JANUARY 1996

POPULAR COMMUNICATIONS

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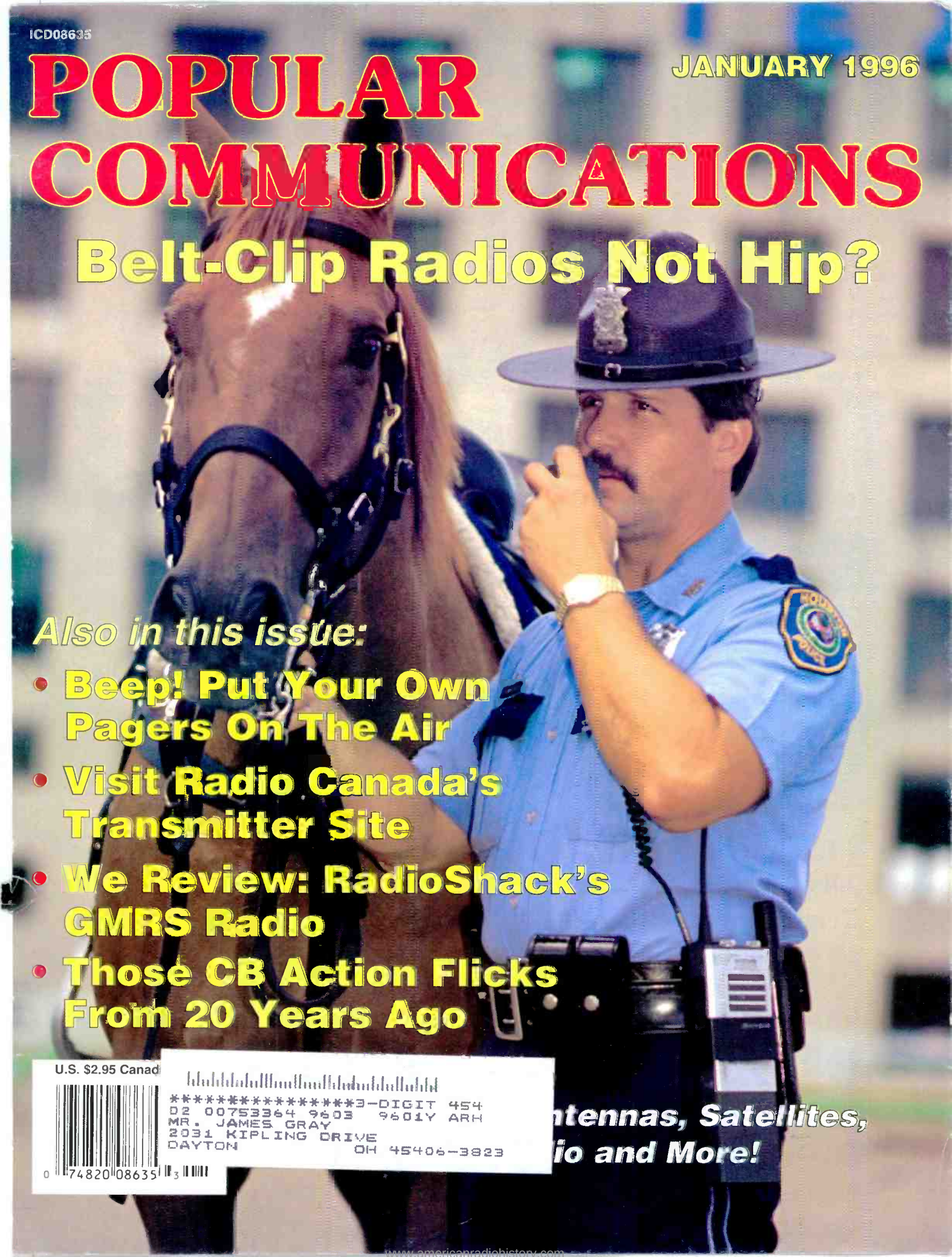

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- **We Review: RadioShack's GMRS Radio**
- **Those CB Action Flicks From 20 Years Ago**

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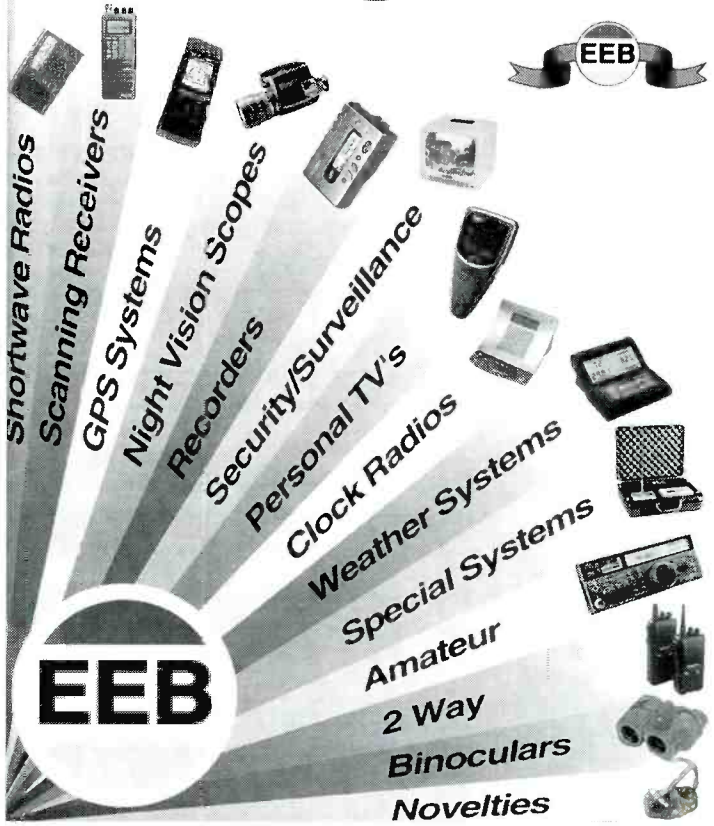
Catalog 1996



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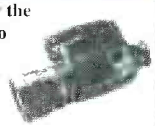

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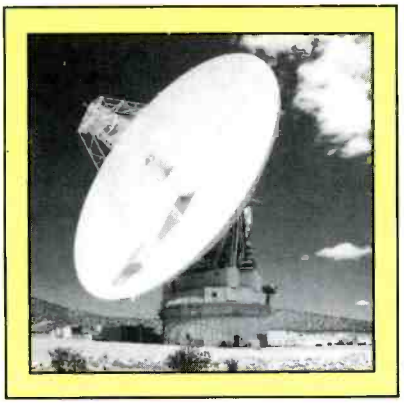
JANUARY 1996 VOLUME 14, NUMBER 5



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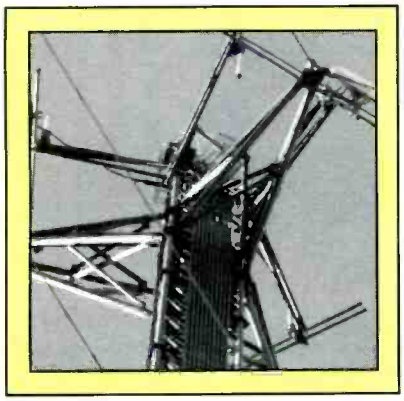

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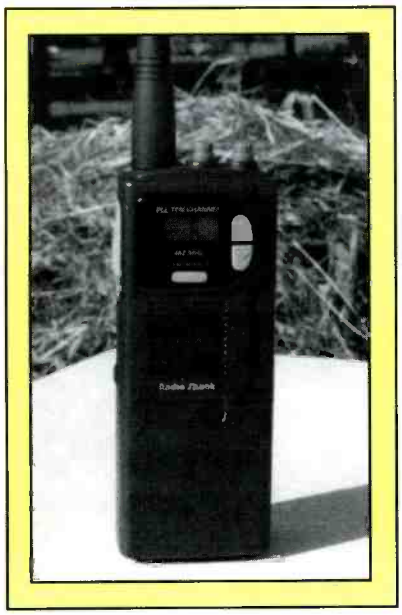

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FEATURES

COLUMNS

DEPARTMENTS

This month's cover: *Officer John S. Nichole of the Houston (Texas) Police Department's mounted unit uses a belt-mounted radio and speaker-microphone to maintain contact with dispatchers while on patrol in the nation's fourth largest city. Photo by Larry Mulvehill, WB2ZPI.*

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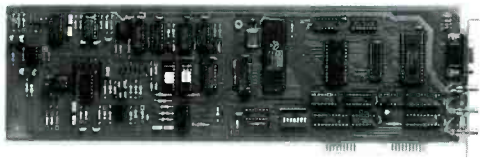

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BY CHUCK GYSI, N2DUP

Thoughtwaves

AN EDITORIAL

A Little of This, A Little of That

Allow me to ramble on this month, if you don't mind. We've been busy with a few projects at the office and I thought I'd fill you in on a few things.

As many of you know, *Popular Communications* is published by CQ Communications Inc. Our company produces several magazines, and if you are a ham, you probably are familiar with *CQ Amateur Radio*. Recognizing that there are a lot of interesting aspects to the amateur radio hobby, we've come out with two new magazines for hams. One may be of particular interest to *POP'COMM's* readers: *CQ VHF* is a new magazine that focuses on the ham who likes to operate on frequencies above 50 MHz, including the popular 2-meter and 440-MHz bands.

The editor of *CQ VHF* is *POP'COMM's* online coordinator, Richard S. Moseson, NW2L. As I was ready to sit down and write this month's installment of Thoughtwaves, I was chatting briefly with Rich and he tells me that there are articles in *CQ VHF* that might be of interest to not only *POP'COMM's* ham readers, but also our scanner enthusiasts. The first edition of *CQ VHF,* for instance, carries a story on sporadic-E propagation, which every scanner listener contends with when the signals start blasting in!

Another new magazine to the CQ lineup includes *CQ Contest*, which deals with the contesting aspect of amateur radio. If either of these magazines sound like something that would interest you, feel free to call our circulation department on the toll-free line at (800) 853-9797 for the details.

Lookin' Good

You also may notice a slight change in this month's edition of *POP'COMM*. Our art department has been tinkering with our pages to make *POP'COMM* more attractive for the reader and we hope you like our improvements. Through efforts of both our art and editorial departments, we're trying to make the magazine more readable and we hope to entice you to take a look at each of the various stories presented on our pages.

I appreciate all the comments I have received from our readers since I took over as editor last year. I always invite your input. I may not change things to your liking, but I am sensitive to what all our readers desire in the overall picture.

On the Web

As an Internet junkie, one thing I have been striving for is to get *POP'COMM* on the World Wide Web. For those of you who cruise this feature of the Internet, you know that there are plenty of graphics, files and information out there just by connecting with various other computers on the Internet.

I've set up a presence for *POP'COMM* on the web at the following URL—http://home.aol.com/popcomm. It's a start for us and being that I am serving as webmaster at the moment, I only tinker with the web page when I have time. I've tossed a few links to other home pages on the web and have allowed web cruisers to e-mail our various departments right from our web page.

You'll also find out how to order *POP'COMM* and *CQ* products when you visit our home page. As time allows and I become proficient with what is known as HTML, a coding scheme to create these web pages in cyberspace, you'll see more when you log onto our page. Let me know if you cruise into our home page and have some ideas.

Kirk Is Back

Long-time readers will recognize a name that returned to *POP'COMM's* pages last month. Kirk Kleinschmidt, NTØZ, is back as our Ham Column editor. Kirk had handled the task not too long ago and we are glad to have him return. Contact him via the American Radio Relay League's headquarters if you have a question or comment about amateur radio.

Can You Write?

Think you can handle writing a feature for our pages? Want to give it a try? There is no time like the present! The nice thing is that I am willing to work with you, which you won't find in too many editors.

If you have an idea you'd like to tell our readers about, I think you should give it a shot. All queries should be via letter (Chuck

(Continued on page 84)

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 and to edit to conform to style. All letters submitted must be signed and show a return mailing address or valid e-mail address. Upon request, we will withhold a sender's name if the letter is used in Mailbag. Address letters to: Chuck Gysi, N2DUP, Editor, *Popular Communications*, 76 N. Broadway, Hicksville, NY 11801-2909, or send e-mail via the Internet to POPCOMM@aol.com.

Thinking About Other Communications Modes

I just received my November issue of *Popular Communications* and read your Thoughtwaves column. It got me to thinking some thoughts that have been in the back of my mind for some time now, and I'll share them with you.

I have been continuously licensed as a radio amateur since 1959 (KN9TXN) and now hold an extra-class license as W3HGM. I read both *QST* and *Popular Communications*, and eagerly await their arrival each month. They are fun to read.

Am I unusual? I suspect not, but I have lost interest in the active communications aspect of our hobby. Maybe it is the profane and uneducated banter on SSB. Perhaps it is the low point in sunspot activity. Maybe it is the inaccessibility of any local repeater on my HT.

But what I really suspect is that my lack of interest in participating in radio communications is more a function of my tremendous interest in anything that relates to computers. I am writing HTML for a home page and its many links. I am communicating via e-mail. I don't know how anyone ever lived without a computer to help with *everything*.

So back to the point of my letter: If I am not that unusual (I never thought I was), how does that bode for the future of the hobby/hobbies?

Good luck with your new job.

Jim Hughes
(via the Internet)

Jim, you pose a very interesting question that paused me to stop and think, too. Like, when was the last time I operated on HF; when was the last time I ragchewed on VHF or UHF, or when I last actually sat down for more than five minutes in front of any radio! Well, I find myself behind the computer(s) for many hours of every day. And I am doing e-mail, writing World Wide Web pages on the Internet, cruising newsgroups, etc. And with things like Iphone on the market now, I suppose it won't be long before I am chatting via voice on the Internet, too! Scary thought...maybe I really don't need that antenna farm out in the back forty anymore.— Editor

Goodbye...and Welcome

It was a sad day when I read Tom Kneitel was stepping down. Thanks for the ride, Tom. What a long strange trip it's been.

Welcome, Chuck. I will looking forward to reading about your exploits in radio. I love your magazine. Keep up the good work. By the way, this is only my third time sending e-mail.

Adam Fine
(via America Online)

Watch it, Adam! In conjunction with the letter above yours, you'll get hooked on computer communications. Don't say we didn't warn you back about that third time you sent e-mail! Oh, and by the way, as senior editor, Tom still is very much a part of POP'COMM. *He's still writing his monthly Telephones Enroute column and occasional features. — Editor*

Cleveland Goes Incommunicado

It's one thing for members of the *private* sector to go to a totally digital, scanner-proof 800-MHz system. It's quite another, though, for Cleveland to use its citizens' tax dollars to encrypt all of its *public* wireless communications (October POP'COMM). That, my friends, is a textbook example of the ECPA gone berserk.

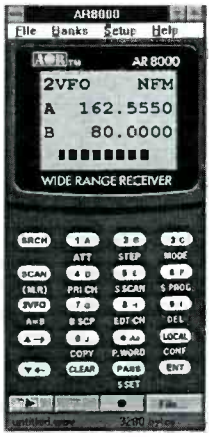
I have no problem with certain channels being off-limits to listeners, such as those used for stakeouts, hostage negotiations and other sensitive situations involving life and limb. But for a municipality to digitally cloak *all* its transmissions is tantamount to freeing it from its accountability to Joe Taxpayer. It's time for the Supreme Court to give this kind of activity a serious review.

Marc Manis, K5NO
Winter Springs, Fla.
(via America Online)

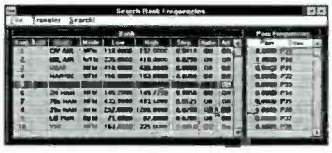
The Latest Software Available At Your Favorite Dealer!

Remote Computer Scanning System

The RCSS, Windows '95 compatible Software significantly enhances the AOR AR8000 receiver's capabilities by providing automate Personal Computer control over the receiver's scanning, logging and memory functions! These features and many more make this software a great choice for Windows use:

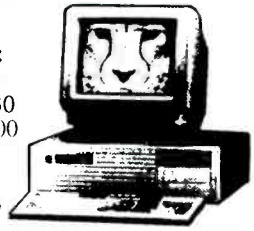


- Auto detection and storage of active frequencies and add'l. info while scanning
- Scan user specified tuning steps from 10Hz - 100 MHz
- Scan by mode, class of service, or type of unit
- True signal detection allows scanning upon loss of carrier with user supplied delay
- Max scan rate, user adjustable
- Scan by radio or computer
- Unattended frequency monitoring by time and date
- Lockout unwanted signals
- Rearrange all freq. in any combination by click/drag or entry



SCANCAT GOLD

SCANCAT



presently supports:

- **AOR** 3000/3000(A) & AOR2500, AR3030 HF receiver, AR8000 (Newest handheld)
- **Drake** R-8
- MOST **Icom** Radios
- **Kenwoods** including TS-440, TS-450, TS850 & R5000
- MOST **Yaesu's** including FRG-8800 & FRG-9600 Yaesu, PLUS FRG-100, FT-840 and more!
- The NRD-525 & 535 **JRC**.
- **LOWE** HF-150m
- **Watkins Johnson** HF-1000
- **Opto Electronics** add-on boards for **PRO** series Radio Shack Radios.

Our software allows complete control of all functions supported by these radios through the standard manufacturer's interface.

SCANCAT allows you to:

1. Enter any one frequency and increment up-down from that point.
2. Enter any two frequencies and scan between them with ANY increment, time delay or pause.
3. Scan a file of frequencies, search by description or wildcards.
4. Create Databases of frequency files. Sort by any field, and save to disk and/or send to printer.
5. Create 30 personal "Preset" frequency BANDS for SW, aircraft etc. including increment and mode. The most popular presets are included in the program.

- **Multiple Scanning Banks**
- **Multiple Scanning Diskfile Banks**
- **Unlimited Files Sizes**
- **Dual Radio Simultaneous Scanning**
- **Comma Delimited Conversion**
- **D-Base Support. Scanport- Gold**
- **Direct Import of TRS**
- **Macro Control per Record**
- **Command Line Control**
- **Automatic Birdie Lockout**
- **Top Hits Table**

WINDOWS™ Control for Scanners

ScannerWEAR™ SoftControl 2.0- WINDOWS 95' compatible now supports:

- **OptoScan 456** with **Radio Shack** PRO 2005/2006
- **AOR** 3000/3000A/8000 with Radio Shack **PRO** 2035
- **ICOM** R7000/R7100/R9000

- Memory banks include 100 channels per bank with frequency, description and mode.
- Search ranges include frequency, step, mode and description. New database search by service codes.
- Data logging to the file includes date and time stamp, signal strength, tone and number of hits, location (requires PerCon Database)
- Spectra analysis uses search ranges or displays logged data
- **NEW** High Speed CTCSS & DCS controlled scanning with the RS-2005/6, RS-2035 and OptoScan with 456/535.
- CTCSS & DCS controlled scanning on R7000/7100 & AOR 3000/3000A AOR 8000 with optional RC-125 Tone Interface Box
- Scan multiple groups, banks, or search ranges in the same session.
- Birdie control file. • Unlimited file size.
- Import PerCon Database and comma-delimited ASCII.
- Special Eprom support for the AOR 8000 including up and downloading of hex values, plus MODPLAN to enable lost 800-900 mhz.
- NEW database scan by service code, create memory banks from service codes.
- NEW memory bank up and downloads for ICOM R7000/R71000/R9000 and AOR 3000A/8000.
- NEW config window with support for com ports 1-8, IRQ calls on all ports, user modifiable dwell setting for all radios.
- NEW slave- master scanning with CIV protocol, scan on your receiver and all hits are transferred to the slave receiver for monitoring.
- NEW minimize window allows viewing of freq status while in any other WINDOWS or DOS application.

Computer Interface for the AR8000 & AR2700

Unlike some of the European devices sold today, this unit is smaller, lighter, and makes no power demands on your receiver. With the extra shielding and smaller size there is less chance of additional interference leaking into your radio. The AR8000INF is also the only interface that is upgradeable for use with the optional Tape recorder controller due first quarter '95.

- △ Low Power, powered by your serial port
- △ No Drain on the batteries in the radio
- △ Light weight, perfect for Laptop use
- △ Hi-Tech Surface mount design for reliability
- △ 100% Shielded cable to receiver for reduced interference
- △ PC Software included for Windows and DOS
- △ Detailed Programers documentation available
- △ Designed and Manufactured in the USA

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Set Up Your Own Beeper Network

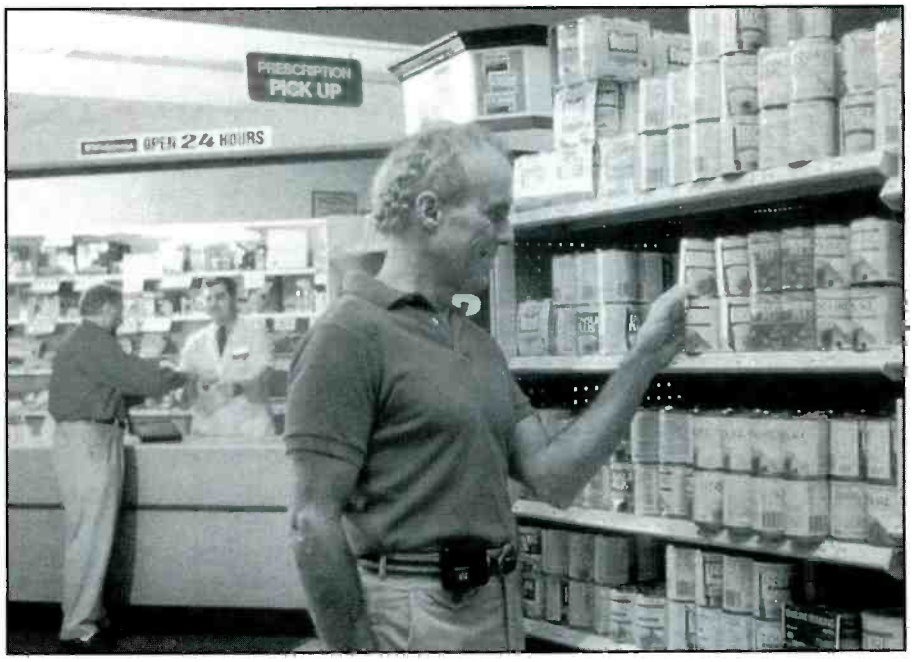
Why Pay For Paging Service? Do It Yourself!

BY TOM KNEITEL, K2AES, SENIOR EDITOR

While monitoring commercial beeper traffic, I often copy messages from parents reminding kids it's time to come for supper or do homework. I also have encountered endless streams of pages that obviously are sent to persons not too distant from the person seeking them. Like the hotel front desk that continually reaches out to the housekeeper, handyman and bell captain. Or the construction site that keeps paging various foremen and subcontractors to return to the office trailer.

These people probably don't realize they can set up their own short-range beeper radio systems without much trouble, and sometimes without even needing FCC licenses. This is a rapidly growing communications field with many suppliers entering the market.

Many beeper users prefer to own their own networks as well as the pagers that work on that system. Among the advantages to owning a network vs. paying monthly airtime service charges are knowing that your pages will be instantly transmitted without being delayed, and that they will have the best possible signal coverage where they are most needed.



On-site pagers can be used to allow shoppers to browse while their prescriptions are being filled or cars are being repaired. (Photo courtesy of Motorola)

Where To Go?

Privately owned paging stations can be monitored on their own special frequencies across the spectrum from the 27-MHz band, all the way up to 940 MHz. The most popular voice/non-voice frequencies and bands for private paging systems is shown in Table 1. Of course, some private, or so-called "customer-owned" beeper networks are intended for wide-area coverage, and might run as much as 2,000 watts (in accordance with FCC regulations). But systems considered as "on-site" operate with low power and are designed to be effective mainly within a certain limited area.

Private paging systems on frequencies other than 929 to 930 MHz are obligated to share channels with other stations on a non-exclusive basis. Stations in the 929 to 930 MHz band use advanced non-voice technology and are assigned exclusive frequency use. Most 929-MHz paging systems use high-power transmitters serving wide areas. In instances where FCC licenses are required, they are available to applicants who qualify in the business or other radio services.

The number of uses for customer-owned, limited-range beeper systems is quite diverse. Known purchasers include public safety agencies, private security companies, malls, hospitals, summer camps, amusement parks and carnivals, fairs and exhibitions, marinas and boat yards, repair shops, clubs, pharmacies, hotels, museums, office and housing complexes, stores, restaurants, factories, golf courses, entertainment activities, sports arenas, construction sites, ranching and agricultural operations, mining and oil field operations and families.

In hospitals, stores and offices, the beepers eliminate distracting overhead loudspeakers used to summon personnel, while contact is maintained with scattered employees. The same theory is true with customers who can continue to shop while awaiting in-store services such as filling prescriptions, car repairs or film developing.

According to figures compiled by Economic and Management Consultants International (EMCI), a Washington, D.C.-based company that follows telecommunications industry trends, about one-third of the 19 million pagers in America are non-business customers. Not only that, half of all new pager customers are personal users.

Commercial paging services can be as simple or sophisticated as a customer wants or needs. But the latest paging techniques, including alphanumeric and voice, also are available in popular priced cus-

In restaurants, waiters can be paged to let them know when orders are ready for pickup. (Photo courtesy of Motorola)

A close look at the beeper that comes with RadioShack's inexpensive on-site paging system. Users assign their own meanings to the 10 different message codes the system transmits.

The Motorola CourtesyCALL was designed with a vibration-only alerting system. It advises waiting customers when their orders are ready. (Photo courtesy of Motorola)

Motorola's People Finder is a multimode on-site radio paging system. It's perfect for contacting roving employees in large hotels, office complexes, construction sites, etc. (Photo courtesy of Motorola)

tomer-owned, on-site systems. Technologies such as voice compression and high-speed data transmission are helping to bring the newer paging techniques into wider usage. Price levels for complete on-site paging systems have decreased to the extent that small businesses now have found it cost effective to own their own paging systems, once the price is factored in the monthly service fees ordinarily paid.

Sure, there are the high-power private systems available starting at $10,000. Forget them. Even the most elaborate on-site networks discussed here can be put online for a fraction of that. You'll learn about a basic beeper transmitter that might send pager messages to 100 beepers throughout your county. What's more, it can be up and running for around $100. Someone can practically go into the beeper business! Let's take a look at a sampling of the on-site units at different levels of complexity.

Jeepers Beepers!

Motorola has been very aggressive in this emerging field. Their on-site paging units transmit on frequencies in the 455 to 470 MHz range with 2 watts, so easily obtained FCC licenses are required. The company offers a variety of products such as the SiteMate voice paging system. This base station can be used to access as many as 60 pagers, allowing messages as lengthy as 15 seconds each. The company claims the unit has a range from one and a half to two miles, depending upon the environment. Punch up a pager number, talk, and the voice message goes out to that pager.

One retail ad we saw for the Motorola SiteMate offered a package consisting of the base station and three pagers for roughly $1,300. The base station was available separately for around $830, with individual pagers at $200 each. Other dealer prices may vary from this.

Motorola's CourtesyCALL was designed as a vibration-only alerting system for notifying waiting customers. This system can accommodate 90 customers.

Motorola's People Finder is an on-site central base pager. It is a tone-alert, voice, alphanumeric and display paging encoder/transmitter. People Finder LT or PLUS systems will support voice, numeric and alphanumeric pagers and are available with a landline phone interconnect allowing callers to place pages from any Touch-Tone phone. People Finder PLUS accommodates up to 1,000 user numbers, while the LT version accommodates up to 100 user numbers.

The Motorola AlphaAlert on-site pager is an alphanumeric system designed to send information to wall-mounted display signs throughout a store. These signs make special sales announcements and offers to customers.

Popular Private Paging Frequencies

All stations may transmit distinctive tones to activate specific pagers. Unless otherwise noted, frequencies observed being used for voice and non-voice paging. Low power restrictions are in effect on some frequencies, as indicated

MHz	Comments
26.995	4 watts max., non-voice only, no license.
27.045	4 watts max., non-voice only, no license.
27.095	4 watts max., non-voice only, no license.
27.145	4 watts max., non-voice only, no license.
27.195	4 watts max., non-voice only, no license.
27.255	25 watts max. for non-voice, no license. 4 watts max. for voice (CB Channel 23), no license.
35.02	Special Emergency. 3 w. max., non-voice, FCC states for "physically handicapped" use.
35.64	Special Emergency.
35.68	Special Emergency.
43.64	Special Emergency, 10 w. max., non-voice only, FCC states for "physically handicapped" use.
43.68	Special Emergency.
49.82 to 49.90 band	Part 15 low power no-license band.
151.995	(Unauthorized freq., illegal pager use noted.)
152.0075	Medical.
152.48	Business.
154.57	Business, 2 watts max., voice only.
154.60	Business, 2 watts max., voice only.
154.625	Business.
157.45	Medical, 30 watts max.
157.74	Business.
158.46	Business.
163.25	Medical.
453.025	Medical.
453.075	Medical.
453.125	Medical.
453.175	Medical.
462.75	Business.
462.7625	Business, 2 watts max., voice only.
462.775	Business.
462.7875	Business, 2 watts max., voice only.
462.80	Business.
462.8125	Business, 2 watts max., voice only.
462.825	Business.
462.8375	Business, 2 watts max., voice only.
462.85	Business.
462.8625	Business, 2 watts max., voice only.
462.875	Business.
462.8875	Business, 2 watts max., voice only.
462.90	Business.
462.9125	Business, 2 watts max., voice only.
462.925	Business.
464.50	Business, 30 watts max., voice only.
464.55.	Business, 30 watts max., voice only.
465.00	Business.
469.50	Business, 30 watts max., voice only.
469.55	Business, 30 watts max., voice only.
851 to 869 MHz band	Business (Specialized Mobile Radio Systems).
929.3625 929.3675 929.4125 929.4375 929.4625 929.6375 929.6625 929.6875 929.7125 929.7375 929.7625 929.7875 929.8125 929.8375 929.8675 929.8875 929.9125 929.9375 929.9625 929.9875	Channels between 929 and 930 MHz are available for paging use by licensees in virtually all of the private land mobile services, and also to Federal agencies.
935 to 940 MHz band	Business (Specialized Mobile Radio Systems).

Table 1. Make note of these frequencies and bands popularly used for privately owned paging systems.

More information on these Motorola beeper products can be obtained from Motorola Customer Owned Paging, 1500 Gateway Blvd., MS 101, Boynton Beach, FL 33426-8292; phone (800) 382-9336.

A versatile series of in-house pagers called the PageOne has been sold for the past few years by Shinwa. The VHF version (150-170 MHz) puts out 2 to 5 watts, while the UHF version (450-470 MHz) operates with 2 to 4 watts. These are two-channel units and require FCC licenses.

The system has a 100-unit capacity, but can be expanded to 6,000 with the use of a PC (IBM or clone). Tone-only, tone and voice, talk-back, DTMF and other paging formats may be employed, including local interconnect to landline phones.

For more information on the current availability and prices, contact: Shinwa Communications of America Inc., P.O. Box 26407, Oklahoma City, OK 73126; phone (405) 789-9371.

Maxon Systems has numerous Maxcall on-site paging systems available in power ratings from 2 to 100 watts. They offer voice and non-voice models. These systems require FCC licenses. Check with Maxon for their available models at: Maxon Systems Inc., 10828 N.W. Air World Drive, Kansas City, MO 64153; phone (816) 891-1093.

The Cheaper Beeper

There is an economical and effective beeper system that does not require an FCC license. This is RadioShack's unit (Cat. No. 17-6020), which operates numerical beepers. RadioShack says that with only its built-in center-loaded antenna, the transmitter has a range of up to two miles. This operates on 27-MHz frequencies. Its 7-watt, tone-coded signal is far more penetrating than any 4-watt AM voice CB signal.

Ponder upon the perky coverage range the RadioShack 27-MHz system could have if it got itself hooked to a roof-mounted CB antenna! It might well be able to reach out and ring the chimes of beepers around an entire county.

The RadioShack beeper system allows for up to 100 pagers. It sends 10 different message codes, which are displayed via LED, and saved over a year without power. It can page an individual unit, or buzz them all at once. For only about $100, RadioShack sells a package consisting of the transmitter and one beeper. Additional beepers are about $30 each. This system is available at all RadioShack stores.

Another attractive system that appears to have essentially similar specs and external appearance as RadioShack's is marketed as the PrivatePage. There are two obvious differences between it and the RadioShack package we can immediately discern. One is that the basic PrivatePage package comes with two beepers. The oth-

AR5000 CYBERSCAN... The Ultimate Receiver

Join the AOR Revolution with high tech, state of the art receivers

Never before has there been so much in such a small package. Hear naval submarine command and control at 21.4kHz, push a button and copy GOES WX Satellite 1691MHz.

10kHz-2600MHz

Leading Edge Technology has now become affordable.

The answer to every receiver need. Prior to the AR5000, it took two, three or even four receivers to cover this range, plus the small size and low power demands make the AR5000 ideal for field use, remote control radio, and local & remote computer control. Every circuit and component is state-of-the-art, surface mount technology. Low noise circuits and devices assure wide dynamic range and great sensitivity.

- Totally computer controllable.
- Local and remote control of all functions.
- 7 I.F. Band width filters
- Triple conversion to reduce imaging.
- Multi-Receiving modes covers today's data and voice communications.
- High speed scan and search modes
- 1000 memory channels (10 Banks x 100ch)
- 2 antenna inputs computer/front panel control.
- Varactor RF tuning .5 - 500MHz for low cross talk and intermod
- Switchable attenuator for high RF environments.
- Power 13.8VDC at <1amp, AC Adaptor included
- Small, lightweight (approx. 8.5"W x 3.5"H x 10"Deep)
- SDU5000 compatible

AR5000 Specifications

Frequency Range:
10kHz - 2,600MHz
Receiving Mode:
FM, AM, LSB, USB, CW, Special
I.F. Bandwidth: 3kHz, 6kHz, 15kHz, 40kHz, 110kHz, 220kHz, 0.5kHz (Opt.)
Triple Conversion: I.F.
622.2, 10.7 & .455MHz
Frequency Stability:
±1ppm (0 to 50C) ext OSC jack
Antenna Impedance:
50-Ohm (N, BNC)
Programmable Step:
1Hz to 999.999kHz
Search/Scan Speed:
50 steps/second (less than 100kHz steps)
Power Supply:
DC 12V, (<1A) 120VAC adaptor incl.

AR 3000A

Compact, professional quality, wide range monitor receiver

Incredibly wide continuous coverage from 100kHz all the way up to 2036MHz* • Receives all modes • FM, AM, FMW, LSB, USB, and CW - so you'll hear everything! • Superb R.F. performance thru the use of 15 switched discreet band-pass filters with GaAs FET R.F. amplifier, delivers high sensitivity, wide dynamic range and excellent intermodulation rejection • Tuning rates are continuously selectable from 50Hz to 1MHz steps • True professional's choice!

AR8000 shocks the market. AOR made every effort to incorporate the latest technology in to this new scanner.

• SPECIFICATIONS •

- **Range:** .5 - 1900MHz* usable to 100kHz
- **Modes:** AM/NFM/WFM/USB/LSB/CW
- **Stepsize:** 50Mz to 999.995kHz
- **Sensitivity(μV):** 30 to 1000MHz
  SSB .2 **AM** 1.0 **NFM** .35 **WFM** 1.0
- **Filters:** (kHz) **SSB** 4 **AM/NFM** 12 **WFM** 180
- **Memories:** 50 ch. x 20 banks= 1000 total
- **Size/Wt.:** 6.1 x 2.8 x 1.6 inch. 20 oz. batt. incl.

* Cell blocked for all, but Approved agencies.

- Ferrite Rod antenna below 2MHz
- Only portable scanner on U.S. market to have true SSB, both LSB & USB.
- Others attempt SSB using a BFO, but are difficult to tune and produce poor SSB audio.
- 4 level alpha numeric LCD read out frequency, mode, signal strength, band scope spectral display, battery low, remote and more.
- Computer control up/down load data, will add a new dimension to the world of scanning.
- Clone your memory banks with a friend, load 1000 memory channels in seconds

"The New Star" AR 2700...Out of this world Wideband Scanner

The new AR 2700 from AOR is another break-through for general coverage scanners at an affordable price.

• FEATURES •

Wide frequency range: 500kHz to 1.300MHz with various step size, 5, 6.25, 9, 10, 12.5, 20, 25, 30, 50, & 100kHz (wide FM only).

Auto Mode tuning: Comprehensive band plan has been pre-programmed to simplify the operation. The AR 2700 will automatically select the appropriate mode and channel step.

Great flexibility in programming: for Scan and Search mode. Delay, Pause and Priority intervals can be set to a specific value. Program search, Manual search, Bank link. Delay, Pause, Pass, Scan, Bank delete, Priority are provided.

High Capacity: 500 channels into 10 banks and 10 search banks.

Optional Digital Voice Recording: 20 seconds of digitized recorded conversation and playback through the use of the **RU-2700** option.

Computer control port may be connected via an optional adaptor to a computer for remote control of the AR 2700.

CIRCLE 130 ON READER SERVICE CARD

This Shinwa PageOne system is for in-house use and is available in VHF or UHF.

Maxcall, by Maxon, is available in a wide variety of voice and non-voice configurations, with power ratings from 2 to 100 watts

The PrivatePage base station comes with two beepers. Externally, this looks similar to the RadioShack system, although it costs more.

This no-license Personal Pager system has a range of 100 feet. It probably has a lot of uses.

er is that the PrivatePage package has a suggested price of about $230, with additional beepers available at about $70 each.

Maybe I missed something, but according to my rough calculations the two-beeper PrivatePage ensemble costs about $100 more than the basic one-beeper RadioShack package, with an additional beeper included.

PrivatePage is sold through office supply chain stores. For additional information on PrivatePage, contact Command Communications Inc., 10800 E. Bethany Drive, Aurora, CO 80014; phone (303) 751-7000.

Help—I've Fallen and I Can't Speak Up!

Here's the most inexpensive on-site beeper system I could locate. Pressing the Personal Pager transmitter button triggers a portable beeper anywhere within 100 feet, indoors or out. The license-free device is mainly intended for summoning children. Also, the manufacturer suggests it for persons who need to alert or bring health-care attendants or family members, and otherwise would have to gain their attention by shouting through walls or making phone calls. A fertile mind should be able to devise numerous other practical applications.

The short-range Personal Pager transmitter is matchbox-sized and uses a 12-volt battery. It has a cord to allow it to be worn around the neck. The accompanying beeper is about the size of a deck of playing cards, and requires two AA batteries. It may be placed on a table or clipped to a belt. This entire two-piece system costs about $40, plus shipping.

For more information on the Personal Pager, contact The Greatest of Ease Co., 2443 Fillmore St. #345, San Francisco, CA 94115; phone (415) 441-6649.

As you see, customer-owned beeper systems for short-range or on-site applications offer a wide choice of hardware. If you use a beeper, consider whether your application can best and most economically be served by owning your own system.

Are you primarily a scanner enthusiast? If so, *POP'COMM* hopes you have gained new leads and insights into this communications activity, which is now displaying increased activity. ■

OUT OF THIN AIR AND INTO THE THICK OF THINGS.

THE DRAKE R8A

The Drake R8A World Band Communications Receiver. Turn it on, tune it in, and as easy as that, you're hearing world events as they happen... uncensored and complete. And with the R8A's astounding clarity, it's almost as if you're there. In fact, no other communications receiver puts you closer to the action in even the most distant parts of the world.

If you're a hobbyist, you'll marvel at the R8A's simplicity of operation. If you're an expert, you'll admire the high-powered features. The Drake R8A offers superior performance in a complete package that includes built-in filters and other unique features that have made Drake the foremost name in world band communications. The R8A from Drake...you've got to hear it to believe it.

DRAKE, FOR A WORLD OF DIFFERENCE.

Order Now Risk-Free!

