last couple of phone bills and read them carefully. Everything you want to know is hidden in there. If you have any questions, phone bill in hand, call the business office. This is usually a free call. Over the years, charges can get put on subscribers accounts and still be charged for long after the need or apparatus is gone. One of the biggest single costs can be equipment rental when the equipment is gone or no longer needed.

Many subscribers are still renting phones from their local phone company or AT&T. This is not a wise practice. The average monthly rental for a phone is about \$1.50 and often substantially more for a Trimline or "Designer" phone. Seeing as a top quality phone costs between \$40 and \$60 and lasts twenty years, there is no economic reason to rent the phone. At the cost of the rental, you could buy the same phone in a little over two years. This means for the rest of the time you are just giving profit to the phone company. When you return a rental phone to AT&T, they will credit you \$5.00 for returning it. The only advantage to renting phones is that they are repaired free. If you use your phone as a hockey puck, renting can make economic sense. Otherwise, it is cheaper to throw the phone away every five years or so and buy a new one. What you should do, is keep it for the twenty year average lifetime and count the savings. To return rental equipment, call the number mentioned on the bill. If the equipment is being charged for, yet no longer exists, or if you no longer live at the address where it was installed, you may experience some trouble getting it cleared from the bill. With perseverance it can be removed. Looking carefully at the bill may also turn up things like outside bells, that were once tacked to the barn and haven't rung in years, yet are still being paid for.

Many subscribers have paid for custom calling features that they have never used. A

quick look at the phone bill will turn up speed calling accounts, touch tone service in houses with only rotary phones, and maybe call forwarding that made sense a couple of years ago. Also, some houses may have a second line, to combat the "teenager on the phone syndrome." It's cheaper to have only one line, so avoid the other line charge, and use the Call Waiting custom calling feature instead.

Since deregulation, the phone company no longer makes free housecalls. Seeing as phones are now modular, and it is legal to do your own phone wiring, housecalls are hardly necessary. If you want "free" housecalls to repair the phone wiring, you can pay the phone company a monthly fee, usually under a dollar. Then again if you are slightly handy and can do your own work, cancel the payments. Usually the only thing that goes wrong with phone lines in the house is animals eat the wire, construction crews cut it, or floods and hurricanes take their toll. So house wiring problems are rare, phones break more often than the house wiring goes bad. Even if you pay the monthly maintenance charge, it does not cover installation or moving of phone jacks. That is paid for by the hour, and it isn't cheap. Should the family gerbil eat through the phone line and you haven't paid the maintenance charge, you can still have the phone company come out and fix it, they will charge by the hour and put the cost on your regular bill.

The variable costs are the hardest to control. They require the cooperation of every user of the phone line. The first cost that can be controlled is charges for using information. In the old days, the phone company would look up as many numbers as you wished. The result of this was the public became spoiled. Rather than reach for the book to look up John Doe, it was easier to go to the phone and dial 411. These days there is a charge for that service. Most phone companies allow a certain number of free calls per month, after that, there is a charge that can be as high as fifty cents per number. The phone company will provide free telephone books, just call the business office and ask for them. For real savings, AT&T puts out an "800 directory", this lists the 800 numbers of companies across the U.S. Don't forget that Long Distance Information calls are also charged.

A major cost can be the "Dial-it" services. These are usually known as 976 numbers, they are notorious as "Dial a Porn." Not all

Dial-it services are pornographic, some offer stock quotes, the weather, etc. The average charge for calling one of these services is \$2.00. What most of these non porn services give you for \$2.00 is less information than you can get for two bits by buying the newspaper.

Long distance is of course a major area for savings. Which long distance company to subscribe to is a difficult question to answer. No two companies set up their rates the same way. Company A may be cheaper than B for a call from Dallas to Chicago, but B may be cheaper from Dallas to New York. So to find the cheapest company you may have to consider where most of your calls are made. The other bugaboo is each company discounts its cheap rates differently. You may find that on a certain route, company A is cheaper in the day, but at night company B is cheaper for the same call. Confusing? There's more! Some companies charge by the minute, some by the six second period, some round up parts of minutes, some round them down. If you do manage to get all this straight, the companies change their rates every month or so, just to keep everyone on their toes. It may seem that through all this mess you should perhaps pick a long distance company for the best quality and service. The old maxim still applies: "You get what you pay for."

There is one sure-fire way to save money on all long distance calls, whoever the carrier is: Make as many calls as possible during the cheap rate times. Usually this is before 8 A.M. any weekday morning, after 11 P.M. any weekday evening. All day Saturday is the cheapest as is Sunday until 5 P.M. The evenings are cheaper, but late night is best. When calling coast to coast, East coasters can call West after 11 P.M. EST and West coasters should call East before 8 A.M. PST. Yes, there are some Californians that are up before 8 A.M. and they are not on their way to bed. Call your long distance company to find out what the cheapest times to call are.

By following the simple guidelines above, you can make some major reductions on your phone bills. There are people who have little more than a suit and some common sense who go round large companies and do similar things. They charge large amounts of money or a percentage of the often quite substantial savings. They make a good living calling themselves "Telecommunications Consultants." Now you know how to be your own consultant.

## INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

### Amateur Satellite Survey

Flash—Moscow—The Soviets announced their plan to launch another 3rd generation multi-transponder Amateur Satellite. Design RS 12/13. The Satellite launch is targeted for late summer or early fall.

**J**ust three years after the launch of Sputnik, the US Amateur Radio community successfully launched its first satellite, Oscar 1, the year was 1961. Since that time, ten US satellites, two English and one Japanese satellite have been launched. The latest US satellite to be launched is Phase III C.

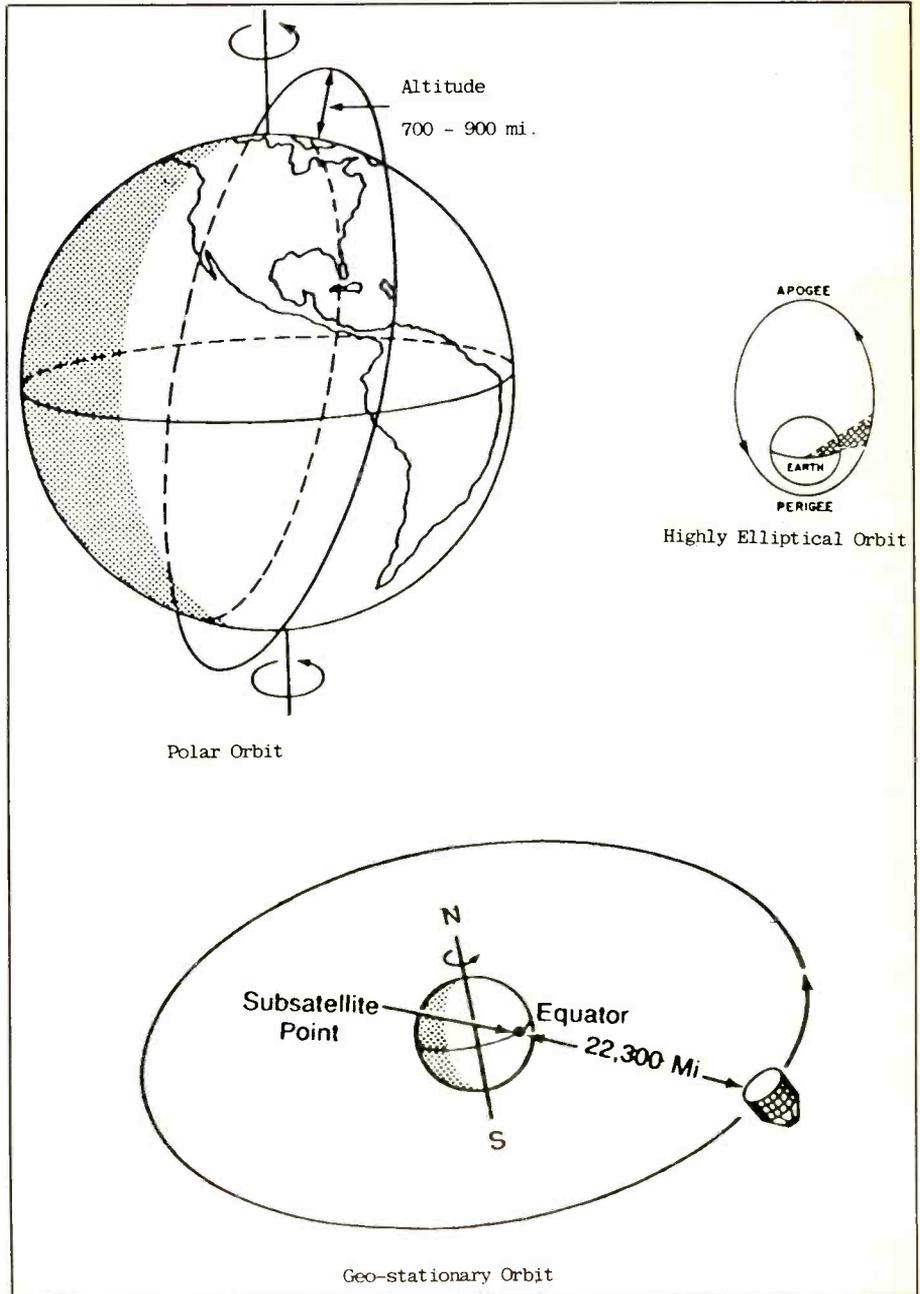
The Soviet Union did not launch its first Amateur Radio satellite until 1978. Since that time, they have launched ten spacecrafts. Four are still operational. This brings the number of operational, international Amateur Radio satellites to nine.

As Amateur satellites use much lower frequency bands than most other types of satellites, they are the easiest to hear. No matter what your specialty; DX'ing, voice, cw, or data communications, Amateur satellites will provide you with many opportunities for each. Whether you are a SWL or a licensed Amateur, these satellites will also provide you with an excellent opportunity to learn about space communication systems and space science in general. Chasing these satellites can even be an interesting way to add to your QSL card collection.

The lowest frequency band regularly used by satellites is 10 meters. The Soviets downlink signals from their satellites between 29.360 to 29.500 MHz. The 145 MHz section of the 2 meter band is one of the busiest satellite bands. It's used for both uplink and downlink by several satellites. 435 MHz is the next busiest band.

As the Amateur satellites operate in the SSB, cw or data modes, you will need a receiver with a BFO to get the most enjoyment from your listening. One exception to this is the UoSat spacecraft which use some FM on their beacons. Most Amateur satellite identification beacons transmit in cw, however, you will be able to identify the spacecraft you are listening to by the frequency you hear it on.

There are two different types of Amateur satellites in orbit, Phase II and Phase III. Phase I satellites were the early experimental spacecraft which maintained a low orbit and carried a radio beacon or experimental transponder. The first four Oscar satellites fell into this category. Phase II satellites are fully operational, low orbit spacecraft. All of the Soviet Union's satellites fit this category.



Current US satellites are Phase III design. These are high altitude multi-transponder satellites.

Our first Phase III satellite is sitting on the bottom of the Atlantic Ocean after a rocket failure in 1983. It never reached orbit. The second attempt to place a Phase II satellite in orbit also had its problems. During launch the discarded second stage of the rocket somehow caught up with the satellite and rammed it. This caused the satellite to occur

an unusual orbit. It also damaged one of the transponders. All of the onboard fuel was lost and the satellite was spinning in the wrong direction. In spite of this, the satellite gave good service for several years. Phase III C, the third satellite and the second to reach orbit, was scheduled for launch in Feb. of 1988. This satellite carries transponders which use the B, J1, J2, L and S modes. These frequency combinations can be seen in the list below.

## Amsat International Satellites

Satellite	downlink	uplink	beacon	mode
Oscar 10	145.825 - 145.975 MHz	435.030 - 435.180 MHz	145.810 MHz B	
Oscar 12	435.800 - 435.900 MHz 435.910 MHz	145.900 - 146.000 MHz 145.850 - 145.910 MHz	435.795 MHz	JA JD
UoSat 9	145.825 MHz 435.025 MHz 2401.000 MHz		7.050 MHz 14.992 MHz 21.002 MHz 29.502 MHz	
UoSat 11	145.825 MHz 435.025 MHz 2401.500 MHz			

## Radio Sputnik 10

downlink	uplink	beacon	mode
29.360 - 29.400 MHz 29.403 (or 29.357) MHz 29.360 - 29.400 MHz 29.403 (or 29.357) MHz 29.360 - 29.400 MHz	145.860 - 145.900 MHz 145.820 MHz 21.160 - 21.200 MHz 21.120 MHz 21.160 - 21.200 MHz 145.860 - 145.900 MHz 21.160 - 21.200 MHz	29.357/.403 MHz  29.357/.403 MHz	A Robot A K Robot K KA
145.860 - 145.900 MHz 29.360 - 29.400 145.860 - 145.900 MHz 145.903 (or 145.857 MHz)	21.160 - 21.200 MHz 21.120 MHz	145.857/.903 MHz	KT T Robot T

## Radio Sputnik 11

downlink	uplink	beacon	mode
29.410 - 29.450 MHz 29.407 (or 29.453) MHz 29.410 - 29.450 MHz 29.403 (or 29.453) MHz 29.410 - 29.450 MHz	145.910 - 145.950 MHz 145.830 MHz 21.210 - 21.250 MHz 21.130 MHz 145.910 - 145.950 MHz 21.210 - 21.250 MHz 21.210 - 21.250 MHz	29.453/.403 MHz  29.403/.453 MHz	A Robot A K Robot K KA
145.910 - 145.950 MHz 29.410 - 29.450 MHz 145.910 - 145.950 MHz 145.907 (or 145.953) MHz	21.210 - 21.250 MHz 21.130 MHz	145.907/.953 MHz	KT T Robot T

## Phase IIIC

downlink	uplink	beacon	mode
145.825 - 145.975 MHz 435.850 - 435.970 MHz 435.850 - 435.970 MHz 435.850 - 435.970 MHz 2400.695 - 2400.725 MHz	435.575 - 435.575 MHz 145.820 - 145.860 MHz 144.440 - 144.480 MHz 1269.325 - 1269.450 MHz 435.610 - 435.640 MHz	145.812 MHz 435.650 MHz	B J1 J2 L S

## Operational Modes

mode	downlink	uplink
A	29 MHz	145 MHz
B	145 MHz	435 MHz
JA/J1 (voice)	435 MHz	145 MHz
JD (data)	435 MHz	145 MHz
J2	435 MHz	144 MHz
JL	435 MHz	145 & 1269 MHz
K	29 MHz	145 MHz
KA	29 MHz	145 & 21 MHz
KT	29 & 145 MHz	145 MHz
L	435 MHz	1269 MHz
S	2400 MHz	435 MHz
T	145 MHz	21 MHz

## Satellite classification

- Phase I - Beacons only.
- Phase II - Beacons and transponders/low orbit.
- Phase III - Beacons and transponders/high orbit.
- Phase IIII - Beacons and transponders/geo-stationary orbit.

## UoSat

The University of Surrey in England built two educational satellites known as UoSat 9 and UoSat 11. They were built for experimentation and education, rather than just voice communication. Both have beacons on 145.825 MHz which are easily heard on a scanner which covers the two meter band. The beacon has a voice synthesizer which transmits in narrow band FM. The spacecraft will identify in FM before it goes into cw and data telemetry modes. Despite the low transmitting power of the satellite (450mW), both spacecraft can be heard when within range of your station. The spacecraft uses the ASCII format for telemetry at 1200 baud. It also carries a camera for imaging experiments.

UoSat 9 carries two other experiments which are of interest. A microwave beacon experiment on 2.4 and 10.4 GHz and a HF propagation study. It consists of 4 HF beacons, one each in the 40, 20, 15, and 10 meter bands. UoSats also have an engineering beacon on 435.025 MHz. UoSat 9's LM can be decoded with a Bell 202 interface.

The second satellite in the UoSat series is UoSat 11. It is much like UoSat 9. There are two main differences. The audio tones in the TLM format are reversed. Both satellites use the same downlink frequency. UoSat 11 is capable of storing messages from a network of ground stations known as gateway stations. They can access the spacecraft and leave messages, make one way broadcasts etc. Amsat has computer programs available to decode the TLM from UoSats.

