

POPULAR COMMUNICATIONS

JANUARY 1994

Cordless Phones: Who's Eavesdropping

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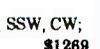
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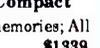
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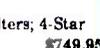


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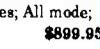
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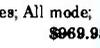
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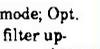
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JANUARY 1994

VOLUME 12, NUMBER 5



8

FEATURES

Cordless Phones: Who's Eavesdropping? 8

Unlike their cellular phone relatives, cordless phones are easily monitored on every scanner ever made.

By Tom Kneitel, K2AES, Editor

Radio: The Good Ol' Days 12

Rummage through the trunks in POP'COMM's attic to experience the history of radio.

By Alice Brannigan

Ship Broadcasters All at Sea? 19

Enter the port where broadcasting ships make their transmissions a reality.

By Ransom Stoddard, KWA7MZ

POP'COMM Reviews: 20

The AOR SpectraVu™ SV150 Spectrum Analyzer & The Grove SDU-100 Spectrum Display Unit

By POP'COMM Staff

Double Your Scanning Fun: Use Two Antennas 28

Add a High-gain UHF Beam and a GaAsFET Preamp To Your Arsenal.

By Art Harris, N2AH



52



72



34

COLUMNS

Books You'll Like	22
New Products.....	27
Antennas 'n' Things	32
Scanning VHF/UHF.....	34
The Ham Column	36
Broadcast DXing	38
You Should Know.....	42
Pirates Den	47
Satellite View	48
How I Got Started	51
CB Scene	52
Emergency	54
Telephones Enroute.....	56
Communications Confidential.....	58
RTTY.....	66
Clandestine Communique	71
Listening Post	72
Washington Pulse	79

DEPARTMENTS

Beaming In	5
Mailbag	6
World Band Tuning Tips	44
Communications Shop.....	84

This month's cover: This young man enjoys the luxury of having a personal conversation via cordless telephone. What he may not realize is that almost every scanner in receiving range is hearing his conversation. Photo by Larry Mulvehill, WB2ZPI.

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Note: Radios listed above are all LW-MW-SW-FM digital. Contact us for other models.

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● Shortwave Receivers Past & Present

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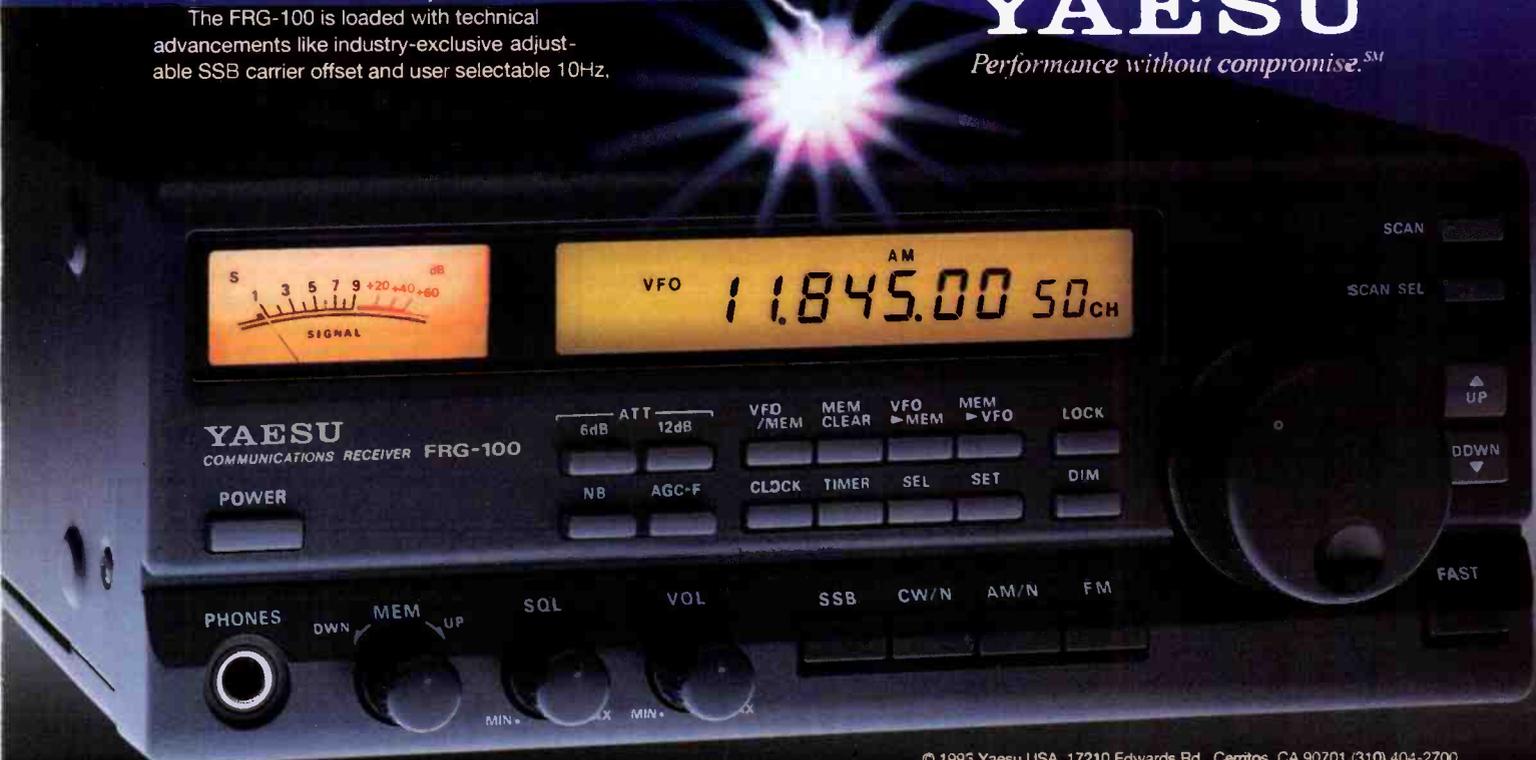
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BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Extracting Hot Air From The Privacy Bubble

Readers are always on the lookout for great stuff to send our way. Our readers are involved in many areas of industry and technology, and they are located in all areas of the world. What with the many newspapers, trade, and tech periodicals in circulation, we like to think that people are keeping us in mind as they come into contact with media that we would not otherwise know about.

So it was when Craig Dible, KB6LAK, of Sedona, Arizona, came across an item in a publication called *Network World*. It was entitled "Scanner Laws Not Strict Enough," and related to cellphones. That's when he sent it along to us.

This piece looks to be an opinion submitted to that publication by a reader named Craig Paul, who is a wide-area network computer specialist. Craig Paul complains that recent legislation passed by Congress outlawing receiving equipment that can intercept digital messages are worthless because the laws "don't go far enough to protect the privacy of user digital cellular transmissions." Mr. Paul claims that if any network managers want to extend their corporate nets using wireless technology, this lack of privacy "should be chilling."

He points out that the recently passed anti-scanner law does not affect those who currently own such scanners. He neglects to mention that hobbyist scanners cannot decode digital transmissions. He goes on to mention the worn-out old chestnut about how cellular calls can be picked up on UHF TV tuners. We would be interested in knowing if he has ever met anyone in the continental US who listens to cellular calls this way, or who has had tried it with any repeatable success. More importantly, Mr. Paul should have explained the particular process by which *digital* cellular comms might be monitored via a UHF TV tuner.

In the main, Mr. Paul appears particularly annoyed that federal agencies are exempt from restrictions on eavesdropping on digital cellular calls. He particularly cites the FCC. He sees no need for any government agency to own equipment that "can both receive and decode digital cellular transmissions." Claims it sets a "bad precedent," and he doesn't know why the cellular industry isn't fighting against this. He hopes people will demand that the industry force the government to forego its ability to snoop on cellular calls.

Ho boy! Is this fellow typical of how the



"...the only federal employee in Washington who probably isn't eavesdropping on phone calls is Floyd, the hair stylist in the Congressional barber shop. That's only because Floyd is kept busy explaining the pending laws to the Congressmen."

general public perceives communications privacy? Based on letters I get, and the things people say in the media, I'd say yes. After ten years of being bashed over the head with the privacy smokescreen put out by the cellular industry, the poor public is actually buying into the fantasy.

Wouldn't you think it would be obvious to everyone that in order to enforce its regulations, it must be the FCC's right and its duty to monitor the radio transmissions of all of its licensees? Guess not! Hard to believe, but people have gone totally overboard with this privacy assurance thing. Perhaps they buy it to the point where the impression is that the cellular industry is like St. George slaying the evil eavesdropping dragon, and now remains ever-vigilant to protect against any and all who would overhear the private comms of their customers.

Dare we destroy the fantasy by breaking the news about the federal agents that have always listened in on phone calls (including cellphones) during various active surveillances and investigations? Like the FBI, DEA, Customs Service, BATF, Treasury, US Attorney, DIA, IRS, INS, Postal Service, and individual military services'

(Continued on page 82)

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MAILBAG

LETTERS TO THE EDITOR

Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted must be signed and show a return address. Upon request, we will withhold sender's name should the letter be used in Mailbag. Address letters to Tom Kneitel, Editor, Popular Communications Magazine, 76 N. Broadway, Hicksville NY 11801.

Weather or Not

I am a dedicated reader of your magazine. This isn't a "complaint," because that would be too strong a word. This is more of a suggestion. I found the September information on weather emergency frequencies interesting and useful, but background information presented along with this could have made this even more useful. For instance, explaining how to track storms and hurricanes, and a section on computer tracking programs for PC use. Just a thought.

Brian Weber,
Registered Monitor KNY2AFA,
Pittsford, NY

Your comments are appreciated, Brian. The intent of the September feature was to present communications enthusiasts with a basic guide to the most important and vital voice frequencies to have handy during weather emergencies. While this information is not particularly esoteric, gathering all it together and having it in one convenient place when needed isn't always easy. The background tracking material you suggested was beyond the scope of this particular feature, but this is something that will be considered for coverage in a future issue.—Editor.

Along The River

I have read *POP'COMM* for many years, and I particularly enjoyed the story about monitoring the Mississippi riverboat casinos. One of the reasons I enjoyed the story was because the issue arrived just as I was heading to Atlantic City and the Trump Taj Mahal Hotel-Casino. So I took along my scanner!

There were many people at the casino with HT's, and these were used by security, maintenance, and for other types of activities. After I got to my room, I began scanning VHF, UHF and 800 MHz, but I wasn't able to hear anything from my hotel, or any other hotel. I did pick up taxis, paging, and

other services. I go there quite often, so I am hoping you can offer some suggestions.

Ron Goldstein, KA2IIA
Putnam Valley, NY

Scan the Trump Taj Mahal Hotel-Casino on: 460.80, 468.3125, 469.1125, 469.3375, 897.6375, and 897.6625 MHz. Digital paging takes place on 929.0125 and 929.9375 MHz. My guess is that it's best to restrict the use of a scanner to the privacy of a hotel room, or off the hotel's property. Can you imagine the sensation a scanner would create in the casino?—Editor.

Alternative Name Ideas

Two alternative names for amateur radio operators would be Radio Audio Developers International Organization, or RADIO. A less technical name would be Humanitarian Auxiliary Message Service, or HAMS.

In the July issue *Mailbag*, a blind *POP'COMM* correspondent complained that a cellular phone she purchased didn't work anywhere. She had purchased it in order to avoid the problems in tracking down pay phones in bus terminals. I checked with the blind hams on our 2-meter net, and either they hadn't had experience with cellulators, or had no trouble related to their blindness. It was pointed out that some areas don't have cellular service, and that there are also signal drop-out areas even where there is service. They suggest that blind users request dealers to program their cellular phones.

I thank you for your braille edition, and I am thankful for being able to read braille.

Barbara Mattson, KA4UIV
Spartanburg, SC

I Think She's Got it!

TV sets come with picture-in-picture, stereo, sleep timers, freeze frame, and so many other built-in features. My idea is that TV sets should all have a switch that allows the picture tube to be turned off while the audio remains on. This would be an inexpensive addition that would be useful if you are working or reading while the TV is on, and only wanted to listen. Or use it if you are trying to doze off or listen from another room. It would conserve electricity and might extend the life of the costly picture tube. Don't you agree this would be convenient?

Barbara Mancini,
Oregon

Very convenient. Congratulations, you have managed to re-invent the table radio!—Editor.

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Cordless Phones: Who's Eavesdropping?

They're First Cousins to The Cellular Phone

BY TOM KNEITEL, K2AES, EDITOR

A look at the future of cellular telephony indicates a gradual, but inevitable, changeover to digital communications that cannot be picked up by standard scanners. When this fact is combined with the approaching time when there will be no more new 800 MHz band scanners on sale anyway, only one conclusion can be safely drawn. Under presently existing circumstances, at some point a few years down the line, virtually all hobby monitors are going to find that hearing cellphone comms is beyond the operational capabilities of their equipment.

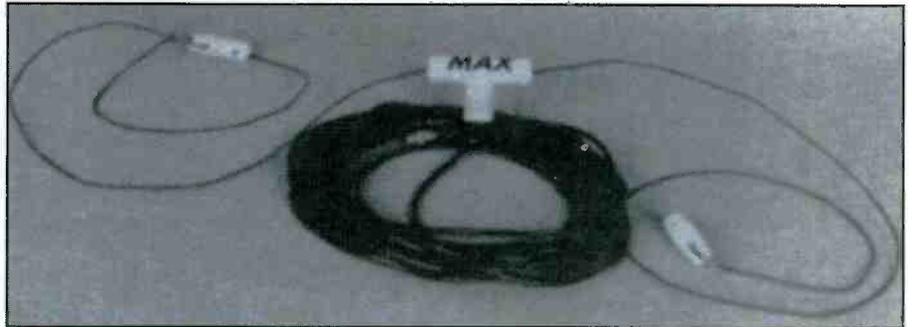
Scannists have reacted negatively to this turn of events, since many enjoy checking out what's happening on the cellular channels. There's seldom a dull moment. Cellphones turn up illicit romances, drug transactions, loud arguments, and sleazy business deals. Easily as juicy as any prime time TV "soap" ever was, bar none. Definitely as interesting as police, fire, federal, or any other scanner fare. No wonder people don't want to ever lose the ability to hear these communications.

In The Know

In-the-know scannists are aware that cellular phones have close relatives in the form of cordless phones. Although monitoring cellular phones generated media attention and public panic, eavesdropping on the nation's 60-million cordless phones has attracted little notice. Yet, most cordless phones can be monitored using any scanner since they don't employ the 800 MHz band.

The contents of cordless phone conversations are the same as can be heard over cellu-lars, with several added extras. An extra is that all the cordless phones within receiving range of any scanner are all in the residences or offices of neighbors. While cellphone callers are mostly strangers, any voice you hear on a cordless could well be someone you either know or can identify. This can add to some spice to the proceedings.

Another extra is that neighbors' phone calls often produce lurid and tacky gossip about other neighbors, or themselves—or you.



The Cellular Security Group's 49 MHz dipole as it appears before it's installed.

Ads for cordless phones usually claim a handset-to-base system operating range of 1,000 ft., which is about one-fifth of a mile. The average scanner installation should be able to hear most cordless phones from far greater distances than that. Scanners using VHF low-band antennas mounted outside and high can often obtain cordless phone reception range over several miles.

Two extremely effective long-range antennas made especially for 46 MHz cordless telephone eavesdropping are available. One is an end-fed Zepp (\$29.95), the other is a dipole (\$49.95). Each is supplied with 50 ft. of coaxial lead and a BNC connector. These are from the Cellular Security Group, 4 Gerring Road, Gloucester, MA 01930. The order phone there is 1-800-487-7539.

Doing It With Frequency

The majority of cordless phones operate with the base portion of the systems able to transmit on one or more of the ten designated cordless phone channels in the band lying between 46.50 and 47.00 MHz. The ten specific present channels are: 46.61, 46.63, 46.67, 46.71, 46.73, 46.77, 46.83, 46.87, 46.93, and 46.97 MHz. Because of growing congestion, the FCC is allocating another 15 channel pairs near 44 and 49 MHz. These are being created from lightly-used channels presently allocated to Land Transportation, Petroleum, and Forest Products stations. By monitoring the 46 MHz base frequencies, both sides of conversations can be heard.

The cordless phone handsets operate in



Radio Shack's DuoFone ET-475 is the type of cordless phone found in most homes and offices. It offers four channels in the 46 MHz band.

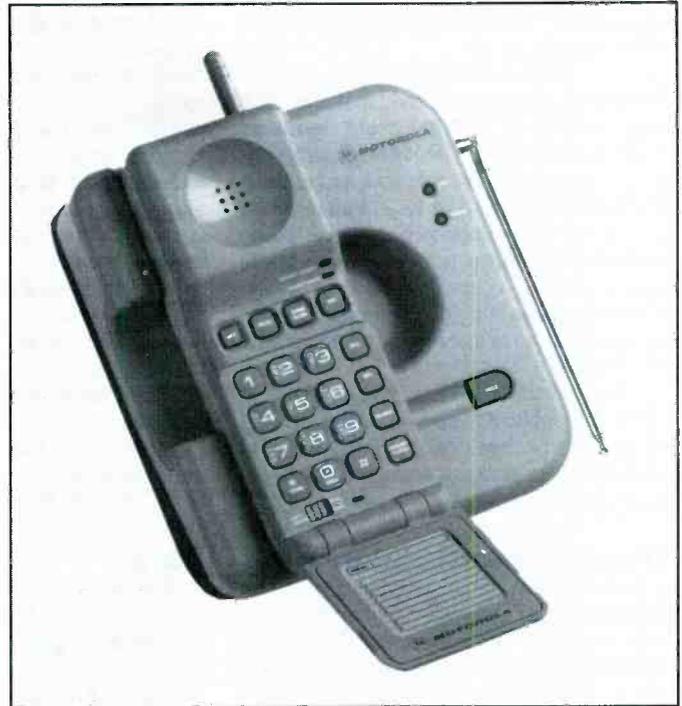
the 49.67 to 49.97 MHz band. While there's no need to monitor these frequencies to hear the handset side of conversations, this band is also used by wireless baby and room monitors. Monitor 49.84 to 49.93 MHz for these devices. Wireless room monitors are often located in parents' bedrooms, for use where an infant is sleeping while the family is in another part of the home or apartment.

With surprising regularity, many people



↑ Panasonic's KX-T4370 cordless operates in the 46 MHz band, and is mated to an answering machine.

Motorola's Secure Clear America Series 300 is a 900 MHz cordless. →



leave room monitors operating all the time. Either they forget, become lazy, or otherwise neglect to turn them off at bedtime. They seem to assume the sounds from their room monitor are going only into the little receiving unit in their own living room. The living room unit gets turned off at bedtime along with the TV set. But the people don't realize that the unit in the bedroom is a tabletop 49 MHz radio station that continues to broadcast a vivid and at times hilarious soundtrack of their lives behind closed doors. This *Late Late Show* can be heard over every scanner in the entire neighborhood.

A Matter of Perception

Cordless telephones invariably carry a warning notice that the devices do not offer their users any expectation of privacy. Regardless of this, the perception of the public is that they can hold conversations over cordless telephones that are at least as private as those utilizing standard hard-wired phones (such as that privacy may actually be).

From listening to the conversations taking place on cordless phones, it does seem that the public appears either unaware or unconcerned that these calls can be easily accessed by every scanner in the neighborhood.

The 1986 Electronic Communications Privacy Act, which falls all over itself in a futile effort to impart an aura of privacy to cellular phone calls, ignores cordless phones. The US Supreme Court refused to hear an appeal of a lower court decision that cordless phones did not offer a "justifiable expectation of privacy."

Title 18 USC Sec. 2515, Sub 3, State vs. Delaurier, Rhode Island, 1985, which

is reported in 488, *Atlantic Reporter*, 2nd, 288 states that cordless phone conversations are not "intercepted." It holds that cordless phone calls are not private "as the owner is warned by the companies when these phones that conversations are not private."

Hoosier Home Theatre, Inc. vs. Atkins, reported at 595 Fed Sub 389, 1984, also holds that there is no expectation of privacy since anyone can hear them. They held that it is not an oral communication; it is not wired; it is not an interception.

Edwards vs. Bardwell, 632 Fed 2nd, 854, affirmed in 808 Fed 2nd 54, stated there was "no reasonable expectation of privacy in any communications which are broadcast in all directions to be heard by countless people who purchase receiving devices such as Bearcat scanners, or who happen to have another mobile radio or telephone tuned to the same frequency."

However...

Granted that there are no federal laws that prohibit eavesdropping on cordless phones. Admittedly, even if there were, it would be very difficult to gather evidence of violations of such laws. Evidence might be available if violations were blatant, public, and either involved tape recordings made of calls, or else a conviction based upon attempted or successful criminal use of information obtained from monitoring.

As has been pointed out numerous times, monitoring of cordless (or cellular) calls can't logically be described as an invasion of the calling party's privacy. The scanner is sitting in his/her own home using a passive piece of detection equipment. The person placing the call is broadcasting omnidirectional signals that pass into the

scannist's person, the privacy of his home, and property, uninvited and without permission. Those signals are unscrambled, and use the public airwaves. Shouldn't the scannist have every right to detect and examine those signals without being harassed? Is the scannist depriving the caller of his privacy? Nobody has yet explained this logic.

Yet, cordless phone calls are protected by the state wiretap law in Connecticut (*State vs. McVeigh*). In New York State, a state appellate court said that the state's eavesdropping law covers intentional tuning in on cordless calls.

California has its Cordless and Cellular Telephone Privacy Act (amended Sections 632, 633, 633.5, 634, and 635 of the Penal Code, Sec. 1 of Chap. 909 of Statutes of 1985, and added Sec. 632.6 to the Penal Code). Running afoul of this law can cost up to \$2,500 and a year in the slammer.

A scanner owner in Georgia reported an active attempt at prosecution of cordless phone monitoring under the Official Code of Georgia Annotated 16-11-62, Sec. 1. This section states, "It shall be unlawful for any person in a clandestine manner intentionally to overhear, transmit, or record or attempt to overhear, transmit, or record the private conversation of another which shall originate in any private place."

When asked by the scanner owner about the Georgia law, a letter from Richard B. Engleman, the Chief, Technical Standards Branch, FCC's Office of Engineering and Technology stated, "I question whether cordless phones are covered by OCGA Section 16-11-62 because they may not provide 'a means of private communication.'" He suggested seeking the advice of

an attorney, and thought that it was likely for a decision to have to ultimately be made within a court of law.

As you can see, this is still a gray area. There have been many times that scannists have overheard criminal plots discussed over cordless phones. This information has been presented to law enforcement authorities which have then pressed independent investigations leading to convictions. Many media reports have appeared with these stories over the years. It is hard to understand why some state governments seek to supersede federal laws to protect cordless phone calls.

In fact, all that the state laws accomplish is give the public a false and misleading assurance of cordless privacy, even after the manufacturers and government have said there isn't any.

The Big Mouth Syndrome

People who have eavesdropped on cordless phone calls are particularly horrified if they are, themselves, cordless phone users. It is only then that they first realize how vulnerable to widespread interception their personal information is every time they speak into these devices. There's no telling who else is listening. Could be a dozen people with scanners in range!

That's the time to think back and wonder about the times your own cordless phone was used to mention charge account numbers, phone numbers, addresses, last names, credit card numbers, bank account numbers, times away from home, vacation plans, personal matters, opinions about neighbors, confidential business information, financial or tax matters, plus other gems and priceless tidbits.

Here's something else to ponder. People on cordless phones who promise never to give out their phone number over the thing, still do it when they leave a callback message on someone else's answering machine. Think about it.

Something else. Let's say you have something particularly personal to discuss, and you decide to temporarily shun the convenience of a cordless phone. Remember that the person on the other end of the call may be using *their* cordless phone. One of *their* neighbors may be getting their jollies by from your innemost thoughts or business proposals. Sorry about that, but next time ask the other party if they're using a cordless before you go into your spiel. Especially important if you are an accountant, attorney, physician, broker, a member of the clergy, or other professional.

Ideas

Remember the famous GE System 10 cordless phone, Model 2-9675? That was the phone they said wouldn't shut up, being prone to transmitting the calls made over extension phones on the house's regular hard-wired phone system to which it was connected.

Other cordless phones were guilty of cutting on the air briefly when triggered by a sudden increase in the noise level of the room in which they were installed. A laugh, shout, door slam, or loud voice could activate them. Cordless phones have come a very long way since the earlier and more primitive devices.

Newer cordless phones offer, at least, better designs. Many offer sophisticated refinements.

Several cordless phones are now avail-



Cobra's new entry into the 900 MHz cordless market is the Intenna 900, which utilizes digital technology.

able for the new so-called "900 MHz band" (actually 900 to 928 MHz). Although considerably more expensive than the 46 MHz band cordless phones, they are designed to thwart eavesdropping by scanners. In addition, their audio quality is far better than the 46 MHz phones, they have longer range, and suffer negligible interference from other nearby cordless units. The new Cobra digital technology *Intenna 900* unit promises at least two or three times the range of 46 MHz phones. Units are also available from Radio Shack, Motorola, and many others.

Radio Shack's DuoFone ET-499 is a unique ten-channel 46 MHz cordless phone that offers frequency inversion voice scrambling. The Panasonic KX-T4330 has a ten-channel 46 MHz cordless phone mated to an answering machine. Stores offer a wide variety of models from dozens of manufacturers, offering diverse features and in all price ranges.

Cordless telephones have become extremely popular with the public. They are convenient, and serve a definite need. However, the government and their manufacturers say these aren't secure communications instruments. In that the majority of cordless phones transmit unscrambled FM signals on a frequency band that may be accessed by virtually every scanner currently manufactured, some scannists are saying this is the "poor man's alternative to cellular telephone monitoring."

So, who's eavesdropping? Could be many more people than anybody guesses. For instance, a lot of the people in your neighborhood.

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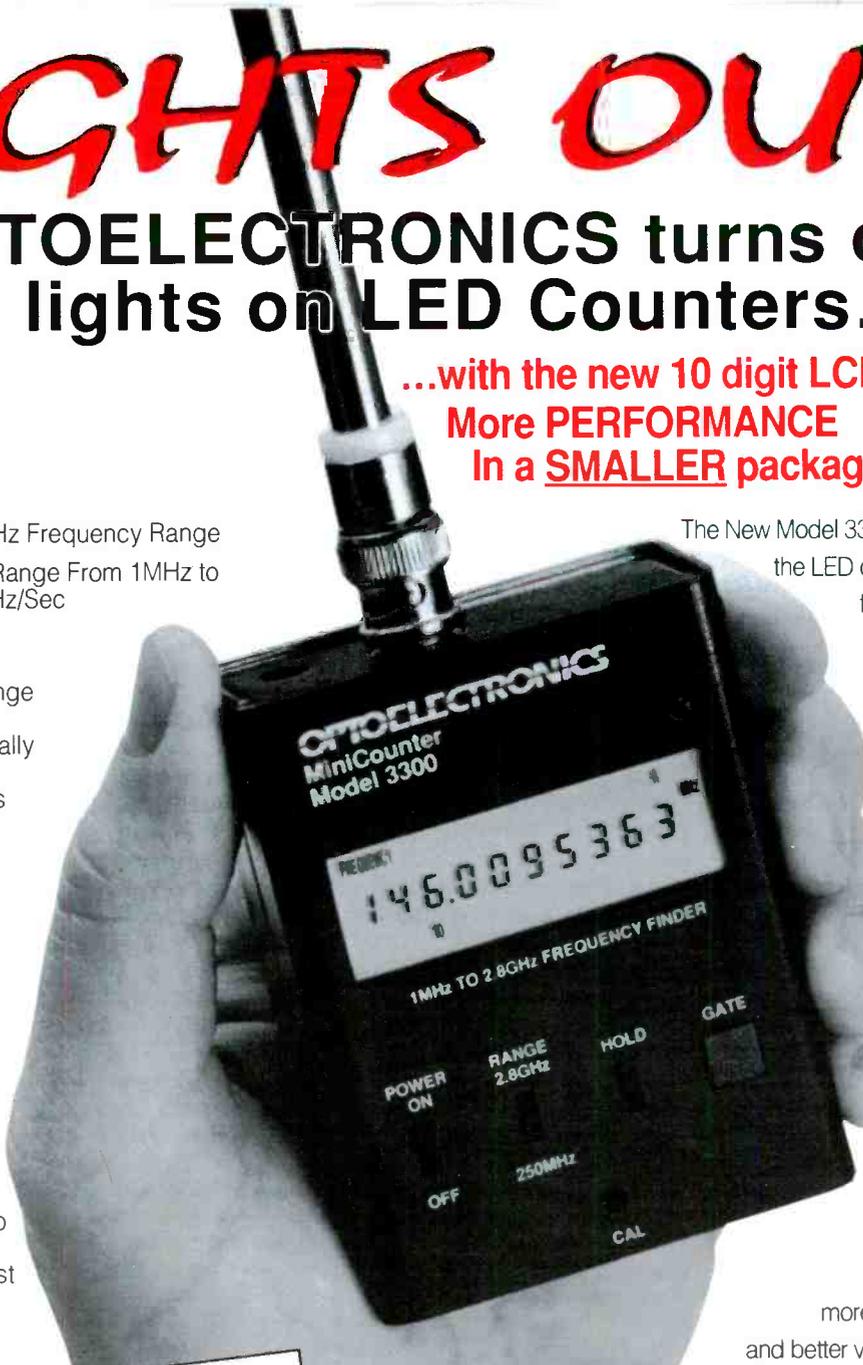
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Radio: The Good Ol' Days

Rummaging Through History

BY ALICE BRANNIGAN

Religious stations have been a part of broadcasting since the earliest of times. Churches took out licenses for stations for on-premises stations in order to bring their services to those unable to attend.

Going one step further, there were also religious communities that obtained licenses for the purposes of bringing their teachings to the public. Preaching the gospel could be done in a church, but it would reach so many more people if it went out over the airwaves.

A fine example of this would be religious broadcaster WAWZ, operated by the Pillar of Fire, Zarepath, New Jersey. The station began humbly in 1931 with 250 watts on 1330 kHz, but needed to expand to 500 watts in a short time. In 1940, WAWZ moved to 1380 kHz and increased its power to 5 kW, and then, in 1955, they added 99.1 MHz FM. The AM operations were dropped in the 1980's, but WAWZ-FM continues.

No mention of early broadcasters operated by religious groups would be complete without mention of WCBD, Zion, Illinois. The station started up in the mid-1920's on 870 kHz with 500 watts, but was up to

5 kW on 1000 kHz by the time it was sold and moved to Waukegan in the early 1930's.

WCBD was owned by controversial preacher Wilbur Glen Voliva, head of a sect called the Christian Apostolic Church in Zion. Voliva's gospel had unusual theories that attracted media curiosity. Voliva held that the Bible said the earth was flat, and hollow, and that all of the planet's inhabitants exist on the inside of the squashed planet. The North Pole, he insisted, was an opening at the top, while the South Pole was the rim around the inside circumference of the planet. WCBD was used to spread this gospel.

A notable, popular, and more traditional station was WBBR, located in Brooklyn, New York. WBBR was operated by the Watch Tower Bible and Tract Society, which is affiliated with the Jehovah's Witnesses.

WBBR went on the air February 24th, 1924 as a non-commercial station running 500 watts on 1100 kHz. In 1924, there was only one congregation of Jehovah's Witnesses in New York City. The station was established to reach out to those per-

sons in outlying areas who could not attend services in person. Even as late as 1940, the Society felt that there were insufficient members distributing its literature in the area to reach all of those who relied upon the station's programs.

The WBBR transmitter was located at Rossville, an area of Staten Island, 18 miles west of the studios. Programs were fed via landline. There were three 411 ft. towers located at a lovely country site also used as a retreat.

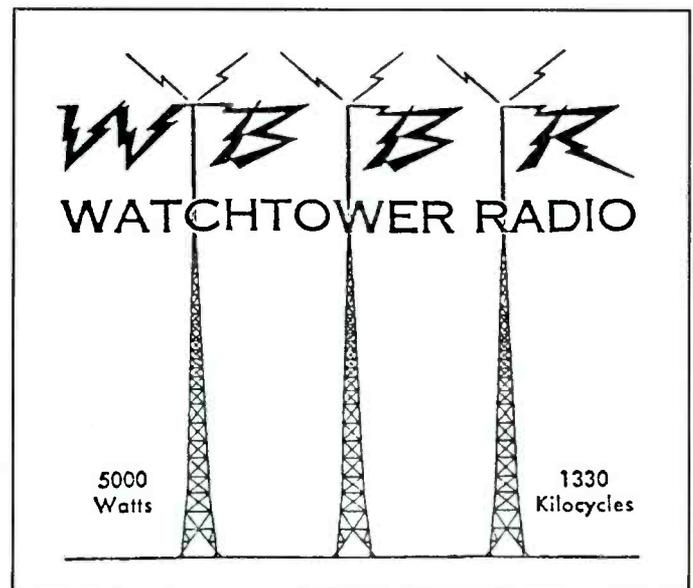
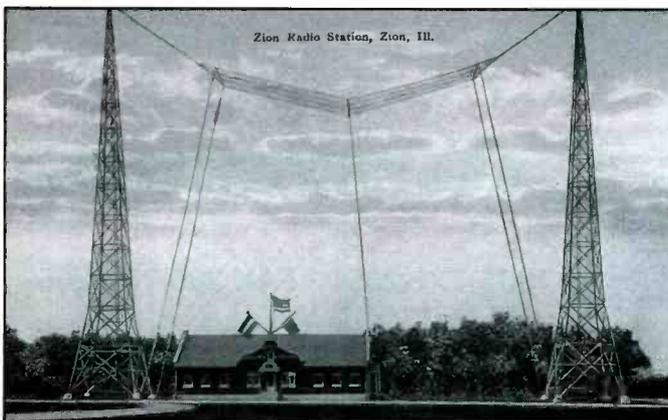
After switching to 720 kHz in 1926, the station later hopped over to 1300 kHz, and increased to 1 kW. Just prior to World War II, WBBR changed to 1330 kHz and went up in power to 5 kW, although it shared time with 5 kW foreign language station WEVD (which is presently running 50 kW on 1050 kHz).

Programming included news, classical music, inspirational items, religious teachings, and Bible questions answered.

By the mid-1950's, it appeared the Society felt that WBBR had done a good job, but the station's successful mission was winding down. There were 62 congregations active in the area, and more than 7,00 per-

The official WBBR logo, as used in 1950 by the original holder of the callsign. (courtesy Chris Edwards, New Jersey.)

Wilbur Voliva's controversial religious broadcasting station in Zion, Illinois, WCBD.



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sons distributing the Society's tracts. There were more than 5,000 Bible studies being conducted weekly with bound books, booklets, and magazines as study guides.

The Society decided that the large amount of money it took to operate WBBR, at that point, would be better used in missionary and special pioneer work elsewhere in this country and overseas. On April 15, 1957, WBBR was sold. The station's new owners changed the call letters to WPOW. It is now known as WNYM and operates with 5 kW.

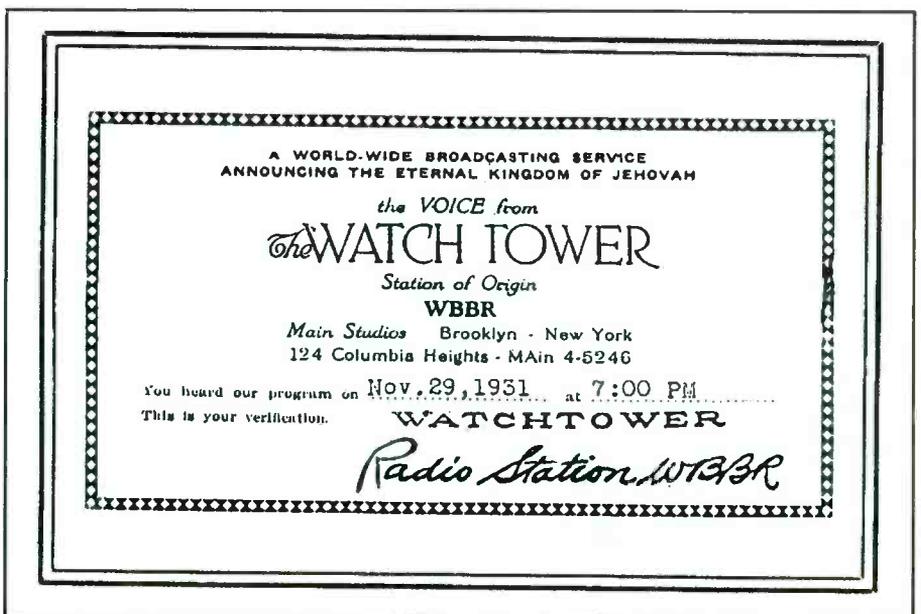
New York City's present WBBR/1130

is the old WNEW, and is completely unrelated to the station originally known as WBBR.

We are indebted to Chris Edwards, Program Director of WMTR, Cedar Knolls, NJ for information on WBBR. A friend of his came across some WBBR literature recently and gave it to him, and Chris was kind enough to share it with all of us.

Take Note of This One

We have, in the past, discussed Prof. Reginald A. Fessenden's remarkable early



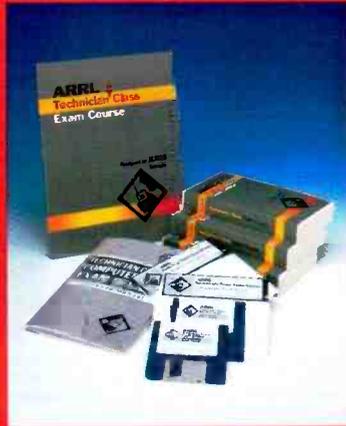
A 1931 QSL from WBBR wasn't elaborate, but said it all.

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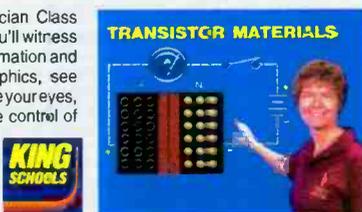


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SONY ICF-SW55

World Band Receiver

\$339

Travel the world with Sony's ICF-SW-55 World Band radio. It's the ideal radio for business travelers, hobbyists or anyone living a long way from their homeland. It comes factory-programmed with 20 worldwide broadcasting stations covering 60 frequencies, tuning them in is about as simple as pressing a button. Plus, you can program in your own favorite stations. The built-in clock lets you check the time around the world, functions as an alarm and sleep timer and even turns on automatically at a preset hour and station. Handsomely packed in a hard carrying case, the ICF-SW55 comes with all necessary accessories plus information-packed shortwave reference guides.



SANGEAN RTS-202

Ultra Compact Shortwave Receiver

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This ultra compact PLL synthesized digital shortwave receiver fits easily in the palm of your hand yet offers more performance and features than many full-sized receivers. Unique switch allows user to choose continuous tuning across entire SW band or continuous scanning within the selected SW band. Covers all shortwave bands from 120 to 11M as well as AM/FM stereo. Includes 20 memories, auto and manual tuning, a sleep timer and an alarm clock. Measures only 5 1/4" x 3" x 1" and weighs only 10 oz. Comes complete with earphones and a carrying case.

NEW!



ICOM R-71A \$1059

Communications Receiver

This receiver covers the entire spectrum from 100 kHz to 30 MHz and is as professional in performance as they come. The latest loom receiver performance features such as passband tuning and that excellent loom clean receiver feel. That receiver performance is what separates this radio from its competitors. 86 dB dynamic range and 60 dB image rejection are just examples of its excellent performance in this area. Features are too numerous to list but include 32 memories, 2 VFOs, optional computer interface and 3 selectable filters.

BEARCAT BC 890 XLT

280 Channel Scanner-With 900 MHz!

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This new item from Bearcat has continuous frequency coverage through 956 MHz* with 200 channels of action in 10 banks! The turbo scan feature lets you zip through the channels in lightning speed. 10 priority channels let you scan important frequencies every 2 seconds. It even includes a VFO knob for up-down frequency control. Other features include weather search, auxiliary tape output, weather alert, illuminated LCD display, reception counter, and step select. Frequency Range of 25 to 956 MHz. * Cellular blocked-modify-able.



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DATONG FL-3 \$259

Deluxe Audio Filter

The model FL-3 connects in series with the speaker lead from the receiver. The twelve pole tunable filtering can be used in six different ways which will assist you to dig down into the DRM and hear the weak SSB DX, listen to CW that you didn't even know was there, pull RTTY out of the noise, and remove offensive whistles and heterodynes from any mode of transmission. The FL-3 has two notch filters. One is manually operated, the other (an additional 4 poles of filtering) is completely automatic and continually searches for whistles and heterodynes and removes them in a second or so. Combine this with completely independent variable high and low pass filtering and you have a truly remarkable audio filter. Can be used with any receiver/transceiver old or new. Uses 10 to 15 VDC at 150 mA.



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SIGMA SE 1300 \$89

VHF/UHF Omnidisc Antenna

If you've been looking for a superior wide band omni-directional antenna covering 25 to 1300 MHz, this is it! The SE 1300 is the ultimate wideband omni-directional antenna for hours of listening pleasure. Not only is it a receiving antenna, but it can also transmit on 50 MHz, 144 MHz, 430 MHz, 900 MHz and 1200 MHz with a maximum power rating of 200 watts. The antenna has stainless steel construction and comes complete with low-loss "N" connector, mounting kit and short mast section. The SE 1300 is excellent for indoor installation since it's only 5' 6" and weighs just 2.2 lbs, yet its construction and weather protected feedpoint peg to be out in the elements. This antenna is a must if you want the best possible results!

MFJ-1214PC

Multimode IBM Controller

\$134

This multimode computer interface covers FAX, We Fax, RTTY, ASCII and CW. Lets you use your computer and radio to receive, display and transmit brilliant full color news photos and include We Fax weather maps with all 16 gray levels. You get easy-to-use menu driven software, cables, power supply, comprehensive manual and Jump-Start guide. All of this plus the following mode-specific features: FAX- Full color capability with 4096 colors supported. A timer function lets you set your 1214 to automatically receive pictures at any time. They can then be automatically saved to disk, printed out on your printer, or both. Versatile zoom function gives you incredible details of pictures and maps. RTTY- sync and QRM features give you greatly improved copy under poor conditions. A superb on-screen tuning indicator makes it easy to lock stations in perfectly. Received text can be saved directly to disk or printed out and a full fledged text editor lets you enter, save and transmit text files. ASCII- transmit and receive all 7 bit ASCII files. CW-automatic speed tracking, on-screen tuning and easy sending. This is radio's most value packed multimode.

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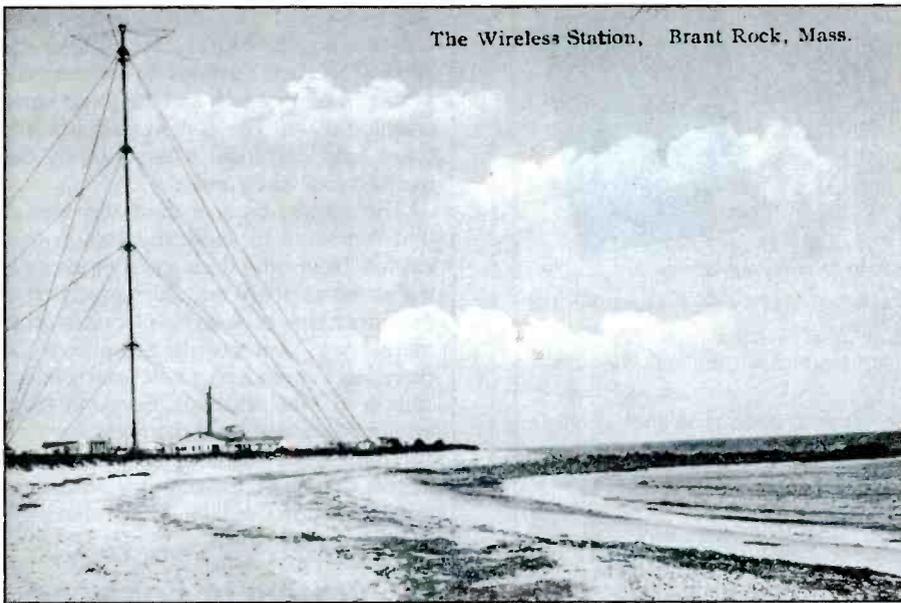
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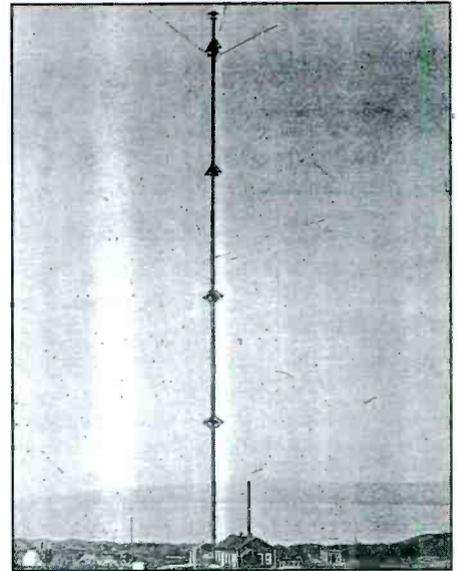
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The Wireless Station, Brant Rock, Mass.

Wireless station "BO," Brant Rock, Mass. was built by Fessenden, and achieved some degree of fame.



Wireless station "LK," built by Fessenden in Scotland, existed for less than a year. It was an exact duplicate of the Brant Rock station. The station has remained virtually unknown.

National Signalling Co. wireless pioneering experiments, and the tower he erected on the beach at Brant Bay, Mass.

Until having been made aware of it just recently by Richard, of Port Hardy, British Columbia, the existence of a companion station in Scotland had escaped notice here. This station was located at Uisaed Point, Machrihanish. The station seems to be practically forgotten by all concerned, although it was mentioned in the long defunct *Argyllshire Herald* of May 6, 1905 beneath the headline, "Proposed Marconi Station at Machrihanish Bay." It speaks of a location on the Losset Estate "facing the broad Atlantic."