15-DAY MONEY BACK TRIAL

We are so confident you'll be impressed with the R8A's performance, we'll give you a full refund on your factory direct order, less shipping charges, if the R8A doesn't meet or exceed your expectations. Call for complete details.

Order Today, Factory Direct or call for the dealer nearest you **1-800-937-2538**

DRAKE

R.L. Drake Company, P.O. Box 3006, Miamisburg, Ohio 45343, U.S.A. ▪ Sales Office: 513.866.2421 ▪ Fax: 513.866.0806 ▪ Service and Parts: 513.746.6990 ▪ In Canada: 705.742.3122

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CIRCLE 114 ON READER SERVICE CARD

Radio Recalled

Two Important Historic Stations You May Not Know About

BY ALICE BRANNIGAN

After all these years you thought you had heard from and about every claimant to the honors of being the first broadcaster. Hold on, here's 1907 broadcaster Frank E. Butler of Toledo, Ohio!

Tom Schoen sent us Seymour Rothman's article in the *Toledo Blade* describing Butler's wireless work. He started out as the associate of Dr. Lee de Forest a few years after the turn of the century. In 1906, after losing a patent suit to Fessenden, de Forest decided to leave the United States for a while. Butler moved back to his hometown of Toledo, and set up his own company making a lantern accessory called a Radiolite. When his company burned down, he moved to New York to locate de Forest. He and de Forest soon got to work.

Butler claimed he and de Forest invented the word *radio*. Butler felt *radio* should be used to describe voice transmission mode, so as to differentiate it from wireless telegraphy. Author Rothman notes that Butler thought *radio* was easy to say and remember in all languages. He didn't like the word wireless anyway, because *less* was a negative expression.

In June 1907, de Forest built a transmitter with a carbon mic. After some tinkering and jarring of the carbon particles, it produced sound. Not that they expected any results, but they strung up an antenna on a flagpole and began playing the two phonograph records they had on hand. One of the records was *The Anvil Chorus*.

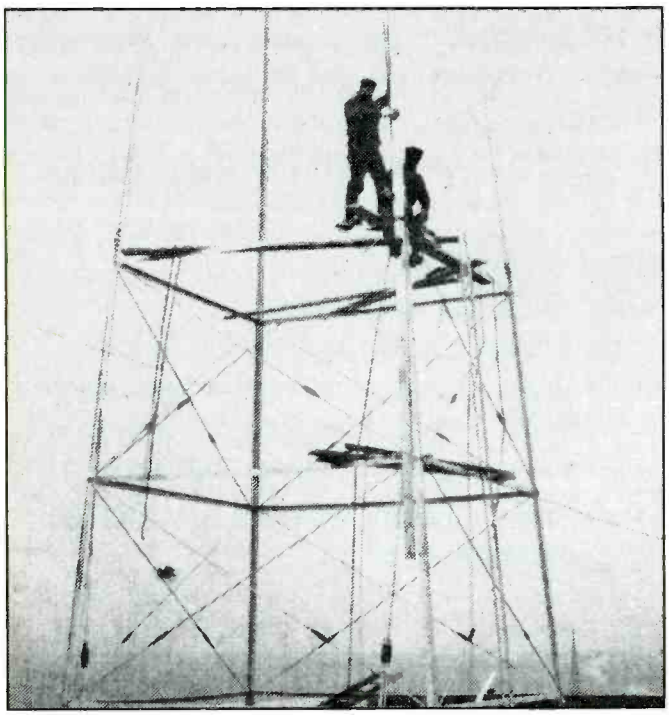
A few days later, newspapers began carrying stories about how wireless operators at the Brooklyn Navy Yard and ships at sea heard *The Anvil Chorus*. De Forest contacted the media to claim credit, which resulted in news photos of the station with Frank Butler at the controls.

The hope was that this publicity would result in investors coming forward. Wireless telegraphy already had proven itself profitable for de Forest on the Great Lakes. He thought that telephony would have applications on the lakes, too. Butler and de Forest arranged for a demonstration of radio telephony during the annual regatta of the Sandusky Yacht Club in Ohio.

The club's commodore offered his 72-foot yacht for the broadcast, and de Forest agreed. The commodore even smilingly suffered through copper grounding plates being attached below the water line on his luxury vessel's mahogany hull.

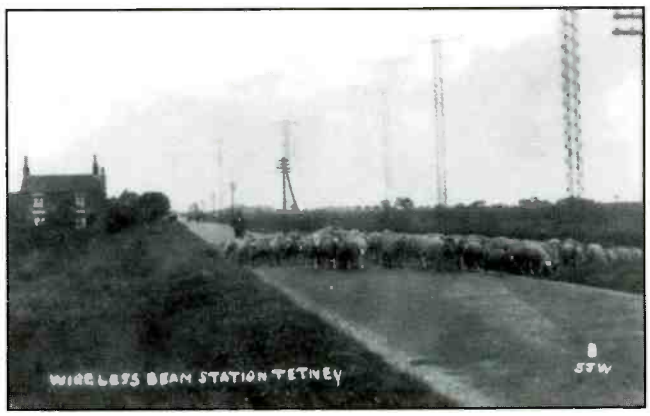
On July 19, 1907, de Forest manned the mic, while the receiver on shore was operated by Frank Butler. Members of the press and spectators crowded around. As the boats crossed the finish line, de Forest announced their names and the exact time. Between each race, he played phonograph records. Seymour Rothman writes that this demonstration was declared "a miracle and a success."

As de Forest headed back to New York to line up investors, Butler took the transmitter and turned it into Toledo's first radio station. The station's studio—consisting of a phonograph and transmitter—was located in Room 1638 of the Nicholas Building (now the Fifth Third National Bank Building). Originally, it had been planned to use the building's roof-mounted flagpole for the antenna. During installation of the antenna, the flagpole fell a dozen floors and damaged the glass roof of an adjacent building. Butler finally had to erect an 80-foot, steel lattice tower for the antenna.



◄ *Frank Butler's broadcasting station went on the air in Toledo back in 1907. This is the tower being assembled on the roof of the old Nicholas Building.*

A general view of the wireless towers used by Marconi's shortwave station at Tetney, Great Britain. (Marconi Co. Ltd. photo) ▼



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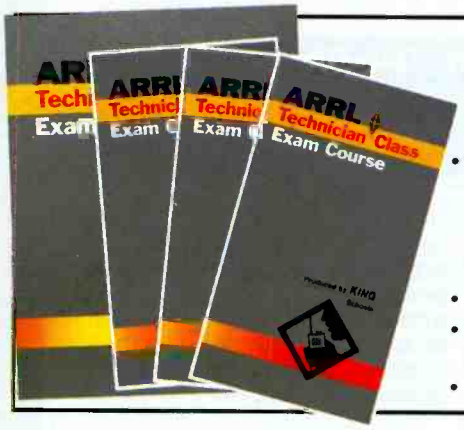

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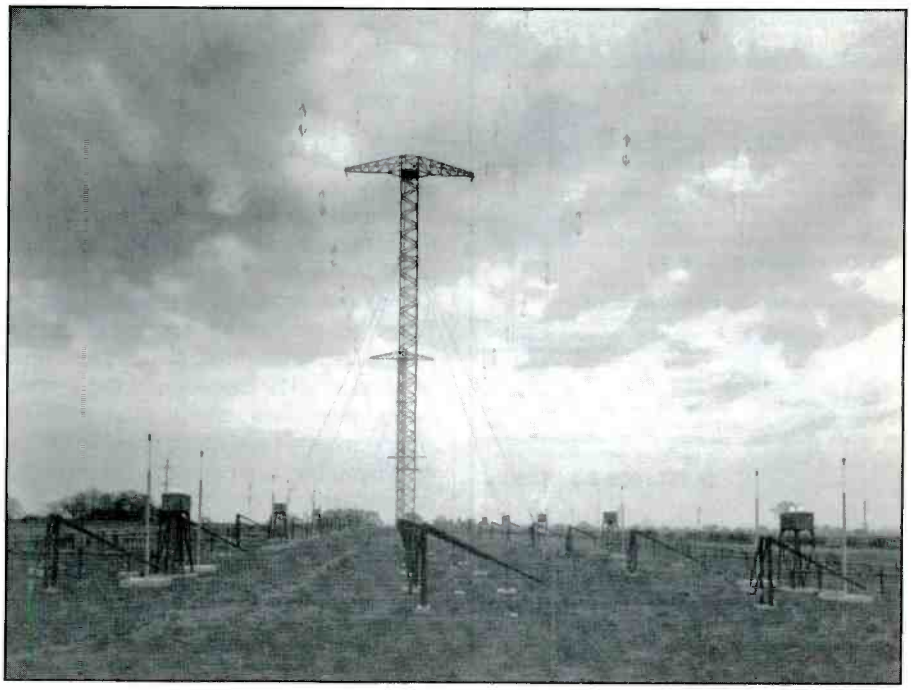
A receiver was established so that people, especially prospective investors, could listen to the demonstration broadcasts. This receiver was located in Room 1253 of the Edison Building (now the New Ohio Building). The distance from the transmitter was exactly 600 feet.

The Toledo station commenced broadcasting music on Aug. 1, 1907. It attracted many visitors to view both the transmitting and receiving apparatus. Operations continued until the station was discontinued in January 1908. It was shut down so that it could be operating Jan. 13, 1908, at an electrical show at Chicago's Coliseum.

Frank Butler went on to become dean of a school that trained radio operators, technicians and engineers. He died in 1948 at age 70.

Seymour Rothman's lengthy article in *The Blade* was a fine tribute to Frank Butler. We had the space only to offer a brief summary of this pioneer whom you may not have known of until know.



The directional shortwave antenna system at Tetney was aligned using the sun and stars because a compass wasn't sufficiently accurate. Shown in 1927. (Marconi Co. Ltd. photo)

Speaking of Demo Stations

In the early days of wireless, long-distance communications were routinely exchanged via longwaves, the portion of the spectrum today considered low frequency. Frequencies ranged as low as 21, 19 and 18 kHz. This required enormous antennas. Great Britain, for one, needed long-distance point-to-point communications in order to maintain contact with the Empire. As early as 1906, it had been suggested replacing the original cable system with longwave wireless. Yet, the years dragged on and nothing had been done because of the intervening war, as well as political disagreements. By 1924, it seemed as though the plan was set to roll, but a new factor had come to the fore.

By 1924, Marconi had been experimenting with shortwave wireless, and it was his opinion that this was a far better way of establishing Great Britain's global network than via longwave. He argued that the antennas would be smaller, and because reflectors could be used to beam signals in certain directions, lower-powered stations were feasible. He claimed the capital cost was only a tenth of a cable system, and the operating costs were lower, too.

Traditionalists were aghast, and the government's plans were thrown into disarray. Marconi offered to build, at no cost, an international shortwave point-to-point network to demonstrate his Beam System. His one stipulation was that the government suspend development of a longwave network until after they had evaluated his system. The government agreed.

A contract was written naming the first link built as the one to Canada. It designated three other stations (Australia, India and South Africa) to be constructed in the event the link to Canada proved successful. The Canadian Beam Station opened at midnight on Oct. 5, 1926. Then Australia opened in April 1927, with India following in September of that year.

The British station at Tetney (Grimsby) reported excellent communications with the station at Ballan, Victoria. The Australian government had been guaranteed an

This is the transmitter room at the Marconi Beam Station, Tetney, shown in 1927. This station played a key role in popularizing shortwave as the primary medium for international communications. (Marconi Co. Ltd. photo)

average traffic capacity of 20,000 words per day. In actuality, the capacity was more than three times that. In a single week during December 1927, the total number of words carried by all the stations in the net was at a rate that would total nearly 35 million per year.

Support for the Marconi Beam System by the governments of Canada, Australia, South Africa and India to adopt this technology put considerable pressure on the British government to adopt the shortwave system. According to a story in *The Times* of London, "The invention of the wireless beam system has revolutionized overseas communication and made possible the use of telegraphic communication as an everyday necessity rather than as a luxury."

Marconi had proven his case. That marked the point when worldwide shortwave communications networks began replacing older longwave systems.

A close look at the Tetney station is in order. Tetney operated with 20 kW, just a fraction of the enormous power that would have been required to run a longwave station capable of reaching such great distances. The callsign to Australia was GBH, and this circuit used 11955 kHz. Australia, is roughly halfway around the earth from Britain. This meant signals could be beamed either toward the east or west in order to take advantage of the best propagation conditions, as these existed in the darker half. In practice, GBH operated toward the longer westward path in the mornings, and eastward during evenings.

The link to India had the call letters GBI. Depending on the path length, GBI would operate on either 8570 or 18750 kHz.

It was claimed that the success was largely because of the directivity of Tetney's beam antennas. Precise placement and alignment was vitally important, and was at right angles to the shortest great circle routes to the circuits. Compass bearings were deemed less than sufficiently accurate to meet Marconi's specs. Installation engineers had to take position fixes using the sun and stars in order to establish beam orientations with the degree of accuracy Marconi demanded.

Ownership changes and world events eventually caught up with Tetney. Factor in the growth of air mail services, competition from foreign wireless services, the war situation in Europe, and the worldwide economic woes of the 1930s. These and a matrix of other business and military considerations combined to bring the station's career to an end after a dozen years of service.

The Tetney Beam station operated until the winter of 1939-1940, when it was closed and the towers dismantled. The towers had been maintained in excellent condition, so they were reconstructed at Dorchester and Somerton, Somerset, where they were used for communications for the duration of World War II.

Information on the Marconi Beam System and station at Tetney was extracted with permission from a richly detailed research monograph prepared by Paul Hewitt, G0NUE. Paul is headmaster at Tetney County Primary School, which operates school amateur station GX0PHA. Our appreciation to Russ Streeper, WA4BWB, of Electronic Service Co., Lynchburg, Va., for arranging our use of this material and the Marconi Co. Ltd. photos showing the historic Tetney (Grimsby) Beam Station.

Named for Marconi, But He Didn't Build It

In 1947, the five Myrtle brothers shared a vision of putting a radio station on the air in the small town of Fort Bragg, Calif. That's when they obtained a permit to build their new station. The permit read: KDAC, 250 watts, 1230 kHz.

A transmitter was needed, so they decided to buy one in kit form from RCA. In those days, the company sold the kits along with plans for setting up small stations. No matter that none of the five Myrtle brothers had any knowledge whatsoever about kit building, or radio, or electronics. People on the KDAC staff jokingly referred to the transmitter as "the Marconi kit."

When the brothers finished building the transmitter, it was so large that it wouldn't fit through the doors leading into the basement room where it was supposed to go. It ended up in KDAC's main studio.

It was decided to erect KDAC's first tower on the ground then hoist it into vertical position. This idea failed in disaster as the tower got partly up, then came crashing down. A tower worker lost his life in the incident. They untangled the crumpled tower as much as possible, then erected it, kinks, bends, dents, twists and all. It remained in service for a full year until KDAC could take it down and put up a new one.

More than 20 years ago, KDAC increased its daytime power to 1 kW, 250 watts at night. In 1991, KDAC was sold. The station now runs a talk-radio format.

We were just beginning to get the keyboard warmed up, and all too soon we find ourselves facing the tattered edges of our allotted space for January. You'll have to come back next month. Your help in keeping these pages viable is always sought and appreciated. We seek old time wireless and radio QSL cards and letters (originals or good photocopies), station photos, picture postcards, station lists, relevant personal memories and anecdotes, news clippings, questions and comments. Best wishes for the coming year. ■

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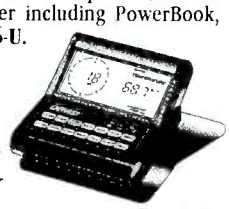

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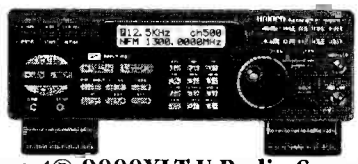

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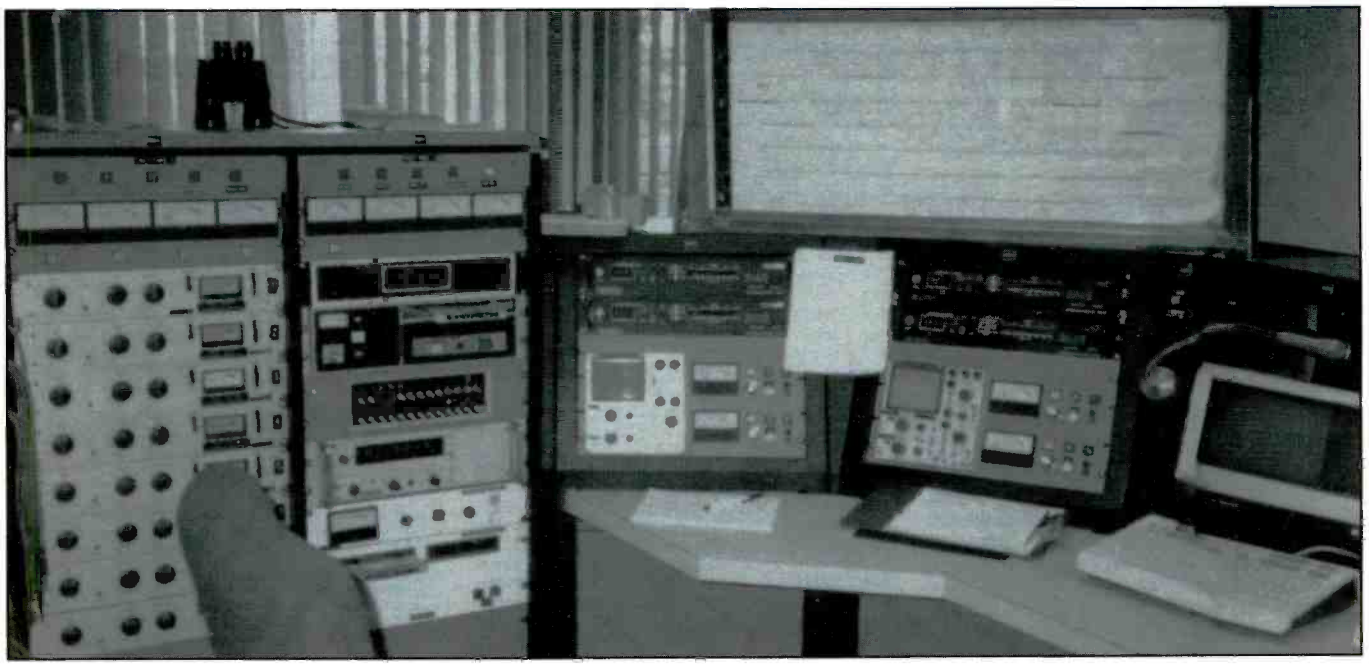
CIRCLE 28 ON READER SERVICE CARD

RCI: Canada's Shortwave Voice

A Visit to Sackville

BY BRYAN S. CONSTABLE



The control room at Radio Canada International relies heavily on computers for transmitter monitoring and control.

On a trip to the Maritime portions of Canada, I was able to visit the Sackville, New Brunswick, transmitter site of Radio Canada International. As most SWLs know, this is one of the most widely heard shortwave transmitters in North America. This is partly due to the tremendous power and excellent location, to be sure, but also because of RCI's reciprocal relay agreements with other international broadcasters.

The Sackville site first came on the air in 1944, utilizing a 50-kW transmitter built by RCA. Under the callsign of CBA, the original mission was to provide programming for Allied forces in Europe during World War II.

Over the years, the site has grown to its present configuration consisting of five 250-kW Collins transmitters and three 100-kW Harris units. Programming consists not only of RCI's own broadcasts in a dozen languages, but the relayed programming of stations such as the BBC, Radio Korea, Radio Austria and Radio Japan as well. It is Canada's only international shortwave broadcast facili-

Here's a look at the 250-kW Collins transmitters at Sackville

ty. Programming for Radio Canada's broadcasts originates in Montreal, Quebec, and is relayed to Sackville via an Anik D satellite link.

The transmitters are on the air 22 hours each day. A monitoring station in Stittsville, Ontario, keeps an ear on the signal quality. The monitoring station also serves as an off-the-air pickup site for other stations' signals for retransmission. All the transmitters are water-cooled; the water source is on site as well. This means there is extensive filtering (reverse osmosis) and de-ionization prior to being sent to the transmitters.

All transmitters are interfaced with a computer which automatically controls all switching functions. Additionally, computers monitor all transmitter functions and assist in problem diagnosis. With all those watts and all those computers, the building is heavily air conditioned in the summer and requires no extra heat in the winter!

In the "matrix house," the feeds from any of the transmitters can be switched to any of the antennas. A large display on the wall shows which transmitter is connected to which antenna at a glance. They recently have changed their coaxial switches to the open air variety, for greater ease of maintenance. Each transmitter can be automatically tuned to any frequency from 3.95 to 26.5 MHz in about 10 seconds.

The area around Sackville was reclaimed from the sea with a series of dikes and dams. The swampy landscape forms a nearly perfect ground plane for the many antennas that grace the site.

The various bidirectional curtain arrays are arranged in a semicircle, and are visible from several miles away. Supporting towers range from 30 to 200 feet in height, with individual arrays for each target area. With all the clearance lit at night, the antenna farm is truly impressive!

The snow starts to fall in Sackville in mid-October and it isn't always possible to get in and out during the harsh New Brunswick winters. Because of this, the facility sports bunks, kitchen facilities and a VCR for those long, cold nights. Also contributing to the self-sufficiency of the installation is the extensive machine shop facilities and spare parts inventory of some 1,400 items. There even is a facility for silverplating.

The installation employs about two dozen people, including several full-time riggers for the antenna farm.

Radio Canada's Sackville transmitters are open to the public five days a week, from 10 a.m. until 6 p.m. local time, and the friendly staff is ready to answer visitors' questions. ■

POP'COMM Reviews:

RadioShack's PRS-101 GMRS Handheld

It's So Easy To Operate, Even Kids Can Figure It Out

BY CHUCK GYSI, N2DUP/KAB3210, EDITOR

The General Mobile Radio Service is a great resource. For the past few years, it has become a safe bet for families that have a unique need to communicate. I first became licensed on GMRS, then Citizens Band Class A, in the mid-1970s. I use the service sporadically as my family's needs dictate.

The nice thing about GMRS is it is a family radio service, despite what the Federal Communications Commission wants to create in a separate radio service. As each year passes, there are fewer grandfathered businesses operating on GMRS' 462- and 467-MHz frequencies. That makes a two-way radio service that is viable in many areas of the United States. Outside most metro areas, you'll probably find most GMRS channels quiet and unused. However, that is changing!

Various radio manufacturers are marketing low-cost GMRS handheld radios that prove attractive to many families and individuals. In the past, GMRS licensees have had to use strictly commercial land mobile equipment to operate on this UHF band. That equipment is designed for business and public safety users, not individuals. And that's not to mention that the cost of commercial land mobile equipment can prove prohibitive. I have a host of two-way gear that I use on GMRS, but it's not so necessary anymore, especially if you just want to have a couple of handhelds for outdoor or fun activities.

Robert Gysi, 7, left, points out a feature on the RadioShack PRS-101 walkie-talkie to his brother, Will, 5. The author's sons were used to help test these family-style two-way radios. (Photo by Chuck Gysi, N2DUP)

Tandy's HT

We decided to check out how one set of these new handhelds work under family conditions. RadioShack's PRS-101 handheld GMRS transceiver is a 10-channel walkie-talkie that proves very flexible for GMRS operations. And because families are the primary users of these radios (businesses *aren't* supposed to use GMRS; that is they no longer can obtain new licenses), I decided to put a pair of these in the hands of my family, primarily my two sons, Robert, 7, and Will, 5. My thinking is that if a kid can operate these radios, then they are good for families.

We tested these radios around the house and through the neighborhood. The two-ways are a cinch to operate. We found that the bells and whistles are limited so that the radio is not complicated to work. My sons found it quite easy to operate all the controls on these radios with minimal effort on Dad's behalf.

The Lowdown

In a nutshell, the PRS-101, a 10-channel GMRS transceiver, has a power output of 2 watts on high power and 900 milliwatts on low power. For most family outings, low-power should prove adequate.

The PRS-101 comes preprogrammed with most frequencies, however, it is flexible enough to be programmed for the frequencies you are licensed on in the General Mobile Radio Service. All seven of the interstitial low-power frequencies (see box) are programmed into the PRS-101, which allows a lot of frequency flexibility to operate on a quiet channel.

Also, there is direct access to 462.675 MHz, which is considered the emergency and travelers aid frequency for GMRS; any two other GMRS 462-MHz channels can be programmed for usage.

Programming

While it is not an impossible task, programming the unit for usage on the two additional open channels proves time-consuming at best. To accomplish storing your two assigned GMRS channels into the channels called GMRS 1 and GMRS 2 in the walkie-talkie, you must turn off the radio and remove the battery pack.

Four small screws on the back of the ra-

dio are removed and the cover is carefully pulled off. The battery pack is slid back into place while the cover is off and you turn back on the radio.

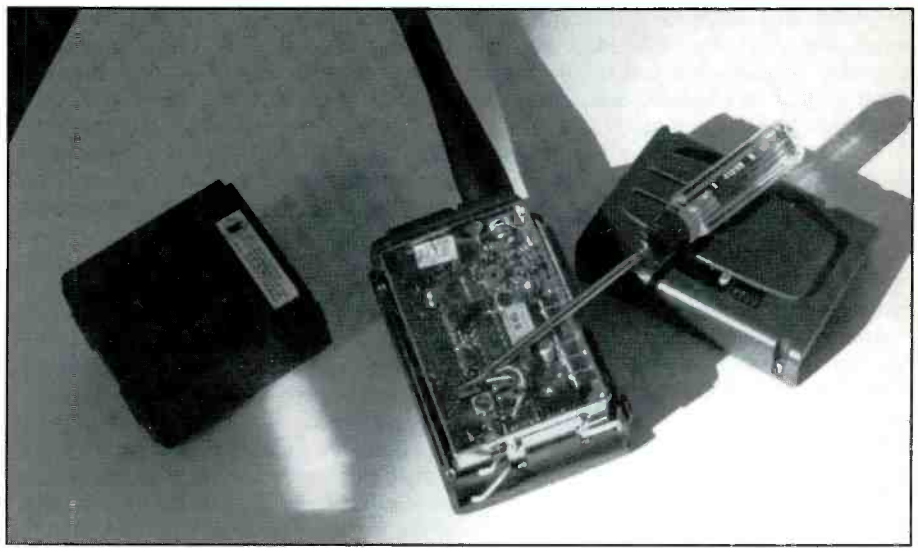
Using a small Phillips screwdriver, you carefully press a small button underneath a strategically placed plastic cover over top the circuit board and you are now in the radio's programming mode.

The radio reads out GMRS 1 and SET. By pushing the up and down arrow keys on the front of the radio, you can select a number that corresponds to the frequency you wish to use in your radio (for instance, 1 equals 462.550, which is preprogrammed at the factory into both GMRS 1 and GMRS 2).

After pressing the PTT switch on the side of the radio, you then program the frequency for GMRS 2 likewise. Pressing the button back on the circuit board again allows the programming to take hold and the radio automatically tunes itself to 462.675 MHz, which displays as EMERG on the LCD readout.

The screws in the back cover then are replaced, but be careful. On both units I tested, I had trouble with the battery slide latch on the side of the radio popping out. It just made the task a little more difficult.

Rather than going through this cumbersome process to set the frequencies for the radio, my preference would be to see a recessed switch on the back of the radio, perhaps underneath the belt clip. Even a keyboard sequence would be helpful, especially for emergency communicators who may need flexibility to change GMRS primary channels in a jiffy. However, the Federal Communications Commission may not like such easy programmability.



This is how you set the two optional frequencies in the RadioShack PRS-101 GMRS radio. With the back removed, a small Phillips screwdriver (its tip showing the exact spot) is used to push a button underneath a plastic cover protecting the circuit board. (Photo by Chuck Gysi, N2DUP)

The Controls

How easy is this radio to use? Very! As I said, I placed these radios in my sons' hands after I programmed in our GMRS channels. They didn't need more than a minute of instruction to start using the radios and blabbing our GMRS callsign on each channel.

The channel is changed by pushing the up/down arrows on the front of the radio. This allows you to move through the channels dubbed GMRS 1 and GMRS 2, which are the primary GMRS channels, plus all seven GMRS interstitial channels, dubbed GMRS INTER 1 through GMRS INTER 7. You also can go up and down through the channels to the channel dubbed EMERG (462.675). If you need to use 462.675, which all GMRS licensees can use for emergencies or travelers aid even if they aren't licensed on it, simply press the button marked EMERGENCY on the front of the radio and you are there instantly, much like instant Channel 9 buttons on some CB rigs. Being licensed on this frequency, my family can use it for chitchat. My sons found moving to this channel as easy as turning on the TV.

The volume and squelch controls are mounted on top of the radio. It possibly would be helpful if the squelch control had an instant detent setting like some commercial two-way radios to avoid playing with the dial to adjust the squelch properly.

The mic button on the side has a nice feel to it, but it is slightly stiff to push in. My youngest son, Will, had a tendency to cut off his transmissions possibly because of the stiffness of the switch. Mounted right above the push-to-talk switch is the high-low power switch for the transmitter. It's mounted within the same rubber pad as the

RadioShack PRS-101 GMRS Transceiver

Channels: 10

Frequencies preprogrammed: 462.675 (EMERG), 462.5625 (GMRS INTER 1), 462.5875 (GMRS INTER 2), 462.6125 (GMRS INTER 3), 462.6375 (GMRS INTER 4), 462.6625 (GMRS INTER 5), 462.6875 (GMRS INTER 6), 462.7125 (GMRS INTER 7), 462.550 (GMRS 1), 462.550 (GMRS 2). Note: GMRS 1 and GMRS 2 channels can be reprogrammed for any of these seven GMRS primary frequencies: 462.550, 462.575, 462.600, 462.625, 462.650, 462.700 and 462.725.

Power output: 2 watts, high; 0.9 watt, low

Battery: Slide-off, 7.2 volts

Dimensions: 2.5 by 1.5 by 6 inches

Weight: 14.3 ounces

Antenna length: 5.75 inches

Antenna connector: BNC

Jacks: Top-mounted for earphone and/or microphone, especially a headset or speaker-mic combination

Audio output: 250 milliwatts

Frequency Tuning: phase-locked loop (PLL)

Miscellaneous controls: high/low power, push-to-talk switch, battery release, emergency channel instant access, channel up/down selector, volume, squelch

Accessories included: Battery charger, plastic belt clip, vinyl protective cover

Warranty: one year

License: General Mobile Radio Service license required from Federal Communications Commission to operate. Cost is $60 for the license and fees for a five-year term. FCC Form 574 is included to apply for license. An information sheet has been added by RadioShack to simplify filling out the FCC form, plus a postage-paid post card is added to obtain more information about GMRS and licensing from the knowledgeable folks at the Personal Radio Steering Group, a non-profit organization.

Place of manufacture: China

Serial numbers of radios tested: 50315166, 50315282

mic switch and could be confused if not paying attention to the radio. However, its operation is easily identified by the beep sound as you switch back and forth between high and low power.

Accessories

The RadioShack PRS-101 GMRS UHF HT comes with several accessories to make the radio a complete package. A cube wall charger recharges the nickel-cadmium battery pack in about 14 to 16 hours. However, the radio's battery pack can be slid off, and by purchasing a spare battery pack, you can keep yourself on the air when one battery dies and is recharged.

When battery power starts dropping off, a flashing battery appears on the radio's LCD display to alert you.

A vinyl carrying case covers all except the top part of the radio and fits smartly. It doesn't have a bad feel to it, either.

The flexible rubber antenna supplied with the radio seems cumbersome for UHF operations, however. Personally, I prefer to use stubby antennas for UHF; with low power, you generally get adequate coverage. The antenna supplied with the radio is 5.75 inches long and its length seems more like a VHF high band antenna instead of UHF. It terminates in a BNC connector, however, because the antenna mounts flush on top of the radio, the BNC connector is recessed inside the base of the antenna.

The owner's manual instructs the user to push on the antenna, squeeze its base so that it locks down past the tabs on the BNC connector on the radio and then turn the antenna until it locks into place. At no time could I get the antenna to lock in place on either radio; it continuously turns. However, you do need to squeeze the base again to remove the antenna. If you use these radios in a vehicle, the BNC connector makes it nice so that you can attach an exterior land mobile UHF antenna, such as the magnetic variety, for extended range.

A plastic belt clip also comes with the radio, however, I personally prefer the metal variety to allow it to be bent to the proper position for mounting on belts or garments. Using a plastic clip makes one cautious as not to break the clip when mounting on a thick leather belt, for instance.

Options

The PRS-101 has mic/speaker jacks on top of the radio to allow earphones, external microphones or speaker-microphones to be used. Tandy's PTT/VOX headset works handily with this radio, too. If you are a ham, Standard/Icom/Alinco/Yaesu HT speaker-mics will work no sweat!

It would be nice to have a CTCSS encode/decode option for this radio for users in metro areas. By adding a CTCSS board, one could screen out all calls except their own. Perhaps future versions of GMRS handhelds from Tandy will consider this option as more and more users jump onto the original family band.

Range

One of the first questions new two-way radio users have is how far will the radios reach? And unfortunately, there is no exact answer. The answer will vary on terrain, conditions, power output, battery condition and more.

With myself on a 5-watt commercial radio and my sons on the PRS-101 handhelds, the radios had no problem reaching a mile or more with the boys inside the house and myself on the commercial HT driving away from the house. In fact, the RadioShack units apparently were sensitive enough to hear me while I transmitted from the gas station two miles away from home, however, I no longer could hear the 2-watt PRS-101s at a full mile.

These PRS-101 handhelds also could be used as a base station, if you license them as such. With good coaxial cable and a UHF base station antenna with very good gain, you can operate under the GMRS rules what is called a "small base station." You may find that depending on antenna height, that you might be able to reach up to 2 miles or more.

Keep in mind that 2-watt power output will discharge your battery a lot faster than the low-power 900-milliwatt setting. If your family needs coverage of up to a mile for an outing, or highway car-to-car communications, these PRS-101 handhelds will prove more than adequate. The radios seem to be solidly built and probably will take a moderate beating that would result from family use (well, you won't hit suspects over the head with them like some police officers use their walkie-talkies!).

RadioShack's PRS-101 GMRS handheld radio operates on 10 UHF frequencies. (Photo by Chuck Gysi, N2DUP)

Summary

If you need two-way radios for your family and walkie-talkies seem to be the way to go on mostly quiet channels, these PRS-101 handhelds are readily available at any RadioShack store. At a retail price of $219.99, the price is comparable with low-end business walkie-talkies, which families can't technically use for personal communications. If my children can operate these radios, your family members can, too. You won't go wrong with GMRS and the PRS-101.

Receiving Antenna Measurements

Making Sense Out of a Difficult Topic

BY JOE CARR, K4IPV

Over the past few years interest in receiving antennas has grown tremendously, along with the general rise in shortwave listening and monitoring hobbies. Shortwave guru Harry Helms once told me that the quantity and quality of receiver antenna work going on amongst the listening community is catching up with, and often surpassing, the work on transmitting antennas in the ham radio community.

Two types of receiving antennas seem to be the most popular research topics: directional antennas that will enhance reception of weaker signals in a specific direction, and notch antennas that will allow the nulling of an interesting co-channel signal arriving from a specific direction (on many types of antennas both goals are achieved).

There are several reasons why SWLs/monitors like directional or notch antennas, but perhaps the most important is that they allow you to suppress co-channel interference and possibly reveal "hidden" signals underneath the blowtorch signals. The reception of a weak signal is made much easier—or possible in the first place—by suppression of the strong signal. The situation is analogous to signal-to-noise ratio problems, but in this case the "noise" is a strong signal that might be desired in other situations.

Measurements are very important in antennas development, but they can be especially difficult to perform correctly for any number of reasons...none of which are related to the often-told myth that RF work is somehow "black magic." Such problems are especially accurate if you attempt to measure either the radiation pattern of the antenna or the ratio between the main beam and the notch.

If you have a professional anechoic antenna chamber, a so-called "compact antenna range," then the chore is made a lot easier. But such facilities are beyond the means of all but a few billionaire hobbyists, or the few professionals amongst us who can slip in "after hours" and use the company's facility (with permission, of course). But what about the rest of us? How can we do at least a minimally credible job of measuring antenna parameters using only a receiver, some workshop bric-a-brac and our wits?

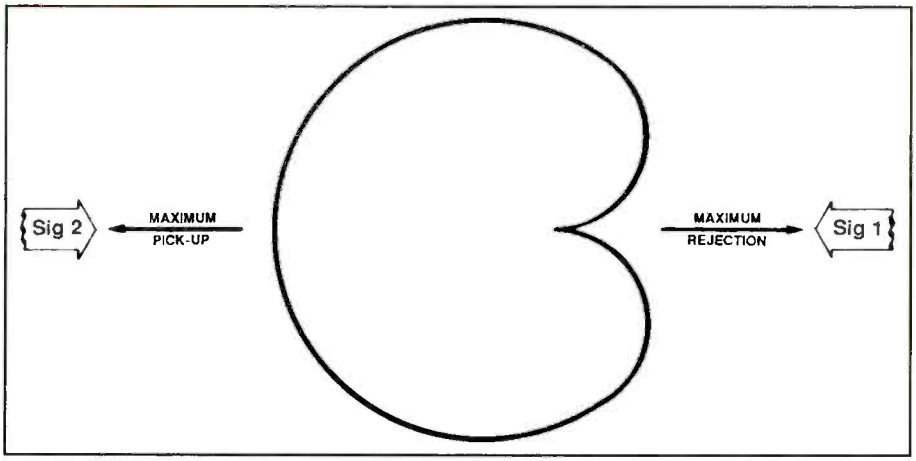


Fig. 1. Pattern of a hypothetical loop antenna being tested.

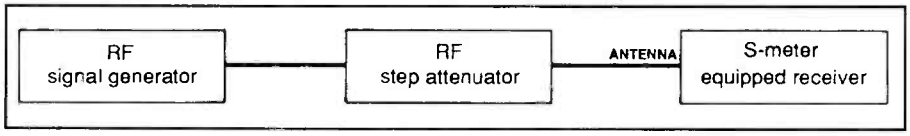


Fig. 2. Test set up to calibrate receiver S-meter to decibels, rather than S-units.

There is a way. But first, let's take a look at some of the problems that can beset an antenna project. For our example, we will pretend that we are designing SuperLoop, a short ferrite loop antenna that has a cardioid null pattern such as in Fig. 1. The idea on SuperLoop is to use the notch (null point) to overcome the interference between two signals on the same—or close—frequencies; the dreaded "co-channel" problem. The idea is to position the null of SuperLoop in the direction of the undesired signal (SIG1), and some part of the non-nulled section of the pattern in the direction of the desired signal (SIG2).

The purpose of our measurement will be to find the depth of the notch, usually expressed in decibels (dB), compared with the antenna's response at the maximum point on the pattern. There are many problems with making these measurements, but they are alleviated by using a few basic statistical methods.

Calibrating the System

The first job is to calibrate our tools, principal amongst which is the receiver and its signal strength indicator, or "S-meter." If the manufacturer of the receiver publishes the specification for the S-meter, then we can use it as a guideline. Otherwise, it may be necessary to find the number of decibel changes required for a one S-unit change in reading. Most receivers typically provide an S9 indication when the received signal is either 150μV, 100μV or 50μV (depending on how conservatively it is rated) at the 50-ohm antenna terminals.

The S9 microvolts point is the type of S-meter spec that's normally published in receiver owner's manuals, but what we also need to know is the dB/S-unit number... which sometimes is not published in the manual. Figure 2 shows how the dB/S-unit might be found. Connect the receiver antenna input to the output of a signal generator through a switching circuit that allows a 50-ohm calibrated RF antenuator to be either inserted in the antenna line, or removed, at will (Fig.2). Make the coaxial cables as short as possible. If you can afford only one attenuator, then make it a 6dB model. With the attenuator out of the circuit, carefully adjust the signal generator to

produce an S9 reading. Flip the switch and insert the attenuator. Now note the new S-meter reading. If the meter pointer is not directly on a mark on the meter face, then estimate ("interpolate" is the fancy term) the distance.