Last year, Japan also entered the Amateur space program with the launch of Jas-1. It will operate in both data and voice modes but not simultaneously. Due to the crowding of 2 meters in Japan, it is used for uplink, instead of downlink, and the downlink is on 435 MHz. This is known as J mode. The satellite has a 1 watt RF output. It also has a unique FM data mode. It takes a special modem in front of your TNC to decode the TLM on your computer.

## Radio Sputnik

The Soviet Union now operates four Phase II satellites. RS-5 & RS-7 operate on a very limited schedule as they have been in orbit since 1981 and are showing signs of failure. In June of 1987, two new satellites, or more accurately two new transponders, were launched on a host satellite, Cosmos 1861. The spacecraft is in LEO orbit. Only one transponder, or set of transponders, are operational at a time. The transponder packages are known as RS-10 and RS-11. They use an innovative combination of HF and 2 meter frequencies. Both carry 2 to 10 meter and 15 to 2 meter transponders. These satellites operate in voice and cw modes. The Beacon telemetry is a cw format. As with Rs-5 & 7, each transponder also carries a robot, which is an automated transceiver. Its the Amateur Radio version of a video game. It allows an Amateur to talk

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directly to the spacecraft's onboard computer in cw.

The next amateur radio satellite to be launched from the USSR will be a joint project, unlike previous satellites which were completely financed and built by the Soviets, certain Eastern Bloc countries will assist the Soviets. No launch date or details are available at this time as the countries involved are just now organizing.

The Soviet Union had received a proposal from its Amateurs and engineers to include an Amateur Radio station onboard their Mir Space Complex. This proposal was received enthusiastically by all in the radio community, both east and west. But it should come as no surprise that the idea has run into a snag. The militarist and conservatives in the government have dug in their heels in protest. If history has taught us anything about the Soviets, it's that their military usually has its way. So for now it looks as though the plan is dead. (This is an uncanny similarity to a shift now being made in our own space program. More on this in a future column.)

The ARRL has presented a proposal to NASA concerning our own space station. They have asked that it be equipped with a permanent Amateur Radio station. The station is scheduled for launch in 1997. NASA has allowed two Astronaut/Amateurs to transmit from the space shuttle in the past. But with the backlog of military payloads schedule for the shuttle, it's doubtful that any Amateur Radio activity (no pun intended) will be scheduled for the shuttle for some time to come.

## Tracking Data

Tracking data will simplify your listening for the satellites and save you loads of time. Oscar Project Inc. publishes a yearly orbit schedule for all Amateur Radio Satellites. It's well worth the modest fee. Both Amsat and the ARRL carry several Satellite operators handbooks and computer tracking programs. The Satellite Experimenters Handbook is an excellent way to learn about satellite communications. It includes a manual satellite tracking device, the Oscar locator. With these two items, you can track virtually any and all Amateur satellites. Good listening.

AMSAT  
 Radio Amateur Satellite Corporation  
 P.O. Box 27  
 Washington, D.C. 20044  
 Phone (301) 589-6062

Project Oscar, Inc.  
 P.O. Box 1136  
 Los Altos, California 94022

American Radio Relay League  
 225 Main St.  
 Newington, Connecticut 06111

AMSAT-UK (UoSat 9 & 11)  
 Ronald J. C. Broadbent  
 Wanstead Park  
 London E12 5EQ England



# LISTENING POST

BY GERRY L. DEXTER

## WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

**L**ook! Over there! It's another one! Yes, still another shortwave broadcaster has taken to the airwaves in the United States. KUSW at Salt Lake City, Utah began its on-the-air tests in mid-December and then started regular broadcasts shortly after Christmas.

The new 100 kW station is owned by Carlson Communications which also owns KRSP AM and FM in Salt Lake City. Early programming consisted of rock and pop music and a few commercials promoting books on Utah tourism, magazine subscriptions and so on.

At this writing, KUSW is scheduled to be on as follows: 0000-0300 on 11680, 0300-0600 on 9755, 0600-1100 on 6135, 1100-1600 on 9850, 1600-1900 on 15225, 1900-2200 on 17715 and 2200-0000 on 15580. Reception reports go to KUSW Worldwide Radio, P.O. Box 7040, Salt Lake City, Utah 84107.

Radio Discovery, the very low power, very seldom heard station in the Dominican Republic, has been placed on hold for a few months according to Jeff White, who was the driving force behind the project. A planned relay of the government station, Radio Television Dominicana, hasn't worked out. In the meantime, you may hear Jeff doing freelance news and feature reporting over WCSN.

The plot thickens. Last month we mentioned the wholly unexpected appearance of a Radio Beijing relay over the facilities of Mali government radio. Before that, it was a switcheroo between Radio Beijing and Swiss Radio International. The latest twist has Radio Beijing and Radio Exterior de Espana (Spanish Foreign Radio) in a similar deal. Radio Beijing will use Madrid's facilities to reach the Eastern US and Spanish Foreign Radio will pump their signal out over Radio Beijing transmitters in order to better reach the Philippines and Japan.

Not only has Radio Australia totally revamped their program schedule, but many old shows have been dropped. Those that have been retained have been rescheduled and some reformatted, and many new shows have been added. Haven't seen a complete program schedule yet, unfortunately. The popular "Talkback" DX show has been made into a longer feature and retitled "Communicator." Radio Australia is also issuing a series of special QSL cards this year in honor of the station's 50th anniversary and Australia's 200th.

KYOI in Saipan, property of WCSN for several months now, is finally undergoing some serious programming adjustments. KYOI's rock format has been further lightened and, now that the satellite link is in

place, you can look for some WCSN programs on KYOI now.

The mailbox: Jim Ross in Vancouver, WA says he's concentrating on pirate and 60 meter band reception now, as well as trying to increase his country totals. Jim says propagation to his area has been pretty good lately.

George Neff and family, late of Ohio, moved to Tampa, Florida. Lots of fine DX'ers in Florida, George!

Andy Johns in Tyler, Texas wonders about some kind of rule to use in deciding when English, Spanish or Portuguese should be used in reports to Latin America. The only place you need to use Portuguese is to Brazilian stations, Andy. As for sending reports in English, figure that if a station carries at least some English programming an English report is probably ok. Radiobras, HCJB, RAE, TIFC, HRVC and so on will accept English reports. Otherwise, it's usually wise to stick with Spanish.

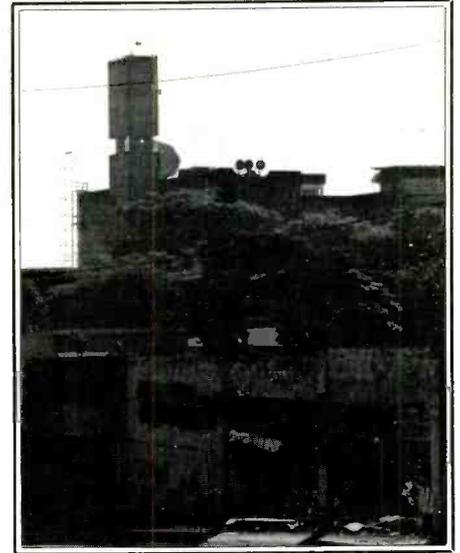
Walter C. Jacobs in Seattle, Washington says he's been an SWL "since Kon Tiki floated across the Pacific." Walter and his dad listened to Hitler march across Europe, hearing stations in countries about to be occupied "beg for support, only to go silent the following night, one after the other!" Oh, to have had a tape recorder back then.

Gary Emerson of Golden, Colorado and friend Mike Lewis of Boulder put in their annual all night DX session at Gary's shack recently. Gary says he's been listening since the mid-1950's and started with a \$15 Allied Radio Kit. Today he has an Icom R71A and a Hallicrafters SX-100.

William E. Haake of Healdsburg, CA comes to shortwave listening only recently and as the result of a sad event—the passing of his lifelong friend, William Aten, a ham who left his Icom R70 to Haake. Aten had been an active ham in the San Francisco in the 1950's and 1960's, though in recent years his license had expired, and he enjoyed SWL'ing. Bill Haake would like to correspond with any listeners who'd like to and can be written at 1330 Pinon Drive, Healdsburg, CA 95448.

POP'COMM was among the sources Ross W. Comeau in Andover, MA recently used in a term paper. Hope you got an "A," Ross! Ross has been reading us all along and says he finally broke down to send in some logs. He was into listening some years ago and now getting back to it.

Helio Soares in Sao Paulo, Brazil sends some photos of Radio Bandeirantes, a well known broadcaster in Sal Paulo which operates on 6090, 9645 and 11925 (latter best in the US), each with 10 kW. Bandeirantes is celebrating its 50th anniversary. Many



The studio building of Radio Bandeirantes in Sao Paulo, Brazil. (Courtesy: Helio Soares, Sao Paulo)



Merritt Lawrence in Phoenix, AZ is one of our log reporters this month.

thanks Helio and we were glad to know POP'COMM has so many readers in Brazil. Keep in touch!

And you keep in touch, too! Send your loggings, comments, questions, schedules, QSL's you don't need returned, shack photos and general shortwave broadcast news and information. Please—add you last name and state abbreviation after each logging, leave us some room to cut and don't forget essentials such as language, time, station name, program info, frequency.

Here's this month's crop. All times UTC and language English except as noted.

### SWEC Loggings

Albania: R. Tirana, 7065 at 0340 (Burns, NJ); 9755 at 0235 (Gilbert, CA).  
R. Gjakaste, 5057 at 0500 0515 in Albanian w/national pgm & folk mx (Mietzowski, PA).  
Antigua: DW relay, 6040 at 0106 (Haake, CA); 9605 at 0250 (Lewis, CO); 15335 at 2034 in GG (Gilbert, CA).



Mike Lewis and Gary Emerson—the morning after an all night listening session at Gary's Golden, CO. shack.



This recent Radio Korea QSL card is courtesy of Ross Comeau in Massachusetts.

BBC relay, 9510 at 0429 (Mierzwinski, PA).  
**Angola:** R. Nacional de Angola, 3354 at 0300 (Emerson, CO).  
**Argentina:** RAE, 9690 at 0400 when into EE (Cole, CO); 11710 at 0200 (Neff, FL); both freqs at 0303 in SS (Gilbert, CA).  
**Armenian SSR:** R. Yerevan (via R. Moscow facilities), 11790 at 0330 s/on after R. Kiev segment, in Armenian till 0351, then EE (Watts, KY).  
**Ascension Isl.:** BBC Atlantic relay, 6005 at 0500 (Lawrence, AZ); 7105 at 0357 (Mierzwinski, PA); 15260 at 2035 (Zirkelbach, CA).  
**Australia:** ABC Brisbane, 4920 at 0915 (Zirkelbach, CA); at 0753 (Loran, CA).  
**Austria:** R. Austria Int'l., 9550 at 0135 (Burns, NJ); 15320 at 1220 (Durant, NY).  
**Azerbaijan SSR:** R. Baku (tentative logging), 4785 at 0605 in AA (Durant, NY). Logging was probably Azerbaijan, but doubt was AA--Ed.  
**Belgium:** BRT, 5910 at 2220 w/letterbox (Durant).  
**Belize:** R. Belize, 3285 at 1205 (Emerson, CO).  
**Benin:** ORTB, 4870 at 2115 in FF (Woodruff, PA).  
**Bolivia:** R. Nuevo America, La Paz, 4795 in SS at 0342 (Ross, WA).  
**Botswana:** R. Botswana, 4820 w/usual pre-s/on IS at 0350 (Cole, CO); 7255 at 0417 (Ross, WA).  
**Brazil:** R. Anhangera, Goiania, 4915 in PP w/nx at 0116 (Ross, WA).  
**R. Brazil Central, Goiania, 4985 at 2355 in PP (Emerson, CO); 11815 at 0933 in PP (Durant, NY).  
 R. Amazonas, Manaus, 4805 in PP at 0231 (Loran, CA).  
 R. Nacional, Manaus, 4845 in PP to 0230 off (Loran, CA).  
 Radiobros, 11745 at 0125 in PP (Gilbert, CA); at 0200 (Durant, NY).  
 R. Nacional, 11780 at 0217 (Shute, FL).  
**Bulgaria:** R. Sofia, 6070 at 0053, into presumed Bulgarian at 0100 (Gilson, MD); s/on 0000 (Gilbert).  
**Burkina Faso:** RTV Burkina, 4815 at 0618 in FF (Gilbert, CA).  
**Cameroon:** R. Cameroon, Yaounde, 4850 at 0700 (Emerson, CO). Presume FF?--Ed.**

R. Douala, 4795 at 2140 w/nx in FF, ID at 2210 (Woodruff, PA).  
**R. Garoua, 5010 at 0530 in vernaculats (Mierzwinski, PA).  
 Canada:** RCL, 11880 at 2150 (Lukas, NY).  
**CBC N. Quebec 5vc., 9625/11720 at 1400 w/nx (Gilson, MD).  
 CFRX, Toronto, 6070 at 2337 w/rock & coll-ins (Gilson, MD).  
 CKZN, St. John's, 6160 at 1205 w/regional nx (Comeau, MA).  
**Central African Republic:** RTV Centrafricaine, 5035 at 0456-0535 in FF, nx at 0530 (Goodlet, TN); 2245-2259 s/off (Woodruff, PA).  
**Chile:** R. Nacional, 15140 in SS at 2319 (Gilbert, CA, & Durant, NY); 9550/15140 at 0055 (Loran).  
**China:** R. Beijing (including various relays--Ed.), 9665 at 0000 (Durant, NY); 11980 at 0000 in un-ID language also 11715 at 0045, 9655/9715/9770 at 0345 (Jerzykowski, OH).  
**CPBS Urumqi, 5075 at 1028 (Emerson, CO).  
 Presume CC--Ed.  
 CPBS X'ian, 5163 at 1032 (Emerson, CO). Again, presume it was CC--Ed.  
 CPBS-1 domestic svc in CC at 1230 on 5860/5880 (Loran, CA).  
**Fujian PBS at Fuzhou, 4975/5040 at 0835; at 1005 on 2340 (Loran, CA).  
 V. of the Straight (a/k/a People's Liberation Army R.), 3535/4045 in CC at 1334 (Loran, CA); 0940 on 5770 (Emerson, CO).  
**Guangxi PBS (at Nanning--Ed.) in CC at 1532 on 4915 (Ross, WA).  
 Colombia:** Caracol Neiva, 4945 at 0545 (Emerson, CO). Presume was SS--Ed.  
**R. Sotatenza, 5095 at 0024 in SS (Lukas, NY).  
 Cook Is.: R. Cook Isls., 11761 at 0640 (Emerson, CO). Language?--Ed.  
**Costa Rica:** Radio For Peace, 7375 at 0134 w/DX pgm & EE ID (Comeau, MA).  
**R. Reloj, 4832 in SS at 0715 (Gilbert, CA); 6006 in SS at 0807 (Lawrence, AZ).  
 R. Impacto, 6150 at 0300 in SS (Zirkelbach, CA). Now also on 5030--Ed.  
 TIFC Faro del Caribe, 5055 at 0515 in SS (Mierzwinski, PA).  
**Cuba:** R. Havana Cuba, 5965 at 0446 (Ross, WA); 6140 at 0048 (Hoake, CA); 11760 in SS at 1430 (Durant, NY).  
**R. Rebelde, 5025 in SS at 0436 (Ross, WA).  
 Czechoslovakia:** R. Prague, 5930 at 0148 (Gilbert, CA); also 7345 at 0100 (Durant, NY); 6055 at 2325 (Gilson, MD); 15110 at 1440 (Lukas, NY); 21505 in Czech & Slovak at 1458-1510 (Mierzwinski).  
**Dominican Republic:** R. Clotin, 11700 at 1855 in SS (Neff, FL).  
**East Germany:** RFI, 6165 at 0544 (Loran, CA); 9560 at 0330 (Zirkelbach, CA); 9730 at 0127 s/off (Gilbert, CA); 21540 at 1330 (Mierzwinski, PA).  
**Ecuador:** HCJB, 11740 at 1349 (Gilson, MD); 15155 at 0120 (Mierzwinski, PA); 15270 at 1905 (Hoake, CA).  
**R. Tarqui (tentative logging), Quito, 4971 in SS at 0021. Several mentions of Quito (Cole, CO).  
 R. Jesus del Gran Poder, 5050 at 1025 (Emerson, CO). In SS--Ed.  
 R. Saba'i, (at Otavalo--Ed), 4990 at 0012 (Emerson, CO). Assume in SS--Ed.  
**R. Poplar, 4800 at 0230 (Emerson, CO). SS--Ed.  
 La V. de Upano, 5040 at 1140 (Emerson, CO). Was SS--Ed.  
 R. Quito, 4920 at 0300 w/big band mx, SS (Goodlet, TN); at 0415 (Mierzwinski, PA).  
**Egypt:** R. Cairo, 9475 at 0200 w/EE s/on (Gilbert, CA); 0329 s/off (Cole, CO); 12050 in AA at**************