Eight weeks later, it was announced that the arrangements for construction were completed and station would be operational in three months. Plans were for a 400-ft. (later increased to 450 ft.) steel tower, 3-ft. in diameter, with two cross spars at the top each 50-ft. long. The tower was to be made of eight-foot sections bolted together and supported by guy wires. Inside the mast there was a ladder to permit access to the top. The base of the tower rested on a ball and socket insulator. Basically, this was an exact duplicate of the Brant Rock facility, and the details fill in the blanks about Brant Rock's construction. The Brant Rock station, we now learn, was built by the Brown Hoisting Machinery Company, Cleveland, Ohio.

The first 40-ft. section of the mast in Scotland was erected by lifting five of the sections with a separate erection pole. Thereafter, the mast itself became the erection pole. At each lift, a temporary cross

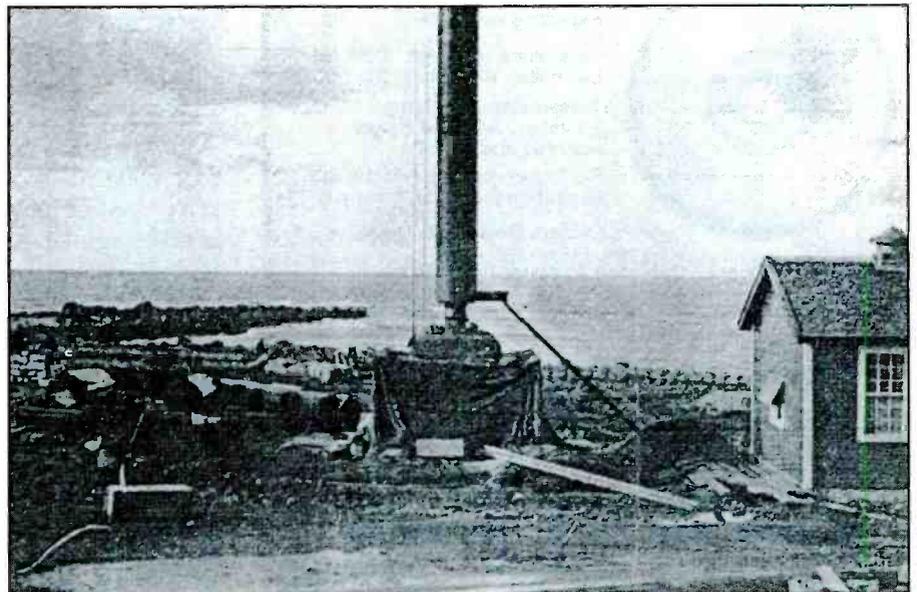
arm was installed, with a pulley wheel at the end, and the next section was lifted into place. The cross arm and pulley kept moving up in stages until the job was finished.

Each joint was bolted by a fitter swinging in a bosun's chair. As the mast grew taller, the guys were put into place. This was built by Neil McArthur of Campbeltown, Scotland.

A ground system for the antenna system consisted of a wire grid covered by earth. The ends of the wires led into a deep trench along the shore at sea level.

The *Campbeltown Courier* described the station as looking like "a badly proportioned chimney stack, having a cap-like arrangement on top all bristling with huge spikes...The ground is fenced off and no visitors are allowed within the enclosure."

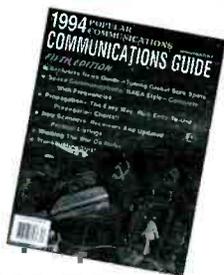
Brant Rock's first message's were exchanged with Machrihanish on January 1, 1906. The callsign used by Machrihanish was "LK," while Brant Rock was known as "BO" on the air. The messages were by spark. They were exchanged for three days. Then, for three weeks no mes-



A look at the base of the mast of station "LK," as seen during its construction.

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sages could get through, but then they were able to resume. This didn't last very long. On December 5, 1906 a severe gale struck. After a few days, the guys on the west side of the tower gave way and the tower came crashing down. The station, consisting of tower and buildings, was promptly dismantled and taken away.

The cement base of the tower was all that remained to show the station ever existed. Now, after decades of exposure to the elements, there isn't even much left of the cement tower base. No plaque or other marker was ever put up to indicate the place, so Fessenden's short-lived wireless station at Machrihanish, Scotland fades into oblivion, and from memory.

Thank you, Richard, of Port Hardy, British Columbia, Canada, for sending us information on this little-known station.

A Question of Frequency

Chuck Grecco, of Woodside, New York, wrote to ask why early radio stations had so many different operating frequencies until they finally settled down in one place. Says he thinks about that every time he reads these pages.

This is a good question. It's because radio grew from scratch, and expanded quite fast. When broadcasting first began, the government obviously assumed that one frequency was going to suffice. All of the original stations were therefore set up to operate on 833 kHz. As broadcasting became popular, stations and listeners began complaining about interference.

The broadcasting band was expanded and reorganized several times. Each time, many stations were moved to various new frequencies. Not all stations liked the frequencies where they were sent to and asked (more than once) to be moved again. There were a number of government attempts at getting the mess straightened out, like the major one in November of 1928. There were numerous instances where stations were again shifted to new frequencies, after having already been bounced around on several (including some that the government may not have authorized). Some stations were forced to share time, others were kicked off the air altogether.

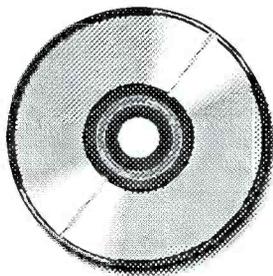
The last major federal shakeup of the band came just before the outbreak of World War II, when the high frequency edge of the band was extended from 1500 to 1600 kHz. The forthcoming expansion of the band to 1705 kHz will again cause frequency changes, although they will be by petition of the stations.

We look forward your old QSL's (originals or photocopies), station information, old postcards, station listings, etc. We appreciate your enthusiastic support of this feature. Best wishes for a prosperous 1994!

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Ship Broadcasters All at Sea?

The Changing Tide of High Seas Broadcasting Ships

BY RANSOM STODDARD, KWA7MZ

When the Israelis and the PLO shook hands last September, it sent a message to Abie Nathan. For the past 20 years, Nathan has operated a radio station called the *Voice of Peace*.

The *Voice of Peace* has been located aboard the *M/V Shalom I*, a 50-year old ship Nathan maintained in international waters near Israel, just beyond that nation's territorial jurisdiction. The station played music and news, but was primarily oriented towards convincing the mideast's various factions to make a lasting peace with one another. It wasn't intended as a profit-making operation, and Nathan was losing money on the station. Yet, it was his dream that there should be peace in the region.

Nathan felt that with peace becoming a reality, the mission of the *Voice of Peace* had been a success, and had ended. Therefore, the station has gone dark after a broadcasting career dating back to 1973.

On the other side of the world, Voyager Broadcast Services, of New York, announced that its new broadcasting ship, the *M/V Fury*, was set to go on the air with four high power shortwave transmitters.

Operating from a Caribbean location, one transmitter will be used exclusively by the Overcomer Ministry of Walterboro, South Carolina, which, through Brother R. Stair, is providing much of the financial backing to equip the vessel. The other three transmitters will lease time to individuals and organizations.



Allan Weiner, shown at work aboard the *M/V Fury*.

This station is being engineered by Allan Weiner, President of Radio New York International. The *M/V Fury* is a former North Sea trawler, and is 140 ft. long, with a 30 ft. beam, drawing 13 ft. It has a 1,500 HP engine. There are nine staterooms, and a complete broadcast studio.

As this is being written, we were advised that ship registration and station licensing arrangements were in the process of being worked out. Specific transmitting frequencies had not been announced.

Voyager Broadcast Services, "Your Lighthouse of The Air," may be reached at 14 Prospect Drive, Yonkers, NY 10705. Phone (914) 423-6638; FAX (914) 376-0759.



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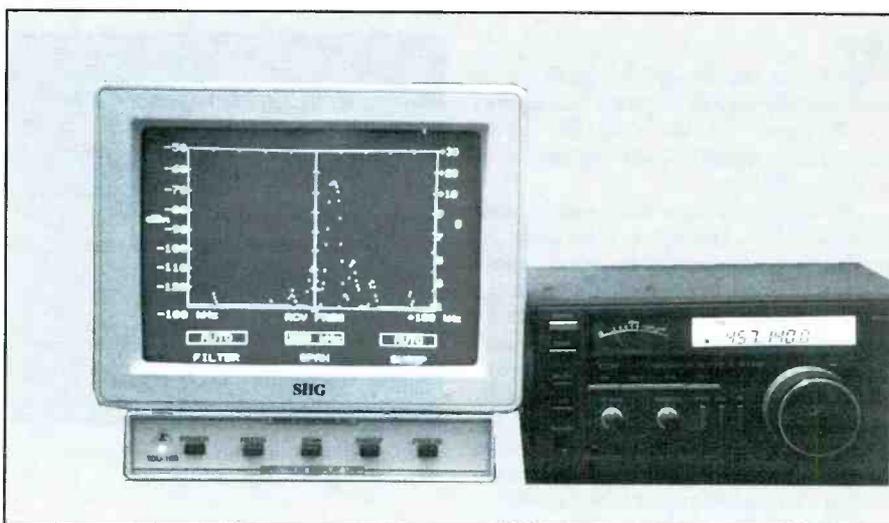
POP'COMM REVIEWS:

The AOR SpectraVu™ SV150 Spectrum Analyzer & The Grove SDU-100 Spectrum Display Unit

Have you ever wanted to “see” the signals present within a bandwidth segment of your scanner or shortwave receiver to aid in tuning? For many years, spectrum analyzers, spectrum displays, and panoramic adapters to accomplish this have been available to the communications enthusiast, but with general high price tags. Two new products of similar, but distinctly unique, capabilities will now allow you to visualize the received spectrum without having to win the lottery!

AOR SpectraVu™ SV150 Spectrum Analyzer

The AOR SpectraVu™ SV150 spectrum analyzer is designed specifically for the AOR line of scanners, including the AR2002, AR2500, AR2515, and AR2800. Small and designed to rest atop your scanner, the installation of the SV150 requires modifications to your scanner's PLL (Phase-Locked Loop) circuit (Please contact Ace Communications for this service). The SV150 also requires a “user supplied”



The Grove SDU-100 is compatible with many different receivers and scanners.

oscilloscope. New oscilloscopes typically cost at least \$300, but used oscilloscopes or “flea market” specials are available at lower prices. Installation of the SV150 is

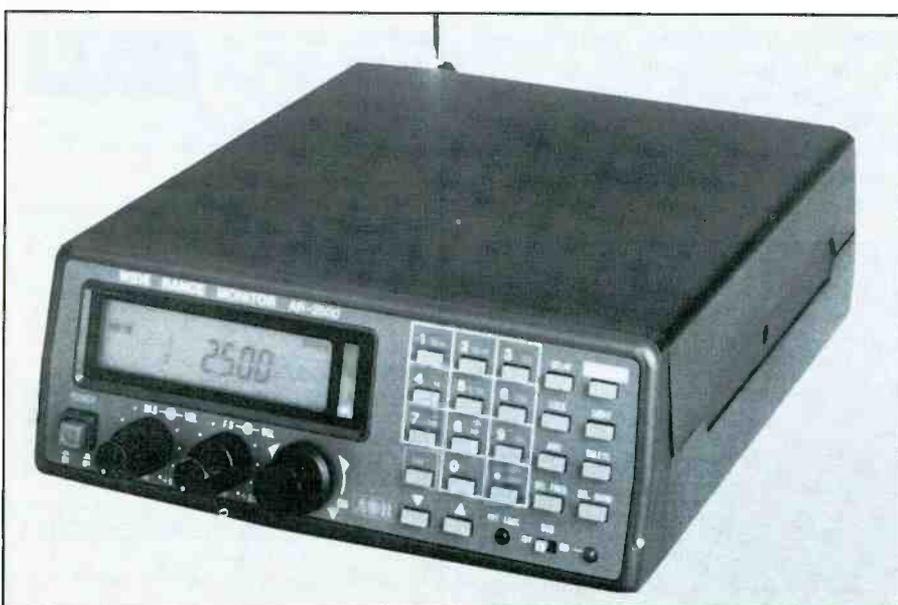
quite easy; connections are made between the scanner, SV150, and the vertical and horizontal inputs of the oscilloscope.

With a frequency range of 0 to 1,300 MHz, the SV150 allows you to view over 500 MHz of frequency spectrum at one time. Or, you may adjust its bandwidth control to narrow the spectrum to zero. Using a front panel toggle switch on the SV150, you must switch from the “scan” or receive mode of your scanner to the “spectrum analyzer” mode to view the selected frequency spectrum. With the SV150's built-in marker generator, frequency identification is quite easy. Plus, scanning rate and frequency bandwidth are continuously variable by front panel controls.

During the review, the SV150 performed admirably with fast scan rates and excellent sensitivity using the AR-2500 scanner supplied for the review. Price of the SV150 is \$179.95.

Grove SDU-100 Spectrum Display Unit

Unlike the AOR SV150, the Grove SDU-100 Spectrum Display Unit can be used with a number of receivers and scanners, including those from Drake, ICOM, JRC, Kenwood, Uniden, and Yaesu. The SDU-100 should be ordered for your spe-



The AOR SpectraVu™ SV150 Spectrum Analyzer is specifically designed for the AOR scanner line, including the AR-2500 wide range monitor. (pictured)

cific receiver, as both units' intermediate frequency (I.F.) must match. Installation of the SDU-100 is a simple matter of connecting the I.F. output of your receiver to the I.F. input of the SDU-100. The display output from the SDU-100 is TTL-level video. Thus, you must have a TTL monitor. If you own an IBM-compatible computer that displays high-resolution monochrome video, chances are good that you may already own one! If not, used TTL monitors are available at extremely reasonable prices. This reviewer, however, recommends the purchase of the Grove VID-100 9" TLL monitor as it was factory selected to match the SDU-100 in size and appearance.

Contained in a low-profile metal enclosure, the SDU-100's frequency range is determined by your receiver. For example, the SDU-100's frequency range using an ICOM IC-R7100 receiver is 25 to 2000 MHz. *REVIEWER'S NOTE: The SDU-100 itself has an upper frequency range of 2000 MHz.* Frequency bandwidth is user-selectable at 10 MHz, 5 MHz, 2 MHz, 1 MHz, 500 kHz, 200 kHz, 100 kHz, and 0. Scanning rate offers four selected rates, including an easy-to-use "auto" sweep rate. Since the SDU-100 samples your receiver's I.F. output, all viewing of the selected frequency spectrum is done in "real time." No switching from the receive and spectrum display mode is required. You can listen to the receiver as well as view the selected frequency spectrum simultaneously. The display's accurate calibration, an innovative "automatic centering" feature to compensate for receiver I.F. drift, a selectable narrow/wide filter, a digital "freeze" mode to indefinitely store that "special find," and well thought out "firmware" design makes signal identification and overall use a breeze.

With excellent sensitivity and user ergonomics, the SDU-100 met or exceeded all of its rated performance specifications. Price of the SDU-100 is \$499.95; a package price of the SDU-100/VID-100 is available for \$599.95.

Summary

Both the AOR SpectraVu™ SV150 Spectrum Analyzer and the Grove SDU-100 Spectrum Display Unit offer the communications enthusiast lower cost, and yet effective, frequency spectrum analysis. For more information on the AOR SpectraVu™ SV150, please contact Ace Communications, 10707 E. 106th Street, Fishers, IN 46038 (800) 445-7717. Information on the Grove SDU-100 may be obtained by contacting Grove Enterprises, Inc., 300 S. Highway 64 West, Brasstown, NC 28902 (800) 438-8155.

Reviewed by POP'COMM Staff

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Decode and display Touch-Tones from a telephone, tape recorder, scanner, or nearly any audio source.
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World's Most Powerful CB and Amateur Mobile Antenna*

Lockheed Corp. Test Shows
**Wilson 1000 CB Antenna Has
58% More Gain Than The
K40 Antenna (on channel 40).**

In tests conducted by Lockheed Corporation, one of the world's largest Aerospace Companies, at their Rye Canyon Laboratory and Antenna Test Range, the Wilson 1000 was found to have 58% more power gain than the K40 Electronics Company, K40 CB Antenna. This means that the Wilson 1000 gives you 58% more gain on both transmit and receive. Now you can instantly increase your operating range by using a Wilson 1000.

**Guaranteed To Transmit and Receive
Farther Than Any Other Mobile
CB Antenna or Your Money Back****
New Design

The Wilson 1000 higher gain performance is a result of new design developments that bring you the most powerful CB base loaded antenna available.

Why Wilson 1000 Performs Better

Many CB antennas lose more than 50% of the power put into them. The power is wasted as heat loss in the plastic inside the coil form and not radiated as radio waves.

We have designed a new coil form which suspends the coil in air and still retains the rigidity needed for support. This new design eliminates 95% of the dielectric losses. We feel that this new design is so unique that we have filed a patent application on it.

In addition, we use 10 Ga. silver plated wire to reduce resistive losses to a minimum.

In order to handle higher power for amateur use, we used the more efficient direct coupling method of matching, rather than the lossy capacitor coupling. With this method the Wilson 1000 will handle 3000 watts of power.

The Best You Can Buy

So far you have read about why the Wilson 1000 performs better, but it is also one of the most rugged antennas you can buy. It is made from high impact thermoplastics with ultraviolet protection. The threaded body mount and coil threads are stainless steel; the whip is tapered 177 ph. stainless steel. All of these reasons are why it is the best CB antenna on the market today, and we guarantee to you that it will outperform any CB antenna (K40, Formula 1, you name it) or your money back!

*Inductively base loaded antennas
**Call for details.

Lockheed - California Company

A Division of Lockheed Corporation
Burbank, California 91520

Aug. 21, 1987

Wilson Antenna Company Inc.
3 Sunset Way Unit A-10
Green Valley Commerce Center
Henderson, Nevada 89015

Subject: Comparative Gain Testing of Citizen's Band Antennas
Ref: Rye Canyon Antenna Lab File #870529

We have completed relative gain measurements of your model 1000 antenna using the K-40 antenna as the reference. The test was conducted with the antennas mounted on a 16' ground plane with a separation of greater than 300' between the transmit and test antennas. The antennas were tuned by the standard VSWR method. The results of the test are tabulated below:

FREQUENCY (MHZ)	RELATIVE GAIN (dB)	RELATIVE POWER GAIN (%)
26.965	1.30	35
27.015	1.30	35
27.065	1.45	40
27.115	1.60	45
27.165	1.50	41
27.215	1.60	45
27.265	1.75	50
27.315	1.95	57
27.365	2.00	58
27.405	2.00	58

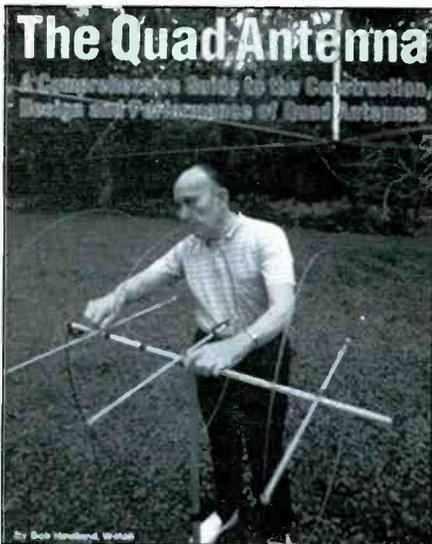
**58%
MORE
POWER GAIN
THAN THE
K40**

Individual test results may vary upon actual use.

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ANTENNA INC.
1181 GRIER DR., STE. A
LAS VEGAS, NV 89119



Antennas On The Square

Quad antennas are easy to build. They offer high gain, good directivity, low wind-resistance, and they are lightweight. For all of this, they are relatively inexpensive. That's because a major component of their construction is just plain wire. The rest can be wood, bamboo, Fiberglass, or PVC pipe. This is why hams and other HF radio fans with a yen for DX have always liked Quad antennas.

Bob Haviland, W4MB, has written a new 159-page book entitled *The Quad Antenna* in which he explores the applications, characteristics, design, performance, and construction of these devices. This book contains numerous charts and graphs, as well as an assortment of plans for different types of quads that may be constructed for various HF bands.

Bob's very thorough and well done book will show you how effortlessly you can put a quad together, then use it to snag that choice DX the other stations have had all to themselves (until now). Well, now it's your turn.

The Quad Antenna is \$15.95, plus \$3.50 shipping/handling from CQ Communications, 76 North Broadway, Hicksville, NY 11801. VISA/MC/AMEX/Discover accepted. Phone orders: (516)-681-2922; FAX: (516)-681-2926.

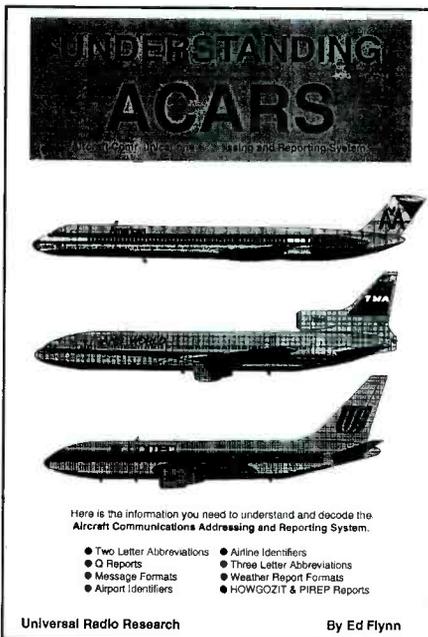
What's ACARS?

VHF aero band monitors have heard the term ACARS used often. The initials stand for Aircraft Communications Addressing and Reporting System. ACARS is a VHF radioteletype system used to exchange messages between airliners and company ground stations. These messages deal with weather data, aircraft maintenance matters, supply requirements, operational and scheduling matters.

According to the book *Understanding ACARS*, by Ed Flynn, ACARS signals may be picked up on any scanner that will tune the designated ACARS frequencies in the VHF aero band. For example, that strange pinging sound you can hear on 131.55 MHz (in the USA) is ACARS. Inexpensive decoders such as the Universal M-400 and M-1200 now include special ACARS reading capabilities.

The 53-page book provides information needed to interpret and understand the ACARS messages, which are sent in a type of abbreviated format in order to keep them uniform and also brief. Codes and abbreviations are all explained, and a listing of airline and airport identifiers are provided in this book.

Understanding ACARS is \$4.95. It's from Universal Radio, Inc., 6830 Americana Pkwy., Reynoldsburg, OH 43068.

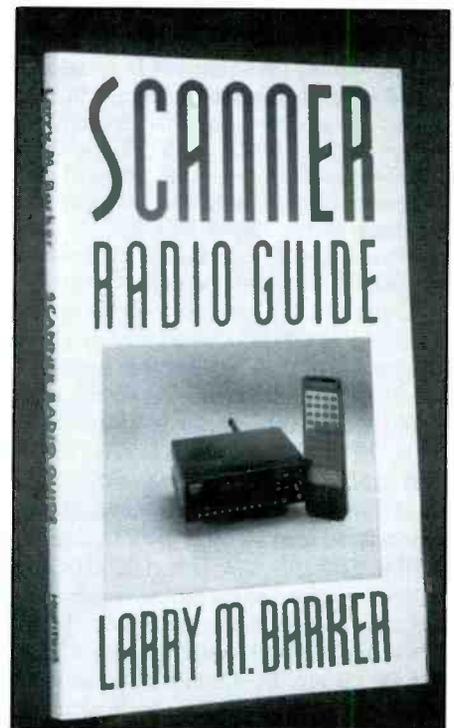


Scanner Radio Guide

Larry M. Barker's *Scanner Radio Guide* is a 148-page illustrated handbook that will interest all who use scanners. Barker really knows his stuff, and this shows from cover to cover as he dives into his subject with gusto and style.

Scanner owners are treated to Barker's canny and useful insights into monitoring various radio services, and are privy to the hundreds of interesting frequencies that he includes in his book. Whether it's the Space Shuttle, or a surveillance transmitter, Barker has it well covered in this book.

Legal considerations of monitoring are discussed, as well as prohibitions. There is an explanation of scanner specs, and what their controls and features do when operated properly. Helpful information is pro-



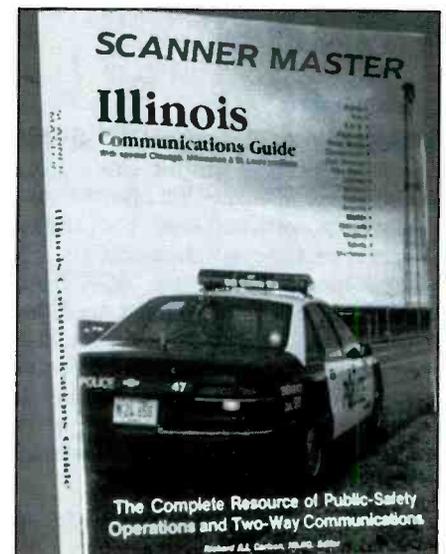
vided regarding maximizing reception.

This is a well-rounded overview that will be of use to scanner monitors active in all areas of the hobby.

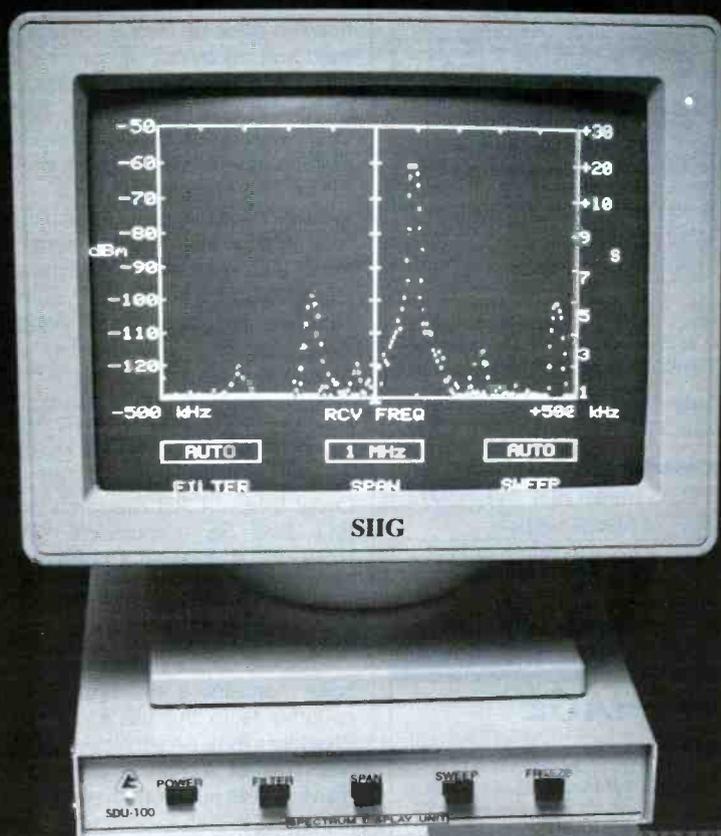
Scanner Radio Guide is \$14.95, plus \$3 shipping. It's from Hi-Text Publications, Inc., P.O. Box 1489, Solana Beach, CA 92075. Residents of Calif., please include sales tax.

Illinois Public Safety Frequencies

The *Scanner Master Illinois Communications Guide* runs to nearly 500-pages, and includes close-up sections for Chicago,



SEE THE SIGNALS YOU COULD BE HEARING!



Put professional power in your radio monitoring with the surveillance technology the pros use! Now you can see hidden radio signals with Grove Enterprises' new SDU-100 Spectrum Display Unit.

The SDU-100 attaches to the IF output jack on the back of your receiver, and it shows you all the signals in a slice of the radio spectrum you select — from 100 kHz up to 10 megahertz wide. Each signal appears as a "spike" on the display (the higher the spike, the stronger the signal).

Use Your Eyes to Spot Hidden Signals

Just the way surveillance countermeasures teams do, you'll be able to use both your ears and eyes in hunting new signals. With the power of spectrum display technology, you'll be able to track down elusive signals faster and more efficiently.

While you can listen to only one signal at a time, the SDU-100 can show you a whole band of signals at once. So, if you are listening to a particular transmission and suddenly a new spike appears on the monitor, you'll know immediately that there's a new signal to be checked out. Without the power of the SDU-100, those momentary transmissions would go undetected.

The Grove SDU-100 Spectrum Display Unit, and a nine-inch video monitor — the same spectrum surveillance technology that the pros use — costs just \$599.95. For a limited time, you can purchase the SDU-100 in combination with a compatible receiver from Grove, and you'll save \$50!

The Grove SDU-100 Spectrum Display Unit is now available for:

- ICOM R7000, R7100, R9000
- Yaesu FT1000, FRG-100*
- Kenwood R5000*
- Drake R8*, TR-7*
- JRC NRD-535-D*
- Uniden BC890XLT*
- Mason A2*
- Watkins/Johnson HF-1000*

If you're serious about communications monitoring, the SDU-100 will put your signal hunting in overdrive!

Call 1-800-438-8155 to order the SDU-100 and nine-inch monitor.



Grove Enterprises, Inc.
300 South, Hwy 64 West
Brasstown, NC 28902-0098

* Requires receiver modification, available from the Grove service department.

CIRCLE 65 ON READER SERVICE CARD

Milwaukee, and St. Louis. Written by the principals of the Chicago Area Radio Monitors Association, the book provides public safety listings for all 102 Illinois counties as well as Lake Co., Indiana, the border counties of Wisconsin, and the St. Louis metro county areas. Frequencies and PL tones are given.

The exhaustive coverage of Chicagoland includes 27 pages of Chicago Police Beat maps, CPD codes, unit designators, and system codes. The book also has Illinois State Police maps and frequency listings with exact channel channel usages.

A public safety frequency sort (including PL tones) is provided. There are also selected listings of stations in various other radio services of general interest.

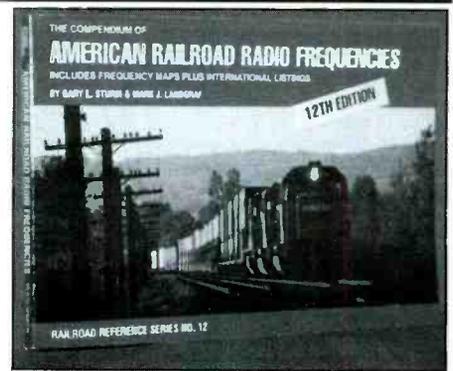
This is, by far, the most complete and comprehensive directory of public safety scanner frequency information ever compiled for Illinois.

The *Scanner Master Illinois Communications Guide* is \$29.95. It's from Scanner Master Corp., P.O. Box 429, Newtown Highlands, MA 02161. The book is also available from dealers who carry Scanner Master publications.

On The Right Track

The Compendium of American Railroad Frequencies, 12th Edition is the new 197-page update of a book that covers all American and Canadian rail lines known to be using comms.

Railroads are arranged in alphabetical



order, and frequencies are shown with their exact usages, or routes. Where certain frequencies are used only in limited geographic areas, noted. Channel number designations are given, where such numbers are assigned by individual railroads within their own systems. Other useful information, as appropriate, is also provided with the listings. Several route maps are included.

Usages for the frequencies include: railroad police, maintenance of way, car inspections, yard, general operations, switching, road, dispatcher, car shop. PBX channels are also given. PBX channels are used for placing telephone calls from the train crew to various railroad offices.

A special section provides information on some overseas railroads. Another section has close-up frequency listings for railroad and rail transit operations in Atlanta, Baltimore, Birmingham, Boston, Chicago, Dallas/Fort Worth, Detroit, Kansas City, Los Angeles, Memphis, New York City, Philadelphia, San Francisco, St. Louis, Toronto, and Washington (DC).

General explanatory information on railroad communications systems is given, along with a glossary of terms and also a complete list of the VHF railroad radio channels and their official Association of American Railroad channel designator numbers.

American Railroad Radio Frequencies, 12th Edition, is \$16.95, plus \$4 shipping/handling (\$5 to Canada). Residents of NY State please add \$1.79 tax. Order it from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. VISA/MC welcomed. Phone orders: (516) 543-9169; 24-hour FAX: (516) 653-7486.

In Addition...

County Cross Reference is a 76-page book containing an alphabetical list of counties from the US and the Canadian Provinces that use such governmental entities. This list is cross-referenced by states/provinces. In addition, there is a sort shown according to states/provinces. This may be used as a reference for the AM, FM, and TV DX'er. Hams can use it to keep track of counties for awards. Good idea! The price is \$8.95, postpaid, from National Radio Club Publications, P.O. Box 164, Mannsville, NY 13661. Please mention POP*COMM when ordering!

Complete Your Collection of Popular Communications Order Your Back Issues Today!

\$3.50 Per Issue

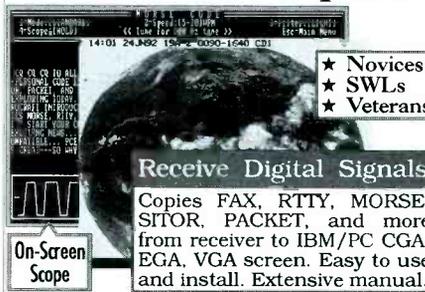
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TIRED OF TOYS? The **VX-100** crystal-controlled miniature FM transmitter uses **surface mount technology** to let you hear every sound in your home up to 2 miles away on any programmable scanner or VHF surveillance receiver! The complete device is only slightly larger than a 9V battery with the battery installed! The **VX-100** is sensitive enough to pick up a whisper from across a large room and is guaranteed to outperform VHF surveillance transmitters selling for hundreds of dollars. RF power is **100mW output** with a 9V battery for long range even under adverse conditions. Automated assembly of surface mount components and simple 5 minute assembly by the user allows the price of the **VX-100** to be a fraction of the cost of even lower quality units. Assembly consists of attaching 3 wires to the transmitter module. Each unit is pre-tested, pre-aligned and comes complete with instructions and a **30 day unconditional moneyback guarantee!** Use it for a month. If you don't like it for any reason, return for a courteous refund. The **VX-100** is available on 3 surveillance transmitter frequencies; **A 139.970MHZ, B 140.00MHZ, C 139.940MHZ.** Channel **B** shipped unless otherwise specified. Custom frequencies available by special order. Only **\$79.98 + \$2.00 S&H** or buy 2 for **\$75 each** with free S&H. VISA/MC, MO for immediate shipping. COD orders add \$5.00.

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NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



PC Pakratt for Windows

AEA announces the recent introduction for Windows—the first and only data controller program for Microsoft® Windows™ on the market today.

PC Pakratt for Windows is a full-featured Windows application for controlling the entire AEA family of data controllers, including the industry-standard PK-232 MBX, PK-88 and PCB-88 as well as the PK-900, DSP 1232 and DSP 2232. Support for dual port controllers makes PC Pakratt for Windows ideal for use with the PK-900 and DSP 2232.

Support for Windows functions (such as cut and paste, background execution, multi-tasking, etc.) makes PC Pakratt for Windows extremely simple to operate. An easily customized user interface and extensive on-line context-sensitive help further simplify operation.

PC Pakratt for Windows supports standard control program features such as split screen operation, binary file transfers, QSO loggings, macro facilities, on-screen status display, and much more. Supported modes include PACTOR, Packet, AMS-TOR/SITOR, Morse, RTTY (Baudot/ASCII), NAVTEX, TDM and SIAM (Signal Identification and Analysis).

Suggested retail price for PC Pakratt for Windows is \$12, and it is available from your favorite amateur radio dealer.

For more information, please contact Advanced Electronic Applications, P.O. Box C2160, Lynwood, WA 98036. Phone: 206-774-5554, FAX: 206-775-2340, or circle 101 on our Readers Service.

Transceiver For Low Frequency Enthusiasts

Curry Communications introduces a professional grade low frequency CW transceiver in a kit. This kit will bring the



enjoyment of license-free low frequency communications to many enthusiasts without the usual expense.

Many radio enthusiasts enjoy 1750 meters (160 kHz-190 kHz) for its technical challenge and the opportunity to contact other "LOWFERS" over the air with no license requirement.

An important benefit of this "Low Frequency" hobby is the training and skills a person develops, often leading to an amateur radio license. Likewise, many amateur radio operators today enjoy the 1750 meter band because of the variety it adds to their hobby. No license of any kind is required.

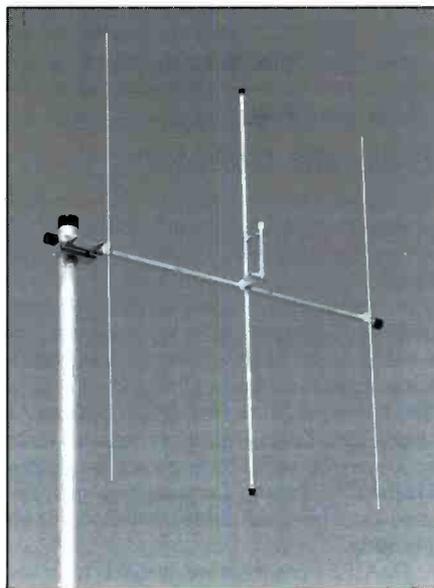
With as little as 1 watt of transmitting power, regular contact with stations over hundreds of miles demonstrates that 1750 meters is a true hobby band, and this frequency provides opportunities for all types of radio enthusiasts.

Founded in 1989, Curry Communications manufactures and markets low frequency communications kits and equipment, and provides LF consulting services to corporate and government clients. The company is headquartered in Burbank, California, and can be contacted at 737 North Fairview Street, Burbank, CA 91505, telephone (818) 846-0617.

Two Meter Yagi

This is the most recent addition to the popular Cushcraft FM Yagi line. It offers a 7.5dB gain over the full 2-meter band. It's ideal for packet, mountain topping or as a dedicated link antenna and comes complete with all stainless steel hardware.

Whatever your purpose, the A148-3S is an economical solution and is available through amateur dealers worldwide.



TINY-TENNA' Active Antenna

The "Tiny-Tenna" is an all-band active antenna and operates on longwave, medium wave, short-wave or VHF/UHF, when the antenna length is shortened to five feet. Outperforms other active antenna's on the market costing much more. (Performance depends on your type of receiver.) Runs on a single nine-volt battery or can be run on a nine to 12 volt "power pack" for hours of listening pleasure. Great for travelers, vacationers, apartment dwellers or just for fun! The "Tiny-Tenna" is completely assembled and bench tested before shipment. The "Tiny-Tenna" uses a seven foot segment of insulated wire connected to its 1 1/2" x 1 1/2" circuit board which then connects to the receiver. No fancy cabinets, knobs, bells or whistles to help drive the cost way up. Complete receiver hook-up instructions are supplied. Nine-volt battery supplied. Only \$19, plus \$3 shipping and handling. Order direct from DWM ENTERPRISES, 1709 North West Avenue, Jackson, MI 49202, Attention: Shipping #103. Dealer inquiries welcome. Inquiries from customers please call 1-517-563-9022, or circle 102 on our Reader's Service.

Electronic T/R Switch For Linear Amplifiers

Ameritron announces the release of the ultra-fast QSK-5 T/R Switch.

Electronic T/R switches like this rugged Ameritron QSK-5 are a solution to the noise and speed problems associated with vacuum relay T/R switching. It provides switching over six times faster than a vacuum relay and works with any linear amplifier.

The self-contained QSK-5 provides full CW break-in and rapid switching in digital modes like packet and RTTY, as well as faster, quieter switching in SSB. It operates on a regular 120 VAC outlet.

The QSK-5 handles 2500 watts PEP and 2000 watts CW in normal amateur service when the SWR is below 1.5:1. It handles 750 watts on continuous carrier modes such as RTTY and packet. An optional cooling fan (CF-5, \$39.95) allows sustained operation at 1500 watts in any mode.

To order, contact any Ameritron dealer. For more information or for the location of your nearest Ameritron dealer, contact Ameritron, 921 Louisville Rd., Starkville, MS 39759, telephone (601) 323-5869; FAX: (601) 323-6551; or toll free at 800-647-1800, or circle 103 on our Reader's Service.

Double Your Scanning Fun: Use Two Antennas

Add A High-gain UHF Beam And A GaAsFET Preamp To Your Arsenal

BY ART HARRIS, N2AH

When I was first bitten by the scanner bug, I was amazed at all the signals I could receive with just a telescoping whip antenna. However, I soon found myself straining to hear weaker and more distant stations. Reception of those weak stations improved greatly when I installed an outdoor discone antenna, but I still couldn't pull in some of the very weak UHF signals I was hunting for. In particular, I wanted to monitor the 477-MHz police activity from my old neighborhood in New York City. My current location (about 50 miles away over hilly, wooded terrain) was clearly beyond the intended range of those transmissions.

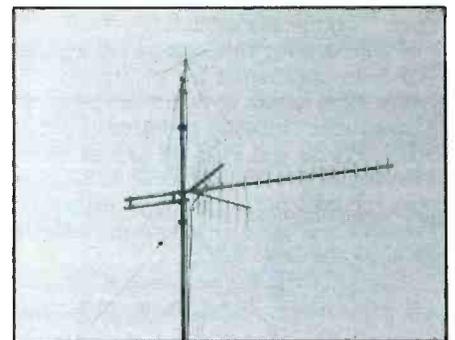
Reception of distant UHF signals is a challenge because they normally don't travel much beyond the horizon, and their strength diminishes rapidly as they pass through foliage and other objects. Omnidirectional antennas just don't have the gain needed to snatch these extremely weak signals out of the air. To make matters worse, the coaxial cable connecting the antenna to the scanner can be very lossy at UHF. For example, a 50-foot length of RG-58 cable will reduce signal strength by 75 percent (6 dB) at 470 MHz. Finally, the sensitivity of some scanners drops off a bit at UHF.

While that all sounds pretty depressing, there is hope. An article in *POP'COMM* (Nov '88) by Chandler Harrison described how to modify a standard corner-reflector UHF-TV antenna for scanner reception. Basically, all that's required is to drill a few holes in the boom of the antenna so it can be mounted for vertical polarization. I decided to try Chandler's idea with one difference: I fed the antenna with 300-ohm TV twinlead to avoid the inherent loss of coax. Since TV antennas are designed for 300-ohm feed, this was no problem. I matched the twinlead to the scanner with a 300 to 75 ohm balun (Radio Shack #15-1140) and a short piece of RG-59 coax.

This arrangement brought in all the city-wide police frequencies from the Big Apple, but only a few noisy signals from the various precincts. As encouraging as these results were, I wasn't satisfied. I still needed to



Discone antenna/bird perch above UHF corner-reflector yagi beam.



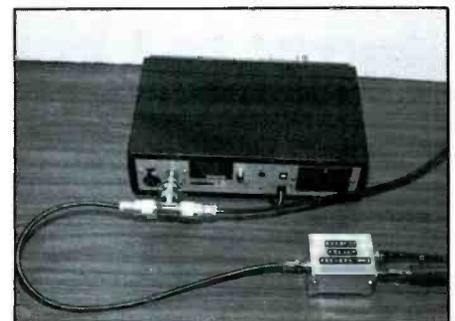
Close-up view of the discone and UHF beam antennas.

squeeze a little more signal from those unreadable precincts. In addition, I found that while the UHF antenna improved reception above 400 MHz, it didn't match the performance of my discone antenna on the lower frequencies. Switching between the two antennas was a drag.

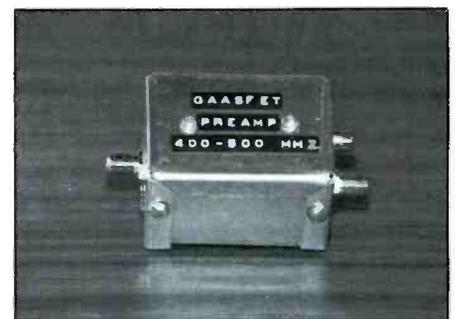
Enter The GaAsFET

I know a few people who have added preamps to their scanners to boost signals, but in most cases the improvement was marginal. Problem is that while untuned, broadband preamps provide reasonably good gain, their internally generated noise tends to mask very weak signals. Ham operators involved in weak signal work on the UHF and microwave bands invariably use GaAsFET (Gallium Arsenide Field Effect Transistor) preamps tuned to a specific band to improve reception. GaAsFETs, known for their high gain and very low noise, are ideally suited to this application.

GaAsFET preamps are available from sev-



Rear view of scanner showing "T" connector, dual feedlines, preamp, and balun.



My secret weapon: a low-noise GaAsFET preamp.