If the reading dropped two S-units when 6 dB of attenuation was added, then the numbers are the standard 3-dB/S-unit. Right? Maybe. We need to do some more work. Repeat the measurement several times, starting at different S-unit values each time. In fact, try it 15 or more times, and then average the results. For each of these trials, calculate the S-unit change $\Delta S=(S_{initial}-S_{atten})$. Table 1 shows some real data taken on my test receiver. Each data point (X) is calculated from:

$$\Delta X = \frac{\text{Atten (dB)}}{\Delta S} \quad (1)$$

Where: ΔX is the S-meter factor in decibels per S-unit (dB/S-unit); Atten (dB) is the attenuation in decibels (dB) and ΔS is the S-unit change caused by inserting attenuation.

Once we've calculated a series of several values of X (I like to use at least 15, and more would help), calculate their mean average:

$$\overline{X} = \frac{\Delta X_1 + \Delta X_2 + \Delta X_3 + \ldots + \Delta X_n}{N} \quad (2)$$

The mean average isn't the end of the story, however, because there's one little problem, and it besets all scientific and engineering measurements: variation. For one reason or another, the measurements will vary from one to another. I was frankly surprised at the degree of variation in the dB/S-unit measurements on my receiver. In the case of noting received "off-the-air" signal strength on the HF bands, the signal can change several decibels in the time it takes to rotate the device from the null to the peak, and that's a source of error. Other errors include the acuity of your vision when reading the meter, the ability of your S-meter to repeat measurements, and a host of other variables. So how do we home in on "truth and beauty" when making such measurements in the face of such variability?

Table 1 shows the results of measurements made on a moderate grade shortwave receiver that is equipped with an S-meter. The average of the data is 3.53 dB/S-unit, which is not far from the published 3 dB/S-unit. Before we can put much confidence in our measurement we need to know something of the variation of the readings. We gain some insight into the problem by calculating the standard deviation using:

$$S = \sqrt{\frac{\sum_{i=1}^{N} (X_i - \overline{X})^2}{N-1}} \quad (3)$$

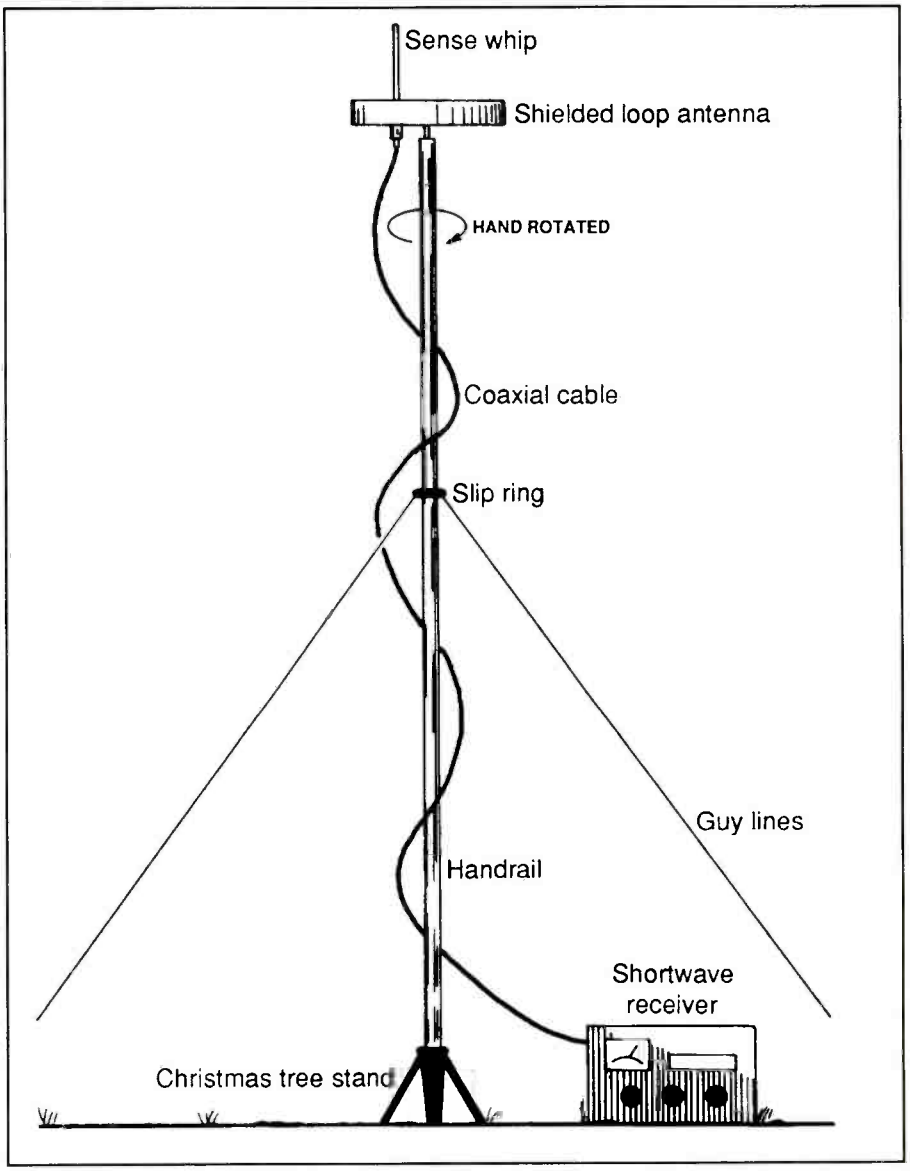


Fig. 3. SuperLoop antenna on test mast for use in large, open field.

Table 1

Trial	Attenuation Used (dB)	ΔS-Units	X ΔdB/S-Unit
1	6	3	2
2	10	4	2.5
3	3	0.3	10
4	11	1.5	7.33
5	8	3	2.67
6	21	6	3.82
7	20	5.5	3.64
8	20	6.2	3.23
9	10	4.5	2.22
10	4	3	1.3
11	10	2.8	3.57
12	3	1.5	2
13	11	5	2.2
14	18	5.8	3.1
15	20	6.1	3.3

Table 2

20	16	20	15	20	22	16	14	19	15	16	15	23	15	14
18	20	15	13	18	14	18	18	23	22	14	17	19	14	17
23	17	13	21	13	16	18	13	16	22	16	23	20	15	17

The standard deviation of the dB/S-unit data in Table 1 is 2.3. The larger the standard deviation, the greater the dispersion in the result.

When looking at the tabulated data it was noted that one of the readings (trail no. 3) was anomalous, i.e., it didn't seem to track with the others. It produced a 10 dB/S-unit result, which seemed odd. This data point may be real, but it also could be an "outlyer" caused by sine factor other than the receiver parameter being measured. When the "outlyer" is eliminated from the data, the mean average becomes 3.06 dB/S-unit, for 14 data points rather than 15, with a standard deviation of 1.43. Once the outlyer, which was probably an error in measurement created by me, was eliminated, the measured data mean agreed well with the design specification.

Note what would have happened if only one or two data points were used in the determination of the receiver's capability. Most of the data points are not close to 3 dB/S-unit, so an error would've been created.

We can use the standard deviation (s) to gain some insight into the error in our measurement. An indication of the trust that we should put in the measurement is found from:

$$(4) \quad S_m = \frac{S}{\sqrt{N}}$$

For the data in Table 1, less than the outlyer, the value of Sm is ±0.82, so the way to report the result is 3.06±0.82 dB/S-Unit.

Making the Measurement

Now that we have the receiver calibrated, we can make some measurements of the gain ratio between the null point on SuperLoop and the main beam or lobe. The idea is to tune in a shortwave station that is strong enough to provide a high reading on the receiver S-meter when the loop is broadside to it. The antenna is rotated until a peak is noted. This peak will be very broad, so turn the antenna slowly while watching the S-meter. The antenna is then rotated until the notch is found. This notch is usually much sharper than its peak, so turn the antenna slowly in order to prevent missing it altogether.

Because of the broadness of the peak, and the inherent error in our S-meter readings, (see above), we will record the figures only to the nearest decibel. It doesn't make a whole lot of sense to record numbers like "16.43 dB" when "16 dB" is the limit that the system can justify. Also, these same error sources make it reasonable to take a larger number of readings. Sources of potential variation are many, so we need more samples to smooth the figures a bit. Take a number of different readings, on a number of different frequencies within the passband of the antenna, from different directions.

The site chosen for the measurements can be critical. My own back yard is not terribly good because a house with aluminum siding is only a few feet away. Reflections and radiation from metallic objects can distort the data and are thus another source of error. Because my receiver is portable, after a fashion (it takes either an external battery pack or automobile electrical system), I took it to a nearby public park where there are a number of baseball fields and a soccer field...that were unused in the late fall when the measurements were made. The idea is to get the test antenna as far away as possible from any objects that can distort the pattern. It's not possible for most readers to do this trick in the most optimum manner, but one can eliminate the largest offenders simply by finding a site like my local public park. For this very reason my friend and antenna guru (especially an expert on loops), the late Johnnie H. Thorne, K4NFU/5, chose to live on a 46-acre farm in the flattest part of Texas.

The loop antenna was mounted on top of a 10-foot wooden "handrail" purchased for a less technical purpose at a local "Harry & Harriet Homeowner" hardware store (Fig. 3). The handrail was mounted in a Christmas tree stand, and was guyed with a TV antenna mast slip ring and rope (NOT wire) guys; four were needed in order to keep the antenna erect. This assembly was rotated by hand in order to make the measurements.

A total of 44 different observations were made, on 10 different stations that were on two different shortwave bands. Each station selected was strong, and did not display any significant fading. It is usually impossible to find a shortwave station that is totally free of fading, especially when defined as "movement of the S-meter" rather than aurally. However, it usually is possible to find one where the variation is minimal, or takes a dozen or more seconds to occur. The data taken is tabulated in Table 2. This data had a mean of 17 dB, and a standard deviation (s) of 3.1 dB. The error term was calculated as ± 2.6 dB, so the result is reported here as 17 ±2.6 decibels ratio between the main beam lobe and the notch.

Conclusion

The average SWL/monitoring enthusiast who does amateur antenna research does not have the resources of professional researchers, but with some ordinary statistical techniques they can home in on the true attributes of the antennas being investigated. Try 'em; your hobby will be enhanced. ■

Emergency

COMMUNICATIONS FOR SURVIVAL

BY GORDON WEST, WB6NOA

Using Speaker-Microphones May Not Be the Hip Thing To Do

All professional and amateur radio handheld transceivers can accommodate speaker-microphone systems. All portable equipment also offers an earphone jack for noisy environment monitoring.

Emergency communicators can achieve a dramatic improvement in receive capabilities plus low-noise transmit when using a professional noise-canceling headset. Telex/Hygain offers one of the best "concert series" headsets around, but a radio technician will need to solder on the right type of plugs in order for this "heavyweight" headset to work with a particular style of radio.

An emergency communications rescue squad serving a major outdoor amphitheater recently could be heard clearly over the rock concert, talking on its Telex/Hygain headset system, even though the team was just a few feet away from center-front stage. Yet another responder on his normal handheld transceiver was unintelligible over the pounding bass of the speaker system. This points out that noise-canceling headsets and boom mikes are a must for emergency medical personnel serving a rock concert venue.

Manufacturers like Motorola, GE, Maxon and Bendix/King all offer noise-canceling headsets as part of their accessory packages for each model of handheld transceiver. With the "big name" manufacturers, you would only consider their own type of headset assembly to ensure full compatibility and a perfect match on both the microphone input circuits as well as the audio output.

On less expensive handheld transceivers, most notably amateur radio transceivers and imported business band "plastic" radios, headsets may be nothing more than a plastic boom mike with a fuzzball on the end to cancel out wind noise and a single ear cushion to hear audio. Unlike professional headsets that sell for hundreds of dollars, these lightweights go for less than $50.

And lightweight headsets with their little belt-clip push-to-talk switch seem to be good performers on most handsets I have tried them on, and an equally good performer on business band, GMRS and itinerant frequency business radios from popular sources like RadioShack and Maxon.

Speaker-mikes are handy, but don't transmit with the handheld on your belt.

Headsets with VOX circuitry sometimes can be more of a problem than a benefit to the operator and receiving station. VOX circuitry quickly keys the transceiver when it detects sound in the microphone, has an adjustable delay for hang time, and cycles back to receive so the operator can talk and listen without having to use their hands. It's a good idea in principle, but for outdoors use it may not be so hot after all.

VOX headsets can inadvertently transmit on wind noise, external sounds like sirens and crowd noise, overhead aircraft, and sometimes will catch you in the middle of an expletive if you forget that you're operating VOX. The VOX circuitry usually will chop the first syllable of any message, too, because it requires a few hundred milliseconds to engage for transmit. Full-time operators using VOX circuitry get around this first-syllable-dropout by saying the word "UUUU AAAA HHHH" before they actually say something over the air. This becomes a bad habit that sometimes carries over to face-to-face conversations without the radio even being on!

External speaker-microphones are another good way to run a portable radio system, but they develop bad habits. One is leaving the radio on your belt. When you transmit, most of the radio-frequency energy goes in your gizzard. On receive, you could be down as much as 20dB through body absorption of the incoming radio signals. Holding the radio in one hand, and the speaker-mike in the other, has little merit over just holding the radio up to your mouth as you normally would do without the external speaker-mike.

One solution I use is to bend the flexible antenna out from my side so it's sticking out at about a 45-degree angle. This gets the signal into and out of the airwaves without it being right next to my body. The only problem with this is friends trying to straighten your antenna thinking that it accidentally got tweaked!

Another interesting problem with speaker-microphones is "dropout." At a recent 30-block-long parade, amateur radio operators providing emergency communications through the local repeater system continued to drop out of the repeater when transmitting their reports. At first the problem seemed like they were at the fringe of the radio ranch, but how could this be only two miles away from the building-top repeater? Even when the handhelds were held up high to get the antenna in the clear, the signals over the speaker-microphone still continued to break up through the repeater. And what was more baffling, the entire system with the hams and their radios and speaker-mikes ran several days of tests long before the event with no problems.

Figure the Problem?

The problem was traced to a common occurrence along parade routes—as the crowd and the passing bands get louder, the operator tends to speak louder into the radio mike, headset mike or speaker-mike. Combined with the background drone of noise, it raises the overall deviation on the transceiver and the unit "deeves out" of the repeater when modulation peaks exceed

the nominal 4-kHz repeater deviation input level. While most ham sets won't peak much beyond 4.5 kHz, loud noises in the background plus an operator talking loudly in the mike could cause deviation to escalate up to 5 kHz. And talking less loudly doesn't help; you still have that ear-splitting crowd and band noise that tends to saturate the mike input levels.

For those operators preparing for a large loud event, their radio deviation control should be internally adjusted to limit deviation peaks to less than 4 kHz, and to doublecheck that an accessory speaker-microphone or headset indeed won't drive the peaks more than 4 kHz.

Finally, is there an ear-microphone transducer that really works well? Maybe custom-made $1,000 units attached to a professional Motorola radio, but less expensive ear microphones never have been well received by radio communication officers or technicians. Most inexpensive ear-mikes sound like you're talking with your mouth full of spaghetti, and I have never heard one that I could really understand well. I'm interested in your comments about how ear-mikes work in the emergency communications field.

So watch your deviation—stay off of VOX whenever possible—and try not to transmit with the radio on your belt except for close-in situations at low power. Headsets are nice, but they have their limitations.

Broadcast DX'ing

BY TIM KRIDEL

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

New Jersey Station Is First at Top of Dial

Elizabeth, N.J.'s WJDM became the first broadcast station in the United States to move to the expanded AM band this fall, one year after the Federal Communications Commission gave the green light for 79 stations to pioneer the spectrum between 1610 and 1700 kHz. Testing on 1660 kHz began in early September with regular broadcasts starting in mid-October, station general manager John Quinn said in a telephone interview.

WJDM's move comes after what Quinn estimated as a 10 years of effort aimed at providing 24-hour service to Elizabeth, the largest city in the nation without a full-time station. WJDM will go from 1 kW and daytime-only on 1530 kHz to 10 kW days and 1 kW nights, non-directional, on 1660 kHz. The format on 1530 kHz was oldies, with a recent addition of Spanish programming aimed at Elizabeth's sizable Hispanic population. Quinn declined to give details about what other changes are being made in programming, including how the new overnight time would be filled, saying it was "a secret." He would say only that he was thrilled to be able to serve listeners full time.

Although "top-end" broadcasters are permitted to simulcast on their old and new frequencies for a period of five years, Quinn said WJDM will abandon 1530 kHz for the new channel. Quinn was bullish about the new frequency—and the expanded band as a whole. He cited the April 1995 test broadcasts from Las Vegas on 1660 kHz by USA Digital, and was excited by the fact that the experimental station was heard throughout California and as far away as the East Coast.

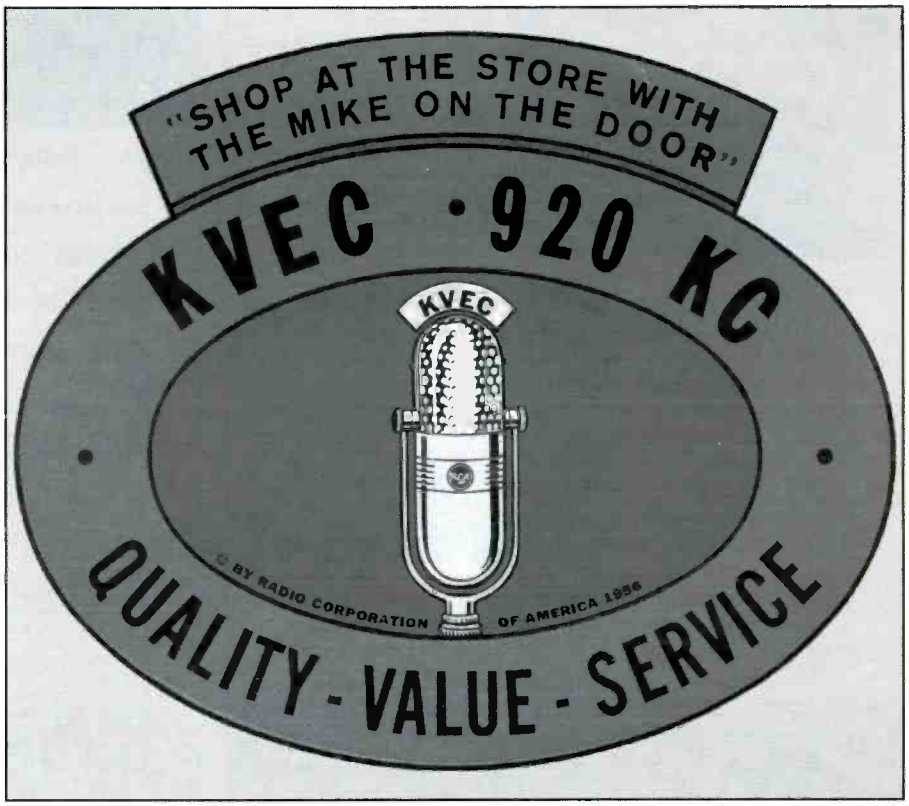
"I feel like Marconi," he said. "This is going to be like the early days of AM." Quinn looked forward to escaping the crowded old band for the new spectrum, where "the stations are going to be so far apart." And while some industry watchers have questioned how many listeners would follow a station to the new band, Quinn pointed to estimates that in the New York metropolitan area, where Elizabeth is located, there are 16.6 million radios equipped to receive the expanded band.

Hall of Fame

Chicago was the site of ceremonies for 1995 inductions into the Museum of Broadcast Communications' Radio Hall of Fame, and a couple of the Windy City's own were among those honored Oct. 29.

Inducted posthumously was Yvonne Daniels, whose 30-plus-year career included stints at seven Chicagoland stations, among them WYNR-FM, WNUA-FM and WCFL-AM, according to a *Chicago Tribune* article sent to us by Elmer Wallesen of La Grange Park, Ill. Daniels also was the first female DJ at WLS-AM when she became the overnight host in 1973, and was co-founder of WSDM-FM's all-female format. Another Chicago veteran inducted was Herb Kent, best known for his "Stay in School" campaign during the 1960s at WVON-AM.

Another inductee was Jack Buck, the voice of the St. Louis Cardinals baseball



Although he wasn't yet with KVEC when it issued this merchant-friendly sticker in the mid-1950s, Steve Berk was news director when the San Luis Obispo station began its "Lucky Mic" contest in 1972. Listeners could win $92 if the number on their sticker was chosen.

Not only is South Bend, Ind., home to the University of Notre Dame, it's also the city of license of WNDU-FM. Sue Wilden, registered monitor KIN9GK, of Columbus, Ind., picked up their sticker at the city's Ethnic Festival last summer.

team for the past 41 seasons. Buck was selected over Rick Dees, Karl Haas of *Adventures in Good Music*, Bruce Williams and National Public Radio's Susan Stamberg in the "contemporary network or syndicated program" category, reports the *St. Louis Post-Dispatch*. Although this was the second time Buck was nominated—he lost in 1994 to Garrison Keillor—it isn't his first hall of fame award. He was inducted into the broadcasters division of the Baseball Hall of Fame in 1987 and the American Sportscasters Hall of Fame in 1990.

The Radio Hall of Fame isn't limited to people, either—also inducted was *The CBS World News Roundup*. Nominees were selected by a 47-member committee comprised of industry executives, publishers and previous inductees, who then sent out ballots to more than 6,000 other radio officials and historians.

Davids and Goliath

In spite of its shoestring budget and low power, a Springfield, Mo., station has survived a challenge by the U.S. Department of Labor. As we reported last month, KTOZ-AM was under scrutiny by the department's Wage and Hour Division for its use of volunteers as staff. The agency, basing its investigation on the Fair Labor Standards Act of 1938, maintained that because the station was for-profit, it couldn't be run by volunteers. Under the law, KTOZ could have been forced to pay $20,000 in back wages. But in mid-August, the department announced it was dropping the investigation following what it described as "a very preliminary screening," which had concluded that KTOZ's volunteer-run operation fell outside the scope of the departmental mission to "focus on low-wage employees."

In spite of the victory, KTOZ general manager Ron Johnson wasn't satisfied. "We're going after them," he told The Associated Press. "They're not getting off the hook this easy." Armed with offers of free legal services from some 50 attorneys moved by KTOZ's plight, Johnson says the station plans to sue the Wage and Hour Division to clarify the laws regulating volunteer work at for-profit companies. "They should specifically spell out very clearly that anyone who wants to volunteer their time for any company...can do that," he said, adding the station is "all set for a 10-year battle" if necessary.

If so, Johnson might want to get some pointers from Stephen Dunifer. As founder of renegade micropower station Free Radio Berkeley, Dunifer has become something of a folk hero, a leader in the growing, free-speech-based movement to rewrite FCC rules regulating low-power radio stations. Since starting the Bay Area station in April 1993, Dunifer has weathered several attempts by the FCC to shut down the unlicensed, 30-watt operation, and is now using what he's learned in the process to help others—from supporters of the democracy movement in Mexico to the rock band Pearl Jam—use low-power radio stations as alternative media outlets.

Dunifer objects to the FCC's 1978 financial qualifications rule, which requires that applicants for new stations demonstrate sufficient financial resources to construct and operate their station for 90 days. And therein lies the rub: The FCC's refusal to license stations running less than 100 watts means that a substantial—and, in Dunifer's view, prohibitive—amount of money is required to start a station using FCC "type-approved" equipment. By using micropower transmitters built from kits costing less than a hundred dollars, would-be broadcasters still can get on the air—they just can't do it legally.

Dunifer wants to end that restriction. He envisions an "electronic democracy" built around low-power stations, where "people come together around the radio" to discuss local issues that otherwise might be ignored by larger, mainstream outlets.

"Micropower broadcasting is about giving the airwaves back to the people," he told *The Sacramento Bee*. "It's all about giving everyone an equal chance...Nowadays, all the media in this country is run by rich corporations...The little guy doesn't have a chance."

Never mind, says David Silberman, an attorney for the FCC: An unlicensed station still is an illegal station. "What he is calling for is anarchy," Silberman said of Dunifer's proposal. "It would create chaos and confusion on the airwaves."

With the aid of the National Lawyers Guild Committee on Democratic Communications, Dunifer's fight to force the FCC to legitimize low-power stations took a major step forward early last year, when a U.S. District Court judge refused the FCC's request for a preliminary injunction to close down Free Radio Berkeley. The challenge, evolved from a July 1994 FCC fine of $20,000 levied against Dunifer, culminated in the District Court's ruling that "the FCC is arguably violating its statutory mandate as well as the First Amendment, by refusing to" reconsider the ban on micropower broadcasts, which it maintains is necessary because spectrum is limited. The court also found that "the harm to the First Amendment rights of (Dunifer) and the

Applied for Permits to Construct New AM Stations

NJ	Hackettstown	1510 kHz	900/230 watts
NM	Farmington	1610 kHz	1 kW experimental
NV	Elko	1340 kHz	1 kW
TN	Bluff City	1680 kHz	400 watts

New AM Station

(Mobile Station)		1670 kHz	U.S. Army

Applied for Permits to Construct New FM Stations

AK	North Pole	89.1 MHz	3 kW
AL	Pine Hill	96.7 MHz	2.5 kW
AR	Atkins	99.3 MHz	6 kW
AR	Bentonville	88.1 MHz	1 kW
AZ	Constellation	105.3 MHz	790 watts (KRDS-FM booster)
CA	Livingston	89.1 MHz	5.8 kW
CA	Paradise	89.7 MHz	15 kW
CA	Tahoe City	89.7 MHz	600 watts
CO	Fowler	88.1 MHz	100 kW
CO	Hudson	107.1 MHz	1 kW (KSIR-FM booster)
FL	Key Largo	90.9 MHz	45 kW
FL	Lacrosse	99.5 MHz	6 kW
GA	Remerton	88.1 MHz	1.9 kW
GA	Thomasville	88.1 MHz	52 kW
GA	Toccoa Falls	89.7 MHz	100 watts
IA	Sageville	106.1 MHz	4.4 kW
IN	Terre Haute	91.9 MHz	1 kW
KS	Plainville	96.7 MHz	5 kW
LA	Monroe	88.7 MHz	25 kW
LA	S. Ft. Polk	95.7 MHz	
MA	Dudley	91.5 MHz	100 watts
MI	Baraga	104.3 MHz	100 kW
MI	Menominee	103.7 MHz	7 kW
MI	Pentwater	101.1 MHz	3 kW
MI	Saginaw	98.3 MHz	2 kW
MN	Appleton	88.5 MHz	100 kW
MN	Bemidji	95.5 MHz	100 kW
MO	Bismarck	99.5 MHz	
MS	Clarksdale	92.1 MHz	6 k
MS	Crenshaw	106.9 MHz	6 kW
NC	Spring Lake	89.3 MHz	6 kW
OH	Massillon	88.7 MHz	12 kW
OK	Poteau	91.7 MHz	3.25 kW
PA	New Berlin	88.1 MHz	550 watts
SD	Winner	98.1 MHz	100 kW
TX	Bells	92.9 MHz	
TX	Pecos	97.3 MHz	100 kW
TX	Uvalde	93.7 MHz	2.9 kW
VA	Farmville	92.9 MHz	6 kW
WY	Pinedale	101.1 MHz	211 watts

Issued Permits to Construct New FM Stations

AR	Ft. Smith	88.9 MHz	1 kW
CO	Glenwood Springs	92.7 MHz	1 kW
CT	Torrington	89.9 MHz	100 watts
FL	Clermont	88.7 MHz	1 kW
IL	Virginia	101.3 MHz	6 kW
KY	Beaver Dam	100.7 MHz	6 kW
LA	Franklintown	98.9 MHz	6 kW
LA	New Orleans	95.5 MHz	3.6 kW (experimental)
NE	Winter Harbor	97.7 MHz	6 kW
MN	Moose Lake	107.1 MHz	25 kW
MN	Roseau	102.1 MHz	50 kW
MN	St. Charles	107.7 MHz	1.6 kW
MO	Grand Marais	95.3 MHz	100 kW
OK	Broken Bow	90.9 MHz	2.5 kW
TN	Mt. Juliet	106.7 MHz	6 kW
TX	San Saba	97.1 MHz	780 watts
VT	Royalton	99.7 MHz	1.8 kW

Applied for Permit to Construct New Shortwave Station

ME	Monticello	Freqs. not available.

Canceled

KCVN	Fairbault, MN	107.5 MHz	34 kW
KKGL	Pinetop, AZ	106.7 MHz	100 kW
WDBS	Bolingbroke, GA	102.1 MHz	3 kW
WRJV	Berne, IN	91.1 MHz	25 kW
WWLF-FM	Copenhagen, NY	106.7 MHz	200 watts

Seeking to Modify AM Facilities

KFCC	Bay City, TX	1270 kHz	Seeks 2.5 kW/850 watt power.
KZTW	Troutdale, OR	860 kHz	Seeks increased nights to 5 kW.
WBZT	West Palm Beach, FL	1290 kHz	Seeks 10/4.9 kW power.
WREF	Ridgefield, CT	850 kHz	Seeks increased nights to 500 watts.

Modified AM Facilities

KFIA	Carmichael, CA	710 kHz	Increased to 25 kW/500 watts.
KKCM	Shakopee, MN	1530 kHz	Reduced nights to 10 watts.
KKCQ	Fosston, MN	1480 kHz	Reduced nights to 90 watts.
KORG	Anaheim, CA	1190 kHz	Increased days to 20 kW.
KRMO	Monett, MO	990 kHz	Moved to Cassville, MO.
WBGB	Mt. Dora, FL	1580 kHz	Moved to Bithlo, FL.
WCER	Canton, OH	900 kHz	Reduced nights to 75 watts.
WJDM	Elizabeth, NJ	1530 kHz	Added 1660 kHz channel.
WNNI	Christiansburg, VA	1260 kHz	Increased days to 2.8 kW.
WRHL	Rochelle, IL	1060 kHz	Increased nights to 50 watts.

Modified FM Facilities

KLVN	Chowchilla, CA	93.1 MHz	Became non-commercial.
KLVS	Kingsburg, CA	106.3 MHz	Became non-commercial.

Rescinded FM Call Letters

WANK	Jupiter, FL

New FM Call Letters Issued

KAMM	Madison, SD
KAMT	Juneau, AK
KANF	Gering, NE
KJZY	Sebastopol, CA
KNWV	Clarkston, WA
KTHC	Sidney, MT
KZOW	Forest City, IA
WAPR	Selma, AL
WOSE	Coshocton, OH
WREI	Clermont, FL
WSCS	New London, NH
WTUR	Upland, IN
WXZX	Culebra, PR

public at large that may result from enforcing the current regulations outweighs the slight showing of interference proffered by the government."

The decision was the first time the FCC has been denied an injunction to stop such unlicensed broadcasts, a ruling that quickly spawned several new micropower stations in the Bay Area, including San Francisco Liberation Radio on 93.7 MHz, Radio Libre on 103.3 MHz and Free Radio Santa Cruz, which is said to operate around 89 MHz. But the issue is far from settled. The District Court's order that the FCC act on Dunifer's appeal of their fine means that

Pending AM Call Letter Changes

New	Old	
KIRS	KHIT	Sun Valley, NV
KKPZ	KUPL	Portland, OR
KLDZ	KAVP	Commerce City, CO
KNRC	KRCV	Reno, NV
KNRQ	KZZX	Springfield, OR
WDCD	WPTR	Albany, NY
WLUX	WLIX	Islip, NY

Changed AM Call Letters

New	Was	
KAAM	KWFT	Wichita Falls, TX
KKLA	KLFE	San Bernardino, CA
KKND	KMXZ	Tucson, AZ
KLFE	KPOZ	Seattle, WA
KRIG	KXVQ	Pawhuska, OK
KRLV	KMTW	Las Vegas, NV
KVSO	KKAJ	Ardmore, OK
WCKD	WHNK	Madison, TN
WDZS	WDAR	Darlington, SC
WEZW	WMME	Augusta, ME
WIQR	WRNB	Prattville, AL
WMEN	WKNL	Knoxville, TN
WMSP	WLWI	Montgomery, AL

Pending FM Call Letter Changes

New	Old	
KNRQ-FM	KZZK-FM	Creswell, OR
KNWB	KFSH	Hilo, HI
WZSK	WJTI	Bethany Beach, DE

Changed FM Call Letters

New	Was	
KBKK	KUTC	Spanish Fork, UT
KJJY	KJJY-FM	Ankeny, IA
KKLA-FM	KKLA	Los Angeles, CA
KLBN	KGST-FM	Auberry, CA
KLVA	KKER	Casa Grande, AZ
KOAS	KCMA	Broken Arrow, OK
KPKX	KBOZ-FM	Livingston, MT
KRBL	KAHT	Idalou, TX
KRIG-FM	KRIG	Nowata, OK
KRQZ-FM	KBIX-FM	Wagoner, OK
KVOP-FM	KATX	Plainview, TX
KWJZ	KEZX-FM	Seattle, WA
WBEY	WLSL	Crisfield, MD
WBZU	WKIK	Crewe, WA
WJST	WROC-FM	Ft. Myers Villas, FL
WLJZ	WFGE	Mackinaw City, MI
WMDE	WEOZ	Saegertown, PA
WNDD	WLVX	Silver Springs, FL
WPZM	WHVK	Tullyhoma, TN
WWIL-FM	WKQK	Wilmington, NC
WWKL	WYMJ	Harrisburg, PA
WWKQ	WREI	Kissimmee, FL
WXRV	WLYT	Haverhill, MA
WYMJ	WWKL	Harrisburg, PA
WZBN	WCAZ-FM	Carthage, IL
WZYQ	WHTX	Mound Bayou, MS

this won't be the last time Dunifer and the commission battle.

For more information, contact Free Radio Berkeley at 1442A Walnut St., #406, Berkeley, CA 94709, or on the Internet at frbspd@crl.com. A tip of the hat to Douglas Stingley, who sent us a sheaf of information on the micropower movement, including articles from the *San Jose Mercury News*, *Good Times* of Santa Cruz County and Portland, Ore.'s *Willamette Weekly*, as well as his own report from a forum on micropower broadcasting in Portland.

Radio Grows Up

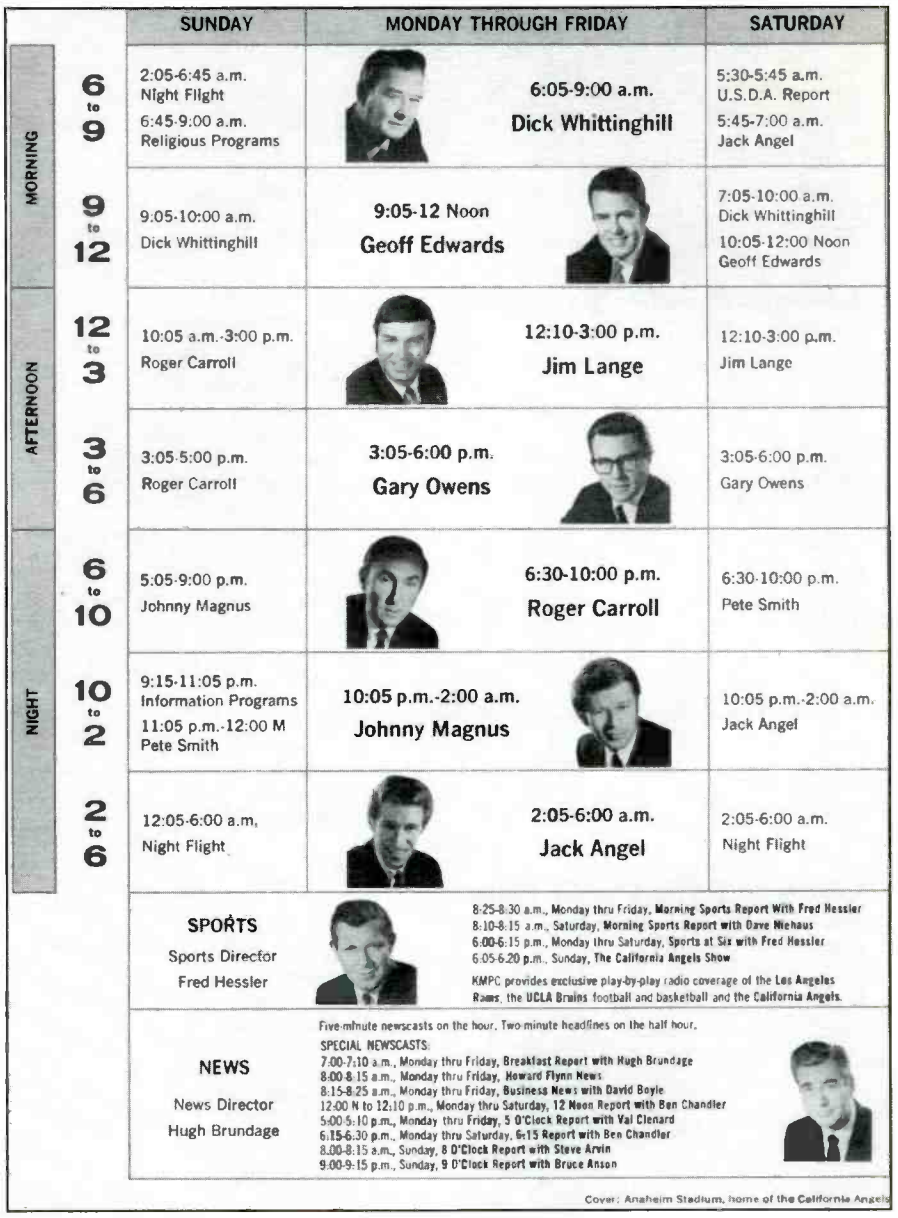
"The nation's first FM educational radio station targeting persons 60 and over" is how a new station in the Cincinnati, Ohio, area is billing itself. WMKV made its debut

on 89.3 MHz on May 16, 1995, 10 years after Southwestern Ohio Seniors Services Inc., the station's licensee, saw a need for a station serving the area's older population. According to its program guide, sent to us by Greg Wilkins of Cincinnati, WMKV will serve "people who 'grew up with radio' and who now feel that it has abandoned them. The noncommercial station will offer an alternative to "crude and sensational talk shows and disc jockeys who push the limit of what's acceptable over the airwaves." The 24-hour format includes big-band and easy-listening music, classic radio programs and news for and about seniors.

WMKV, which takes its call letters from its home in the Springdale retirement community of Maple Knoll Village, can be reached in care of Southwestern Ohio Seniors Services Inc., 11100 Springfield Pike, Cincinnati, Ohio 45246.

Memories of L.A. Radio

POP'COMM reader Steve Berk checks in to offer us a trip back in time to Los Angeles, circa 1970. Notice KMPC's program schedule from that year, featuring its on-air personalities, many of whom went on to successful television careers. Dick Whittinghill, who at one time had the No. 1-rated morning show in the city, appeared in *Dragnet* and *Adam 12*, while Jim Lange hosted the original *Dating Game*. Both Gary Owens and Roger Carroll made the move from behind the mike to in front of the camera as announcers—Owens on *Laugh-In* and Carroll on the *Smothers Brothers Comedy Hour*.