1745 (Durant, NY).  
**England:** BBC, 3955 at 2230 (Durant, NY); 9590 at 0116 (Burns, NJ); 15260 at 2210 (Hoake, CA).  
**Equat. Guinea:** R. Nacional, Bata, 5004 at 1940 to elaborate s/off in SS w/anthem 2020-2030 (Woodruff, PA).  
**Ethiopia:** V. of Revolutionary Ethiopia, 9500 at 1500 (Lewis, CO). Language?--Ed.  
**Falkland Isls.:** FIBS (tentative logging), 3958 at 0643-0709, OM anncrs, rock mx (Loran, CA); at 0650 (Emerson, CO).  
**Finland:** R. Finland Int'l., 9635 at 0315 w/ID & address (Cole, CO); 1400 on 15400 (Durant, NY).  
**France:** RFI, 7160 in FF at 2100 (Lukas, NY); 11620 at 1641 (Durant, NY).  
**Gabon:** Africa #1, 15475 at 1833 in FF w/nx then commercials, contest, address (Cole, CO).  
**Ghana:** GBC, 4915 w/nx at 0604 (Gilbert, CA); 0600 w/ID, sked/freqs (Zirkelbach, CA).  
**Greece:** V. of Greece, 7395 at 0135 w/nx (Gilbert, CA); 9395/9420 at 0045 in Greek (Loran, CA); 7430/9420 w/nx (Burns, NJ). Time?--Ed.  
**R. Macedonian, Thessaloniki, 9935 at 1435 in Greek w/mx & ID (Cole, CO).  
 Guam:** KTWR on 9870 at 1347-1357 in presumed CC, ID (Goodlet, TN).  
**Guatemala:** TGNA R. Cultural, 3300 in SS at 1135 (Cole, CO); at 0401 in SS (Loran, CA); at 0340 (Burns, NJ).  
**R. Maya de Barillas, 2360 at 1155 (Emerson, CO). Language?--Ed.  
 Honduras:** HRPC R. Luz y Vida (tentative) at 0350 on 3250, s/off 0400 (Loran, CA).  
**HRR1 Soni R., Puerto Limpira, 4755 at 0030 in EE & SS (Neff, FL).  
 HRVC, La V. Evangelica, 4820 at 0442 in SS (Loran, CA).  
**Hong Kong:** BBC relay on 7180 w/World Service & English by Radio pgm, 1150-1203 (Cole, CO).  
**Hungary:** R. Budapest, 11910 at 1515 w/IS & s/on (Gilbert, CA).  
**India:** AIR, Delhi, 9910 at 0100 w/nx (Gilbert, CA); 4860 at 1330 (Emerson, CO). What language on 4860?--Ed.  
**Indonesia:** RRI Ujung Pandang, Sulawesi, 4719 at 1450 (Emerson, CO). Presume in Indonesian?--Ed.  
**RKIP Surabaya, 4700 (nominal 4699--Ed.) at 1455 (Emerson, CO). Assume Indonesian?--Ed.  
 Iran:** VOIRI, 9022 in Farsi at 0241 (Shute, FL).  
**Iraq:** R. Baghdad, 11760 at 1447 in AA after Havana leaves at 1445 (Durant, NY).  
**Israel:** Kol Israel w/nx at 0105 on 9435/9885 (Lukas, NY); 2230 on 9435 (Watts, KY).  
**Reshet Bet home svc in Hebrew, 17555 at 1315 (Lukas, NY).  
 Italy:** RAI, 9575 at 0141 w/stout of II pgm (Gilbert, CA).  
**Ivory Coast:** RTV Ivorienne, Abidjan, 4940 at 2238 in FF (Shute, FL); 7215 at 0605 in FF (Mierzwinski, PA); 11920 at 2240 in FF (Cole, CO); 11940 at 2355 in FF (Gilbert, CA).  
**Japan:** R. Jonan, 5960 (via Canada--Ed.) at 0310 (Cole, CO); 0410 in JJ (Ross, WA); 5990 at 0718 (Gilbert, CA).  
**Nihon SW Broadcasters, NSB, 3945/6115 in JJ at 0805 (Loran, CA); 9900 on 9545 in JJ & EE (Zirkelbach, CA).  
 Kenya:** V. of Kenya, 4885 at 2002 w/ID, commentary (Woodruff, PA).  
**Kuwait:** R. Kuwait, 9840 at 0448 in AA (Hamil, CA); 13495 & 15505 at 1525 in AA (Mierzwinski, PA); 15505 at 1125 in AA (Durant, NY).  
**Lebanon:** V. of Lebanon, 6549 at 0156 in AA w/easy listening mx (Durant, NY).  
**Lesotho:** R. Lesotho, 4800 at 0312 (Loran, CA);**

#### Abbreviations Used in Listening Post

AA	Arabic
BC	Broadcast/Ing
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America/n
nx	News
OM	Male
pgm	Program
PP	Portuguese
RR	Russian
rx	Religion/lous
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-GMT)
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel frequencies

at 0345 0415 (Goodlet, TN).

**Liberia:** VOA relay, 15600 at 1610 (Emerson, CO)

**Libya:** R. Jamahiriyah, 21645 at 1340 in AA (Mierzwinski, PA).

**Lithuanian SSR:** R. Vilnius, 6200 at 2305 w/nx, folk mx, language lessons, into R. Moscow in RR at 0130 (Chaney, CT); 7260 at 2305 (Durant, NY).

**Luxembourg:** R. Luxembourg, J5350 at 1759 in FF w/commercials, pop mx (Durant, NY).

**Madagascar:** R. Netherlands relay at 1600 in Dutch on 17575 (Lawrence, AZ).

**Malaysia:** RTM Sarawak, 4950 at 1400 w/pgm about 60's mx (Loran, CA).

V. of Malaysia, 6100 at 1440 (Lewis, CO). Language?-- Ed.

**Mali:** RTVM, 4783 at 2219 in FF (Durant, NY); 4835 at 0649 in FF (Loran, CA).

R. Beijing relay, 9770 at 0340 (Watts, KY).

**Malta:** R. Mediterranean, 6110 at 2315 (Comeau)

**Marshall Is.:** WSZO, 4940 at 0745-1000 s/aff in EE & Marshallese, island mx & standards (Cole, CO).

**Mauritania:** ORTM, 4845 in FF w/nx 0659-0731 (Goodlet, TN); 2200 w/ix pgm, local mx (Woodruff).

**Mexico:** XEQQ La Q Mexicana, 9680 in SS at 1308 (Cole, CO); 1641 mx & commercials in SS (Shute, FL).

La Hora Exacta, 9555 in SS w/ID, time & date checks (Shute, FL).

R. Huayacocotla, 2390 at 2251-0100 in SS, weak w/QRN from maritime comms, s/off 0100 (Loran, CA monitored from IL).

R. Mexico Int'l., 17765 at 2350 in SS (Mierzwinski, PA).

**Monaco:** TWR, 7105 at 0805-0840 w/rx pgm (Comeau, MA).

**Morocco:** RTV Marocaine, 17595 at 1439 w/local mx (Shute, FL).

R. Medi-un (tentative logging), 9575 at 2245 w/AA & light mx (Watts, KY).

**Namibia:** SWABC, 3290 at 0245 (Emerson, CO). In EE?-- Ed.

**Netherlands:** R. Netherlands, 15180 at 1845 w/"Shortwave Feedback" (Lukas, NY); 17605 at 1830 w/nx (Hoake, CA).

**Netherlands Antilles:** R. Netherlands relay, Bonaire, 6020 at 0230 (Durant, NY); 6165 at 0036 (Gilson, MD); 9590 at 0300 (Burns, NJ); 21680 at 1727 in Dutch (Mierzwinski, PA).

TWR, Bonaire, 9535 at 0330 (Zirkelbach, CA).

**New Caledonia:** R. Noumea, 7170 at 0710 (Emerson, CO). Presume was FF-- Ed.

**Nicaragua:** V. of Nicaragua, 6100 in SS at 0455 (Ross, WA).

**Niger:** RTV du Niger, 5020 in FF at 2247 w/clock chimes, anncr saying goodbye in several languages, time pips, freq anncr, anthem, tone (Shute, FL).

**Nigeria:** R. Nigeria (Kaduna-- Ed.), 4770 at 0650 (Lewis, CO). Language?-- Ed.

R. Nigeria, Lagos, 4990 at 2240 (Shute, FL).

V. of Nigeria, 7255 at 0519 w/mx (Comeau, MA).

**North Korea:** R. Pyongyang, 6575 at 1138 (Cole, CO); 6576 at 1100 (Durant, NY).

**Norway:** R. Norway Int'l., 15310 at 1301 & 1405 (Durant, NY).

**Pakistan:** R. Pakistan, 11615 at 1605 w/presumed nx. Tentative logging (Comeau, MA).

**Papua New Guinea:** NBC Port Moresby, 4890 at 1124 (Emerson, CO). EE or Pidgin?-- Ed.

**Paraguay:** R. Nacional, 9735 at 0043 in SS (Comeau, MA); 0900 in SS (Gilbert, CA).

**Philippines:** VOA relay, 11920 at 1620 (Emerson). R. Veritas Asia, 6160 at 1230 w/IS & info that pgm in Karen would follow (Gilbert, CA).

**Peru:** R. Andina, Huancayo, 4996 at 0404 in SS (Loran, CA).

R. Norperuana (Chachapoyas-- Ed.), 9655 at 1140 (Emerson, CO). Although not specified, I assume this & all other Peru loggings are SS-- Ed.

R. Atlantido (Iquitos-- Ed.), 4790 at 0340 (Emerson, CO).

R. Imagen (Tarapoto-- Ed.), 4970 at 2356 (Emerson, CO).

R. Tacna, 9486 at 1100 (Emerson, CO).

R. Altura (Chapimarca-- Ed.), 3340 at 0252 (Emerson, CO).

R. Ancash (Hutaz-- Ed.), 4990 at 1115 (Emerson). R. del Pacifico (Lima-- Ed.), 9675 at 1145 (Emerson, CO).

**Poland:** R. Polonia, 6135 at 0630 (Lukas, NY); 7270 at 0215 w/nx & rock (Jerzykowski, OH); 9525 at 0355 w/piano IS (Gilbert, CA).

**Portugal:** RFE/RL, Gloria xmtr site, 21745 at 1400 in RR (Mierzwinski, PA).

R. Portugal, 9705 at 0301 w/anthem (Gilbert). AWR (via R. Trans Europe facilities at Sines), 9670 at 0800 s/on (Gilbert, CA) Language?-- Ed.

**Qatar:** QBS Doha, 9585 at 0400 in AA, "Huno Doha" ID at 0415 (Watts, KY).

**Romania:** R. Bucharest, 9570 at 0130 in presumed Romanian (Gilbert, CA); 11940 at 1320 to Europe (Comeau, MA).

**Rwanda:** DW relay, 7225 at 0330 w/FF & GG s/on anncr (Gilbert, CA).

**Saudi Arabia:** BSKSA, 9720 at 2020 w/oldies mx, nx 2045, ix 2053, close 2100; 2155 in AA on 9870 (Watts, KY).

**Solomon Is.:** SIBC at 0732 on 9545, nx/mx (Ross)

**South Africa (Rep. of):** R. South Africa, 3955 in Afrikaans at 0302 w/jazz & dance mx, "This is

Radio Suid Afrika" ID (Cole, CO); 9580 at 0240-- off 0225 (Burns, NJ); 0250 on 11730; 1545 on 21590 (Lukas, NY); 1521 on 21530 (Gilson, MD).

Radio 5 s/vc, 4880 w/rock, commercials, ID 0325 (Neff, FL).

SABC, 3215 at 0317 (Ross, WA).

R. Orion sve, 3220 at 0250 (Emerson, CO).

**South Korea:** R. Korea, 15575 at 2240 in SS (Mierzwinski, PA); 2345 in EE (Gilbert, CA).

**Spain:** Spanish Foreign R., 6125 at 0025 w/nx & wx (Gilson, MD); 7450 at 2145 in SS, also 21575 at 1550 in SS (Lukas, NY); 9630 at 0125 (Burns, NJ).

**Sri Lanka:** SLBC, 4902 at 0425 in Sinhala w/national svc, mx, YL anncr (Mierzwinski, PA).

**Sudan:** R. Omdurman, 5040 at 0400 s/on, ID in AA, mx. Weak w/QRN (Woodruff, PA).

**Sweden:** R. Sweden Int'l., 15345 at 1400 w/"Nordic Newsweek" (Durant, NY).

**Switzerland:** Swiss R. Int'l., 3985 at 0610 (Durant, NY) EE?-- Ed.; 6135 at 0419 w/nx (Ross, WA), 15570 at 1336 (Durant, NY); 21635 at 1530 (Gilson, MD).

**Tahiti:** R. Tahiti, 11825 at 0415 in FF & Tahitian, island mx, anncr, requests (Zirkelbach, CA).

**Togo:** RTT on 5047 at 0535-0623 in FF (Goodlet)

**Tunisia:** RTT Tunis, 7475 at 0510 in AA (Mierzwinski, PA).

**Uganda:** R. Uganda, 4975 at 2044 w/commentary, mx (Woodruff, PA).

**Ukrainian SSR:** R. Kiev (via R. Moscow facilities), 11875 at 0309 (Gilbert, CA); 7165//11860-//13645 at 0300 (Zirkelbach, CA).

**Unidentified:** 6100 ticking & beeping like a time station (Ross, WA). It's YVTO, Observatorio Naval Cagigal, Caracas, Venezuela-- Ed.

9715 at 1150 w/JJ ix pgm to EE ID 1200 but s/off tight after "This is the..." (Watts, KY).

**United Arab Emirates:** UAE R., Dubai, 9900 s/on in AA at 0200 (Watts, KY); 21605 at 1212 in AA (Lukas, NY).

**United States:** VOA on 9715 at 0358, 9740 at 0350, 9975 at 1145, 21590 at 1815 (SS), 21560 at 1817 in SS (Lukas, NY); 2328 on 6190 in Creole, also 9815 at 0140 (EE) (Gilson, MD).

WCNS, 9850 at 0017 (Burns, NJ); 11945 at 1115; 15280 at 1755 (Durant, NY).

WYFR, 9555 at 0135, 13965 at 1303 (Gilson, MD); 9715 at 2243 in SS; 9585 at 2243 in SS (Lukas).

AFRTS, 6030 at 2314 (Gilson, MD).

WHRI, 5995 at 1220 (Lukas, NY); 9770 at 2216 (Hoake, CA); 17830 at 2233 (Durant, NY).

WRNO, 15420 at 1850 (Burns, NJ).

**USSR:** R. Moscow, 5940 at 0121 (Hoake, CA); 7150 (Lvov site listed) at 0039 (Cole, CO); 7165 at 0130 in RR (Chaney, CT); 9600 at 1201 (Durant, NY); 9635 (listed Vladivostok) at 0212; 9820 (listed Irkutsk) at 0451 in RR; 9890 in RR at 0430; 12045 at 0244 (Hamill, CA); 12050 (listed Khabarovsk) at 0108 (Cole, CO); 6000 at 0159, also 2330 on 6045, 6200 at 2255, 11730 at 1400 in un-ID language; 1318 on 13730 (Gilson, MD).