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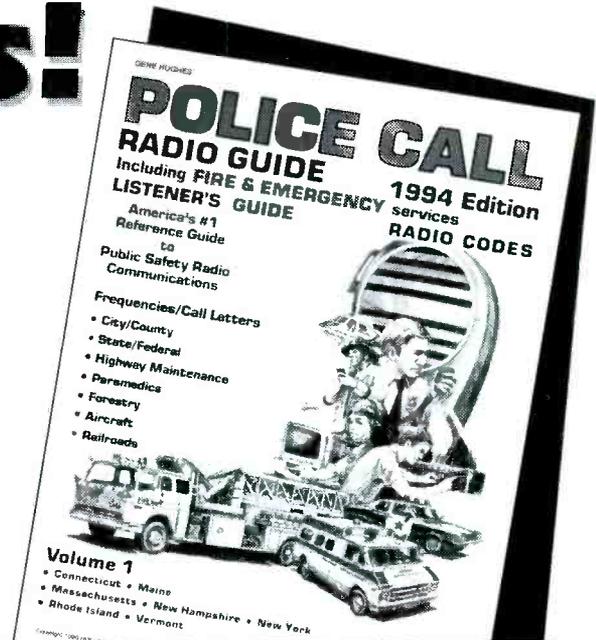
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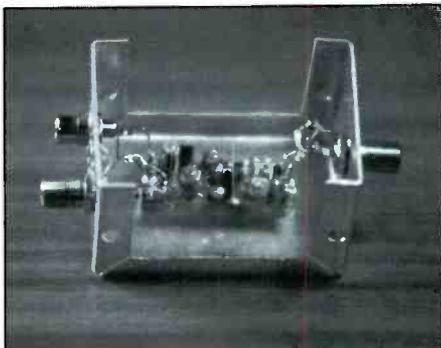
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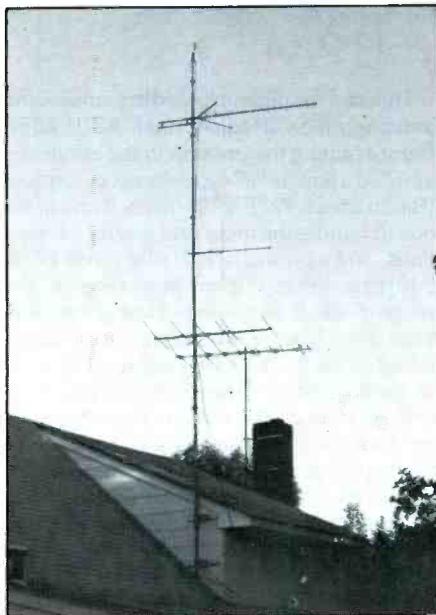
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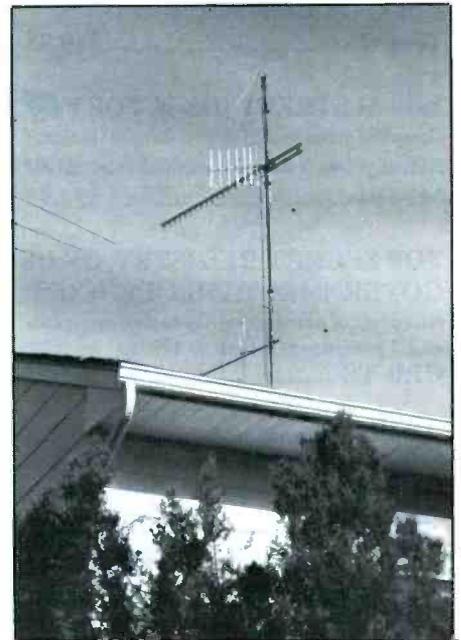
Inside view of the preamp.



Scanner and preamp in normal use.



This high-rise antenna farm features from top: a wideband discone, a UHF beam, a 2-meter ham antenna, and a standard FM antenna.



Alternate view of the antenna farm.

eral manufacturers and for various frequency ranges. Some can be installed right at the antenna, their operating voltage being supplied through the feedline from a power source in the shack. Homebrew enthusiasts can find several GaAsFET preamp circuits in

The ARRL Handbook for the Radio Amateur published by the American Radio Relay League.

I settled on the no-frills Model LNW-432W preamp from Hamtronics (65 Moul Rd., Hilton, NY 14468) because of its low cost and

relatively wide bandwidth. This unit, which consists of a tiny (5/8" × 1-5/8") circuit board packed with components, is available as a kit (\$24) or wired (\$39). It requires 12 volts DC and covers 400 to 500 MHz with 18 dB gain and a noise figure of just 0.8 dB.



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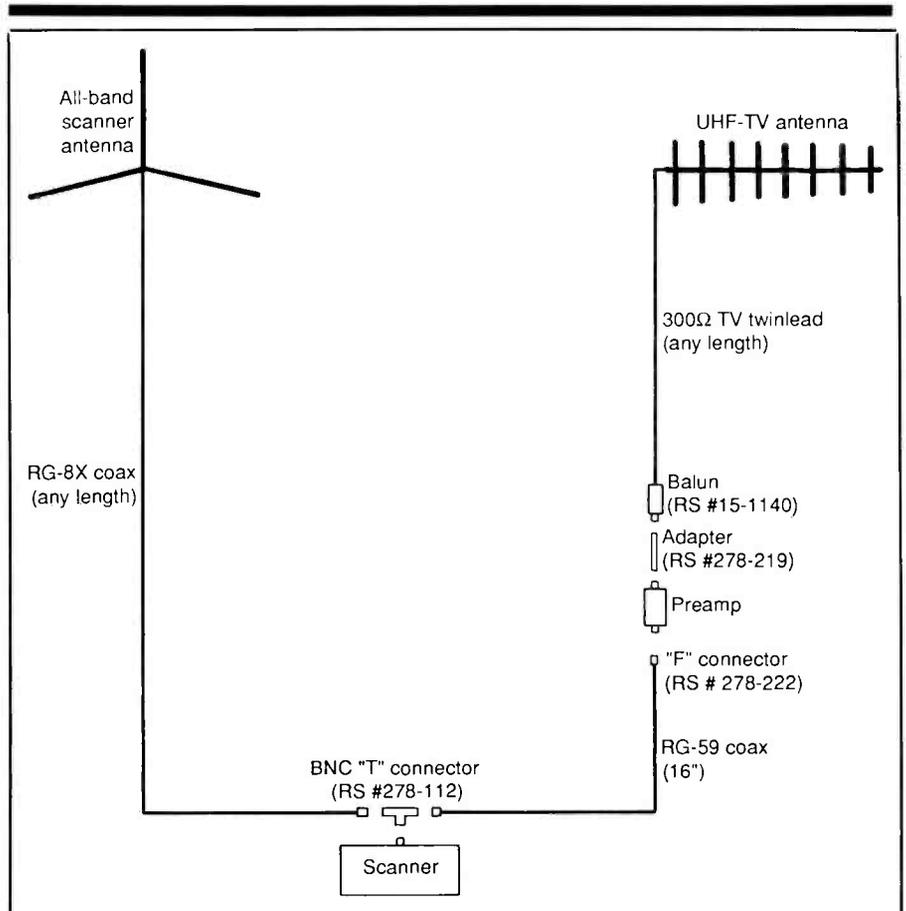


Figure 1—Cabling diagram for connecting UHF antenna/preamp and VHF antenna to scanner.

I housed the preamp board in a small aluminum minibox (Radio Shack #270-235). Before putting the preamp in the minibox, I installed a female "F"-type chassis mount jack (Radio Shack #278-212) on each end of the box to handle the input and output connections, and a phono jack (Radio shack #274-346) to accept my 12-volt power source. The preamp was then mounted using the hardware provided and short wires were soldered between the jacks and the appropriate posts on the board. Since I have a 2-meter transmitting antenna on the same mast as my scanner antennas, I installed back-to-back 1N914 diodes across the preamp input terminals to protect the sensitive GaAsFET from damage.

The improvement with the preamp in-line has exceeded my expectations. Signals that had been down in the noise are now full quieting, and other signals that just weren't there before are now easily readable. Now I can monitor all the NYC police precincts as well as EMS, Highway, and many other city services.

Putting It All Together

Finally, I attacked the problem of combining the signals from my two antennas to avoid having to switch between them. I tried using a hybrid splitter/combiner, but the signal loss was unacceptable at both VHF and UHF. Further experimentation led me to a solution

that is simple, cheap, and causes no noticeable signal loss. I simply connected the two antennas to the scanner through a BNC "T" connector (Radio Shack #278-112). While this is not exactly the textbook way of doing things, there's no arguing with success! As shown in Figure 1, I use 16 inches of RG-59 cable between the preamp and the "T" connector. Other lengths may result in reduced signal strength at some VHF frequencies due to the combined effect of the cable length and the preamp output circuitry.

Both antennas are supported by a single roof-mounted mast. The discone antenna is fed with RG-8X coax (similar to Radio shack's RG-8M) which is a good compromise between lossy RG-58 cable and the expensive and bulky RG-8 type. The 300-ohm line feeding the UHF beam is of the low-loss "foam" type (Radio shack #15-1174) and is supported by stand-off insulators throughout its run.

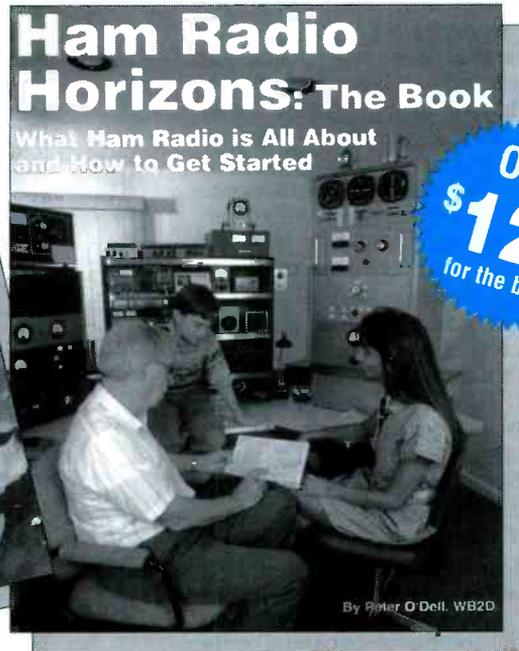
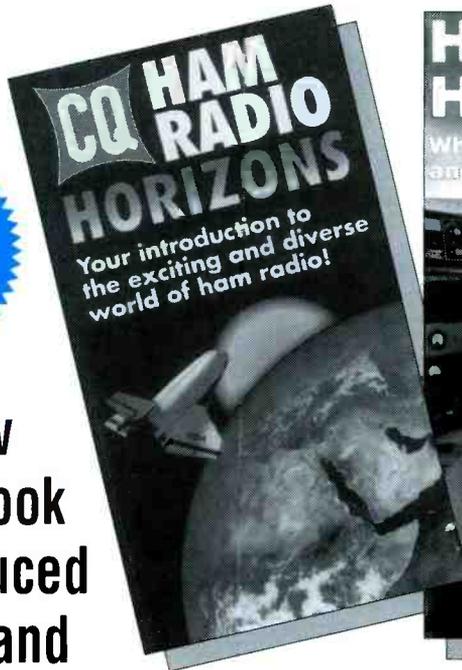
The net result is that my discone antenna continues to perform well throughout the VHF/UHF range (including 800 MHz) while the UHF beam and preamp provide outstanding gain in the 400 to 500 MHz range where I really need it. If you live in a suburban or rural area and want to greatly extend the range of your UHF monitoring without compromising your VHF reception, I highly recommend this arrangement.



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SIMPLE ANTENNAS AND ACCESSORIES FOR SIGNAL IMPROVEMENT

Some Feedback

In the November 1992 edition of this column we took a look at loop antennas made on embroidery hoops. That form of loop antenna is made by separating the two halves of the embroidery loop, opening up the outer section, and then inserting a length of 16 conductor "ribbon" cable. When the wires of the ribbon cable are cross connected, the result is a 16-turn loop antenna. In that article I stated that computer ribbon cable is best because ordinary enameled "magnet" wire keeps falling off the loop, and is thus difficult to wind. Frank Carson (N3OCW) solved the problem, and, from his letter, here is how he did it:

"I found a simple solution in my basement. My other hobby is building scale models, so I have a battery operated Dremel hobby grinder. I took one of the grinding attachments and used it to sand a shallow "furrow" around the circumference of the inner hoop.

"The rest was simple. I taped the end of the magnet wire into the hoop in the furrow. Keeping tension on the wire I wrapped it around the hoop. About every five turns I put another piece of tape on the wire to make sure it stayed on. Getting the turns onto the form was no problem, and it went faster than cross wiring the 16 conductor computer cable."

Congratulations Frank. For that great idea I'm sending you a complimentary copy of my new HighText book, *Joe Carr's Receiving Antenna Handbook*. It contains what has been called by one critic "...the best discussion of loop antennas to date."

By the way, my wife (Bonnie) owns a Dremel tool (although not battery powered) for her eggery (artistic egg decorating) hobby. One of my current projects was a 60 KHz WWVB loop antenna, and if Frank thinks 16 cross connected conductors was a bit of a pain, he ought to try 64 conductor cable needed for that VLF loop! Next job will be a 25 KHz VLF loop for monitoring solar eruptions that cause Sudden Ionospheric Disturbances (SIDs)...and that antenna takes 120 turns. Perhaps I'll give Frank's method a try.

Ground Plane vs. Vertical Antennas

Another reader wrote and asked the difference between ground plane antennas (Fig. 1) and vertical antennas. It seems that the reader noted that a vertical with radials looks a bit like a ground plane antenna. There is no difference, for the ground plane is a vertical antenna in which the ground is a set of quarter wavelength radials, which

are usually mounted horizontal to the antenna 90 degrees from the vertical radiator element.

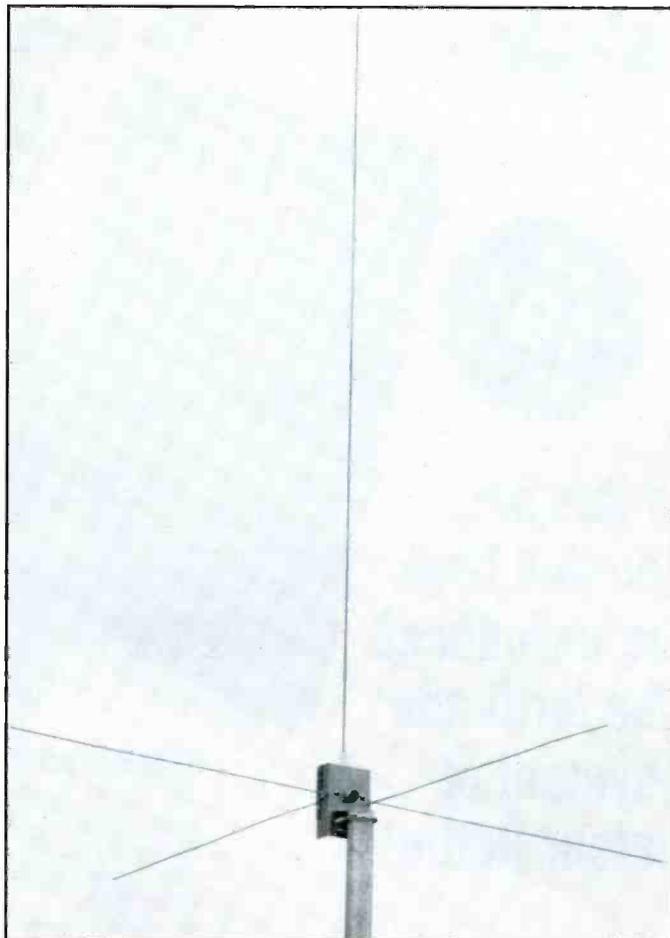
The typical ground plane is typically used in the VHF and UHF bands, and as such find popularity with scanner and monitor receiver operators. In some cases, both the radials and the radiator are quarter wavelength long, but in other cases the radials are quarter wavelength and the radiator is 5/8 or 3/4 wavelengths. These ground planes are capable of low angles of radiation, so are also popular with DXers in the upper ham bands and the CB.

Antlers Software

Antlers is a software program that allows you to find the required length and element spacing (where appropriate) for common

antennas used in amateur radio, shortwave listening and scanning. The program will run on any MS-DOS or Windows "IBM-PC compatible" that has a color monitor. It will also run on many machines equipped with a monochrome monitor if they have a graphics card installed.

After the opening sequence, a Main Menu appears that asks for the type of antenna that you wish to design. After you select an antenna type, Antlers asks for the frequency that you wish to cut the antenna for. Two choices are available: either you enter the specific frequency in kilohertz, or select a "standard band" (i.e. one of the S/W broadcast or ham bands). If the standard band selection is made, the soft



Ground plane antenna is basically a vertical antenna with four or more quarter wavelength radials forming a counterpoise ground (which is where it gets its name). Courtesy MFJ Enterprises.

(Continued on page 82)



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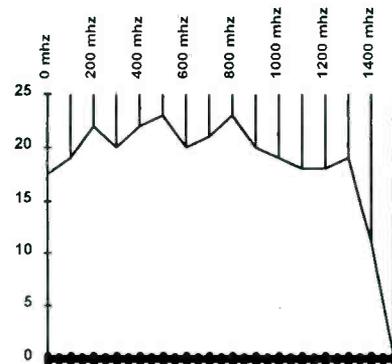


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SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

It's about time to start a new year, and for many radio hobbyists, it's a good time to consider making some resolutions for 1994.

For instance, do you set aside a certain time period each day or each week for monitoring? Perhaps you even monitor 24 hours a day and it's time to consider turning off your radios, if not for your family's sake, for your own mental health! Perhaps when you listen, you jot down notes on various scraps of paper that clutter your listening post. Consider consolidating those notes, if not into file folders, perhaps into your computer's memory. It sure would make it easier to find things.

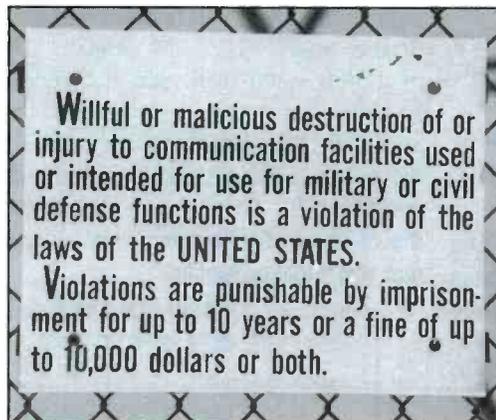
Whenever I travel, I usually carry a pad of paper and jot down all my monitoring notes from a given region. When I return home, I tear those sheets off the pad of paper and file them in file folders. If I travel to a certain area on a regular basis, there will be a separate file folder for that area. If I travel through a given area and may only travel through it again in the future without stopping, there would be a separate folder for those notes.

It sure makes it easier to find those notes the night before leaving on a trip (when I usually pack up all the radio gear—as the rest of the family sleeps!).

In any event, hopefully you will have a good monitoring year in 1994. With that, we continue forward into the new year.

Wayne Bortle of Belair, Maryland, writes in requesting information on a scanner club for the Baltimore area. We'd recommend you check with Northeast Scanners, which publishes the monthly Northeast Scanning News. The approximately 64-page publication covers an area from Virginia to Maine and focuses on each of the major metropolitan areas. A sample issue of Northeast Scanning News is \$3; an annual subscription is \$29. Make checks payable to Les Mattson, and mail to: P.O. Box 62, Gibbstown, N.J. 08027.

Landon Perillan of Fairfax City, Virginia, writes to request information on frequencies used by the Virginia State Police for his area. In the Fairfax County area, the state police uses 159.000 for base stations and 154.935 for mobiles. Other frequencies include 154.680 for executive protection, 154.665 for car to car, 154.695 for surveillance and 458.350 for portables operating through vehicular repeaters. The Virginia State Police uses a variety of VHF high band frequencies throughout the state for its other divisions. There are a total of 14 channels that combine base and mobile frequencies throughout the state. For more information on Virginia State Police's radio system and others in Virginia, you may want to check out the Scanner Master Vir-



These photos show a tower site used by Burlington Northern Railroad at its Eola Yard in Aurora, Illinois. Thomas L. Quimby sent in these photos detailing what a sign on the fence surrounding the tower reads. BN's frequencies used at the Eola Yard are 161.100, Channel 1, road; and 160.160, Channel 2, switching and yard work. Other BN frequencies heard by Thomas include PBX on 160.245 and 160.425.

ginia/Metro D.C. Guide, available through several POP'COMM advertisers.

Landon also requests information on frequencies used by the Drug Enforcement Agency, the Bureau of Alcohol, Tobacco and Firearms and the Secret Service. To get you started, you may want to search the 418 MHz range for DEA channels. Most simplex and repeater operations can be found here, as well as the low end of 419 MHz.

ATF uses these primary frequencies: 165.2875, F1 simplex and F3 repeater output; 166.5375, F2 simplex and input frequency for F3 and F8 repeaters; 166.4625, F4, or Treasury Common, used by all U.S. Treasury Department agencies; 165.9125, F5 for surveillance; 173.8875, F6 simplex and F8 repeater output; and 168.000, F7 simplex and F6 repeater input.

The Secret Service generally uses a set group of frequencies allocated to the White

House Communications Agency. Some of these frequencies include: 165.7875, Baker; 165.375, Charlie; 165.2125, Mike; 164.8875, Oscar; 166.5125, and Sierra (primary presidential protective detail use). Most Secret Service communications are digitally encrypted, however, there usually is a surprising amount of clear voice communications during a visit. For those with CTCSS decoders, the Secret Service has started using a tone of 103.5 Hertz recently. Many metropolitan areas have Secret Service repeaters that operate on discreet VHF high band frequencies for use on a statewide or regional basis. For the most complete information on federal frequencies available, we recommend the eighth edition of "The 'Top Secret' Registry of U.S. Government Radio Frequencies" from CRB Research Books. The 268-page guide is available from CRB for \$21.95 plus \$4 shipping. Write to: CRB Research Books Inc., P.O. Box 56, Commack, N.Y. 11725.

Orders also by phone to (516) 543-9169. Visa and MasterCard may be used. New York residents please include \$2.21 tax. The book is by Tom Kneitel, K2AES.

Bill Cereske of South Lake Tahoe, California, checks in with some interesting frequencies. He said he uncovered some frequencies active at Disneyland in Anaheim, California, during a recent visit: 464.6375, security RED; 461.850, BLUE; 464.5125; 464.575; 463.5125.

He said Anaheim Convention Center was found using 464.425 and 464.925. In South Lake Tahoe, Bill says that police use 156.030, while fire uses 153.950. Caltrans snowplows use 47.04 and 47.16, which he adds are important frequencies to monitor this time of year. Heavenly Valley ski area reportedly uses 151.580, 464.600 and 464.850, as well as a helicopter frequency of 464.950 for rare use.

Bill's shack consists of an AOR AR-1000XLT handheld with a long-wire antenna for shortwave, a Realistic Pro 32 and an old Realistic Pro-2001 16-channel unit.

David K. Wilson of Ogden, Utah, sends in a list of his favorite frequencies for his area: 155.310, Utah Highway Patrol dispatch, Weber County; 155.745, Utah Highway Patrol car to car; 155.790, Weber County Sheriff dispatch; 155.730, Weber County Sheriff car to car; 460.250, Ogden police F1, detectives/reserves; 460.500, Ogden police F3 dispatch; 154.250, Ogden

fire F1 dispatch; 154.130, Ogden fire F2, fireground/training tower; 154.160, Weber County fire; 155.340, McKay-Dee/St. Benedict's Hospital; 155.505, Utah Highway Patrol statewide; 154.280, Utah statewide mutual aid; 156.030, Roy police; 154.710, Riverdale and Washington Terrace police; 154.755, South Ogden police; 156.180, Ogden streets and parks departments; 118.700, Ogden Municipal Airport tower; 127.150, Hill Air Force Base tower; 148.150, Utah Civil Air Patrol; 165.0625, Defense Depot Ogden military police.

David has been a scanner listener for about a year now and his equipment includes a Uniden Bearcat 147XLT, a Realistic Pro-2023 and a Uniden Bearcat 55XLT handheld. David got involved in monitoring in an interesting way. About two years ago, he located some replacement tubes for an old Monitoradio model MR-10, which tunes in the 152-174 MHz band. After a while, the tuner broke and he purchased the BC147XLT. The older radio was manufactured by the Monitoradio Division of IDEA Inc. of Indianapolis, Indiana. David is looking for information or parts for this old receiver. He can be contacted at: David K. Wilson, 574 15th St., Ogden, Utah 84404.

Paul Godshall of Perkasio, Pennsylvania, passes along his favorite frequencies: 158.790, Allentown police F1; 159.090, Allentown police F2; 155.040, Allentown

police F3; 156.210, Allentown police speed traps; 154.175, Lehigh County fire dispatch; 155.835, Lehigh County ambulance; 155.265, Lehigh County ambulances to hospitals; 155.670, base to car, and 155.910, car to base, Pennsylvania State Police Fogelsville barracks; 155.505, base to car, and 155.850, car to base, Pennsylvania State Police Dublin barracks; 155.220, Lehigh Valley Hospital Center MedEvac helicopter.

Lee Hilliard of St. Peters, Missouri, says that he's a new POP'COMM reader and has a Realistic Pro-46 and Uniden Bearcat 55XLT that he listens with.

Lee says he listens to St. Charles County Sheriff's Department dispatch on 155.490; St. Charles City on its trunked system on 856.2625, 857.2625, 858.2625, 859.2625 and 860.2625; St. Charles County fire on 154.445, 154.250. In addition, he listens to Heartland Park in Topeka on the following frequencies: 463.675, Channel 1; 464.800, Channel 2; 462.050, Channel 3; and 462.150, Channel 4.

Angel Ramon of Chester, Pennsylvania, sent in this list of frequencies for the Philadelphia Police Department: 453.050, north; 453.150, central; 453.200, north-central; 453.250, traffic; 453.300, east; 453.350, west; 453.400, detectives; 453.450, airport; 453.500, southwest;

(Continued on page 82)

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GETTING STARTED AS A RADIO AMATEUR

How Much Will It Cost?

Wouldn't it be great to explore every nook and cranny of our vast hobby? As diverse as Amateur Radio is, you'd spend a lifetime doing it—along with a fair amount of cash! (But oh, what a lifetime!)

Unfortunately, most of us have restricted budgets. As much as we would love to pour unlimited funds into new ham gadgetry, other priorities such as food, clothing and shelter usually get top billing.

The following list describes the gear and associated costs of several popular Amateur Radio activities. Each section is a summary of the necessary equipment along with the average cost of each item (tailored to new gear normally purchased by beginning hams).

Average is the operative word when you scan the equipment lists. If you shop carefully, you can probably beat these prices by a reasonable margin. If money is no object, you can spend much more and buy top-of-the-line models.

Note that the list covers *new equipment only*. If you really want to save cash, look for good used gear. By purchasing used instead of new, you can shave the costs by about 50%, if not more. Buying used equipment is an art unto itself with its own potential pitfalls. We'll discuss it in more detail in a future column.

As you review the items, you'll notice some repetition. For example, an SSB/CW HF radio can be used for more than one type of activity. (HF radios and computers are characteristically multipurpose devices.) Of course, if you already own a particular item, deduct its cost.

Here's the list—put your credit cards and check book in a safe place!

HF CW/SSB (80-10 meters)

Description: Voice and CW communications on the HF bands. SSB/CW transceiver and power supply: \$1200. Antenna: \$350 (triband beam); \$60 (multiband trap dipole); \$300 (commercially made vertical). Antenna tuner: \$150 (optional). Tower and rotator: \$1000 (50-foot tower).

If you demand tower-mounted, high-performance antennas, you can sink a large wad of money into a beam, tower and rotator. If you don't mind the performance trade-off, an antenna tuner and a dipole will serve you nicely—and save you about \$2500.

Another alternative is to try low-power (QRP) operating. QRP transceivers typically cost \$200 to \$500 and power supply requirements are minimal. However, most QRP rigs operate CW only and few have multiband capability.

2-meter FM (HT And Mobile)

Description: Voice and CW communications on the 2-meter band. FM transceiver: \$400

(mobile); \$300 (HT). Mobile antenna: \$50. Base antenna: \$60.

You can cut some corners on antennas here, too. If you're willing to settle for a basic, 1/4-wave ground-plane antenna at home, you can buy one for about \$20. A 1/4-wave mobile antenna with a magnetic base can be yours for only \$25.

HTs (hand-held transceivers) are usually less expensive than mobile radios. Each has advantages and disadvantages. HTs are convenient and versatile, but they lack the power for reliable, wide-area coverage. Even with a base antenna at home, you may need an amplifier to extend your range—particularly on simplex. Mobile rigs lack portable convenience, but they have plenty of power and usually have features not found on HTs.

Packet Radio (2-meter FM)

Description: Digital communications on the 2-meter band. FM Transceiver: \$400. Antenna: \$60. TNC: \$130. Computer System: \$1000.

The transceiver price assumes that you'd use a typical mobile rig. However, many packeteers use HTs with outstanding results. If you have a node or digipeater nearby, you can even use an HT with a rubber duck antenna!

Computer prices are so unstable it's difficult to pinpoint an average cost. For \$1000, you should be able to obtain a 386 or 486 PC with about two megabytes of memory, a hard drive and a VGA monitor. Enterprising computer shoppers can probably cut about \$300 from that figure. If you want a deluxe, high-speed 486 PC, or a well-equipped Macintosh, expect to fork over at least \$1600.

RTTY/AMTOR/PacTOR

Description: Digital Communications on the HF bands. SSB/CW transceiver: \$1200. Antenna: \$400 (triband beam); \$60 (multiband trap dipole); \$300 (vertical). Antenna tuner: \$150 (optional). Tower and rotator: \$1200 (50-foot tower). Computer system: \$1000. Multimode communications processor (MCP): \$300.

I'm listing a complete HF section because some hams may want to jump straight into HF digital communications without owning a single piece of equipment. Most hams, however, already have a few of the items shown above.

The heart of any HF digital communications station is the multimode communications processor, or MCP. The MCP acts as the middleman between the radio and the computer. It translates computer data into shifting audio tones (or MARK/SPACE pulses) for the radio. It also decodes received audio into data and sends it to the computer.

Once again, you can save a great deal of

money by using a simple dipole antenna strung between a couple of trees. Towers and beams are wonderful things, but they can wait until later.

6-meter/2-meter VHF SSB/CW

Description: Voice and CW communications on the VHF bands. 6- or 2-meter transceiver: \$600. 6- or 2-meter beam antenna: \$100. Rotator: \$200. 6- or 2-meter amplifier (160 watts): \$300. Tower: \$1000 (50-foot tower).

If you're going to do serious signal chasing on the VHF bands, you need a beam antenna—the larger the better. A rotator is also a necessity. Do you need a tower? Not really. Many weak-signal VHF enthusiasts do a fine job with roof-mounted antennas. Others take their equipment on the road, traveling to the tops of hills or mountains for a day or two of the VHF DXing at a time.

With a few exceptions, it's common to find a transceiver that offers 6- and 2-meters in one enclosure. The same is true of amplifiers. Depending on your budget, you may have to choose one band or the other at the beginning. An alternative is to use the HF SSB/CW transceiver you may already own in a combination with a transverter. A transverter converts the HF signal to VHF, and vice versa. Transverters will set you back about \$200 to \$300 per band.

Conclusion

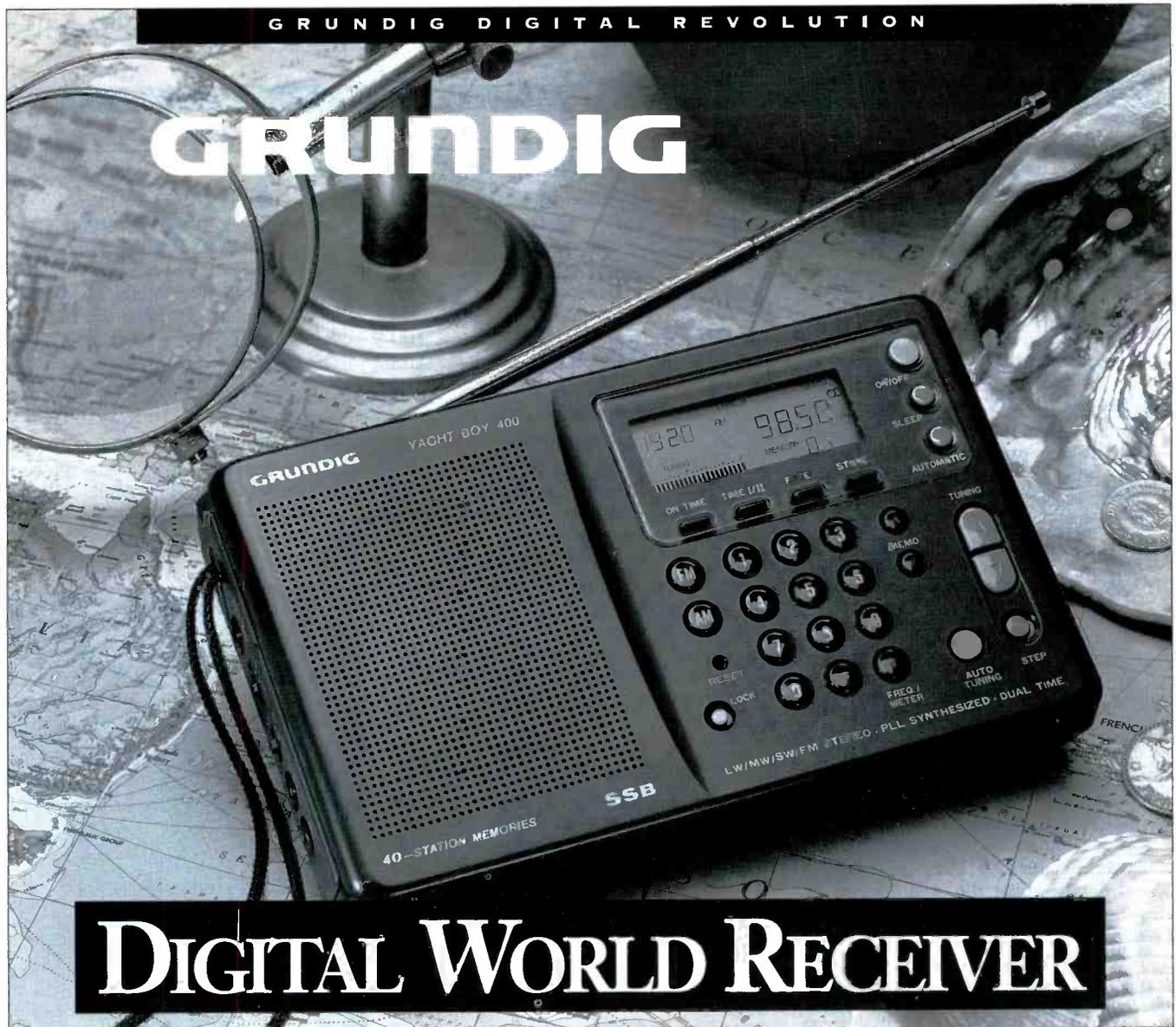
No one said that Amateur Radio was the least expensive avocation on the planet. Even so, you can soften the impact on your bank account by using the following tips:

- Don't buy on impulse. You may drool at the first sight of a beautiful piece of equipment, but don't make a hasty decision.
- Shop at hamfests. Amateur Radio equipment dealers attend many of the larger hamfests and they often offer special prices on new equipment.
- Sell your current equipment. There is always a market for good used gear. By selling off some of your older equipment, you can accumulate enough money to take the sting out of a new purchase.
- Save your money. I know this sounds like common sense, but you'd be surprised at how many people neglect this option.
- Don't buy more than you need. When you're evaluating equipment, beware of the bells-and-whistles syndrome. Basic radio performance is where it's at.

So, there you have it. Now gear is expensive (ouch!). I'll try to hurry with the Buying Used Gear column, I promise.

Keep your cards, questions and letters coming to me at ARRL, Department PCN, 225 Main Street, Newington, CT 06111.

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Editor-in-Chief, Passport to World Band Radio

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If you have any questions regarding the YB-400, please call our shortwave Hotline and talk to the experts, U.S. (800) 872-2228, and Canada (800) 637-1648 (9am to 4pm PST).

BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

In The Lab?: We don't normally think of the broadcast services when we think of Experimental stations, but not so of late. A license for an experimental TV station on Channel 65 may become a reality for Austin, Texas.

Licenses for experimental AM and FM broadcast stations have been issued for Baltimore MD. The AM station has the call letters WAFE and is allowed to operate only daylight hours. It runs 1 kW on 1630 kHz. The FM is WAFE-FM on 90.5 MHz. These stations are licensed to Morris H. Blum, 3800 Hooper Avenue. Both stations exist for the purpose of testing new EBS technologies. Experimental stations don't usually operate with regular skeds, nor do they exist for very long. Log them while you can.

New Banders: Last May, the FCC invited AM stations to file petitions to migrate to the new portion of the band running between 1605 and 1705 kHz. As of the end of June, when the FCC stopped accepting petitions, 997 stations told the FCC they wanted to change to the new frequencies. The FCC determined that 882 of these were eligible to become priority-ranked for frequency assignments, according to an FCC ranking formula. Those excluded from consideration included Class C stations, and those whose petitions were received after June 30. The FCC is still analyzing details about the stations and the ranking formula, so no final approvals have been given or frequency allotments made.

A sampling of a few of the stations in some major cities petitioning to move to the new band: KXED, KURS, KDIT, KGER, WNIV, WAOK, WYZE, WSCR, WMBI, WNOE, WILD, WBMD, WBGR, WERQ, WUST, WLQV, KTCJ, KUOM, KFEZ, WEW, WRTH, WGIV, KHAT, WSKQ, WNRJ, KQEO, KKIM, KXKS, KZKS, KKVV, WEBR, WHTT, WKDM, WWRL, WBBF, WPXY, WTSJ, WCIN, WERE, WABQ, WMNI, WVKO, KVSP,

Applied to Change FM Facilities

KCCQ	Ames, IA	107.1 MHz	Seeks 105.1, 13 kW.
KQEX	Rohnerville, CA	100.3 MHz	Seeks move to Fortuna.
KTRY-FM	Bastrop, LA	94.3 MHz	Seeks 93.9 MHz, 50 kW.
KTTN-FM	Trenton, MO	92.1 MHz	Seeks 92.3, 5.8 kW.
KWRL	La Grande, OR	100.1 MHz	Seeks 99.9 MHz, 91 kW.
KZCD	Lawton, OK	94.1 MHz	Seeks 94.3 MHz, 50 kW.
WGTN-FM	Andrews, SC	100.9 MHz	Seeks 100.7 MHz, 6 kW.
WOKC-FM	Okeechobee, FL	103.1 MHz	Seeks move to Hobe Sound.

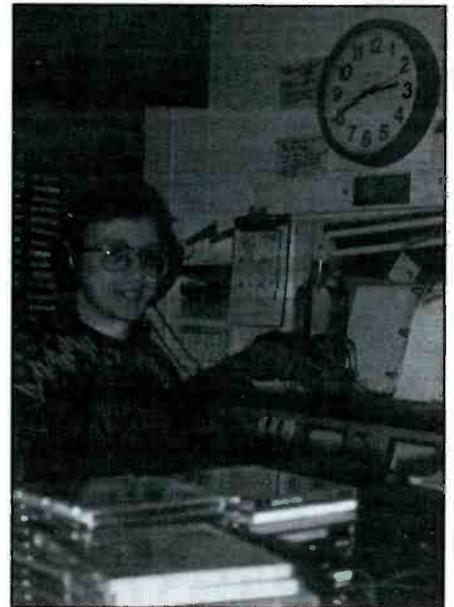
Changed FM Facilities

(new)	Noyack, NY	88.3 MHz	To operate 89.3 MHz, 3 kW.
WDWN	Auburn, NY	88.9 MHz	Moved to 89.1 MHz, 3 kW.
WPBX	Southampton, NY	91.3 MHz	Moved to 88.3 MHz, 25 kW.

WTEL, WDAS, WPGR, WEEP, WPAL, WXTC, WHBQ, WREC, WBBP, KEYS, KGGR, KAAM, KHVN, KNRB, KEYH, KKZR, KCRR, KCOH, KLAT, KONJ, KCOR, WLEE, WREJ, KJR, KKDZ, KZOK, KJRB, KUDY, KMBI, WTDY, WHIT.

OTR Source: Once in a while we mention old time radio (OTR) programs played over many radio stations. An anonymous reader in Texas tells us that the program *When Radio Was*, hosted by Art Fleming, is distributed nationally to 100 stations five days per week by satellite. It contains classic shows like *Lights Out*, *Fred Allen*, *Sherlock Holmes*, *Fibber McGee and Molly*, *The Life of Riley*, *Our Miss Brooks*, *The Lone Ranger*, and others. The program is available on a barter basis, which means no cash payments. Stations interested in carrying *When Radio Was* can get more information by calling (201) 385-6566.

Aircraft vs. Antenna: A privately owned Piper Cherokee aircraft crashed into the 1350 ft. transmission tower of FM station WKTK, Crystal River, Fla. Although



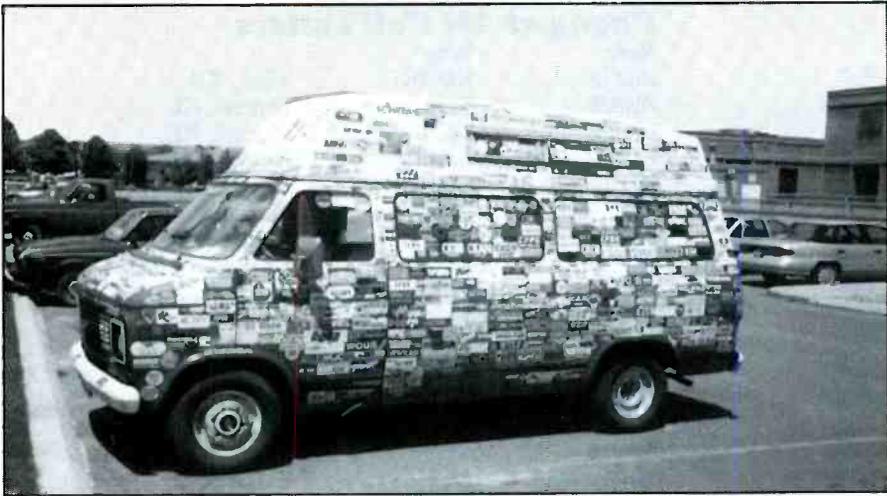
Doug Schnackel, known on the air as Doug Thompson, at WHYR in Saco, Maine.

Applications Filed to Construct New FM Stations

AZ	Bagdad	103.9 MHz	1.4 kW
AZ	Bisbee	90.9 MHz	
IA	Sibley	100.3 MHz	6 kW
MN	Willmar	91.9 MHz	25 kW
MO	Kennett	104.3 MHz	6 kW
MS	Brooksville	98.9 MHz	
MS	Tulepo	90.9 MHz	3.5 kW
NE	Falls City	101.3 MHz	3.4 kW
OK	Stillwater	98.1 MHz	6 kW
TN	Coalmont	91.3 MHz	1 kW
TX	Littlefield	95.5 MHz	25 kW
WA	Ephrata	93.9 MHz	50 kW
WI	Allouez	106.7 MHz	25 kW
WI	Sheboygan Falls	106.5 MHz	6 kW

Permits Issued to Construct New FM Stations

AR	Danville	105.5 MHz	1.5 kW
AS	Fafaitua	103.1 MHz	30 kW
CA	Columbia	98.9 MHz	300 watts
IL	Breese	97.5 MHz	6 kW
IL	Ottawa	88.9 MHz	3 kW
KS	St. Mary's	102.9 MHz	50 kW
MI	Houghton	91.9 MHz	100 watts
NY	Corning	91.1 MHz	12.6 kW
NY	Endwell	107.5 MHz	3 kW
PA	Allentown	89.3 MHz	120 watts
SC	Ladson	106.3 MHz	3 kW
TX	Amarillo	99.7 MHz	6 kW
UT	Ephriam	89.5 MHz	100 watts



Bumper stickers? I don't have to show you no stinkin' bumper stickers! Get a load of this great van driven to the IRCA convention by Ontario DX'er Dave Whatmough. (Photo by R.C. Watts, Louisville, Kentucky.)

the impact didn't take the station off the air, the daylight accident completely sheared off one of the aircraft's wings. Only a few parts of the tower, and a guy wire were damaged in the incident. The antenna, itself, was bent, but still functional.

The pilot of the aircraft and the single passenger aboard were both killed when the plane came down.

Witnesses said the plane emerged from a nearby cloud bank and flew directly into the tower, deflecting off to the right after losing its left wing (and probably its prop) in the collision. The tower's strobe lights were operating at the time of the accident.

Drove My Chevy to The Levee, But The Levee Was Dry: Those who spent the last 23 years enjoying the 1950's and 1960's classic oldies on Kansas City's WHB/710 awoke one day to find the music had stopped. No more Buddy Holly, Joey Dee and the Starlighters, or Little Eva. Everybody gone, and replaced by a new station with agricultural news and traditional country music. This turn of events the result of the sale of WHB and its companion station, KDUL-FM. Locals fondly remember 71-year old WHB as one of the original pioneers in Top-40 programming 40 years ago.

Here's a hint to our readers in KC. Don't

fret. You can still rock around the clock and get your fill of Elvis, Ben E. King, CCR, and Brenda Lee over KCMO-FM/Oldies-95.

We appreciate the information from C.W. Riggs, Edwardsville, Kansas.

Big Show at The Big House: One of the nation's most unusual radio stations is KLSP-FM/91.7 MHz. This is the 100-watt broadcast station of the Louisiana State Penitentiary, Angola. It's believed to be the only inmate-operated radio station in the United States.

Operated from three small rooms in the institution's Administration building, and using old donated equipment, KLSP has been operating for seven years, covering a 15 to 25 mile range. A music library has been put together consisting of about 750 discs and tapes encompassing jazz, blues, rock, country, gospel, reggae, and oldies. KSLP operates from noon to 2 AM, playing its music along with interviews, rehabilitation, and other programming for the 5,000 LSP inmates. Sundays are devoted exclusively to religious programming.

There aren't any commercials on KSLP, so the staff doesn't get paid much. Actually, the staff members work 50 hours per week at a weekly pay of \$2, which comes out to 4-cents per hour. The yearly budget of

Applied to Change AM Facilities

KCCF	Cave Creek, AZ	1100 kHz	Seeks daytime increase to 50 kW.
KCKC	San Bernadino, CA	1350 kHz	Seeks night increase to 600 watts.
KDUK	Eugene, OR	1280 kHz	Seeks night increase to 1.5 kW.
KFIR	Sweet Home, OR	1370 kHz	Seeks move to 720 kHz, 250 watts at night.
KFWB	Los Angeles, CA	980 kHz	Seeks increase to 50 kW.
KIAM	Nenana, AK	630 kHz	Seeks increase to 10/3.2 kW.
KMVP	Commerce City, CO	670 kHz	Seeks increase to 5 kW days.
KOQI	Soquel, CA	1200 kHz	Seeks drop to 25/10 kW.
WBMA	Dedham, MA	890 kHz	Seeks move to Bala Cynwyd, 50 kW/500 watts.
WWCM	Ypsilanti, MI	1520 kHz	Seeks increase to 9.2 kW days.