Pay TV and Satellite Descrambling

POP'COMM reader Steve Berk checks in to offer us a trip back in time to Los Angeles, circa 1970. Notice KMPC's program schedule from that year, featuring its on-air personalities, many of whom went on to successful television careers. Dick Whittinghill, who at one time had the No. 1-rated morning show in the city, appeared in *Dragnet* and *Adam 12*, while Jim Lange hosted the original *Dating Game*. Both Gary Owens and Roger Carroll made the

Steve himself is a part of California radio history. In the early 1970s, he was news director at San Luis Obispo's KVEC—once owned by Valley Electric Co.—and before that he was with KGIL's news department. Although he no longer lives in Los Angeles, Steve remains active in radio, now on the Houston, Texas, dial. You can catch him doing traffic reports for Shadow Broadcast Services on KTRH-AM, a station that gave rise to another name you may recognize—Dan Rather.

In Brief

If you live in the Louisville, Ky., area, here's one station you probably *won't* want to hear. The Disaster and Emergency Services Department serving the city and surrounding Jefferson County have set up a station on 1610 kHz to alert residents. According to reader R.C. Watts of Louisville, the station is aboard a hazardous-materials response vehicle.

DXers have a friend in Plainfield, N.J. Frank Doosey, a staffer at WERA-AM, welcomes reception reports and will answer them with a QSL, provided that the details of the report are accurate and that either a self-addressed, stamped envelope or return postage be enclosed. Send reports to: Frank Doosey, WERA, 120 W. Seventh St., Plainfield, NJ 07060. But don't delay! Frank says the offer is good only as long as he's with the station, and "given conditions there, it's probably not going to exceed a few months."

Thanks

News clippings, station and shack photos, QSLs and bumper stickers are always welcome. Send 'em to me in care of *POP'COMM*. Until then, 73. ■

The Ham Column

BY KIRK KLEINSCHMIDT, NTØZ
AMERICAN RADIO RELAY LEAGUE HQ

GETTING STARTED AS A RADIO AMATEUR

Ham Radio: Conversations Disguised By Technology

Ham Radio is extremely technical. Just ask anyone, and they'll tell you straight away that our hobby has a lot to do with complicated doohickeys and thingamabobs. There are wires galore, and transistors, integrated circuits, the occasional big amplifier and digitally enhanced circuits of every type, to name just a few.

And don't forget the tests we're all required to pass to get our licenses! Although beginning hams no longer need to learn Morse code, they do need to bone up on radio and electronics theory—it's not a total walk in the park.

With all of the study, brainpower and red tape involved, you'd think that the whole mess is about technology, right? About knowing when 10 meters will be open to the Pacific...how grounded-grid linear amplifiers are tuned...or how digital signal processing helps dig out those weak DX signals.

Wrong!

That's the great irony about many technology-based hobbies (ham radio, computers, cruising the Internet, BBSing, etc.). For the majority, the technology is simply a vehicle for an underlying, deeper reason for participating: communicating with other people who share similar interests (people who often live outside the local area. After all, if they lived down the street, you could talk to them over coffee, during barbecues or while playing canasta!).

To effectively participate, hams need to learn about the technology involved—and certainly about operating procedures and protocols (that is, how to correctly communicate with others using whatever technology is involved). But once that's learned, they're still faced with simply talking to someone else: having a conversation, sharing something of themselves, or learning something about the person on the other end of the mike, key or keyboard.

Sure, there are some who become hams primarily for "technical" reasons. They might love to build radios, or study the intricacies of VHF propagation from a scientific standpoint. But even these folks love to talk to other hams who share their particular interest. Just listen to two "homebrewing" hams talk about building anything and you'll be convinced.

So it's all really about communicating. And to maximize your enjoyment of amateur radio, you need to be a good communicator. It's not difficult, but a refresher course often can help get the ball rolling!

Before we discuss ways to have more fun talking with and learning about our fellow hams, let's review several (unfortunately) typical exchanges you could hear on the bands almost anywhere:

•The rapid-fire exchange between "robot DXers" immediately comes to mind: call sign, signal report, adios. Over and over. Amazingly, it took me 10 years to become bored with this. How long will it take you? (I'm not picking on contesters, just hams who seem to never stop contesting!)

•The domestic version is just as boring: name, location, signal report, rig, antenna type, see-ya-later. Over and over. Painfully boring! Why bother turning on the rig?

•Most repeater conversations aren't much better, although some greater communication takes place occasionally—if only to convey street directions to inquisitive hams who are passing through town!

Instead of propagating (and perpetrating!) these limiting, unfulfilling comms, why not enhance your communicating skills and expand your ham radio horizons? There are millions of interesting individuals out there disguised as ham operators! Dig deeper—you won't be disappointed!

Tips for Better Communicating

Here are a few tips to "break the ice." Remember: Don't be shy! If necessary, just blurt something out. If your QSOs are stuck in a boring rut, dare to do something different! You'll enjoy amateur radio in an exciting new way.

• The Map/Atlas Gambit—There's no doubt about it: The handiest tool for budding ham radio conversationalists is a good map or atlas.

When you figure out where the other "guy" lives, check out his QTH on the map. That little blue squiggle might seem insignificant on your end, but your new friend might have been trout fishing there since he was a kid.

Just by asking about local geography, at least two things will happen: (1) you'll learn a lot more about that little blue squiggle (or whatever it is), (2) you'll wake up the ham on the other end to the fact that a real conversation is about to take place. Both are big steps in the right direction.

• Famous Places—If you or your QSO partner live in a "famous place," feel free to get a little conversational mileage out of it. If you're chatting with someone in Winterset, Iowa, try out your best John Wayne accent. It couldn't hurt, could it?

I've started many an interesting QSO by mentioning that I live in Little Falls, Minn., the boyhood home of Charles Lindbergh (and the stomping ground of Paul Bunyan and his blue ox Babe). You can, too.

• The Big Question—Asking people questions—on almost any topic—often can spice up an otherwise routine exchange. Be tactful, but ask away. Examples: "What do you do for a living?" "How about those Minnesota Vikings?" "Have you ever been to Japan?" You get the idea. To narrow down the range of possibilities, tailor your Big Question to what you already know about your QSO partner—or what you intuit or suspect.

•Say Cheese—One of the most interesting and potentially rewarding ways to visually liven things up—usually with a "more established" QSO partner—is the film exchange. You each shoot a roll of film, choose subjects that have meaning to your ham radio and personal lives, and then exchange the undeveloped film or the printed pictures. When the exchange is complete, you hook up on the air to discuss the photos. This adds a visual element to the mix in a very personal way.

•IDs—As long as it's within reason, feel free to let other hams know a little bit about what you're up to. Instead of keying the repeater with "This is W9XYZ, listening," try "This is W9XYZ, on a round-the-world motorcycle trip, listening." Which do you think would garner more responses on a typical sleepy repeater?

Maybe the old-timer's CQ—"This is Bill, W9XYZ, calling CQ from the Louisiana bayou town of Swampy Creek"—heard regularly in decades past, has some merit. Don't use it while checking into an emergency net, and don't use it all the time, but you might give it a try on an uncrowded HF band just to see what happens.

•Delicate Subjects—One last word of advice: Be careful when discussing potentially controversial subjects such as politics, religion, sex, light beer, left-handed pitchers, etc. I'm not trying to step on your First Amendment rights; I'm merely suggesting that you be respectful and use common courtesy when bringing up certain topics. Amateur radio is diverse, but it's also tolerant and accepting, and the best ham radio discussions build on a common ground of shared interests.

Regardless of which techniques you use (there are many more than those listed here), taking steps to make ham radio friends through better conversation only will increase your enjoyment of our hobby. You never know when you'll make a lifelong friend you otherwise would have overlooked because of a "cut-and-dried" QSO!

Write In

That's it for this month. Keep your QSL cards, letters, photos and topic suggestions coming to me at ARRL, Dept. PCN, 225 Main St., Newington, CT 06111. I'll talk to you later!

Satellite View

INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

BY DONALD E. DICKERSON, N9CUE

Deep Space Network

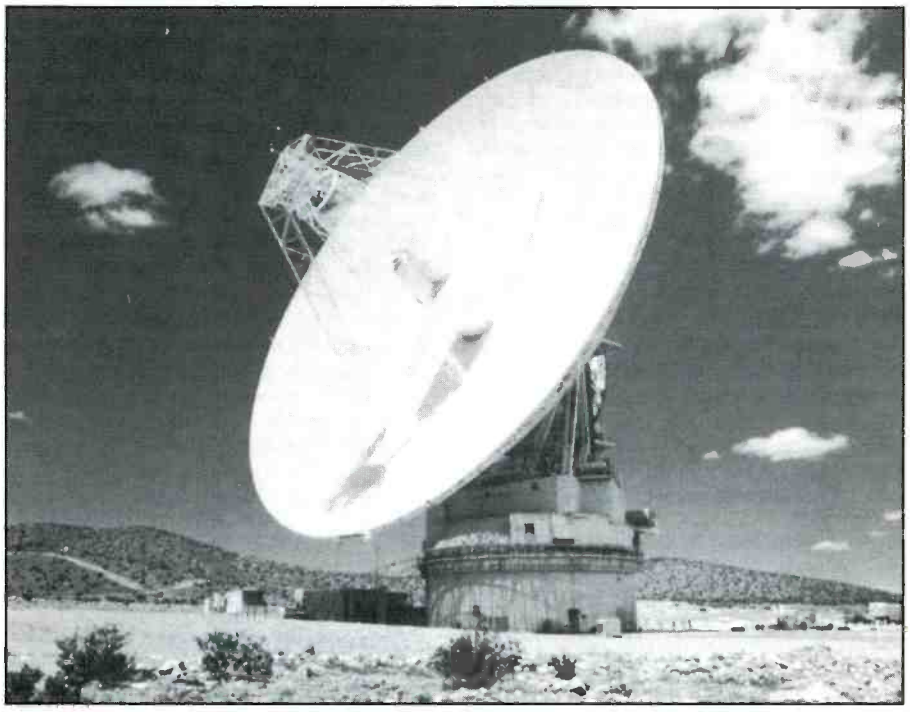
The Deep Space Network is the largest and most sensitive telecommunication and radio navigation network in the world. DSN is responsible for the operation and navigation of our interplanetary spacecraft; it is operated by the Jet Propulsion Laboratory (JPL) of California's Institute of Technology in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

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

Every U.S. deep space mission is designed to allow continuous radio communication with the spacecraft. Continuous 24-hour coverage for several spacecraft requires several earth-based stations at locations that compensate for the earth's rotation. The locations in Spain, Australia and California are about 120 degrees apart in longitude, which ensures continuous observation and overlap coverage allowing control of the spacecraft to be transferred to the next communications complex.



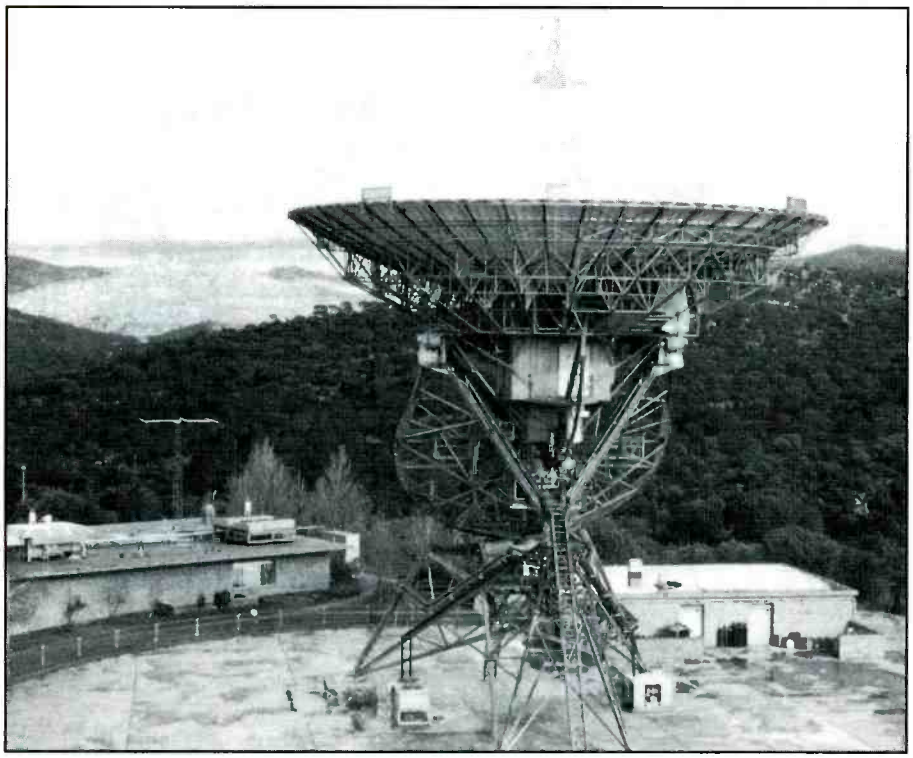
The Gladstone 210-foot antenna.

The Australian complex is located 25 miles southwest of Canberra; the Spanish complex is 37 miles west of Madrid; and the Gladstone complex is located at the Army's Fort Irwin near Barstow. Each complex is situated on mountainous, bowl-shaped terrain that helps 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, an 85-foot antenna and a 230-foot antenna. The antenna sizes form a separate subnet, each with different communications capabilities. The 230-foot subnet supports spacecraft in earth orbit. Designed as part of the Spaceflight Trafficking and Data Network, they were consolidated into the DSN when the TDRS (Tracking and Data Relay) satellites replaced the ground stations. The 111-foot subnet supports both deep space and earth orbit missions.

Ground Center, 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 located overseas. Communications traffic between these locations is sent via landlines, submarine cables, terrestrial microwave and the communications satellites. These circuits are leased from common carriers and provided to the facility as needed by the NASA communications network, at the Goddard Space Flight Center. Spacecraft data sent over these circuits is automatically checked for transmission errors and outages through error-detecting and correcting techniques. This process automatically retransmits any data blocks received with transmission error. JPL also is linked to the launch support and compatibility testing facility at Kennedy Space Center, Florida.



Here is Spain's 85-foot antenna. (Photos courtesy of Caltech/JPL Facilities)

One of DSN's missions included Magellan, which mapped 90 percent of the surface of Venus, and Galileo, the Jupiter orbiter-probe. DSN also supported the European Space Agency's Ulysses, a solar environment explorer, and Mars Observer, completed in 1990 and 1992 respectively.

During the relatively brief time span since the beginning of space exploration (about 30 years), exceptional progress has been made in the quality and quantity of scientific data returned by each mission. For example, Mariner 4's 134-million-mile voyage to Mars in 1965 required eight hours to return one 240,000-bit image of the planet. The transmission rate was limited to 8.5 bits per second. By the time Voyager encountered Jupiter in 1979, the transmission data rate increased to 115,200 bits per second. One five-million-bit image was received every 48 seconds from the spacecraft—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 navigation technique called differential very long baseline interferometry, which is used to augment conventional Doppler and ranging navigation techniques. The interferometry techniques uses two widely separated network stations on different continents. These simultaneously receive signals from the spacecraft and from angularly close natural radio sources (quasars) that have celestial coordinates that 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 to 10 times more accurate than Doppler and ranging radar techniques.

Major improvements are continuously taking place at DSN facilities. One of the changes involved the National Radio Astronomy Observatory's very large array located in New Mexico. The array consists of 27 dish antennas, each 85 feet in diameter. It now is connected to the Gladstone facility by microwave link and communication satellite.

The single factor making 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. After traveling across the overwhelming vastness of interplanetary space, the spacecraft signal that reaches the earth ranges in power from a billionth of a watt down to a trillionth of a watt. The main technology elements making possible to receive, amplify and extract scientific data from such an ultra-weak signal is the use of high microwave radio frequencies (2110-2300 and 8400-8450 MHz), an optimum energy-per-bit telemetry scheme, state -of-the-art sensitivity, efficiency of network antennas and low-noise receiving systems.

Books You'll Like

BY R.L. SLATTERY

Broadcasting's Big Sport

One of the biggest audience attractions for radio and TV broadcasters always has been sports. Football, hockey, baseball, basketball, soccer, boxing or wrestling—pro or college—the public can't get enough. Indeed, sportscasting dates back to the dawn of broadcasting when the heavyweight match between Jack Dempsey and Georges Carpentier was transmitted over WJY on July 2, 1921. That was several months before the government began issuing commercial broadcast station licenses.

John R. Catsis' new book, *Sports Broadcasting* is the complete guide to this fascinating and lively area of telecommunications. Beginning with the history of broadcast sports in both radio and TV, Catsis then goes on to discuss and analyze every facet of the sports broadcasting industry, including the opportunities for employment now and in the future.

Catsis explains the hardware and technologies used in radio and TV sportscasting, as well as production considerations and problems. The roles of the many different personnel involved in sportscasting are delineated. On the business end of the mic, he describes how to prepare for and do play-by-play and color sportscasts.

The book discusses sportscasting considerations that tie it to satellites, cable TV, ratings, networks, various sports, the Olympics, pay-per-view, interactive sports and numerous other factors. It's easy to read, and it is written in a pleasant, informal style. This is a non-technical book.

Sports Broadcasting is a 275-page illustrated book that is completely absorbing. Every sports fan, or anyone interested in learning what sportscasting is all about, or who hopes someday to be a part of this industry, should gain a lot from John Catsis' book. That includes anyone who aspires to be a technician, commentator, play-by-play announcer or a producer in radio or TV sportscasting.

John Catsis worked for many years in sportscasting, as well as elsewhere in radio and TV. Over the years, he eventually performed practically every job from play-by-play announcing to station owner and manager. These days, he's an assistant professor in the School of Journalism and Broadcasting at Oklahoma State University and teaches the school's full-credit course in sports broadcasting.

Sports Broadcasting is $25.95, and is available from bookstores (ISBN 0-8304-1379-0). Or, you can order it through Nelson-Hall Publishers, 111 N. Canal St., Chicago, IL 60606. Phone: (312) 930-9446.

Avoiding High-Tech and Other Surveillance

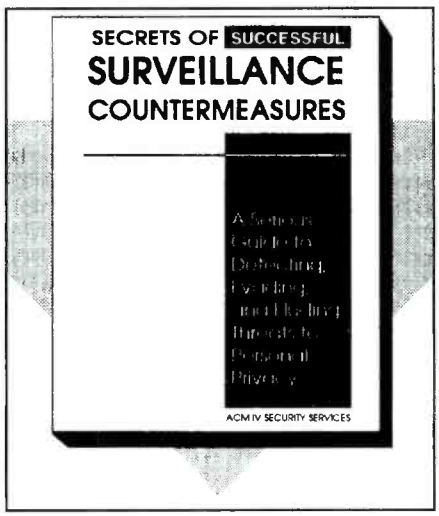
Privacy is becoming a rare commodity. As we have seen, privacy can be easily breached with nothing more than a computer and a modem, and some claim even a scanning receiver. A well-stocked consumer electronics store offers dozens of electronic devices that also could be used to snoop. Some people go a step further, launching sophisticated surveillance efforts to root out information not available through the usual channels.

The threat of surveillance is ever present these days. When one accepts and understands this, the first positive steps toward privacy protection have been taken. So states ACM IV Security Services in their revealing 188-page book, *Surveillance Countermeasures: A Serious Guide to Detecting, Evading and Eluding Threats to Personal Privacy*.

They point out the only defense is to conduct countermeasures, but first you need to understand how the snoops work. Here's the book that shows those techniques, then goes on to provide a systematic approach to detecting and evading surveillance. This includes tactics that have proven most effective against sophisticated surveillance techniques.

Among the surveillance, detection and countermeasures covered are audio, radio frequency, hidden mics, combined radio/wire, telephone bugs and taps, active and passive physical surveillance, stakeouts, vehicular and foot surveillance, and our favorite, countersurveillance.

Countersurveillance means snooping back at those who are trying to snoop on you. How sweet it is!



There are plenty of diagrams included to amplify the text, which is written for the average person to follow with ease. This is not a dull technical treatise, but a unique and resourceful how-to book loaded with clever and useful ideas.

Surveillance Countermeasures is $19.95, plus $5 shipping/handling ($6 to Canada) from CRB Research Books Inc., P.O. Box 56, Commack, NY 11725-0056. Residents of New York State should add $2.06 tax. VISA/MC accepted. Toll-free phone orders: (800) 656-0056; Canada/AK/HI orders: (516) 543-9169.

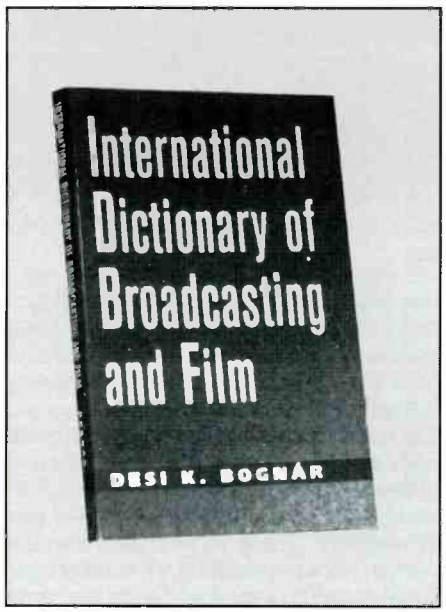
It's All Here

The *International Dictionary of Broadcasting and Film*, by Desi K. Bognar, is a comprehensive 268-page guide to current media terminology.

The distinct professional language of radio and TV broadcasters as well as video and film makers is complex and specific, and is standard throughout the world. This reference tool is a compendium of the professional jargon and terminology that is used to effectively communicate thoughts and ideas in these areas of the media.

In addition to defining terms from A to Z and explaining acronyms and abbreviations, the entries include information on professional organizations, guilds, festivals and awards. Appendices contain tables of international television technical standards (line/field and color systems in more than 200 nations); film speed, emulsion and size standards; plus a listing of national and international news agencies.

Do you know what a *scrim* is, or a *dish pan*? Can you define the jobs done by a



key grip or *best boy*? Here's where you learn these things.

International Dictionary of Broadcasting and Film comes from Focal Press, 313 Washington St., Newton, MA 02158-1626. Check with them for the price. Phone: (617) 928-2500.

If Actual Reality Isn't Sufficient

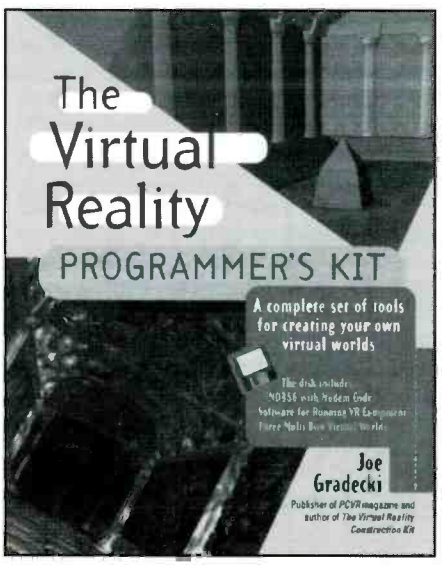
As virtual reality (VR) shows up in commercials, films, music videos and arcade games, this new technology is becoming more and more accessible to the public. With *The Virtual Reality Programmer's Kit*, by Joe Gradecki, computer users with no programming experience can create virtual worlds right on their own PC.

Gradecki's kit consists of an illustrated 383-page book plus a 3.5-inch diskette containing a complete set of tools to create VR worlds. In all, there's everything an aspiring VR programmer needs to create virtual cities, monsters and heroes.

With only a little knowledge of the C programming language, users can create multiuser worlds that work over modems. They can design labyrinths with secret passages and VR games with sophisticated animation and 3D sound, which can be explored by several friends. Users can integrate hardware projects (such as CyberMan and Gravis) from the kit into original VR worlds.

The kit also contains tips for experienced C programmers providing code for adding advanced features to their creations, including a modem, null modem and collision detection. Four complete VR applications are included on the diskette, which users can explore or customize to their own VR tastes.

The Virtual Reality Programmer's Kit, by Joe Gradecki, is $29.95 from John Wiley and Sons Inc., 605 Third Ave., New York, NY 10158-0012. Phone: (212) 850-6630. ■



You Should Know

BY CAPT. WILLIAM MAULDIN, WG4R

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

The Bug Problem

Have you ever heard of the Omnibus Crime and Safe Streets Act of 1968? If you asked this question to a hundred radio hobbyists, you probably wouldn't find two that have any idea what you were talking about. Let me tell you a little about this mostly unknown law.

The 1968 Omnibus Crime and Safe Streets Act is a federal law, part of which makes it a federal crime for any ordinary citizen to own, manufacture or sell any eavesdropping equipment specifically designed for "the surreptitious interception of wire, oral or electronic communications."

Recently, the U.S. Customs Service and other law enforcement officers spent nearly 16 months working undercover to investigate the possession, manufacture and sale of electronic listening devices that were being sold both over the counter and under the counter. So called "spy communications" shops often advertise in communications magazines and other publications where there would seem to be a market for such listening devices. Some sell the listening devices with the full knowledge that even mere possession is a violation of federal law while others seem to know nothing of the 1968 law.

The investigation resulted in quite a few raids by federal officers nationwide. The raids took place in 24 cities and resulted in at least 15 arrests of those heavily involved in the listening device market. Customs Service agents raided 15 locations in just the Miami and Fort Lauderdale area, using 70 agents to check those known to be involved in the trade in that area alone. Agents confiscated many different covert listening devices and short-range transmitters. Most were manufactured to look like ordinary pens, calculators, light sockets and telephone jacks, and yet contained sensitive microphones and low-power voice transmitters. Customs became aware of how widespread the problem was when a covert listening device was found in a cargo shipping container filled with illegal drugs at the Port of Miami.

A local U.S. Customs agent in Miami was quoted as saying: "These devices are tools for any kind of crime you want to commit...illegal eavesdropping, industrial espionage, etc. The possession, sale, distribution and manufacture of such devices is against the law unless you have a court order, as in the case of law enforcement agencies."

The U.S. attorney in Miami said after the raids that "the concern here is for the basic right of privacy and the dangers which devices such as these pose to it."

While raids took place in two dozen cities, Dade and Broward counties in Florida and New York City received the most attention. For months before the raids, agents and undercover operatives wearing hidden listening devices investigated the illegal sales. Affidavits soon followed, and search warrants were issued. Most of the devices were manufactured by two electronics firms in Japan. The illegal devices then were shipped to the companies in the United States using false invoices that misrepresented the items as microphones. Customs agents also said that the false invoices also reduced the actual price paid by the dealer so that import duties were less than they should have been.

No arrests resulted in Florida, according to the news media. Some of the dealers openly selling the listening devices claimed they knew nothing of the federal law covering the items. Others, aware of the law, were requiring customers to sign a release form. The form said that the items purchased were for export only and would not allow them to be used inside the United States. A Customs spokesman said that the dealers clearly knew the listening devices would be used illegally in the United States, but used the tactic to try to make the sales appear legal.

One dealer in Miami told a reporter that they had been in business for years, and never had any hint that the listening devices were illegal to sell or own. Most considered the devices illegal to use improperly, however, few were aware of the federal law against their sale, manufacture or ownership. Most radio and private detective magazines have carried advertisements relating to covert, hidden and secret listening devices for years, totally unaware of the 1968 Omnibus Crime and Safe Streets Act.

Being unaware of the federal law didn't help the dealers in Florida who had hundreds of thousands of dollars of inventory along with business records and sales receipts seized during the raids. Local authorities said their investigations were continuing, and that arrests might result if violations of local and state privacy invasion laws could be proven.

Small listening devices, so-called "bug transmitters" have been widely advertised recently in ads from so-called "spy shops" and others serving the private detective trade and others. Many of the transmitters have been of a major concern to industry in their efforts to protect company secrets. The same "spy shops" investigated in these raids also were found to be in possession of devices for monitoring and capturing cellular phone conversations and phone serial numbers. Those interested in stealing cellular phone identification numbers for illegal use often were found to be the same customers who bought the illegal listening devices, according to investigators.

Modern electronics technology has advanced to the point to where a small transmitter, battery and microphone can be easily built into small pens and other everyday devices. Agents indicated the listening devices that were confiscated ranged greatly in price, quality and range. The larger devices such as calculators and fake wall sockets were able to transmit a good, clear signal to receivers a quarter-mile away. Because of the increased size, the power and life of the battery could allow the service life of the "bug" to be quite extensive.

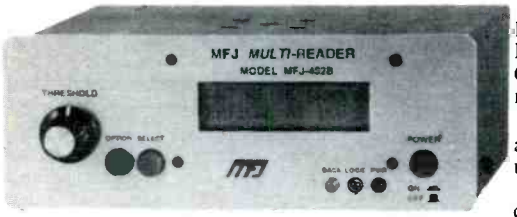
One device, designed to be installed inside a regular telephone, could draw operating power from the phone line, and allow covert monitoring of all telephone calls for an indefinite period of time. This small device is difficult to detect because it appears to be part of the actual phone and requires no battery because operating power is drawn directly from phone lines.

The average pen listening devices were found to have limited but useful range, sometimes as much as 1,000 feet, and normally operated on higher FM frequencies. Some of the more common devices found were quite simple and just transmitted their signal on a frequency in the standard FM broadcast band. The listener could easily monitor the desired conversation on an FM car radio while parked just outside the building. No special equipment is required for reception when a simple, low-power transmitter on the FM broadcast band is used. Of course, range had to be limited by design. If not, the bug would be quickly detected by anyone using an FM radio within the transmitter range. When the FM broadcast band is used, most of the bugs are found at either the extreme upper or lower edge of the band, and off slightly from the exact frequency used by FM broadcast stations.

(Continued on page 84)

Tap into *secret* Shortwave Signals

Turn mysterious signals into exciting text messages with this new MFJ MultiReader™



MFJ-462B **$169.95** **Plug** this self-contained MFJ MultiReader™ into your shortwave receiver's earphone jack.

Then *watch* mysterious chrips, whistles and buzzing sounds of RTTY, ASCII, CW and AMTOR turn into exciting text messages as they scroll across your easy-to-read LCD display.

You'll *read* interesting commerical, military, diplomatic, weather, aeronautical, maritime and amateur traffic . . . traffic your friends can't read -- unless they have a decoder.

Eavesdrop on the World

Eavesdrop on the world's press agencies transmitting *unedited* late breaking news in English -- China News in Taiwan, Tanjug Press in Serbia, Iraqui News in Iraq -- all on RTTY.

Copy RTTY weather stations from Antarctica, Mali, Congo and many others. Listen to military RTTY passing traffic from Panama, Cyprus, Peru, Capetown, London and others. Listen to hams, diplomatic, research, commercial and maritime RTTY.

Listen to maritime users, diplomats and amateurs send and receive error free messages using various forms of TOR (Telex-Over-Radio).

Monitor Morse code from hams, military, commercial, aeronautical, diplomatic, maritime -- from all over the world -- Australia, Russia, Hong Kong, Japan, Egypt, Norway, Israel, Africa.

Printer Monitors 24 Hours a Day

MFJ's exclusive *TelePrinterPort*™ lets you monitor any station 24 hours a day by printing their transmissions to your Epson compatible printer.

Printer cable, **MFJ-5412**, $9.95.

MFJ *MessageSaver*™

You can save several pages of text in 8K of memory for re-reading or later review.

High Performance Modem

MFJ's high performance *phaselock loop* modem consistently gives you solid copy -- even with weak signals buried in noise. New threshold control minimizes noise interference -- greatly improves copy on CW and other modes.

Easy to use, tune and read

It's easy to use -- just push a button to select modes and features from a menu.

It's easy to tune -- a precision tuning indicator makes tuning your receiver easy for best copy.

It's easy to read -- the 2 line 16 character LCD display with contrast adjustment is mounted on a sloped front panel for easy reading.

Copies most standard shifts and speeds. Has *MFJ AutoTrak*™ Morse code speed tracking.

Use 12 VDC or use 110 VAC with MFJ-1312B AC adapter, $12.95. 5¼x2½x5¼ inches.

No Matter What Guarantee

You get MFJ's famous one year ***No Matter What***™ *unconditional* guarantee. That means we will repair or replace your *MFJ MultiReader*™ (at our option) *no matter what* for a full year.

Try it for 30 Days

Order an *MFJ-462B MultiReader*™ *from* MFJ and try it in your own setup -- compare it to any other product on the market regardless of price.

Then if you're not completely satisfied, simply return it within 30 days for a prompt and courteous refund (less shipping).

Order today and try it -- you'll be glad you did.

Super Active Antenna

"World Radio TV Handbook" says MFJ-1024 is a "first rate easy-to-operate active antenna . . . quiet . . . excellent dynamic range . . . good gain . . . low noise . . . broad frequency coverage."

Mount it outdoors away from electrical noise for maximum signal, minimum noise. Covers 50 KHz to 30 MHz.

Receives strong, clear signals from all over the world. 20dB attenuator, gain control, ON LED. Switch two receivers and aux. or active antenna. 6x3x5 in. remote has 54 inch whip, 50 ft. coax. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, $12.95.

$129.95 MFJ-1024

Indoor Active Antenna

MFJ-1020B **$79.95**

Rival outside long wires with this *tuned* indoor active antenna. *"World Radio TV Handbook"* says MFJ-1020 is a "fine value . . . fair price . . . best offering to date . . . performs very well indeed."

Tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Use as preselector with external antenna. Covers 0.3-30 MHz. Has Tune, Band, Gain, On/Off/Bypass Controls. Detachable telescoping whip. 6x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312B, $12.95.

Compact Active Antenna

MFJ-1022 **$39.95**

Plug this new *compact* MFJ all band active antenna into your general coverage receiver and you'll hear strong clear signals from all over the world from 300 KHz to 200 MHz -- including low, medium, shortwave and VHF bands.

Also improves scanner radio reception on VHF high and low bands.

Detachable 20 in. telescoping antenna. 9 volt battery or 110 VAC with MFJ-1312B, $12.95. 3⅛x1¼x4 in.

MFJ Antenna Matcher

MFJ-959B **$89.95**

Matches your antenna to your receiver so you get maximum signal and minimum loss.

Preamp with gain control boosts weak stations 10 times. 20 dB attenuator prevents overload. Pushbuttons let you select 2 antennas and 2 receivers. Cover 1.6-30 MHz. 9x2x6 inches. Use 9-18 VDC or 110 VAC with MFJ-1312, $12.95.

High-Gain Preselector

MFJ-1045C **$69.95**

High-gain, high-Q receiver preselector covers 1.8-54 MHz. Boost weak signals 10 times with low noise dual gate MOSFET. Reject out-of-band signals and images with high-Q tuned circuits. Pushbuttons let you select 2 antennas and 2 receivers. Dual coax and phono connectors. Use 9-18VDC or 110 VAC with MFJ-1312B, $12.95.

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Easy Up Antennas Book

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MFJ-1214PC **$149.95**

Use your computer and radio to receive and display *brilliant full color* FAX news photos and incredible WeFAX weather maps with all 16 gray levels. Also RTTY, ASCII and Morse code.

Animate weather maps. Display 10 global pictures simultaneously. Zoom any part of picture or map. Frequency manager lists over 900 FAX stations. Automatic picture capture and save.

Includes interface, easy-to-use menu driven software, cables, power supply, comprehensive manual and Jump-Start™ guide. Requires 286 or better computer with VGA monitor.

Super Hi-Q Loop™ Antenna

The *Super Hi-Q Loop*™ is a professional quality remotely tuned 10-30 MHz high-Q antenna. It's very quiet and has a very narrow bandwidth that reduces receiver overloading and out-of-band interference.

MFJ-1782 **$269.95**

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MFJ-956 **$39.95**

The MFJ-956 is a *high-Q* passive LC preselector that lets you boost your favorite stations while rejecting images, intermod and other phantom signals. Covers 1.5-30 MHz. Has preselector bypass and receiver grounded position. 2x3x4 in.

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Cellular look-a-like. Covers 25-1300 MHz. Highest gain on 406-512 and 108-174 MHz, 19 in. Magnet mount. MFJ-1824BB has BNC/UHF plug; MFJ-1824BM has Motorola plug.

MFJ-1824BB/BM **$19.95**

MFJ 12/24 Hour LCD Clocks

MFJ-107B **$9.95**

MFJ-108B **$19.95** MFJ-105B **$19.95**

MFJ-108B, dual clock displays 24 UTC and 12 hour local time *simultaneously*. **MFJ-107B**, single clock shows you 24 hour UTC time. *3 star rated* by *Passport to World Band Radio*!

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MFJ-1702B **$21.95**

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MFJ-1702B for 2 antennas.

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CIRCLE 120 ON READER SERVICE CARD

POP'COMM's World Band Tuning Tips

January 1996

This *POP'COMM* feature is designed to help you hear more shortwave stations. Each month this handy, pullout guide shows you when and where to tune to hear a wide variety of local and international broadcasters on the shortwave bands. The list includes broadcasts in languages other than English. Most of the transmissions are not beamed to North America. Keep in mind that stations make frequent changes in their broadcasting times and frequencies.

Changes in propagation conditions may make some stations difficult or impossible to receive. Your equipment and receiving location also will have a bearing on what you are able to hear. Note: EE, FF, PP, etc., are abbreviations for English, French, Portuguese, and so on. Some frequencies may vary slightly. All times are in UTC, which is five hours ahead of Eastern Standard Time (i.e., 0000 UTC equals 7 p.m. EST).