R. Peace/Progress, 15470 at 1400 (Goodlet, TN).

Radiostansiya Rodina, 7165 at 0200 in RR (via Cuba?) (Watts, KY); 7260 at 0200 in RR (Durant)

Georgian R., Tbilisi, 5040 at 0525 in RR (Mierzwinski, PA).

**Uzbek SSR:** R. Tashkent (via R. Moscow

facilities) at 1200 s/on (Comeau, MA).

**Vatican:** Vatican R., 6150 at 0105 (Burns, NJ); 9645 at 0730 w/"Four Voices" pgm (Gilbert, CA); 21725 at 1420 in SS (Mierzwinski, PA).

**Vietnam:** V. of Vietnam, 12020 at 1021 w/ID by YL & commentary (Comeau, MA).

**Venezuela:** YVTO time station, 6100 time sigs, SS (Lawrence, AZ).

Ecós del Torbes, San Cristobal, 4980 in SS at 0330 (Neff, FL).

R. Capitol, Caracas, 4850 in SS at 0500 s/aff (Watts, KY).

R. Tachira, San Cristobal, 4830 in SS 0221, many ID's, commercials, Latin pop tunes (Goodlet, TN).

La V. de Caraboba, Valencia, 4780 in SS at 0357 (Ross, WA).

R. Rumbos, Caracas, 4970 at 1035 in SS (Gilbert, CA); 4970/9660 at 0344 (Loran, CA).

R. Moro, Maracaiba, 3275 at 1046 in SS w/mx, commercials, many ID's (Goodlet, TN).

R. Valera, Valera, 4840 at 0337 in SS, soft Latin mx, ID's, anthem at 0357 & off 0400 (Cole, CO).

R. Occidente, Tovar, 0345 in SS, off 0405 (Woodruff, PA).

**West Germany:** DW, 3995 in GG 2228 (Durant, NY); 6040//6085//9545 at 0130, also 6085 at 0101, 6100 at 2304 in GG (Gilson, MD).

Sudwestfunk, 7265 in GG at 0042-0112 w/rock, pop, U.S. mx thru ham QRM (Goodlet, TN).

RL, 17750 at 0345, 21500 at 1600, both jammed (Lukas, NY). Nat EE-- Ed.

RFE, 6135 but jammed at 2244 (Lukas, NY). No EE here, either-- Ed.

And that does it! A lift of our glass to the following:

K. J. Burns, Freehold, NJ; Michal Loran, Azusa, CA; Frjank Mierzwinski, Reading, PA; Cliff Goodlet, Chattanooga, TN; Barbara Woodruff, State College, PA; R. C. Watts, Louisville, KY; Michelle Shute, Pensacola, FL; Mark Chaney, Waterbury, CT; Alexander Durant, Albany, NY; Ross W. Comeau, Andover, MA; Warren Gilbert, Sherman Oaks, CA; Jackie Cole, Denver, CO; William E. Haake, Healdsburg, CA; Gary Emerson, Golden, CO; Mike Lewis at Golden, CO; Ed Hamill, Burlingame, CA; Hank Lukas, Plainview, NY; Bob Zirkelbach, Pleasant Hill, CA; Jim Ross, Vancouver, WA; George Neff, Tampa, FL; Bruce R. Gilson, Silver Spring, MD; Merritt Lawrence, Phoenix, AZ and David Jerzykowski, Toledo, OH.

Back again next month and until then, good listening!



### Preamp Boosts Scanner Signals

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**By Bob Grove**  
WA4PYQ

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CIRCLE 27 ON READER SERVICE CARD

## Making Hay With 10-Meter Sporadic E

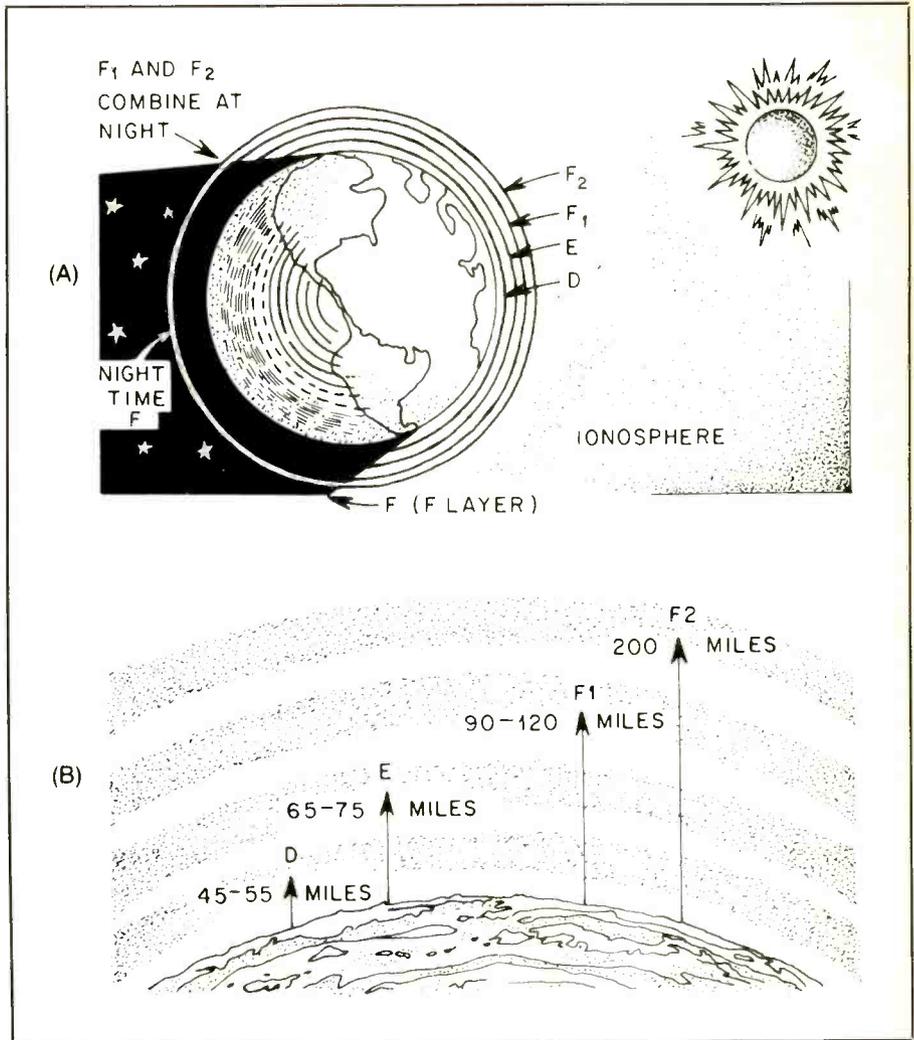
As if new SSB privileges, solid local contacts and great transoceanic DX weren't enough to make 10 meters a major draw for Novice, and Technician-class Hams, each summer brings the yearly peak of *sporadic-E* propagation. You may hear long-time Hams refer to it simply as *E skip* or *short skip*; some radio textbooks call it  $E_S$  (the subscript S stands for *sporadic*). Whatever you decide to call it, sporadic E makes for great Ham-radio fun—and this year's peak E-skip season is right around the corner!

### What is Sporadic E?

Most long-distance medium- and short-wave radio propagation, depends on the interaction between solar radiation and the ionosphere (See Fig. 1). Bombardment by the sun's electromagnetic and particle radiation renders the ionosphere capable of refracting (bending) radio waves back to earth. As Fig. 1 shows, the ionosphere consists of several layers of ionized gases; these are labeled, from lowest to highest, D, E,  $F_1$  and  $F_2$ . Most medium- and shortwave DX is propagated mainly by means of the  $F_2$  layer, although E-layer propagation (not of the sporadic variety) does get into the act below 25 MHz or so. Normal E- and F-layer propagation is mysteriously related to the number of spots visible on the solar disk: Generally, the greater the number of sunspots, the better the ionosphere supports DX propagation.

Sporadic-E propagation, however, seems to have little relation to the action of solar radiation on the ionosphere. For instance, even though we're just coming out of a period of minimal sunspot activity, last year's summer E-skip season was one of the best on record! On many days, from mid-May well into August, Hams operating on 10 meters enjoyed astonishingly strong medium-distance propagation from early evening until well after midnight. In fact, last summer's sporadic-E season was so hot that Bill Duval, K5UGM, Texas, and John Moore, W5HUQ/4, Florida, completed the first 220-MHz E-skip two-way contact in Amateur Radio history!

Sporadic-E propagation is particularly amazing because we don't know what causes it! We do know that it seems to occur when "clouds" of particularly dense ionization form at E-layer heights. We know that these clouds appear, drift and disappear sporadically, and that their frequency of oc-



Most long-distance shortwave propagation comes to us courtesy of interaction between the ionosphere and solar radiation. The ionosphere isn't just one layer of ionized particles, however: Four ionospheric layers—D, E,  $F_1$  and  $F_2$ —have been characterized and named so far. At night, the  $F_1$  and  $F_2$  layers merge, and normal ionization disappears at the D and E layers. This month's mystery guest, sporadic-E ionization, can occur at E-layer heights at any time of day and year. When it does, watch for the 10-meter Ham band to sound like one big celebration!

currence varies predictably with the seasons. We know that sporadic-E propagation can support contacts of over a few hundred miles (one earth-ionosphere-earth hop) to transcontinental and even transoceanic distances (several hops), and that sporadic E's effects are particularly striking between 21 and 225 MHz. And we know at least one

more thing: You can get in on the E-skip action, too!

### Using E Skip

Sporadic E can happen any time of the year, but the principal E season occurs from late April to mid-August. (There's another,

peak from mid-December to mid-January.) The principal key to E success is *being at your radio when E-skip happens*. Last summer's 10-meter E-skip action was hottest in the evening; statistics show another peak sporadic-E period from about 8 am to mid-afternoon. Consider making two agreements: one with yourself to check 10 meters daily between 6 and 7 pm (and at lunchtime, if possible), and another with your friends to alert each other by telephone or 1.25-meter FM when one of you spots an opening.

In checking for a band opening, *call CQ if you don't hear anyone on the air*. Someone has to "open the opening," and that person may be you! If you have a beam antenna, check conditions in several directions before you decide that the band is quiet. (You don't need a beam antenna to have fun with sporadic E, though: A friend of mine worked California from Connecticut on the 6-meter [50-MHz] Ham band with two watts and a car-mounted whip antenna! That's E to a T!)

As you read this, 1988's spring/summer sporadic-E season may already be under way. There's only one way to find out: Turn on the radio and scan the 10-meter band. (For Novices and Technicians, that's 28.1-28.5 MHz, with SSB from 28.3 to 28.5 MHz.) If this year's E season is anything like last year's, you may be in front of that radio for the rest of the evening! **PC**

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CIRCLE 14 ON READER SERVICE CARD

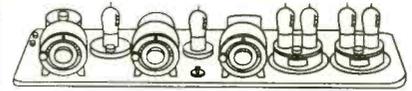
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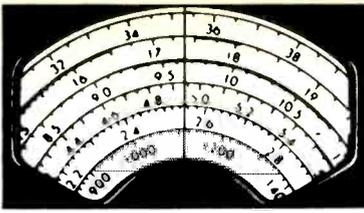


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# COMMUNICATIONS CONFIDENTIAL

BY DON SCHIMMEL

## YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

**A** letter from Andrew Gordon, CT arrived at a very appropriate time because I had just received a number of requests for frequencies of Navy and Marine Corps MARS stations. Here is the information sent in by Andy:

7 MHz Band: Hailing frequency 7493.5 kHz. Working frequency 7391.5 kHz.

14 MHz Band: Hailing frequency 14441.5 kHz. Working frequencies 13826, 13974, 14383.5, 14467, 14470, 14477, 14483.5, 14818.5, 14838.5, and 16298.5 kHz.

From Alaska, we heard from Jerry Brookman who said he used a Kenwood R-600, with a 75' longwire.

Frank Mierzwinski, PA wrote to say "I've been DX'ing for about 10 years. I use a Kenwood R-1000, a 100' longwire and a Yaesu Tuner, and a Autek QFI Audio Filter or MFJ-752B Signal Enhancer as needed."

Another first-timer, Chris Skornia, wrote from Southern England and indicated he used a Kenwood R-2000 receiver linked through a Yaesu 7700 ATU. His antenna was an 80' longwire. Chris said he wished there was a magazine like POP'COMM in the UK.

Also from England, Simon Mason reported listening to a domestic radio program which presented Romanian Folk music and the opening piece of music caught his ear. It was the "Gypsy Violin" tune which accompanies the Romanian "Numbers" broadcast. The announcer identified the music as "The Skylark" written by "Chokesleer."

Simon also furnished some details he had compiled for the YL/GG "PAPA NOVEMBER" broadcasts. These transmissions are

Q S L	<b>ZKLF</b>	Q S L			
TO <u>HUGH M. HAWKINS</u>					
VERIFICATION OF RECEPTION					
FROM	<u>WELLINGTON WEATHER</u> (station)	<u>ZKLF</u> (call sign)			
<u>AUCKLAND NEW ZEALAND</u> (location)					
DATE (UTC)	<u>12 SEPTEMBER 1987</u>				
TIME (UTC)	<u>0508</u>				
FREQUENCY	<u>13550.1</u> kHz				
POWER	<u>5</u> kW				
ANTENNA	<u>MARCONI CONICAL MONOPOLE</u>				
		<table border="1"> <tr> <td>N.Z. METEOROLOGICAL SERVICE WELLINGTON</td> </tr> <tr> <td>12 SEP 1987</td> </tr> <tr> <td>NATIONAL WEATHER FORECASTING SERVICE</td> </tr> </table>	N.Z. METEOROLOGICAL SERVICE WELLINGTON	12 SEP 1987	NATIONAL WEATHER FORECASTING SERVICE
N.Z. METEOROLOGICAL SERVICE WELLINGTON					
12 SEP 1987					
NATIONAL WEATHER FORECASTING SERVICE					
(signature)		(station stamp)			

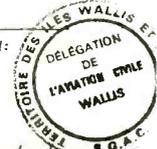
This PFC was returned to Hugh Hawkins, TX for his QSL. Reception of the New Zealand Meteorological Station in Auckland.

simulcast on four frequencies: 2705, 5015, 7405 and 11105 kHz with schedules of 0000, 0030, 0600, 0630, 1200, 1230, 1800 and 1830 UTC. The transmissions on the half-hour are in SSB. Simon has noted that three different YL's have made the broadcasts. The message texts are preceded by a 3F group (addressee?) and GRUPPEN (group count). Upon completion of the text of the first message the YL says ENDE followed by ACHTUNG and into the second message. Messages are repeated on successive schedules so it is possible

that a recipient could miss 2-3 days of messages and catch up on the 4th day.

The next letter was from B.J. Anderson, British Columbia, Canada. He said "Since buying my 'SWL' Cartridge (used with a computer) last year, CW has become very useful to me. Although I am learning Morse through my cartridge, I still can't read it off the air. But, the cartridge comes through for me!"

George Osier, NY again reports hearing VEB2 Time Signals on 4625 kHz. "The station is hard to hear because of heavy CW &

<b>70</b>	WALLIS ISLAND WALLIS & FUTUNA TERRITORIES HIHIFO INT'L AIRPORT 315 KHZ
This will confirm your reception of RADIOBEACON <u>HO</u> on <u>315</u> KHZ at <u>12.46</u> hrs UTC on <u>3 October 86</u>	
PUISSANCE de XMTR: <u>300</u> watts ANTENNE: <u>DAISY TELERAD</u> ANTENNA XMTR: REMARQUES et le CACHET OFFICIAL de STATION: TRANSMITTER "RBT 200/400 TELERAD"	
signature:  C. HAZELIER CHEF DE SECTION NAVIGATION AGRICULTURE. AGRIPORT DE WALLIS / HIHIFO	

<b>COOK ISLANDS</b>		
RAROTONGA BEACON	<b>RG</b>	352 KHZ
THIS WILL CONFIRM YOUR RECEPTION OF RADIOBEACON <u>RG</u> ON <u>352</u> KHZ ON <u>29 Sep 1986</u> AT <u>1335</u> UTC TRANSMITTER POWER: <u>2400</u> WATTS ANTENNA: <u>120 ft. Vertical wire.</u> REMARKS:		
signed:  S.T.O.		