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Changed FM Call Letters

New	Was	
KAVE	KSDC	Oakridge, OR
KCPI	KRGR	Albert Lea, MN
KDOK	KGLD	Tyler, TX
KERC	KZZO	Clovis, NM
KFXE	KXIY	Cuba, MO
KGOE	KECU	Eureka, OR
KMEM-FM	KMEM	Memphis, MO
KNUC	KVEZ	Smithfield, UT
KOOJ	KAKT	Riverside, CA
KWCD	KZMK	Bisbee, AZ
KYOT-FM	KOY-FM	Phoenix, AZ
KZBK-FM	KZBZ	Brookfield, MO
WBBY	WJHT	Cedar Bluff, VA
WCDK	WWYS	Cadiz, OH
WDSP	WKIP-FM	Arlington, NY
WKFS	WNFI	Palatka, FL
WGAY	WGAY-FM	Washington, DC
WISQ	WRLM	Whitewater, WI
WKQV	WINH	Olyphant, PA
WNGX	WZYB	Ft. Ann, NY
WNSP	WNWT	Baraga, MI
WSKP	WWFT	Key West, FL
WYHK	WRED	Gibsonburg, OH
WYRX	WFRY	Lima, OH

New AM Call Letters Issued

WAFE Baltimore, MD

Requesting Changed AM Call Letters

Now	Seeks	
KKIS	KATD	Pittsburg, CA

Changed AM Call Letters

New	Was	
KGLD	KDOK	Tyler, TX
KKAR	KOIL	Omaha, NE
KMEM	KFMQ	Lincoln, NE
KOIL	KKAR	Bellevue, NE
KZBK	KGNG	Brookfield, MO
WIPI	WODE	Easton, PA
WHGT	WAYZ	Waynesboro, PA
WTCY	WNNK	Harrisburg, PA
WTGM	WLVW	Salisbury, MD

Requested Chaned FM Call Letters

Now	Seeks	
WVIP-FM	WMJU	Mt. Kisco, NY

New FM Call Letters Issued

KAEC	Arkansas City, KS
KAED	Slayton, MO
KAEH	Beaumont, CA
KAEI	Wishak, MD
KHMC	Goliad, TX
KLTD, TX	Temple, TX
KOOU	Hardy, AR
WAFE-FM	Baltimore, MD
WVMS	Sandusky, OH

Changed AM Facilities

WAGE	Leesburg, VA	1200 kHz	Increased days to 5 kW.
WHOT	Youngstown, OH	1390 kHz	Increased days to 9.5 kW.

KSLP is a mere \$3,500, which is about one-third what the staff figures it needs, given the old equipment in use, and the old tapes and records that are played over and over. All funds for KSLP are raised from inmate concession sales and other private sources.

The station meets all FCC requirements, and is run under the close supervision of the institution's authorities. Donations of records, tapes, and used broadcast equipment can be put to good use by KSLP. You might wish to contact Asst. Warden R. Dwayne McFatter if you have something

along these lines you think the station can use.

We appreciate Martin Wade, N5PZJ, of Galliano, Louisiana sending us this information, based upon Ed Anderson's story in *The New Orleans Times-Picayune*.

Fine Tuning: The FCC fined KLDT-TV/55 \$20,000 for violating FCC public inspection files, main studio staffing, and filing of contracts affecting ownership or control of a license.

The FCC Howard Stern fines are still in high gear. KFBI, an FM station in Pahump, Nevada, was fined \$73,750 for

broadcasting nine days worth of Stern's morning show the agency felt dealt with matters unsuitable for daytime radio discussion because "there was a reasonable risk that children may be in the audience." The FCC described the violations as "egregious."

The FCC came knocking at Infinity Broadcasting Corporation's door about Stern, too. Each of four Infinity stations received a fine of \$125,000, a total of \$500,000, for "egregious" violations by Stern. These stations were New York's WCRK, Philadelphia's WYSP, Baltimore's WJFK, and Manassas' WJFK-FM.

AM station WIP, Philadelphia, Penna., had its license renewed, but not without problems. The renewal was subject to certain reporting conditions imposed by the FCC, and there was also an FCC fine of \$12,500 for the FCC's claim that the station had violated the Equal Employment Opportunity Act. The license was renewed despite the objections of black, hispanic, gay, and women's rights groups.

Are You There?: The FCC has new rules that requiring AM/FM/TV stations seeking license renewals reveal the current status of their operations. In the past, stations did not have to state if they were on the air or had gone dark. The FCC ended up renewing several dark stations that would not have been renewed had the agency realized their discontinued status.



KYGO/98.5 hails from Denver, Colo., and this is their bumpersticker. (Submitted by Pat Griffith, N0NNK, Federal Heights, Colo.)

This new information is requested on modified FCC Form 303-S.

AM station WKLO, in Danville, Kentucky, was revoked for being off the air without authority since December of 1992.

AM station KRAN, Morton, Texas, was told to explain why its license should not be revoked because it has been dark since the end of March, 1991. KRAN last wrote to the FCC in July of 1992 with a request to remain silent, but two letters sent by the FCC to the station in reply were returned as undeliverable. Eventually, contact with the licensee was established and a better address was obtained. The licensee wrote again to the FCC asking for permission to remain silent while he attempted to sell KRAN's facilities. The FCC wrote back several times seeking additional information, but the licensee didn't respond. Now the FCC assumes the station is simply off the air without authorization.

The FCC reports there are 4,951 AM radio stations, 4,903 commercial FM stations, plus 1,630 non-commercial FM stations. There are another 2,015 FM transmitters and boosters.

Check This Reader!: Doug Schnackel works for WHYR/95.9. This is a 3 kW station in Saco, Maine, which covers Portland and all of southern Maine with a decent signal. Doug has been there for six years doing the a.m. drive time shift. His air-name is Doug Thompson. WHYR is the area's only CHR station.

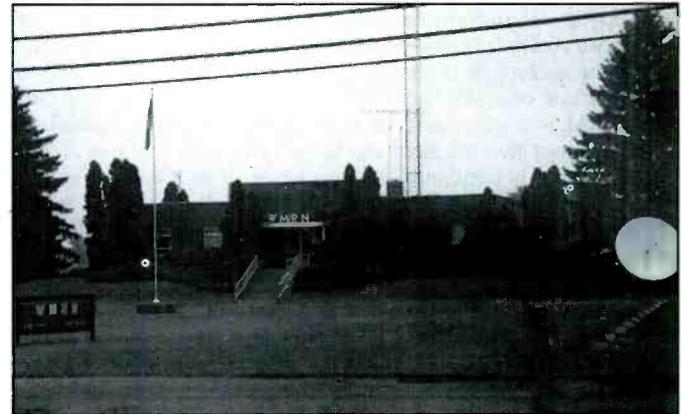
Doug advises that he is interested in buying and/or trading radio air checks of the Buffalo/Rochester, New York markets. He is particularly interested in the 1960 to 1989 time frame, but current material is also welcome. He's originally from that area (Batavia, to be precise), and spent many years working on stations in western New York. Contact Doug at P.O. Box 1575, Saco, ME 04072-7575.

Short Spacing FM: Looks as though the FCC rules may be changed relating to the

way applicants for FM stations can round off distances when computing the extent to which they are short spaced. Presently FCC rule 73.208(c)(8) specifies that the compound distance between two reference points should be rounded off to the nearest kilometer. Where questions of short spacing arise, the FCC feels it needs a more precise number with which to work. Therefore, it proposes to amend the rule to call for rounding off the distance separation calculations to the nearest one-hun-

dredth of a kilometer (two decimal places) in instances when the applicant isn't in compliance with FCC minimum distance separation requirements. This degree of precision produces an accuracy of 10 meters (approximately 31 ft.).

Have a Happy!: We are up against the end of the tape cart. Please join us again; same time, same station. Pass along your AM/FM photos, decals, stickers, news clippings, station information, comments. Be sure to have a happy 1994. ■



↑ The good looking facility at WMRN (AM/FM), Marion, Ohio. (Photo by Craig Banks, Jeffersonville, Indiana.)

← A drive-by view of WQFE/101.9, Speedway, Ind. (Photo by Michael Moran, Brownsburg, Indiana.)

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* "The best...built like an antenna should be." -Larry Magne in *World Radio TV Handbook*
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 * "Now in use in 45 countries." -Giffler Shortwave in 1983

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Forgotten Modulation Methods

Every monitor is familiar with amplitude modulation (AM) and its half-sibling, single sideband (SSB). But there are some other half-siblings and first cousins to these two methods that have been tried and largely forgotten over the years. But these discarded methods do offer some real advantages over plain vanilla AM and SSB, especially now that receiver and transmitter technology has advanced to the point where they are a lot more practical than when they were first introduced. Maybe it's time to trot out a few of these and look at them fresh.

Understanding AM

Figure 1 is a really simplified diagram of a typical AM signal. When we vary the output level (or amplitude) of a transmitter in accordance with the variations in an audio signal, we create a radio signal like that in Figure 1. It consists of a *carrier* signal with a pair of identical *sidebands* above and below the carrier. The carrier has a very narrow bandwidth—only a few Hertz—while the sidebands are equal in bandwidth to the highest audio frequency being used to modulate the transmitter. Let's suppose that we have an AM transmitter tuned to 5000 kHz and decided to modulate it with a steady 3 kHz audio tone. The carrier itself would remain at 5000 kHz, but there would also be a lower sideband (LSB) present from 4997 to 5000 kHz (this is the bandwidth of the 3 kHz tone) and an *upper sideband* (USB) from 5000 to 5003 kHz (again, equal to the 3 kHz audio tone). Thus, the total bandwidth of an AM signal is equal to twice the highest audio frequency used to modulate the transmitter.

There are a couple of interesting things about AM. For one thing, both sidebands contain the same information; the two sidebands are redundant. It's possible to convey all the useful information in an AM signal with just one sideband. For another thing, AM is a big waste of transmitter power. About two-thirds of the power of an AM signal is contained in the carrier, which contains no useful information whatsoever. A carrier does just what its name implies—it "carries" the sidebands. Since one of the sidebands is redundant, this means only about one-sixth of the power of an AM signal contains useful information!

Many years ago some bright radio engineers figured out that it would make a lot more sense to get rid of the carrier and one of the sidebands and put all of the transmitter power into just one sideband. That was the idea behind single sideband modulation, which today dominates the ham

and utility radio bands and is also widely used on the CB channels.

While the carrier is pretty useless on transmit, such is not the case on receive. When an AM signal is demodulated and converted back to music or speech, the sidebands need to "beat against" the carrier for the audio to be extracted. If no carrier is present, the result is a distorted "Donald Duck" sound that is completely unintelligible on an AM receiver. To successfully demodulate SSB, we have to produce a replacement carrier in the receiver using a circuit known as a beat frequency oscillator (BFO). But tuning SSB is much more crucial than tuning AM. The replacement carrier must be precisely placed in relation to the received sideband for best results; mistuning only by a few Hertz can produce unnatural, irritating audio. This is why even deluxe shortwave receivers have controls with names like "fine tuning" or "delta tuning" to precisely adjust SSB tuning. It's also why many marine, military, and commercial SSB systems have a control with a name like "clarifier" so SSB can be more finely tuned in. This difficulty in tuning is one big reason why SSB has largely been passed over in favor of FM for land and local marine mobile radio work despite SSB's vastly superior range for the same transmitter power compared to AM.

It sounds like what we need is a modulation method that puts more power into the sidebands than conventional AM, reduces the carrier, and yet is as easy to tune as AM. Fortunately, there are three methods that fit this bill to varying degrees.

Amplitude Compandered Sideband (ACSB)

Amplitude compandered sideband (ACSB) has already been the subject of numerous on-the-air tests, mainly on the VHF and UHF bands. It has been suggested as a possible replacement for FM on some of the VHF land mobile frequencies, as it is possible to comfortably put two or three ACSB stations into the frequency space occupies by one FM signal. ACSB also offers greater range for the same transmitter power than FM, and is much easier to tune than conventional SSB.

ACSB is easier to tune because a *pilot tone* is transmitted for the receiver to "lock on." The typical bandwidth of an ACSB signal is 3.1 kHz, and the pilot tone audio frequency is precisely 3100 Hz. The ACSB receiver has a circuit to generate an identical 3100 Hz pilot tone. When an ACSB signal is received, the receiver matches its pilot tone against the one in the ACSB sig-

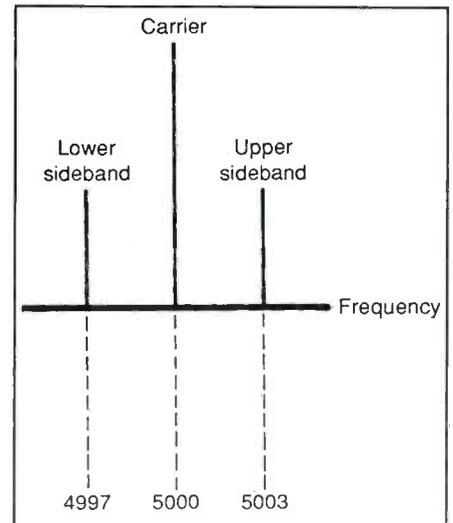


Figure 1

nal. The receiver adjusts its tuning circuits so that its pilot tone is synchronized with that in the received signal. Thus, there's no need for any sort of fine tuning on the part of the operator when receiving ACSB; tuning ACSB is no more complicated than tuning ordinary AM or FM. (By the way, the pilot tone is filtered out before final demodulation, so there's no annoying tone heard by the operator.) The use of a pilot tone makes ACSB practical for fixed channel operation, such as that found in the land mobile and marine services.

The term *compandoring* means compressing the audio signal when it is transmitted and then expanding it back to normal in the receiver. For example, an audio signal may have a dynamic range (the difference between its loudest and quietest levels) of 30 dB. After compression, the dynamic range may be only 7 dB or so. However, this compression does not distort the audio signal waveform; it only "shortens" it. When the signal is received and expanded back to its original form, the audio signal is expanded to a much greater degree than any noise that is received with the signal. The result is that ACSB has a much better signal to noise ratio than conventional SSB or AM, with FM only marginally better than ACSB in noise suppression. FM still has better total audio quality than ACSB, but ACSB is superior to AM and conventional SSB.

The FCC has conducted tests of ACSB at VHF and UHF, and every so often makes some noise about allocating new bands for ACSB or forcing some existing users of the VHF and UHF bands to convert over to

ACSB. So far, there has been very little in the way of experimentation with ACSB below 30 MHz. Only a handful of hams have bothered to dabble in it. The ease of tuning would seem to make ACSB a natural for international broadcasters interested in going to SSB. Are there any stations and receiver manufacturers out there who might be game to experiment with ACSB?

Keep One Sideband, Trash The Other

The FCC uses symbols to identify different transmission modes in its official documents. One such symbol is H3E (formerly A3H), which stands for single sideband, full carrier. In other words, this is one sideband with a full carrier. This gives an improvement in transmitter efficiency over conventional AM, since approximately one-third of the transmitter power is in the sideband and two-thirds is in the carrier. There's also the symbol R3E (formerly A3A), which stands for single sideband, reduced carrier. With R3E, the power ratio between the sideband and carrier are closer to 50-50. Both of these modulation methods are attempts to put power in the useful sideband while still maintaining compatibility with existing AM receivers.

Actually, there are some surprising users of H3E on the shortwave bands now—almost all four-digit numbers stations in "AM" actually use H3E! The professionals

can tell H3E is being used by displaying the received signal on a spectrum analyzer. The rest of us can carefully tune across the signal using a narrow receiver filter; a sideband will be found on one side of the carrier (usually the upper sideband) but not the other. Most listeners can't tell they're listening to a H3E signal since it sounds so much like conventional AM.

H3E occupies a little more than half the bandwidth of a conventional AM signal. It's possible to put two H3E signals into only slightly more space than an ordinary AM signal. It's more efficient than ordinary AM and sounds the same. So why haven't broadcasters gone over to H3E?

Good question. There have been some claims H3E is not as well suited to skywave propagation as ordinary AM. The theory behind this is that one sideband may be fading while the other one is well received. In such a situation, ordinary AM would have one "good" sideband to work with but H3E could be stuck with one "bad" sideband. That's the theory, at any rate—I haven't noticed this problem with any of the four-digit numbers stations that use H3E. A bigger problem would be the conversion of station transmitter gear from conventional AM to H3E. That would be expensive, and that would be a disincentive to many financially strapped stations. But from a technical standpoint, H3E has a lot to offer both broadcasters and listeners. It would cut down on interference (stations on the same

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CIRCLE 8 ON READER SERVICE CARD

POP'COMM's World Band Tuning Tips

January—1994

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
2410	R. Enga, Papua New Guinea	1100	Pidgin	6955	R. Continental, Peru	1000	SS
3200	R. 9 de Abril, Bolivia	0100	SS	6075	R. Super, Colombia	1000	SS
3220	HCJB, Ecuador	0400	SS	6075	Deutsche Welle, Germany	0030	
3221	R. Kara, Togo	0530	FF	6080	R. Australia	0830	
3250	R. Luz y Vida, Honduras	0200		6090	R. Bandeirantes, Brazil	0700	PP
3255	BBC Lesotho Relay	0300		6100	Deutsche Welle, Germany	0400	GG
3270	Namibian Bc Corporation	0300		6120	R. Japan	1130	via Canada
3275	R. So. Highlands, Papua New Guinea	1100		6135	Swiss Radio Int'l	0230	
3280	LV del Napo, Ecuador	0305	SS, close	6150	AWR, Costa Rica	1000	
3300	R. Cultural, Guatemala	0200		6160	R. Malargue, Argentina	1000	SS
3316	SLBS, Sierra Leone	0600		6165	Swiss R. Int'l	0600	
3320	Afrikaans Stereo, S. Africa	0300	s/on	6180	Radio Havana Cuba	0130	SS
3335	R. E. Sepik, Papua New Guinea	1000		6185	R. Educacion, Mexico	1000	
3356	R. Botswana	0300		6199	RFPI, Costa Rica	0045	
3365	R. Rebelde, Cuba	0300	SS	6220	R. Bulgaria	0430	s/on
3366	GBC, Ghana	0600		6245	Vatican Radio	0640	
3375	R. Nacional, Brazil	0930	PP	6803	Ondas del Mayo, Peru	0200	SS
3385	R. E. New Britain, P/New Guinea	1130		7020	V of Broad Masses, Eritrea	0300	vern.
3995	Channel Africa, S. Africa	0430		7105	REE, Spain	0430	SS
4000	R. Cameroon, Bafoussam	0430	FF	7120	R. Oman	2130	S/OFF, aa
4410	R. Eco, Bolivia	0100	SS	7125	RTV Guinea	0700	FF
4485	R. Tikhiv Okean, Russia	1200	RR	7150	R. Vilnius, Lithuania	0000	
4649	R. Santa Ana, Bolivia	0130	SS	7185	ORTS, Senegal	0100	s/off, vern.
4705	Estacion Laser, Peru	1010	s/on, SS	7195	R. Ukraine Int'l	0100	
4753	RRI, Ujang Pandang, Indonesia	1100	II	7200	R. Omdurman, Sudan	0257	S/ON, AA
4755	Educadora Rural, Brazil	0230	PP	7215	R. Norway	0500	NN
4759	R. Tingo Maria, Peru	1030	SS	7225	R. Bulgaria	0100	
4765	RTVC, Congo	0355	s/on, FF	7240	R. Australia	1100	
4770	R. Centinela del Sur, Ecuador	0230	SS	7245	R. Nacional, Angola	0545	PP
4770	R. Nigeria, Kaduna	0500		7250	Vatican Radio	0600//6245	
4775	R. Amarela, Brazil	0900	PP	7255	V of Nigeria	0500	
4780	RTV Djibouti	0300	s/on, FF	7260	R. Netherlands via Russia	1327	s/on, Dutch
4800	R. Lesotho	0400		7265	Sudwestfunk, Germany	2200	GG
4805	Rdf. Amazonas, Brazil	1000	PP	7285	RT Malienne, Mali	0700	FF
4815	R. Burkina, Burkina Faso	0530	FF	7290	TWR, Swaziland	0255	s/on
4830	R. Botswana	0500	vern.	7315	R. Free Croatia, via WHRI	0100v	
4830	R. Tachira, Venezuela	0200	SS	7375	R. For Peace Int'l, Costa Rica	0000 [USB]	
4835	R. Tezulutlan, Guatemala	0100	SS	7415	Voice of America, Morocco	0430	
4845	R. Fides, Bolivia	0100	SS	7475	RTT Tunisienne, Tunisia	0500	AA
4845	ORTM, Mauritania	0630	AA	7580	R. Pyongyang, N. Korea	0900	JJ
4865	LV del Cinaruco, Colombia	0400	SS	9022	VOIRI, Iran	0030	EE
4870	ORTB, Benin	0500	FF	9165	R. Omdurman, Sudan	0255	sign on, AA
4875	Afrikaans Stereo, S. Africa	0500	Afrikaans	9275	Icelandic State BC	2300	Icelandic
4885	R. Clube do Para, Brazil	0100	PP	9420	Voice of Greece	0130	GG/EE
4890	NBC, Papua New Guinea	1100	EE/pidgin	9445	Voice of Turkey	2330	TT
4890	RFI Relay, Gabon	0355	s/on, FF	9460	Voice of Turkey	0430	TT
4895	R. Bare, Brazil	0800	PP	9475	R. Cairo, Egypt	0200	
4915	GBC, Ghana	0600		9480	TWR, Monaco	0730	
4932	RRI Surabaya, Indonesia	1200	II	9485	R. Prague, Czech Republic	0000	
4935	R. Tropical, Peru	1000	SS	9495	Radio France Int'l	2030	FF
4965	Namibia Broad. Corp.	0600		9510	R. New Zealand	0930	
4865	R. Santa Fe, Colombia	1000	SS, irr.	9510	R. Havana Cuba	0600	
4980	Ecos del Torbes, Venezuela	0300	ss	9525	R. Marti, USA	2300	SS
4985	R. Brazil Central	0100	PP	9535	Swiss Radio Int'l	0700	
4996	R. Andina, Peru	1030	SS	9540	R. Educadora Bahia, Brazil	0900	PP
5005	R. Nacional, Eq. guinea	0500	SS	9545	Solomon Is. Bc Corp.	0700	
5015	R. Brazil Tropical, Brazil	0700	PP	9560	Radio Finland	0300	
5020	Solomon Is. Bc. Corp.	0730		9570	R. Portugal	0230	
5020	LV du Sahel, Niger	0500	FF	9570	R. Romania Int'l	0230	
5025	R. Rebelde, Cuba	0100	SS	9575	Radio Medi Un, Morocco	0730	FF
5035	R. Aparecida, Brazil	0200	PP	9575	RAI, Italy	0100	
5045	R. Cultura do Para	0800	PP	9580	R. Tirana, Albania	0230	
5047	RTV Togolaise	0524	s/on, FF	9600	R. Universdiad, Mexico	1300	s/on, SS
5055	TIFC, Costa Rica	0300		9605	UAE Radio, Abu Dhabi	2200	s/on
5075	Caracol Bogota, Colombia	0400	SS	9615	KNLS, Alaska	0800	s/on, CC
5260	Kazakh Radio, Kazakhstan	0030	unknown lang	9615	R. Veritas Asia, Philippines	1500	CC
5770	R. Miskut, Nicaragua	2330	SS	9625	CBC Northern Service, Canada	0300	
5882	Vatican Radio	0030	Italian	9640	Ecos del Torbes, Venezuela	1100	SS
5930	Slovak Radio	0100		9645	R. Bandeirantes, Brazil	0000	PP
5960	Channel Africa, S. Africa	0330		9650	Swiss Radio Int'l	0000	
5960	R. Japan, via Canada	0100		9655	R. Nacional, Colombia	0200	SS
5965	R. Havana Cuba	0230	SS	9655	R. Norway Int'l	2300	Sun/EE
6010	R. Mil, Mexico	1100	SS	9670	Voice of Indonesia	1130	JJ
6020	R. Gaucha, Brazil	2300	PP	9690	China Radio Int'l, via Spain	0300	
6045	R. Melodia, Colombia	1000	SS	9695	R. Sweden	0200	
6050	HCJB, Ecuador	0700	pp	9700	R. New Zealand	1030	

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
9705	R. Portugal	0230		13675	UAE Radio, Dubai	1630	
9715	Radio France Int'l	0130	FF	13685	Swiss R. Int'l	0700	
9725	AWR, Costa Rica	1100		13730	r. Austria Int'l	1130	
9740	BBC via Singapore	1400		13750	AWR Latin America, Costa Rica	1200	s/on
9745	HCJB, Ecuador	0730		13755	R. Australia	1200	
9750	R. Korea, S. Korea	1200		13785	R. Pyongyang, N. Korea	1500	
9750	R. Canada Int'l	0530		13830	Croatian Radio	2100	
9765	R. Moscow	0530		15090	Vatican Radio	2245	s/on
9780	Rep of Yemen Radio	2000	AA	15095	R. Damascus, Syria	2100	
9785	KTWR, Guam	1330	CC	15100	FEBC, Philippines	1400	EE, others
9790	R. France Int'l	0130	FF	15110	REE, Spain, via Costa Rica	1900	
9815	Radio Havana Cuba	0200	USB	15120	R. New Zealand Int'l	0200	
9825	R. Kiribati	0555	s/on	15140	R. Nacional, Chile	0100	SS
9830	Croatian Radio	0700	Croatian	15165	R. Tashkent, Uzbekistan	1300	local
9835	R. Budapest, Hungary	0200		15175v	Radio Tahiti	0500	FF/TT
9840	R. Kuwait	2100	AA	15180	R. Ukraine	0030	
9845	FEBC, Philippines	1600		15185	R. Finland Int'l	2300	
9870	BSKSA, Saudi Arabia	2030	AA	15210	China Radio Int'l	1200	
9880	China Radio Int'l	2200	via Russia	15220	R. Bangladesh	1230	
9885	Swiss Radio Int'l	0200		15250	VOA via Sri Lanka	0200	
9930	R. Vlanderen Int'l, Belgium	0030		15260	VOIRI, Iran	0030	
9955	R. Miami Int'l	due on		15265	UAE Radio, Abu Dhabi	0400	AA
9977	R. Pyongyang, N. Korea	1100		15265	Radiobras, Brazil	1200	
10030	R. Cairo, Egypt	2130	AA	15320	UAE Radio, Dubai	1630	
10330	All India Radio, Bombay	1330		15325	R. Japan via Fr. Guiana	0300	EE
11335	R. Pyongyang, N. Korea	1100		15325	FEBA, Seychelles	0400	AA
11530	Wings of Hope, Lebanon	2200		15330	R. Bulgaria	0000	
11550	RTV Tunisienne, Tunisia	1600	AA	15345	RAE, Argentina	0200	SS
11600	R. Cairo, Egypt	0200		15360	BBC via Singapore	1230	CC
11620	All India Radio	2000		15365	R. Australia	0100	
11625	Vatican Radio	0630		15410	VOA, Morocco relay	2200	close
11645	Voice of Greece	1600	Greek	15415	Libyan Jamahiriya Broadcasting	1500	AA
11685	BSKSA, Saudi Arabia	2200	AA	15425	Sri Lanka Bc Corp	0130	
11690	FEBC, Philippines	0900		15425	ABC, Perth, Australia	0400	
11705	VOA, Thailand	1400		15445	Radio Nacional, Brazil	1245	EE
11705	R. Sweden	2330		15470	R. Tashkent, Uzbekistan	1200	
11710	RAE, Argentina	0100		15475	Africa Number One, Gabon	2100	FF
11715	KJES, New Mexico	1300	s/on	15505	Swiss Radio Int'l	1500	
11720	R. Bulgaria	0400		15505	R. Kuwait	2245	AA
11725	R. Korea, S. Korea	1000	SS	15550	R. Pakistan	1600	
11740	Vatican Radio	0700		15570	R. Ukraine Int'l	1500	
11740	R. Moscow	0800		15575	R. Korea, S. Korea	0030	
11745	Channel Africa, S. Africa	0200		15635	V of Greece	1230	
11750	R. Vilnius, Lithuania	2300		15640	Kol Israel	1400	
11755	R. Finland Int'l	0130		15675	R. Copan Int'l, Honduras	2300	SS
11760	R. Japan	0800		17500	RTT Tunisienne, Tunisia	1400	AA
11795	UAE Radio, Dubai	1600		17515	R. Vlanderen Int'l, Belgium	1600	
11795	Deutsche Welle via Rwanda	0200	GG	17550	Vatican Radio	1230	RR
11800	SLBC, Sri Lanka	0045		17575	Kol Israel	1700	
11805	Iraqi Radio	2100	EE	17575	R. France Int'l	1230	EE
11810	Deutsche Welle via Brazil	2330	SS	17595	R. Cairo, Egypt	1200	
11815	Polish Radio Warsaw	1245	GG	17630	Africa No. One, Gabon	1430	FF
11820	R. Sweden	0100		17655	R. Netherlands via Bonaire	1730	s/on
11827	R. Tahiti	0300	FF/TT	17670	R. Cairo	1700	Urdu
11835	HCJB, Ecuador	0700		17690	R. Ukraine Int'l	0100	
11835	R. El Espectador, Uruguay	2330	SS	17705	R. Pakistan	0227	s/on
11840	R. Japan	1100	JJ	17705	R. Havana Cuba	2130	SS
11870	R. Yugoslavia	0040		17720	R. Romania Int'l	1430	
11880	R. Galaxy, Russia	2100		17740	R. Yugoslavia	1200	
11880	R. Australia	1600		17745	R. Algiers, Algeria	1930	
11885	UAE Radio, Abu Dhabi	2330		17750	Voice of Free China, Taiwan	2200	
11890	R. Oman	2100	AA	17760	R. Havana Cuba	2030	FF
11905	R. Universo, Brazil	0700	PP	17770	R. New Zealand Int'l	0300	
11920	RT Marocaine, Morocco	2000	FF	17790	Radio Norway Int'l	1900	
11925	R. Canada Int'l	0400		17840	Radio Australia	0500	
11930	R. Yerevan, Armenia	2145		17850	R. France Int'l	1600	
11940	R. Jordan	0400	AA	17870	R. Sweden	1500	
11970	R. Havana Cuba	0130		17875	R. Canada Int'l	2030	
11980	AWR/KSDA, Guam	1600		17880	R. Finland Int'l	1300	
11985	UAE Radio, Dubai	2100	AA	17890	Spanish National Radio	2130	SS
11995	R. Sweden	2200		17900	R. Portugal	2000	PP
12005	R. Netherlands	1210	unid lang	17940	R. Iraq Int'l	2330	
12040	R. Vilnius, Lithuania	2300		21455	R. Canada Int'l	1345	
12050	R. Cairo, Egypt	0300	AA	21500	BSKSA, Saudi Arabia	1600	AA
12070	Australian Armed Forces Radio	1230		21520	R. Pakistan	1100	
12080	VOA Botswana	0500		21545	R. Canada Int'l	1500	
12984	VNG, Australia	1100	time sigs	21550	R. Finland Int'l	1430	
13605	Radio Australia	1200		21605	R. Yugoslavia	1230	
13620	R. Kuwait	2000		21625	Radio Sweden	1330	
13625	KHBI, Saipan	1200		21655	R. Portugal	1830	PP
13635	Swiss Radio Int'l	2130		21675	R. Kuwait	1500	AA
13650	R. Pyongyang, N. Korea	2300		21700	Radio Japan, via Gabon	1600	JJ
13655	R. Vlaanderen Int'l, Belgium	2300	Dutch	21820	Swiss Radio Int'l	1500	
13660	R. Havana Cuba	0200	USB, EE				

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frequency could alternate using lower and upper sideband) and put more of the transmitter power in the remaining sideband where it does good. Anyone looking for a solution to the overcrowded AM broadcasting band would do well to look at H3E as a possible solution.

R3E—a single sideband with a reduced carrier—does have some technical shortcomings, especially for skywave propagation. For best demodulation, the carrier needs to be substantially stronger than the sideband (tests indicate the carrier needs to be at least 15 to 20 dB stronger than the sideband for best demodulation). Maintaining this condition is not a problem with ground wave propagation, but can be with skywave propagation where the carrier can fade more than the sideband. However, it's possible that synchronous detection circuits in receivers could overcome this problem.

Anyway, someone (broadcasters? hams?) ought to give H3E and R3E a shot and see just how they perform for broadcasting, especially with skywave propagation.

"Regency Modulation"

Thirty years ago, Regency was a big name in deluxe CB radio gear. Their transceivers were loaded with all the latest state-of-the-art technical advances (like frequency synthesis to cover all 23 channels and dual conversion receivers—wow!) and were highly prized by CBers of the day. Perhaps their most innovative transceiver was the

"Range Gain," which employed reduced carrier double sideband modulation.

Regency's version of reduced carrier double sideband modulation reduced the carrier strength in relation to the two sidebands so that the carrier was only slightly stronger than the two sidebands. Since CBers were not supposed to communicate via skywave, the possible loss of carrier through ionospheric communication was no big deal. The "Range Gain" would theoretically deliver stronger signals via space wave, and from the reviews of the period it seems as if Regency achieved that—all of the reviews I've read from that period remark how the "Range Gain" produced signals that sounded louder than ordinary transceivers when used with the same antenna and over the same range. Unfortunately, I've never had a chance to use one of these rigs myself so I don't if those reviews were accurate. Certainly, the "Range Gain" modulation system makes sense, although it's hard to see what advantages it would have over H3E or R3E modulation. The "Range Gain" transceiver wasn't a big success, but I think this was more because of its high price than any shortcomings of its modulation system.

It would be interesting to see some over-the-air tests of these modulation systems. Conventional AM has been around for almost eighty years, and something tells me we're now capable of improving the sound and performance of AM and SSB! ■

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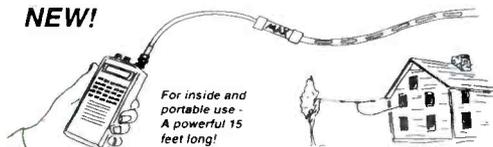
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- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
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- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTA COMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.



DELTA COMM™ I-7100 communication manager comes complete with Delta Research custom (CI-V) communication interface, UL listed power supply, manual and receiver interface cable for \$349.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H. Contact us for additional information on DELTA COMM™ communication managers for ICOM™ R7000, R71A, R72 and IC735. Performance is proportional to video card, type of computer and receiver squelch detection method.



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SATELLITE VIEW

BY DONALD E. DICKERSON, N9CUE

INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

Deep Space Network

The Deep Space Network is the largest and most sensitive telecommunication and radio navigation network in the world. The Deep Space Network (DSN) is responsible for the operation and navigation of our interplanetary spacecraft. DSN is operated by the Jet Propulsion Laboratory (JPL) of California's Institute of Technology in Pasadena.

The network was established in 1958 when JPL was contracted by the Department of the Army to design and build radio tracking stations in Nigeria, Singapore and California. These stations were used to track our first successfully launched satellite, Explorer 1. The Army was the first branch of the service to reach space. Since then, JPL has become the leader in the development of low-noise receivers, digital signal processing, radio navigation, tracking and telemetry systems.

The network currently consists of 12 deep space stations positioned at three deep space communications complexes, which are located on three continents: at Gladstone in Southern California's Mojave Desert; near Madrid, Spain; and Canberra, Australia.

The network operations control center, which controls and monitors operations at three complexes, is located at JPL in Pasadena. The network's ground communications facility provides and manages the communications circuits that link the complexes, the control center and remote project operations centers together.

The unmanned space flight projects supported by the network are managed and controlled by NASA Office of Space Science and Applications or by foreign space agencies. The network's responsibility is to receive the telemetry signals from the spacecraft and to generate the radio navigation data used to locate and guide the spacecraft to its destination. The Network is also used for flight radio science, radio and radar astronomy, very long baseline interferometry and geodynamic measurements. They are even used in NASA's search for Extraterrestrial Intelligence.

Every U.S. deep space mission is designed to allow continuous radio communication with the spacecraft requires several earth-based stations at locations that compensate for the earth's rotation. The locations in Spain, Australia and California are approximately 120 degrees apart in longitude, which ensures continuous observation and overlap coverage which allows the control of spacecraft to be transferred



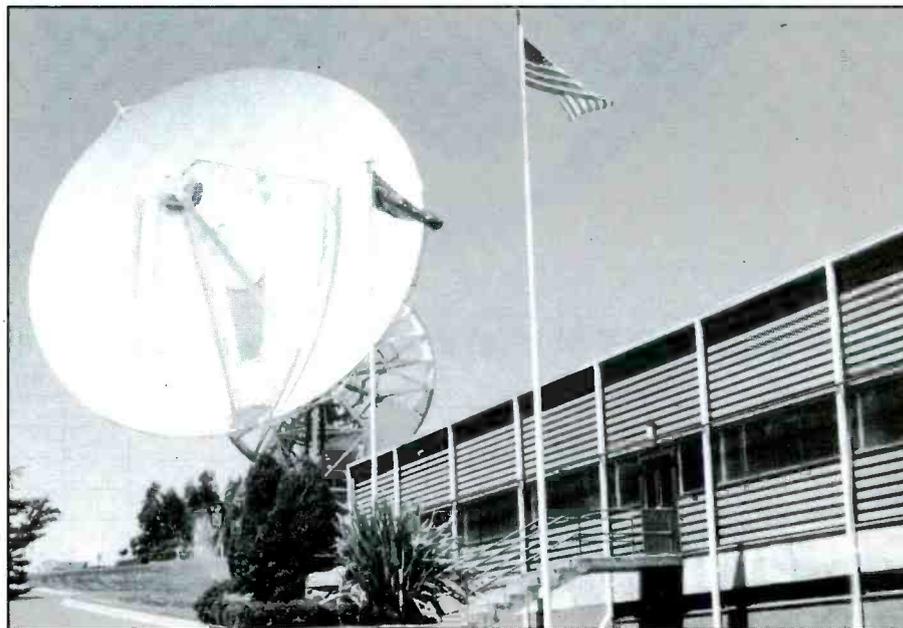
SFOF

to the next communications complex.

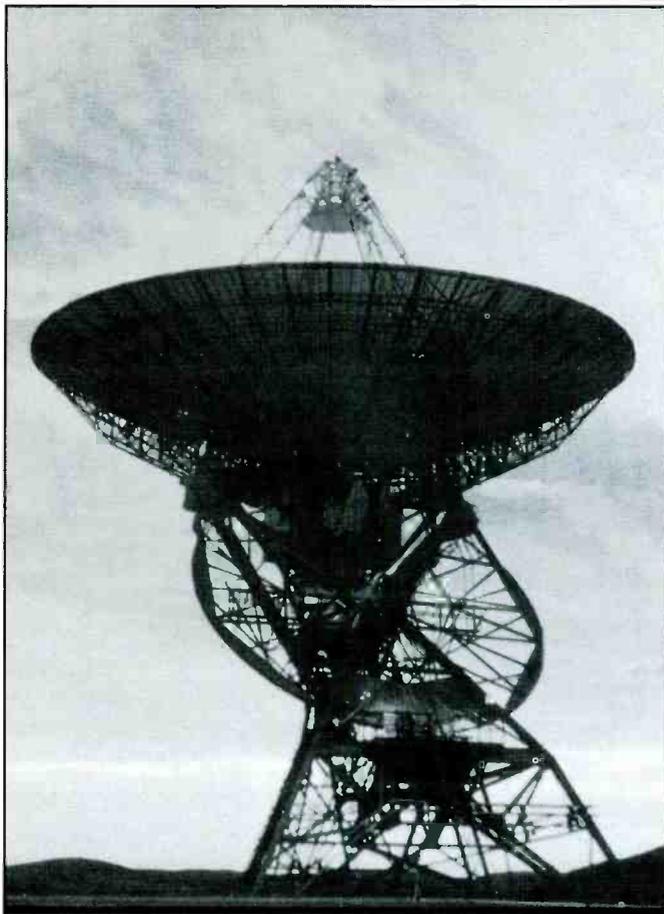
The Australian complex is located 25 miles southwest of Canberra. The Spanish complex is 37 miles west of Madrid. The Gladstone complex is located on the Army's Fort Irwin near Barstow. Each complex is situated in a mountainous, bowl-

shaped terrain to help shield it against radio frequency interference.

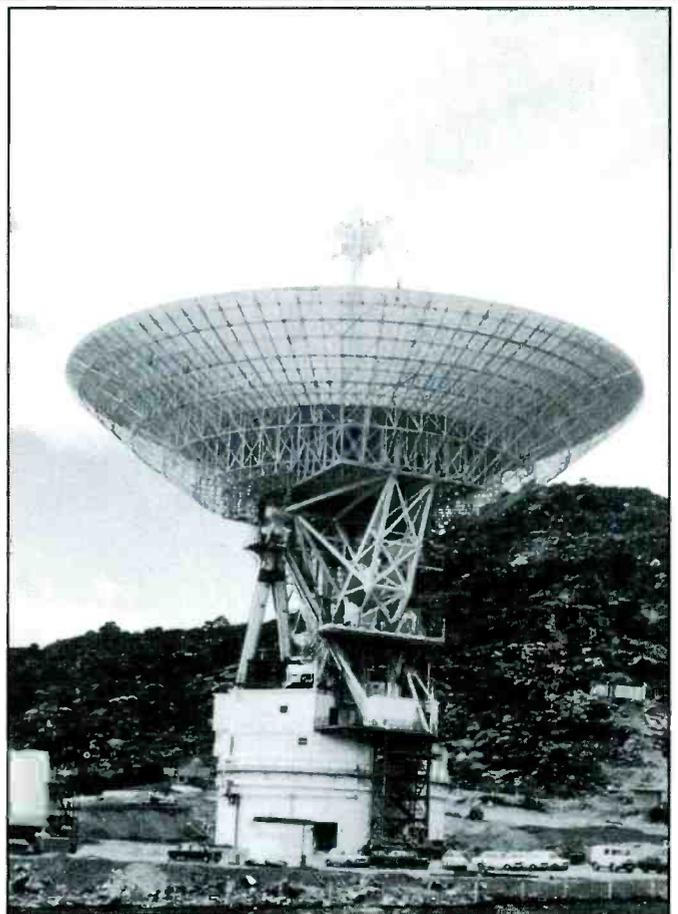
Each complex consists of four deep space stations equipped with ultra-sensitive receiving systems and large parabolic dish antennas. There are two 111 foot diameter antennas, one 85 foot antenna and one



Canberra, Australia hosts an 85 foot antenna.



The Gladstone 85 foot antenna, located in southern California's Mojave Desert.



Near Madrid, a 210 foot antenna stands at Spain's Deep Space Communication Complex

230 foot antenna. The antenna sizes form separate subnets, which have different communications capabilities. The 230 foot subnet supports spacecraft in deep space; the 85 foot subnet supports spacecraft in earth orbit. They were designed as part of the Spaceflight Tracking and Data Network. They were consolidated into the DSN when the TDRS (Tracking & Data Relay) satellites replaced the ground stations. The 111 foot subnet supports both deep space and earth orbit missions.

The control center, which is the operations hub of the network, is located at JPL in Pasadena. Its functions are to monitor operations at the three complexes, to analyze and validate the performance of the network and to provide information for controlling and testing spacecraft capabilities.

The ground communications facility provides and controls the communications circuits that link the three communications complexes to the control center at JPL, and the control centers overseas. The communications traffic between these various locations is sent via land lines, submarine cables, terrestrial microwave and communications satellites. These circuits are leased from common carriers and provided to the facility as needed by the NASA Communications Network, located at Goddard Space Flight Center. Spacecraft data sent over

these circuits is automatically checked for transmission errors and outages by error detecting and correcting techniques, which automatically retransmit any data block received with transmission error. JPL is also linked to the launch support and compatibility testing facility at the Kennedy Space Center, Florida.

The DSN's latest missions include Magellan which will map 90% of the surface of Venus and Galileo, the Jupiter orbiter-probe. DSN will also support the European Space Agency's Ulysses, a solar environment explorer and the Mars Observer.

During the relatively brief time span since the beginning of space exploration (approximately 25 years) exceptional progress has been made in the quality and quantity of scientific data returned by each mission. For example, in 1965 Mariner 4's 134 million mile voyage to Mars required eight hours to return one 240,000 bit image of the planet. The transmission data rate had increased to 115,200 bits per second. One five million bit image was received every 48 seconds from the spacecraft which was 435 million miles away. The last decade has seen even greater accomplishments in advanced computer and data compression techniques.

Another network contribution to the success of deep space encounters is a radio nav-

igation technique called differential very long baseline interferometry, which is used to augment conventional doppler and ranging navigation techniques. The interferometry techniques use two widely separated network stations on different continents to simultaneously receive signals from the spacecraft and from an angularly close natural radio source (quasars) whose celestial coordinates are very well known. The data taken by the two stations are then correlated to provide a precise measurement of the angular separation between the spacecraft and the quasar. This provides measurements five and ten times more accurate than doppler and ranging radar techniques.

Major improvements are continually taking place at DSN facilities. One of the latest changes involves the National Radio Astronomy Observatory's Very Large Array, located in New Mexico. The array consists of 27 dish antennas. Each is 85 feet in diameter. It will now be connected to the Gladstone facility by microwave-link and communication satellite.