Freq.	Country/Station	UTC	Notes
3210	Radio Mozambique	0250	s/on PP
3220	Channel Africa, South Africa	0300	
3225	Radio Maya de Barillas, Guatemala	0200	SS/local
3280	La Voz del Napo, Ecuador	1000	SS
3300	Radio Cultural, Guatemala	0300	
3305	Radio Western, Papua New Guinea	1130	
3325	Radio Maya, Guatemala	1100	SS
3330	CHU, Canada	0200	
3360	La Voz de Nahuala, Guatemala	1100	
3366	GBC, Ghana	0600	
3396	ZBC, Zimbabwe	0256	s/on
3925	Radio Tampa, Japan	1000	JJ
3945	Radio Vanuatu	1030	Pidgin/EE
3995	Deutsche Welle, Germany	0200	GG
4549	Rdf. Tropico, Bolivia	0030	SS
4760	ELWA, Liberia	0600	
4765	Radio Rural, Brazil	0230	PP
4770	Radio Nigeria, Kaduna	0430	
4777	RTV Gabonaise, Gabon	0530	FF
4785	Ecos del Combeima, Colombia	0200	SS
4790	Radio Atlantida, Peru	0200	SS
4795	RTV Cameroon, Douala	0430	FF
4805	Radio Amazonas, Brazil	2300	PP
4820	La Voz Evangelica, Honduras	0300	
4840	Radio Valera, Venezuela	0300	SS
4845	ORTM, Mauritania	0630	FF
4865	La Voz del Cinaruco, Colombia	0100	SS
4885	Ondas del Meta, Colombia	0300	SS
4890	NBC, Papua New Guinea	1100	EE
4890	Radio France Int'l, via Gabon	0500	FF
4915	GBC, Ghana	0600	
4920	Radio Quito, Ecuador	0200	SS
4930	Radio Internacional, Honduras	0200	SS
4935	Radio Tropical, Peru	0400	SS
4955	Radio Nacional, Colombia	0400	SS
4980	Ecos del Torbes, Venezuela	0200	SS
4991	Radio Andina, Peru	0230	SS
5010	Escueles Radiofonicas, Ecuador	1000	SS
5019	La Voix du Sahel, Niger	0500	FF
5040	La Voz del Upano, Ecuador	0130	SS
5047	RTV Togolaise, Togo	0500	FF
5055	TIFC, Costa Rica	0400	
5097	Radio Eco, Peru	0400	SS
5522	Radio Sudamerica, Peru	0040	
5850	Monitor Radio, USA	0500	
5860	Vatican Radio	0600	
5930	Radio Prague, Czech Rep, via Slovakia	0230	
5955	Channel Africa, South Africa	0400	
5995	RTVM, Mali	0700	FF
6000	Radio Havana Cuba	0130	
6010	Radio Budapest, Hungary	0230	
6015	Radio Austria Int'l, via Canada	0530	
6020	Radio Australia	0800	
6025	Radio Amanecer, Dominican Republic	0200	SS
6040	Deutsche Welle, via Antigua	0100	
6060	Radio Nacional, Argentina	0900	SS
6070	CFRB/CFRX, Canada	24 hr.	
6095	Vatican Radio	0250	
6100	Radio New Zealand	0800	
6110	Radio Japan, via Canada	0500	
6115v	La Voz del Llano, Colombia	0100	SS
6120	Radio Japan, via Canada	1100	
6135	Swiss Radio Int'l	0100	
6135	Radio Aparceida, Brazil	0930	PP
6135	Radio Santa Cruz, Bolivia	0930	SS
6185	Radio Educacion, Mexico	0500	SS
6250	Radio Nacional Malabo, Eq. Guinea	0500	SS
6520	Radio Pyongyang, North Korea	1000	KK
6560	Republic of Iraq Radio	0200	AA
7105	Radio Bosnia Hercegovina	0100	
7110	Radio Ethiopia	0329	Amharic
7120	Radio Sweden	0230	
7240	Radio Ukraine Int'l	2200	
7255	Radio Nigeria	0500	
7300	Radio Slovakia Int'l	0100	
7335	Vatican Radio	0130	
7345	Radio Prague, Czech Republic	0600	
7355	WGTG, Georgia	2100	
7370	Croatian Radio	0100	
7480	Radio Norway	0100	
7560	Radio Altura, Peru	0000	SS
8127	Galei Zahal, Israel	0000	USB
9200	Radio Omdurman, Sudan	0250	
9430	KHBI, Saipan	1000	
9435	Kol Israel	0400	
9445	Voice of Turkey	2330	TT
9475	Radio Cairo, Egypt	0200	
9510	Radio Australia	1300	

Freq.	Country/Station	UTC	Notes
9515	BBC, via Canada	1300	
9535	Swiss Radio Int'l	0500	
9540	Radio Espana Exterior, Spain	0100	
9545	Deutsche Welle, Germany	0500	GG
9560	Radio Norway	0100	
9560	China Radio Int'l, via Canada	0400	
9570	Radio Portugal	0230	
9580	Africa Number One, Gabon	1900	FF
9580	Radio Yugoslavia	0000	
9600	Vatican Radio	2230	various
9615	Radio Australia	1400	
9615	KNLS, Alaska	0800	
9640	Radio Ukraine	1430	
9645	Faro del Caribe, Costa Rica	0500	SS
9665	Radio Finland	2230	
9675	Spanish National Radio	2200	
9675	Radio Cancao Nova, Brazil	1100	PP
9690	China Radio Int'l, via Spain	0300	
9695	Channel Africa, South Africa	0500	
9700	Radio Bulgaria	0000	
9710v	Radio Vilnius, Lithuania	2130	
9725	RAI, Italy	0100	
9735	Radio Nacional, Paraguay	0100	SS
9750	Radio Japan	1400	
9755	Radio Canada Int'l	0000	
9760	Cyprus Bc Corp., via BBC Cyprus	2215	wknds
9770	Voice of UAE, Abu Dhabi	2300	
9775	Radio Varna, Bulgaria	2300	Fri
9805	Radio France Int'l	1200	
9820	Radio Havana Cuba	0100	USB
9825	Radio Kiribati	0600	
9835	Radio Budapest, Hungary	0100	
9840	Radio Kuwait	0500	AA
9850	Radio Sweden	1100	Swedish
9865	Radio Alfa & Omega, Russia	1430	RR
9870	Radio Austria Int'l	0130	
9900	Radio Cairo, Egypt	2300	
9950	Radio Ulaanbaator, Mongolia	1445	
9965	KHBN, Palau	0930	
11570	Radio Pakistan	1600	
11603	Kol Israel	1900	
11620	All India Radio	1900	
11635	Croatian Radio	2200	
11650	Radio Sweden	1200	
11670	Radio France Int'l, via French Guiana	0130	SS
11690	FEBC, Philippines	1200	VV
11705	Radio Havana Cuba	2100	
11710	RAE, Argentina	0200	EE
11715	China Radio Int'l, via Mali	0300	
11715	Radio Veritas Asia, Philippines	1500	
11720	Radio Bulgaria	2100	
11740	Radio Jordan	1930	AA
11750	Radio Dniester Int'l, Moldova	2030	
11780	Radio Nacional Amazonia, Brazil	0000	PP
11780	Qatar Broadcasting Service	0300	AA
11790	Radio Japan	0100	
11805	Radio Globo, Brazil	0100	PP
11830	Vatican Radio	2250	
11830	Radio Veritas Asia, Philippines	1500	
11850	Radio Thailand	1300	CC
11865	BBC, via Canada	1400	
11870	Radio Yugoslavia	0430	
11885	UAE Radio, Abu Dhabi	2300	
11890	Voice of Russia	1500	
11895	Radio Japan, via French Guiana	0300	
11930	VOIRI, Iran	1130	
11960	Radio Havana Cuba	2200	USB
11990	Radio Kuwait	1900	AA
11995	FEBC, Philippines	1330	
12005	RTV Tunisienne, Tunisia	1900	AA
12015	HCJB, Ecuador	0530	
12060	Radio Mayak, Russia	0900	RR
12085	Radio Damascus, Syria	2030	
13605	Golos Rossi, Russia	0230	RR
13625	Radio Atlantika, Russia	1200	RR
13635	Swiss Radio Int'l, via French Guiana	0030	
13670	Radio Vlaanderen Int'l, Belgium	1300	
13675	UAE Radio, Dubai	1630	
13700	All India Radio	0212	s/on,unid
13740	Radio Sweden	1130	
13785	Radio Pyongyang, North Korea	1500	
13800	Radio Vlaanderen Int'l, Belgium	2300	
13860	INBS, Iceland	2300	Icelandic
15009	Voice of Vietnam	1330	
15050	RFPI, Costa Rica	2200	
15095	Radio Damascus, Syria	2030	
15115	Radio New Zealand	0030	
15160	Radio Algiers, Algeria	1800	
15170	Radio Jordan	1100	
15180	Voice of Russia	0300	
15190	Radio France Int'l	2300	SS
15235	Voice of Great Homeland, Libya	2000	AA
15240	Radio Australia	0400	
15240	Radio Sweden	1330	
15265	Radiobras, Brazil	1700	
15270	Radio Intercontinental, Armenia	1700	Armenian
15295	Radio Tashkent, Uzbekistan	1330	
15315	Radio Netherlands, via Bonaire	1830	
15345	RTV Morocaine, Morocco	1800	AA
15350	Voice of Turkey	1330	s/on, TT
15365	Radio France Int'l	1230	
15400	Radio Finland Int'l	1330	
15405	Radio France Int'l	1400	
15415	Radio Jamahiriya, Libya	0230	AA
15445	Radiobras, Brazil	1200	
15475	Radio Atlantika, Russia	1300	RR, Tu-Fr
15475	Africa Number One, Gabon	2100	FF
15505	Swiss Radio Int'l	2000	AA
15530	RAI, Italy	2200	
15540	HCJB, Ecuador	0800	USB
15565	Radio Australia	1200	
15570	Vatican Radio	1745	
15575	Radio Korea, South Korea	0030	
15590	Vatican Radio	1345	
15640	Kol Israel	1515	
15650	Voice of Greece	1400	GG/EE
15665	Monitor Radio, USA	1800	
15675	Radio Copan Int'l, Honduras	2300	SS
17490	HCJB, Ecuador	1000	USB
17500	RTT, Tunisia	1330	AA
17510	KWHR, Hawaii	0300	
17525	Voice of Greece	1330	GG/EE
17620	Radio France Int'l	1600	
17625	Radio Bulgaria	1200	
17630	Africa Number One, Gabon	1430	FF
17655	Radio Ukraine Int'l	2330	
17670	Swiss Radio Int'l	1500	
17740	Radio Finland Int'l	1430	
17800	Deutsche Welle	1600	
17810	Radio Japan	2300	
17820	Radio Canada Int'l	1300	
17825	UAE Radio	1300	
17870	RAI, Italy	1730	II
17895	Qatar Broadcasting Service	1400	AA
17900	Radio Portugal	2000	PP
21605	UAE Radio, Duba	1600	AA

Product Parade

REVIEW OF NEW, INTERESTING AND USEFUL PRODUCTS

Get Optimum Battery Charging

Alexander Batteries' Optimizer 2000 series battery management system supports nickel-cadmium, nickel metal hydride, sealed lead acid and specific lithium technology rechargeable batteries in three- or six-bay configurations.

Features of the Optimizer 2000 series include charge/discharge with capacity measurements; analyze, which cycles automatically through a charge, discharge and additional charge; condition, which cycles automatically through three separate charge/discharge cycles showing the capacity for each cycle; and the final capacity for all three cycles combined.

The Optimizer 2000 is equipped with a universal switching power supply that has a power management control for the international market. Features include interchangeable battery adapters; a basic, although adjustable 900mA charge rate; 600mA discharge rate; and computer interface and software to perform analysis of charge and discharge curves with respect to temperature, time, voltage and charge current. Fast charge termination is monitored according to voltage and temperature characteristics. The unit also includes a 10-hour safety backup timer.

Alexander Batteries' Optimizer 2000 series battery management system will keep your rechargeable batteries in top-notch condition.

The Optimizer 2000 supports nickel chemistry batteries with three to 12 cells, lead acid with three to nine cells and specific two- to three-cell lithium technology batteries. Adapters are available for virtually any style battery for cellphones, two-way radios, medical equipment, laptop computers, bar code scanners, GPS units, and radio control transmitters and receivers, as well as generic clip lead adapters for general use.

For more information, contact Alexander Batteries, P.O. Box 1508, Mason City, IA 50402; phone (515) 423-8955; fax (515) 423-1644.

New 900 MHz Phones Offered By Panasonic

We know many of our readers are ready to leave the crowded 46- and 49-MHz bands when it comes to cordless phones. With manufacturers slowly adding the new 43- and 44-MHz channels, 900 MHz models look more promising all the time. There's also a little better range with some

The cellular-look Panasonic KX-T9520 cordless phone operates on 900 MHz.

900-MHz models and perhaps, a bit more privacy. At least you know you won't be splattering all over the neighbor's baby monitor!

Panasonic has just come out with a pair of new 900-MHz 30-channel cordless phones that offer a few extra features. The KX-T9520 and KX-T9550 models are designed to offer extended range as well as take advantage of Panasonic's Sound Charger technology that helps filter out background noise that may be present to enhance sound quality even better. And with 30 channels (as opposed to 10 channels on most 46-MHz versions, or even 25 channels on newer 46-MHz models), there's less of a chance of you landing on a busy channel, rendering your conversation unintelligible.

Both Panasonic phones look good, especially if you have a home-based office. In fact, you might even mistake their design for a cellular phone if you don't look close enough. Your neighbors will think you're walking around the yard with a cellular phone all the time. Close—only a few megahertz higher, though. These phones easily fit in your pocket and they even have lighted keypads for dialing in the dark. The KX-T9520 also has a keypad on the base for dialing convenience, and offers a speakerphone for hands-free conversations.

Both Panasonic cordless phones also offer spare battery charging. If you purchase the optional spare battery, you can always have a fresh battery for your cordless phone. But, unless you are long-winded, the supplied battery will keep you on the air for seven days in standby mode.

Paging between the handset and the base is available on each model, as well as an LED battery indicator. The KX-T9550 has 10 speed-dial numbers, while the KX-T9520 offers 20 memory numbers.

There's also a bonus on the KX-T9550. The base unit also features a full digital answering system for both outgoing and incoming messages. It can record up to 15 minutes of incoming messages in its digital memory.

And, if you're tired of taking messages for everyone else in your household or office, the KX-T9550 offers three personal mailboxes for incoming messages. With passcodes to protect the privacy of the messages, users need only to listen to their own messages when checking messages.

Some other digital features offered include: New Message Playback, which delivers only the latest messages even if others have been saved; one-touch Message Skip and Repeat; Message Memo, which serves as an electronic notepad between two extensions; two-way recording; and a two-digit LCD to show the number of messages waiting. Messages can be obtained remotely with a Touch-Tone, phone, too, and voice prompts guide the user.

One of the nice things about the KX-T9550 is that it can be set up to alert your pager every time you receive a message. That allows you to call in for your messages then, and not worry about missing an important message.

The KX-T9550 carries a suggested retail price of $319.95, while the KX-T9520 carries a suggested price tag of $239.95. They are available at select locations where Panasonic cordless phones are sold. For information, write to Panasonic, Matsushita Consumer Electronics Co., One Panasonic Way, Secaucus, NJ 07094. ■

Scanning VHF/UHF

BY J.T. WARD

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Public Safety Gone Digital? You Still Can Keep Informed!

Excuse me while I suffer from severe scanner withdrawal. No, I haven't given up my radios. Rather, my local police, fire department and EMS division likely will have switched to a new all-digital 800-MHz trunked radio system by now. As this column is being written (in mid-September), it remains to be seen whether the switch will occur on time, but even if delayed the change is inevitable.

As most scanner listeners are aware, monitoring an 800-MHz trunked public safety radio system is a pain. The conversations jump around from frequency to frequency and those annoying data channels fill your radio speakers with an irritating buzz.

But as more and more listeners are discovering, when compared with the new all-digital systems, conventional trunking soon may become "the good ol' days." While listening to a conventional trunked system is annoying, at least it's possible. With the new all-digital systems, it's impossible to monitor the transmissions with a scanner.

You see, digital systems convert the voice transmissions into a stream of digital data, then convert it or reassemble it back into sound at the receiver. Today's analog scanners are incapable of making the conversion. Depending upon the system, all the scanner listener hears is either a hiss, much like static; or a squeal similar to listening to a fax machine or computer modem.

So, what's a dedicated scanner listener to do? Well, you could sell all your radios to me—cheap! Or, you can do like I did and look for interesting alternatives to police, fire and EMS monitoring.

If you're a dedicated news junkie suffering from withdrawal because you no longer can hear the cops firsthand, then search out the frequencies used by your local TV and radio news departments and newspapers. In many areas, the public safety agencies allow the local media to purchase radios compatible with the digital systems so their reporters can stay informed. You can bet that when something big happens, there'll be plenty of chatter about it on the media radios.

Most vehicle accidents require tow trucks, and the local power company almost always is dispatched to house fires to disconnect the electricity. So, monitoring tow truck operators and utility company frequencies, particularly late in the evening when routine service calls are at a minimum, is a must.

Here's your columnist's listening post. J.T. Ward's shack includes not only a RadioShack Pro-2030 VHF/UHF scanner, but also a Realistic DX-300 shortwave receiver, a Realistic TRC-415 CB radio and a Uniden MC-615 VHF marine transceiver. A Tandy 1000SX computer is used for radio-related computer bulletin boards and online services.

If you're lucky enough to live near the water, don't forget to monitor 156.800 MHz, the marine emergency and calling channel. This frequency can get quite busy on weekends when many inexperienced pleasure boaters take to the water. Listeners living near the ocean, the Gulf of Mexico, the Great Lakes or the Mississippi, Ohio or other major rivers also should monitor the Coast Guard on 157.050, 157.075, 157.100, 157.150 and 157.175 MHz. There can be some real drama heard as Coast Guard crews respond to accidents, boat fires, medical emergencies on the water and other crises.

Need more to listen to? Then don't forget the local airport. If you're lucky enough to live near a major airport used by the airlines, be sure to monitor the airlines' company frequencies. It's here that you'll hear the pilots requesting help with mechanical problems, or perhaps asking for security to meet the plane because of a problem (often drunk) passenger or a VIP on board. Airline company frequencies in use at your airport can be found by searching between 128.825 MHz and 132.000 MHz.

If your scanner will tune low enough, be sure to program in 27.065 MHz in the AM mode. That's citizens band Channel 9, the emergency and travelers assistance channel.

This should get you started in finding alternatives to listening to police, fire and EMS calls. Write in with your suggestions on alternative monitoring and I'll include them in a future column.

They're Not Scanners

While we're on the topic of alternative monitoring, I suggest thinking about alternative radios. While scanners are great, by

their very nature compromises must be made in their design. When compared with professional radios dedicated to a single use, scanners often suffer from poor sensitivity and even worse dynamic range.

Recently, I picked up a Uniden marine VHF transceiver in a pawn shop for a very attractive price. By connecting the transceiver to a RadioShack VHF/UHF groundplane scanner antenna ($17.99), I get far better reception than what my scanners produce on the same frequencies. The same goes for a used ICOM VHF airband handheld transceiver I picked up at an aviation swap meet for less than $100. Even with a simple whip attached, I get better reception than on any scanner I've ever seen.

I don't consider myself a CBer, but I do keep a citizens band radio tuned to Channel 9 because I live near two interstate highways. A RadioShack mobile CB, purchased in a pawn shop for $20, receives this frequency better than most scanners. On occasion I'm even able to offer assistance to a lost or stranded motorist or relay an accident report to police.

The moral of this story is do not overlook those old, specialty radios in the bargain bin at the next hamfest you attend. Keep in mind though that you can't transmit on some radios unless you have a license.

Western Maryland

Rob Peterson of La Vale, Md., writes via e-mail to offer the following frequencies in use in western Maryland.

"With these frequencies, my community is becoming a great place to listen to a scanner. Each summer, at Rocky Gap State Park, country music fans are treated to one of the biggest outdoor concerts in the United States.

"Also, Frostburg State University is the new home of the Washington Redskins training camp. The small campus turns into a media madhouse.

"And, they're planning to build one of the country's largest casinos just a few miles north of Cumberland," Rob says.

His favorite monitoring frequencies include: 33.78, Allegheny County Civil Defense; 33.88, Cumberland City Fire Department; 39.24, Maryland State Police Channel 8; 47.32, Maryland State Road Department; 122.800, Cumberland Airport; 145.450, Mountain Amateur Radio Club; 146.880, Mountain Amateur Radio Club; 151.205, Maryland Department of Natural Resources police; 155.025, Frostburg State University campus police; 155.115, Allegheny County Road Department; 155.805, Mineral County, W.Va., police; 155.835, Mineral County, W.Va., fire and rescue; 159.150, Frostburg police; 409.150, 409.350, 409.750, 409.550 and 409.950, Federal Prison, Cumberland; 453.100, Cumberland Fire Department; 460.175 and 460.425, Cumberland police; and 464.575, Country Club Mall.

Rob also monitors the Allegheny County Sheriff's Office on 861.9875, 862.9875, 863.9875, 864.9875 and 865.9875.

Revisiting DEN

In September, we published a list of radio frequencies in use at the new Denver International Airport. A reader who wishes to remain anonymous provided the following list of corrections and additions to the previously published information.

Denver International Airport: 128.750, ground control for westside inbound traffic; 127.500, ground control for westside outbound traffic; 120.150, ground control for eastside outbound traffic; 121.850, ground control for eastside inbound traffic; 133.300, tower-runway 7/25; 135.300, tower-runway 16/34; 124.300, tower-runway 8/26; 132.350, tower-runways 17L/35R and 17R/35L; 118.750, clearance delivery; 134.025, automated departure information; 125.600, automated arrival information; 118.975, south arrivals; 119.300, north arrivals; 134.850, VFR approaches to the north (also a departure frequency); 126.375, VFR approaches to the south; and 128.450, for all other VFR approaches.

Other approach/departure frequencies include 125.300, 127.400, 120.200 and

CIRCLE 65 ON READER SERVICE CARD

128.050. Ramp control and departure fre- difficult or impossible to locate the reply on "G'day," Alek wrote.

Listening Post

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCAST BANDS

Try to Catch This Station Before It's Too Late!

Shortwave has a visitor: a station that makes use of the higher medium very infrequently (its last shortwave appearance was around 15 years ago!).

Currently heard by SWLs is Galei Zahal, the Israeli Defense Forces radio, which normally broadcasts only over its own network of AM and FM stations. It is being relayed on shortwave over some sort of utility-type transmitter. (One report says it is VLB near Tel Aviv.)

The broadcast is said to be the network's traffic information service, consisting mostly of music. It seems best heard around 0000 on 8127 upper sideband, although other reports show it active as early as 1750 and as late as 0600. The trouble is that these shortwave stays never are for very long, so it is possible that Galei Zahal may have left by now.

If you catch it and want to send a reception report, the address is: Military Post Office Box 01005, Israel (no city). Despite what you may hear about this being a spurious or accidental transmission, we understand the shortwave broadcasts are quite intentional, although the "why" isn't known.

"La Maison de la Radio" is the headquarters of Radio France International. (Courtesy of Sue Wilden of Indiana)

New Life

Mexico's Radio Huayacocotla, which the government closed down a few months ago, has been allowed to return to the air after a new Secretary of Communications and Transport took over that office. The station would prefer to operate on mediumwave, rather than shortwave, and is trying to get a license to do so. It is a good idea to go after this one while you can.

Radio Huayacocotla operates on 2390, best heard in the morning around dawn or in the early evening, up to nominal 0100 sign-off. It's not an easy catch. Be careful, though, because the Guatemalan, La Voz de Atitlan, also uses this frequency.

Another One

Still another U.S. commercial-religious station has come on the air. WGTG (Glory to God) began testing late this summer with a 50-kW transmitter from McCaysville, Ga.

Initially, the station is running tests between 0900 and 1800 Fridays, Saturdays and Sundays on 7355 and should start regular programming before the end of the year. In one rather neat touch, the test announcement includes the phrase "for circuit adjustment purposes." Odd usage for a broadcaster, but something we used to hear often from utility and point-to-point transmitters as they kept a frequency on standby. Reception reports go to P.O. Box 1131, Copper Hill, TN 37517.

Meanwhile, Family Radio has sold KECR-FM in El Cajon-San Diego, Calif., for $9 million. The money will provide continued funding for WYFR, which has been running a deficit of about $3 million a year for the last three years. We're given to understand that a couple of the other U.S. religious stations are experiencing money problems, too.

VOA-Germany

The Voice of America now is using the two German transmitter sites of Radio Free Europe/Radio Liberty. Currently, the VOA is airing via Holzkirchen on 7270 from 1800-2100 in Russian and via Lampertheim at 1500-1530 on 15235 and Saturday and Sunday from 1530-1545 on that frequency.

Africa Notes

La Voix du Zaire has been inactive for a long time, but now the station seems to have been reactivated again. Some listeners are hearing weak signals from what appears to be this station on 15244v, in French around 1800.

Radiodiffusion National Tchadienne, off the air for several months, has resumed operations on 4904.5. Check just before 0500 for sign-on in French.

Trans World Radio in Swaziland is making use of Channel Africa's shortwave facility from 0333 to 0419 on 7215; 1900-2057 on 9510, 1630 to 1800 on 9530 and 0600-0657 on 11730. (Those odd times are correct.)

Rarely heard Radio Tanzania at Zanzibar is active again on 6014.7. So far, it has only been reported (in Europe) at its 1759 sign-on, which we wouldn't have a prayer of hearing in North America. The station also signs on at 0300, and while use of 6014 isn't confirmed at that time, it's worth trying (just in case).

RAE Argentina will confirm reception reports if this information is included: date and time of reception, frequency, reception quality given in the SINPO or SIO report code and the details of 30 to 40 minutes of their program. Their current English schedule is 1900-2000 to Europe and North Africa on 15345 and 0200-0300 to America on 11710. Address: Radiodifusion Argentina al Exterior—

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

RAE, C.C. 555, Correo Central, 1000 Buenos Aires, Argentina. This info came direct from the station to Dave Jeffery, Niagara Falls, N.Y. Thanks, Dave!

Brazil's Radio Nacional has a new address: C.P. 08840, CEP 70912-790 Brasilia, DF, Brazil.

Uruguay

Keep an ear on 9650 and 15230 for a new station due on the air from this country. Radio Emisora Ciudad de Montevideo is supposed to be coming on the air soon, if it's not active already. More good news: SODRE, the government station, is supposed to resume its shortwave service soon. SODRE is one of the real old-timers from South America. It'll be good to have them back!

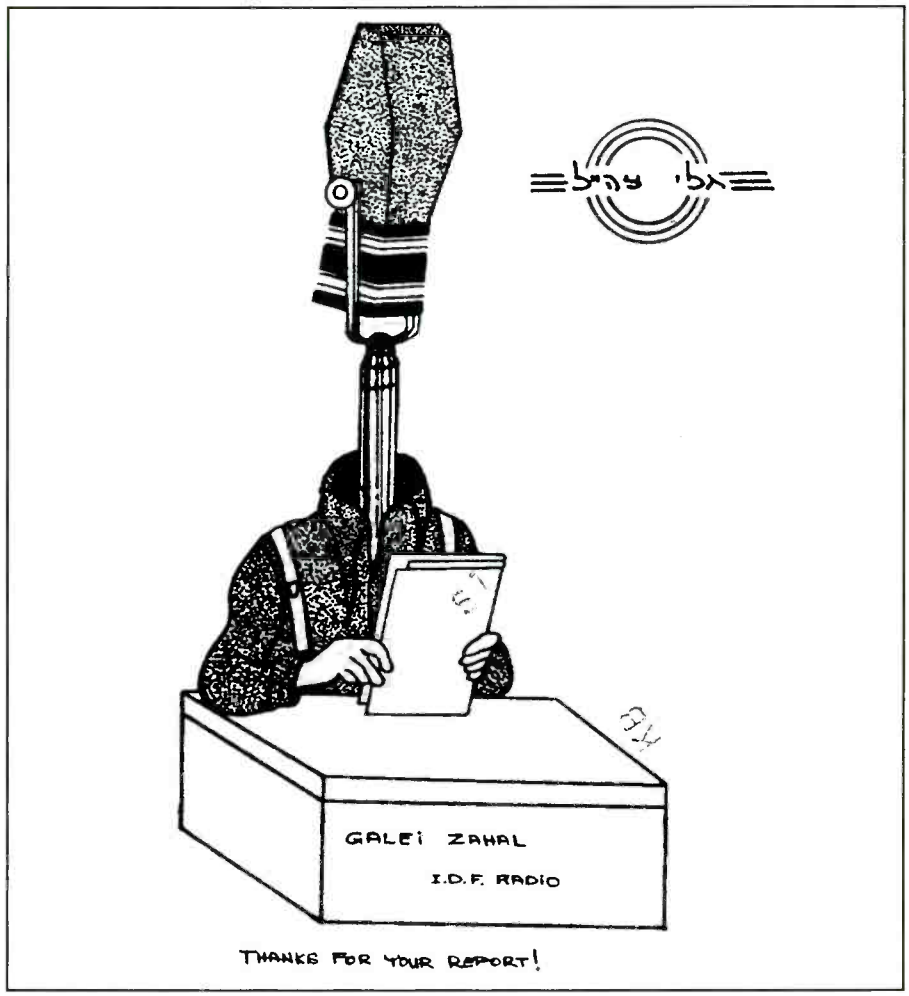
Listener Logs

Your reception logs and other input always are welcome. We only ask that you list items by country, double or triple space between everyone and put your last name and state abbreviation after each. We're also interested in receiving spare QSL cards and shack photos for use as illustrations, station schedules and brochures, information about QSL policies, new addresses and information, news clips and anything else you might run across relative to shortwave broadcasting, listening and DXing. Thank you!

Here's what we're hearing. All times are UTC, which is five hours ahead of EST, i.e. 0000 (midnight) UTC=7 p.m. EST, 6 p.m. CST, etc. Broadcast language is assumed to be English (EE) unless specified otherwise, as FF=French, PP=Portuguese, SS=Spanish, etc.

ALASKA—KNLS, 6149 at 1108 in RR, with some QRM from Caracol, Colombia. (Williams, TX)

ANTIGUA—BBC relay, 6195 at 1048. (Williams, TX)



Ed Rausch of New Jersey received this QSL from Galei Zahal. A penned note on the back says: "We don't transmit on 8127 kHz." But that's where they are!

ARGENTINA—Radio Nacional, 6060 in SS at 0615; 1057. (Miller, WA; Williams, TX)

ASCENSION ISLAND—BBC relay, 17830 at 1910 with Postmark Africa, ID, maildrop addresses for various African countries. (Lamb, NY)

AUSTRALIA—ABC/Rum Jungle-VL8K, Katherine, 2485 in Pidgin with aboriginal music at 1030. (Klingman, NY)

Radio Australia, 5995 at 1400. (Miller, WA) 7240 at 1122 and 9580 at 1155. (Williams, TX) 15365 at 0450, time pips and ID at 0500 and into news. (Wilden, IN)

AUSTRIA—Radio Austria International on 9655 at 0229. (Miller, GA)

BOLIVIA—Radio Illimani, 4945 at 0325 to 0406 close. Talk with correspondent, ID, announcement, orchestral music, address. (Paszkiewicz, WI)

BOSNIA HERCEGOVINA—Radio Bosnia Hercegovina, 7108 in unidentified language with opera ballads, time pips, ID, rock. (Rausch, NJ)

BOTSWANA—Radio Botswana, 4830 at 0416 in unidentified language, some EE. (Paszkiewicz, WI)

VOA relay, 7375 at 2000 with ID, IS, African news, editorial, mailbag. (Rausch, NJ) 7375//7415 at 1902. (Lamb, NY)

BRAZIL—Radio Nacional, 11780 in PP at 2347. 15445 in EE at 1254. (Miller, WA)

Radio Bandeirantes, Sao Paulo, in PP at 0617 on 6090. (Miller, WA)

Radio Cancao Nova, Cachoeira Paulista, 4825 in PP at 0326. (Miller, WA)

Radio Anhanguera, Goiania, 11830 in PP at 0201. (Miller, WA)

Radio Brazil Central, 4985 at 0748 in PP with Brazilian pops, talks, whistle sound effect, possible commercial, canned IS. (Lamb, NY)

BULGARIA—Radio Bulgaria, 11720 at 1933 with Across the Map of Bulgaria program. (Wilden, IN) 2157. (Miller, GA)

BURUNDI—Radiodiffusion Burundi, 6140.1 at 0300 sign-on in FF, into choral national anthem, ID, pops, mention of Rwanda in newscast. (Rausch, NJ)

CANADA—CHNX, Halifax, 6130 at 1715 with local FM relay, call-in contest, time check, weather. Running 28 watts! (Rausch, NJ)

Radio Canada International, 11940 at 0206. (Miller, WA) 15235 at 1732 in unidentified language. (Klingman, NY)

CHU, 14670 with time signals at 0628. (Wilden, IN)

CHINA—Voice of the Strait, 7280 in CC at 1050 and 1125. (Williams, TX)

China Radio International, 6140 in RR at 1045. Also 9845 at 1250 in CC. (Williams, TX) 9560 at 0416 and 9690 (via Spain) at 0320. (Wilden, IN) 11680 (via French Guiana) at 0413. (Miller, WA) 11715 via Mali at 0000 and 15110 (via Mali) in unidentified language at 1745. (Klingman, NY)

COLOMBIA—Caracol Bogota, 6150 at 0628 in SS. (Miller, WA) 6152 at 1107 in SS with ID. IS. QRM from KNLS. (Williams, TX)

La Voz del Cinaruco in SS at 1013 on 4865. (Williams, TX)

La Voz del Llano, Villavicencio, 6115 at 0624 in SS. (Miller, WA)

COSTA RICA—Adventist World Radio, 5030//6150//7375 at 0449 in SS with contemporary Christian music, IDs, QTH. Into FF at 0465. (Lamb, NY) 5030 at 1041, 9725 at 1218, 13750 at 1311. (Williams, TX) 6150 at 0050 with religious story,

Two staff members of WHRI/KWHR in the station control room. Joe Hill, left, and Joe Brashier are responsible for programming and sales.

//9725. (Paszkiewicz, WI) 13750 at 2300 with music, ID, religion. (Jeffery, NY)

REE relay, 11815 in SS at 1301. (Williams, TX)

RFPI, 7385 at 1104 requesting donations, into mailbag program. (Williams, TX) 9400 at 0211. (Miller, WA)

Faro del Caribe, 9644 at 1409 in SS with religion. (Lamb, NY) 9645 at 1117 and 1241 in SS. (Williams, TX)

Radio Universidad, 6105 at 0230 in SS with Peanut Vendor (Yea! ed.) and ID. (Paszkiewicz, WI)

CROATIA—Croatian Radio, 13830 at 2300 with Croatian Radio News in English and a wealth of info about the situation in Bosnia. (Jeffery, NY) Presumed news or interview in Croat at 1709. (Klingman, NY)

CUBA—Radio Rebelde, 5025 in SS at 1039. (Williams, TX)

Radio Havana, 6000 at 1056 with IS, 9505 at 1225 with *La Musica de Cuba*, 9550 at 1200 with IS, ID in SS and 11760 at 1140 in SS. (Williams, TX) 6000 at 0402 with anti-U.S. talk, 9820 at 0230. (Wilden, IN)

DENMARK—Radio Denmark, via Norway, 9560 at 0149, in Danish. (Miller, WA)

ECUADOR—HCJB on 9415 at 1110 in RR, 9765 at 0428 in JJ, then into SS, 11960 at 1304 in SS and 15115 in EE at 1313. (Williams, TX) 9745 at 0438. (Wilden, IN) 15140 in SS at 2259. (Miller, GA)

Radio Quito, 4920 at 0501 in SS with commercials, news, airplane sound effects, promo. (Lamb, NY) 1115 in SS. (Williams, TX)

Radio Alianza, 5453 at 0120 until 0300 sign-off in SS with ID slogans, time checks, religious music. This is an unlicensed station located in Imbabura province. (Rausch, NJ)

EGYPT—Radio Cairo, 9900 in EE at 2218. (Miller, WA)

ENGLAND—BBC World Service (European Program Stream) on 9410 at 1734. (Jeffery, NY) 9515 at 1707 to 1715 close, 9600 at 0600 and 11775 at 1501. (Wilden, IN) 9590 at 0151, 11895 to Europe, perhaps in Romanian. (Miller, WA) 11775 to 1715 close. (Klingman, NY)

ETHIOPIA—Radio Fana, 9335 at 0327 sign-on in unidentified language, IS, ID, Mideast music, international news in Amharic, Dolly Parton song at 0356. (Rausch, NJ)

FINLAND—Radio Finland, 15400 at 1320 with IS, talk in Finnish. (Williams, TX) 1538 in EE. (Miller, WA)

FRANCE—Radio France International, 9790 in FF at 0134. (Miller, WA)

FRENCH GUIANA—RFI relay, 5920 at 1018 in SS, 11670 at 1143 in SS, 13625 in FF at 1309, 15365 at 1319, 15515 in FF at 1321. (Williams, TX) 13625 at 1157 in EE with IS, ID, news. (Jeffery, NY)

GABON—Africa Number One, 17630 at 1322 in FF. (Williams, TX)

GERMANY—Deutsche Welle, 5960 at 0500 with QRM from VOFC/WYFR-5950. 11810 at 1720 in unidentified language. (Klingman, NY) 6040 at 0100. (Wilden, IN) 9640 at 0227. (Miller, WA) 15275 at 1317 in GG. (Williams, TX)

GHANA—GBC, 4915 in EE at 0559. (Miller, WA)

GREECE—Voice of Greece, 11645 in EE at 0347. (Miller, WA)

Radio Makedonias, 9935 in Greek at 0308. (Miller, WA)

GUAM—Trans World Radio—KTWR, 9870 at 1203 in JJ. (Williams, TX)

GUATEMALA—Radio Tezulutlan, 4835 in local language at 1135. (Miller, WA) 1113 in SS. (Williams, TX)

Radio Maya de Barillas, 3325 at 1035 coming on the air with IS, ID, national anthem, music. In SS. (Williams, TX) 0205 with full ID and QTH. (Paszkiewicz, WI)

HAWAII—KWHR, 9930 at 1152 in CC. (Williams, TX) 15405 at 2015 in CC with religious talks, IDs in EE/CC. (Lamb, NY)

WWVH, 10000 at 0436, woman with time announcements. (Williams, TX)

HONDURAS—La Voz Evangelica, 4820 at 1133 in SS. (Miller, WA) 0324 in SS. (Williams, TX)

Radio Luz y Vida, 3250 at 0320 in SS. (Williams, TX)

Radio Copan International, 15675 at 2200 with WRMI features in EE. (Klingman, NY)

HUNGARY—Radio Budapest, 5935//7250//9835 at 2112 with DX program, address, ID. (Lamb, NY) 9835 at 0233. (Miller, WA)

ICELAND—INBS, 13860//15770 at 2007 in Icelandic with presumed news, instrumental music and off at 2010. (Lamb, NY)

INDIA—All India Radio, Panji, Goa with the Vividh Bharati service, subcontinental music, Hindi talks, tabla drums, commercials, choral music. Break at 0227 and back at 0236, but weaker then. (Paszkiewicz, WI) (Editor's note: as we understand it, the AIR programming before 0200 is not via Goa. Goa, incidentally, is considered a separate country on some SWBC DX country lists, including the list of the North American SW Association and Ontario DX Association.)

AIR, Thiru'puram, 5010 at 0024 to 0040 with IS, announcement, anthem, news in Hindi. Poor. (Paszkiewicz, WI)

All India Radio, 10330 at 1559 in unidentified language, and 15075 at 1832 in English. (Miller, WA)

INDONESIA—RRI, Jakarta, 9525 at 1138 in FF and 1205 in Indonesian with mentions of Jakarta, Indonesia, communism, Buddhism. Then an ID and more place and people names noted. (Williams, TX) 15154 at 0420. (Miller, WA)

IRAQ—Republic of Iraq Radio, 6560 at 0400 in unidentified language. Jammed, but by whom? (Klingman, NY)

ISRAEL—Galei Zahal—Defense Forces Radio, on 8127 at 2350 in Hebrew and EE with blues and pop, ID, reveille. Kol Israel news. (Rausch, NJ) 2315 in upper sideband, broadcast for Israeli Forces. (Boender, Netherlands)

Reshet Bet service, 11590 at 0333. (Miller, WA)

Kol Israel, 9435 at 0405. (Miller, WA) 9435//11603 at 1858 with IS, ID, Israel News Magazine. (Jeffery, NY)

ITALY—RAI, 11800 at 2341 in II. (Miller, WA)

JAPAN—Radio Japan, 6190 at 1048, 9750 at 1145 in JJ. (Williams, TX) 11705 at 1449. Off at 1459 and into Radio Canada International relay. 11895 at 0316. (Wilden, IN)

Radio Tampa, 6055 at 1108 and 9595 at 1233 in JJ. (Williams, TX)

Radio Canada International relay, 9660 at 1245. (Williams, TX)

BBC relay, 6120 at 1103 in CC and 1040 in JJ. (Williams, TX)

JORDAN—Radio Jordan, 15270 at 1430 with pop and country dedications, ID and news at 1500. (Rausch, NJ)

KUWAIT—Radio Kuwait, 9840 in AA at 0242. (Miller, WA)

LEBANON—Voice of Lebanon (presumed), 6549 at 0335 in AA with talks, Mideastern music, flutes. No clear ID. (Lamb, NY)

LESOTHO—BBC relay, 6190 at 1117. (Williams, TX)

MADAGASCAR—Radio Netherlands relay, 7310 at 0415 in DD, 12005 at 1307. (Williams, TX)

MALAWI—Malawi Broadcasting Corp., 3381 at 0430 with QRN. African hi-life music. Gone by 0440. (Klingman, NY)

MALAYSIA—Radio Malaysia, 6100 at 1427 in unidentified language. (Miller, WA)

MEXICO—Radio Educacion, 6185 in SS at 1111 and at 0342. (Williams, TX) 0640. (Miller, WA)

Radio Mil, 6010 at 0331 in SS. (Williams, TX)

MOLDOVA—Radio Moldova, 15225 at 1718 in unidentified language. (Klingman, NY)

Radio Dniester International, 11750 at 2030 sign-on in EE with IS, ID, location, music, press review. (Rausch, NJ)

MONGOLIA—Radio Ulaanbaatar, 9960 at 0300 in EE with music, woman in low voice, more music, man saying he hoped the music had entertained listeners. (Jeffery, NY)

MOROCCO—Presumed VOA relay, 7210 at 0350 in unidentified language. (Williams, TX) 15205//15410 at 1821. Also 17705 at 1849 in Albanian. Off at 1900. (Lamb, NY)

NETHERLANDS—Radio Netherlands, 9895 in DD at 0156. (Miller, WA)

NETHERLANDS ANTILLES—Radio Netherlands relay, 9715 at 1158 with IS, chimes, ID, site ID and into SS. (Williams, TX)

NEW ZEALAND—Radio New Zealand, 6100 at 1057 with rugby game. (Williams, TX) 15115 at 2250. (Miller, WA)

NIGERIA—Radio Nigeria, Ibadan, 6049.2 at 2200 EE with incorrect local time check and ID: "This is the station with a vision, Radio Nigeria One." Then religious program, *Vision of Joy*. (Rausch, NJ)

Voice of Nigeria, 7255 at 2013 with In the News, headlines, ID, promo, drums and into FF at 2100. (Lamb, NY) 0537. (Miller, WA)

NORTH KOREA—Radio Pyongyang, 7580 at 1108 in JJ. (Williams, TX)

NORWAY—Radio Norway, 9560 at 0200 in NN. (Miller, WA)

OMAN—Radio Oman, 7270 at 0353 with chants and singing in AA. (Williams, TX)

PAKISTAN—Radio Pakistan, 11750 at 1712. (Miller, WA)

PALAU—KHBN—Voice of Hope, 9975 (moved? not on 9965? ed.) at 0312. (Miller, WA)

PAPUA NEW GUINEA—NBC Port Morseby, 4890 at 1139. (Miller, WA)

PARAGUAY—Radio Nacional, 9735 at 0029 in SS. (Miller, WA) 0802 in SS with anthem, ID, slogan

That's either a Martian or an announcer on the cover of a recent Radio Bulgaria QSL.