PFC's from Steve McDonald, BC, Canada for radio beacon stations in the Pacific.



## Telecoms

Date: 18 May 87

Your Ref:

Our Ref: ZGS/R3/02/07

Dr A M Peterson

U.S.A

Dear Sir

RECEPTION VERIFICATION QSL

Thank you for your report on Singapore Radio transmission.

2. We are pleased to hear from you and listed below are details of our transmission :-

TYPE OF SERVICE : MARITIME TELEGRAPHY  
 FREQUENCY/CALLSIGN : 16868.5 KHZ/9VF 53  
 TYPE OF EMISSION : A1A  
 TYPE OF TRANSMITTER : MARCONI HS 71  
 POWER OUTPUT : 5 KW  
 TYPE OF AERIAL : QUADRANT  
 DIRECTION : OMNI  
 SCHEDULE : 0000 - 1400 UTC  
 CLOSING TIME MAY BE  
 EXTENDED UPON REQUEST.

3. We return herewith the International Reply Coupon as we do not make use of them.

Yours faithfully

  
 Lim Yuk Min  
 Engineer (Frequency Management)  
 Regulations & Licensing Dept.

QSL letter received by Dr. A. Peterson, IN gives technical data on a Singapore station.

hum QRM on that freq. I used my .375 filter and PBT on my NRD-515 to find the station. It has 1-pulse every 2-seconds and no pulse to identify the minute, no ID of any kind."

Do our readers have any info regarding this Canadian allocated callsign?

Two anonymous contributors, one in KY and the other in MO, both sent in intercepts of the same unidentified activity. I had also copied similar signals as had our RTTY Editor, Bob Margolis, IL.

The traffic is auto-sent 5L groups with each message being 120 groups in length. The speed of transmission is about 17-18 wpm and there is a slight pause after every 8 groups. Over a dozen frequencies have been observed carrying this traffic which exhibits a callsign structure of the LFL type. The message headings are preceded by KNLOAD or CLOAD, or TPLOAD or just LOAD. A typical heading is: QRADE P9Q-R-T 141455Z GR 120 BT and into the text. The message ends with BT AR KK followed a minute later by a tone. Two minutes later there is a 30-second high-speed transmission, a pause, another 30-second burst followed one minute later by a tone, a pause,

then KK LOAD (or one of the others) and the entire message is repeated. This sequence takes place during a period of a half-hour.

A new message of 120 groups is then sent and repeated during the next half-hour. The activity has at times passed traffic for as long as 4-5 hours.

In comparing messages there were a few differences. For example: Call L1M had DTG updates of every 15 minutes. Z5N and G6D had DTG updates of every 30 minutes. G6D began its heading with LOAD rather than KNLOAD.

Additionally, neither Z5N nor G6D had tones associated with the high-speed (data?) transmissions.

Table 1 presents the observed frequency/time/date/callsign information. With seeing just two callsigns reused during the many months of monitoring, the ROTA callsign plan is not readily apparent. Perhaps with additional intercept such rotation can be determined.

The LFL callsign structure is like that used by the US Navy for their tactical CW callsigns. That is not to say that this is a Navy activity.

Table 1

KHZ	UTC	DATE	CALL SIGN
4495	0212	02-19-87	WOY
4611	0454	05-17-87	T4R
5438	0445	02-21-87	K4Q*
6768	2446	11-14-87	P9Q
6873.3	1900	11-04-87	I4I*
8160	0020	02-20-87	Y5Z
8160	1845	02-24-87	B3G
8160	1530	03-18-87	H1S
8161	1230	10-08-87	L1M
8613	0436	06-16-87	F3A
8961	0032	06-05-87	B2J
8961	0518	07-10-87	Q0P
10121	1745	04-27-87	J1W
10121	1547	05-06-87	V9I
10969	1932	10-12-87	Z5N
10969	1947	10-14-87	O4R
11631	1937	03-17-87	K4Q*
12076	1947	08-21-87	Y6P
14764	1632	07-24-87	I4I*
14764	1717	05-28-87	K2P

\*REUSE OF CALLSIGN

It would be most interesting to make a tape recording of the high-speed bursts that occur between the repeated messages, recording at 15 ips and then cut the playback speed down to 3 $\frac{3}{4}$  or 1 $\frac{1}{8}$  ips to see if it is possible to determine what the signal contains. Unfortunately my multi-speed recorder is out for repair so I have been unable to check this out.

By the way, for those who might be interested, I ran mono-alphabetic frequency counts on two of the messages and as anticipated the counts were fairly flat with the Index of Coincidence for one message being .0378 and the IC for the other being .0384. There is no doubt this is not a simple cipher system.

Utility Station Intercepts  
 (All Times Are UTC)

- 262: Beacon CTM, Chetumal, Mexico at 1100 (Bill Farley, Belize).
- 288: Beacon X, Pt. Tuna Light, PR at 0250 (Pat O'Connor, NH).
- 294: Beacon J, Jupiter Inlet Light, FL at 0504 (O'Connor, NH).
- 300: Beacon SFM, San Francisco de Macoris, Dominican Republic (O'Connor, NH).
- 304: Beacon BN, Nashville, TN at 0411 (O'Connor, NH).
- 313: Beacon Z, Cape Canaveral, FL at 0424 (O'Connor, NH).
- 316: Beacon MAJ, Majuro, Marshall Is., at 1242. QRM from Beacon SPY in AK on 314 kHz (Brookman, AK).
- 343: Beacon PJG, Williamstad, Curacao, Neth. Antilles at 0508 (O'Connor, NH).
- 344: Beacon ZIY, Georgetown, Grand Cayman at 0510 (O'Connor, NH).
- 356: Beacon TIM, Georgetown, Guyana at 0415 (O'Connor, NH).
- 392: Beacon BZE, Belize City, Belize at 1105 (Farley, Belize).
- 396: Beacon ZBB, S. Bimini, Bahamas at 1110 (Farley, Belize).
- 500: PJG, Williamstad, Curacao, Neth. Antilles calling CQ in CW at 0401 (O'Connor, NH).
- 524: Ben. AJG, Mt. Carmel, IL at 0626; also Beacon UOC, Iowa City, IA at 0654 (J.M., KY).
- 2716: NRW, USS *Hayler* (DD-997) calling Norfolk Tug Control in USB at 1155 (Gordon, CT); VDOC, HMCS *Protecteur* in USB wkg Halifax at 1634; also CGZP, HMCS *Nipigon* in USB wkg QHF Halifax (O'Connor, NH); NIDC, USS *Valdez* (FF-1096) c/w Weapons Station Earle Port Control at 1005; NGXQ, USS *Frank Cable* (AS-40) c/w

Rio de Janeiro, September 24th, 1987.

HUGH M. HAWKINS

Dear Sir,

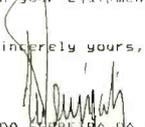
We are very glad to have received your letter contesting our transmissions. We manage the Principal Station of Brazilian Coast Station Network, "RIO-RADIO (PPR)" which signal you have received.

Our organization, named EMBRATEL, is in charge of all Brazilian Telecommunications network, national and international. This includes telephony, telex, data, TV network, maritime communications, satellite communications. In the last 20 years, our organization set up about 12000km of high capacity line of sight microwave link and 5000km of troposcatter microwave links crossing our country from north to south, from east to west. We set up 25 telephony toll switching stations, 16 telex toll switching stations, 30 TV distributing centers, 16 coast stations, etc. In the last 10 years we set up 20 earth stations and last year our domestic satellite went to work. Here you have a brief description about EMBRATEL.

Now we will give you some information about Rio-Radio, the Principal Coast Station of Brazil. It is located in Rio de Janeiro, the receiving station at Guaratiba and the transmitting station at Santa Cruz. These are suburbs of Rio, about 50km of the city. The station is equipped with high power transmitters, operating in CW and voice from 500KHz to 22MHz. We also operate VHF equipment for short distance voice communications. Rio Radio started its operation in 1975 in its present configuration.

The call signal for ship contact in CW emission is: "CQ CQ CQ DE PPR PPR PPR TFC LST ..." This signal is emitted at frequencies of 435, 4244, 8492, 8634, 12738, 16984, 22352 and 22420KHz at 01:00, 03:00, 05:00, 07:00, 09:00, 11:00, 13:00, 15:00, 17:00, 19:00, 21:00 and 23:00 GMT. We hope to have given you a good notice about the station which signal you had received in your equipment and we thank you for your request.

Sincerely yours,

  
WALDO FERREIRA DA SILVA  
RIO-RADIO

Informative letter received by Hugh Hawkins, TX for his reception of

*Informative letter received by Hugh Hawkins, TX for his reception of EMBRATEL, Brazil transmission.*

Charleston Navy Tug Control at 0930; NGHY, USS Peterson (DD-969) clg Norfolk Tug Control at 1000; NJZK, USS Josephus Daniels (CG-27) clg Norfolk Tug Control at 1045; NDQV, USS Spruance (DD-963) clg Mayport Control & NTCC Mayport at 2235 (Gordon, CT).

2765: NSD (un-ID) in CW w/5L grps at 0703 (JM)  
2670: NMA10, USCG Mayport, FL w/notices in USB at 0624; NMG, USCG New Orleans w/wx in USB at 0553; NCF, USCG Bose Miami confirming t/c from un-ID ship in USB at 0638 (J.M., KY).

2692: Gander Aeradio, Nfld. in USB at 0515 w/kg Royal Jordanian 266, then Air France 044, Swiss Air 121, & Lufthansa 4240 (Mierzwinski, PA).

3116: K4A in USB w/FoxTrot Hotel at 0559. At 0600 War 46 w/kg Anger Cat confirming primary & secondary freq use (freqs had 2L designators) (Fernandez, MA).

3170: OLB5, Czech. Institute of Science, Prague, Czechoslovakia in CW w/time pips at 0311 George Osier, NY).

3188.5: YL/GG in AM-mode at 2210 sending 3/2F (D.O.C., APO).

3225.5: YL in Serbo Croatia, AM-mode at 2150 w/5F grps. Began stepped tone call up at 2200. Started msg of H-3 on 3225, 3240 & 3400 kHz. All freqs had some YL annor but freqs not simulkeyed (D.O.C., APO).

3292: Un-ID sta in CW at 0316 w/5L grps (Osier)

3370: YL/GG in USB at 1530 w/5F (D.O.C., APO)

3515: CKN, Canadian Military, Vancouver, BC w/freq listing in CW (Anderson, BC). Time? - Ed.

3560: YL/Czech in AM-mode at 2046 w/5F grps. Very strong in middle of ham band (Skornia, England).

3562: OM/RR in AM-mode at 2045 w/5F grps. Curiously ended w/2F grp count & 3F ID before usual 000 finish (Mason, England).

3963: Missouri Emergency Operations & Weather Net in LSB at 1721 in special session. NCS was NOOE; stas in Net attempting to work pocket on 2 meter band thru an airborne digital repeater, "AIRMO" on the Blue Channel-- later the a/c had to

land due to engine problems. Several stations were successful at w/kg thru repeater while a/c was at 7000 ft altitude (Anonymous, MO).

4010: YL/GG in AM-mode at 1705 w/5F grps (D.O.C., APO).

4066.1: NLF1, USNS Truckee (TAO-147) clg Norfolk ICSB & NAVCAMSLANT at 0500; NEDO, USS Austin (LPD-4) clg ICSB at 0400; NVIN, USS Vincennes (CG-49) clg San Diego CSSI at 0135; NXXG, USS Iwo Jima (LPH-2) clg Norfolk ICSB at 0135; NHXD, USS Lynde McCormick (DDG-8) w/kg San Diego CSSI at 0300; NMYU, USS Sylvania (AFS-2) w/kg NAVCAMSLANT & ICSB at 2145; NSWU, USS MacDonough (DDG-39) clg Norfolk ICSB & NAVCAMSLANT at 0200 (Gordon, CT).

4125: KLJH, ship Sealand Venture in USB at 2001 w/kg WHAU, ship Charles Carroll (O'Connor).

4127: Cold Bay, AK w/marine wx in USB at 1935. USCG Commsta Kodiak, AK in USB at 1936 asking vessels to be in lookout for missing aircraft (Brookman, AK).

4235.5: EAD2, Aranjuez, Spain w/QSX market in CW at 0039 (Osier, NY).

4292: IAR24, Rome PT Radio, Italy in CW w/wx at 0057 (Osier, NY).

4312.4: FUG, French Navrad, LaRegine, France clg FAAW in CW at 0325. One 5L grps msg, then others in plaintext FF & EE (Anonymous, MO).

4327.5: JOS, Nagasaki, Japan in CW at 1352 w/CQ market (Szalony, CA).

4562: JWT, Stavanger Navrad, Norway clg CQ in CW at 2058 (Skornia, England).

4564: RFE Holzkirchen, FRG feeder in USB w/pgm relay at 2052 (Skornia, England).

4770: YL/GG in AM at 1846 with 3/2F grps (Sabo, S. Korea).

4822: Three ascending musical notes, then Achtung-Achtung & into YL/GG #'s. Ended bc w/Ende-Ende. AM-mode 1900-1905 (Mason, England).

5062: CMU967, Santiago Naval R., Cuba w/ID marker in CW at 0550 (J.M., KY).

5063: Yokota Monitor w/misc comms to another (unheard) sto making reference to 15 MHz secondar-

**Abbreviations Used For Intercepts**

AM	Amplitude Modulation mode
BC	Broadcast
CW	Morse Code mode
EE	English
GG	German
ID	Identifier/location
LSB	Lower Sideband mode
OM	Male operator
PP	Portuguese
SS	Spanish
t/c	Traffic
USB	Upper Sideband mode
w/	with
wx	Weather report/forecast
YL	Female operator
4F	4-figure coded groups (i.e. 5739)
5F	5-figure coded groups
5L	5-letter coded groups (i.e. IGRXJ)

freq. USB at 2101. This freq good for both NorPac & CentPac LORAN nets (Sabo, S. Korea).

5125: RFE feeder in E. European language from Holzkirchen, FRG at 2124 (Skornia, England).

5288: YL/GG repeating 413-413-413-1 of 2100; the 5 mins later 236-66-236-66 & into 5F grps (Mason, England).

5413: YL/EE in AM at 0204 with 3/2 grps (Osier, NY).

5415: YL/EE repeating 1-0 383 in AM-mode from 2000-2010. At 2010 YL/GG sta w/bells marker on this freq. At 2100 some YL/EE w/1-0 count 759 but this time msg followed at 2110 (Mason, England).

5433: FZD (un-ID) in CW at 0533 w/5L grps (J.M., KY).

5440: YL/GG in AM-mode at 2232 running 3/2 grps (Fernandez, MA).

5547: KUA3, Honolulu Aeradio, HI w/pos reports from Northwest 86 & United 131 at 0308 in USB (Szalony, CA).

5597.4: Air France 220 in USB at 0304 w/kg New York (Stinnett, WV).

5684: St. Johns Military R., Canada in USB at 0304 q/3L grps addressed to J54T (not heard). (Anonymous, MO).

5692: YL/GG in USB at 2130 with 3/2F grps (Skornia, England).

5696: N2C, R5D, & 1418 in USB at 1755 in contact w/NAVCAMPAC, also radio check between NAVCAMSPAC & Sacramento Avionics (Kommler, CA); USCG Commsta Miami w/kg Kingstan CG in USB at 0550 w/wx data (Fernandez, MA).

6251.8: 781JU (un-ID) in CW at 0410 clg 75RQA (Anonymous, MO). May be Spanish naval-- Ed.

6450: Time sigs at 1431 (Szalony, CA). Believe this might be XSG, Shanghai, PRC on 6454-- Ed.

6577: KEA5, New York Aeradio w/kg Clippet 98 at 0228; American 698 at 0232, w/pos reports (Szalony, CA).

6694: 6NL clg OYG & 7RQ in USB at 0400 (Stinnett, WV).