The single factor that makes the deep space communications system different from other radio systems is the distance involved. The Network currently maintains direct radio links with spacecraft that have left our solar system. All spacecraft signals that reach the earth range in power from

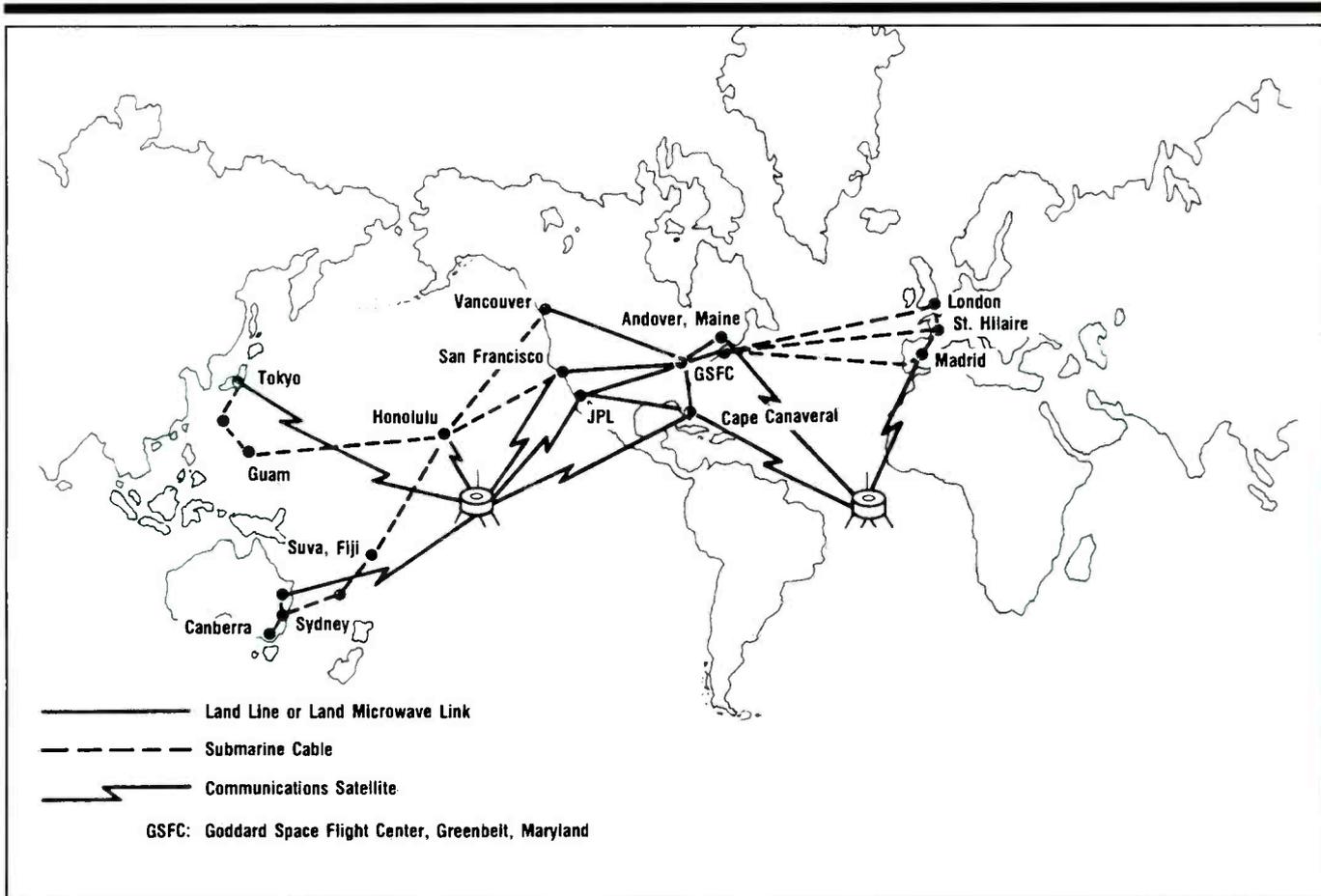
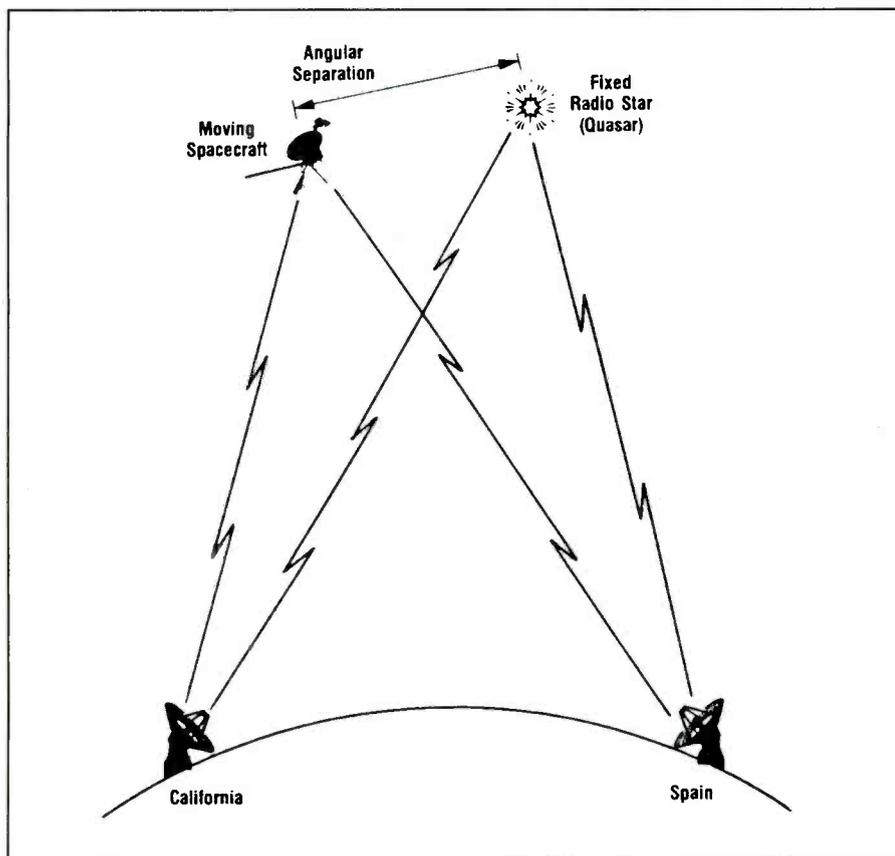


Diagram of very long baseline interferometry radio navigation. Approximately 100 extra-galactic natural radio sources serve as fixed points for spacecraft navigation.



Receivers, demodulators, processors, etc., recover the telemetry and navigation data from the spacecraft signal. The "raw" telemetry is sent via worldwide circuits directly to the flight project control centers in the United States, Europe and Japan.

a billionth of a watt down to a trillionth of a watt. The main technology elements that make it possible to receive, amplify and extract scientific data from such a ultraweak signal is the use of a high microwave radio frequencies (2110-2300 and 8400-8450 MHz), an optimum energy-per-bit telemetry scheme, and the state-of-the-art sensitivity and efficiency of the network antennas and low-noise receiving systems.

We close this month's edition with a question or perhaps a riddle. The first two people to give the correct response, in writing, will receive a NASA poster or 8 by 10 photo you are sure to like. This should not be a difficult question if you have followed the news recently. Here goes. What do the Mars Observer, Hubble telescope, NOAA 13 (weather satellite), our most recently launched spy satellite and the next generation geo-stationary weather satellite, all have in common? ■

HOW I GOT STARTED

Popular Communications invites readers to submit, in approximately 150 words (more or less), how they got started in the communications hobby. They should preferably be typewritten, or otherwise easily readable. If possible, a photo of the submitter should be included.

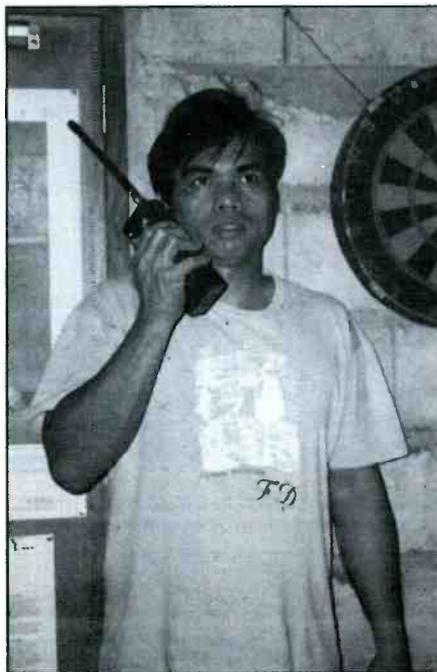
Each month we will select one entry and run it here. You need submit your entry only once, we'll keep it on file. All submissions become the property of Popular Communications, and none can be acknowledged or returned. Entries will be selected for use taking into consideration if the story they relate is especially interesting, unusual, or even humorous. We reserve the right to edit all material for length and grammar, and to improve style.

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to Popular Communications.

Address all entries to: How I Got Started, Popular Communications, 76 North Broadway, Hicksville, NY 11801.

Our January Winner

This month our winner is Hermogenes



Hermogenes A. Certeza, M.D., of Rizal, Philippines found out about radio in an unusual way.

A. Certeza, M.D., of Rizal, Philippines. He told us: "Four years ago a doctor friend loaned me an old VHF transceiver to listen on. It was quite exciting to hear the communications. I knew nothing about radio, so I pressed the PTT button a few times and asked for a 'Break' on the strongest frequency. After two nights without a reply, I took the set back to my friend and said it didn't work. He informed me that I was triggering a 2-meter FM repeater and nobody on the repeater knew who I was or what to make of my incorrect attempt to speak.

"I found out that you needed a license to talk, and you had to understand the radio regulations. I was guided and shown these things, as well as how the conversations take place on the radio bands.

"Now I have my DY ticket (equivalent to a Class D amateur license), and am active in REACT Philippines. We conduct assistance in instances of emergencies, floods, fire, storms, epidemics, and other community problems. We have also formed the Medicare and Dental Team. This Team uses radio to facilitate bringing aid and services to depressed and remote areas." ■

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The question is, how inexpensively can you get on CB? When I saw the Realistic TRC-90 handheld, I knew the answer to that question. Last week I drove through Denver and stopped to scarf down a Rocky Mountain oyster and buffalo steak dinner at the Buckhorn Exchange that cost me more than the TRC-90. That's because the TRC-90 is priced at only \$19.99.

For yer double sawbuck, the TRC-90 operates on one channel (Channel 14 crystals are installed), and puts out 100 milliwatts. The antenna is a telescoping whip. The TRC-90 has no frills, but what kind of bells and whistles could you expect at such a low price? Its one luxury feature is that you can change the channel by (internally) swapping the two crystals. Radio Shack sells CB crystal pairs for Channels 5, 9, 11, 19, 30, and 35 that will work in this set.

However, the TRC-90 is not a toy. This fiesty handheld kicks out a decent enough signal for short-range use. It's well-built, and rugged. Plenty of applications for sports events, snowmobiling, skiing, hiking, mountain climbing, treasure hunting, camping, exploring, spelunking, surveying, and many other things. Don't forget that when communicating with a base station, the range will be further than when communicating between handhelds.

Communications of The Rich & Famous

Instead of our usual look at a vintage CB radio, this month, we can give you a peek at a very special CB'er of the past along with their radio installation.

We go back to 1978. The camera has snapped a shot of the actress then known as Farrah Fawcett-Majors. This was soon after she left the cast of the hit TV series *Charlie's Angels*. At this time, Farrah's distinctive hairstyle was being copied around the world.

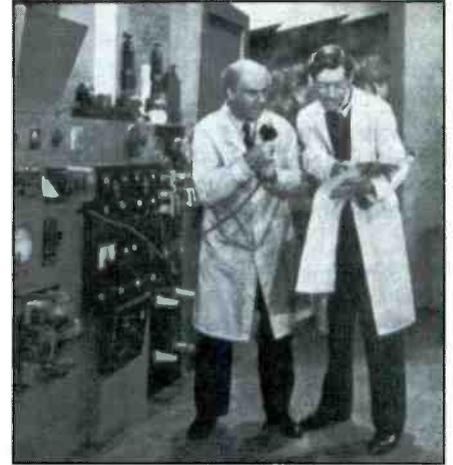
Farrah was especially proud of her new 'Vettes (she had bought two of them) which had both been customized for her by Hollywood automotive designer George Barris. These cars had 426 engines with Cyclone headers and side pipes. On each door, it read "Farrah—Foxy Vette."

Each of Farrah's vehicles was equipped with a Craig 40-channel CB radio, also a (pre-cellular) car telephone.

The late 1970's was the era when CB was getting enormous coverage in films, TV, music, and the press. It was known that although dozens show biz celebrities were said to be active on CB in those years, it was usually hype concocted by their press agents. In the case of Farrah, however, the photo of her mobile CB came from a reli-



Rafael Cruz decided to take a ride with his CB when the landlord told him no more operating from his apartment house.



"FCC monitoring HQ Washington assumed its Pikeville director had been eaten by a bear around 1963 or 1964."



Farrah Fawcett-Majors (as the actress was known when this photo was taken in 1978) in her customized CB-equipped Corvette.



"The director passed the time over the years by dressing up like Genghis Khan and trying to contact CB'ers..."

able CB source. I understand that at one time there really were Hollywood celebs active on the channels, including Farrah, Robert Wagner, John Astin, Marlon Brando, Robert Conrad, as well as others.

From Readers

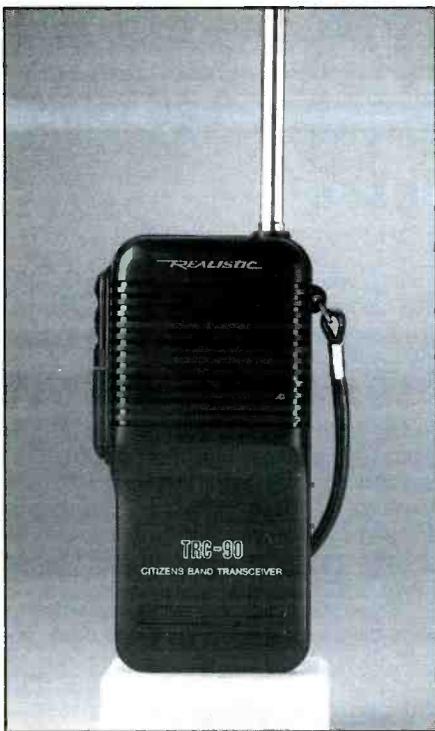
Bob, SSB Network member SSB-187C, now with the US Army in Germany, is a former Boston CB'er. He hopes to get on the air from Germany. Bob would like to hear from any readers who can provide him with information regarding applicable regulations, and where to purchase new or used equipment. Also, he seeks the address of *Alpha Tango* and *2600 DX'ers* in Germany. Anyone who can provide this information is invited to write to: SPC Robert W. Blair, CMR 457, Box 1029, APO AE 09033.

Rafael (Roadmaster) Cruz, of Brooklyn,

New York, wrote to say that he has been on CB for five years. Not long ago, he found himself with dual problems. First, there was a stubborn TV interference problem in his apartment house. Even worse, the landlord said he didn't want Rafael's CB operations there any longer.

So, Rafael took his Cobra 148GTL and mounted it on the handle bars of his bike. A whip antenna and a battery pack rounded out the installation. Now Rafael can ride all around and talk. If he can successfully dodge the taxis while still maintaining his CB contacts, he figures he's doing just fine.

Heath Meyers, of Perkasie, Penna., writes to say that he has a problem. His Cobra 29 mobile CB has an unhappy interaction with his Bearcat 590XLT mobile scanner, and even the Bearcat 200XLT handheld when held close to the CB. Receiving various channels on the CB causes



Realistic's TRC-90 is a handheld mini-CB that sells for about \$20.

the Bearcat to lock up and stop scanning on different VHF high band frequencies. The CB doesn't even need to be transmitting, simply located near the Bearcats.

The Cobra 29 is an ancient 23-channel CB radio. These sets are, today, antiques and should be used only for display purposes. By modern standards, many of their designs and circuits are, at best, rather cockamamie. Some circuit in this old CB's receiver is capable of being tuned to oscillate on at least 23 frequencies guaranteed to give any nearby scanners the willies.

The solution is to stop using an obsolete CB radio. If that's out of the question, I'd try operating the CB and scanners from antennas placed outside the vehicle, and separated as far as possible from one another. Mounting the BC-590XLT away from the CB is another idea. These suggestions might not help, but they couldn't hurt.

Upper/Lower Frequencies Directory

We were sent a copy of a most unique 32-page frequency guide. It's called *Uppers and Lower*, being a monitoring directory of everything it seems there is to hear on all of the frequencies between 25 and 32 MHz, often referred to as the *freeband*.

This book provides more than 700 listings of specific channels in the band, as used for numerous legal and illegal communications purposes, encompassing unauthorized freebander working frequencies and networks, legal CB in various nations, secret trucker's frequencies, federal gov-

ernment allocations, military, spies, hams, business and industrial frequencies, fishing boats, aero, and more. Frequencies known to be active are given with explanations of their reported communications uses.

The directory also features hard-to-find detailed uppers/lowers channel/frequency charts for the Galaxy-88, Export 6-Band, older 3-band, and kit export transceivers. This section contains nearly 800 listings.

Uppers and Lower looks to be as complete a guide to what's currently taking place in this curious part of the spectrum as we have ever seem. There has been very little published about the activity on specific frequencies here. Those who are interested in the 25 to 32 MHz band may end up using this book as a constant reference. You'll be surprised at everything there is to hear on these frequencies.

Uppers and Lower is available by mail for \$5.95, plus \$2.50 shipping/handling for 1st Class Mail to USA or Canada addresses. Order it by mail from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State please add 72 cents tax.

Ever On Guard

To kick off 1994, we wanted to give you one last reminder that the FCC is on guard to seek out any rulebreakers.

An FCC Notice of Apparent Liability (fine) in the amount of \$475 was sent to Dye's Cab, Pikeville, Kentucky. This was for apparent willful violation of Section 95.411 of the FCC rules, including operating linear power amplifiers in three taxicabs.

We assume there isn't much illegal radio activity in Pikeville, population 4,756. In the jovial spirit of the holidays, we will mention that we heard the director of the FCC's Pikeville monitoring station has been there since 1960, however discovery of the three CB linears is the first time he ever found anything wrong. When he filed his report on the taxicab linear amps, Washington was horrified. Thirty years had passed since they last heard from the Pikeville station, and FCC monitoring HQ assumed its Pikeville director had been eaten by a bear around 1963 or 1964.

Our own reporter took his hidden camera and went to Pikeville to visit the director of the FCC office there. He learned that the director passed the time over the years dressing up like Genghis Khan and trying to contact CB'ers by using a terrible Mongol accent that didn't fool anybody. However, now that he has finally gotten his teeth into a genuine CB violation situation, all of this foolery is behind him. He faces 1994 with renewed dedication.

Our suggestion to stay legal in 1994. Remember the Pikeville FCC monitor is back on duty! And may 1994 be a happy one for you.

Kindly let us hear from you with CB photos, CB QSL's, questions, ideas, local monitor channels, and what-have you!

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BEYOND VAN ECK PHREAKING: Plans for surveillance systems some use to eavesdrop on TVs and computer monitors. \$29

SECRET & SURVIVAL RADIO: Detailed manual describes the optimum freqs. equipment, modes and circuits for secret, survival and security situations. Includes small transmitters and receivers; ultrasonic, infrared and fiberoptic commo, improving and optimizing antennas. 70+ circuit diagrams. \$29

COMPUTER PHREAKING: Detailed manual describes both computer viruses and how computers are penetrated. Includes 2 PC disks [1] FLUSHOT+ protection system. [2] Disk loaded with hacker files. \$39

Many more: STEALTH TECHNOLOGY (\$19), PHONE COLOR BOXES (\$29), TV DECODERS & CONVERTERS (\$14), STOPPING POWER METERS (\$19), RADIONICS MANUAL (\$29), EM BRAINBLASTER (\$29), UNDER ATTACK (\$29), HIGH VOLTAGE DEVICES (\$29), DISK SERVICE MANUAL (\$29), ATM (\$39), include \$4 S/H. Educational purposes only.

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FCC Required Radio Licenses

You should start out the new year with a double-check that your emergency squad is operating under valid FCC licensing requirements. Recent FCC enforcement through on-the-air monitoring spot-checks for valid licenses reveals one out of four rescue squads and ambulance companies operating with an expired license. The typical fine—\$6,000.

Your dispatch center should have a valid FCC station license in the files, or posted by the equipment. This license will also indicate all associated mobile units and all portable units in connection with your station.

FCC Form 405A (good through 4/30/95) may be used for renewal, reinstatement, and/or notification of change to license information. You may obtain this form from the FCC's Consumer Assistance Branch in Gettysburg, Pennsylvania, at 717-337-1212.

A personal permit to operate your rescue squad's emergency radios is not required. However, if your team transmits from aircraft or operates marine and air ground stations on SSB, the restricted radiotelephone operator permit (RP) is required. This is a lifetime license, and does not require an examination. FCC Form 753 must be completed and submitted to the Commission with the appropriate fee to acquire the restricted radiotelephone operator permit.

Emergency personnel operating certain

boats on the Great Lakes, or operating certain rescue craft which could carry more than six passengers, may need to obtain a radio operator permit (MROP), a license valid for five years, formerly known as the "third class" ticket. This is a good license to possess for those emergency personnel involved in regular radio communications.

To pass this relatively easy test, you must be familiar with basic radio law and radio telephone operating practice. Emphasis is on maritime operation, although the license pertains to the operation of certain aviation radiotelephone stations, and certain coast radiotelephone stations. FCC written Element 1 is a 24-question test, with a passing score of 18 questions out of a total of 170 questions in the pool. No longer do you need to go down to the FCC to take the test either. It is now administered by the new commercial radio operator testing program, directed by multiple private groups known as Commercial Operator Licensing Examination Managers (COLEM). The COLEM, the commercial version of the amateur services' VEC, will be certified by the FCC private radio bureau after they enter into an agreement with the government in much the same manner as ham VEC's. The program is up and running now, and it is an overwhelming success.

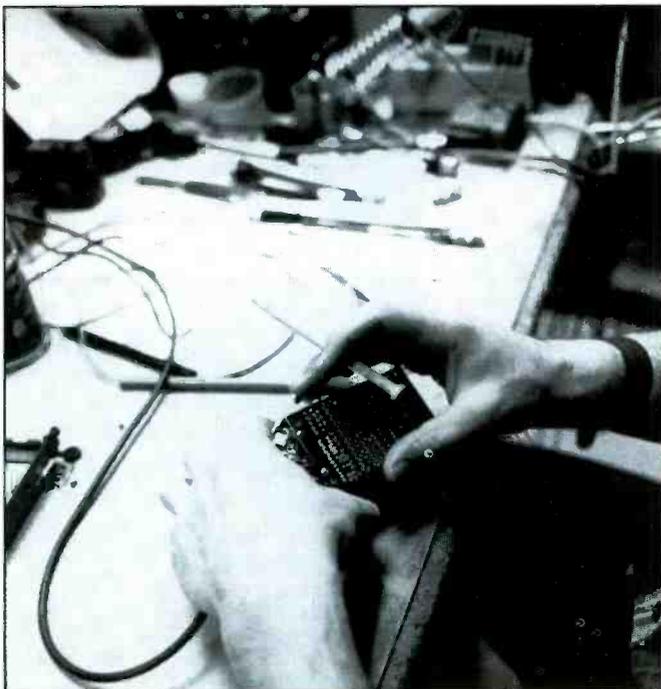
If you regularly work on your rescue squad's radio system, and specifically tune and adjust marine radios and aeronautical

radios, you will also need to pass FCC written Element 3 in addition to written Element 1. Element 3 focuses on electronic fundamentals and techniques required to adjust, repair, and maintain radio equipment in the aviation, maritime, and international fixed public radio services. There will be 76 questions on the test, and a passing score of 57 questions is required. There are 729 questions in the pool, including 20 diagrams. Passing Elements 1 and 3 leads you to the popular general radiotelephone commercial radio license.

If you maintain and adjust the small radars on your search and rescue boat, you will also need to obtain the ship radar endorsement, FCC written Element 8. It is a 50-question test, and you will need to score at least 38 correct answers.

All FCC commercial test questions are now made public. No longer must you study for a "secret" examination. When you take your test, it will be identical to those questions found in the commercial test question pool. The question pool is presently available for Elements 1 and 3 from National Radio Examiners (817-461-6443).

Even though your emergency squad may not require certain FCC licenses, examination opportunities are now plentiful under the new COLEM system, and it's always a good idea to have additional FCC licenses that may go well beyond the basic requirement of your rescue squad's station license. ■



The FCC requires a commercial general radiotelephone license to adjust marine and air handheld transceivers.

Your rescue squad radio service shop is probably run by a licensed GROL (General Radiotelephone Operator License).



Scanners/Shortwave/GMRS/Ham

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List price \$649.95/CE price \$339.95/SPECIAL
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 Rotary tuner feature • Auto Store • Auto Sort
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 Frequency Coverage: 25,000 - 549,995, 760,000 - 823,995, 849,0125 - 868,9950, 894,0125 - 1,300,0000 MHz.

Signal intelligence experts, public safety agencies and people with inquiring minds that want to know, have asked us for a world class handheld scanner that can intercept just about any radio transmission. The new Bearcat 2500XLT has what you want. You can program frequencies such as police, fire, emergency, race cars, marine, military aircraft, weather, and other broadcasts into 20 banks of 20 channels each. The new rotary tuner feature enables rapid and easy selection of channels and frequencies. With the AUTO STORE feature, you can automatically program any channel. You can also scan all 400 channels at 100 channels-per-second speed because the Bearcat 2500XLT has TURBO SCAN built-in. To make this scanner even better, the BC2500XLT has AUTO SORT - an automatic frequency sorting feature for faster scanning within each bank. Order your scanner from CEI.

For more information on Bearcat radio scanners or to join the Bearcat Radio Club, call Mr. Scanner at 1-800-423-1331. To order any Bearcat radio product from Communications Electronics Inc. call 1-800-USA-SCAN.

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New FCC Rules Mean Last Buying Opportunity for Radio Scanners

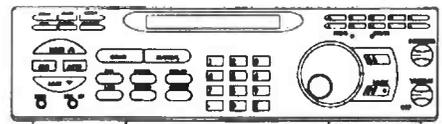
On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz cellular telephone service. Supplies of full coverage 800 MHz scanners are in very short supply. If you need technical assistance or recommendations to locate a special scanner or solve a communications problem, call the Communications Electronics Inc. technical support hotline for \$2.00 per minute at 1-900-555-SCAN.

Bearcat® 8500XLT-H

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 Turbo Scan • VFO Control • Priority channels
 Auto Store • Auto Recording • Reception counter
 Frequency step resolution 5, 12.5, 25 & 50 KHz.
 Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High
 Frequency Coverage:

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- 54,000 - 71,995 MHz (WFM), 72,000 - 75,995 MHz (NFM),
- 76,000 - 107,995 MHz (WFM), 108,000 - 136,995 MHz (AM)
- 137,000 - 173,995 MHz (NFM), 174,000 - 215,995 MHz (WFM),
- 216,000 - 224,995 MHz (NFM), 225,000 - 399,995 MHz (AM)
- 400,000 - 511,995 MHz (NFM), 512,000 - 549,995 MHz (WFM)
- 760,000 - 823,9875 MHz (NFM), 849,0125 - 868,9875 MHz (NFM)
- 894,0125 - 1,300,000 MHz (NFM).

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning-fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include VFO Control - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. Counter Display - Lets you count and record each channel while scanning. Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. 20 banks - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from Communications Electronics Inc. today.



CB/GMRS Radios

The Uniden GMR100 is a handheld GMRS UHF 2-way radio transceiver that has these eight frequencies installed: 462.550, 462.725, 462.5875, 462.6125, 462.6375, 462.675, 462.6625 and 462.6875 MHz. This one watt radio comes with flexible rubber antenna, rechargeable ni-cad battery, AC adapter/charger, belt clip, F.C.C. license application and more.

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- Uniden GRANTXLH SSB CB Mobile \$149.95
- Uniden PC66XLH CB Mobile \$78.95
- Uniden PC76XLH CB Mobile \$99.95
- Uniden PC122XLH SSB CB Mobile \$107.95
- Uniden PRO510XLH CB Mobile \$36.95
- Uniden PRO520XLH CB Mobile \$49.95
- Uniden PRO538W-H CB & Weather \$69.95

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- ICOM R71A-H 100 kHz.-30 MHz. base (add \$39.00 shipping) \$1,029.95
- ICOM R72A-H 100 kHz.-30 MHz. base (add \$39.00 shipping) \$954.95
- ICOM R7000-H base with 99 memory (add \$49.00 shipping) \$1,249.95
- ICOM R7100-H base with 900 memory (add \$49.00 shipping) \$1,289.95
- ICOM R9000-H base 30 kHz.-2 GHz. (add \$149.00 shipping) \$4,999.95
- ICOM AH7000-H super wideband discone type antenna \$109.95
- Grundig Satellit 700-H portable with 512 memory & AC adapter \$449.95
- Grundig Satellit 500-H portable with 42 memory & AC adapter \$349.95
- Grundig Cosmopolit-H with integrated mini-cassette recorder ... \$179.95
- Grundig Yacht Boy 230-H portable shortwave \$139.95
- Grundig Traveller 2-H portable shortwave \$79.95
- Sangean ATS802-H ultra compact 20 memory shortwave \$79.95
- Sangean ATS606-H ultra compact 45 memory shortwave \$149.95
- Sangean ATS606P-H shortwave with antenna & AC adapter \$169.95
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- Sangean ATS803A-H portable with SSB reception & AC adapter \$159.95
- Sangean ATS808-H portable 45 memory shortwave \$159.95
- Sangean ATS818-H portable without cassette recorder \$189.95
- Sangean ATS1805-H with cassette recorder \$209.95
- Sangean ANT60-H portable shortwave antenna \$9.95

Weather Stations

Public safety agencies responding to hazardous materials incidents must have accurate, up-to-date weather information. The Davis Weather Monitor II is our top-of-the-line weather station which combines essential weather monitoring functions into one incredible package. Glance at the display, and see wind direction and wind speed on the compass rose. Check the barometric trend arrow to see if the pressure is rising or falling. Our package deal includes the new high resolution 1/100 inch rain collector part #7852-H, and the external temperature/humidity sensor, part #7859-H. The package deal is order #DAVI-H for \$524.95 plus \$15.00 shipping. If you have a personal computer, when you order the optional Weatherlink computer software for \$149.95, you'll have a powerful computerized weather station at an incredible price. For the IBM PC or equivalent order part #7862-H. For Apple Mac Plus or higher including Quadra or PowerBook, order part #7866-H.

Other neat stuff

- Cobra CP910-H 900 MHz. spread spectrum cordless phone ... \$299.95
- ICOM GP22-H handheld global positioning system \$699.95
- WR200-H weather radio with storm alert \$39.95
- RELM WHS150-H VHF handheld 5 watt, 16 ch. transceiver ... \$349.95
- RELM RH256NB-H VHF 25 watt synthesized transceiver \$289.95
- Ranger RC12950-H 25 watt 10 meter ham radio \$244.95
- Ranger RC12970-H 100 watt 10 meter ham radio \$369.95
- Uniden LRD9000W1-H Super wideband laser/radar Detector \$169.95
- PWB-H Passport to Worldband Radio by IBS \$10.95
- POL1-H Police Call for CT, ME, MA, NH, NY, RI, VT \$5.95
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TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

Say It Isn't So!

John M. Blair, N0HF0, of Olathe, Kansas, sent me a copy of a recent issue of *Kansas Peace Officer* magazine. It contains a story entitled "Law Enforcement Makes Move to Mobile Communications," which outlines the many advances police comms have seen in recent years.

The authors are especially impressed with the availability of cellular telephones for police use. They cite examples of various Kansas agencies that routinely use cellphones because of their portability, versatility, convenience, and because they lend themselves to so many applications.

They agree that it's the fact that the cellphone transmissions are secure that makes them so well suited to exchanging confidential police information. The authors decry the fact that the need for secure transmissions has never been more apparent now that emergency traffic is subjected to being overheard by anybody who owns a VHF scanner. But, they tell their readers, cellphones are unique tools that offer special things which make them free from eavesdropping.

John Blair's note to me, accompanying

this article was, "Should we tell them?"

What? And spoil the myth? The cellular phone industry has pitched hard to build this elaborate hilarious security idea for 10 years. Wouldn't our giving the authors the facts be akin to telling a youngster Super Mario Brothers aren't real?

Rent-A-Phone

Travelers who rely on cellphones and need detailed, real-time billing, can now have their needs met with the introduction of *InstaFone*. It's the first automated rental cellphone.

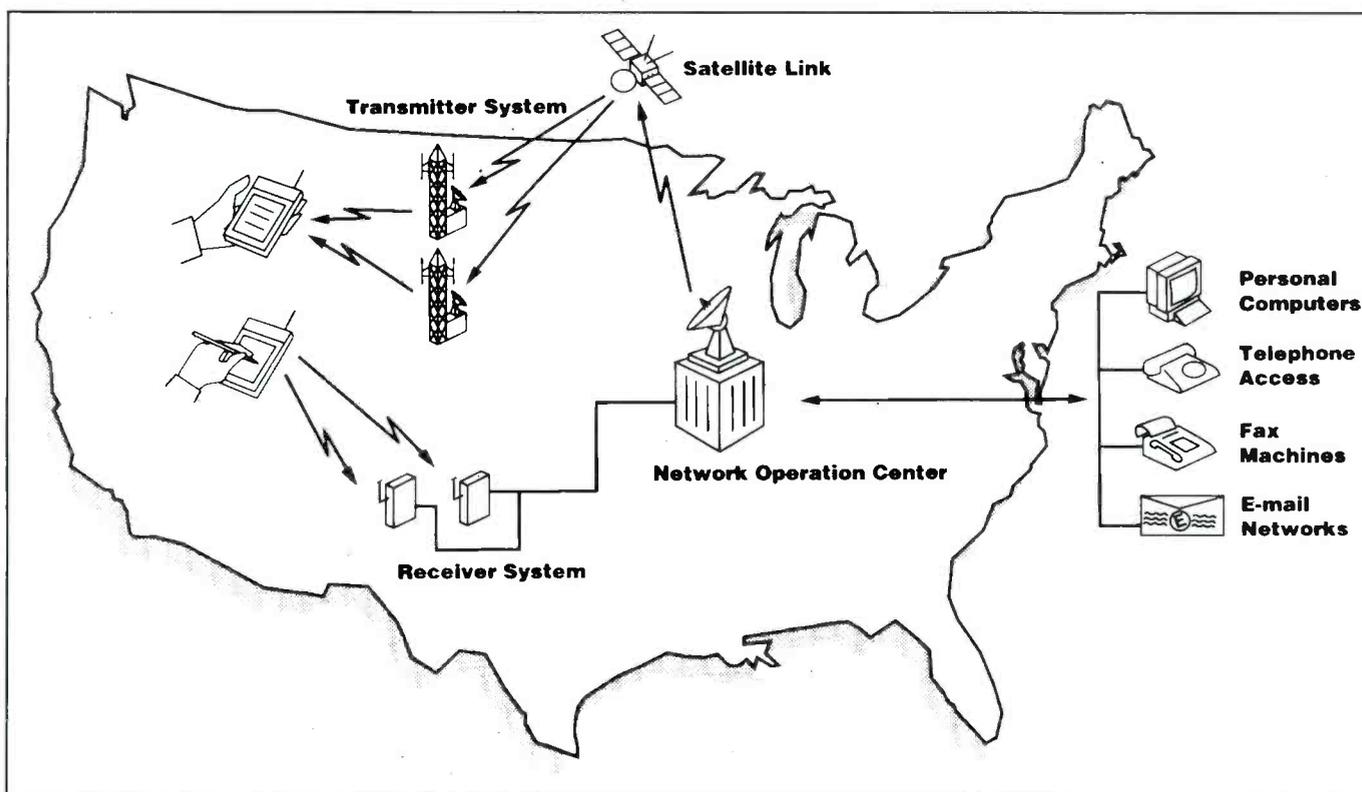
Automatic vending machines that look like large 6-ft. cellphones are being placed in airports, rental car agencies, and hotels in major cities nationwide. Customers can use a credit card to rent a cellphone package from one of these machines, which operate in a manner similar to a bank ATM. Some 200 centers should be in operation by the time you read this.

The complete rental package consists of a Murata phone, car plug-in adapter, two extended-life batteries, built-in 110 volt

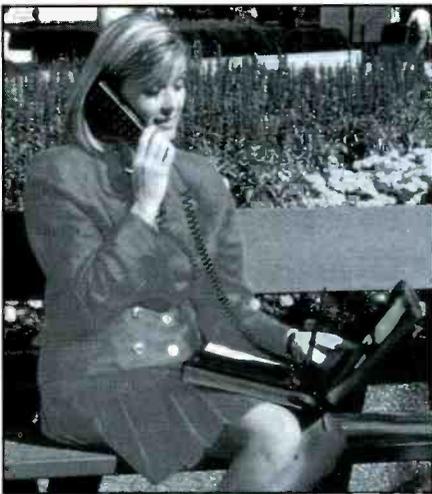


The Technophone BC901P is housed in a portfolio.

charger, and a carrying case. The rental rate should be about \$6.95 per day, with per-minute charges about \$1.60 for local calls and \$2 for roam calls. The renter receives a detailed bill for real-time charges,



MTEL's Nationwide Wireless Network combines several technologies to allow subscribers to exchange messages using various portable comms devices.



The Technophone BC901P portfolio phone is intended for people on the go. Say, just who is that using the cell-phone? We'll never tell.

in one-minute increments, with the first 25-seconds free, including taxes. This bill is given upon return of the phone.

This clever rental service is provided by Sims Communications Inc., 3333 South Congress Ave., Delray Beach, FL 33445. For further information, call 1-800-999-1333.

Softpack Portable

The Technophone BC901P portfolio softpack transportable is a new lightweight unit designed for people on the move. In addition to an MC901 analog phone, the portfolio also has a notepad and pen with additional room for documents.

There is a multi-lingual menu, 100 number memory, name search, PIN number, datalink select, ringer volume, memory lock, hands free operation, user security, call barring, speed dial, 3-NAM's, credit-card dialing from memory, one-touch 9-1-1 access, and many other clever features. This unit operates with the full 3-watts of power allowed.

Four different configurations are available for customizing to your particular needs. The basic unit carries an MSRP of \$399.00.

Technophone Corp. is a part of the Nokia Mobile Phone Co. For more information, contact Technophone Corporation, 1801 Penn Street, Suite 3, Melbourne, FL 32901. Tel. (407) 952-2100.

On The Track

A wireless network that locates vehicles and provides two-way data comms was recently demonstrated in Washington, DC. This is a low-cost, high-capacity data comms network known as ARRAY, which uses a technology derived from modern radar.

ARRAY locates multiple cars quickly and accurately, showing vehicle locations

on a computerized map at a fixed site, and also in the moving vehicles themselves. Simultaneously, two-way data may be exchanged with moving vehicles. Personal laptop computers may be used to interact with any number of commercial information services via ARRAY. When fully on-line, an ARRAY metro network can serve one-million users.

The ARRAY Network Control Center is in Landover, Md., and there are five bases elsewhere in the National Capital area.

While ARRAY is not yet commercially available, the system has been shown to work well, and that it is feasible. There are many obvious applications for owners of fleets of vehicles, such as trucks and buses. The hope is that ARRAY can be turned into a commercial reality in most major US cities during the next few years.

In September, the FCC issued a license for the first commercial ARRAY network. This is for Dallas, Texas and utilizes the entire 8 MHz sub-band between 918 to 926 MHz allocated by the FCC for such services. This is a band that has been designated by the FCC for shared use by a wide variety of different equipment. As this column is being written, 19 other ARRAY license applications have been filed for other service areas.

ARRAY is a development of Pinpoint Communications, Inc., 2435 N. Central Expressway, Suite 850, L.B. 27, Richardson, TX 75080. Tel. (214) 705-2400.

Two-Way Wireless Network

The FCC granted Mobile Telecommunication Technologies Corp. (MTEL) "first final Pioneer's Preference" for a two-way Personal Communications System (PCS). MTEL plans to file for a license to construct the system as soon as the FCC rules allow.

This MTEL Nationwide Wireless Network (NWN) system will use 11 channels at 930 MHz, and will enable people to exchange messages using laptops, palmtops, and new handheld messaging units known as personal digital assistants (PDA's). The system will also accommodate acknowledgement messagers, or pocket-sized devices capable of returning confirmations of message receipt to senders.

The technology is high-speed, high-capacity, enabling messages to be sent at 24,000 bps. It combines computer, satellite, and radio transmission techniques. The wireless portion of NWN will deploy more than 3,000 terrestrial base transmitters across the nation (upon final FCC licensing).

MTEL expects to operate this in at least 300 top US markets by next year, and serve as many as 13-million subscribers by the year 2000. A demonstration system in Dallas has already shown that the idea works, and is useful.

Mobile Telecommunication Technologies Corp. is headquartered in Jackson, Miss. ■

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COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

We were notified by Wellington Radio, New Zealand that Maritime Radio Operations from Wellington Radio/ZLW and Auckland Radio/ZLD closed 30 September 1993. The Wellington Station Manager asked that we carry notice of this matter as they had frequently received correspondence from POP'COMM subscribers. The letter added: "To all those DX'ers who have written to ZLW over the years from all around the world, thank you for your correspondence, QSL and postcards...we have enjoyed hearing from you."

Most of you probably know that the US Coast Guard, effective this past August, discontinued the 500 kHz Morse code emergency distress system. The final message broadcast by the Coast Guard closed with "Fair winds and following seas with 73s from all of us."

A note from Simon Mason, England indicated he had obtained lots of unusual intercepts, especially a number of MOSSAD transmissions.

Mike Starr, MI said he uses a Sangean 818CS as well as two Radio Shack \$8.95 longwires.

An individual signing as "Crunch" wrote that he lives in the San Francisco Bay area, "which can make HF listening a problem on some bands (like 8 MHz) with KFS and KPH always hammering my Icom R70. I only have a piece of wire about 16 feet long as an antenna these days and it is connected to the R70 with an MFJ 959 antenna tuner."

A card from Joe, VQ9ZZ, in Diego Garcia contained the following information: "UTE fans may be interested to know that the UN Operation for Somalia (UNOSOM



Offut receive site at Scribner, NE. The tower behind the buldings is used by the County Sheriff. Photo by Richard Baker, OH.

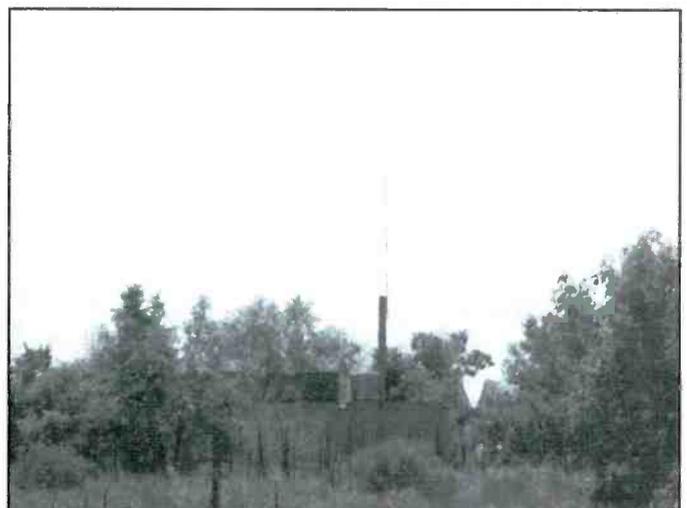
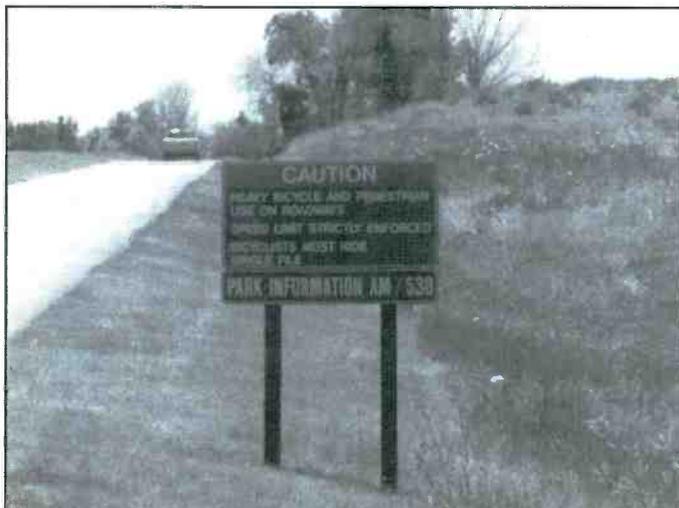
II) communicates between Somali locations and Nairobi, Kenya on 10037 USB. Suspect modest power and simple antennas. Comms are in English language."

Wally Dickson, MA told of buying a Sony ICF2001 at a flea market for \$80. His very first UTE heard was station WOO (Ocean Gate, NJ) in SSB. He also heard a YL/EE on 10125 kHz with the callup of CIO2. Wally, this was an Israeli Intelligence Service (MOSSAD) transmission. Wally also heard an SS numbers station positioned at 10545 kHz.

Mark Heywood advised he had moved

to Vancouver, Canada and was getting very good reception of San Francisco and Honolulu Air Traffic Control stations. "I use a Sangean ATS-803A and a longwire antenna. I have most airline's schedules and I check the flight number to see the type of aircraft and the route. I ordered a book 'High In The Sky' from England. It contains Selcal listings. When you hear a Selcal you can check it in the book to learn the registration for the particular aircraft."

Jim Navary, VA does his monitoring with a Yaesu FT-757GX and a Kenwood TS-440S. "My antennas leave a bit to be de-



Patrick Griffith provided these photos which pertain to the TIS station located near the East entrance of Cherry Creek State Park in Denver, CO.

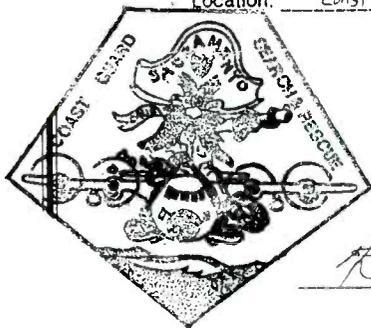
To: David Sabo, Seoul, Republic of Korea

Rescue 1500

This confirms your reception of
United States Coast Guard Aircraft
"Rescue 1500"

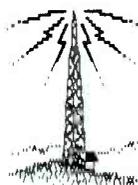
on 8984 USB/voice at 1330 UTC on 27 June 1993.