Less recent is this Radio Sofia QSL sent to Andy Johns of Texas 20 years ago!

"comunicacion y democracia" and Paraguayan folk music. (Lamb, NY)

PERU—La Voz de Huamanga, 6199.9 at 0010 in SS with talk by woman, ID, mention of Peru, talks, flutes, "buenos noches," choir. (Paszkiewicz, WI)

La Voz de San Antonio, 6627.7 at 0215 with vocals, announcements, ID, time checks, shouts. SS. (Paszkiewicz, WI) 6628 at 0352 with Peruvian folk music, LA pops, IDs, time check, anthem and off at 0429. (Lamb, NY)

Radio San Ignacio, 6752.3 at 0148 in SS with huaynos, announcements. ID at 0205 and vocals with guitar, accordion. (Paszkiewicz, WI)

Radio Huancabamba, 6536 at 0249 in SS with Peruvian music, talks, canned IDs, anthem. Off at 0331. (Lamb, NY)

La Voz de Andamachay, 5547.4 at 0200 in SS with vocals, time check, ID and news. (Rausch, NJ)

Ondas del Huallaga, 3329.7 at 1020 in SS with long religious talk, kids' choir, ID. CHU not audible. (Rausch, NJ)

Radio Imperial, 6544.6 at 2350 to 0205 close, in SS. ID, echo, Peruvian music, communicados, commercials. National anthem at sign-off. (Rausch, NJ)

PHILIPPINES—Radio Veritas Asia, 9520 at 1227, faint, in Asian language. (Williams, TX)

FEBC, 9400 at 1211 in CC. (Williams, TX)

VOA relay, 6110 at 1059 with IS. 9760 at 1247 in EE and 15225 in CC at 1316. (Williams, TX)

PORTUGAL—Radio Portugal, 11710 at 0150 in PP. (Miller, WA) 15200 at 1315 in PP. (Williams, TX)

ROMANIA—Radio Romania International, 9550//9690//11940 at 2119 with a Romanian Elvis imitator and travel feature. (Lamb, NY) 11940 at 0410. (Miller, WA)

RUSSIA—Voice of Russia, 9620 at 0231. (Miller, WA) 9670 at 1120 in RR. (Williams, TX)

Radio Tikhiy Okean service via Yakutsk on 5940 at 1042 in RR. Via Khaborovsk on 7210 at 1118 in RR. (Williams, TX)

Radiostansiya Atlantika, 13605 at 0200 sign-on in RR with IS, ID, news, including a live report from Chechneya. (Rausch, NJ)

RWANDA—Deutsche Welle relay, 17860 at 1934 in GG with pops, IS by orchestra, sports program. (Lamb, NY)

Voice of Vietnam relay at 0223 on 7250. (Paszkiewicz, WI)

SAUDI ARABIA—BSKSA, 15060 in AA at 0445. (Miller, WA)

SINGAPORE—BBC relay, 9605 at 1235 in CC and 9740 at 1218 in EE. (Williams, TX)

SOMALIA—Radio Mogadishu, 6870 at 0330 sign-on in AA and Somali. IS, ID, Koran. (Rausch, NJ) (Editor's note: there are three stations using "Radio Mogadishu" as part of their name now operating in this country. For more info, see this month's Clandestine Communique column.)

SOUTH AFRICA—Channel Africa, 3220//5955 at 0254 sign-on with IS, ID, news, contest promo, Dateline Africa. (Lamb, NY) 9655 at 0456. (Miller, WA)

Radio Orange on 3230 at 0211 in EE and Afrikaans. (Lamb, NY)

SOUTH KOREA—Radio Korea International, 7275 at 1100 in JJ or KK with Sousa march. (Williams, TX)

SPAIN—Radio Exterior de Espana, 9540 at 0001. (Wilden, IN) 15110 at 2250 in SS. (Miller, WA)

China Radio International relay, 9690 at 0300. (Jeffery, NY)

SRI LANKA—Radio Japan relay, 11900 at 0115 with frequency announcement, site ID and *Asia Today*. (Rausch, NJ)

SUDAN—Republic of Sudan Radio, 7200 at 0347 in AA, possible Koran readings. (Williams, TX)

SWEDEN—Radio Sweden, 9850 at 0235; 0237. (Miller, WA; Jeffery, NY)

SWITZERLAND—Swiss Radio International, 6135 at 0423 with news, then into FF. (Wilden, IN) 9885 in SS at 0259 and 9900 in EE at 0124. (Miller, WA)

TAHITI—Radio Tahiti, 15167 at 0533 in FF. (Miller, WA)

TAIWAN—Voice of Free China, via WYFR, 5950 at 0701. (Wilden, IN) 11745 at 1257 in CC. (Williams, TX) 11780 at 1534 in CC. (Miller, WA)

THAILAND—VOA relay, 11785 at 1300 with IS, ID, into CC. (Williams, TX)

TOGO—Radio Lome, 5047 at 0526 in FF with talks, vocal pops, ID. (Lamb, NY)

TURKEY—Voice of Turkey, 9445 at 2359 in TT. (Miller, WA)

UKRAINE—Radio Ukraine International, 6020 at 1025 in presumed Ukrainian. (Williams, TX) 9860 at 0300 in EE. (Miller, WA) 11780 at 0015 with *Ukrainian Diary*. (Wilden, IN) 13720//15135 at 1809 in UU. (Lamb, NY)

VANUATU—Radio Vanuatu, 3945 at 1040 with rock and pop. (Williams, TX) 7260 at 0940 in Pidgin EE, ID, country music, IS and news at 1000. (Rausch, NJ)

VATICAN—Vatican Radio, 4005//5860 at 0458 in FF with religious talk, ID, IS into EE at 0500. (Lamb, NY) 7305 at 0355 in SS. Repeated IS. (Williams, TX) 9605 at 0228 in FF. (Miller, WA)

VENEZUELA—Radio Rumbos, 9659 at 1220 with call-in program in SS. (Williams, TX) 0215. (Miller, WA)

YEMEN—Radio Sana'a at 0308 on 9780 with Koran. (Paszkiewicz, WI)

YUGOSLAVIA—Radio Yugoslavia, 6100//6185 at 2122 in EE with music and talk about Montenegro, ID, frequencies, IS. (Lamb, NY)

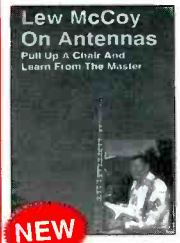
9580 at 0008. (Wilden, IN) 9720 at 1840 with Bosnia update and sports report. (Rausch, NJ) 11870 at 2358 with IS, ID, frequency info and news. Rather neutral view about events in Bosnia. (Jeffery, NY) 0432. (Miller, WA)

That's it for this time. Raise your glass to the following good folks who came through for you this month:

Richard Klingman, Mount Upton, NY; Sue Wilden, Columbus, IN; Sheryl Paszkiewicz, Manitowoc, WI; Steve Williams, Corpus Christi, TX; Ary Boender, the Netherlands; Michael Miller, Issaquah, WA; Ed Rausch, Cedar Grove, NJ; Dave Jeffery, Niagara Falls, NY, and Marie Lamb, Brewerton, NY. Thanks to each of you! Until next month, good listening! ■

CQ BOOK &

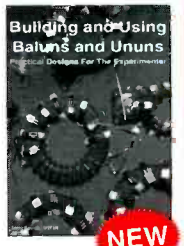
McCoy on Antennas



NEW

CQ magazine author and acclaimed authority on antenna theory and design, Lew McCoy, W1ICP, has written a truly unique antenna book that's a must for every amateur. Unlike many technical publications, Lew presents his invaluable information in a casual, non-intimidating way. **Lew McCoy on Antennas**—It's not just an antenna handbook, but a wealth of practical antenna advice for the ham! **Order No. MCCOY.....$15.95**

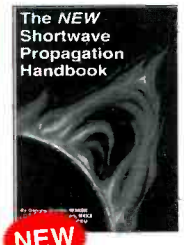
Building and Using Baluns and Ununs



NEW

Written by world-renowned expert Jerry Sevick, W2FMI, this volume is the definitive source for his latest practical information and designs on transmission line transformer theory. W2FMI has unraveled the technological mysteries with designs that are simple and work. Discover new applications for dipoles, yagis, log periodics, beverages, antenna tuners, and countless other examples. **Order No. BALUN.....$19.95**

The NEW Shortwave Propagation Handbook



NEW

The most comprehensive source of information on HF propagation is available from CQ! We've built an award-winning team, gathering information from individuals and organizations around the world. Collectively, co-authors George Jacobs, W3ASK, Ted Cohen, N4XX, and Robert Rose, K6GKU, have devoted much of their professional and amateur careers to advancing ionospheric science. Propagation principles, sunspots, ionospheric predictions, photography, charts and tables galore—it's all in this unique reference volume!
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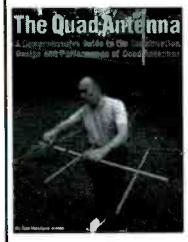

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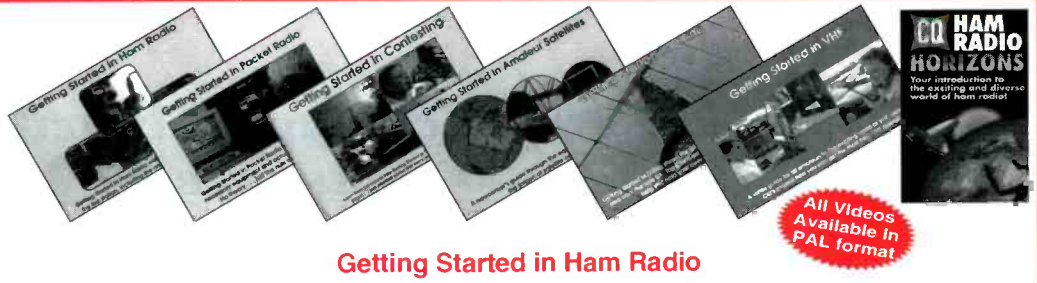

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CB Scene

27 MHz COMMUNICATIONS ACTIVITIES

BY JOCK ELLIOT, SSB-734

Let's Go To the Videotape: CB Action Flicks 20 Years Later

Wow—did I take a trip down memory lane! It seemed like events ganged up on me, flashing me back about 20 years.

It all started during a routine trip to the local discount store for household necessities. I was cruising one of the aisles when a box on a rack of discount videotapes flagged me down. The title screamed *Breaker! Breaker!,* so I picked it up.

The promotional copy on the box promises: "Chuck Norris has a 'handle' on action in this thrill-a-minute action adventure. ...When J.D. (Norris) gets a tip on his brother from a CB network, he and a convoy of angry truckers head for Texas City and the biggest showdown since the gunfight at the O.K. Corral."

What CBer could resist that? I sure couldn't, particularly when the price was only a couple of pennies shy of six dollars, so into the cart it went. Later that night, I watched *Breaker! Breaker!* and, outside of a couple of funny over-the-air lines from CBers in the opening few minutes, I'm saddened to report the entire movie is pretty disappointing. My directory of *Movies on TV and Videocassette* gives it a half-star.

Then a few days later, another CB-related movie, *Citizens Band* was broadcast by a cable channel. Like the Chuck Norris movie, *Citizens Band* also was made in 1977 to take advantage of the rage for CB that was burning across the nation.

But *Citizens Band*—some of you may remember it by the other title under which it was released, *Handle with Care*—is a much better movie. It begins with a trucker listening to a female sweet-talk another CBer. As the conversation becomes more steamy, the trucker first loses concentration, then control of his rig, putting it in a ditch. He calls for help on Channel 9, and a young man responds.

The rest of the plot revolves around the trucker, who has multiple wives, and the young Channel 9 monitor, who wants to do away with abuses on the CB airwaves. Eventually, our hero, played by Paul LeMat, mounts a powerful linear in his Chevy Nomad wagon, along with some direction-finding gear, and sets out to clean up the band. He yanks down antennas, cuts coax, smashes CBs, and does a bunch of highly illegal things to achieve his goal. It's a great fantasy, but remember: it's just a movie; in real life, activities like that can land you (or me) in jail.

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Wishing you continued success in the Radio Communications field.

Signed_____ Date_____

Jumping Jack Flash sends out this good-looking QSL certificate.

Some characters are wildly overblown just like in *Smokey and the Bandit* to make the movie entertaining. But what struck me is that, while many things have changed in CB, many things are the same.

The equipment sure has changed—at one point, the hero uses a CB that has a microphone-speaker and resembles a telephone handset. And the legal requirements have changed, too—you certainly won't hear anyone today asking whether another CBer has a license.

But with or without licenses, 20 years later the cast of characters heard on CB channels remain the same. There are cowboys, drunks and Christians, sweet-talkers trying to drive the truckers crazy, crypto-facists, garbage mouths, ratchetjaws, people with nothing better to do than make weird noises and many regular folks just interested in talking on the radio and maybe helping somebody out once in awhile.

Frankly, *Citizens Band* encouraged me. It helped me to see the problems we face on the airwaves today are no worse than those 20 years ago. It made me grateful for all the people, like the readers of this column, who add something positive to citizens band radio.

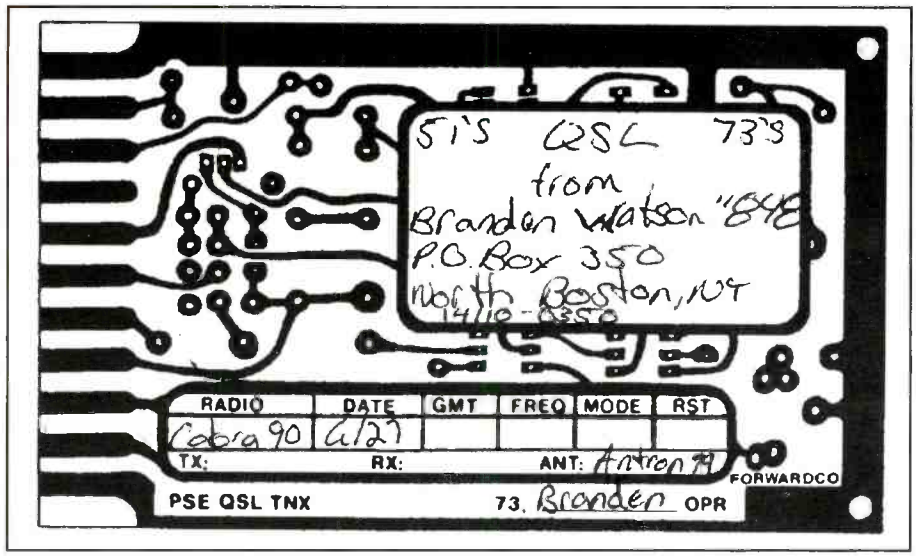
Incidentally, if anyone knows where I can obtain a "mint" (without the commercials) videocassette of *Citizens Band* (or *Handle with Care*), please write to me here at *POP'COMM*.

New REACT Training Manual

Bonnie Zygmunt, training and development chairwoman for REACT International, reports that a new *REACT Training Manual for Radio Monitoring* is available now. Aimed primarily at CB Channel 9 monitors, but applicable to other radio services, it teaches how to respond to a call for assistance and relay the information accurately to authorities.

According to Ms. Zygmunt, "Many situations are outlined from accidents with injuries, to travel directions, even fire reports. If a caller is reporting a car fire, what is the best indicator as to what is actually burning? This manual reveals this easy-to-remember information that dispatchers and fire departments will thank you for."

Cost of the training guide is $10 ($7 for



Here's Branden Watson's card.

REACT members), shipping included, from REACT International Inc., P.O. Box 998, Wichita, KS 67201.

CB Logging Software

If you ever wished you could quickly and easily log the details of your 11-meter contacts, Jaisen C. Nailen, president of Impact Software, may have the answer. He has developed the CB Logger software program, which includes an indexed database for logging QSOs as well as a viewer for 10 codes and Q codes.

For more information, contact Jaisen at 1004 Poplar Blvd., Suite 2, Jackson, MS 39202, or call him at (601) 352-7777.

Jaisen also sent in his QSL certificate "to rival Cookie Monster's in the September issue!" Thanks, Jumping Jack Flash!

From the Mailbag

Branden Watson, P.O. Box 350, North Boston, NY 14110, would like to hear from other CBers. He sent in his QSL card and reports that active channels in his area are 10, 30, 34 and 38 LSB.

Trevor Fletcher—Cornbinder—from Edmonton, Alberta, Canada, writes in to say: "Hats off to the CB operators in Saskatoon, Saskatchewan!" He was there on business not long ago and needed directions. He not only got good directions, but he found no swearing, no fighting, no carrier chucking, and—get this—they still use their license call signs! Zowee, sounds like Trevor might have visited "CB Heaven."

Trevor also wonders whether anyone can help with a source for tubes for an old Hallicrafters CB. If you can, please write to him direct: Trevor Fletcher, 14125 23 St., Edmonton, AB T5Y 1P9, Canada.

Craig Blankenhecler writes from Indiana to say he's been involved in CB radio since 1975 and the worst thing that ever happened to CB was when Browning and Tram went out of business. He went on to ask if I would "consider printing a few lines about the greatness of some of these high-performance radios of the past."

Well, Craig, I hate to disappoint you, but I have been a CBer about as long as you, though I have never had the pleasure of operating one of those rigs. I have heard them on the air and they sound terrific. But as far as operating them, I really cannot comment.

I do think, however, that the overall quality of CB equipment is at an all-time high. During the height of the CB boom in the 1970s, there were scores of manufacturers pumping out all kinds of gear, and not all of it was top quality. Some of it was outright junk. (Today, some export manufacturers still are cranking out junk, gear that doesn't work the first time you fire it up!)

By contrast, today's CBer can be fairly sure of yeoman performance in almost any piece of name-brand gear. Some top-end mobile and base station equipment available from manufacturers like Cobra will even, in some regards, outperform amateur radio gear costing several times as much. In addition, I've heard that some manufacturers are working on developments that may raise the standard of performance even higher.

In short, Craig, while I would love to experience firsthand the performance of the Brownings and the Trams, newcomers to CBing can grin—because great gear still is being manufactured today.

Wade Oestreich of Beatrice, Neb., is interested in the whole subject of tuning up CB radios. Well, Wade, that really opens up a whole can of worms.

The FCC says you can't run more than 4 watts AM or 12 watts SSB. Period. Run more power, and you're illegal. On the other hand, there is a huge number of CBers who have had their radios tuned up. The result is that they get a watt or two more output on AM, a few more watts on SSB.

Now, here's the real question: how much difference does a tune-up make in actual operating practice? The answer: not much. Here's why: To make a one S-unit difference on receive, you'd have to increase transmit power from 4 watts AM to nearly 16 watts, and if you want an additional S-unit, you'd have to increase power to over 60 watts!

So, if you really want to make a difference in the punch your CB rig delivers, there are two perfectly legal ways to get the job done. First, operate in single-sideband mode; you're legally entitled to run 12 watts. That buys you nearly an S-unit difference in signal strength. Second, put up a beam antenna. You can double or triple your apparent power and still be completely legal with a really big signal. And, Wade, I can tell you from my own experience that beam antennas work great!

A Word of Thanks

It's been a year since I took over the helm of CB Scene, and I'm deeply thankful for your support. I've been astounded at the wonderful letters, QSL cards, shack photos and other goodies that have been sent to me. Please, keep them coming to me here at *Popular Communications*! ■

Telephones Enroute

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

Does Driving Mix With Cellphone Usage?

A New York man claiming his car was struck by another vehicle driven by someone using a cellphone filed a $35 million lawsuit against Motorola (the phone's manufacturer), others who manufactured the phone holder and the installers of the unit. So far as we can learn, it's the first lawsuit of this kind against a cellphone manufacturer.

Filed in August 1995 in New York State Supreme Court in Manhattan, Ron Silber claims that he was driving his wife and daughter along a road in Southold, N.Y., in October 1993. He claimed that a vehicle heading toward his crossed a double yellow line and crashed into his car. It is his contention that the other vehicle's driver was holding a conversation over a cellular phone at the time.

Silber's suit further maintains that the cellphone had been installed on the vehicle's transmission hump on the floor of the Ford Explorer and that such an installation required the vehicle operator "to turn right and look down to operate the phone." He claimed that Motorola didn't provide warnings and instructions for the proper use of the phone.

The accident caused Silber to suffer a hip broken in more than two dozen places. At age 58, he was forced to retire early from his job. His wife's ankles and feet were crushed, and her eye sockets were punctured. The daughter required a metal bar be placed in her leg. The suit points out that both Silber's wife and daughter still have pain, and their personal mobility has been affected.

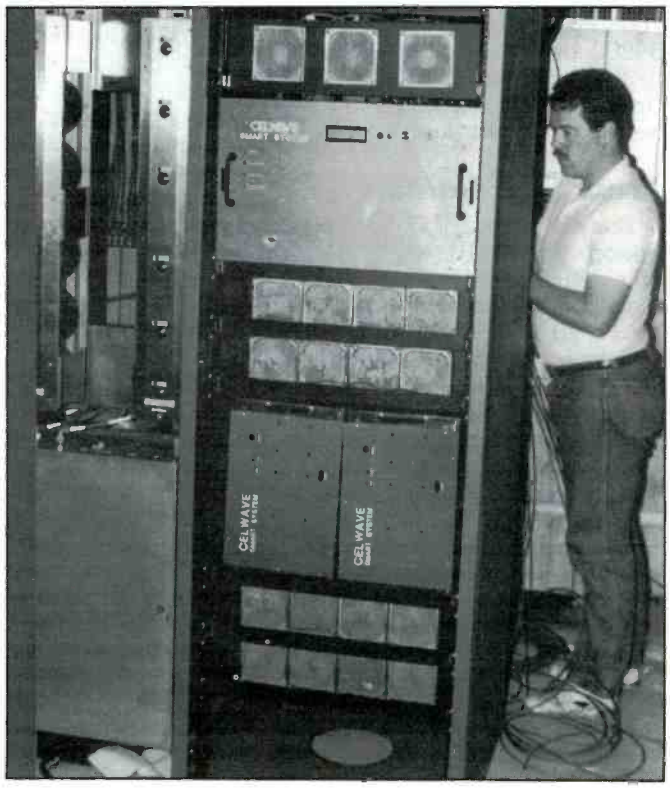
An out-of-court settlement had been made between the Silbers and the driver of the other vehicle.

Norman D. Sandler, Motorola's director of strategic issues, said, "We will vigorously defend our products and good name. ...As millions of motorists demonstrate each day, basic common sense can make cellular phone use compatible with safe driving. And that's important to remember as these products become ever more essential tools of everyday life in an increasingly mobile society."

Consider that many people are technophobes and fear they'll never be able to learn how to operate computers, VCRs and cellphones. The cellular industry has sought to allay such fears by emphasizing that cellphone use is essentially as simple and private as talking from a home phone. Was this smart? At-home people can relax and direct all their attention to the conversation. That makes us suspect a lot of car accidents have resulted from drivers using cellphones as though they were talking from their homes.

Anything a driver does while driving is a distraction and, therefore, has some degree of potential hazard. Some drivers become too focused on their conversations, then can't maintain the necessary attention level required to safely negotiate several thousand pounds of steel through the ever-changing flow of trucks, cars, bikes, skaters and pedestrians. So, using a car phone while driving adds a hazard factor to such drivers, their passengers, those in nearby vehicles and pedestrians. But remember, there's even a hazard factor involved when the driver is distracted in order

System operators fine-tune the Celwave SMART System antenna at a recent field test in Montgomery, Ala. ►



A Celwave SMART System antenna as it looks on a tower-top test site. The system cuts interference and increases call capacity. ▼

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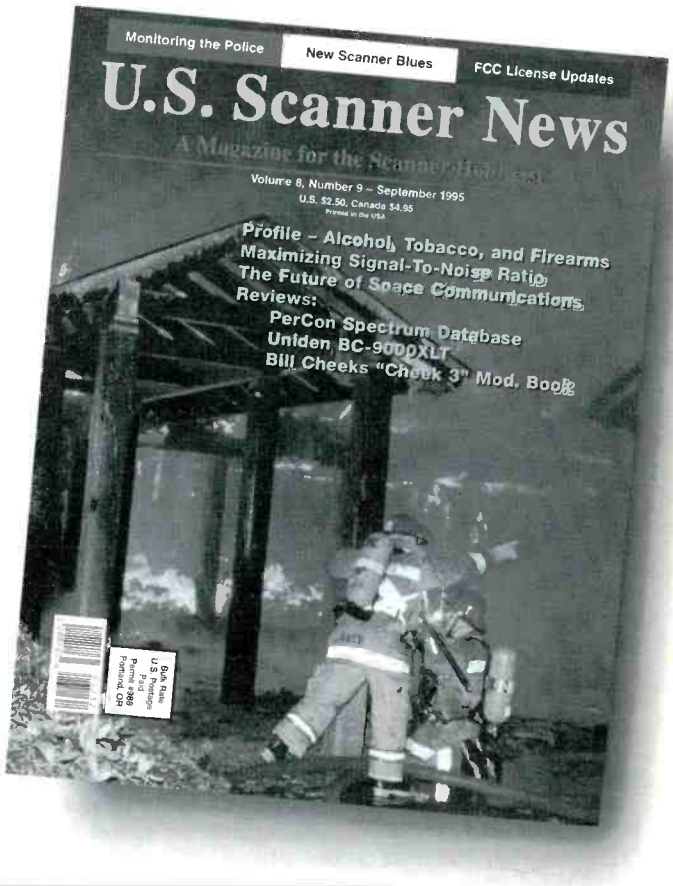

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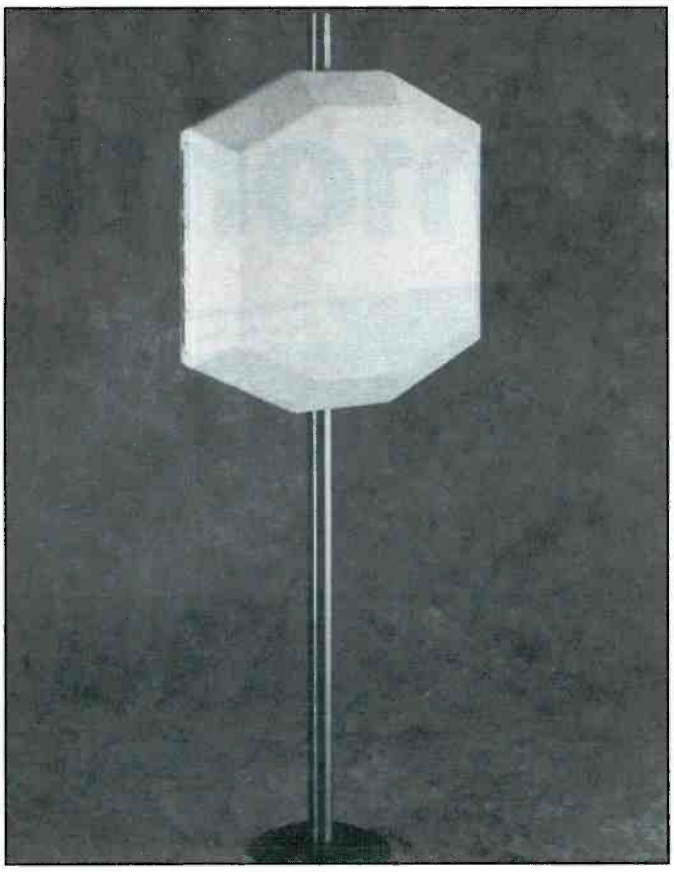


▲*The ESPNET To Go wireless receiver allows sports fans to remain current-to-the-minute on all major events and activities. The service is provided through the facilities of Motorola's Wireless Broadcast Network (WBN).*

◄*The Celwave SMART System was designed to increase the capacity of urban cellular sites, as well as range for economical coverage in rural systems.*

to light a cigarette or look at a street sign.

Ponder this. The cellular industry exerted enormous long-term pressure on Congress and the FCC to get laws pushed through and regulations changed to provide assurances of a "reasonable expectation of privacy." They reasoned that if the feds assumed their industry's responsibility for ensuring communications privacy, it would help the public accept the new telecommunications service. That's what they kept repeating around Washington until they finally convinced the politicians to validate the incredible concept.

All this made us wonder whether the cellular industry has matched that same effort to ensure that subscribers and the public would be provided a reasonable expectation of safety. Would you agree that safety is more important than a "reasonable expectation" of non-existent cellphone privacy? The problem is that safety warnings and laws don't help sell radios or service. If anything, they scare people.

We couldn't find a single cellular industry-inspired federal law or regulation seeking to assure safety. However, we did locate the industry's scanty "User's Code of Responsibility," which steers clear of the word "safety." The code fell short of their frenzied efforts to assure reasonable expectations of privacy. The code is scarcely better than having said nothing at all.

Their code presents six points: 1. Operate your car in a safe manner; 2. Make sure your phone is easily reached; 3. Use a "hands-free" telephone; 4. Use memory dialing; 5. Don't write while dialing; and 6. Don't let a call interfere with driving.

Some ideas for safely using a car phone also are offered by the American Automobile Association (AAA). They suggested nine points: 1. Recognize that driving requires your full attention; 2. Familiarize yourself with the phone's buttons; 3. Pull off the road before dialing; 4. Use a hands-free speakerphone and keep both hands on the wheel; 5. Pull off the road if the conversation is emotional or complex; 6. Ask a passenger to place the call; 7. Monitor traffic conditions; 8. For emergencies, provide concise information to the operator; and 9. Secure a portable phone in a cradle.

Apparently the cellular industry hasn't said much about safety because they assumed drivers would have the common sense to intelligently use car phones while enroute. After all, safe driving laws and warnings aren't provided for using mobile CBs, car stereos and CD players, car AM/FM radios, vehicle air conditioners and heaters. Road map publishers don't include a list of problems you might cause if you check the map while driving.

A National Highway Traffic Safety Administration study shows that the involvement of car phones in auto accidents is a fraction of 1 percent. A 1993 University of Michigan Transportation Research Institute study found that talking on a car phone actually is less distracting than changing a tape cassette. Reading a map was nearly twice as distracting as using a car phone.

Obviously, some drivers just don't use common sense. That must be why they had to put a law on the books in Tennessee stating you cannot drive while asleep. A Massachusetts law makes it illegal to shave while driving.

Specific laws and warnings aside, each cellphone user must assume the sole responsibility for the safe operation of the vehicle they drive. Tens of thousands of cellphone users have been doing this daily, and for more than a dozen years.

We have sympathy for any family that suffers through a car accident, but can't agree with bringing legal action against the cellphone's manufacturer, nor its installer. Not when the accident resulted because one driver was so busy yakking they failed to pay attention to operating their vehicle.

As *Old Jim* likes to say, "The trouble wasn't the apple on the tree, it was the pear on the ground." Write and share your opinions about cellphoning while driving.

SMART System Test

Celwave, in cooperation with BellSouth, completed the first phase of field testing of the Celwave SMART System. Last spring, after extensive lab tests of the system, the companies put theory to the test, and brought a full cell-site online for several days using this new antenna system.

The SMART System antenna that was field tested is based on a novel scheme that

directs a signal more efficiently toward a customer. The SMART System, an analog cell site antenna and subsystem, utilizes electronically switched, narrow signal beams for improving call quality, increases call site capacity and lowers operating costs.

In the trial system, coverage was provided by 12 narrow beams enclosed in three panel antennas. Celwave described the event by telling us, "the SMART system detected the two strongest beams and fed these to the inputs of the cellular base radios, while the transmit signal was sent back over the strongest receive beam."

According to analysis and field trial results, the SMART System antenna showed a typical capacity increase of 30 percent or more while C/I ratios were enhanced by 5 dB or better. The Celwave/BellSouth team is studying more aggressive frequency reuse patterns that could result in even greater capacity gains.

Celwave, a Division of Radio Frequency Systems Inc., is located at Two Ryan Road, Marlboro, NJ 07746-1899. Their phone number is (908) 462-1880.

Long Distance

John M. Blair, NØHFO, of Olathe, Kan., writes to mention that the Kansas Highway Patrol and Kansas City police stopped an out-of-state vehicle. They became suspicious when they eyeballed the high-tech electronics it contained.

The driver agreed to a search, and police turned up a computer, discs and other sophisticated equipment used for stealing cellular phone numbers and electronic serial numbers from unsuspecting subscribers.

The New York man who owned the car was charged. Meanwhile, the U.S. Secret Service observed that though such cases have been numerous along the coasts for several years, these people have ignored the Midwest. He said, "It's been a big problem in markets like New York and Miami but, like everything else, it gets to the Midwest eventually." Certainly, this seems to be the first incident of its kind in Kansas City.

Maybe the cellphone companies in coastal metro areas have had so many complaints about cloned numbers that they have taken sufficient steps to protect subscribers. That's forced the crooks to pack up and search out new territories.

There's a message here for everyone. Don't think that cellphone numbers are safe from being ripped-off and cloned just because they are used at a distance from major cities.

Jeepers Beepers

ESPN sports coverage of news, game information and score updates every five minutes is available now in the new ESPNET To Go pocket receiver. The receiver is an alphanumeric beeper made by Motorola. Service is available in 230 metro areas of the United States and Canada via Motorola's Wireless Broadcast Network (WBN).

Information provided includes NFL football, NBA basketball, Major League Baseball, NHL Hockey and NCAA Football. The service also provides PGA Golf leader board updates, top 25 college rankings, and scoring and play situations for NFL football and Major League Baseball.

Additional headlines will cover boxing, auto racing and other noteworthy major sports events. Plus, there is a wide selection of stats, trivia and more features from ESPN staff experts and guest commentators.

You have to purchase the receiver, which costs $99, then pay a $25 activation fee. After that, there are monthly charges that range from about $12 to $15, depending upon the specific type of service being ordered.

To order ESPNET To Go, or for more information, call (800) 926-3776, Ext. 002.

Your feedback is sought. Pass along news clippings, press releases, new product and service information, comments and questions relating to personal communications, cellphones, beepers, cordless phones and similar devices. Please include the words "Telephones Enroute" in the address of anything sent. Happy New Year!

Washington Pulse

FCC ACTIONS AFFECTING COMMUNICATIONS

New Experimental Licenses

The Federal Communications Commission has granted the following experimental applications:

KA2XKL, Johns Hopkins University, to operate on 22.733, 26.725, 29.7-29.999, 141.5-144.0, 148.0-149.375, 149.425-149.999 MHz to fulfill a U.S. Navy contract. Fixed and mobile: Laurel, Howard County, MD.

KQ2XWH, Litton Industries Inc., under subcontract with the Army to develop a handheld computer system to interface with field radio equipment in the 30-88 MHz band. Mobile: Moorpark, CA.

KE2XOD, Volunteers in Technical Assistance Inc., to operate on frequencies 149.81-149.90 MHz to construct a satellite ground station. Fixed: Blacksburg, Montgomery County, VA.

KM2XEE, Phonic Ear Inc., to operate on frequencies 169-172 MHz to conduct test of wireless microphone devices. Mobile: Continental United States.

KE2XPI, Systems Wireless Ltd., to operate in the 169-608 MHz band to test RF equipment such as wireless microphones, intercoms and cuing systems, and low-power wireless video transmission. Mobile: United States.

KM2XEH, Tracor Applied Sciences, to operate on 401.704 MHz for fulfillment of U.S. government contracts with NSF, ONR and NOAA. Mobile: Within San Diego, CA, and off coast of ME.

KE2XLL, Northern Arizona University, to communicate with GOES satellite (401.707 MHz) for collection and dissemination of environmental data. Fixed: Coconina National Forest, AZ.

KE2XLA, Mirage Systems Inc., operate on 420-450 MHz and 902-928 MHz to assess low-power UHF radar for traffic surveillance. Mobile: CA.

KQ2XWA, Paul L. Richards, to form a communications link between a balloon-born telescope and ground-based computer on 459.500 MHz. Fixed and mobile: Palestine, TX.

KE2XKS, Phoenix Wireless Group Inc., to operate on frequencies 895-905, 940-950, 806-821, 824-849, 851-866 and 869-894 MHz for testing and demonstrating wireless local loops and cellular systems for export. Fixed and mobile: Maitland, Seminole County, FL.

KE2XIF, Steinbrecher Corp., to develop microcellular technology in the frequency bands 824-849 MHz and 869-894 MHz. Fixed and mobile: Middlesex County, MA.

KE2XJC, Telephonics Corp., to test a prototype digital/analog cellular transceiver on 824-849 MHz band. Mobile: Continental United States.

KE2XMC, GTE Mobile Communications Inc., to assess and demonstrate the capabilities of a Cellular Digital Packet Data (CDPD) system in the 824-849 and 869-894 MHz bands. Fixed and mobile: Atlanta, GA.

KM2XJY, Qualcomm Inc., to operate on 824-849 and 869-894 MHz bands for fulfillment of U.S. NSA Contract. Fixed and mobile: Within 80km of San Diego, CA, and Boulder, CO.

KE2KOK, Rutgers University/Winlab, to operate on 881.792-1897.344 MHz band to test Winlab Multimedia Wireless Information Network. Fixed and mobile: Piscataway, NJ.

KE2XNH, Motorola, Inc., to operate on frequencies 901-902, 930-931, 940-941 MHz for testing and developing paging products used in the PCS bands. Fixed and Mobile: Within 80 km of Boynton Beach, FL.

KF2XBY, Motorola Inc., to test and develop two-way paging on 901-902, 930-931 and 940-941 MHz bands. Fixed and mobile: Sunnyvale, Santa Clara County, CA.

KE2XBY, California Microwave Inc., to operate wireless radio modems designed to comply with section 15.247 in the 902-928, 2400-2483.5 and 5725-5850 MHz bands. Fixed and mobile: Sunnyvale, Santa Clara County, CA.

KE2XMG, Westinghouse Communications Services Inc., to operate a Part 15 device prior to FCC equipment authorization in the 902-928 MHz band. Fixed and mobile: Cincinnati, OH, metro area.