6750: USAF Lajes, Azores in USB w/wx at 2200 (Skornia, England).

6760: Utah Testing Range in USB talking to Amex-44 at 0200 re range finder settings (Stinnett)

6769: P6W (un-ID) in CW at 1603 w/5L grps. Also on 10236 kHz at 1703 in CW w/5L grps (J.M.).

6784: YL/GG in AM-mode at 2349 w/5F grps, Ende & off at 2351, carrier remained on another 2 mins (Mierzwinski, PA).

6868: FUE, Brest Navrad, France w/VVV marker in CW at 0737 (J.M., KY).

6875: YL/GG repeating 613 from 2100-2105. At 2105 Numo-543 the Gruppen 15 & into 5F grps, ended w/0000 (Mason, England).

6876: E7K (un-ID) in CW at 2145 w/5L grps (J.M., KY).

6924.9: YL/EE w/3F grps in AM-mode at 0102; 1-0 counts & repeating 301 (Stinnett, WV).

6935: YL/EE (sounded British) repeating 36511 from 0000-0005 in AM. At 0006 sent Ready-Ready 22 22 then into 5F grps (Mason, England).

6961.6: YL/EE w/3F grps in AM-mode at 0210; a 1-0 count & tpts Attention 547 (Stinnett, WV).

7532: YL/B-N, Mossad, Israel has YL/EE repeating ID from 2000-0400 (Mason, England).

7651: LTC31, Buenos Aires, Argentina in CW at 0255. On for 50 secs, then silent for 1 min., QRM from a VOA feeder (Mierzwinski, PA).

7902.5: Beacon U in CW & beacon K in AM-mode at 0039 (Vendetti, NJ).

8161: Liftmaster 03 clg Liftmaster 767 in USB at 1607, then AM-mode at 1623 (J.M., KY).

8198.1: GZIT, HMS Brozen in USB at 1924 w/patches thru Patshead R. (O'Connor, NH).

8238.4: DLAL, cruise ship Europa in USB at 1444 w/patches via Ocean Gate R. (O'Connor, NH).

8291.1: ZGPK, ship Steno Carrier in USB wkk sta WPE, Tug Communications, Jacksonville, FL (O'Connor, NH).

8294: Two stas w/barge ops in USB at 1301 (Fernandez, MA).

8362: H9DW, ship Flores in CW at 2040 clg WCC (O'Connor, NH).

8364: IBUF, ship **Mariasperanza F.** in CW at 2032 clg WSC (O'Connor, NJ).

8368.4: UWUT, ship **Zopolyarny** in CW at 0006 clg VCS w/wx (O'Connor, NH).

8501.5: XSG, Shanghai, PRC in CW at 1320 clg CQ (Szalony, CA).

8437: 7TA, Algiers, Algeria w/CQ tape at 2146 (Skornia, England).

8448.7: T5MG (un-ID) w/CW marker at 0020 (Osier, NY).

8460: PPJ, Juncao, Brazil w/QSX marker in CW at 0029 (Osier, NY).

8464.3: NMN, USCG Commsta Portsmouth, VA in CW announcing new 8 MHz ARQ freq pair of 8716.5/8355.5 kHz (Anonymous, MO).

8467: Beacon E at 1316 (Szalony, CA). This may be a new one, haven't seen it before-- Ed.

8515: 5AT, Tripoli, Libya clg CQ in CW at 2119 (Skornia, England).

8547: JFA, Chuo Gyogyo (Matsudo), Japan clg CQ in CW at 1322 (Szalony, CA).

8574: HKC3, Buenaventura, Colombia w/CW marker at 0155 (Osier, NY).

8646.5: Beacon F at 1313 (Szalony, CA).

8686: CNP, Casablanca, Morocco clg CQ in CW at 2104 (Skornia, England).

8708: WPD, Tompa, FL clg CQ in CW at 1311 (Szalony, CA).

8717: PCH, Schvenigen, Netherlands clg CQ in CW at 2052 (Skornia, England).

8731.3: WOM, Miami High Seas op w/kg ship Steward in USB at 0221 (Kammler, CA).

8765.4: GKU46, Portishead R., England running a marker reading GKY6 (listed as 16 MHz RTTY) at 2110 along w/phone t/c (O'Connor, NH).

8784: HEB18, Berne, Switzerland w/patches in simplex at 2042 (Skornia, England).

8843: KUA3, Honolulu, HI w/kg Delta 1564 at 0241 (Szalony, CA).

8861: Ascot 3336 w/kg Dakar Air in USB at 0202 (Jarrett, TN).

9003.7: MKL, Pitreavie Castle, Scotland w/time pips, USB at 0002 (Vendetti, NJ).

9118: GPN4, Reuters News Service, London, England w/CW marker at 0009 (Vendetti, NJ).

9886: A1A (un-ID) in CW at 1549 w/5L grps (J.M., KY).

10000: "43 this is 45" in voice 1830-1840 & making "tango tango" (RTTY) tests right on top of WWV. Also heard Kilo 2 calling Golf Bravo (Fernandez, MA). Is nothing sacred?-- Ed.

10075: Gray-Southern Airways a/c Douglas 90201 w/kg Houston ATC in USB at 2233 (Kammler, CA).

10194: Sta ID'ing as 32 reloying a/c tracking to Bandsaw in USB at 1904 (J.M., KY).

10236: Z4U (un-ID) in CW at 2117 w/5L grps (J.M., KY).

11176: Elmendorf AFB, AK in USB at 2200 w/much activity; more than a dozen Skyking bc's in less than an hour. A/c KC-135 crass Delta 015 requests to abort mission & assist in SAR in progress. KC-135 #021 already on sta. One o/c down, another missing. 2nd a/c KC-135 Golf Delta requests to abort mission & assist. A/c told RTB. Other code names mentioned were Homepatch, Firebird Base, & something like Mr. Hillitay(?) (Kammler, CA).

11271: CHR, Trenton Military R., Ontario in USB at 1748 w/wx for a/c Bison 10 (J.M., KY).

11288: Slingshot DE-70 mentioned Charlie 20 & L600 several times. USB at 2115. (Kammler, CA). Kneital's Top Secret Registry 6th Ed lists this as freq "Yankee Delta" as used for chasing drug smugglers off the Southeastern shores-- Ed.

11633: F2P (un-ID) in CW at 2006 w/5L (J.M., KY).

12001: FIU (un-ID) in CW at 2017 w/5L grps (J.M., KY).

12124.3: CKN/C13E, Vancouver Forces R., BC in CW at 0100 w/VVV marker. One priority msg sent to Guam (Anonymous, MO).

12168: AAD32, Ft. Rucker, AL closing net ops. Was USE at 1943 (J.M., KY).

12185: X98QC, Mexico City, Mexico in USB at 2133. Two OM's in 5S (Bob Margolis, IL).

12200.8: X58MU, Mexico City, Mexico in USB at 2107 w/5S t/c (Margolis, IL).

12429.3: WTL4517 un-ID ship clg KTD442, Marco Polo, USB at 1810 (Kammler, CA).

12544.8: PPXV, un-ID Brazilian ship in CW at 1945 clg PWJ (Rio Navrad) (Szalony, CA).

12657.6: JNA, Tokyo Navrad, Japan clg CQ in CW at 1455 (Szalony, CA).

12692.2: ZRQ5, Navrad Simanstown, RSA w/CW t/c at 1951 (Osier, NY).

12717: ZLO, Iirangi, New Zealand w/call marker in CW at 0550 (J.M., KY).

12740: ZLB, Awarua, New Zealand w/ID marker in CW at 0544 (J.M., KY).

12750: CWA, Cerrito, Uruguay clg CQ in CW at 0548 (J.M., KY).

13045: A CW xmsn consisting of a Q, then PT, followed by ILPSY repeated over/over at 0017 (Vendetti, NJ).

13138: VCS, Canadian CG, Halifax, NS w/wx in USB at 1614 (J.M., KY); URPR un-ID Soviet ship in USB at 1930 placing call via VCS (Anonymous, MO).

13196: SVN5, Athens, Greece w/phone patches in USB at 1544 (Skornia, England).

13826: NNN0PCF, MARS sta aboard **USS Peoria (LST-1183)** in USB at 0000 w/kg NNN0NRI, Pt. Hueneme, CA (Gordan, CT).

13957: CLP1, MFA Havana, Cuba w/Minrex t/c in CW at 2232 (J.M., KY).

14467: NNN0CRI, MARS aboard **USS Sculpin (SSN-590)** clg NNN0KRQ at 0005. Submarines not hrd very often on MARS. Have a QSL from them sent from **USS DeWet** (Gordan, CT).

14470: NNN0COQ, MARS aboard **USS Pensacola (LSD-38)** at 1805 in USB at 1805. Was passing patches thru NNN0COZ, **USS Forrestal (CV-59)** which was docked & acting as a shoresta (O'Connor).

14523: ONY27, NATO Rouveroy, Belgium in CW at 1316 w/crypta t/c to OBY24 (Margolis, IL). Since OB calls are Peruvian, would assume OBY24 to be a tactical ID-- Ed.

14563: Un-ID sta in CW at 1343 w/5F grps. Zeros cut as letter T (Margolis, IL).

14612: FAD21, French Army, Paris, France in CW w/FF t/c at 1714 (Margolis, IL).

14664: RIW, Khiva Navrad, USSR in CW at 1350 clg a naval vessel w/callsign LUXYR (Margolis, IL).

14668: CLP12, a Cuban embassy somewhere clg CLP5 (Embocuba, Algiers) in CW at 1804 (Margolis).

14777: Compress & Sincere w/signal checks, USB at 2241 (Brookman, AK).

14780.5: FTO77, DGT Paris, France in LSB at 1430 w/patches in FF (Margolis, IL).

14890: RFK64, PTT Mascaw, USSR w/patches in RR, 0707 in USB (Margolis, IL).

14818.5: Y7A60, MFA Berlin, GDR in CW w/call marker at 1349; see 16199 kHz (Margolis, IL).

16199: Y7A63, MFA Berlin, GDR in CW at 1433 w/call marker (Margolis, IL).

16400: FTQ41, Paris, France in USB at 1637 w/t/c in FF (Vendetti, NJ).

16587: WLEB, tanker **Overseas Natalie** w/patch via KHT, USB at 1957 (J.M., KY).

16595.5: Un-ID shoresta clg ship **Havana Trader** in USB at 2010 (Kammler, CA).

16784: SXDJ, Greek vessel **MV Agamemnon** w/kg KPH w/telegams in CW at 1929 (Hall, WA).

16785: DVLN, Philippine ship **Star Junri** w/kg

NMC w/AMVER rpt, CW at 2200 (Hall, WA).

16790: 3FSU, ship **Panay** w/kg VAI w/AMVER rpt in CW at 2258 (Hall, WA).

16795: ONME, Belgian vessel **Mortha** w/kg NMN w/AMVER t/c in CW at 2232 (Hall, WA).

16912: SUH5, Alexandria, Egypt clg CQ in CW at 1118 (Skornia, England).

17008: TAH, Istanbul, Turkey clg CQ in CW at 1610 (Skornia, England).

17037: WNU55, Slidell, LA clg CQ in CW at 1828 (Anderson, BC).

17079.4: SAC, Goteborg, Sweden in CW clg CQ at 1620 (Vendetti, NJ).

17353: SVN, Athens, Greece in USB at 1138 w/patches; also at 1619 on 17354 (SVN6) w/same (Skornia, England).

17408.5: WWD, NOAA LaJolla, CA in USB at 1656 w/kg WEDK & W17115 (Margolis, IL).

17426: GPA6, Portishead, England in CW of 1459 w/marker & ARQ phasing sig (Margolis, IL).

18240.8: Un-ID sta in CW at 2100 w//#'; apparently in contact w/another sta that was requesting grps to be repeated ("fills") (Anonymous, MO).

19010.7: OST, Qstende, Belgium in CW at 1616 w/call marker (Vendetti, NJ).

19295: YL/GG in USB w/musical marker; YL rpts Hotel Kilo then into 5F grps, rpts text & ends at 1616 (Margolis, IL).

21864: N. Korean embassy in Havana in CW at 1832 w/5F grps. Partial cut #'s: AU34567DNT (Margolis, IL).

22325: PCH70, Schevenigen, Netherlands w/CW marker at 2011 (J.M., KY).

22362.5: HEB, Berne, Switzerland clg CQ in CW at 1736 (J.M., KY).

22376: IAR62, Rome, Italy w/VVV in CW at 1736 (J.M., KY).

22404: OXZ, Lyngby, Denmark clg CQ in CW at 1700 (J.M., KY).

22407: GKJC7, Portishead, England w/CW call marker at 1704 (J.M., KY).

22408.5: SPH, Gdynia, Poland in CW at 1450 w/nx in Polish, t/c list & telegams (Margolis, IL).

25197: LSAB, Boca, Argentina in CW at 1756 w/5S & EE t/c then marker (Margolis, IL).

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# SCANNER SCENE

BY CHUCK GYSI, N2DUP

## MONITORING THE 30 TO 900 MHz "ACTION" BANDS

If you live in a metropolitan area, chances are you won't escape trunked radio communications on the 800-megahertz band. More and more trunked systems are being put on the air everyday in major cities and their surrounding areas. However, it takes an understanding of trunked radio systems in order to monitor them successfully.

There are two types of trunked radio users to be encountered on 800 MHz: public safety and business. In many areas of the country, including rural towns, trunked radio systems are on the air for businesses to use. Meanwhile, public safety users, which usually are a little behind their commercial counterparts because of budget considerations, are gradually moving from VHF and UHF radio channels to trunked radio systems on 800 MHz. When a radio manufacturer attempts to sell a trunked radio system to a city, it offers it as a citywide radio system that can support communications of all the city's departments and agencies, if that is what the city wants. However, because of the capacity of trunked systems, usually only medium to large size cities and counties are switching over.

A trunked radio system typically uses five, 10, 15, or 20 channels all tied together. Public safety users typically operate systems in the 856-861 MHz band while business systems use the 861-866 MHz band. In a five-channel trunked system, each frequency in the system is exactly 1 MHz apart. Thus, a five-channel trunked system might operate on the following frequencies: 856.4625, 857.4625, 858.4625, 859.4625 and 860.4625. If you were to tune in each of the channels, you'd find one of the frequencies would have constant buzzing of computer-like noises. This channel usually is referred to as the "data channel."

This data channel is the controlling channel of the system. The computer-like noises on the channel are assigning frequencies to mobile units in the system so that different groups don't interfere with each other on the same system. The mobile units in the system automatically hear the controller noises on the data channel and automatically switch to one of the other channels in the trunked system for monitoring a conversation or initiating a conversation. On a trunked system within a given city, different groups and subgroups will have their own "systems" on a trunked system. For instance, the initial groups on a city's trunked system may be divided into police, fire, rescue, sanitation, streets and administration. The system will allow any of the groups to communicate with each other for emergency situations. However, within each group, there will be subgroups for the users. In this instance, the police group would be broken



A nifty card made up by Marv Anderson, Registered Monitor KNE0DO.

Depending on a city's needs for communications, some trunked systems may support just police or basic public safety functions. In more elaborate systems, every municipal department or division within a city may be using the system, which increases the possibility the system may be 10, 15, or 20 channels rather than five channels. Because the data channel switches units around on various channels, the possibility of overloading is minimal.

There are two basic types of trunked systems. Without being specific, one system places the mobile unit on a given channel via the data channel and keeps the units in conversation with each other on that frequency until the conversation is over. In the other system, the data channel can "order" the mobile units to switch frequencies each time the microphone is depressed by each unit. Because of this, it makes monitoring trunked systems somewhat difficult. A five-channel trunked system is much easier to attempt to monitor than a 20-channel trunked system when the controller starts moving the mobiles around from channel to channel. First of all, you can lock out the data channel from your scanner. In a five-channel trunked system, that leaves four other channels in the system that might be used for communications. It is a lot easier to chase around a conversation on four channels than on 18 or 19 channels in a 20-channel trunked system.