Aircraft Type: HC-130 H
Transmitter/Power: 400 WATTS
Antenna: 60' LONG WIRE
Location: COAST SOUTHERN CALIFORNIA



(Signature/Official Stamp)

David Sabo, USCG, USCG



QSL

David Sabo shares this PFC with readers.

sired for SWL'ing. One rig is hooked to a Cushcraft R5 vertical (trapped for the Ham bands) and the other, for the time being, uses a short dipole in the attic."

Jim's letter continued "Would like to put in a good word for the SWL SIG (Special Interest Group) that Rick Baker runs on the Youngstown Free Net. Any UTE monitor with a computer and a modem should be encouraged to check it out. Although all UTE flavor to the group. Those with access to the Intercet can connect at yfn.yu.edu. There's also telephone dial-up access at (216) 742-3072."

An interesting letter was received from Michael Ryan, FL who worked as the Communications Coordinator at Palmer station in Antarctica. Michael stated that 11552 kHz in USB was the correct frequency. "We had three Sun Aire HF (3-30 MHz) transceivers, 3 Icom R70s, Dovetron units (for RTTY), two 10 kW HF transceivers, 1 Satellite terminal (ATS-3 Satellite was used), Ham gear, and for antennas we had 2

RLPA-11 elements, 1 conical monopole (360° radiation pattern) and one very large ULPA and UHF/VHF antennas. The frequencies in use were: 11552 USB, 4063 LSB (just used in inter-island comms between different sites), 13972.5 MARS (RTTY & Voice), 14310 for Ham operation. All frequencies in kHz."

David Sabo, South Korea provided correct addresses from three of his recent responses to verification requests. For all USN/USMC MARS stations on Okinawa use this address: Navy-Marine Corps. MARS Area Coordinator, Communications-Electronics Branch, Camp Smedley D. Butler Okinawa, FPO AP 96373-5005.

The next address was: Berne radio/HEB, Swiss PTT, Mobile HF Radio Services, Laupenstrasse 18, CH-3030 Berne, SWITZERLAND. And the final address is: Commanding Officer, USCG Air Station Sacramento, ATTN: Aircraft Commander Rescue #####, 6037 Price Avenue, McClellan AFB, CA 95652-1260.

David Sabo also sent in some frequency

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These two photos were taken in the SAC museum at Offutt AFB by Richard Baker, OH.

information he had received from the Radio Communications Division of Berne Radio. All frequencies in the list are in kHz.

- 3010:** Night freq (on request)
- 4654:** Night & short range freq (24 hours)
- 6643:** Preferred night freq
- 8936:** General use within European area (24 hours) and worldwide range at night
- 10069:** General use within European area (24 hours) and worldwide range at night
- 13205:** General use (24 hours)
- 15046:** General use (24 hours)
- 18023:** Long range freq (24 hours)
- 21988:** Preferred freq for Middle East & Africa, during daytime in Switzerland
- 23285:** Long range freq. during daytime in Switzerland
- 25500:** Long range freq. during daytime in Switzerland (on request)

Richard Baker, OH forwarded a lengthy report and here are some excerpts: "The photos were taken during a trip to Offutt AFB, NE for their annual open house and air show. I spent two days there and saw many aircraft including a DRAGON or

HAWK callsign B1-B from Dyess AFB, TX; a CUJO or RISKY callsign B-52G from the 34th BS; and BLUE ANGEL 01 through 09. The 09 is the C-130 support aircraft, also known as 'FAT ALBERT'. There were of course numerous others, many of these callsigns are heard on the GHFS frequencies, Offutt being one of the GHFS stations.

Got to talk to a lot of the crews, including the crew of a 412 (Transport) Squadron Canadair Challenger (tail 144616) based at Ottawa. They did confirm the radio callsign of Canadian Forces aircraft to be 'CANFORCE'. Some monitors believed the call to be CANFORS. The VIP transport squadron uses the callsign CANFORCE 01 when transporting the Prime Minister of Canada, as does any Canadian Forces aircraft. When not transporting the PM, these aircraft use the 3700 numeric series.

Drove out to the various Offutt annex communications centers in the area. First stop was Elkhorn, NE, location of Annex

2, the transmit site for Offutt GHFS. There were about 3 conical antennas and 6 others. Next was Scribner, NE where the Offutt GHFS receive site is located. The antennas found there consisted of one conical and two LPH-89s. After that, there was a failed attempt to find Annex 3, listed in the book as 'Nuclear Battlefields,' located in Hooper, NE.

The next day the VLF transmitter site at Silver Creek, NE was located. Built in the 1950's, this was a SAC airborne command post ground entry point (GEP) where they were capable of beaming the multiplexed (MUX) wide-band FM signal used for communications for links with the autovon/DSN military telephone net. The VLF system is used to maintain comms between the bombers, missile sites and other Strategic Command (STRATCOM) assets. This was a large single tower with a large insulator at the base, with a tunneled entrance visible below it. The tower supported what looked like strings of insulated wire antenna on the upper third, or half. There were also several VLF loops visible, possible used to receive GWEN (Ground Wave Emergency Network) VLF signals. Also a lone HF conical antenna could be seen, and what may be a UHF wide-band MUX antenna on the tower. With SAC gone, the sign at the gate showed the facility as 1 ACCOOMG, USAF. This site sends out STRATCOM coded data on 58.5 kHz."

On another matter, Richard advised: "Regarding the US Army Transportation Corps ships heard on 6227 kHz. I believe this is the primary frequency for Ft. Eustis and that the callsign AAC2 is the 10th Battalion. While monitoring this frequency for the Army ships, I came across the Woods Hole Oceanographic Institute (KXC-713) in comms with the R/V Atlantis II, (KADC). You may recall that the R/V carries the Deep Sea Submersible (DSV) 'Alvin', which was used to discover the Titanic in it's resting place."

Richard also provided a few new frequencies for the US Coast Guard in Operation Able Manner (Haiti). 7626 kHz seems



This view shows the receive antennas at Scribner, NE which are used for the USAF GHFS Global network. Photo by Richard Baker, OH.

to be the primary with 5223 kHz stated as being the secondary but nothing heard there. Both were indicated as being USB mode. 7626 kHz was designated tactical channel "3 Echo 10 (3E10)," while 5223 kHz had an ID of "3 Echo 5 (3E5)."

And to close out his letter, Richard reported that the USS Nebraska (SSBN 739) was commissioned and the USS Iwo Jima (LPH 2) was decommissioned. Both actions took place this past June.

The final item in the October 93 column was inadvertently garbled. It should have read: "Gary Spurway, Australia reported a RTTY transmission on top of HCJB's SSB service. Gary, my references show two possible sources of the RTTY. HSD37, Bangkok, Thailand or NRV, USCG CommSta Barrigada, Guam.

Another fine WINTER SWL FESTIVAL is planned for March 10-13 in Kulpville, PA. This will be the 7th annual running of this affair and each year it is bigger and better. I hope a lot of you will be attending and I look forward to chatting with you there. Registration details can be obtained by sending your request to SWL Winterfest, PO Box 591, Colmar, PA 18915. Please include a SASE.

Ute Intercepts. All UTC.

122.3: OUA23, Danish Navy Stevns in CW at 1440 w/mkrs for OVK 11/14/21/23 and OUA23/25/32/38/52. (Boender, Netherlands)

205: Beacon COR, Corcoran Salyer Farms, CA at 0625; Beacon IA, Portland Int'l, OR at 0638. (Vaage, CA)

220: Beacon HLE, Hiley (Friedman Memorial), ID; Beacon VI, Visalia, CA. (Forsman, CA) No time given.

222: Beacon CUU, Chihuahua, Mexico. (Forsman, CA) No Time

227: Beacon SJY, San Jacinto Ryan, CA at 0643. (Vaage, CA)

233: Beacon LG, Long Beach, CA. (Forsman, CA) No time.

305: Beacon RO, Roswell Industrial, NM at 0712. (Vaage, CA); Beacon P, Pine Island, BC, Canada. (Forsman, CA) No time given.

308: Beacon CI, Channel Island Harbor, S. Jetty L2 near Oxnard, CA at 0713. (Vaage, CA)

317: Beacon MB, Mission Bay N. Jetty L1 NW of San Diego, CA at 0714. (Vaage, CA)

327: Beacon AY, Watsonville, CA. (Forsman, CA) No time.

359: Beacon BO, Boise Air Terminal, ID at 0730; Beacon EMT, El Monte, CA at 0731. (Vaage, CA)

415: Beacon HJM, Bonham Jones Fld, TX at 0800; Beacon IEE, oil platform Irene, SE of Vandenburg AFB, CA at 0800. (Vaage, CA)

439: OST, Oostende, Belgium w/MV Intrepido in CW at 0705. Gave navigational warnings at 0920. (Boender, Netherlands)

442.5: FFB, Boulogne-Sur-Mer, France in CW at 0800 w/navig. warnings. (Boender, Netherlands)

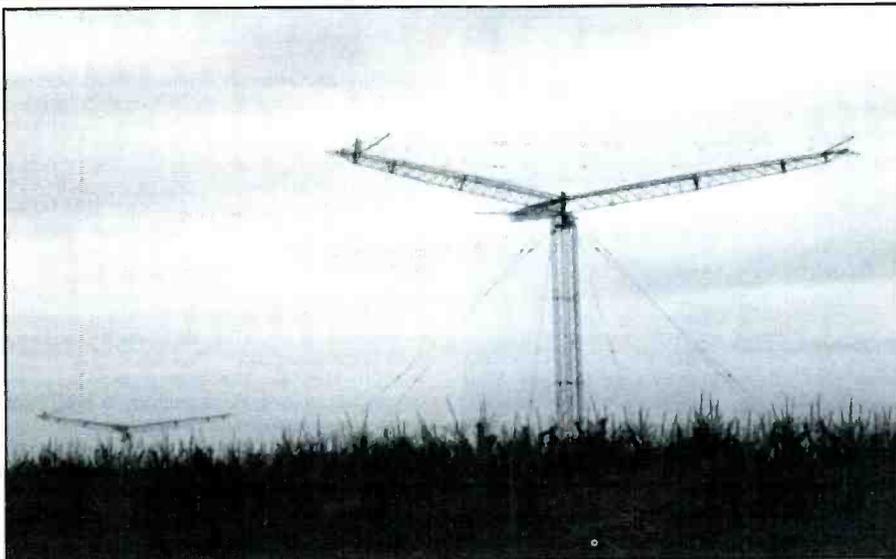
444.5: PCH, Scheveningen, Holland in CW at 0711 w/MV Granada. (Boender, Netherlands)

480: UFIX, MV Neferudovoz 49. Position Steenbank. In CW at 0742 w/msg to Pilot Vlissingen. (Boender, Netherlands)

525: DAN, Norddeich, Germany in CW at 0805 w/wx. Tfc list sent at 0930. Also hrd wx at 2000 sked. (Boender, Netherlands)

2182: MV Penguin w/Humber radio. USB at 0722; PBK, Netherlands Coast Guard in USB at 0733. Indicates nav wmg bcst on 1890 kHz. (Boender, Netherlands)

4134: NPSE, USS Philippine Sea (CG-58) wkg USCG CommSta. NMN, Portsmouth, VA for RTTY freqs in use. Hrd 0534 in USB. (Baker, OH)



Elkhorn, NE is the location of the Offutt Global transmit antennas and the Kawn Global Weather Center. The antennas in this view are Antenna Products LPH-89's. Photo by R. Baker, OH.

4372: Giant Killer, FACSFAC VA Capes. NAS Oceana, w/G5M relaying comms for 7XV, gives UHF freqs. (note new freq, no longer 4373 kHz). Hrd 0037 in USB. (Baker, OH)

4605: GXG, RN School of Signals Portsmouth w/GXF at 2000. Unclass drill msgs in Baudot 75 bd and then results were discussed in voice (USB). All msgs sent by 'Caroline' and addressed to 'Calliope, Claverhouse, and Camperdown'. Calliope ID'd as GXF (Boender, Netherlands)

4725: USNA/C Navy RV231 in USB at 0216 wkg Andrews AFB w/pp. QSY to 4742 kHz to work pp from Congressman in A/C to his wife at home. (Navary, VA)

4882: YL rptng Uniform Lima Xray from 1900-1903 then into usual 5L text. This YL was not the usual one that says 'November' etc. It was a different voice. YL signed off w/End of Message. End of Transmission. At 2000 on 4880 kHz usual YL came back w/ULX and into different 5L message. (Mason, England)

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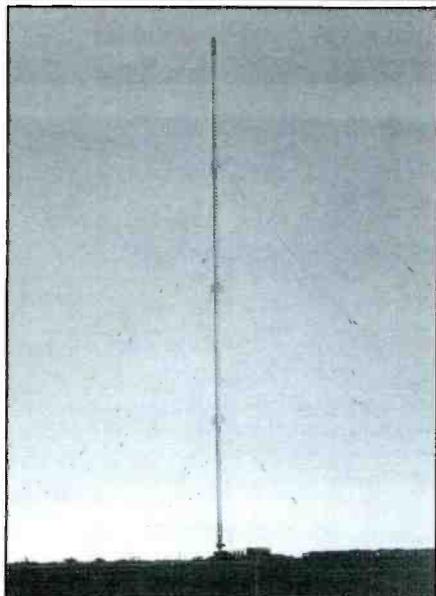
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This VLF Transmitter antenna at Silver Lake, NE is now utilized for transmission of STRATCOM data. Photo by Richard Baker, OH.

5306.4 SLHFM "F" at 1210. (Crunch, CA)

5311 She's Back! YL 'Bulgarian Betty' w/555 x3 616 x3 05 from 1355-1400. Then 72066 rptd & off. She is on everyday for 7 minutes—a far cry from 1990. (Mason, England)

5320 NOY. USCG Grp Galveston, TX wkg CG 8101 (RG-8A Schweizer) at 0331 for Operations status. At 0438 NOY wkg u/i Point-class cutter re disabled F/V. NOY8, USCG Grp Corpus Christi, TX wkg Rescue 2137 at 0608. 2137 advises is s/by until u/i ves gets pumps running. USCGC Point Baker (WPB-82342) wkg Grp Galveston at 0710 re Grp is wkg a collision of vessels. All USB mode. (Baker, OH)

5400 WNFT417. Bell Telephone. Morristown, NJ testing rdo w/ IBM-1. Later said would return, was going to other freqs to make checks w/other stns. Hrd 1546 in USB. This freq is USCOE CH 8. (Baker, OH)

5680 Rescue 166 w/ Plymouth rescue in USB at 1408. Heli is searching for a 17' Shetland pleasure craft in the vicinity of Royal Sovereign light tower; Rescue 174 w/Plymouth rescue. Heli of Solent CG is looking for a child that fell overboard a vessel off Brighton Coast. USB at 1433. At 1449 Solent CG reports that the child is safe. (Boender, Netherlands)

5692 NOP. Brooklyn Air, NJ accepting rdo guard for CG 6522 w/5 POB at 0106. NOT. Traverse City Air, MI wkg Rescue 6011 at 0242. 6011 inbound

w/patient. advised ambulance is at station. All USB. (Baker, OH)

5696 USCG Rescue 6016 in USB at 0038 wkg Boston. Airborne out of Otis AFB en rte to wreck of Andrea Doria to search for missing diver. Later was relieved/diverted to Brooklyn. (Navary, VA)

5715 YL rptng Zulu Whiskey Lima 3 at 2100. New MOSSAD station I presume. (Mason, England)

5718 CanForces Rescue 306 wkg CZW. Halifax Military. pp RCC, being given instructions re location of distressed ves and to assist heli at that location. Hrd 0301 in USB. (Baker, OH)

5732 YL rptng Papa Zulu from 1900-05 w/electronic tones. Then 5F grps in GG for 411. This addressee was used by DFC37/DFD21 until it closed early 1993. (Mason, England)

6200 M/V Safari in USB at 0420 w/emerg comms wkg CommSta Portsmouth (6501 kHz). Safari was 67' wooden yacht en rte Virgin Islands from Aruba. Taking on water. seas 8-10 ft. At 0450 lost generator. Prepared dinghy at 0453 and abandoned ship at 0534. Absolutely gripping. kept me glued to my seat in shack. (Navary, VA)

6501 U/i tactical call 'Viking Romeo' wkg CAMSPAC San Francisco re HFDL (High Freq Data Link) freq. Hrd 0405 in USB. (Baker, OH)

6720 I3C. u/i w/long alpha-numeric msg. //11255 and 18009 kHz. (Sabo, S. Korea)

6758 MKL. RAF Edinburgh in CW at 2110 w/airfield forecasts. (Boender, Netherlands)

6780 CW Dashes sent at 0030 foll by CW dot dashes sent at 0040. At 0042 '726' x3 98 98 44 44 and into CW 5F grps. Zero was cut as letter T. (Mason, England)

6784 YL/EE w/1-0 count and '009' from 2100-2110. After ten tones 'Count 198' and into 3/2F grps. Also on 5413 kHz. (Mason, England)

6880 New freq for Lincolnshire Poacher station. YL/EE was rptng 40136 from 1900-1910. Then into 200 5F grps. Jammed here and also on //5746 kHz. (Mason, England)

7039.4 SLHFM "F" hrd at 1209. (Crunch, CA)

7445 MOSSAD YL rptnd Kilo Papa Alpha Two Zero at 1800. (Mason, England)

7452 SLHFM "R" in CW in background of Voice of Greece at various times between 1200-0200. Not noted before. (Mason, England)

7480 OM/RR at 1800 w/362 in DSB til 1805. Then 759 x2 48 x2 and into 5F grps. Ended w/00000. (Mason, England)

7535 NOPQ, USS Thorn DD988 wkg SESEF going UFH for xmtr test at 1517. In-bound naval unit clg Norfolk SESEF at 1538, after answer. secure data bursts. USS Curtis Wilbur wkg SESEF for xmtr test at 1710. NJUL. USS Bainbridge CGN25 clg Norfolk SESEF at 1725. no joy, but SESEF comes up on freq at 1818 for HF xmtr tests. NNGW, USS George Washington CVN73 clg SESEF at 1911 for rdo ck. All in USB. (Baker, OH)

7541 At 0030 ten tones foll by YL/EE rptng 5787/4563 and off at 0040. (Mason, England)

7605 YL rptng VLB50 at 1800 and VLB60 at 1850. Also on 4665 kHz. (Mason, England)

7763 At 0130 ten tones foll by YL/EE rptng 6358/5187/6209/3363 and off at 0140. (Mason, England)

7871 YL/EE in AM mode at 1401 rpts 172 x3 and 1-0 count. Noted with 3/2F grps at 1411. (Sabo, S. Korea)

7887 CW station sending M Q E Q over and over at 0305. Went down with AR. (Mason, England)

8120 YL/GG with 1-0 count and '791' from 2000-2010. After ten tones 'Gruppe 224' and into 4F grps. Also on 10135 kHz. (Mason, England)

8173 YL/EE w/Delta Mike from 1900-05. Then "Message for 214, 214 11 Groups and 15 Groups." "Attention" then into 5F grps. YL said the same word for 'and' & 'end'. Same message sent next day at 0900 on 17430 kHz and at 1900 on 9325 kHz. (Mason, England)

8198 ELNC5. Carnival Lines cruise ship M/S Ecstasy initiating R/T rfc w/WOM, Pennsuko. FL (8722 kHz). Hrd 0039 in USB. (Baker, OH)

8294 WPE. Tug Communications, Jacksonville. FL wkg WBN3011, Tug Pilot at 0505 w/operations msg. WPE wkg WBN6501. Tug Sandal. at 0507 w/ops msg. At 0510. WGY. Tug Communications, San Juan. wkg Tug Carib Trader, then Partridge. WBN3913 for

ops info. All USB. (Baker, OH)

8495.2: SLHFM "F" at 1203. (Crunch, CA)

8571 UFN. Novorossiysk, Russia in CW at 2050 w/tfc list. (Boender, Netherlands)

8641: YL in USB mode at 1814 w/5L phonetic grps. Announced 'end of message, end of transmission' at 1822, then rptd 'MIW' in phonetics til 1825. Foll by 'Message, message, group 58, group 58, text, text.' then rptd same 5L phonetic msg. Went through the same routine at least twice more. At least two faint, non-parallel 5L bests were audible in background. (Sabo, S. Korea)

8728: EHY, Madrid, Spain w/tfc list at 0200. //8746//13077//13104 kHz. USB mode. (Baker, OH)

8819: Rainbow Radio, LDOC Tors Cove. Nfld, Canada (now Sea-Link Ltd) wkg Delta 26 for company msg & wx "EDDF" Hrd 0347 in USB. (Baker, OH)

8843: Singapore 11, Boeing 747, Selcal KM-BH at FL 330; Delta 88, Selcal EQ-1. w/posit report at 0021. FL 370. This flight later asked for pp to Company. Controller advised contact freq 13348 kHz. (Heywood, BC, Canada)

8861: Recife, Brazil (en route stn) wkg Lufthansa 526 in USB at 0440. Advised a/c to QSY 3452 kHz. (Navary, VA)

8897: Lanzhou Aeradio. PRC. wkg a/c 9512 (poss Aeroflot 9512) in USB at 1219. (Sabo, S. Korea)

8898: Poss foreign military. 3-uniform (OM/EE, strong, heavy accent) wkg Tango-7 (OM/EE, similar accent, faint) in USB from 1634-1641. 3-Uniform passed msgs w/lots of phonetic-numbers combinations. Sounded maybe oriental or Filipino. 3-Uniform complained he not able hear Tango-7. (Sabo, S. Korea)

8959: Jeddah Op's. Saudi Airlines LDOC. wkg Jeddah 002 in AA. Hrd 0343 in USB. (Baker, OH)

8984: Rescue 6029 wkg CommSta Portsmouth w/flight ops & position report at 1830. (Starr, MI) CG Rescue 1500 checking in w/CAMSPAC San Francisco. CAMSPAC asked a/c to confirm that Homeplace was Sacramento, and advised would stand by on 5696 kHz for next comm sked. USB at 1330. (Sabo, S. Korea)

9006 CANFORCE 4607 wkg VXA. Edmonton Military re landed at closed airfield & are locked out, requests Edmonton send them a taxi. Hrd 0607 in USB. (Baker, OH)

9250: OM/RR with '124' from 1300-05 then into 5F grps but stopped after 8 grps. Then started up with '124' again til 1311 when into 5F grps ending w/249 x2 38 x2. 0000. (Mason, England)

9450: YL rptng Golf Kilo from 1930-35. Then 5F GG msg for 4TL. (Mason, England)

10051: Gander w/wx bcst at 2025. (Starr, MI)

10066: Air France 6735 checking in w/Dhaka Aeradio in USB at 1325. Calcutta then came up and told 6735 to contact Calcutta Control on VHF 120.7 MHz and Dhaka Control on 125.7 MHz. At 1330 Lufthansa 7451 reported position ?LITRO? to Rangoon. (Sabo, S. Korea)

10090: Tashkent VOLMET. YL/EE w/aero wx for various Central Asian locations in USB at 1542. Signed off w/"Tashkent Metero. out" at 1544. (Sabo, S. Korea)

10162: OM/EE with '947' from 1920-1925 then 183 x2 207 x2 and into 5F grps. Male version of YL that says 8 as 'ATE'. Hrd previous evening at same time but w/diff msg. (Mason, England)

10235: YL/GG with '465' from 2115-2120. Then 972 972 15 15 and into 5F grps. Down w/0000. (Mason, England)

10345.5: Sent NUG TM til 0403; then AGM TM til 0405 and into 5L grps til 0418. Ended w/AR AR AR SK SK. This cut nbr system used ltrs T M I A N D G U R and W. (Crunch, CA)

10424: Big carrier at 1740 w/tune up tones til 1800. Then YL/GG w/620 x3 00000 and oif at 1805. (Mason, England)

10464.2: QRA DE KUN50 QSX 10/12/14/17/24 K. Same CW speed and mkr format as KKN50. Hrd at 0357. (Crunch, CA)

10610.2: OM/SS in USB at 0241 dictates msgs w/3L grps in SS to 2nd OM/SS. (Margolis, IL)

10665: YL/SS in AM at 0303 w/callup 967 x3 & 1-0 count. (Navary, VA)

10740: OM/RR rptng 567 x3 00000 from 2130-05 then off. (Mason, England)

10820: Unusual MOSSAD activity over a few days.

Abbreviations Used For Intercepts

AM	Amplitude Modulation mode
BC	Broadcast
CW	Morse Code mode
EE	English
GG	German
ID	Identification/led/location
LSB	Lower Sideband mode
OM	Male operator
PP	Portuguese
SS	Spanish
tfc	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)

At 1740 YL rptng MIW 14B05B88. Next day at 1938 MIW 14D37 D38 D39 D40 D41 D42 D43 D44 D45 D46 D47. At 1914 on another day MIW14D76D77 D78. At 1700 MIW14B07 and one hour later MIW14 B88. Also on 8641/5230 kHz. (Mason, England)

10871: SLHFM "D". Odessa in CW at 1907; SLHFM "C", Moscow in CW at 1907. (Boender, Netherlands)

10872.2: SLHFM "F" hrd at 1155. Distinct 50 Hz hum on the signal which was not present on any of the other "F" mkr. (Crunch, CA)

11108: YL rptng Mike Delta from 2000-05 foll by 'Message for 241 70 Groups, Attention'. Then into EE 5F grps. In background was CW stn sending 360 x3 TTTTT. This freq was solely used by Papa November til it ceased operation. (Mason, England)

11176: Reach 61 in USB at 1636 wkg Albrook w/pp to "Hilda" re oil leak in engine #1; Reach 05336 in USB at 2226 wkg Incirlik, wanted wx for West Cairo. Advised that once in Egypt would change to callsign Reach 503R. (Navary, VA)

11200: RAF wx bcst at 2018. (Starr, MI)

11247: Two stns, both British accents, hrd in USB at 1012. One ID'd something like "Prestige 28 from Hawkes Air, message, over, on Hotel Fox." Sig was pretty poor so wouldn't swear to these calls. (Sabo, S. Korea)

11306: American LDOC, Lima, Peru wkg American 905 at 0432. At 0516 w/United 923 Selcal ck MPHQ, and at 0517 w/American 909 w/posit report. USB mode. (Baker, OH)

11342: Speedbird 299 wkg NY LDOC in USB at 1651 w/pp to Speedbird Ops, Chicago. Sick passenger on board (liver failure) en rte Chicago O'Hare, requests ambulance meet a/c on arrival. (Navarry, VA)

11440: At 1800 YL/GG sending '461' then 406 x2 128 x2 and into 5F grps. This YL had same voice as an East German '4 organ note' station which ceased operation in 1990. (Mason, England)

11455.7: QRA DE KKN50 QSX 6/10/11/15 K. Hrd at 0347. I don't recall KKN50 being on this freq. (Crunch, CA)

11467: Big DSB carrier here at 1920 foll by extremely rapid CW sending '733', nearly too fast to read.

Then into even more rapid CW, too fast to even recognize as CW. (Mason, England)

12314: YL rptng Mike Delta from 1930-35. Then 'Message for 241, 241. 69 Groups. Attention' and into EE 5F grps. (Mason, England)

12319: YL/EE in AM mode at 1506 rpts 255 x3 1-0 counts til 1510. then 10 beeps, 'count 225' x2 and into 3/2F grps. //14703 kHz. (Sabo, S. Korea)

12455: CW stn at 2109 sending 5F grps. Cuts zero as ltr T, rest all sent full. (Ed.)

12736.6: TAH, Istanbul, Turkey at 0358 w/mkr "DE TAH 12 MHz CH 3 4 8 K". (Crunch, CA)

13201: Danish Air Force 67 in USB at 1724 wkg Thule w/pp to Danish Liaison Office at Thule. (Navary, VA); Andersen Global wkg Reach 220TT in USB between 2042-2101. A/c declared in-flight emergency (IFE) due loss of hydraulic systems 2 & 3. Andersen instructed all other stns to stop xmtng this freq. & set up three-way patch between 220TT, a hydraulics specialist at Travis Command Post, and the Standards/Evaluation Section at Scott AFB. A/c was in process of re-loading hydraulic fluid, which was believed to have leaked out through tail section. Fluid reservoir was empty, although there was no visible evidence of leakage on engines or wings. A/c was 15 mins out from Misawa at approx 2058. All down at 2101. Andersen came back up at 2139 and advised net that Reach 220TT IFE was over and freq was available for use. (Sabo, S. Korea)

13312: Rockwell LDOC wkg Saudi 005, pp Jeddah Op's (Saudi Airlines Op's). Hrd 1836 in USB. (Baker, OH)

13333: Caledonian 120 wkg Longon in USB at 2343. Engine problems discussed w/Maint. Rep. Flight also stated they had some smoke through ventilation system but that it had now subsided. (Navary, VA)

13636.5: SLHFM "F" hrd at 1158. (Crunch, CA)

13636.8: SLHFM "S" hrd at 0340. (Crunch, CA)

13775: YL rptng Juliet Whiskey from 2100-2105. Then 5F GG grps for 542 and 824. (Mason, England)

13890: YL/GG rptng Whiskey Lima from 1930-35 foll by 5F grps for 522 and 026. (Mason, England)

14360: QRA DE KWS78. US Embassy, Athens, Greece w/QSX mkr in CW at 2114. (Ed.)

14452: CIW822, CFARS Saint John. NB, Canada w/VXN91, Nicosia in USB at 1907 for rdo check; CIW615, CFARS Ottawa w/VXV9, Nicosia in USB at 1926; CIW645, CFARS Richmond w/VXV9, Nicosia in USB at 2005. (Boender, Netherlands)

14467: NNN0COU, USS Saratoga CV60 wkg NNN0TDU for pp t/c. Hrd 2319 in USB. (Baker, OH)

14478.5: NNNONCA, USCG Loran Stn Marcus Island. trying work NNNOUTO. who advises is very weak. USB at 2218. (Baker, OH)

14736: U/i CW stn at 1408 w/cut nbr t/c. (Ed.)

14977: CW station sending OLX mkr from 1255-1300. Then YL/Czech w/'177' til 1305 and into 5F grps. (Mason, England)

15015: Two stations giving Emergency Action msg bcsts at same time. Hrd at 2024. (Starr, MI); Shark 57 wkg Albrook GHFS pp, Lobo re flight info. Hrd 2352 in USB. (Baker, OH)

15026: Jeddah LDOC w/unid a/c in Arabic. USB at 1455. Also hrd data bursts. (Boender, Netherlands)

16245.3: Stn using Speed Key CW at 2102 sending 5 charac grps (cut nbrs). AU34567DNT=1-0. (Ed.)

16434: At 1300 long tone foll by carrier til 1330 when ten tones were sent. Then YL/EE rptng 8273/8276/4187 til 1340. Also on 13423 kHz (every day). (Mason, England)

16667: LASU, M/V Solsyn in CW at 1628 wkg SPH, Warsaw, Poland. (Navary, VA)

17007.7: KLB, Seattle, WA in CW at 0330 w/mkr. (Navary, VA)

17060: 4XO, Haifa, Israel in CW at 1350 w/QSX mkr. (Boender, Netherlands)

17410: Poss MOSSAD bcst, YL passing 5L phonetic grps in USB at 1718. (Sabo, S. Korea)

18994.9: CLP5, Cuban Embassy Moscow, DE CLP1, MFA Havana in CW at 1740 requesting QSV QSV. Other end not hrd. (Ed.)

20821: Foghorn blasting several times at 2155. (Ed.)

22487: WLO, Mobile, AL, in CW at 0235 xmtng nx story re labor issues in the Maritime industry. (Navary, VA)

22543: 7TF12, Boufarik, Algeria in CW at 0220 w/mkr. (Navary, VA)

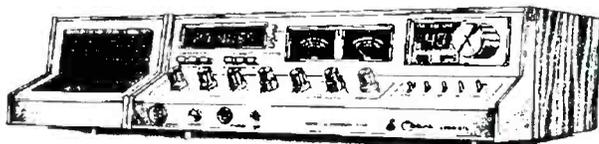
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Glay pager mode communications were heard last September on the Spacenet 3 satellite, transponder 13. The transmissions were copied by tuning a shortwave radio receiver to 910.95 kHz on upper sideband at 1510 UTC. All transmissions had the letter "P" followed by a four-digit number, colon, and a single number or letter, or followed by "W1/W2:" and a four-digit number, slash, four-digit number. The satellite is 87 degrees West.

A news broadcast in Spanish from Guayaquil, Ecuador, ran on 16743.5 kHz in FEC at 2049 UTC, one day last August. All news items focused on South America, but most were datelined from Guayaquil. The next day, the station was on 16745.0 kHz at 2047 UTC, running news until 2057. The station then went to CW, returning to FEC at 2100 with foxes, 10 counts, and an Ident of "GHF," which could stand for Guayaquil High Frequency. This was followed by a repeat of the earlier news broadcast. Signoff was in CW at 2114. For the next several days, attempts were made to find this news station, but it did not return to the air on any frequencies surrounding the ones heard earlier.

Stax of Fax Dept.: A new radiofax broadcast schedule was released on Aug. 2 by the Naval Eastern Oceanography Center, Norfolk, Va. It replaces the one issued May 19, 1992.

Major changes were made to the GOES satellite images retransmissions. The full disk images previously seen at 0200 and 1400 UTC were replaced by North Atlantic images at 0215 and 1415 UTC. The Gomex images at 0515 and 1715 UTC are now North Atlantic views in the same time slots. North Atlantic images at 0545 and 1745 UTC were unchanged, but the Gomex image at 0745 and 1945 UTC is now a North Atlantic view in the same time periods. The North Atlantic views at 1115 and 2315 UTC stay the same, as well as the misspelling of the word, "satellie," which has remained uncorrected for many years on past schedules.

Both 3357.0 and 10865.0 kHz will remain in service 24 hours daily. But 15959.0 kHz, which was in operation from 0900 to 2100 UTC, and 20015.0 kHz, from 1200 to 2100 UTC, will now be on call via Commspot, along with 8080.0 kHz. The broadcast from Keflavik, Iceland, will be continuous on 9318.0 kHz, and on call on 3820.5 and 18486.0 kHz.

An unidentified weather satellite transmitted a blank picture with a phasing bar on 137.840 MHz on Sept. 11, from 0120 to 0127 UTC. I find no listing for any satellite using 137.840. The Russian Meteor 3-3 transmits on 137.850, so this isn't it.



Have you seen this man? Newsfax photo from Telam, Buenos Aires, Argentina. (From Robert Margolis.)

Does anyone know what satellite was heard?

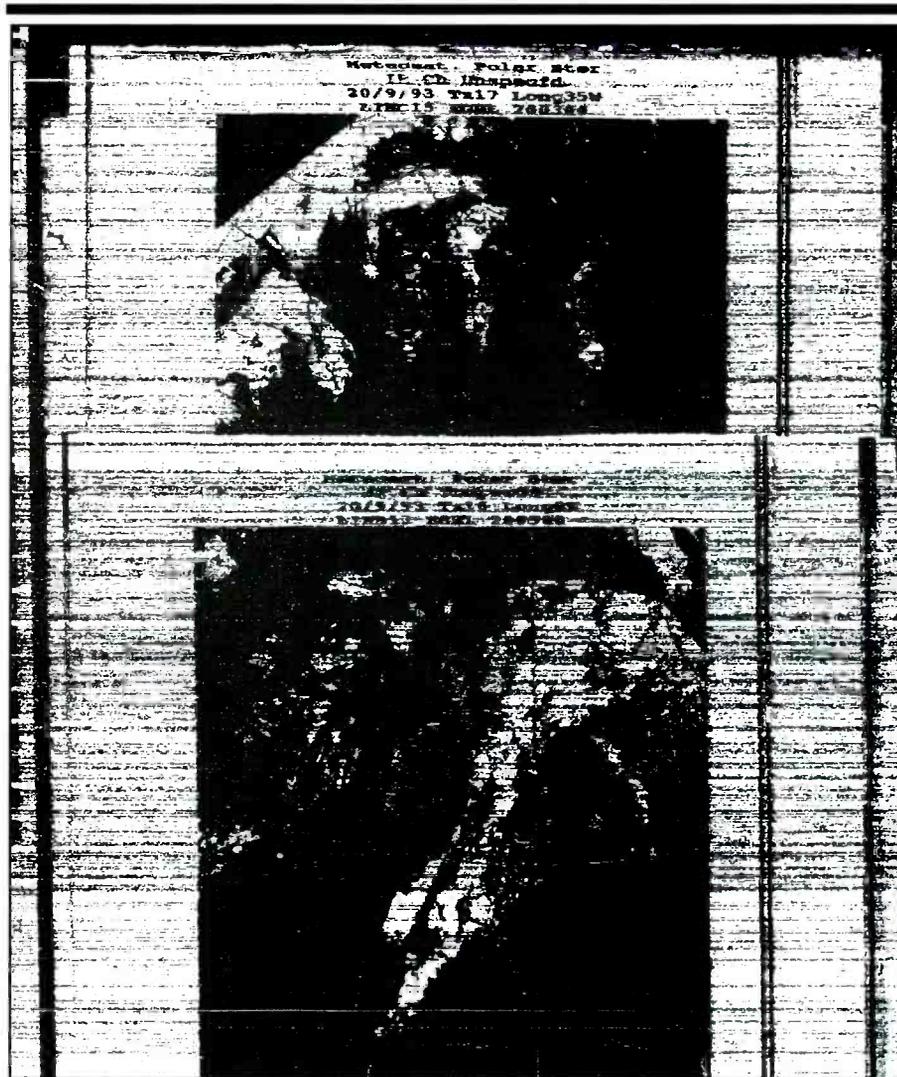
RTTY Intercepts

- 2137.5:** WLC, Rogers City R., Mich., w/FEC t/c at 0151. (Ed.)
- 2474.0:** PBC32, Goeree Island Navrad. NLD, w/available channels list, 75 baud at 0118. (Ary Boender, NLD)
- 2845.0:** PBB, Den Helder Navrad, NLD, w/channel availability list at 0102. 75 baud. (Boender, NLD)
- 2892.0:** MTO, Royal Navy, Rosyth, Scotland. w/available channels list at 0059, 75 baud. (Boender, NLD)
- 4069.5:** WLO, Mobile R., Ala. w/Telex to C6KG, Carnivale, FEC at 0044. (Ed.)
- 4173.0:** ULMU, ship Pablo Neruda, w/msg to Ballimar Schiffahrt Rostock, ARQ at 2158. (Boender, NLD) Russian cargo ship—Ed.
- 4175.0:** IBZC, ship Nuova Rosandra, w/ETA Barcelona msg at 2040, ARQ. (Boender, NLD) Italian cargo ship—Ed.
- 4177.5:** JXQN, ship Atlantic, calling JXVC, Topas, ARQ at 2135. (Boender, NLD) JXQN is a Norwegian trawler—Ed.
- 4178.0:** 3EQW8, ship MSC Ariane, w/msg to MSC Sorrento at 2110, ARQ. (Boender, NLD) Panamanian registry, class of ship unknown—Ed.
- 4178.5:** SBCX, ship Nordic Pride, w/msgs at 2145, ARQ. (Boender, NLD) Swedish cargo ship—Ed.
- 4462.5:** WLO, Mobile R., Ala., w/wx forecast in FEC at 0956. (Ed.)
- 5097.0:** CFH, Canadian Forces, Halifax, N.S., w/"NAWS de CFH" + freq. list, 808/75 at 0449. (Ed.)
- 5706.0:** RFLI, French Navy, Fort de France,

- Martinique, w/"meteo atlantique," at 0905 & 0943, ARQ E3/96. (Ed.)
- 6215.0:** Un-ID w/MPRK selcal in ARQ at 0125. On another day at 0150, un-ID w/sk'd of wx broadcasts, ARQ. (Ed.)
- 6260.5:** USNA, Annapolis, Md., w/Packet xmsns all day long, on many days. (Ed.)
- 6316.0:** LSD836, Buenos Aires R., Argentina, w/ARQ phasing sig & ID in CW. (Fred Hetherington, FLA.)
- 6384.5:** CKN, Canadian Forces, Vancouver, BC, w/"NAWS DE CKN II ZKR F1 2386 4170 6236 8318 12374 16552 22200 kHz" at 0320, 837/75. (Ed.)
- 6416.3:** CCS, Santiago Navrad, Chile, w/wx,

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
RURY	"RURY . . ." test tape
SS	Spanish
t/c	Traffic
w/	With
wx	Weather



Retransmissions of Meteosat polar weather charts by GYA, Royal Navy, Northwood, England. (From Robert Margolis.)

850/100 at 1040. (Fred Hetherington, Fla.)
6424.5: GYU, Royal Navy, Gibraltar, w/encrypted msgs separated by RYRY + "vmgntjnh" at 0345, 170/100. (Ed.)
8303.0: LOR, Puerto Belgrano Navrad, Argentina, w/wx synops in SS, 170/75 at 0027. (Ed.)
8380.0: ATNC, ship Lok Vinay, w/msg to Antwerp, ARQ at 2035. (Boender, NLD) Indian bulk carrier—Ed.
8382.0: UUKK, ship Skulptor Matveiev, clg UAH, ARQ at 2040. (Boender, NLD) Russian merchant ship, class unknown—Ed.
8384.5: UOJK, ship Jan Griva, w/ETA deutsche bucht msg at 1745, ARQ. (Boender, NLD) Russian merchant ship, class unknown—Ed.
8388.5: VRRF, the Hong Kong bulk carrier Product Endeavor, w/Telexes, ARQ at 1325. (Ed.)
8402.5: UJCF, the Russian cargo ship Mamaev Kourgan, w/RYRY to UJY, Kaliningrad, foll by telegrams, 170/50 at 0145. (Ed.)
8673.0: MTO, Royal Navy, Rosyth, Scotland, w/available channels list at 2226, 830/75. (Ed.)
9112.0: Possibly Egyptian Emb., Washington, D.C., w/text in AA, 0050-0142. (Ed.)
9126.7: RFTJD, French Forces, Libreville, Gabon, w/"de Paris...controle de voie" msg, ARQ-E3/192 at 0204. (Ed.)
10493.7: RFTJF, French Forces, Port Bouet, Ivory Coast, w/5L msg to RFFA, ARQ-E3/48 at 0230. (Ed.)
10521.7: RFLI, French Navy, Fort de France, Martinique, w/"controle de voie," ARQ-E3/192 at 0421. (Ed.)

10663.3: AFS, Offutt AFB, Elkhorn, Nebr., w/KAWN wx data, 831/75 at 0337. (Ed.)
10798.5: RFLI, French Navy, Fort de France, Martinique, w/"non protege" tlc at 0334, ARQ-E3/96. (Ed.)
10805.2: LRO, Noticias Argentinas, Buenos Aires, Argentina, w/nx in SS at 0132, 775/75. (Ed.)
10814.0: RFQP, French Forces, Djibouti, w/"controle de voie," ARQ-M2 242/200, channel B, at 0325. (Ed.)
10945.0: CFH, Canadian Forces, Halifax, N.S., w/"NAWS de CFH" tape at 0140, 824/75. (Ed.)
10987.3: CCS, Santiago Navrad, Chile, w/coded & plaintext wx + other tlc, 850/100 at 0220. (Ed.)
11139.0: DFZG, MFA, Belgrade, Yugoslavia, w/Tanjung nx in EE, 356/75 at 1500. (Ed.)
11199.0: MFA, Lagos, Nigeria, w/ARQ phasing sig + "LYNX" in CW at 2357. (Ed.)
11476.0: HMF52, KCNA, Bosong, North Korea, w/nx at 1836, 50 baud. (Boender, NLD)
11536.0: HMF49, KCNA, Bosong, North Korea, w/nx at 1840, 50 baud. (Boender, NLD)
11541.7: RFLI, French Navy, Fort de France, Martinique, w/5L msgs, ARQ-E3/96 at 1311. (Ed.)
12140.0: HWN, Paris Navrad, France, w/RYRY & SGSG, 850/75 at 1535 & 2106. (Ed.)
12175.0: HMF42, KCNA, Jungsan, North Korea, w/nx in EE at 2144, 250/50. (Ed.)
12186.0: 5AQ62, Jana, Tripoli, Libya, w/nx in EE at 1757, 366/50. (Ed.)
12196.5: RFLI, French Navy, Fort de France, Martinique, w/"controle de voie," ARQ-E3/96 at 1205. (Ed.)

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12480.0: VTSR, the Indian bulk carrier Jag Rahat, w/Telex to Bombay, ARQ at 2122. (Ed.)

12480.8: UFZL, SS Gepar, w/telegrams in RR to Odessa R., Ukraine. ARQ at 2041. Also, un-ID ship sending selcal KYVV (St. Petersburg R., Russia), Arq at 0137. No tfc followed. (Ed.)

12490.0: HBDL, the Swiss cargo ship Grischna, w/msg to NMN for relay to NMG. ARQ at 1824. (Ed.)

12500.5: WHTP, American cargo ship Elizabeth Lykes, w/ETA Rijeka msg, ARQ at 1818. (Ed.)

13370.0: GYA, Royal Navy, London, England, w/encrypted msgs separated by RYRY & "vmgtcnjhb," 100 baud at 1834. (Boender, NLD)

13417.0: CCS, Santiago Navrad, Chile, w/IANTN tfc to LOL at 2013. 807/75. (Ed.)

13480.3: Un-ID w/foxes, 10 count, RYRY & "INT ZBZ" at 1510. foll by encryption, 1515-1524, 782/75. (Ed.)

13512.0: Un-ID idling. FEC, 1250-1309. (Ed.)

14352.0: "V5G," MFA, Bucharest, Romania, w/encryption after RRRRR, ROU-FEC/164.5 at 1652. (Ed.)

14353.0: SAM93, Swedish Emb., Havana, Cuba, w/"kurslista" (curriculum list), SWED-ARQ at 1845. (Ed.)

14367.0: BZP54, Xinhua, Yuryumqi, China, w/"items in leading U.S. newspapers today," 347/75 at 1307. (Ed.)