KE2XMI, Enterprise Network Applications Inc., to develop a system to identify and locate individuals for the purpose of prevention of personal injury, property theft, etc. The mobile units transmit on 3.592 MHz, 318 MHz and 418 MHz. A central receiving location will transmit on 902-928 MHz. Fixed and mobile: Alpharetta, GA.

KE2XIE, Westinghouse Communications Services Inc., to operate on 1030 MHz to permit customer radar system training. Fixed: Anne Arundel County, MD.

KE2XLZ, Westinghouse Communications Services Inc., to demonstrate advanced airborne surveillance radar at 1240 and 1270 MHz. Mobile: Airborne.

KE2XHQ, Noller Communications Inc., to operate on 1425-1527 MHz band for development and testing associated with an advanced Rural Telephone System (for export). Fixed and mobile: Petaluma, Sonoma County, CA.

KE2XLF, Northeastern Indiana Medical Response Team, to operate on 4626.5-1660.5 MHz band for emergency and priority communications. Mobile: United States.

KE2XLK, Scientific Research Corp., to operate on INMARSAT on 1626.5-1645.5 MHz band to support the United Nations' Sanctions Assistance Mission System project. Mobile: Facility in North Charleston, SC.

KE2XMM, Exxon Communications Co., to operate eight land-based transportable INMARSAT terminals in the 1626.5-1646.5 MHz band for communications from remote locations where no alternative form of communication exists. Mobile: Within the United States and its territories.

KE2XPQ, COMSAT, to use one INMARSAT Standard-C for customer demonstration and in-house evaluation of "system" integrity and for testing and evaluation of value-added services. Fixed: Clarksburg, Montgomery County, MD.

KE2XPS, Texaco International Trader Inc., to operate on frequencies 1626.5-1660.5 MHz band for communication in remote areas where no other means of communication exists. Mobile: U.S. Gulf Coast area.

KE2XWO, The Conservatory Ltd., to operate on 1626.5-1660.5 MHz band for communication in remote areas where no other means of communication exists. Mobile: U.S. Gulf Coast area.

KE2XWO, The Conservatory Ltd., to operate on 1626.5-1660.5 MHz band using INMARSAT-M for emergency communications. Mobile: United States.

KQ2XYB, World Bank, to operate an INMARSAT terminal on 1626.5-1660.5 MHz band for backup communications during emergencies or natural disasters. Mobile: United States.

KC2XCW, Advanced Broadcasting Services, to operate on 1990-2110, 2450-2483.5, 6425-6525, 6875-7125, 11700-12200, 13200-13250 and 14200-14400 MHz bands to conduct beta-testing of videocamera/transmitters (RF cameras) in field prior to type acceptance. Mobile: Continental United States.

KE2XKX, NS Microwave, to operate on various frequencies from 1990-6875 MHz to conduct on-the-air measurements and

demonstrate new microwave equipment. Mobile: United States.

KQ2XUB, Frontier Engineering Inc., to develop a shipboard radar for the U.S. Navy in the following bands: 2900-3700 MHz, 5250-5600 MHz, 5650-5750 MHz and 9250-10000 MHz band. Fixed and mobile: Scottsdale, AZ.

KE2XMD, AT&T Corp., to operate two earth stations to transmit data voice, fax and video using the INTELSAT satellites in the Pacific and Atlantic Ocean regions to and from seagoing vessels. Frequencies: 6.0-6.56 GHz band. Fixed: Salt Creek, CA; Roaring Creek, PA.

KE2XOC, Motorola Satellite Communications Inc., to operate on 19.4175, 19.5000 and 19.5825 GHz to construct and operate a new earth station to be used to carry out testing of the IRIDIUM project. Fixed: Chandler, Maricopa County, AZ.

KE2XKO, Tracor Flight System Inc., to operate on 22525 and 22575 MHz for fulfillment of NASA contract. Fixed: Fort Walton Beach, Okaloosa County, FL.

Coordinated Frequency Use for Summer Olympics

The Federal Communications Commission is working with the Atlanta Committee for the Olympic Games (ACOG) to promote interference-free communications during the 1996 Summer Olympic Games.

The 1996 Olympic Games in Atlanta will be the largest radio frequency (RF) event ever held. About 200 countries will be represented at the Games and the city is expecting between two million and five million visitors for the event. There will be extensive use of fiber optics, land mobile radios, cellular phones, pagers and various other RF devices for security, commercial, public and individual communications.

In order to facilitate an interference-free event, the FCC reminds all users that all transmitting equipment must be FCC-type accepted. Direct equipment questions to the FCC's Customer Service Branch, Office of Engineering and Technology, at (301) 725-1585, ext. 300. FCC identification numbers can be checked by accessing the FCC's computer bulletin board, public access link (PAL) at (301) 725-1072. (You will need a 300- to 14,000-baud modem, eight bits, no parity, two stop bits; turn off error-correction function.)

Visitors needing radio communications are encouraged to use vendors with preapproved spectrum-coordinated equipment. For approved vendors, contact Ray Malone (ACOG) at (404) 224-1641.

All domestic out-of-town users will need a Special Temporary Authority (STA) to operate at the Olympics. Domestic out-of-town radio users can request an STA from the FCC's Wireless Telecommunications Bureau at (800) 322-1117 or (717) 337-1311, ext. 411.

Foreign radio users may operate under a special STA granted to the Atlanta Committee. Current law prohibits foreign nationals from holding an FCC license or STA. Unlicensed operation is prohibited. Requests from foreign delegations should be directed to Ray Malone of ACOG at (404) 224-1641.

As an alternative to two-way radio, the FCC and the ACOG encourage the use of cellular telephones. This will help to reduce congestion as the radio frequency spectrum currently available for two-way radio use is extremely limited.

Commercial and public broadcast frequency coordination will be handled by an ACOG special committee. The Olympic Broadcast Frequency Coordination Committee (OBFCC) will be managing coordination of all auxiliary broadcast short-term operations. This temporary authority of the OBFCC supersedes applicable sections of FCC Rule Part 74.24—Auxiliary Broadcast Short Term Operations. Commercial and public broadcast transmitting equipment must be coordinated throughout the OBFCC. Contact Mike Smalls of the ACOG at (404) 224-1400 or Louis Libin of NBC at (212) 664-2746.

Auxiliary Broadcast Rule Suspended for Political Conventions

The commission suspended Section 74.24 of the rules from June 15 through Aug. 31, 1996, for the 1996 National Political Conventions in San Diego and Chicago. The suspension of Section 74.24 will allow for advance coordination of auxiliary broadcast frequency usage. To minimize harmful interference, all Part 74, 21 and 78 licensees sharing Part 74 spectrum are covered by the scope of this action.

The affected area is within a 100-kilometer radius of San Diego and Chicago for terrestrial stations and a 150-kilometer radius for any mobile stations onboard aircraft. Section 74.24 allows eligible broadcasters to operate auxiliary broadcast stations on a short-term basis, not to exceed 720 hours annually, without prior commission authorization.

Similar action previously has been taken by the commission to suspend Section 74.24 in New York during the events surrounding the rededication of the Statue of Liberty; during the visit of Pope John Paul II to the U.S.; and during the 1988 National Political Conventions. Actions were taken in view of the fact that uncoordinated use of auxiliary broadcast stations on an automatic STA basis might result in spectrum congestion and excessive interference causing less complete broadcast coverage. The commission believes that the potential for a similar situation exists during the 1996 National Political Conventions.

The Broadcast Operations Coordinating Authority (BOCA) has been designated as the auxiliary broadcast frequency coordinator during the period covered by the suspension of Section 74.24. All short-term auxiliary broadcast use should be coordinated in advance through the BOCA Chairman at CNN, c/o CNN Field Engineering, One CNN Center, Box 105366, Atlanta, GA 30348-5366, (404) 885-0886, fax (404) 885-0891. The local frequency coordinator will provide assistance to all local and non-local Part 74 licensees, as well as all Part 21 and 78 licensees that share Part 74 spectrum, for temporary fixed, mobile and portable installations. The contact for the Wireless Telecommunications Bureau Office of Operations is the Consumer Assistance Branch at (800) 322-1117 or (717) 337-1212.

Amateur Service Reciprocal Operating

The United States has arranged with the following countries to grant a reciprocal operating permit, FCC Form 610-AL, to citizens holding amateur service licenses issued by the country of citizenship:

Antigua and Barbuda, Argentina, Australia, Austria, Bahamas, Barbados, Belgium, Belize, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Canada (Canadian amateur service stations do not need a reciprocal operating permit while operating in the United States), Chile, Colombia, Costa Rica, Croatia, Cyprus, Denmark (including Greenland), Dominica, Dominican Republic, Ecuador, El Salvador, Federated States of Micronesia, Fiji, Finland, France (including French Guiana, French Polynesia [Gambier, Marquesas, Society and Tubuai Islands and Tuamotu Archipelago], Guadeloupe, Ile Amsterdam, Ile Saint-Paul, Iles Crozet, Iles Kerguelen, Martinique, New Caledonia Reunion, Saint Pierre and Miquelon, and Wallis and Futuna Islands), Federal Republic of Germany, Greece, Grenada, Guatemala, Guyana, Haiti, Honduras, Hong Kong, Iceland, India, Indonesia, Republic of Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kiribati, Kuwait, Liberia, Luxembourg, Macedonia, Republic of the Marshall Islands, Mexico, Monaco, Netherlands, Netherlands Antilles, New Zealand, Nicaragua, Norway, Panama, Paraguay, Papua New Guinea, Peru, Philippines, Portugal, Seychelles, Sierra Leone, Solomon Islands, Republic of South Africa, Spain, St. Lucia, St. Vincent and the Grenadines, Surinam, Sweden, Switzerland, Thailand, Trinidad and Tobago, Tuvalu, United Kingdom (including Bermuda, British Virgin Islands, Cayman Islands, Channel Islands [including Guernsey and Jersey], Falkland Islands [including South Georgia Islands and South Sandwich Islands], Great Britain, Gibraltar, Hong Kong, Isle of Man, Montserrat, Northern Ireland, Saint Helen, (including Ascension Island, Gough Island and Tristan Da Cunha Island) and Turks and Caicos Islands), Uruguay and Venezuela.

A reciprocal permit is valid for one year or until the expiration date on the alien's amateur service license, whichever comes first. An alien may apply for the permit by sending a completed FCC Form 610-A application and photocopy of the alien's license to FCC, 1270 Fairfield Rd., Gettysburg, PA 17325-7245. The form is available from the FCC Consumer Assistance Branch at the same address or, in some cases, from United States missions abroad.

A reciprocal operating permittee is authorized to operate an amateur station in areas where the amateur service is regulated by the FCC. Such operation must comply with Part 97 of the FCC's Rules and the International Telecommunication Union Radio Regulations operator privileges are those authorized by the alien permittee's own government, but do not exceed those of the FCC amateur extra class operator license.

The call sign transmitted in the station identification procedure is that issued by the licensing country, preceded by an appropriate letter-numeral indicator, separated by the slant mark (/) or any suitable word that denotes the slant mark. (Canadian amateur stations must transmit the indicator after its call sign.) At least once during each intercommunication, the alien amateur station must include in the English language the geographical location as nearly as possible by city and state, commonwealth or possession.

The station location letter-numeral indicators are: Alabama, W4: Alaska, KL7; American Samoa, KH8; Arizona, W7; Arkansas, W5; Baker Island, KHl; California, W6; Colorado, WØ; Commonwealth of Northern Mariana Islands, KHØ; Commonwealth of Puerto Rico, KP1; Connecticut, Wl; Delaware, W3; Desecheo Island, KP5; District of Columbia, W3; Florida, W4; Georgia, W4; Guam, KH2; Hawaii, KH6; Holland Island, KH1; Idaho, W7; Illinois, W9; Indiana, W9; Iowa, WØ; Jarvis Island, KH5; Johnston Island, KH3; Kansas, WØ; Kentucky, W4; Kingman Reef, KH5; Kure Island, KH7; Louisiana, W5; Maine, Wl; Maryland, W3; Massachusetts, Wl; Michigan, W8; Midway Island, KH4; Minnesota, WØ; Mississippi W5; Missouri, WØ; Montana W7; Navassa Island, KP1; Nebraska, WØ; Nevada, W7; New Hampshire, Wl; New Jersey, W2; New Mexico, W5; New York, W2; North Carolina, W4; North Dakota, WØ; Ohio, W8; Oklahoma, W5; Oregon, W7; Palmyra Island, KH5; Peale Island, KHl; Pennsylvania, W3; Rhode Island, Wl; South Carolina, W4; South Dakota, WØ; Tennessee, W4; Texas, W5; Utah, W7; Vermont, Wl; Virgin

Islands, KP2; Virginia, W4; Wake Island, KH9; Washington, W7; West Virginia, W8; Wilkes Island, KH9; Wisconsin, W9; and Wyoming, W7.

No United States citizen, regardless of any other citizenship also held, is eligible for an FCC-issued reciprocal operating permit. Any person, however, except a representative of a foreign government, may apply for an FCC amateur service license upon passing the qualifying examinations. Alien amateur operators who will be in the United States for extended periods of time are encouraged to obtain an FCC amateur service license. An alien holding an FCC amateur service license is not eligible for a reciprocal operating permit. When an alien obtains an FCC license, it supersedes any FCC-issued reciprocal operating permit held.

For more information, call the FCC's Private Wireless Division, (202) 418-0680.

Amateur Service International Arrangements

The following arrangements are for amateur stations regulated by the FCC to communicate with amateur stations located in other countries.

Permissible countries: Section 97.111 of the commission's rules, 47 C.F.R § 97.111, authorizes an FCC-licensed amateur station to exchange messages with amateur stations located in other countries, except those in a country whose administration has given notice that it objects to such radio communications. Currently, there are no banned countries.

Types of messages: Section 97.117 of the commission's rules, 47 C.F.R § 97.117, says amateur station transmissions to a different country, where permitted, shall be in plain language and limited to messages technical in nature relating to tests, and remarks of a personal character that, by reason of importance, recourse to the public telecommunications service is not justified.

Third-party communications: Section 97.115 of the commission's rules, 47 C.F.R § 97.115, allows an FCC-licensed amateur to transmit a message from its control operator (first party) to another amateur station control operator (second party) on behalf of another person (third party). No amateur station, however, shall transmit messages for a third party to any station within the jurisdiction of any foreign government whose administration has not made arrangements with the United States to allow amateur stations to be used for transmitting international communications on behalf of third parties.

The following countries permit an FCC-licensed amateur station to exchange messages for a third party with amateur stations: Antigua and Barbuda, Argentina, Australia, Belize, Bolivia, Bosnia-Herzegovina, Brazil, Canada, Chile, Colombia, Federal Islamic Republic of Comoros, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Gambia, Ghana, Grenada, Guatemala, Guyana, Haiti, Honduras, Israel, Jamaica, Jordan, Liberia, Republic of the Marshall Islands, Mexico, Federated States of Micronesia, Nicaragua, Panama, Paraguay, Peru, Philippines, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines, Sierra Leone, Swaziland, Trinidad and Tobago, United Kingdom (special event stations with callsign prefix GB followed by a number other than 3), Uruguay and Venezuela. The United Nations also has arrangements with the United States to permit an amateur station regulated by the FCC to exchange messages for a third party with amateur stations 4U1ITU in Geneva, Switzerland, and 4U1VIC in Vienna, Austria.

No amateur station regulated by the FCC shall transmit messages for a third party to any amateur station located within the jurisdiction of any foreign government not listed above. This prohibition does not apply to a message for any third party who is eligible to be the control operator of the station. For more information, call the FCC's Private Wireless Division at (202) 418-0680. ■

Antennas & Things

BY JOE CARR, K4IPV

SIMPLE ANTENNAS AND ACCESSORIES FOR SIGNAL IMPROVEMENT

Glimpse of Heaven and Hell: The Rhombic Antenna

Many years ago, a ham radio publication had a humorist who wrote occasional articles (especially for the April issues!). In one article, he stated that his idea of heaven came in a dream. He was given a high hilltop location, with an HF rhombic antenna, a 2,000-watt SSB transceiver, and a massive rotator that rotated the hill (!?!) to point the rhombic wherever he wanted it. But, he averred, there was a down side to his vision of heaven...but more of that later.

One of my ham radio mentors from the late 1950s was a U.S. Army Signal Corps colonel, who also was a "big gun" ham radio DXer. He was stationed in Turkey in the 1950s, when that country did not allow ham radio operations. At a diplomatic reception, Dick met up with a friend who was Turkey's minister of communications, and obtained a license for a single amateur radio station, valid only for 24 hours of the weekend of the CQ World Wide DX Contest, with official permission to contact foreign ham stations. Dick had a U.S. Army 7.5-kW transmitter fed into a very long rhombic antenna aimed on the eastern United States.

He could put a bodacious signal stateside with that "rig." Dick fired up the transmitter, called CQ on the 20-meter CW band, only to be met with a storm of what today's Internet freaks would call flaming: "Off the air pirate!" It seems that everyone "knew" that there were no legal Turkish stations on the air, so anyone signing a Turkish call sign was a pirate operator ...and flamed him. Frustrated, Dick went to the 15-meter and 40-meter novice bands, and worked a bunch of newcomers who didn't know that Turkey was a "banned country"...and Dick saw to it that those novices got a proper QSL card! Revenge—even passive revenge—was sweet, he said.

The rhombic antenna (Fig. 1) gets its name from the fact that it is diamond-shaped, a pattern that is known in geometry as a rhombus. It is essentially a pair of front-to-front V-beams as discussed last time, with legs several hundred feet long (for coverage of the entire HF band). As with the unterminated long-wire and V-beam antennas, this antenna is resonant, and operates on both the fundamental frequency it is cut for, and its harmonics.

If the ends are left open, then the rhombic is a resonant antenna (Fig. 1); if it is terminated (Fig. 2) in its characteristic impedance (typically 400 to 800 ohms), then it is a non-resonant "traveling wave" antenna. The resonant rhombic, like the V-beam, is bidirectional along the line that bisects the end angles, while non-resonant rhombics are unidirectional. The direction of maximum radiation is toward the termination resistor, and away from the feedline.

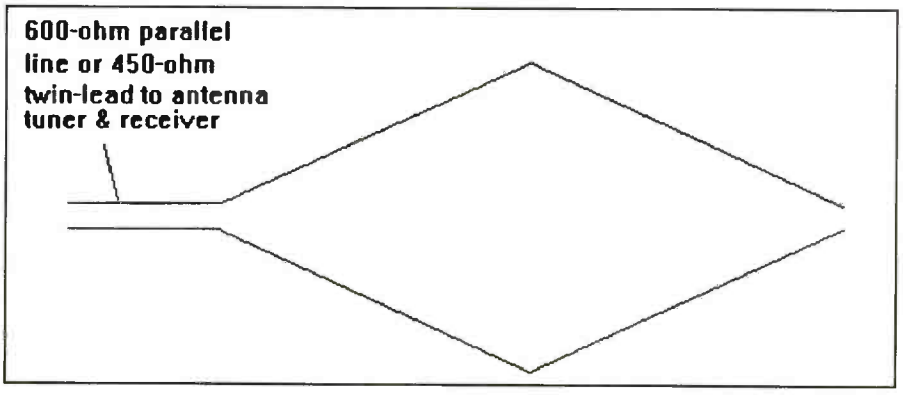


Fig. 1–Unterminated rhombic antenna

The rhombic antenna is a high-gain, wideband antenna capable of good directivity. Although the main use is in HF communications, there have been others in use on other frequencies. The late Vic Clark, W4KFC, former ARRL president (and another of my early mentors) told me once that he saw a Peruvian navy rhombic for VLF frequencies (about 20 kHz) that was 24 miles on each leg.

Vic was director of the U.S. Coast Guard Electronic Engineering Laboratory in Virginia at the time, and was on a business trip to Peru. He traveled by train up into the mountains, and on the way saw a single wire strung on telephone poles. At first, he thought it was a landline telegraph system like we had in the 19th century, but he was wrong: it was the rhombic. Those low frequencies are used to communicate with submarines just below the surface.

In the early days of television, before wideband, high-gain, highly directional VHF antennas were available, it was common practice for remote viewers to use terminated, wideband rhombic antennas with about 56 feet of wire per leg. Regular high-gain television antennas were costly affairs, and often came down with even relatively low wind speeds. Unfortunately, the "sail area" of 30- and 40-element TV antennas is huge. I know one 220-pound weightlifter who was blown off a roof while installing such an antenna...he "hang-glided" to the ground when the wind kicked up...breaking his pelvis and leg in the bargain.

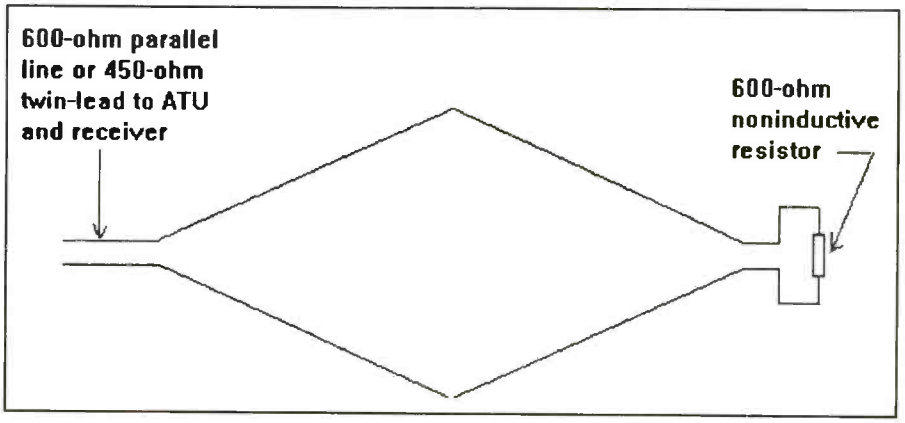


Fig. 2–Terminated rhombic antenna.

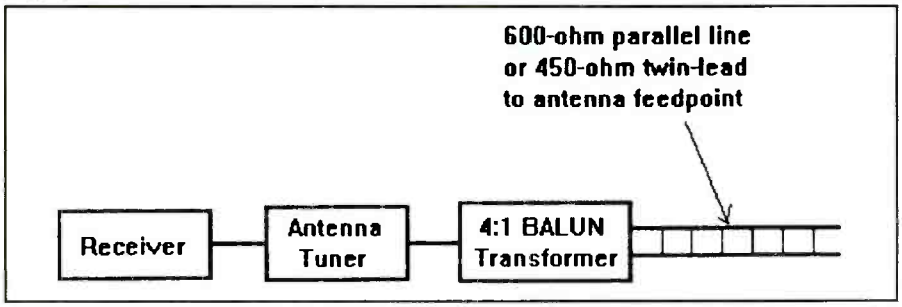


Fig. 3–Using a 4:1 balun transformer to make an antenna tuner work with a parallel or twinlead transmission line.

Down Side? You're Kidding!

What could be the down side of a ham station with a high hilltop location, an HF rhombic antenna, a 2,000-watt SSB transceiver, and a rotator that rotated the hill to point the rhombic wherever desired? The hell of it was that he called CQ for eternity and no one answered...not even an SWL's QSL card! Only kidding.

Feeding Long-Wire, V, Rhombic Antennas

The transmission lines used with the antennas discussed in this month's column, and the two previous columns, usually are fed with either 450-ohm twin-lead transmission line, or 600-ohm parallel "open-wire" transmission line (the 450-ohm twin-lead is easier to work, by the way). This cable is not compatible with the antenna inputs of most receivers.

Another little problem is that an antenna tuner usually is required, and most antenna tuners sold today are intended for coaxial cable transmission line, or random length single-wire radiators that are not longwires. The transmission line used on these antennas wants to see a balanced output antenna tuner.

Figure 3 shows a way to make a conversion from coaxial cable tuners to parallel/twinlead. A 4:1 impedance ratio balun ("balanced-unbalanced") transformer will do the trick nicely. Insert it into the transmission line after the antenna tuner. In some cases, you can mount the balun transformer at the feedpoint of the antenna, and run coaxial cable all the way. However, that may not be what you want to do if you want to depend on the tuned feeders to help resonate the antenna; try it, though, it might well work.

Antenna Installation Safety

I keep harping on antenna installation safety because it is so important. A lot of installers lack experience or knowledge of what can happen when installing simple wire antennas. These antennas seem so simple that little could go wrong...want to bet? There are both electrical and physical hazards.

The electrical hazards come from being in close proximity to the AC power lines that come into your house. Don't even think about tossing an antenna wire over the AC power lines! The insulation on the power line might look intact, but it ages and could be cut by the antenna wire. That puts 110 volts onto the antenna wire, and it could kill you if you touch the wire. Every year, it seems, we hear some sad story of someone trying to run an antenna across the power lines, and being electrocuted in the process.

Also be careful to install the antenna so that it won't be wind-whipped into the power lines if it breaks. After all, breaking is fairly common in wire antennas, especially with ice and winds.

Another rule is to never work on an antenna when it is connected to the receiver. Although most receivers are well designed, and won't cause a harm if you touch the antenna and ground at the same time, there are short-circuit conditions that could be lethal. Also, if you have one of those old-fashioned AC/DC shortwave receivers, like we had in the 1950s, then there is a distinct danger. I make it a rule to always disconnect the antenna from the receiver before working on it.

The physical hazards come from the fact that wire can get away from you. I recall one accident where a friend of mine was installing an ordinary 80-to-10-meter ham trap dipole (about 133 feet long). He was standing on a ladder trying to secure one end, when the wire somehow looped around one leg. When he tried to climb one rung down on the ladder, he tripped over the wire and did a "Superman" act toward the ground. Only the fact that he wasn't far off the ground, and is a tough sonovagun, kept him from being injured very seriously.

Write In

You can write to me here at *Popular Communications*, or send e-mail via the Internet to CARRJJ@aol.com. ■

BY DON SCHIMMEL

Communications Confidential

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

Donald Tomkinson of California advises that in the August UTE loggings, BV reports 326 MCY is near Reno. "It actually is about 40 minutes northwest of Las Vegas on U.S. 95 where four lanes change to two lanes. Interestingly, it is co-located with 209 kHz beacon AEC. AEC does not appear anywhere, except in *The Beacon Log*. Try to make some words out of AEC. Also Groom Lake is just a few miles to the north of the Desert Rock facility. Additionally, you can see it from U.S. 95. It looks just like the desert airport scene from *The Philadelphia Experiment* when a video camera attached to a missile was fired into that storm!"

Tom Severt of Kansas reports hearing a YL/EE Mossad station on 8025 kHz repeating "Charlie India Oscar Two" from 0310 to 0350. He's never heard a Mossad station transmit for such a long time without sending a message. He believes 8025 kHz is a new frequency for CIO.

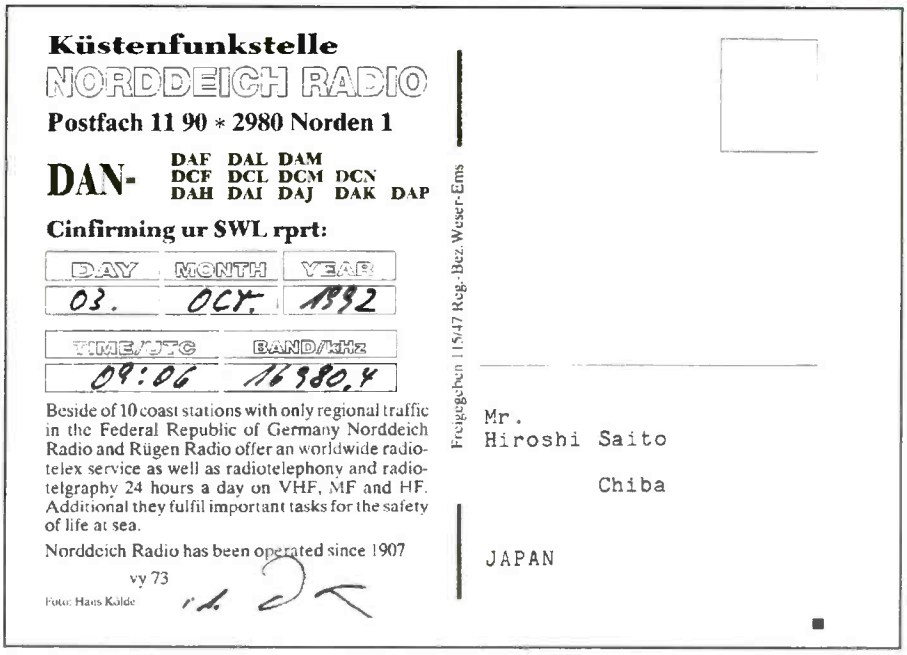
William Moore of Alabama says he has a new RadioShack receiver with digital readout, and he is interested in monitoring some Coast Guard frequencies.

Al Hemmalin of Rhode Island sends in another fine list of beacon loggings and remarks, "I feel like a clamdigger; I pulled so many of these beacon signals out of the mud." Al uses a Drake R8 receiver with an LF Engineering L-400B active antenna that is installed about 25 feet above ground.

Rick Baker of Ohio shares WUN news. Its membership is over 500 from 23 countries, and Israel was added in July.

An informative note from Ary Boender of the Netherlands states, "During the past years, station PLM often is heard. Klingenfuss lists PLM just as PLM and the CFL lists it as MFA Tunis. Both are wrong. This is a Tunisian navy network. PLM means Patrouiller Lance-Missiles (missile patrol boat). The stations are PLM Tunis, PLM La Galite and PLM Carthage. The three PLM stations are in fact the fast attack craft from the Tunisian navy. These Combattante IIIM class vessels are armed with one OTO Melara 76mm, two Breda 40mm, four Oerlikon 30mm guns and eight Exocet missiles. They were built in 1985. The vessels' dimensions are 56 x 8.2 x 2.2 meters and their speed is 38.5 knots. The names with hull numbers are La Galite (501), Tunis (502) and Carthage (503).

"The PLMs work in duplex SITOR-A on 6741.7/4716.7 kHz. All traffic is between either PLM vessels or land-based stations. ENAM/+suffix is a popular addressee. Most messages seem to be shipping related. Messages about passengers, passports and cargo are very common. Also 'Secret' and 'Defense' messages have been noted. Most traffic is in French. Selcal XKTQ often is used. This selcal is assigned to MV Marilee who, in my humble opinion, has nothing to do with the PLM network. I sus-



Küstenfunkstelle
NORDDEICH RADIO
Postfach 11 90 * 2980 Norden 1

DAN- DAF DAL DAM DCF DCL DCM DCN DAH DAI DAJ DAK DAP

Cinfirming ur SWL rprt:

DAY	MONTH	YEAR
03.	OCT.	1992

TIME/UTC	BAND/kHz
09:06	16980,4

Beside of 10 coast stations with only regional traffic in the Federal Republic of Germany Norddeich Radio and Rügen Radio offer an worldwide radiotelex service as well as radiotelephony and radiotelgraphy 24 hours a day on VHF, MF and HF. Additional they fulfil important tasks for the safety of life at sea.

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Foto: Hans Kolde

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Mr.
Hiroshi Saito

Chiba

JAPAN

QSL received by Hiroshi Saito, Japan.

These two views were taken at Andrews Air Force Base, MD, by Kevin D. Tubbs, VT.

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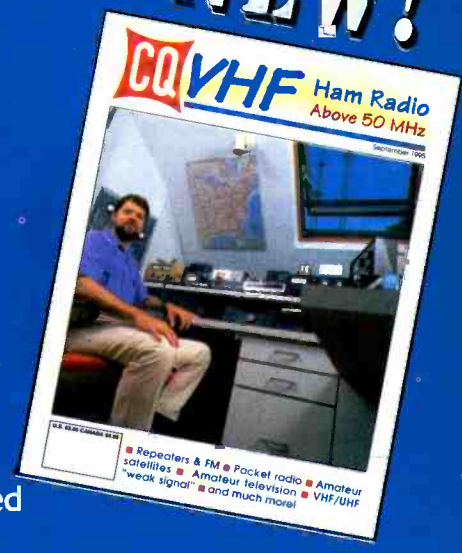
NEW!



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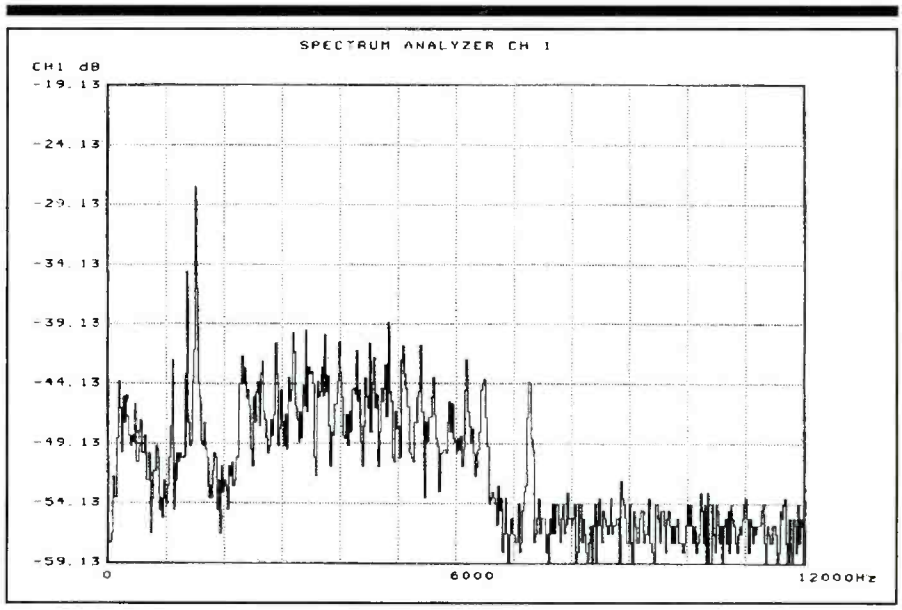


The center frequency of 6950 kHz USB may be wrong; it may be 6953 LSB if this is a raspy dit and dah signal in continuous mode. Signal analysis by Kevin D. Tubbs, VT.

pect that they adopted a couple of selcals just like the Irish military did."

A letter from Basil Shelley of Georgia said in part, "I have been monitoring RTTY/voice numbers broadcasts. So far I have logged more than 55 voice numbers stations. A few are very strange. Sometimes a station would start a message, then go way off frequency and come back a few seconds later." Basil, this sounds as if the transmitting location was experiencing power problems.

Jim Navary of Virginia made his loggings while on vacation for a week in Antigua, West Indies. He had "a rather primative monitoring setup, using a Sony ICF-SW7600G portable receiver and about 15 feet of wire strung up on the curtain rod in the condominium we rented."

The ENIGMA Newsletter which I mentioned previously in the column now is available for subscribers outside the United Kingdom. A one-year subscription provides four issues of the newsletter. Write to *ENIGMA Newsletter*, c/o B.R.C., 17-21 Chapel St., Bradford, West Yorkshire, BDl 5DT, England, for payment details.

A revealing article by Jerod Pore in Issue 8 of the *ENIGMA Newsletter* included a translated version of what many of us have been calling the "New Star Broadcasting" numbers station. Jerod called upon a friend for translation of portions of a transmission. The broadcast begins with music followed by "We are ready to begin transmitting." Next, the station identification is given as, "This is Channel Four Broadcasting Station in Tapei, Republic of China, on 8300 kHz." The language is Mandarin and the confusion over the ID came about because the word "broadcasting" sounds almost the same in both English and Manda-

FAMJ
JEANNE D'ARC
(R-97)

THIS WILL VERIFY RECEPTION OF:

FRENCH NAVY CARRIER JEANNE D'ARC (R-97), FAMJ

ON: 8367.2 CW AT: 0425 UTC DATE: 1 FEB 1995

TRANSMITTER/POWER: SURFACE TRANSMITTER 1KW

ANTENNA: FOUETS EN "V"

*LOCATION: CAP HORN

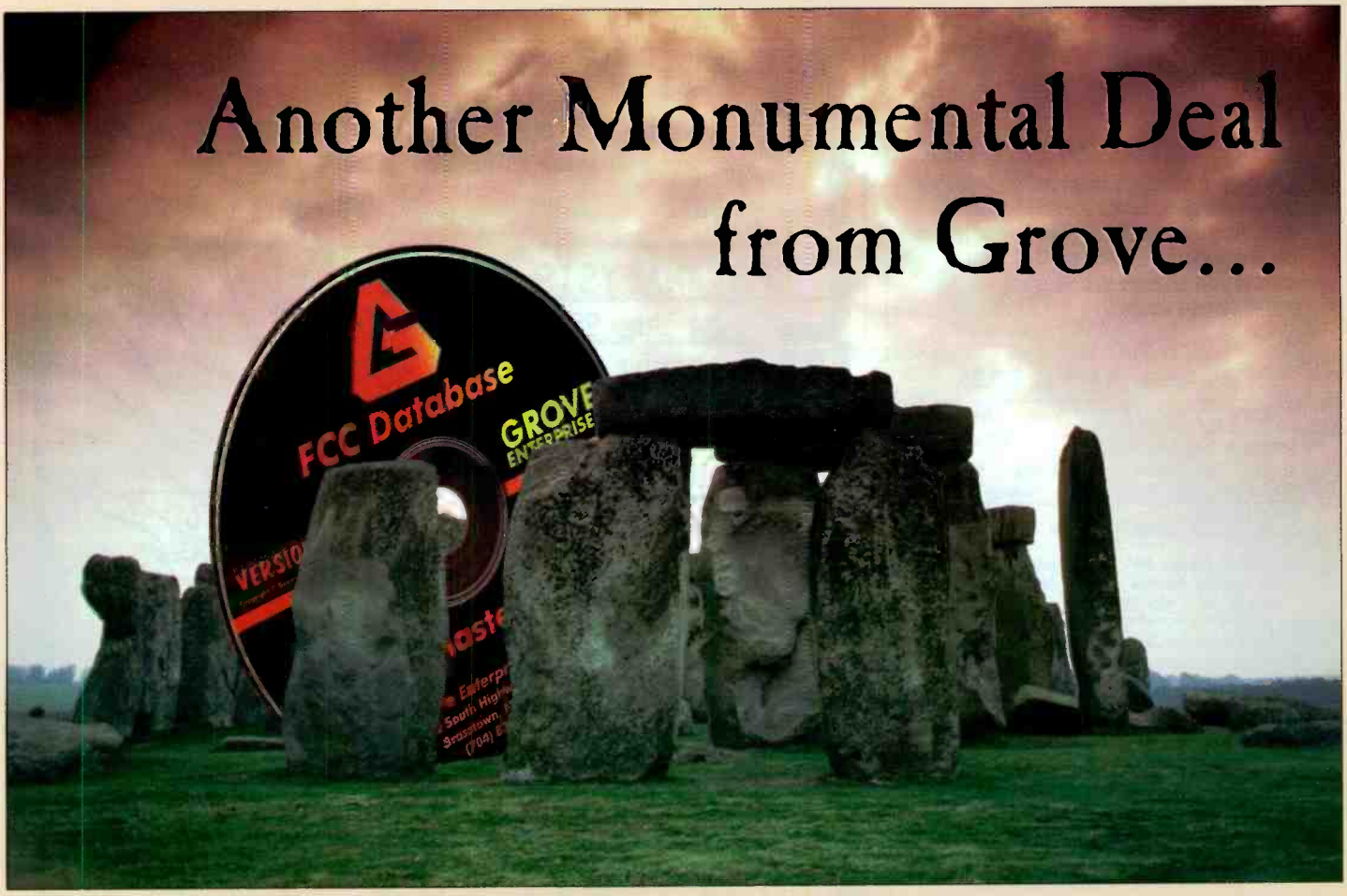
VERIFYING OFFICIAL AND STAMP:

MARINE NATIONALE Service à la Mer

*IF CLASSIFIED, MARK N/A

Here is a PFC from the collection of Rick Baker, OH.

Another Monumental Deal from Grove...