It should be noted that the 856-866 MHz channels in trunked systems are repeater output channels. The mobiles operate ex-down into subgroups of patrol officers, detectives, vice officers, traffic units, commanding officers, etc. Each of those subgroups can communicate with each other, but for all practical purposes, the patrol offi-

cers don't need to communicate with detectives every day, so they will not hear each others' calls or dispatches. In fact, in some cities with internal affairs divisions, the patrol car radios often are set up so they cannot monitor what may be sensitive communications by internal affairs investigators. Actually 45 MHz lower and change their input frequencies (as well as the output frequency they monitor) as the data channel assigns them to a channel.

In a business trunked system that operates on the 861-866 MHz band, the repeaters will support many businesses within a geographic area. These trunked systems typically are operated by radio shops or investors. In fact, these types of systems also can offer mobile-telephone type service to users. In many instances, a single user on the system will use the trunked system solely for mobile telephone service to place calls from his or her vehicle. In fact, so many business people are using trunked systems for mobile telephone service, that the FCC had even proposed at one time allowing individuals access to the trunked service, allowing them an alternative to cellular and conventional mobile phone service; they'd also be able to use trunked systems for personal communications. In some areas, cities and counties also are using trunked service on business frequencies for mobile phone service or communications for a specific agency or department. While you normally won't find public safety trunked systems in rural areas, you might find business trunked systems in rural cities. Some trunked systems are even operated at airports exclusively for airlines and airport-support businesses.

While frequencies in a five-channel trunked system are exactly 1 MHz apart (as

discussed earlier), other channels in a larger system also will be 1 MHz apart, but there is some overlap. For instance, while 856.4625, 857.4625, 858.4625, 859.4625 and 860.4625 may be five channels in a 20-channel trunked system, other channels might be: 856.7125, 857.7125, 858.7125, 859.7125, 860.7125, 856.9375, 857.9375, 858.9375, 859.9375, 860.9375, 856.9625, 857.9625, 858.9625, 859.9625 and 860.9625. Note there are four groups (.4625, .7125, .9375 and .9625) of five channels and that each channel within the group is 1 MHz apart.

One trick to monitoring trunked systems is to lock out the data channel because the computer noises are transmitted continuously. However, trunked systems change the data channel each day, usually around midnight or 1 a.m. Thus, you will need to change the locked-out data channel in your scanner each day. It may be a pain, but it's the only way to continue monitoring the system day in and day out. You might even discover that only certain frequencies in a trunked system will be used for the data channel. Be careful not to lock out a channel that might be used for momentary data transmissions such as mobile data terminals, however. While the channel may be being used one minute for mobile data terminals, it may be used for voice a few seconds later. The data channel in a trunked system transmits continuously, except for when it switches frequency early each morning.

Are 800 MHz trunked systems actually on the air and in operation? You bet. Many frequency directories don't make mention of them because of how hard it is to extract the information from FCC license files. However, the better scanner directories will list trunked systems. Florida has public safety trunked systems in operations in several cities, including Miami-Dade County. Dayton, Ohio, put their trunked system on the air last year and many cities are studying the possibility of switching to the higher frequencies. The first statewide trunked system is being installed in New Jersey, where state police will have the capability of communicating from one end of the state to the other when the system is up and fully functional. Units of the New Jersey Department of Environmental Protection, which responds to environmental emergencies in the state, also will have some units on the state police statewide trunked system. The trunked repeater tower sites are linked by microwave across New Jersey. Other state police forces across the United States also are studying the possibility of going to 800 MHz trunked systems and are watching how New Jersey's system works. New Jersey is using the 20 frequencies I listed in one of the above paragraphs showing how a 20-channel trunked system might be set up.

If your city switches to 800 MHz trunked, and the city currently is using VHF low, VHF high or UHF frequencies, chances are many channels may no longer be in use as

the city switches to the new system. However, don't give up listening to the old frequencies, because another nearby town or local government may grab channels when they become available. In a metropolitan area, those frequencies won't be quiet for too long.

While trunking currently is allowed on only the 300 MHz frequencies reserved for such use, it's very possible that the FCC may issue a ruling several years down the road allowing trunking on VHF or UHF. In fact, when the FCC proposed rules changes for the General Mobile Radio Service last year, it sought comments from GMRS licensees on whether trunking should be allowed on GMRS's 462-MHz channels.

If your city or a nearby city switches to trunked service, don't despair. It may take a little bit of getting used to locking out the data channel each night and following conversations from channel to channel, but after a while, you'll develop your own tricks to keeping tuned in. If you know of trunked systems in operation, let us know here at POP'COMM and we'll let others know as well. Also let us know how you're listening to the trunked systems and we'll pass along your tips.

We also welcome your questions, comments, frequency lists, listening tips and photographs at Scanner Scene. Write: Chuck Gysi, N2DUP, c/o Popular Communications, 76 North Broadway, Hicksville, NY 11801. **PC**

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CIRCLE 3 ON READER SERVICE CARD

## FOCUS ON FREE RADIO BROADCASTING

The January Pirate's Den contained loggings of a station believed to be identifying as the "Voice of Free Loar" and another with the tentative ID "Voice of Foomar". I speculated that both of these might—at the least—be the same transmitter as the **Voice of Free Long Island**. Dave, from VFLI, has written to say that's correct—both of the logs were, in reality, the Voice of Free Long Island. The station, however, was apparently not using "Loar" or "Foomar" in the ID. People may be picking up the word "Tagar" and hearing it as "Loar" or "Foomar." Incidentally, Dave says the station has received about twenty reports from as far west as Oklahoma. New frequencies in use are 7415, 7445 and 7465.

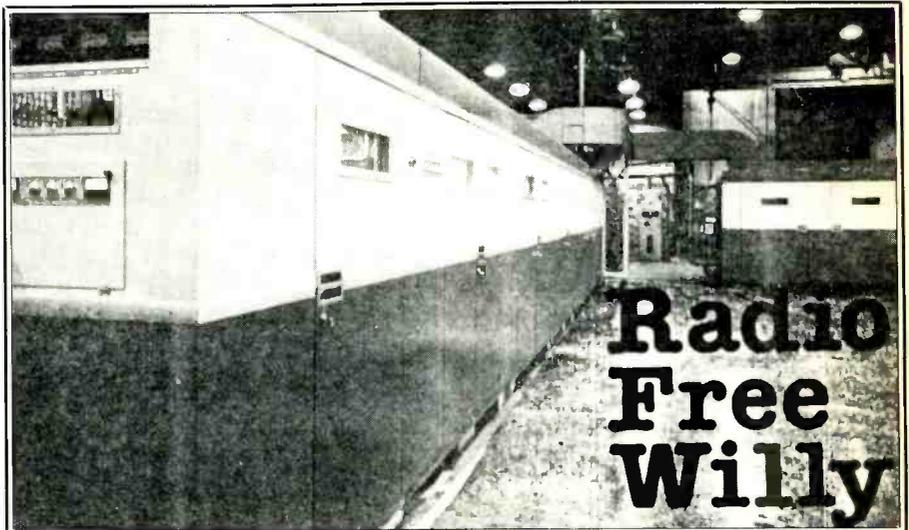
In Alabama, George J. Macksoud Jr., heard **VFLI** and talked to the operator while the station was on the air (it's from George's conversation that we learn that "Tagar" is pronounced "Tuh-gar"; when asked what the word meant the operator said "Let's just call it a codeword.") George says the operator said to watch for the station on weekends. However, George has heard the station four times, each time on a Thursday. He notes, also, that part of the QSL is a hand-written stick-on label, applied over scratched-out ham call letters!

**VFLI** QSL'd for Tim Tromp in Michigan, telling him to listen on 7415 or 7445 on Saturdays around 10:30-11 pm EST (0330-0400 UTC). The information Tim received is that **VFLI** now has a better transmitter.

**Radio Free Willy** tells me they are back on the air. "Lazlo Toth" of the station says they've been off for "about a year" due to a "dangerous regulatory attitude in our FCC district" and a high noise level on 1610 kHz. A broadcast on 7425 was judged "a huge artistic success."

**WRNI-Two** was logged by Tom Chandler in Vienna, VA. The DJ called himself Johnny Ray, and was operating on 7424.8 from 0336 tune in, until the station went off the air at 0447. The program contained claims that the station was broadcasting from the "pirate ship Sarah Two," featured skits (including a parody on the "Today Show.") Tom notes that the station created the "WRNI-Two" name right in the middle of the broadcast! He got the impression that the operator had little previous pirate experience and knows there's no connection with the original **WRNI** (Radio Newyork International). Tim didn't hear any announced address so if anyone has more information on this one, please send it in.

Tim White of Illinois spotted the **Voice of**



Here's the QSL card of Radio Free Willy, recently returned to the air. Think that's really their transmitter! Thanks to Frank N. Decker for this.

**Laryngitis** on 7415 at about 2242. The station seemed to be tuning up prior to sign on at 2202 with programming which featured A. Angus, Hengist Huxley, and DJ Cowboy Sam.

Tim Tromp says he caught **KBFA** (Broadcasters of Free America) at 1618-1653 on 7398, varying to 7400. **KBFA** announced that they have a much better trans-

mitter and sound quality (noting that this was their first broadcast with the new equipment.) They said they were still working on a mail drop and mentioned this column for signal reports (No, no, guys!) Tim said signals were clear and quality excellent at his Muskegan, MI location.

Tim also heard **Radio Mouser Worldwide** from 0105 on 7415. Signal strength

VOICE OF FREE  
41 METER BAND  
LONG ISLAND

100 WATTS  
)))(((

STATION	DATE	GMT	RST	MHz.	2-WAY
GEORGE	25 SEP 1987	0325 0419		7.415	

The Voice of Free Long Island's QSL card. There's a set of ham call letters under the sticker which carries the station name. (Thanks to George J. Macksoud, Jr.)

was poor and the station seemed to be contacting other pirates (Tim couldn't tell which ones) with conversation mostly about personal things rather than pirate broadcasting. Mouser was the last one left, giving an address for reports and doing some singing and whistling before he left the air.

Tim wonders about the "Voice of Salvation" which he hears nightly on 5055. I think this is a religious program carried over legit shortwave station TIFC in Costa Rica, Tim.

Frank Decker of Syracuse, NY sends a copy of a QSL he received from WENJ-1620 kHz. According to the information on it, the station uses 150 watts into a 130 foot long horizontal "L" antenna and occasionally operates on 1630, 1640 or 1650 instead of the usual 1620 channel. There's no set schedule but there are occasional tests on weekdays after sunset. Reports (via phone, apparently) have been received from Ontario, Virginia, Pennsylvania, Maine and Illinois. There's no mailing address available yet. QSL was signed by "Jack Beane."

That covers the action for this month but I'll be back with more pirate news this month. Meantime, be sure to send your pirate loggings, press clippings and pirate information received from the stations, as well as items which can be used for illustrations.

Many thanks for your help. It's good to know so many readers enjoy this column. Keep prowling those pirate bands!

PC

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# CLANDESTINE COMMUNIQUE

## WHAT'S NEW WITH THE CLANDESTINES

BY GERRY L. DEXTER

Clandestine monitors in various parts of the country continue to report reception of the relatively new *Radio Voice of Ethiopian Unity*. In southern France, Jean-Jacques Block confirms the schedule we had last month, noting that broadcasts are heard in Tigrigna from 1800 to 1830, in Oromo (which Block notes is also called Yalla) from 1830 to 1900 and in Amharic from 1900 to 2000 on both 9430 and 11180.

Jean-Jacques also says that at the start of each transmission, the station announces its frequencies as 15790, 12000, 9670, 7120 and 5000. None of these channels are being reported anywhere that we know of. Block also observes that the station is not announcing any address. The *Radio Voice of Ethiopian Unity* is sponsored by something called the Ethiopian People's Democratic Alliance and opposes the current Marxist government in Addis Ababa. The station uses transmitters which are almost certainly located in the Sudan and, in fact, which belong to that government. That oddball 11180 frequency was once used for broadcasts of the *Voice of the Free Sons of Yemen South* (now silent) and which, during its activity, was confirmed as coming from the Sudan.

Takashi Kuroda in Tokyo says he hears

Iran's *Flag of Freedom Radio* on 9035 from 1630 to 1730 with ID's in English, French and Persian (Farsi). Takashi says the station has a strong signal at his location but does suffer from occasional jamming.

He also hears the *Voice of the National Army of Democratic Kampuchea* from 1330 to sign off at 1430 on 5199.7, broadcasting in Kampuchean to 1400 and then in Vietnamese. He notes interference from a radioteletype station as well as a station in SSB and says that, before 1330, the channel is completely covered by a utility station. There's reasonably good reception of this station in the U.S. on occasion.

Takashi notes that he has a problem picking out the ID's of most clandestines since he doesn't speak the language(s) they are using. We all have the same problem and, unfortunately, there's no one publication which carries texts of the ID's. Some club bulletins do, but only from time to time depending upon whether this information is supplied by the reorter. Often as not, it isn't.

It seems this is "international month!" Robert Ross in London, Ontario notes that he's heard the *Radio Camilo Cienfuegos* service of La Voz del CID on its third harmonic (3 x 9940 = 29820) at 2022 and notes that this 10 meter band area was

"wide open" at the time. The 9940 fundamental is noted by Frank Mierzwinski in Pennsylvania at 0300-0330 and the station also found on 7380 at 0335 to 0400. Cliff Goodlet in Tennessee heard the *Radio Antonio Maceo* service of CID on 11635 at 2015 to 2050.

Mierzwinski also notes the anti-Cuban *Radio Caiman* on 9960 at 0301 airing several ID's and music with some English lyrics.

The Contra clandestine, *Radio Quince de Septiembre*, is still on the air and noted recently during the early evening hours just slightly above 6215. If you don't find it there—try one of the station's other hangouts—around 5930 or 5950.

The lesser-known of the two active FMLN stations, *Radio Farabundo Marti*, has been noted recently from past 0000 to sign off prior to 0100 on such frequencies as 6650, 6635, 6645, 6665 and so on. Be careful, though, as *Radio Venceremos* also jumps around this area a lot and makes frequent mention of "*Farabundo Marti*" so it's a good

*Radio Farabundo Marti, lesser of the two El Salvador opposition stations, frequents the area around 6650 MHz during the evening hours.*

**El Salvador**

**Boletín Informativo Farabundo Martí del FMLN**

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idea to be careful about getting an ID. The more so because there's also at least one so-called "music jammer" floating around the area as well. Some nights one needs four receivers and eight hands to keep up with the games of tab being played in this frequency area!

The most recent schedule for the *Radio Free Afghanistan* service aired over Radio Free Europe/Radio Liberty is: In Pashto at 0230 on 9555, 11815 and 11970, in Dari at 0300 to 0330 on 9750, 11815 and 11970. In Pashto at 1330 on 15370, 15445 and 21455 and in Dari at 1400 on 15370, 15445 and 17735. This schedule represents a 100% increase in broadcast hours as compared to the service's beginnings a couple of years ago. RFE/RL transmitters carrying this service are located in West Germany and Portugal.

*The Voice of the Free Sahara* (La Voix du Sahara Libre), which is the program produced by the Polisario Front seeking independence for the Western Sahara region, is aired over Algerian radio (in French) daily at 2200 to 2300 on 9640 and 15215.

Please let us have your clandestine broadcast station loggings as well as any other data or background information you may have or run across on the stations or the opposition groups which back the stations. Those who have a need to keep their identities secret may rest assured that we will maintain the confidentiality you request.

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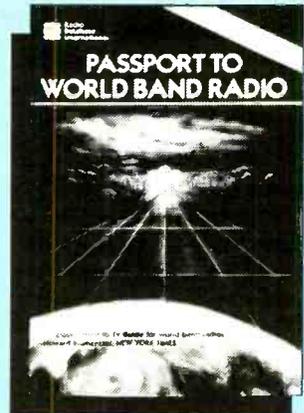
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## Beaming In (from page 4)

tional Geographic, and others look so good, that doesn't mean that it's at all easy.