14374.0: CUW20, USAF MARS, Lajes AB, Azores, w/MARSgrams to AGA1HA at 1602. Packet. (Ed.)

14387.0: MFA, Sofia, Bulgaria, w/crypto after DDDDD to Geneva, Switzerland, 478/75 at 1327, foll at 1331 w/test tape reading, "AGA AGA AGA RYRYRY..." & op msgs. 5F msg to "Haga" (The Hague) at 1337. The "AGA" in the 1331 test tape may've been derived from "Haga." At 1339, "ZNN GB SK 73 88." (Ed.)

14405.0: UNHCR, Nicosia, Cyprus, relaying Telexes from Amman, Jordan, & Baghdad, Iraq, to Geneva, Switzerland, ARQ at 1625. Changed modes at 1645 to UN-ARQ. (Ed.)

14440.7: RFFA, Mindefense, Paris, France, w/nx in FF to Noumea, ARQ-E3/100 at 1354. (Ed.)

14467.5: DDH8, Pinneberg Meteo, Germany, w/coded wx at 1307, 380/50. (Ed.)

14481.7: RFTJ, French Navy, Dakar, Senegal, w/"controle de voie," ARQ-E3/48 at 1700. (Ed.)

14492.2: Un-ID French diplo w/brief op msgs in FF, but mostly idling, 1456-1527. ARQ6-90/200. (Ed.)

14577.7: RFFXL, French Forces, Beirut, Lebanon, w/"non protege" tfc at 1712, ARQ-E/72. (Ed.)

14613.0: Un-ID w/msgs in FF, ARQ, 1442-1450. (Ed.)

14614.0: Un-ID in ARQ at 1515-1542 appeared to be French Military of some sort. Msgs mentd "bey-routh" (Beirut, Lebanon), photos, & "meteo france." (Ed.)

14674.0: DFZG, MFA, Belgrade, Yugoslavia, w/nx in EE at 1530, 353/75. (Ed.)

14675.3: AJE, USAF, Croughton AB, England, w/EGWR wx data, 850/75 at 1420. (Ed.)

14681.0: Un-ID Romanian diplo w/encryption after RRRRR, ROU-FEC/164.5 at 2122. S/off in CW at 2132. (Ed.)

14681.5: "V5G," MFA, Bucharest, Romania, w/nx in Romanian, 1600-1635. ROU-FEC/164.5. (Ed.)

14688.0: Un-ID Romanian diplo w/encryption at 1434, ROU-FEC/164.5. (Ed.)

14695.0: "V5G," MFA, Bucharest, Romania, w/encryption at 1431. ROU-FEC/164.5. (Ed.)

14736.0: Un-ID w/5L msgs containing headers beginning w/11177. Was 479/75 at 1419. (Ed.)

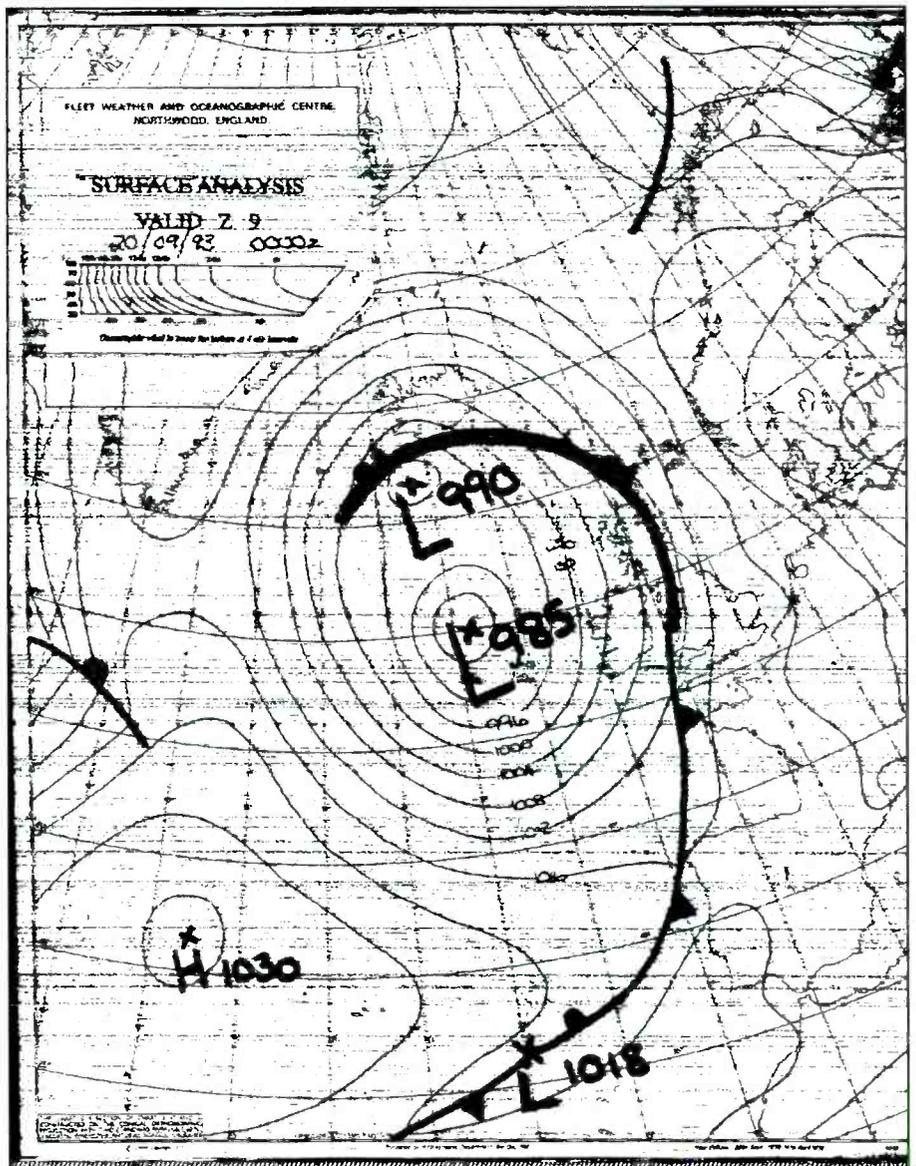
14760.8: YWM1, Maracaibo Navrad, Venezuela, w/foxes, RYRY, SGSG, & 10 count to ZPK, foll by "Ejercicio EC-01" msg, 960/75 at 1324. (Ed.)

14775.0: Un-ID w/encryption at 1217, ARQ-E/192. (Ed.)

14780.0: MFA, Sofia, Bulgaria, w/text in Bulgarian, 484/75 at 1425. (Ed.)

14785.1: ATP65, MEA, New Delhi, India, w/nx in EE, foll by RYRY, ID & freq. list, 179/50 at 1514. (Robert Hall, RSA)

14790.0: "V5G," MFA, Bucharest, Romania, w/encryption ending w/RRRRR, ROU-FEC/164.5 at



Surface analysis weather chart of GYA, Royal Navy, Northwood, England. (From Robert Margolis.)

1440. Two stas heard in CW at 1442 after RTTYcast. (Ed.)

14873.2: RFLIG, French Forces, Cayenne, French Guiana, w/"non protege" msgs & 5L msgs at 1458, ARQ-E3/96. (Ed.)

14935.0: GYA, Royal Navy, London, England, w/"of all the fishes in the sea, the mermaid is the one for me," 850/75 at 1010. (Hetherington, Fla.)

14988.7: TNL77, ASECNA, Brazzaville, Congo, w/wx, ARQ-M2/96, both channels, at 1650. (Ed.)

14991.7: Un-ID Egyptian diplo w/tfc in AA at 1502, ARQ. (Ed.)

15462.1: JANA, Tripoli, Libya, w/nx in FF, 425/50 at 1105. (Hall, RSA)

15544.0: BZS25, Xinhua, Yuryumqi, China, w/nx in EE at 1430, 410/75. (Hetherington, Fla.)

15801.7: French Emb., Fort de France, Martinique, w/5L grps, ARQ6-90/200 at 1857. (Ed.)

15860.0: Un-ID idling, ARQ-E/72 at 2033. Went QRT at 2058. (Ed.)

15922.4: DGP92, PIAB, Elmshorn, Germany, w/nx in GG at 2029, FEC-A/96. (Ed.)

15935.3: SUA291, MENA, Cairo, Egypt, w/nx in EE & FF, 428/75 at 1217. (Hall, RSA)

16017.6: DGQ21, PIAB, Elmshorn, Germany, w/nx in GG, FEC-A/96 at 1921. (Ed.)

16050.0: ZRH, Cape Town Navrad, RSA, w/test tape to CCM, 850/50 at 1348. (Ed.)

16072.2: Un-ID Egyptian diplo w/tfc in AA at 1928, ARQ. (Ed.)

16074.5: Un-ID w/5L msg ending at 1739, 500/50. (Hetherington, Fla.)

16081.7: Un-ID Egyptian diplo w/5L grps & msgs in AA, ARQ at 1745. (Hetherington, Fla.)

16175.0: NNN0NUW, USN MARS, Whidbey Island, Wash., w/MARSgrams to NNN0GKE, San Diego, Calif., ARQ at 1839. (Ed.)

16302.0: "DFZG," MFA, Belgrade, Yugoslavia, w/nx in SC, 481/75 at 1415. (Ed.)

16308.0: MFA, Sofia, Bulgaria, w/nx in Bulgarian, 481/75 at 1410. (Ed.)

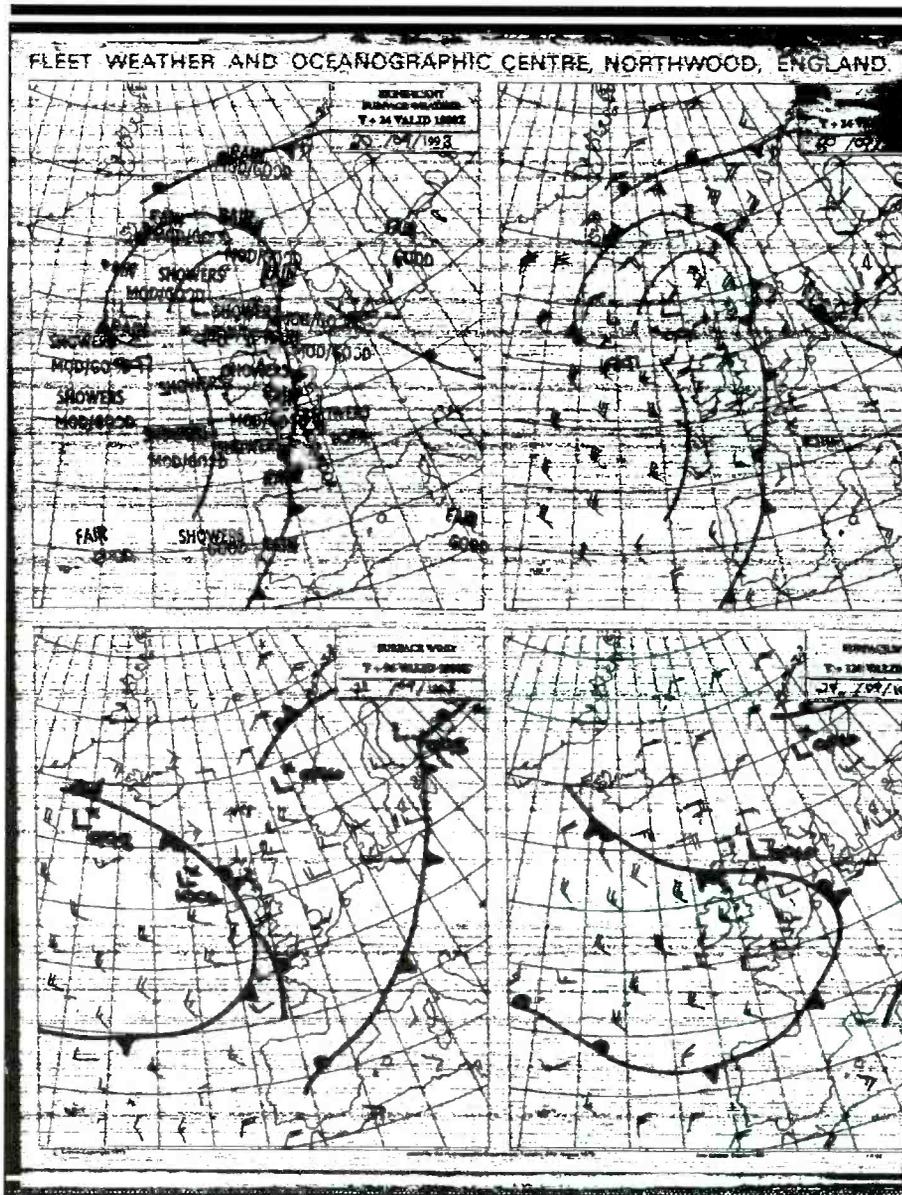
16318.0: MFA, Sofia, Bulgaria, w/nx in Bulgarian, 481/75 at 1343. (Ed.)

16324.7: RFTJD, French Forces, Douala, Cameroon, w/"controle de voie," ARQ-E3/192 at 2001. (Ed.)

16332.0: "V5G," MFA, Bucharest, Romania, w/encryption. ROU-FEC/164.5 at 1158. (Ed.)

16681.0: GFQD, ship Pacheco, w/ETA & supply list msg at 1035, ARQ. (Boender, NLD) British containers ship—Ed.

16684.0: C6HL2, the Bahamian cargo ship



Four-panel weather chart of GYA, Royal Navy, England. (From Robert Margolis.)

Bolivar, w/Tlx to Bremerhaven, ARQ at 1535. (Ed.)
16685.5: 9HEH3, the Maltese merchant ship Anand, w/Telex, ARQ at 2324. (Ed.)
16690.0: ICYZ, the Italian merchant ship Aquarius, w/ARQ msg re passenger whose "intention is to apply for political refugee status," at 2120. (Ed.)
16691.0: J8F15, the Saint Vincent merchant ship Torm America, w/Telex "via DAN" at 2132, ARQ. (Ed.)
16695.5: BPCK, the Chinese cargo ship Nan Ji Zhou, w/Tlx t/c. ARQ at 1557. (Ed.)
16698.5: OYXG2, the Danish cargo ship Mercandian Senator, w/a Telex in Danish, ARQ at 1500, foll by VPV selcal at 1509. The selcal is that of the Canadian Coast Guard station at Halifax, Nova Scotia. Also, OXBW2, the Danish cargo ship Mercandian Prince II, w/Telex in Danish, ARQ at 2110. (Ed.)
16699.5: VTSS, the Indian bulk carrier Jag Rani, w/QSPV selcal in ARQ at 1450. The selcal is that of Goeteborg R., Sweden. Also, S6HR, the Singaporean cargo ship Santiago Star, w/ETA Armuelles msg, ARQ at 2117. (Ed.)
16704.0: PGCJ, the Dutch cargo ship "Mystic," w/pos. rpt (was at Santo Domingo, Dominican Republic) in ARQ at 2100. (Ed.)
16708.0: DILS, the German containers ship Savannah, w/Tlx saying that "Cubans out of a small

boat taken on board and transferred to U.S. Coast Guard cutter "Sitkinac" for embarkation Key West Florida." Was ARQ at 1542. (Ed.)
16708.0: HCPT, the Ecuadorean fruit carrier Provincia del Oro, w/Telex t/c at 2149, ARQ. (Ed.)
16713.5: WMRU, the American cargo ship American Reservist, w/Telex t/c at 2142, ARQ. (Ed.)
16723.0: The Russian space monitoring ship "Cosmonaut Vladislav Volkov" w/telegrams to St. Petersburg R., Russia. ARQ at 1849. (Ed.)
16785.2: UOON, the Russian tanker "Kostrova," w/RURY & telegrams to St. Petersburg R., Russia, at 2230, 170/50. (Ed.)
16814.5: UPB, Provideniya R., Russia, w/ARQ phasing sig + ID in CW at 0010. (Ed.)
16828.0: UBN, Mariupol R., Ukraine, w/t/c in RR, ARQ at 1225. (Hall, RSA)
16914.5: SPH84, Gdynia R., Poland, w/ARQ phasing sigs & CW ID at 1717. (Hall, RSA) And w/msgs in Polish at 1808. (Ed.)
16918.3: GYA, Royal Navy, London, England, w/available channels list, 831/75 at 1832, and MTO, Royal Navy, Rosyth, Scotland, w/similar xmsn the next day at 1645, 822/75. (Ed.)
16927.5: UJY, Kaliningrad R., Russia, w/RURY + "ans 16653.5" foll by telegrams in RR, 170/50 at 1836. (Ed.)

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16937.5: GYA, Royal Navy, London, England, w/encrypted msgs separated by RYRY + "vmgtcnjhb," 170/100 at 1845. (Ed.)

16953.0: RFHJ, French Navy, Papeete, Tahiti, heard at 2026, ARQ-E3/100. (Ed.)

16955.5: UDH, Riga R., Latvia. w/telegrams in RR, ARQ at 1911. (Ed.)

16980.0: UNQ, Novorossisk R., Russia, w/msgs in RR. 170/50 at 2010. (Hetherington, Fla.)

17054.0: Un-ID w/RYRY, "vmgtcnjhb" & crypto, 170/100 at 2039. (Hetherington, Fla.)

17427.5: Un-ID w/encryption, ARQ-E/288 at 1556. (Ed.)

17446.8: Un-ID USAF AWS w/wx summary & forecasts for U.S. cities + wx data from KAWN, KWBC, PGFW & PHWR. 835/75 at 1430. (Ed.)

17506.7: Un-ID Japanese diplo w/5L grps & msgs in JJ. ARQ at 1412. Also w/nx in EE re Russo-Japanese relations at 1300 the foll day. (Hetherington, Fla.)

17521.5: HSW61, Bangkok Meteo, Thailand, w/wx reports from China, Japan, India & Thailand, 365/50 at 1400. (Hetherington, Fla.)

17550.9: RFTJF, French Navy, Port Bouet, Ivory Coast. w/msgs to MFA, Paris, ARQ-E3/192 at 1415. (Boender, NLD)

18013.9: RFGW, MFA, Paris, France, w/5L grps for RFFVAT. ARQ-M2/200 at 1155. (Hall, RSA)

18028.0: OMZ, MFA, Prague, Czech Republic, w/nx in Czech, 1153-1220, 370/100. (Ed.)

18037.2: Un-ID w/UFXX selcalling in ARQ, 1422-1427. (Ed.)

18040.5: HGX21, MFA, Budapest, Hungary, w/msgs in Hungarian to HGX28, London, DUP-ARQ at 1412; and w/5L msg to HGX38, Vientiane, Laos, at 1500. Also, Hungarian Emb., Havana, Cuba, w/tfc at 1651, DUP-ARQ. (Ed.)

18041.2: HGX21 w/5L msg to HGX20, Hanoi, Vietnam, DUP-ARQ at 1528. (Ed.)

18043.3: Possibly the Argentine Navy w/5L grps at 1250, 479/75. (Hall, RSA)

18056.0: DFZG, MFA, Belgrade, Yugoslavia, w/nx in SC. 381/75 at 1411. (Ed.)

18060.0: CYS22, Polish Emb., Ottawa, Ont., Canada, w/tfc at 1342, POL-ARQ. Also, SNN299, MFA, Warsaw, Poland, w/"paszport" tfc to Ottawa, POL-ARQ at 1345. (Ed.)

18060.3: CCM, Magalanes Navrad, Chile, w/RYRY to ZRH, Capetown Navrad, RSA, 1400-1415, 833/50. (Ed.)

18062.8: CCM w/RYRY + "ZB2 5 IN 16.050 kHz" to ZRH, Capetown, 808/50 at 1348. ZRH was on 16050 at same time w/foxes, 10 count & RYRY to CCM. ZRH went QRT at 1358 & CCM followed suit at 1400. (Ed.)

18068.8: SNN299, MFA, Warsaw, Poland,

w/visa tfc in Polish. POL-ARQ, 1602-1637. (Ed.)

18255.0: ATB68, MEA, New Delhi, India, w/nx in EE at 1600, 302/50. (Ed.)

18269.0: Un-ID idling in ARQ mode, 1336-1446. (Ed.)

18284.7: HBD20/2, MFA, Bern, Switzerland, w/s/off msg to HBD46, Havana, Cuba, at 1350, foll by tfc in GG & 5L grps to HBD73, Lima, Peru, ARQ. (Ed.) Same w/nx in GG at 1213. (Hall, RSA)

18337.0: Un-ID at 158/100 at 1140. M-7000 will not decode. (Hall, RSA) This sta. runs encrypted RTTY at 170/110. It comes in strongly here in the States. There are many more freqs. where 170/110 RTTY can be found. Many of these stas seem to operate in pairs, with one being found within 4 kHz of the other—Ed.

18366.7: RFFI, French Forces, Paris, France, w/"non protege" msgs to RFHJ, Papeete, Tahiti, at 1503, and nx in FF ("presse marine") at 1730, ARQ-E3/100. (Ed.)

18448.0: "KRN" w/RYRY foll by a 5F msg w/hdr beginning "11166..." Was 476/75 at 1736. QRU QRU SK SK at 1737. (Ed.)

18490.2: Un-ID w/text in Cyrillic, 513/100 at 1218. (Hall, RSA)

18579.5: CXR, Montevideo Navrad, Uruguay, w/RYRY & SSGS to 5KM, 1457-1510, 817/75. (Ed.)

18592.7: CLP12, Cuban Emb., Lima, Peru, w/"Juridica" tfc in SS, 1618-1622, 452/75. (Ed.)

18640.0: CLP1, MFA, Havana, Cuba, w/RYRY sans ID, 500/50 at 1407, foll by prensaminrex at 1410. (Ed.)

18697.6: DGS70, PIAB, Elmshorn, Germany, w/nx in GG & SS to Central America at 2019, FEC-A/96. (Ed.)

18702.5: DGS70 w/nx in GG at 1900, FEC-A/96. (Ed.)

18768.5: Un-ID w/encryption, ARQ-E/288 at 1305. (Ed.)

18846.3: Un-ID s/off w/"QTU 98203 QRU QRU SK SK," 466/50 at 1633. (Ed.)

18872.0: BZR68, Xinhua, Yuryumqi, China, w/nx in EE at 1311, 360/75. (Ed.)

18907.2: GXQ, British Army, Stanbridge, England, w/foxes, 10 count & RYI's, 170/50 at 1322. (Ed.)

19117.6: MFA, Jakarta, Indonesia. w/nx in EE at 1200, ARQ. (Hall, RSA)

19130.0: JPA59, Interpol, Tokyo, Japan, w/crypto & some tfc in EE to "I.P. Kiev," ARQ at 1214. (Hall, RSA). Interesting to note that Ukraine is an Interpol member. Anyone know when this came about?—Ed.

19214.5: RFLI, French Navy, Fort de France, Martinique, w/5L grps, ARQ-E3/96 at 1715. (Ed.)

19223.2: Un-ID w/RQ on both channels, ARQ-M2-342/200 at 1729. (Ed.)

19332.5: LBL1, Norwegian Army (UNIFIL), Beirut, Lebanon, w/tfc in Norwegian, ARQ at 1235. (Hall, RSA)

19400.0: VVD69, Delhi Meteo, India, w/coded wx, 105/50 at 1240. (Hall, RSA)

19418.7: RFFA, Mindefense, Paris, France, w/"non protege" tfc at 1347, ARQ-E3/100. (Ed.)

19442.0: LOL, Buenos Aires Navrad, Argentina, w/RYRY to DAB22 & RKV, 425/75 at 1730. (Hetherington, Fla.)

20401.5: Indonesian Embassy, Lagos, Nigeria, w/nx re Africa, ARQ at 1300. (Hetherington, Fla.)

20518.0: LOL, Buenos Aires Navrad, Argentina, w/Exercise Oceanic VIII tfc, 425/75 at 1715. (Hetherington, Fla.)

20616.0: OMZ, MFA, Prague, Czech Republic, w/nx in Czech at 1235. (Hetherington, Fla.) Baud rate & shift?—Ed.

20801.5: HBC88, ICRC, Geneva, Switzerland, w/tfc in FF, ARQ at 1015. (Hall, RSA)

20872.0: AGA8HI, USAF MARS, Hickam AFB, Hawaii, w/MARSgrams, 170/75 at 1810. (Ed.)

22356.2: UIAA, the Russian merchant ship Obdorsk (class unknown—Ed.), working Kaliningrad R. at 1120, 170/50. (Hall, RSA)

22365.1: UVKG, ship Stratosfera, working Sevastopol R., 170/50 at 1230. (Hall, RSA) Ukrainian cargo ship—Ed.

22378.1: FFT91, St. Lys R., France, w/tfc list, FEC at 1006. (Hall, RSA)

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CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

Those strange noises, obviously intended as jamming, continue to be noted against the signals of such anti-Castro broadcasters as La Voz del CID, Radio Caiman and La Voz de Fundacion. It amounts to a sort of two or three tone whine, slightly off the target frequency and not strong enough to be anything more than a slight nuisance. You can check it yourself by tuning La Voz del CID on 6305 and 11941 between 0420 and 1200, 7340 and 9942 from 1200 to 0415 and 11635 from 1100 to 2300. Radio Caiman is on 9965 from 1200 to 1530, 1700 to 1800 and 2300 to 0200.

The National Radio of the Arab Saharan Democratic Republic, which appeared on 11520 some months back and was quite widely heard to 0000 closing, has apparently left the air or has moved to a new frequency not yet found by anyone.

There are two stations in Somalia speaking on behalf of their own factions and both using the name Radio Mogadishu. One, using the slogan "the voice of the great Somali people" speaks for General Aidide, with broadcasts very hostile to the United Nations and its mission in Somalia. It is operating from 1500 to 1700 on 6870 upper sideband. The transmitter is reported to be a mobile unit, brought into service after US warplanes destroyed his Radio Mogidishu on June 12. The other station supports Ali Mahdi Muhammed. Its schedule is 0400-0500, 1000-1100, 1400-1430 and 1600-1900, but we'd guess this tends to be irregular. It is operating in the area between 6862 and 6866, also on upper sideband. These two are in addition to the occasionally active Voice of the Somali Masses, mentioned last time. That station uses a frequency near 9540, used by the UN's station in Somalia, Radio Manta. And it's reported there's still another station on the air from Somalia. Apparently the International Amateur Radio Network has put a station in the air, operated by Sam Voron. Veron, incidentally, is the fellow who operated the ill-fated Radio Free Bougainville which you've read about in past columns.

Reports we've seen haven't specified a name for this station but it is supposed to be on the air from 1600 to 1800 on 7499 and 0400 to 0500 on 7460.

The Mozambique National Resistance still operates A Voz de Renamo, which it returned to the air in October, 1991 after operating the "Voice of the Mozambique National Resistance" until 1984. The current station claims to be located at Gorongosa in the central part of Mozambique. As we understand it the Mozambique government has now granted legitimate status to the station. A Voz de Renamo has a so-called external service which is scheduled

at 1600 to 1615 and 0500 to 0515 on 10100. Theoretically the station should be hearable in North America during latter time periods, at least on occasion during the summer months. However, we've noted no reports of anyone having logged it.

Die Deutsche Stimme der Frieheit (Voice of Freedom) is a broadcast via WWCR which reportedly takes a neo-Nazi line. It is produced in Canada by one Ernest Zundel and is on the air Sundays from 1630 to 1700 on 15685.

American Dissident Voices, produced by Kevin Alfred Strom and aired over WRNO now has a second weekly airing—at 0500 on 7395 (the other is at 0100 on 7355).

All too many of today's clandestine broadcasts operate on schedules which make them nearly impossible to hear in North America. One clandestine "situation" we can monitor is Colombia, which offers a good amount of mystery and on-air cat and mouse games. Try tuning in on Radio Patria Libre, the station of the National Army for Liberation. Patria Libre is on the air on virtually a daily basis, signing on at 0030 and running to some minutes past 0100, in Spanish. You may also catch

it in the mornings between 1130 and 1215. The frequencies may vary a good deal but are centered around 5840, 6270 and 15050. 7636 USB is a new frequency. Start on one of those and check up to 30 kHz above and below.

On occasion you may hear something calling itself El Pueblo Responde, which is apparently a station the government operates to answer the guerrillas and condemn terrorism. When active, the Responde station is usually on at the same time as Patria Libre and on a nearby frequency, too. Obviously the government operators are hoping people will tune in their station thinking they're got Patria Libre. Apparently Patria Libre is also being jammed at times. So, there's a bit of a radio war going on here, reminiscent of the days of the Nicaragua and El Salvadoran clandestine games of a few years ago!

If you've logged some clandestines recently or obtained some QSLs or picked up some news we'll be glad if you take a moment and send the info in. Address tips, background information, news clips and so on are always very welcome. Thanks!

Until next month, good hunting! ■

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PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

Radio Esoterica, "Playing the best music you never heard" was recently relayed by Europirate Radio Stella International and operator Moriarty tells me he got reports from all over Europe, including Lithuania. He says that the North American Pirate Relay Service is planning to relay such stations as Radio Freaks (from Germany), Jolly Roger Radio International from Ireland and Radio Magic out of Russia. Radio Esoterica can be QSL'd via P.O. Box 146, Stoneham, MA 02180.

Information arrived from Magic Mike of KMCR, Magic Carpet Radio, stating that it is broadcasting much less often than it used to but, when active it's on 7415 or 7425. The station says it'll be heard on medium wave soon, using around 10 watts on 1610, 1621 or 1650. They also note that QSLs are no longer given except in rare circumstances.

WKIK was logged by Brian Castleberry of Mississippi on 7415 USB from 0140 to 0200. The program included satellite news, mailbag, some commercials, a satirical newscast, and various commercials. They announced the Wellsville address at 0200 closing.

Fake Radio USA was logged by Mike Leclerc in Connecticut on 7515 USB at 0120 to 0134 and again at 0156-0218 with a parody punk rock program takeoff on Radio USA. No address noted.

Mike had Radio Airplane on 7465 at 0249-0327 with Captain Eddy, rock and pop and comedy and a female Spanish number station parody adventure. Announced the Wellsville address.

Radio Stella International was another Leclerc logging, on 7413 at 0202-0232, relayed by NAPRS. Jock Wilson was the host of a pop music program and used the slogan "Scottish Free Radio." Bill Matthieu in Massachusetts caught this one around 0215 with music and IDs.

Matthieu also had Wire Line Radio on 7450 at 0230 with a variety of music styles. Leclerc had them from 0205-0252 including a Johnny Carson parody. They announced the Blue Ridge Summit address. Also heard on a different occasion from 0120-0231 with music and recorded comedy. Part of this program was jammed with white noise and music from an unknown station.

George Roberts in Pennsylvania had Radio Deadman on 7413 at 2340 with heavy metal, numerous IDs and parody on religious programming.

WEED also noted by Roberts on 7465 USB at 0240 with a program of rock announced by a man and slogan "broadcasting from the great southwest."

Leclerc had Hello Radio on 7415 USB



Here's the QSL from Radio Esoterica—"playing the best music you never heard."

at 0336 but with no program content other than the announcer saying "Helloooooo Radioooooooo" a few times.

Down East Radio was also caught by Leclerc, on 7465 LSB at 0108-0129 with a comedy program with a comedian with a Yankee or Maine accent giving Down East humor in front of an audience. The broadcast was relayed by NAPRS. Blue Ridge Summit address. Heard again with a rebroadcast of the earlier program from 0103-0122.

Matthieu had the Voice of Laryngitis on 7415 at 2245 with a comedy skit on the FCC, fake commercials and off at 2300 with a barking seal sound effect.

WCYC was logged on 7415 by Leclerc from 0147-0215 with hard rock and rap music. They gave the Blue Ridge Summit address, as well as an 800 number. Mike says rough audio on this one.

Mike had Cheese Radio on 7415 at 0056-0112 with announcer "Cheeto" and

a jazz program. This one says no QSLs, reports Mike.

Solid Rock Radio noted by Leclerc on 7465 at 2330 with rap and rock music. They're using the old NBC chimes as an interval signal and giving the Wellsville address for reports.

Finally, Mike logged WLIS—We Love Interval Signals—on 7415 at 0201-0231 playing interval signals of various international broadcasters as well as music from some of the countries. Mike says the audio sounded distorted. Use the Blue Ridge Summit address for reports to this one.

Please keep those reports flowing in! Your loggings are always welcome, always appreciated and always important. A reminder to pirate station operators that I'm always interested in details about your station—plans, facilities, programming and so on. Keep the mail coming!

That's it for this time—I'll catch you again next month. ■



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LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

As you may have heard by now The Christian Science Church has decided to sell off WCSN, its shortwave station at Scott's Corners, Maine, and consolidate its shortwave operation at the WSHB facility in South Carolina. WCSN has been on the air with 500 kw since 1987, beaming broadcasts to Europe and Asia. WCSN will continue to operate for six hours per day until an additional transmitter and antennas are installed at WSHB for broadcasts to Africa. KHBI in Saipan will continue to serve Asia, Australia and New Zealand.

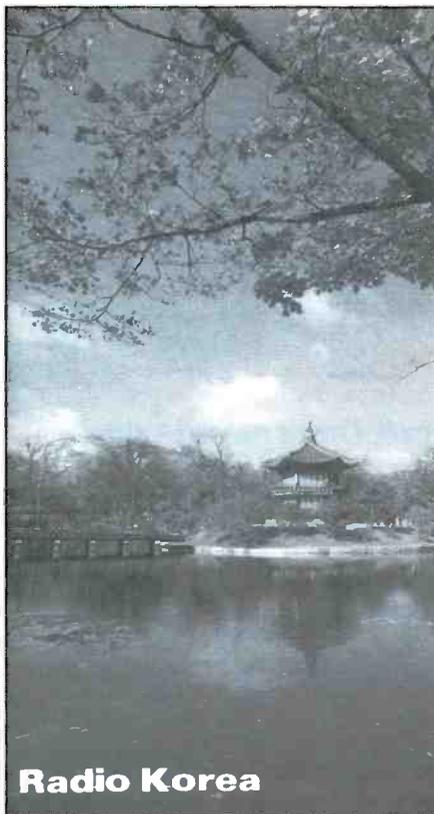
The former two hour program block format has been cut down to one and the number of broadcast hours on all of the stations has been reduced. The new hour long format will include features from American Public Radio, the letterbox segment and features on international news. Weekend programming will continue to feature the various Herald religious programming but in shorter versions. When not in use for Christian Science-produced programming the stations will be available for use by other broadcasters, though they must comply with Monitor standards. The changes are expected to save \$1.6 million yearly. In 1933 it cost \$16.6 million to program and operate the three facilities.

Radio Copan International—affiliated with Florida's not yet active Radio Miami International—has come on the air at last, but it is not an easy station to log. The station is supposed to be using one kilowatt but, early on at least, was running at something around 100 watts. The schedule is 1400-1500, 1745-1900 and 2100-2230 on 15675. Radio Copan International is named after the well known Mayan ruins in Honduras. The address in Honduras is Apartado 955, Tegucigalpa.

Here's an interesting one to try for: There's a special Crisis Forces Radio on the air for Russian troops serving on the Tadjik-Afghan border where a mini war is in progress. It is scheduled Monday through Friday at 1600-1630 on 4740, 4940 and 11835. Only the latter frequency offers any chance for reception in North America.

One nice DX target that is now a little easier to hear is Radio Kiribati, which has moved from its 17 MHz frequency down to 9825. Check for the station at 0555 sign on. The first hour is in English and includes BBC news at 0600.

Speaking of Pacific island DX, if we had a "Best Catch of the Month" award, this month's would surely have to go to Mrs. Gigi Lytle in Lubbock, Texas who had multiple logs of Radio Tonga on 5030, between 1130 and 1300. Gigi sent us a tape of one morning's reception. As she notes there's a problem with Radio Rebelde on



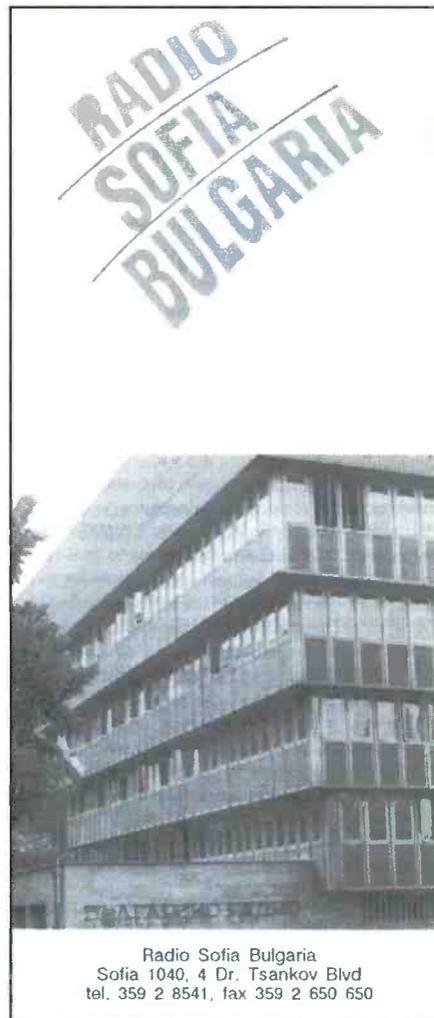
Radio Korea

Another in the endless variety of beautiful QSLs from Radio Korea. Thanks to Christopher Holt, Assonet, Mass.

5030 but that's to be expected. Her log is especially noteworthy since she achieved it on a portable set, using an indoor antenna! Congrats, Gigi, nice work!

John Vodenik, engineer at the VOA's Bethany, Ohio relay station and who also acts as an additional source of VOA QSLs notes that he has been behind with replies lately. He's spotted a few mistakes on QSLs already issued and says that corrected cards will be going out to those who received QSLs with inaccurate information on them.

Adrian Peterson of Indiana notes that three US shortwave stations broadcasting from the Pacific are adding additional transmitters. New 100 kw units are going to be added at KTRW on Guam, KHBN, Palau and at AWR-Asia's KSDA in Guam. KSDA is also expecting to get two more 100 kw transmitters sometime in the future. These will be replacements for the two currently in use, which are destined to be moved to a new AWR station in Africa (the site of which hasn't yet been determined). Peterson also notes that AWR broadcasts via Africa Number One in Gabon have been discontinued. These are now aired via one of the Russian sites.



Radio Bulgaria's building in Sofia.

Two of the South African domestic networks are now being relayed on shortwave for the first time, replacing the former broadcasts of Radio Orion and Radio Suid Afrika. Afrikaans Stereo is on from 0300 on 3320. Radio 2000 airs on that channel between 2300 and 0300, according to Marie Lamb of Brewerton, NY.

KNLS, Anchor Point, Alaska says they can't QSL reports of their transmissions via Novosibirsk, Russia, which are scheduled Fridays through Sundays at 1300-1500 "in the 19 meter band." KNLS notes that the frequency and meter band are subject to change. We suspect the people at KNLS don't know when these changes are made or the frequencies involved and that's why they can't confirm the reports. 11970 is the most recent usage we know of.

A reminder from WWCR that if you used to be on their mailing list and haven't had a schedule in awhile it's because all that

information was lost in the fire. You need to write them again to get back on the list. Contact Adam Lock, Sr., WWCR International Program Director, 1300 WWCR Avenue, Nashville, TN 37218.

Your contributions are always welcome for our monthly Listening Post log. We ask that you list items by country and include your last name and state abbreviation after each item. Please double space (at a minimum) to make it easier to cut the reports for sorting.

Also wanted are news items about stations, schedules, background information, spare QSLs and other station literature, your comments and observations. Readers enjoy shack photos and we'd be more than happy to receive one from you! Thanks for your continued participation at whatever level you can.

Here are this month's logs. Broadcast language is assumed to be English (EE) unless otherwise noted (SS= Spanish, AA = Arabic, GG = German, etc.) All times are UTC.

ANGOLA—Radio Nacional, 7245 at 0544 in PP with African music, man and woman announcers, ID, possibly a Sunday mass. (Lamb, NY)

ANTIGUA—Deutsche Welle relay, 6160 at 0903 with news. (Moser, PA)

ASCENSION ISLAND—BBC relay on 6065//9600 with World Service for Africa to 0659 sign off. (Lamb, NY) 17790 at 1335. (Moser, PA)

AUSTRALIA—Radio Australia, 7240 at 1230. (Northrup, MO)

1132, parallel to 9510//13605//15170. (Pap-pas, SD) 9510 at 1435. (Low, TX) 9580//11800 at 1301 with world news. (Gentry, IL) 17715//21740 at 0100 with news. (Cohen, ON)

AUSTRIA—Radio Austria International, 6015 via Canada at 0639 with economic news. (Moser, PA)

BELGIUM—Radio Vlaanderen International, 13655 at 2330. (Campbell, IL)

BENIN—ORTB Cotonou, 4870 at 2145-2200 in FF with local news and info, some hi-life music. (Urbelis, NY)

ORTB Parakou, 5025 at 2130-2200 with hi-life, local language, FF music. Different programs than Cotonou was running. (Urbelis, NY)

BOLIVIA—Radio San Miguel, 4926v at 0243 in SS with IDs, talks, sign off with anthem at 0306. (Lamb, NY)

The Television Market

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CIRCLE 69 ON READER SERVICE CARD

Radio Perla del Acre, 4600 at 0945 in SS with campesino music, talks, IDs. (Lamb, NY)

Radio Santa Cruz, 6135 at 0900 in SS with IS, sign on announcement, ID, "Buenos Dias, Bolivia" program. (Lamb, NY)

BOTSWANA—VOA relay on 12080 at 0544 with "VOA Wednesday Morning." (Lamb, NY)

BRAZIL—Radiobras, 15445 at 1233 with Brazilian music, woman announcer in EE. (Moser, PA) 1232 with ID "This is Radio Nacional de Brazil broadcasting from its studios in Brasilia." (Zamora, NM) 1244 with talk and local music. (Gentry, IL)

Radio Cancao Nova, 6105//9675 at 0654 in PP

with Christian music, religion, ID, address. (Lamb, NY)

Radio Bandeirante, 6090 at 0730 in PP with Brazilian pops, commercials, IDs, time checks. (Urbelis, NY) Here and parallel 11925 at 0651 with pops, ID, jingles, cookoo clocks. (Lamb, NY)

Radiodifusora Amazonas, 4805 at 0933 in PP with IDs, talks with echo sound effects, Brazilian pops. (Lamb, NY)

BULGARIA—Radio Bulgaria on 11720 at 2220. (Low, TX) 13670 at 1809 with sports news. (Moser, PA) 1820 talk about Bulgarian textile and agriculture industries. (Gentry, IL)

BURKINA FASO—Radio Burkina, 4815 in ver-



KSDA, at Facpi Point, Agat, Guam, will add a third, 100 kw transmitter.



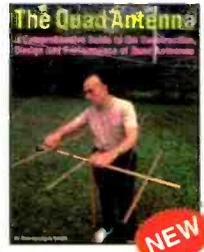
Here's the transmitter hall at WHRI, Indiana showing transmitters "Angel One" and "Angel Two." Thanks to R.C. Watts in Kentucky.



Books and Videos

The Quad Antenna

Hams love antenna books and this book is no exception. Written by world renowned author Bob Haviland, W4MB, The Quad Antenna is the authoritative technical book on the design, construction, characteristics and applications of Quad Antennas. Discover how to easily build a quad antenna for your station that will help you fill your logbook with rare DX that you have only dreamed about before.



Order No. QUAD..... \$15.95

The Packet Radio Operator's Manual

This book is written by CQ columnist and Amateur Radio Packet authority Buck Rogers, K4ABT. An all new introduction and guide to packet operation, it is the perfect single source, whether you're an advanced user or just starting out. Learn about packet radio without all the technical jargon. Also included are detailed hookups for dozens of radio/packet controller/computer combinations, making this book the definitive resource for the active packet user.



Order No. PROM..... \$15.95

Ham Radio Horizons: The Book

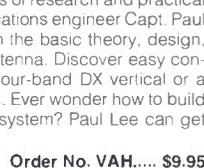
Written by Peter O'Dell, WB2D, this is a book about ham radio that every beginner can enjoy! If you want to get in on the fun and excitement of Amateur Radio, Ham Radio Horizons is the perfect way to get started. HRH is full of tips from expert hams in: DXing, Contesting, Serving the Public, Ham Radio in Space, Experimenting, Digital Communications — you name it! This exciting book is an excellent gift to a prospective ham or for use in your club's licensing classes and library.



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Take advantage of the 20 years of research and practical experience of naval communications engineer Capt. Paul H. Lee, USN(ret), N6PL. Learn the basic theory, design, and practice of the vertical antenna. Discover easy construction projects such as a four-band DX vertical or a broadband array for 80 meters. Ever wonder how to build a functional directive vertical system? Paul Lee can get you started today!



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Learn with this video how veteran operators set up their satellite stations. Find out how to locate and track ham satellites with ease. Watch as operators access current satellites and contact far ranging countries around the world. This video is filled with easy to understand advice and tips that can't be found anywhere else.



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Getting Started in Ham Radio

This is a fast-paced video introduction to the fascinating world of ham radio. CQ's experts show how to select equipment and antennas; which bands to use; how to use repeater stations for improved VHF coverage; the importance of grounding and the basics of soldering. How to get the most out of your station, whether it's home-based, mobile or hand-held.



Order No. VHR\$19.95

Getting Started in DXing

Top DXers share their experience with equipment, antennas, operating skills, and QSLing. You'll see hams work rare DX around the world. If you're new to DXing, this video is for you! All this valuable information may well give you the competitive edge you need to master the exciting world of DXing.



Order No. VDX..... \$19.95

Getting Started in Contesting

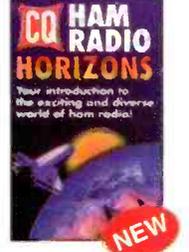
For the newcomer to contesting or an experienced veteran, this video is for you! You'll get advice and operating tips from some of contesting's most successful competitors, including Ken Wolff, K1EA, Dick Newell, AK1A, and CQ's own contest columnist, John Dorr, K1AR. Here's just a sample of what you'll see: what contesting's all about, explaining contest jargon, tips for beginners, how to compete from a small station, operating secrets from the "pros", live QSOs from world class stations, VHF/UHF contesting.



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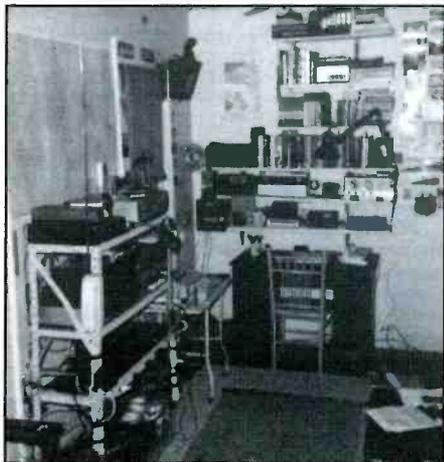
CQ's 1994 Amateur Radio Calendar contains dates for major operating events and conventions. In addition, it's chock-filled with public holiday and commemorative dates plus valuable astronomical information.

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Here's the equipment-filled shack of George Doscher of Poughkeepsie, NY.

nacular with hi-life music at 0000-0045. (Urbelis, NY)
CANADA—Radio Canada Int'l, 17870 at 1956. (Campbell, IL)
 Radio Japan via Sackville, 15325 at 0302 with news. (Moser, PA)
 BBC via Sackville on 15260 at 1616. (Moser, PA)
 CFRX, 6070 relay CFRB medium wave at 1707. (Moser, PA)
CHINA—China Radio Int'l, 11715 (via Mali, editor) at 0025 with program on ancient books. (Cohen, ON)
 Heilongjiang 1, 7350 at 1210 in CC. (Northrup, MO)
COLOMBIA—La Voz de Yopal, 5050 at 0434 in SS with reggae, LA pops, IDs to 0500 sign off. (Lamb, NY)
COSTA RICA—Radio For Peace Int'l, 15030 at 0306. (Campbell, IL)
CROATIA—Croatian Radio, 11830 at 0502 in Croatian with news. IDs and mentions of various Balkan countries. (Lamb, NY)
CUBA—Radio Havana Cuba, 6010 at 0304. (Moser, PA) 9510 at 0648 with medical news. (Vaage, CA) 11970 in SS at 0140. (Low, TX)
 Radio Rebelde, 3366 in SS at 0632 with merengues and other LA music. (Lamb, NY)
CZECH REPUBLIC—Radio Prague at 0405 on 7345. (Low, TX) 11900 at 0300 with sign on, news. (Moser, PA)
DOMINICAN REPUBLIC—Radio Cima Cien,

4960 in SS at 0000-0145 with merengues and many IDs. (Urbelis, NY)
ECUADOR—HCJB, 11925 at 0615; woman with cooking program. (Vaage, CA) 17790 at 1709 with news and comment. (Moser, PA) 1952. (Campbell, IL) 17875 at 1700 in SS. (Low, TX)
EGYPT—Radio Cairo, 9475 at 0230. (Campbell, IL) Here and new 11600 at 0209 in EE with Islamic religious program, ID, news. Poor modulation. (Lamb, NY) ENGLAND—BBC, 9515 at 1615 with "New Ideas." (Moser, PA) 9918 (up from 9915? editor) 9640//12095 at 0559. (Vaage, CA)
 2240 with "Network UK" and documentary about plants. (Cohen, ON) 15070 at 1540 with "A Jolly Good Show." (Gentry, IL)
 Radio Japan via Skelton at 2345 on 60606 and 0741 on 7230. (Lamb, NY)
FRANCE—Radio France Int'l, 17650 at 1416 with interview about Armenia. (Moser, PA)
FINLAND—Radio Finland Int'l, 11755 at 0157 with news, features, ID, fax number. (Lamb, NY) Here and parallel 15400 at 1230 sign on with time signal, news, background reports. (Zamora, NM) 1230 with news, reviews. (Moser, PA)
GABON—Radio France Int'l relay, 4890 at 0355 sign on with IS. ID, news in FF. (Lamb, NY) 17620 at 1617. (Moser, PA)
 Africa Number One, 9580 at 1845-1950 in FF with hi-life music, announcements, pop mix. IDs, EE news. (Urbelis, NY)
 RTV Gabonaise at Libreville, 4777 in FF at 2200-2230 with hi-life and other African music types. Heavy RTTY QRM at times. (Urbelis, NY)
GHANA—GBC, 4915 at 0621 with news, African music, ID. (Lamb, NY)
GERMANY—Voice of Germany, 7285 and 11815 at 0200. (Campbell, IL) 11795//11810 at 0617 with news in GG. (Vaage, CA)
 15135 at 2127 with European Journal. ID, "Africa in the German Press." (Zamora, NM)
 VOA Wertachtal relay, 6140 at 0329 with EE ID and into Romanian. (Lamb, NY)
 Bayerischer Rundfunk, presumed, 6085 at 0227 in GG with middle of the road music. (Lamb, NY)
 Sudwestfunk, 7265 at 2343 in GG with rock, soul, IDs. (Lamb, NY)
 RIAS, Berlin, 6005 at 2312 in GG with jazz, ID, news. (Lamb, NY)
GREECE—Voice of Greece, 9380//9420 at 0341 with news by woman. Off 0350. (Zamora, NM) 9420 at 0128 with balalaika music. (Cohen, ON) 17515 at 1258 with music, anthem and into non-EE at 1300. (Moser, PA)
 Radio Makedonias, 11595 at 1716 in GG with IDs, Greek folk music. (Lamb, NY)
GUAM—Adventist World Radio, 11980 at 1225 with religious program in EE being translated into Chinese. (Zamora, NM)
HAWAII—WWVH, 15000 at 1412, woman with time signals. (Moser, PA)
HONDURAS—HRVC, 4820 at 0530 0615 with SS religious programs, ID, sermon. (Urbelis, NY)
HUNGARY—Radio Budapest, 9835 at 0207 with world news, commentary. (Moser, PA) 11915 at 0200. (Campbell, IL)
INDIA—All India Radio, 4990 from Madras from 2359 to 0045 in Tamil with Hindi music, man announcer, AIR IS. (Urbelis, NY)
 11620 at 1900, woman with news. (Moser, PA)
IRAN—VOIRI, 15084 at 1616 with Koran recitations, talks. (Pappas, SD) 2209 in Farsi with domestic service relay, IDs. (Lamb, NY) 15260 at 1930-2015 with Koran, news, revolutionary talks. Farsi music. Mixed with BBC sign on at 1957. This is parallel to 9022. (Urbelis, NY)
ISRAEL—Kol Israel, 11587//11675//15640 at 1700 with 15 minute EE news. (Lamb, NY) 15640//17575 at 1900 with news. (Gentry, IL)
ITALY—Italian Radio Relay Service, 7125 at 0530-0555 with EE religious program, ID. (Urbelis, NY)
JAPAN—Radio Japan, 6050//7230 at 0730 with "Tuesday Magazine." (Urbelis, NY) 9685 at 2221 in JJ with EE bits on disaster plans. (Cohen, ON) 11760 at 0745 with IS and EE/RR IDs, program in RR and off at 0845. New frequency? (Rausch, NJ) 11815 at

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Abbreviations Used in Listening Post

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



0906 with news, IDs, transmitter site, frequencies, "World Update." (Lamb, NY) 1925 at 2125 (Low, TX) JJY, 8000 with time signals at 1252. (Moser, PA) **JORDAN**—Radio Jordan. 11940 at 0427 in AA with local music, IDs, news. Also noted at 0400 sign on. (Lamb, NY)

KUWAIT—Radio Kuwait, 9840 in AA at 2240, 13620 at 1800 with "Songs and Music." (Cohen, ON) 1859 "Musical Rendezvous" program. (Lamb, NY)

LEBANON—Wings of Hope, 11530 at 2332 with Gene Scott. (Lamb, NY)

LESOTHO—BBC relay. 11940 at 1345 with "News Hour." (Zamora, NM)

MEXICO—Radio Mil. 6010 at 0615-0730 in SS with commercials, IDs, announcements, LA music. (Urbelis, NY)

Radio Educacion. 6185 at 0800 with EE ID and call letters as XEPPM, address, Mexican guitar music. (Lamb, NY)

MONACO—Trans World Radio. 9480 at 0640 with sign on, ID, schedule. "Arise." (Moser, PA) **MOROCCO** RTV Marocaine. 17815 in AA at 1508. (Low, TX)

NETHERLANDS—Radio Netherlands, 17610 at 1402 with interview about economics. (Moser, PA)

NETHERLANDS ANTILLES—Radio Netherlands relay. 11895 at 0904. (Moser, PA) 17605//21590 at 1930. (Low, TX)

NEW ZEALAND—Radio New Zealand Int'l, 9700 at 0900 with ID, news. (Moser, PA) 1139. (Campbell, IL) 15120 at 0314 with commercials, sports scores, news-talk program for a Saturday afternoon. (Zamora, NM)

NIGERIA—Radio Nigeria, Kaduna, 4770 at 0511 with "News Nationwide." (Lamb, NY)

Voice of Nigeria. 7255 at 0454 sign on and into "Morning Flight." (Lamb, NY) 0500. (Campbell, IL)

0638 with African news. (Moser, PA)

NORTHERN MARIANAS—KHBI, Christian Science Monitor, 9425 at 1200 sign on with ID, news. (Zamora, NM)

NORTH KOREA—Radio Pyongyang, 7580 at 1215 with opera-like music. (Northrup, MO) 9977//11335 at 1107 with talks about Russia and North Korea. (Moser, PA)

OMAN—BBC Masirah relay, 15310 at 1307 with news. (Moser, PA) 0407 with news, "Health Matters." (Lamb, NY)

PALAU—KHBN on 9830 at 0858 in CC with hymns, EE ID at 0900 with addresses in Palau and Hong Kong. (Lamb, NY)

PERU—Radio Union, 6115 at 0724 in SS with local music, promos, IDs, possible commercial. (Lamb, NY)

PHILIPPINES—Radio Veritas, 9520 at 1223 in Indonesian, 1225 with interval IDs, definite power increase, ID "This is Radio Veritas Asia broadcasting from Quezon City, Philippines. Please stay tuned for the broadcast in Ukraine which follows at 1230 UTC." (Zamora, NM)

POLAND—Polish Radio, 9520 at 1235, ID in Polish (Northrup, MO)

PORTUGAL—Radio Portugal, 9705 at 0130 sign on, frequency announcements, news, music program. (Zamora, NM)

VOA relay. 15235 at 2222 in Polish with jingles, rock, feature about the musical "Annie" and EE lesson. (Lamb, NY)

ROMANIA—Radio Romania Int'l at 0207 on 11830. (Campbell, IL)

RUSSIA—Radio Moscow, 0031 on 11790. (Cohen, ON) 11805 at 2330. (Low, TX) 12050 at 0600 with news. (Vaage, CA) 17760 at 1619 with economic news, interview. (Moser, PA)

Radio Galaxy. 11880 at 2126 in EE/RR with Russian pops, announcements and promos in both languages. Off at 2200. (Lamb, NY)

Radio Rossii feeder, 12177 USB at 0440 in RR with discussion and easy listening music, ID, news. (Lamb, NY)

Radio Ala. 7370 at 1125 in unknown language (RR probably, editor). (Northrup, MO)

SAUDI ARABIA—BSKSA, 11685 in AA at 2245. (Cohen, ON)

SEYCHELLES—FEBA, 15325 at 0417 in AA with orchestral music, religious talk, ID, IS and off at 0430. (Lamb, NY)

SOLOMON ISLANDS—SLBC, 5020 at 0852 with employment issues. (Cohen, ON) 9545 at 0740 in EE/pidgin, public service announcements, island music, commercials, ID, News at 0800. (Urbelis, NY)

SOUTH AFRICA—Radio 2000, new on SW, 3320 at 2335 to 0300 in EE and Afrikaans with easy listening music, canned announcements. (Lamb, NY) Afrikaans Stereo, new on SW, 3320 at 0300 sign

on in Afrikaans with IDs, news, pops. Also at 0500 sign on 4875. (Lamb, NY)

Channel Africa, 3995//7230 at 0432 with "Countdown" program. 5960 at 0338 with African music, pops, IDs. (Lamb, NY) 15220 at 0605. (Campbell, IL)

SOUTH KOREA—Radio Korea, 9650 at 1145, woman with interview. (Moser, PA) 11945 at 0612. (Vaage, CA) 15575 at 0026. (Campbell, IL)

SPAIN—Spanish National Radio, 9525 at 0025 with international news. (Gentry, IL) 9530 at 0035 talk on water purification. (Cohen, ON) 11845 at 0153. (Campbell, IL) 11850 at 0100 in SS. (Low, TX)

China Radio Int'l relay, 9690 at 0303. (Moser, PA)

SUDAN—Omdurman, 9165 at 2000-2100 with news, talks, Arab music. (Urbelis, NY)

SWEDEN—Radio Sweden, 11705 at 0001. (Campbell, IL) 0210 with news, letters program. (Moser, PA) 15240 at 1507 with "In Touch." (Gentry, IL)

SWITZERLAND—Swiss Radio Int'l, 9890 at 0148. (Campbell, IL) 17636 with interview at 1710. (Moser, PA)

SYRIA—Radio Damascus, 12085 at 2038. (Campbell, IL)

TAIWAN—Voice of Free China via WYFR in CC at 2355 on 11855. (Low, TX)

TOGO—R. Lome on 5047 at 2349 in FF with country oldies, also at 0527 sign on with religion, news. (Lamb, NY)

TONGA—Radio Tonga, 5030 at 1219. Man with report on Somalia and 1222 ID "This program has been brought to you by Radio Tonga" then song by woman. (Lytle, TX)

TUNISIA—RTV Tunisienne, 11550 at 1645 in AA with local music, ID, news. Also 7475//12005 at 0436 to 0503 when abruptly switched to 15550. (Lamb, NY)

TURKEY—Voice of Turkey, 9445 at 2321. (Low, TX) 0300. (Campbell, IL) 9460 at 0438 in TT with relay of domestic service and Mozart's "Rondo alla Turca." (Lamb, NY)

UKRAINE—Radio Ukraine, 15195 at 2116 with talk of hard currency conflict, ID. (Gentry, IL) 15195 at 2140 with news. 15375 at 1959 in GG. (Cohen, ON)

UNITED ARAB EMIRATES—UAE Radio, Abu Dhabi, at 2310. (Campbell, IL) 2338 with news. (Gentry, IL) 0145 in AA. (Low, TX)

UAE Radio, Dubai, 11945//13675//15400 at 0305 in AA, into EE at 0330. (Lamb, NY) 0329 sign on with ID "This is the UAE Radio in Dubai", time signal and news. (Zamora, NM)

URUGUAY—Radio El Espectador, 11835.5 at 0945 in SS with ID, news, commercial for Banco de Montevideo, obituaries. (Rausch, NJ)

VATICAN—Vatican Radio, 5882 at 2300 in Italian with classical music, IDs. (Lamb, NY)

VENEZUELA—Radio Rumbos, 4970 at 0700 in SS with "Rumbos Medianoche" program. (Urbelis, NY) 9659 in SS at 2229. (Low, TX)

Ecos del Torbes, 4980//9640 at 0956 in SS with music, ID, frequencies, address, doorbell sound effects, into network news. (Lamb, NY)

YVTO time station, 5000 at 0901 with time signal by man in SS. (Moser, PA)

YUGOSLAVIA—Radio Yugoslavia, 9505 at 2110 with talk of Yugoslav politics, Bosnia conflict, several IDs. 9580 at 0038 with news about Bosnia-Herzegovina. (Gentry, IL)

And that's the story we have to tell this time. A roaring round of applause to the following who made it happen this month:

Gigi Lytle, Lubbock, TX; Murray Cohen, Fonthill, Ontario; Brad D. Low, Jacksonville, TX; Alan Campbell, Lebanon, IL; Marie Lamb, Brewerton, NY; Larry R. Zamora, Albuquerque, NM; Erroll Urbelis, Kings Park, NY; Scott Gentry, Matteson, IL; Ed Rausch, Cedar Grove, NJ; William Moser, New Cumberland, PA; Bjorn F. Vaage, Granada Hills and Marina Pappas, Huron, SD.

Thanks to all. Until next month, good listening!

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FCC ACTIONS AFFECTING COMMUNICATIONS

Apparent Liability For Malicious Interference

The Vero Beach, FL, Field Office issued a notice of Apparent Liability to the following individual for willful and repeated violations of Sections 97.101(d) and 97.119(a) of the Commission's Rules. The violations included unauthorized transmissions in the Amateur Radio Service, failure to identify with the assigned station call sign and malicious interference.

<u>RECIPIENT</u>	<u>ISSUING OFFICE</u>	<u>AMOUNT</u>
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William P. Irwin DeBary, Florida	Vero Beach	\$2000
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New Experimental Licenses

The FCC granted the following experimental applications:

KA2XZB, MOTOROLA, INC., on frequencies 806-822 MHz and 851-867 MHz for development of mobile and portable radio products. FX & MO: Ft. Lauderdale, FL.

KE2XFQ, DIGITAL SATELLITE BROADCASTING, CORP., on frequencies 2310-2360 MHz for testing of satellite and complimentary terrestrial DARS technology. FX & MO: CONTINENTAL U.S.

KO2XIM, HAZELTINE CORP., on frequency 1030 MHz for research to verify a proposed technique for determining the actual altitude of aircraft equipped with air traffic control radar beacon transponders. FX: RIVERHEAD, SUFFOLK, NY.

KO2XIN, HAZELTINE CORP., on frequency 1030 MHz for research to verify a proposed technique for determining the actual altitude of aircraft equipped with air traffic control radar beacon transponders. FX: EAST HAMPTON, SUFFOLK, NY.

KQ2XPU, MOTOROLA, INC., on frequencies 5650-6105 MHz, 12300-12700 MHz, and 18825-19325 MHz for propagation study.

KQ2CQI, MOTOROLA INC., on frequencies 5650-6105 MHz, 12300-12700 MHz, 18825-19325 MHz and 5725-5875 MHz to evaluate propagation as a function of frequency and the development of new wireless data communications products. FX & MO: WITHIN CHICAGO, IL.

KQ2XQJ, RADIAN CORP., on frequency 915 MHz to collect wind and virtual temperature profiles as part of a minerals management service field measurement program. FX: HOUSTON, TX.

KQ2XSA, RADIO TELECOM AND TECHNOLOGY, INC., on frequencies

216-217 MHz for development of equipment used in Interactive Video Data Services and to conduct limited market studies. FX: NEW YORK CITY, NY.

KQ2XSG, SOUTHERN METHODIST UNIVERSITY, on frequencies 152.715 MHz, 157.885 MHz, 158.300 MHz and 158.715 MHz for US Government contract (Army). FX: TERLINQUA & DALAS, TX.

KQ2XSH, L-BAND SYSTEMS, on frequencies 2450-2483.5 MHz for demonstration and testing of portable surveillance systems. MO: CONTINENTAL U.S., ALASKA & HAWAII.

KQ2XSX, KAVOURAS, INC., on frequency 5625 MHz for research project to improve the resolution and accuracy of pulse doppler meteorological radar techniques through the enhancement of software algorithms and radar performance. FX & MO: MINNEAPOLIS, MN.

KA2XAT, US WEST PERSONAL COMMUNICATIONS DEVELOPMENT, INC., on frequencies 1850-1990 MHz for market trial of a personal communications system. FX & MO: BOISE, ID.

KA2XBO, SAM TRUST-GERRALD BRESLAUER TRUSTEE, on frequencies 1636.5-1645 MHz for use of an INMARSAT System to provide communication where no other means of communication is available. MO: CONTINENTAL U.S.

KA2XBP, TOKO AMERICA, INC., on frequencies 1636.5-1645 MHz and 1535-1543.5 MHz for testing electronic surveillance and intelligence gathering devices. MO: FOLSOM, PA.

KA2XCE, MOTOROLA, INC., on frequencies 18825-19325 MHz for propagation measurements. MO: CONTINENTAL U.S.

KA2XBY, TACTICAL TECHNOLOGIES, INC., on frequencies 136-220 MHz and 406-470 MHz for testing electronic surveillance and intelligence gathering devices. MO: FOLSOM, PA.

KA2XCF, COLUMBIA CELLULAR CORP., on frequencies 902-928 MHz, 941-948 MHz and 1850-1990 MHz for development and testing of personal communications services. FX & MO: FAIRFIELD, CT.

KA2XCN, COLUMBIA CELLULAR CORP., on frequencies 902-928 MHz, 941-948 MHz and 1850-1990 MHz for development and testing of personal communications services. FX & MO: RICHMOND, VA.

KA2XCO, COLUMBIA CELLULAR CORP., on frequencies 902-928 MHz, 941-948 MHz and 1850-1990 MHz for development and testing of personal communications services. FX & MO: NORFOLK, VA.

KA2XCS, COLUMBIA CELLULAR CORP., on frequencies 902-928 MHz, 941-948 MHz and 1850-1990 MHz for development and testing of personal communications services. FX & MO: WILLIAMSBURG, VA.

KA2XCT, TELMARC TELECOMMUNICATIONS, INC., on frequencies 1850-1990 MHz for development and testing of a personal communications system. FX & MO: CHICAGO, IL.

KA2XCX, TPI COMMUNICATIONS INTERNATIONAL, INC., on frequencies 1850-1990 MHz for development and testing of a personal communications system. FX & MO: SAN JUAN, PR.

KA2XDE, SPECTRALINK, CORP., on frequencies 1850-1990 MHz, 2400-2483.5 MHz, and 902-928 MHz to develop wireless PBX products. FX & MO: BOULDER, CO.

KA2XDF, QUANTUM COMMUNICATIONS GROUP, INC., on frequencies 1850-1990 MHz for testing a personal communications system. FX & MO: DENVER, CO.

KA2XDF, QUANTUM COMMUNICATIONS GROUP, INC., on frequencies 1850-1990 MHz for testing a personal communications system. FX & MO: MINNEAPOLIS, MN.

KA2XDT, ELLENSBURG TELEPHONE CO., INC., on frequencies 902-928 MHz, 930-931 MHz, 1850-1990 MHz, 2400-2483 and 5725-5850 MHz for development of a personal communications system. FX & MO: BUFFALO, NY.

KA2XDT, ALLIANCE TELECOM, INC., on frequencies 1850-1990 MHz for development and testing of personal communications systems. FX & MO: BUFFALO, NY.

KA2XFB, ALLIANCE TELECOM, INC., on frequencies 1850-1990 MHz for development and testing of personal communications systems. FX & MO: MIAMI, FL.

KA2XFM, VOLUNTEERS IN TECHNICAL ASSISTANCE, on frequencies 148.260 MHz and 148.560 MHz for operation of an earth station to be used in conjunction with PACSAT--Low Earth Orbiting Packet Radio. FX: HUNTINGTON BEACH, CA.

KA2XFT, VOLUNTEERS IN TECHNICAL ASSISTANCE, on frequencies 148.260 MHz and 148.560 MHz for operation of an earth station to be used in conjunction with PACSAT. FX: BETHEL PARK, PA.

KA2XGL, MCQ ASSOCIATES, INC., on frequencies 1626.5-1646.5 MHz for use of INMARSAT Standard C terminals as a part of a remote data collection and analysis system. MO: CONTINENTAL U.S.

KA2XGN, SCHLUMBERGER INDUSTRIES, INC., on frequency 914.0 MHz to

conduct field test of a water meter reading system. MO: AL, AZ, MI, TX, MA.

KA2XGO, RACON, INC., on frequencies 38600-40000, 31000-31300, 21200-23600, 17700-19700, 10700-13250, 5925-7125, 2450-2500, 1990-2110 and 150-174 MHz for on the air measurements and demonstrations of new communications equipment. MO: CONTINENTAL U.S., ALASKA & HAWAII.

KA2XGW, SEABOARD ELECTRONICS, on frequencies 1626.5-1646.5 MHz to determine the appropriateness of using Galaxy INMARSAT Standard C 7002 for emergency alarm and data collection. FX & MO: CONTINENTAL U.S., Alaska & HAWAII.

KA2XHA, THE AMERICAN RED CROSS, on frequencies 1635.5-1645 MHz for use of INMARSAT-A terminals for emergency voice and data communication capabilities while responding to national disasters. MO: CONTINENTAL U.S.

KA2XHD, SOUTHERN CA MICRO-WAVE, INC., on frequencies 1990-2110, 2450-2500, 5925-7125, 10700-19700, 21200-23600, 31000-31300, and 38600-40000 MHz to conduct periodic on the air measurements and demonstration of new equipment. MO: CONTINENTAL U.S., ALASKA & HAWAII

KA2XHI, COMSAT GENERAL CORP., on frequency 29236 MHz for development of high risk advanced communication satellite technology. FX: CLARKSBURG, MD.

KA2XZC, TELEMARC TELECOMMUNICATIONS, INC., on frequencies 1850-1990 MHz for operating and demonstrating a personal communications system. FX & MO: MORRISTOWN, NJ.

KI2XAE, TLEMARC TELECOMMUNICATIONS, INC., on frequencies 1850-1990 MHz for operating and demonstrating a personal communications system. FX & MO: PRINCETON, NJ.

KO2XEU, BNR, INC., on various fre-

quencies in the 800 MHz range for the development and testing of microcell systems to expand the versatility of cellular equipment. FX & MO: RICHARDSON, TX.

KA2XAM, GTE GOVERNMENT SYSTEMS, CORP., on frequencies 11700-12200 MHz and 14000-14500 MHz for experimental research development, and test of a satellite system. FX: NEEDHAM, MA.

KA2XDJ, UNIVERSITY OF SOUTH FLORIDA, on frequencies 2506-2686 MHz to perform testing to determine whether two different sets of programming can be transmitted on the same channels at two separate locations. FX: TAMPA, FL.

KA2XGY, GTE GOVERNMENT SYSTEMS, CORP., on frequencies 11700-12200 MHz and 14000-14500 MHz for experimental research development, and test of a satellite system. FX: CONTINENTAL U.S.

KA2XHF, SATLOC, INC., on frequencies 935-940 MHz and 902-928 MHz for further development of a Global Positioning System for three dimensional positioning tracking and recording. FX: CONTINENTAL U.S.

KA2XHL, SKYWIRE, INC., on frequencies 928.0625-952.0625 MHz to develop narrowband data transmission systems appropriate for utilization in 900 MHz address systems. FX & MO: MEMPHIS, TN.

KA2XHX, KANNER LANGUAGE SYSTEMS, on frequencies 72.1, 72.3, 72.5, 72.9, 74.7, 75.3, 75.7 & 75.9 MHz to test equipment in connection with simultaneous interpretation operations for the purpose of receiving type acceptance. MO: CONTINENTAL U.S., ALASKA & HAWAII.

KA2XHZ, SIMULTANEOUS WIRELESS INTERPRETATIONS, on frequencies 72.1, 72.3, 72.5, 72.9, 74.7, 75.3, 75.7 & 75.9 MHz to test equipment in connection with simultaneous interpretation operations for the purpose of receiving

type acceptance. MO: CONTINENTAL U.S., ALASKA & HAWAII.

KA2XID, RADIAN CORP., on frequency 915.0 MHz to collect wind and virtual temperature profiles. FX: PORT ARTHUR, TX.

KA2XKF, UNIVERSITY OF NEBRASKA-LINCOLN, on frequency 915 MHz to collect wind and virtual temperature profiles. FX: LANCASTER, NE.

Additional Frequencies For Cordless Telephones

The Commission proposed to provide additional frequencies to relieve channel congestion and reduce interference to cordless telephones operating in the 46 MHz frequency and 49 MHz frequency bands under Part 15 of the Commission's Rules.

A cordless telephone is a two-way low power radio system that is used for voice-grade communications on the public switched telephone network (PSTN). A cordless telephone consists of two parts: a "base" unit that connects to the PSTN, and the handset, or "remote" unit. The base unit and the handset are connected by a radio link that eliminates the handset cord of the standard telephone, thus allowing the user to move a considerable distance from the base unit while carrying on a telephone conversation. Cordless telephones currently operate under Part 15 of the rules on 10 duplex channels in the 46 MHz and 49 MHz frequency bands. According to industry sources, approximately 18 million cordless phones were sold in 1992, and about 60 million are currently in use. The popularity of these devices has led to growing congestion of the 10 channels, particularly in dense urban and suburban areas. Five of the 10 channels are also shared by other Part 15 low power transmitters. In particular, wireless "baby monitors" have made these five channels virtually unusable for cordless telephones in some areas.

The petition of rulemaking, filed by the Telecommunications Industry Association (TIA), requests that the Commission make available an additional 15 channel pairs using 30 frequencies near 44 MHz and 49 MHz for cordless telephones. The proposed frequencies are currently allocated to the Private Land Mobile Radio Service (PLMRS) for use by the Land Transportation, Petroleum and Forest Products Radio Services. TIA states that the risk of interference to the PLMRS is negligible due to light usage of the proposed frequencies, the low power of cordless telephones, and a proposed requirement that the cordless telephone be designed to automatically monitor select channels so as to avoid those that are in use.

The proposed rules are designed to improve the ability of cordless telephones to meet the needs of consumers and to promote more effective use of the radio spectrum. The Commission recommends

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CIRCLE 11 ON READER SERVICE CARD

amending Parts 15 and 90 of the Commission's Rules to provide effective and adaptive regulations for cordless telephones and to further its service to the public in the most efficient, uncomplicated and timely manner possible.

Phantom Air Traffic Controller Arrested

Richard M. Smith, Chief, Field Operations Bureau, and Robert P. Crouch Jr., United States Attorney for the Western District of Virginia announced that Rodney Eugene Bocook, age 27, of Roanoke, Virginia, has been charged in a criminal complaint alleging the safety of aircraft in flight in violation of 18 U.S.C. §32(a)(6). He was also charged with using obscene, indecent, or profane language in a radio transmission in violation of 18 U.S.C. §1464.

If convicted on all counts, Bocook faces a maximum penalty of 22 years imprisonment and a fine of \$500,000.

The investigation of the case conducted jointly by the Federal Communications Commission, the Federal Aviation Administration, Allegheny County Sheriff Thomas D. Warlinter, and the Federal Bureau of Investigation. Assistant United States Attorney Ray B. Fitzgerald, Jr., will prosecute the case.

According to an affidavit filed in support of the United States' application for a war-

rant for Bocook, he is alleged to have transmitted false air traffic control instructions and other information to aircraft flying into or near Roanoke Regional Airport. He is also alleged to have transmitted sexually explicit information and other vulgarities.

Federal agents arrested Bocook and executed two search warrants for Bocook's apartment and vehicle, looking for the radio and radios and related material used in violations.

A criminal complaint is only a charge and is not evident of guilt. The defendant is entitled to a preliminary hearing on these charges, and have these allegations submitted to a grand jury before he may be tried. If indicted, Bocook will receive a fair trial with the burden on the government to prove guilt beyond a reasonable doubt.

Ordered To Forfeit \$5,600

The Commission denied an application by AVI Systems, Inc., Emeryville, CA, for the reversal of the assessment of a \$5,600 monetary forfeiture for displaying an unauthorized computer at a trade show.

Federal laws prohibit the marketing of radio frequency devices that have not been authorized by the FCC.

AVI argued that the back of the computer had a label stating that the computer was not authorized by the FCC and could

not be sold and that it was complying with instructions provided by the FCC.

The Commission noted that its rules allow for a display of a computer that has not been authorized if a conspicuous notice indicates that it lacks authorizations and may not be sold. A notice on the back of the computer does not meet this requirement. Furthermore, there was no evidence that AVI was complying with the FCC guidance and, the Commission added, if it received guidance, it may have misunderstood it.

Notice Of Apparent Liability For \$75,000 To AT&T

The Commission issued a Notice of Apparent Liability to American Telephone and Telegraph Company (AT&T) for violating pay-per-call rules.

The Commission's pay-per-call rules require that billing for calls commence only after the caller had a reasonable opportunity to disconnect after the preamble. In the instant case, the callers immediately disconnected after the preamble, but were billed for the calls.

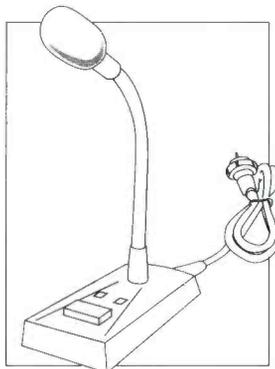
The Commission has concluded that AT&T is apparently liable for a monetary forfeiture in the amount of \$75,000 for willful and repeated violation of the Commission's Rules. ■

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Beaming In

(from page 5)

investigative agencies, to name a few. Pres. Reagan's secret Executive Order 12333 of December, 1981 allowed the CIA to resume domestic snooping within the USA, including electronic surveillance.

Someone once half-jokingly told me that the only federal employee in Washington who probably isn't eavesdropping on phone calls is Floyd, the hair stylist in Congressional barber shop. That's only because Floyd is kept busy explaining the pending laws to the Congressmen.

In addition, state, county, and local law enforcement agencies also eavesdrop on phone calls (including cellular) when necessary during investigations. And just think, all of this, despite the cellular industry's privacy assurances, laws, hype, promises, and caveats. Yet the public continues to be fed fairy tales about the cellular industry's highly publicized federal anti-scanner laws that mean nobody's going to be allowed to listen in! How 'bout that?

I must mention the National Security Agency. For years, the NSA has electronically recorded and computer analyzed every incoming and outgoing international FAX, telex, and voice telephone call. This includes international cellphone calls. Primarily, the giant NSA computers are

looking for messages to or from certain persons under federal surveillance. But NSA computers also scan all other traffic looking for specific key words indicating traffic that may reveal terrorist activities, organized crime, counterfeiting, drug trafficking, smuggling, espionage, national security, military matters, and assorted other things of particular interest to the feds.

The vast majority of the traffic monitored, recorded, and scanned by the NSA computers is determined to be of no interest or value to the feds, so it is dumped. Each day massive numbers of documents and tapes of are disposed of.

The Office of Technology Assessment (OTA), an arm of Congress, conducted a study of federal electronic snooping. OTA noted, "The major public law addressing electronic surveillance is Title III of Title III of the Omnibus Crime Control and Safe Streets Act of 1968 which was designed to protect the privacy of wire and oral communications. At the time Congress passed this act, electronic surveillance was limited primarily to simple telephone taps and concealed microphones."

The wave of communications technologies pressed into widespread daily use by the public since 1968 is astounding, including FAX, E-mail, cellphones, PCS, radiopaging, etc.

The OTA reported that one division of the Treasury utilizes nine of the new tech-

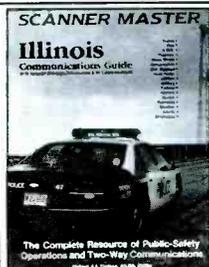
nologies, having spent \$3-million on electronic surveillance equipment in a two-year period during the mid-1980's.

Wholesale and indiscriminate NSA monitoring of everyone's international calls violates the Bill of Rights. NSA's activities also transcend all anti-scanner laws. But who can a citizen complain to about NSA? A group calling itself the Computer Professionals for Social Responsibility filed a lawsuit against the NSA. The NSA is now seeking a one-year delay in answering the suit. We say *rotsa ruck* on that suit!

Can anything be done when members of the public get annoyed about so many federal and other enforcement agencies regularly bypassing their precious alleged and imagined communications privacy? Do they squawk to that famous protector of phone call security, the cellular industry? Yeah, right. Ha!

We say good luck to a person or industry that thinks any federal phone call snooping could be stopped! The cellular industry may be ugly, but it isn't stupid. Its eavesdropping hysteria in the media focused only on scanner hobbyists. Scanner owners aren't nationally organized, and we have no lobbyist. We were sitting ducks, so our hobby took the eavesdropping rap.

President Calvin Coolidge said that nothing he never said never did him any harm. So it is as the cellular folks conveniently don't mention to the public how Big



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Antennas & Things

(from page 32)

ware automatically assumes a center band frequency. If you prefer to skew the design towards one end or the other (e.g. a ham wanting either the CW or phone ends of a band), then do not select the standard band, but rather enter the frequency that you desire.

For many of the antennas, Antlers will draw a schematic of the antenna on the screen, labelling critical dimensions that are used in the equation. The software will then calculate the lengths and print a report on the screen. If other information, such as the value of an inductance for a shortened antenna, is needed, that information is also reported at that time.

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Scanning VHF/UHF

(from page 35)

453.550, emergency; 453.600, command; 453.650, south; 453.750, administration; 453.800, northwest; 453.900, transit; 453.950, northeast. Some VHF frequencies in occasional use include: 154.770, surveillance; 154.890, surveillance; 154.650, surveillance; 155.250, detectives; 155.625, court beat; 155.655, court beat; 155.070, transit.

Angel also passes along frequencies used by the Philadelphia Fire Department: 154.235, south band, F1; 153.950, emergency band, F2; 154.145, north band, F3; 153.830, fireground handhelds, F4; 153.935, fireground handhelds, F5; 154.965, subway, F6; 170.150, rescue dispatch; 463.000, paramedics to hospitals, Med-1.

What information would you like to share with POP'COMM's scanner buffs? We invite your frequency lists, questions and listening tips. We also welcome your photographs of listening posts, mobile setups and antenna farms. If you have a VHF/UHF listeners QSL you'd like to share, we can try to print it here.

Write to: Chuck Gysi, N2DUP, Scanning VHF/UHF, Popular Communications, 76 N. Broadway, Hicksville, N.Y. 11801-2909. ■

Brother routinely and relentlessly eavesdrops on phone calls. The feds do this on such a massive and sophisticated scale that, by comparison, it makes scanner hobby activities look like insignificant piffle. It was contemptuous of these people to zap scanner hobbyists, then turn around and sell the public on the myth that new anti-hobby laws have finally achieved cellular privacy.

Scanner hobbyists tune in to various bands and recreationally monitor analog transmissions being sent the clear. Scanners were invented in 1968, and since that time, this is how hobbyists have monitored the many services on all bands. Scanner users don't pose a threat to a reasonable expectation of communications privacy.

In order for the cellular industry to have been anything more than a paper tiger, it would have been necessary to hook a lot bigger fish than the scanner hobbyists. This was impossible. How fortunate for the cellular people to discover the scanner hobbyists, then find that so much mileage could be gotten on the basis of bluster, bluff, public ignorance, and slick lobbying.

Scanner owners were victims of convenience, and the only ones the industry dared to go after. The industry simply ignored how federal and other agencies beyond their reach posed a real and sophisticated privacy invasion problem; more than any threat scanner hobby users were or could possibly become. As you can see from the item in *Network World*, cellular industry anti-scanner privacy ballyhoo and double-talk has left people misled, confused, and not adequately informed concerning these matters.

Scanner owners have been exploited by the cellular industry's cynical and cruel privacy hoax. Because of it, we have lost the legal right to freely tune the frequency spectrum, and can no longer obtain receivers without coverage gaps. These are things we once freely enjoyed with dignity and honor, and for decades before the wily and glib cellular phone industry came into existence.

In many ways, our hobby was left to twist in the wind. Few from outside the hobby offered any support. A lot of mail comes in here from readers who also feel scanner owners got fleeced. Fleeced by the cellular industry, along with those who permitted them get away with this so relatively easy. This includes Congress, which stupidly passed the anti-scanner laws; the FCC, which went along with the gag; and the national media. The media continues to fall all over itself selling the idea that once sinister scanner owners are controlled by the new laws, full phone privacy will be assured for the multitudes.

Am I happy about it? Not one bit! We were ripped-off, plain and simple. Talk about highway robbery. We are being systematically stripped of important rights, our hobby is under attack, and our image is being shredded. And for no reason, other

than as a sacrifice to sell the public on a communications privacy premise that the FCC and Congress know is absolute drivle.

The public has become suspicious of scanner hobbyists. We have recently seen how the fallout from these new laws inspired the removal from sale of several specific Realistic scanners from the shelves of Radio Shack retail outlets in New Jersey. This past summer there was a serious attempt at passing local legislation that would have outlawed the sale and use of all scanners in Chicago. What's next?

Will we get our rights back? Not very likely. Still, *POP'COMM* isn't ready to roll over and extol the supposed efficacy and virtues of anti-scanner laws that allege or imply privacy for unscrambled communications. These meaningless laws were enacted without justification and at great cost to our hobby. Under such circumstances, you should expect no less of us, nor of any sincere, responsible, and concerned publication, club, or individual connected with hobby communications.

What do you think? ■



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Advertisers' Index

AMC Sales, Inc.	14
A.R.R.L.	6, 15
Ace Communications	33, 88, Cov III
Action Data Processing	61
Antenna Supermarket	41
Antique Radio Classified	53
CB City International, Inc.	10
CRB Research	43, 80
Cellular Security Group	24, 46
Clear Channel Corporation	81
COMMtronics Engineering	39, 59
Communications Electronics	55
Communications Specialists	51
Computer Aided Technologies	65
Consumertronics	53
Copper Electronics, Inc.	65
DECO	24
Delta Research	46
Drake, R.L. Company	13
EDCO	73
EDE	10
Electronic Equipment Bank	1
Frequency Printout Service	59
G & G Electronics	19
GRE America, Inc.	35
Grove Enterprises, Inc.	23
Grundig/Lextronix, Inc.	37
HR Bookstore	30
Hollins Radio Data	29
ICOM America	43, Cov IV
Index Publishing Group	75
J & J Enterprises	65
Japan Radio Company, Ltd.	Cov II
Javiation	71
Jesse Jones Industries	67
Jo Gunn Enterprises	14
L & L Electronics	53
Lentini Communications, Inc.	19
MFJ Enterprises, Inc.	69
MARYMAC Industries, Inc.	57
MetroWest	53
Microcraft Corporation	24
MoTron Electronics	21
National Amateur Radio Assoc.	5
OPTOelectronics	7, 11
Percon Corporation	18
Philips-Tech Electronics	59
Professional Career Development, Inc.	46
R.C. Distributing	57
REACT International	83
Radioware Corporation	39
Satman, Inc.	59
Scanner Master Books	82
Scanner World USA	85
Scrambling News	59
Software Systems Consulting	70, 81
Sports Communications Dist.	77
Total Radio Service	59
Tucker Electronics	16
U.S. Radio	5
Universal Electronics, Inc.	51
Universal Radio, Inc.	3
Vanguard Labs	57
Viking International	10
Wilson Antenna, Inc.	21
Xandi Electronics	57
Yaesu U.S.A.	4

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AM Broadcast to Microwave
1000 Channels

500KHz to 1300MHz coverage in a programmable hand held. Ten scan banks, ten search banks. Lockout on search and scan. AM plus narrow and broadcast FM. Priority, hold, delay and selectable search increment of 5 to 995 KHz. Permanent memory. 4 AA ni-cads and wall plus cig charger included along with belt clip, case, ant. & earphone.

Size: 6 7/8 x 1 3/4 x 2 1/2. Wt 12 oz.

Fax fact document # 205

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1 to 1300MHz

Patented Computer Control

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Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

Fax fact #305

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400 Channels

100KHz to 2036MHz Patented computer control. Top rated receiver in its class, offers AM, NFM Wide FM, LSB, USB, CW modes. 400 scan memories. 4 priority channels. Delay & hold & Freescan. AC/DC pwr cord and whip ant.

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Fax fact document #105

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5 to 1300MHz

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Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

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and 1000 Channels.

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100 Channel 800 MHz

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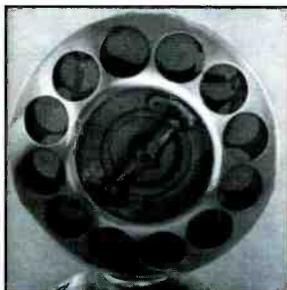
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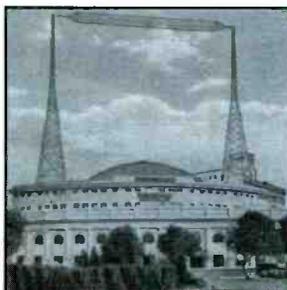
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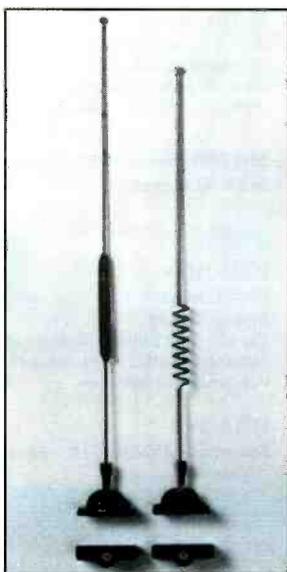
8



14



38



54

FEATURES

Visit A Radio Museum! 8

Museums worldwide preserve telecommunications history.

By Larry Cadota, KTX5BD

PC's SWL Conference Is WorldWide Success! 10

Experience the success of the magazine's first worldwide conference.

By Deena Marie Amato, Associate Editor

Wireless Days 14

A monthly remembrance of things past brings readers a clear view of radio as it was.

By Alice Brannigan

Selected English Language Broadcasts: Winter '93-'94 22

A representative listing helping you "tune in" to the hundreds of shortwave broadcasts aired daily.

By Gerry L. Dexter

Get QSL Power! 28

Build your permanent house of cards!

By Gerry L. Dexter

Beware The Tele-phonies! 32

Frauds posing as Federal Investigative Officers.

COLUMNS

Books You'll Like	24
Broadcast DXing	34
HandiChat	38
Scanning VHF/UHF	40
You Should Know	42
Clandestine Communique	47
RTTY	48
How I Got Started	53
Telephones Enroute	54
Pirates Den	56
New Products	58
Communications Confidential	60
Listening Post	68
CB Scene	72
Washington Pulse	77
Satellite View	80

DEPARTMENTS

Beaming In	5
Mailbag	6
World Band Tuning Tips	44
Communications Shop	84

This month's cover: It is easy to "reach out and touch someone" with the help of AT&T's satellite operations management center in Hawley, PA. Photo by Larry Mulvehill, WB2ZPI.

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