I point all of this out for several reasons. First, you really have to appreciate the immense personal effort expended by a relatively few staff people who produce these newsletters in their spare time with limited funds, and (usually), insufficient participation by others. Secondly, with the trend towards such publications on the upswing in the communications hobby, those who are presently entertaining the possibilities of issuing newsletters, fanzines, or similar for the communications monitoring hobby might wish to take a more realistic view of exactly what's involved before going forward with their plans.

We are here to offer any encouragement, help, advice, and publicity possible. But it's going to take a lot more than that to make it work.

## Moving on To Other Topics

I don't know about you, but I'm an information junkie, especially when it comes to unusual communications and electronics phenomena. I subscribe to all sorts of publications offering curious tidbits of information ranging anywhere from the electro-gravitic theory of celestial motion, to claimed instances of ESP. From time to time, you can come across some very interesting information and research projects that are never mentioned in other media.

For instance, there's a story in *New Scientist* (Sept. 3, 1987 issue) called *Things That Go Buzz in the Night*, by Barry Fox. In the story, Fox mused about the strange world of electromagnetic transmission and unidentified audio-frequency humming. He discusses how our complex arrays of high-tech gadgetry are continuously bombarded by a myriad of electrical signals, noises, and transients. He specifically mentions the Soviet *Woodpecker* over-the-horizon radar signals that have caused so much disruption on the shortwave bands in recent years.

In the audio range of the spectrum, Fox brings up the topic of those still unidentified hums that are perceived by a small group of people who have now become known as "hummers" (Fox is one, himself). He notes that, by coincidence, he has good low-frequency hearing and that for several years he has intermittently heard a "curious" low-frequency sound coming from deep below the high ground around his home (in Hampstead Heath, London, England).

Most of the time, the hum is swamped by other noises, because human hearing adjusts sensitivity to compensate for background noise. The sound he hears is a rumble, like a very distant generator, or the compressor for a pneumatic drill, coming on and off load. Most other people can't hear the thing, and the times when Fox can hear it himself are usually in the still of the night. Fox applied considerable effort in trying to find the source, but without any success. The hum has been recorded and analyzed. It peaks at about 48 Hz, and therefore appears unrelated to the British 50 Hz power mains.

In *The Explorer* (October, '87 issue) there was a story called *Possible Remote Action Effects on a Piezoelectric Transducer*, by G. Scott Hubbard. In this piece, Hubbard describes a serious experiment conducted at Stanford Research Institute. Five participants were chosen in an attempt to mentally affect an electronic device.

He reports how "each participant was asked to influence a pair of piezoelectric transducers, operating in a differential mode, so as to produce an event above a predetermined threshold.

"During the formal data collection, the transducer enclosure was located in a locked laboratory adjacent to the participants' room. Under these conditions, one of the participants produced a total of eleven events above threshold, distributed in three separate effort periods. Control trials were recorded with no one present in the experimental room but with normal activity in the rest of the building. No equivalent, uncorrelated events above threshold were detected in those control periods."

Hubbard emphasizes the preliminary nature of the results, but feels they call out for further investigation. You certainly have plenty to think about when you consider the communications, military, espionage, and other tactical potentials of this effect, if it could be proven, then developed, taught, then carefully controlled and directed.

## SCANNING TODAY

(from page 8)

get a very special personalized certificate that only those who are selected and complete this project can obtain. They also receive special recognition by being listed as a contributing editor in the directories which use this data base. And they can also receive a free copy of the new directory when finally published. But that hardly seems enough for forty hours of hard work, does it? So why do we have so many volunteers. I think it can best be summed up with some quotes from participants:

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"I found a frequency used sometimes by our local police that I didn't even know existed . . . that find alone made this worth it to me."

"I had three scanners running with NiteLogger recorders, plus one "live" scanner going whenever I was home. Suddenly I have ten times the interest in scanning . . . I couldn't believe some of the things happening on the airwaves around here."

"I'm exhausted, but happy. Got maybe four hours sleep a night. But I was able to build a great personal file of things within earshot. Figured out what a bunch of special codes mean. Scanning is a lot more fun for me now . . . please make sure I am invited next time!"

"I even learned things from the computer editing sheets you sent to kick off the project . . . before I even turned the radio on!"

"I don't know how to explain it, but there's something different about scanning with a mission, with a deadline to boot. Sorta like a contest. Hope you make it an annual event."

So maybe they aren't that crazy after all.

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# RADAR REFLECTIONS

## RADAR DETECTORS AND THEIR USE

BY JANICE LEE

### **Kentucky Uses Unmanned Radar To Slow Traffic Down**

Some Kentuckians just hate to take "no" for an answer—especially when highway safety is involved. Kentucky's congressional representatives joined forces to overcome an FCC veto and to sponsor a two-year radar demonstration program. They hope this radar test will end chronic carnage on a winding section of Interstate 75.

After a nine-vehicle pileup last June, Kentucky State Police installed unattended radar units on Death Hill south of Covington. These units sent out radar signals, but did not measure speed. State police were counting on these units to set off radar detectors whose beeps or blinks would remind drivers of dangerous road conditions. That's exactly what happened: Traffic on this hilly winding highway slowed down.

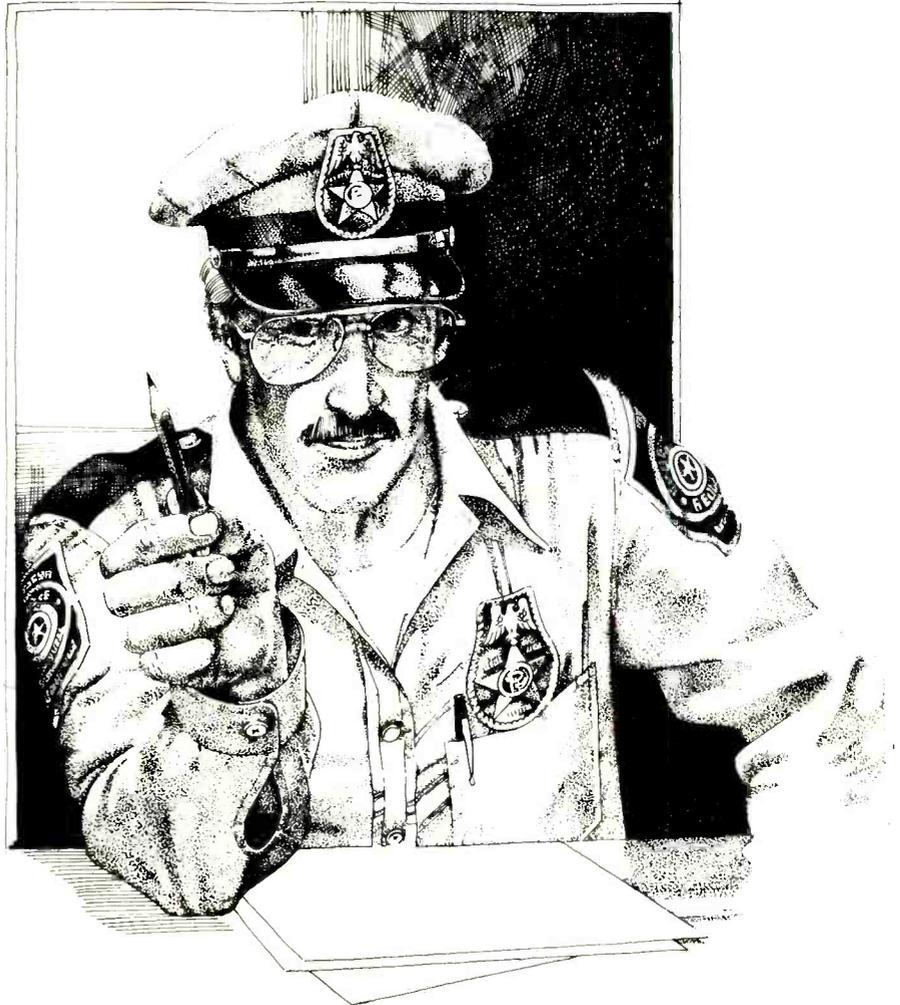
But in August, a Federal Communications Commission (FCC) ruling turned off all of Kentucky's unattended radar units. The FCC cited several federal regulations which these units violated. For example, the FCC ruled that radar units should be attended in case they break down or interfere with other frequencies.

When the state police cried foul, Senators Mitch McConnell and Wendell Ford and Representative Gene Snyder heard them and swung into action. They not only found a loophole in FCC regulations, but also got federal sanction to test the units for two years. The FCC stated it would have no problem with the units transmitting radar, if they did something else. Anything else! Therefore, the manufacturer could modify the units so they could have another function, such as counting cars.

Both the House and Senate passed bills sponsored by Kentucky congressmen to test the effectiveness of unattended radar equipment for two years. During this demonstration project, radar could be used continuously on Interstate 75 between Fort Mitchell and the Brent Spence Bridge over the Ohio River. This would give Kentucky State Police adequate time to measure the effectiveness of their electronics counterparts—radar detectors.

Rising personnel costs have caused police to become more creative in stretching their budgets. They are looking for ways an officer can be in at least two places at the same time. Radar detectors create the illusion of bi-location because they indicate the presence of radar, with, or without, an officer.

As a result of this demonstration project in Kentucky, more agencies could depend on



radar detectors to discourage speeding. We applaud the inventiveness of the Kentucky State Police and the staunch support of Senators Ford and McConnell and Representative Snyder—none of whom would take no for an answer!

### **New Study Shows That Radar Detector Users Have Lower Accident Rates and Buckle Up More Often**

A study that shows radar detector users have fewer accidents per mile driven than nonusers. According to an analysis by Yankelovich Clancy Shulman Inc. of Westport, CT, detector owners have fewer accidents per mile driven and are significantly more likely to wear seat belts compared to nonusers.

The study carefully gathered scientific

data and compared differences between current users and nonusers of radar detectors. To assure the study's accuracy, the two thousand drivers sampled nationally didn't know the study was about detectors.

Two key findings were uncovered:

\*Radar detector users have over 25% fewer accidents per mile driven compared to nonusers.

\*Eighty-one percent of radar detection device users say they use seat belts all or most of the time when driving long distances—10 miles or more. This compares with 69% of nonusers.

Finally there is a definitive answer to questions about radar detective use. This scientific study clearly shows that radar detector use has no negative effect on individual auto accident rates.

PC

Janice Lee is the Editor of Monday, A.M., the newsletter of Electrolert, Inc.

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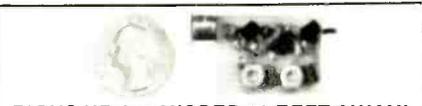
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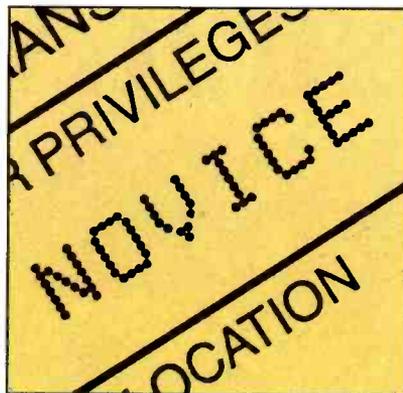
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### Free Product Information

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# You've made a great start. Now, let Yaesu really get you going.



Finally. The 220-MHz, 1.2-GHz, and 10-meter phone bands are open to Novice operation.

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There's a good reason you'll find the 220-MHz FT-109RH on more belts than any other. It simply out-classes the rest.

With a powerful five watts to get you out. A battery saver to keep you going. And a wealth of microprocessor-controlled features you'd expect only from a radio many times its size.

**HT power in its smallest form.** Finally, a miniature HT that you

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The FT-33R fits easily into your jacket pocket. But unlike the others, it features microprocessor control for quick, simple, and surprisingly intelligent operation.

And what other mini HT features five-watt output, a rugged aluminum-alloy case, and rain-resistant seals?

**Two for the road.** Our 220-MHz FT-311RM and 1.2-GHz FT-2311R are two of the most popular mobiles for two popular reasons.

One, they're built for performance. With slick microprocessor-controlled functions to get you around fast. And far.

And two, unlike most mobiles, they're built for simplicity. Because the last thing you need is a radio that interferes with your driving.

### World-class operation.

With our FT-757GX Mark II, you're ready to tackle the HF bands with all the full-featured performance an experienced operator demands.

Plus, when you upgrade to General Class, you won't have to upgrade your radio. Because with the FT-757GX Mark II, you've already started with the best. It's a great way to get maximum HF performance for your dollar.

**Tune in to Yaesu.** You've earned your ticket to the exciting world of amateur radio. Now, discover the exciting world of ham radio technology.

Yaesu's all the ticket you'll need.

# YAESU

CIRCLE 48 ON READER SERVICE CARD



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# KENWOOD

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## Hear it All!

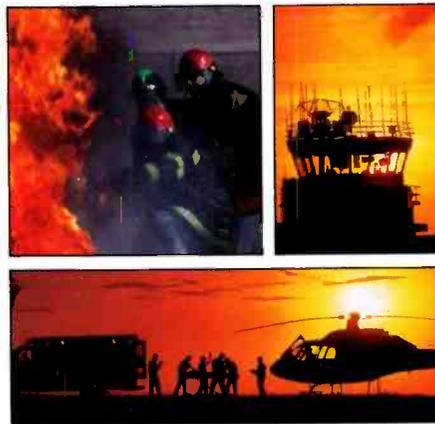


## R-5000

### High performance receiver

**THE** high performance receiver is here from the leader in communications technology—the Kenwood R-5000. This all-band, all mode receiver has superior interference reduction circuits, and has been designed with the highest performance standards in mind. Listen to foreign music, news, and commentary. Tune in local police, fire, aircraft, weather, and other public service channels with the VC-20 VHF converter. All this excitement and more is yours with a Kenwood R-5000 receiver!

- **Covers 100 kHz-30 MHz in 30 bands, with additional coverage from 108-174 MHz (with VC-20 converter installed).**
- **Superior dynamic range.** Exclusive Kenwood DynaMix™ system ensures an honest 102 dB dynamic range. (14 MHz, 500 Hz bandwidth, 50 kHz spacing.)



- **100 memory channels.** Store mode, frequency, antenna selection.
- **Voice synthesizer option.**
- **Computer control option.**
- **Extremely stable, dual digital VFOs.** Accurate to  $\pm 10$  ppm over a wide temperature range.
- **Kenwood's superb interference reduction.** Optional filters further enhance selectivity. Dual noise blankers built-in.
- **Direct keyboard frequency entry.**

- **Versatile programmable scanning, with center-stop tuning.**
- **Choice of either high or low impedance antenna connections.**
- **Kenwood non-volatile operating system.** Lithium battery backs up memories; all functions remain intact even after lithium cell expires.
- **Power supply built-in.** Optional DCK-2 allows DC operation.
- **Selectable AGC, RF attenuator, record and headphone jacks, dual 24-hour clocks with timer, muting terminals.**

#### Optional Accessories:

- VC-20 VHF converter for 108-174 MHz operation
- YK-88A-1 6 kHz AM filter
- YK-88S 2.4 kHz SSB filter
- YK-88SN 1.8 kHz narrow SSB filter
- YK-88C 500 Hz CW filter
- YK-88CN 270 Hz narrow filter
- DCK-2 DC power cable
- HS-5, HS-6, HS-7 headphones
- MB-430 mobile bracket
- SP-430 external speaker
- VS-1 voice synthesizer
- IF-232C/IC-10 computer interface.

More information on the R-5000 and R-2000 is available from Authorized Kenwood Dealers.

### R-2000

150 kHz-30 MHz in 30 bands

- All modes
- Digital VFOs tune in 50 Hz, 500 Hz, or 5 kHz steps
- 10 memory channels
- Programmable scanning
- Dual 24-hour digital clocks, with timer
- 3 built-in IF filters (CW filter optional)
- All mode squelch, noise blanker, RF attenuator, AGC switch, S meter
- 100/120/220/240 VAC operation
- Record, phone jacks
- Muting terminals
- VC-10 optional VHF converter (118-174 MHz)



Specifications and prices are subject to change without notice or obligation.

# KENWOOD

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2201 E. Dominguez St., Long Beach, CA 90810  
P.O. Box 22745, Long Beach, CA 90801-5745  
CIRCLE 64 ON READER SERVICE CARD