The new 1995 Grove FCC Database (version 4.1) is a spectacular compendium of all the licensees in the FCC Master File! Public safety, railroad, industrial, broadcast, marine and many other categories are listed. You can sort through fields like city, service, state, callsign, antenna height, output power, county and many more! The program can also be custom-tailored to fit your specific searching needs, using any available information you have.

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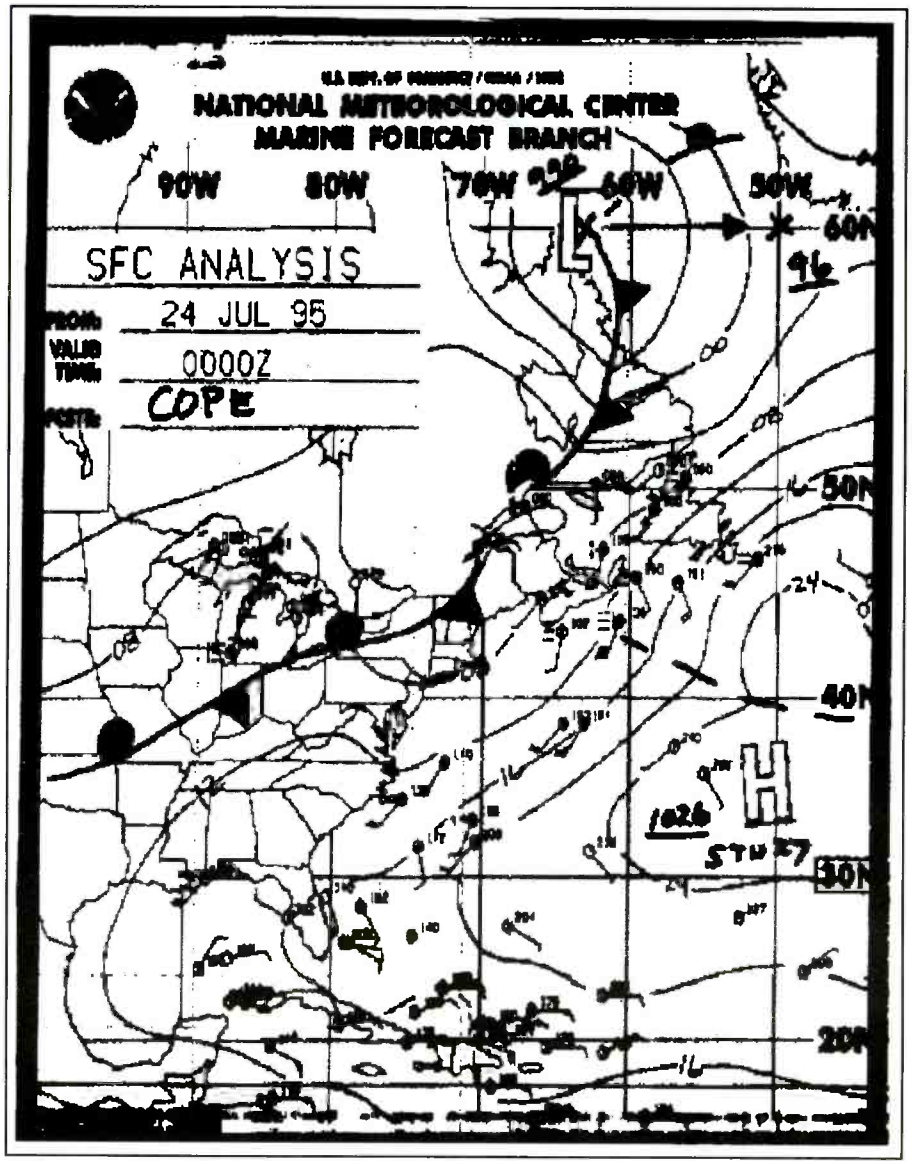
Act Now (Time is of the Essence)

CIRCLE 122 ON READER SERVICE CARD



Sue Wilden, IN, copied this WEFAX sent by Boston NOAA on 12750 kHz USB, 120/576. Her receiver was a Sangean ATS-803A with a dipole antenna. The fax was printed out using PC Telex software and a Tandy 3200 486/33 computer.

rin. Also, the word "station" sounds similar in both languages and "Channel Four" in Mandarin could be mistaken for "New Star" in English.

There is a brief musical break and then, "We are sending telegrams from the following units to the following units." The units were designated by a 3F group. The majority of the recipients were indicated as located "in Japan."

Messages were prefaced with a phrase, i.e., "We are sending a telegram from unit 123 to unit 456, in Japan, please prepare to receive. The telegram contains 10 words." The YL operator then would announce 10 groups of 4F.

Jerod remarked it seems strange that a broadcast supposedly beamed to Japan from Taipei is received on the U.S. West Coast with such strong signals as have been reported by monitors.

He further commented he suspects the broadcasts are intended to make PRC authorities think that Taipei is running communications with agents on the Chinese mainland.

In the August issue of the *Lowdown*, the Longwave Club of America's monthly publication, there were two very important items. One dealt with a request to the FCC by amateur radio operators to have additional allocations in the 160-190 kHz range. GWEN stations operate up to 175 kHz, thus if ham operations are authorized with a power output of 100 watts, the remaining 15 kHz will be impossible for low-power experimenters to use.

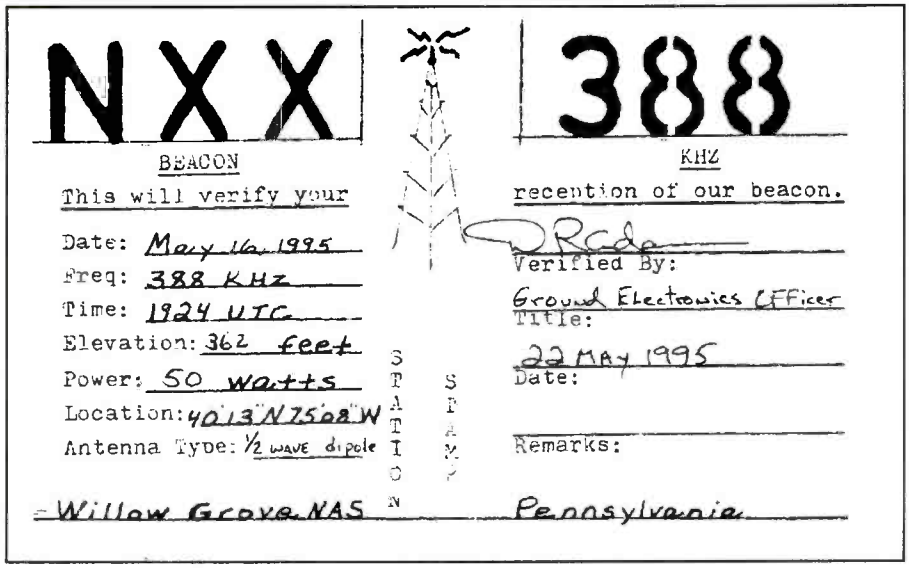
The other item described a new, very long-life light bulb that the FCC has approved for public use. The bad feature is that this new bulb contains an oscillator that operates between 30 and 60 kHz causing

a strong whistling signal radiating via the power lines, varying continuously in frequency (FM) and resulting in harmonics all over the place. In fact, one harmonic is on top of WWVB on 60 kHz. It seems strange that manufacturers were not required to incorporate filtering into the bulb circuitry.

A reminder that the frequency limit of this column is 30 MHz. Scanner material should be forwarded to Scanning VHF/UHF columnist J.T. Ward, while satellite material should be forwarded to Satellite View columnist Don Dickerson.

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)



With the return of his PFC, Allen Renner, PA, also received a QSL from the NAS beacon facility.

UTE Loggings: SSB/CW/RTTY/SITOR/etc. All Times in UTC

206: Beacon GLS, Galveston, TX, at 0723, 1,559 miles; Beacon QI, Yarmouth, NS, Canada, at 0444, 310m. (AH)

212: Beacon SI, St. John, NB Canada, at 0645, 382m; Beacon TS, Timmins, Ont., Canada, at 0818, 692m. (AH)

235: Beacon URT, Uruburetama, Brazil, at 0651, 3,711m. (AH)

265: Beacon SXD, Springfield, VT, at 0626, 136m. (AH)

270: Beacon EZM, Eastman, GA, at 0804, 917m. (AH)

290: Beacon YYF, Penticton, BC, Canada, at 1040, 1093m. (DT)

294: Beacon BMC, Brigham City, UT, at 1015, 629m. (DT)

326: Beacon MCY, Mercury, NV, at 1005, 231m. (DT)

327: Beacon FXC, Cayenne, French Guiana, at 0837, 2,793m; Beacon GB, Maniwaki, PQ, Canada, at 0738, 402m. (AH)

338: Beacon DE, Detroit, MI, at 0805, 609m; Beacon ZEM, East Main River, PQ, Canada, at 0646, 812m. (AH)

344: Beacon CL, Cleveland, OH, at 0545, 522m; Beacon JA, Jacksonville, FL, at 0915, 963m; Beacon PIX, Williamsport, PA, at 0831, 281m; Beacon YGV, Harve St. Pierre, PQ, Canada, at 0540, 704m. (AH)

353: Beacon LWT, Lewistown, MT, at 1105, 1,023m; Beacon LLD, Lanai Island, HI, at 1000, 2,535m. (DT)

359: Beacon BO, Boise, ID, at 1055, 690m. (DT)

360: Beacon KIN, Kingston, Jamaica, at 0702, 1,662m. (AII)

367: Beacon HA, Hao Atoll, French Polynesia, at 0955, 3,810m. (DT)

394: Beacon ENZ, Nogales, AZ, at 1125, 444m. (DT)

400: Beacon PTD, Pottsdam, NY, at 0822, 284m. (AH)

404: Beacon MOG, Yreka, CA, at 1125, 607m. (DT) Beacon Guide and U.S. IFR Supplement both show location as Montague, CA, and as ex-382 kHz. (Ed.)

407: Beacon H, Montreal, PQ, Canada, at 0629, 296m. (AH).

411: Beacon RD, Redmond, OR, at 1145, 750m. (DT)

413: Beacon OEG, Eagle, AZ, at 1010, 215m. (DT)

415: Beacon IEE, Platform Irene, off Santa Barbara, CA, at 1145, 169m. (DT)

420: Beacon CFY, Lake City, SC, at 0833, 704m; Beacon GAS, Galipolis, OH, at 0728, 606m. (AH)

521: Beacon INE. Missoula, MT, at 1145, 944m. (DT)

523: Beacon JJH, Johnstown, NY, at 0751, 185m. (AH)

530: Beacon F9, Chatham, NB, Canada, at 0721, 476m. (AH)

1905: SAB, Goteborg Radio, Sweden, at 0100 in SITOR-A, 100 baud, clg BYUY. (AB)

1923.7: GKR2, Wick Radio, Scotland, in CW at 0106 w/mkr. (AB)

1925: GKZ, Humber, England, in USB at 1010 w/pp. (AB)

2461.5: 99, Irish Navy at 2354 in SITOR-A, 100 baud , w/routine msgs. (AB)

2474: PBC, Dutch Navy Goeree at 0057 in RTTY, 75b w/availability msgs. (AB)

2806: IGJ41, Italian Navy Augusta in CW at 0049 w/V W mkr. (AB)

2840.7: DBPG, German CG oil recovery ship Mellum at 1915 in SITOR-A, 100b wkg CG Cuxhaven w/position report. (AB)

3195: SLHFM "R" in CW at 0039. (AB)

3476: Shanwick, IRE (NAT-F MWARA) at 0246 in USB wkg Air Canada 72 w/posn, at 0248 wkg Speedbird 176 w/selcal ck KM-CJ. (RB)

3485: New York Radio w/aviation wx in USB at 0615. (SW)

3566: T2XL, u/i Russian military in CW at 2240 w/5L grps. (AB)

3831: G5TN, u/i Russian military in CW at 2300 wkg P~NB w/5L grps. (AB)

3839: Russian Air Defense station in CW at 2350 w/QRV msgs BT990350??8?????. No // w/6635 kHz. (AB)

4093: C6CM7, SS Norway, Norwegian Cruise Lines cruiseship, at 0100 concluding R/T tfc w/WOM, Pennsuco, FL. At 0256 ELKI6, M/S Fantasy concluding R/T tfc w/WOM, vsl is Carnival Cruise Lines ship. Both in USB. (RB)

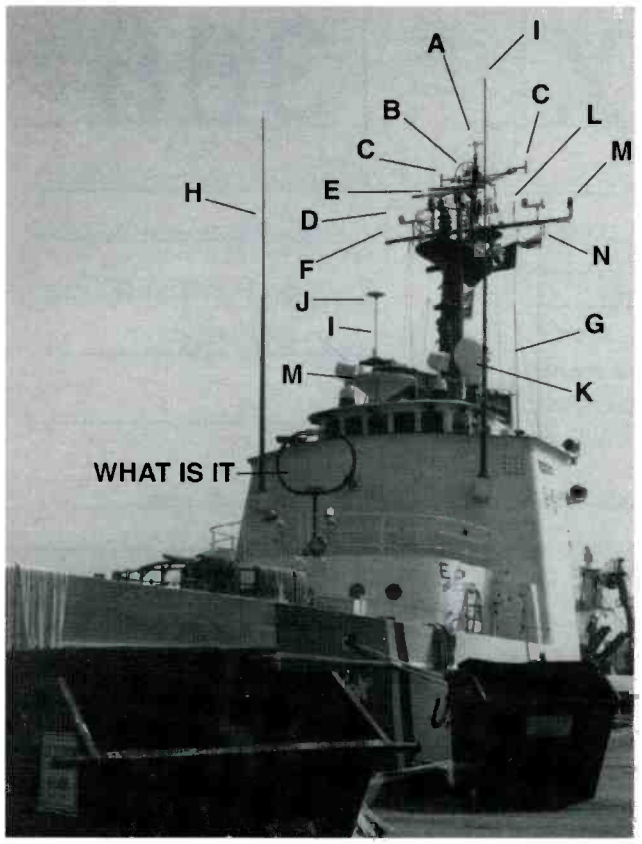
4326: SLHFM "R" in CW at 2315. (AB)

4329: WCC, Chatham, MA, at 0643 in CW w/tfc list. (SW); CW cut # station at 0206 w/5F grps. New freq for this stn. (TS)

4610: YL/EE in AM at 0330 w/409 (x3) 00000. Down at 0335. (BS)

4742: Architect in USB at 0000 w/Ascot 1685 at 0913 and 6AB at 0843 w/rdo cks. (AB)

4807.5: Waterdripper at 1906. Also hrd same day on 4471.5 kHz at 2251 and on 5681 kHz at 1432. (AB) Possible multifreq step-tone data transmission. (Ed.)



Antenna Types

A	**VHF DF**
B	**LF/MF DF**
C	**VHF/UHF**
D	**Long Range Surface Radar**
E	**Short Range Surface Radar**
F	**Low Band VHF**
G	**HF Vertical**
H	**HF/MF Vertical**
I	**VHF**
J	**TV**
K	**Sat Comm**
L	**GPS (?)**
M	**Unknown Type**
N	**Wire MF/LF (2)**

Ralph Craig, OH, took this photo of the USCG Reliance, WMEC-615. Antenna "M" and the loop marked, "What is it," were not identified. Using references "Jane's Military Communications" and "The Naval Institute Guide to the Ships and Aircraft of the U.S. Fleet", I could not identify antenna "M," but the loop appears to be similar to HF-DF antennas. (Ed.)

5070.5: Austrian Embassy Belgrade in SI-ARQ, 96b, at 1300 w/circular msgs to MFA Wien. (AB)

5097: CFH, Halifax Naval, NS, Canada, at 0310 in RTTY 75/850 w/CQ mkr. (TS)

5155: GOLDEN HAWK at 0625 in USB wkg PELICAN 760, P-3C fm NAS Jacksonville, and WAFER 763 re 760 is being retasked to 2 new areas. GH is not the OTH Radar facility listed in some books. (RB)

5404: OTH radar at 0414. (TS)

5532: Amsterdam LDOC (EU-LDOC) at 0151 in USB wkg u/i flt w/route info, contact point to switch to Houston radio. (RB)

5680: Swedish Air Force Lulea in USB at 0740 w/Rescue U93. (AB)

5696: Rescue 6017, USCG HH-60J at 0021 in USB wkg NMN re pp, D-I Ops Center, Duty Flight Surgeon, re injured person they had hoisted off the scallop boat F/V Luzitano that was hit in chest with a trap, passes vital signs, req ambulance at helipad upon arrival. At 0725 NOJ, USCG CommSta Kodiak, wkg CG 6032 re securing his rdo guard. (RB)

5705.7: RFLI, French Forces, Fort de France, at 0508 in ARQ-E3, 96/425 non-protege tfc on "la Force de Reaction Rapide" at Sarajevo, also "Tous Presse Marine" nx in 4 parts on circuit IRT. (RB)

5710: Speech-inversion scrambling in USB at 0319. (TS)

5905: KAWN wx report, 75b, at 0111. (SW)

6230: WIX, Indiana Michigan Power at 1150 in USB wkg towboat Robert M. Kopper re crew relief, at 1154 wkg the towboat A.N. Prentice, both out of Lakin, WV. (RB)

6345: U/i stn, possibly QNP52 w/NAVTEX wx warning at 0804. (SW)

6460: SAB33, Goeteborg radio, Sweden, at 0515 in SITOR-A sending out selcalls. (RB)

6502: TBB, Turkish Navy Ankara at 0420 w/CW mkr. (RB)

6550: Netherlands Coast Guard Center in USB at 1045 w/CG 01, which was investigating an oil slick. (AB)

6635: CIO2 bcst in AM at 2346. New Mossad freq; Russian Air Defense station in CW at 0006 w/QRV msgs BT990405 ??8?????, not // 3839 kHz. (AB)

6741.5: TSBD, PM La Galite (501), Tunisian navy combattante IIIm-class Fast Attack Missile craft at 0138 in SITOR-A w/routine secret traffic after sending selcall. Tfc is in French. (RB)

6785: CW cut # stn (1-0=ANDUWRIGMT) at 0806 w/msg. (TS)

6797: YL/SS in AM at 0303 w/Atencion 37709 93. Then something went wrong, the tape started rewinding and the xmtr went off freq for a second. At 0307 5F, suddenly down at 0311 and back up a few secs later. Down at 0327. (BS)

6825: RIDWD in CW at 1303. At 1308, 947 947 125 125 TTTTT and down. (BS)

6826: YL/SS in AM at 0300 w/5F grps. (TS)

6873.5: Italian Navy La Spezia in USB at 0738 w/MV Basento (IHBA) and MS Bradano (IHBD) both water carriers and MV Vesuvio (IHBC) a replenishment tanker w/rdo cks and positions in the Adriatic. Prob replenishment for Sharp Guard vessels. (AB)

6917: OTH radar at 0808, jumping to various freqs from 6850 to 7000 kHz. (TS)

7535: SESEF, Norfolk: NRLC, USS Conolly (DD-979) at 1504 w/HF tests; N/A, USS Firebolt (PC-10) at 1550 concluding KY-75 testing; NABW, USS Scout (MCM-8) at 1840 w/HF tests. Primary mode is USB. (RB)

7682: 5F CW cut # stn here at 0407. New freq. (TS)

8012: YL/SS w/Atencion 84061 at 0501 in AM. At 0503 84061 101 and into 5F grps. (BS)

8025: YL/EE Mossad stn rptng CIO2 fm 0310 to 0350. (TS)

8170: YL/EE in AM 0325 w/5F. Ended at 0332 w/66 66 00000. (BS)

8297: AADU, USAV Brandy Station (LCU-2005) at 0513 in USB clg/wkg AAC2 re rdo ck. (RB)

8342: YDLR, Bogasari Lima wkg VAI, Vancouver CG radio, BC, Canada. Hrd at 0414 in CW. QSY to 12422 kHz for msg sent to PACTRAMP Singapore. (JN)

8343: UIVF, M/V Palekh in CW at 0020 clg 4KB. These ships then checked in: UYOQ, UERA, URSB, UII?. 4KB apparently is a fleet call. (JN)

8400: TR Kapitan Pryakha in RTTY w/RR personal msg. Vessel leaves Puerto Rico bound for Ecuador. (MR)

8403: UKVE, SRTM (Srednyy Rybolovnyy Trauler Morilzhny or Medium Fishing Trawler, Freezer) Tendra at 2143 in 50/170 RTTY w/RY's/DE to LYL, Klaipeda rdo, no joy, then comes up 8398 kHz w/crew TG's using hull#/ID SRTM-1555. (RB)

8405: TH Suzdal in RTTY w/RR personal msgs at 2334. Vessel leaving Durban, South Africa, bound for Malaysia. (MR)

8494: CLA, Radio Habana, Cuba, in CW at 0122 w/tfc list foll by QSX. (SW)

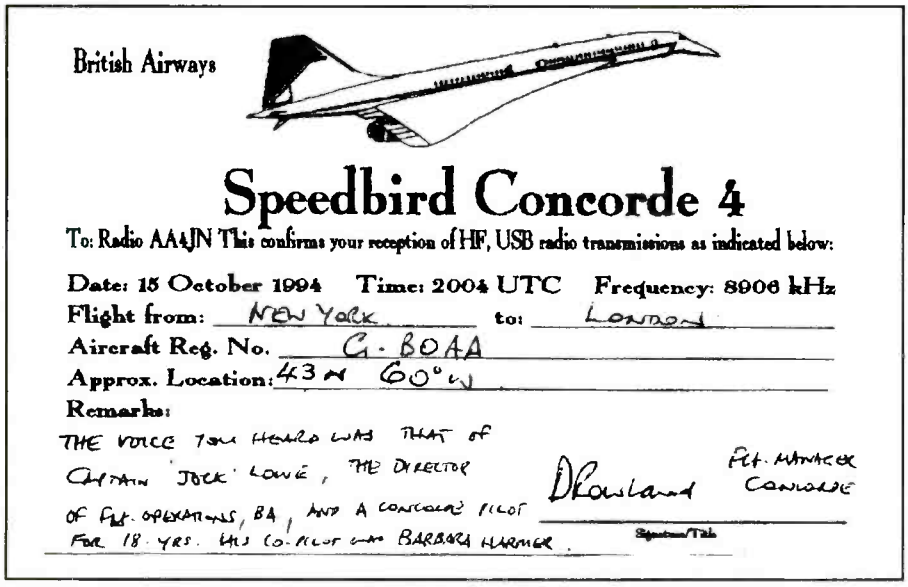
8615: KPH, San Francisco, at 0352 in CW clg w/CQ mkr. (SW)

8677.5: UGC, St. Petersburg radio at 0117 in SITOR-B w/mailbox tfc to vessel w/selcal 55440 for several mins til "mailbox empty." (RB)

8933: Cedar Rapids radio in USB at 0330 wkg United 991 w/selcal ck (AG-JR). At 0415 wkg United 984. Then, at 0418 wkg "SPAN 64" or "SPAM 64" (?). Anyone know who this a/c is?? Selcal was BK-CD. (JN) SPAM 64 poss a/c out of Westover AFB, Massachusetts. (Ed.)

9215: Siren-sounding noise. Two tones shifting on and off. Sounded like European police car siren. At 0357 OM/SS came on. At 0402, siren was back on and OM went off. (BS)

10075: Cedar Rapids LDOC, Iowa, at 0301 wkg



British Airways

Speedbird Concorde 4

To: Radio AA4JN This confirms your reception of HF, USB radio transmissions as indicated below:

Date: 15 October 1994 Time: 2004 UTC Frequency: 8906 kHz

Flight from: NEW YORK to: LONDON

Aircraft Reg. No. G-BOAA

Approx. Location: 43 N 60° W

Remarks:

THE VOICE YOU HEARD WAS THAT OF CAPTAIN 'JOCK' LOWE, THE DIRECTOR OF FLT. OPERATIONS, BA, AND A CONCORDE PILOT FOR 18 YRS. HIS CO-PILOT WAS BARBARA HARMER.

D Rowland Flt. Manager Concorde

Signature/Title

This PFC was used by Jim Navary, VA, for the reception verification of a Concord flight.

United 991 w/ selcal ck AG-KS. At 2318 "Houston", Universal Radio, Houston, TX, wkg N707PE, "over San Diego", req he QSY 17940 or 13330 kHz. Both in USB mode. (RB)

10314: Polish Embassy Belgrade in POL ARQ, 100b at 1135 wkg MFA Warsaw. (AB)

10423: BPA, suspected RR Diplo in RTTY 75/500 at 1530 w/4 msgs, 720 grps. Headers were: 11166 00116 00000 23178 03931 foll by 5F grps. 11166 00116 00000 22177 00671 then into 5F grps. 11144 00116 35854 21175 01309 and into 5L grps. 11166 00116 35854 22176 0139. and then into 5L grps. Down w/QRU QRU SK SK. Rptd on 14724 kHz. (BS)

10479: RFFXQA, French Forces Sarajevo in ARQ-E, 184.6b at 0700 w/5L grps. (AB)

10636: KKN50 in CW w/QRA/QSX mkr at 0114. (BS)

10805: Foxtrot Tango, USN Link-11 coordination net at 0418 in USB wkg Gulf for msg to relay to TechRep. (RB)

11175: Reach 70137 in USB at 0648 w/pp to Ramstein Metro CP. ETA Ramstein 1000. (AB)

11212: MKL, Pitreavie Air, Scotland, in CW at 0113 w/WX info. Later switched to RTTY. (TS)

11453: IMB3, Rome Meteo, Italy, at 0054 in RTTY 50/850 w/ AAXX wx synops. (RB)

11492: YL/SS in AM at 1839 w/5F grps. Gone at 1840. (SW)

11605: YL/SS w/4F grps in USB at 0321. (BS)

12075: ZRX, (South African allocation) in CW at 1524 w/QSX mkr. (BS)

12093: CW stn w/5F grps at 1307. Used cut nbrs 1-0=ANDUWRIGMT system. (BS)

12156: YL/SS in AM at 0200 rptng 260 & 1-0 count. At 0210, 10 tones, "Grupo 143" and 3/2F msg. Also on few nights later w/same 260 callup and 3/2F msg. (TS)

12180: YL/SS w/5F grps here at 0006. (BS)

12359: Chipmunk II wkg Southbound II (Herb) at 2020; WAH9641 S/V Queen Esther wkg Southbound II (Herb) at 2028. All in USB. (JN)

12371: U/i OM/SS in USB at 1905, conversation poss maritime related. (SW)

12424: 3EYA4, M/V Sun II at 0409 in CW wkg A9M, Bahrain radio w/msgs. (JN)

12455: SXCW, M/V Pantokrator in CW at 0326

Thoughtwaves

(from page 5)

Gysi, N2DUP, Editor, *Popular Communications*, 76 N. Broadway, Hicksville, NY 11801-2909), fax (516-681-2926) or e-mail (POPCOMM@aol.com or POPCOMM@genie.com). At present, electronic submissions are encouraged (DOS ASCII or Mac Word 5.1 preferred; uploads OK on America Online or GEnie) and all articles need to be accompanied with some type of artwork (photos, charts, QSL cards, etc.). And you want to know what? We'll pay you for your efforts, too.

Don't be too shy. If you know a lot about something, we'd love to have you impart your knowledge on your fellow readers. Our mailbox awaits your ideas.

Over and Out

Thanks for bearing with me this month. I hope you enjoy our first issue of 1996 and I wish you all a very happy new year.

73, Chuck

You Should Know

(from page 44)

Of the bugs with the greatest range, the fake wall socket seemed to be the winner. Most of these were designed so one of the two sockets actually was usable. The other part of the fake socket contained the electronics for the transmitter. Several used the "wireless intercom" concept and actually transmitted the signals on the electrical wires within the building or home. There was no "on-the-air" transmitter as such. The receiver would be pulled into a real wall socket somewhere on the same electrical circuit, and the hidden bug would act as a transmitter portion of the wireless intercom, sending the detected conversations to anyone in the building with a wireless intercom type of receiver.

Customs agents feel they have not seen the last of illegal listening devices. However, they have accomplished two things with the raids. They have put many dealers out of business, and have identified the sources of manufacture for a majority of the products that were being illegally imported. Other dealers, those reportedly unaware of the federal law regarding the sale, manufacture, possession and distribution of such listening devices, now have dropped the items from their product line.

The main purpose of this article is to make you aware of just a portion of the 1968 Omnibus Crime and Safe Streets Act, and the fact that just the possession of such a listening device is now a clear violation of federal law. ■

Communications Confidential

wkg VIP, Perth, Australia, w/4 msgs. (JN)

12570: THP Smorodin/EOGO in RTTY at 2010 w/RR personal msgs. Vessel enroute Rotterdam, Netherlands. (MR)

12572: UASX, SMB Mikula at 2336 in RTTY 50/170 w/RY's/DE to UDK-2, Murmansk, & w/RR telex to Intershield Marine Moscow for ETA Abidyan, this is ex-EOEX. (RB)

12615: USU, Mariupol, Ukraine, in SITOR-A passing telegrams to u/i ship at 0150. (TS)

12990: WLO, Mobile, AL, at 1939 in FEC w/tfc list and high seas forecast. Also warning for Tropical Storm Dalila. (SW)

13031.2: FUF, Fort de France Naval, Martinique, in RTTY 75/850 w/RY test tape. (TS)

13527.8: SLHFM "S", Arkhangelsk in CW at 0541. (BS)

13528.1: SLHFM "K", Khabrovsk and "F", Vladivostok at 1410 in CW. (BS)

13582: CW stn at 0302 rptng 714. At 0305, sent BT 130 24 BT and into 24 grp SF msg. At end of msg, rptd whole thing and signed down w/000. (TS)

14441.5: USN MARS: NNN0CMB, USS Truett (FFT-1095) at 0249 wkg u/i stateside stn w/QSY to 14467 kHz. At 0250, NNN0NOP, u/i, clg ASSMS, beam heading south, sounded like a helo. At 2152, NNN0CMY, USNS Saturn (T-AFS-10) clg ASSMS w/beam heading of NE for routine pp tfc, NNN0UTO answers. QSY to 14477 kHz for pp. At 2202, NNN0CCL, unknown USN/USCG vsl wkg NNN0UTO. At 2206 NNN0CMI, USS Robert G. Bradley (FFG-49) clg private MARS sta NNN0UTO, no joy. At 2239 NNN0CXR, USNS Sirios (T-AFS-8) wkg NNNORRC re working freq. All USB mode. (RB)

14725: BPA at 1515 w/64s and 1/676. Header: 11177 00116 00000 07188 06761. Last grp of text OWEWZ. (BS)

14890: Russian Man nbrs station in AM at 0800 w/msg to addressee 615. (AB)

14977: OLX, MOI Prague in USB at 0800 w/msg to 755, 5F grps in Czech. (AB)

16218.2: HZW (suspect RR diplo) in RTTY 50/500. Header was 11199 00117 00000 23053 00669 and into msg of 6 grps of 5F. Down with QRU QRU SK SK. Heard two Sundays in a row but not the next Sunday. (BS)

16226.6: Msg for YL in RTTY 75/500 at 1400. Header: 11177 00148 00000 27549 01211. (BS)

16620: ELJL4, LPG/C Mundogas Atlantic in CW at 2130 wkg CBV, Playa Ancha, Chile. (JN)

16694: BRRY, Chinese vsl Guang Yuan at 1722 in SITOR-A w/tlx tfc. (RB)

16705.5: PGEG, container ship M/V Nedlloyd Neerlandia at 2025 in SITOR-A w/tlx in Dutch. (RB)

16800: u/i Russian ship, KM Kuznetsov in RTTY at 1545. Vsl is near Canary Islands, Spain. (MR)

16841.2: JMS, Russian MFA stn receiving 5L grps at 2213. RTTY mode 75/500. (TS)

17477.6: Msg for YBU (RR diplo) at 2215 in RTTY 75/500. Header was 11177 00148 00000 07676 06651, text was 5L grps. Last grp was OWEEU. Msg was rpt of 20138.2 kHz bcst. (BS)

17480: OTH radar at 2213. (TS)

20085: ISX20, ANSA Roma in RTTY, 50b at 1210 w/nx. (AB)

20950: U/i stn at 1214 in ARQ-E, 192b, w/encrypted tfc. (AB)

22396: KPH, San Francisco, at 1451 w/SITOR free signal, CW ID. (RB)

22563.5: 9AR, Rijeka radio at 1242 in CW w/V W mkr. (AB)

Contributors for this month were: AB—Ary Boender, Netherlands; RB—Rick Baker, OH; AH, Al Hemmalin, RI; JN—Jim Navary, VA; MR—Michael Regan, WI; BS—Basil Shelley, CA; TS—Tom Sevart, KS; DT—Donald Tomkinson, CA; SW—Sue Wilden, IN. ■

Clandestine Communique

BY GERRY L. DEXTER

WHAT'S NEW WITH THE CLANDESTINES

Somalia Becomes Hotbed of Semi-Clandestines

A new semi-clandestine is on the air from Somalia. Radio Mogadishu—the Voice of Somali Pacification, is broadcasting in Somali now on 6722 kHz. The station is reported to be operated by Uthman Ali Ato, who once was in league with the country's principal warlord, Gen. Muhammad Farah Aydid. The station broadcasts from 0300-0500, 0930-1200 and 1500-1800. The 0300 segment offers the best chance of hearing the station. A frequency in the 41-meter band also may be active.

Two other semi-clandestines are active in Somalia: Radio Mogadishu—the Voice of the Somali Republic, speaks for Ali Mahdi Muhammad; it's active in the area around 6810 to 6832. Gen. Aydid's station is Radio Mogadishu—The Voice of the Masses of the Somali Republic (a recent name change from the Voice of the Somali People), and is active in the area between 6800 and 6870.

Radio Free Somalia also is active, scheduled from 1000-1215 on 3920, 1230-1300 on 13820 and 1600-1750 on 7215, running 800 watts. This station is operated by the International Amateur Radio Network (IARN), which also supports Radio Free Bougainville.

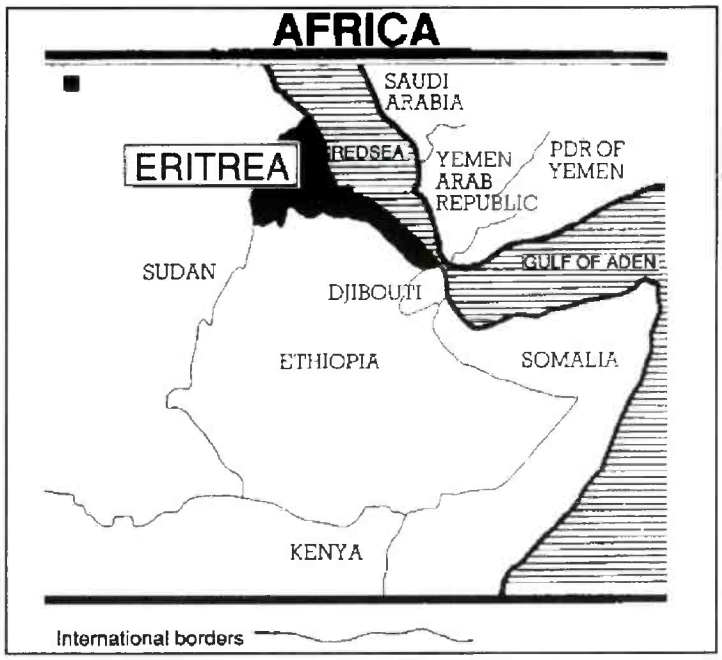
Saddam Hussein's international shortwave station is not operating close to the level it once was. Maybe that's because he's too busy returning some of the former clandestine services to the air.

Mother of Battles Radio has returned with Arabic programming from 1600-1900 daily, and a repeat broadcast at 2000-2300. This is aired on two mediumwave channels (693 and 1377 kHz), the latter also is aired on 7150 and possibly 13650 and 15240. The broadcasts are aimed at Saudi Arabia, Kuwait, Yemen, the Sudan, Somalia and Djibouti. Mother of Battles Radio was first active for a brief period at the beginning of the Gulf War, before the Iraqi broadcasting facilities were put out of commission by Allied bombing.

A similar operation, Holy Medina Radio, is beamed at Saudi Arabia and is active on 11785. It already may have replaced or be sharing time with the newer Radio of the Saudi Opposition from Najid and Hejaz, which was mentioned last month.

Still another Iraqi-sponsored broadcast, the Voice of Eritrea, is noted in the Tigrigna language, as well as Arabic, on 17740 from 1700-1800, after which programming in Arabic from Iraqi government radio begins.

The Voice of Sudan-Voice of the National Alliance is in operation now, using 9025 from 1300-1500 in Arabic. At one time, this station—or something very similar—operated from Ethiopia in 1990-91, before the civil war there overthrew the government. However, information on this one indicates the station actually may be operating from rebel-held areas in southern Sudan. The earlier station also spoke on behalf of the National Alliance, a coalition of various political parties opposing the current government. After this station had been on the air for a few days, the Sudan government station showed up on the frequency, making it very difficult to know which station is being heard. The frequency sometimes drifts down to 9024.



There's a lot of clandestine and quasi-clandestine radio broadcasting coming from Ethiopia, Eritrea, the Sudan and Somalia these days.

Forum for Democracy is a Vietnamese program being aired on KWHR, Hawaii, produced by a group calling itself the Vietnamese Restoration Party. This is the same organization that aired a program on Radio Moscow a couple of years ago. The programs push for free elections and a free economy in Vietnam. It airs at 1400 on 9930, opening with an ID in English.

The Haitian program, Radio 16 Desanm, continues to be aired by WRMI, Miami, in Creole from 2100-2300 Monday through Friday on 9955.

The Voice of Human Rights and Freedom for Iran is now scheduled at 0230-0423 on 9270v, 9380v and 11740 (alternate 9482).

It's also at 0600-0635 on 9270v and 15150; 1545-1623 on 9255 and 15147 (also 11470 on occasion); and 1630-1823 on 9270, 9380 and 11470. The broadcasts are in Farsi, but there is an ID in English and French at sign-on. The transmitters for this station are in Egypt.

The Nigerian clandestine, Radio Freedom Frequency, mentioned last month, is using 93.2 MHz FM, which puts it a bit out of reach for us!

Javier Diez-Canseco Montero in Peru comments on our July column that mentioned the miniwar between Peru and Ecuador. He says he did not note any clandestine activity related to the war but notes there was a lot of radio activity around 10 MHz, which apparently was just ham operators in Ecuador and Peru trading insults.

That covers things for this month. Remember that we welcome your contributions. Loggings of clandestine or quasi-clandestine stations, background information, schedules, addresses, QSL information and so on always are very welcome!

Until next month, good hunting! ■

Pirates Den

FOCUS ON FREE RADIO BROADCASTING

BY EDWARD TEACH

Pirate hunting has been subject to a lot of noise lately, not to mention the usual lessening of station activity that occurs every now and then. Things should have picked up by the time you read this, so get that receiver on and prowl for pirates!

Steven Zinn of Pennsylvania logged WRV Radio Virus ("the station nobody wants to catch") on 7470 LSB at 2230. Steven got a quick QSL signed by Pete the Pirate. It'd be great if you could send in your logs, as well as copies of the QSLs, Steven. Thanks!

Dick Pearce heard the Caribbean Sound System on 6955 upper sideband at 0116, with several Latin-sounding songs and hosted by "Count Whip," who noted he'd heard Radio USA, KDED, Bullfrog Radio and K2000. The Count claimed he just got back into port and had a box full of QSLs to get out. He signed off with the *Whole Lotta Love Boat* song.

Terry Richards in Georgia had Radio Free East Coast on 6958 USB at 0051 with apparent modulation problems. The program included a parody on the Billy Idol rock song, *Cradle of Love* and a "profanity-laden" comedy bit. They closed with the "log" jingle from the *Ren and Stimpy* TV show.

Richards also had KDED on 6956 USB announcing as the "Voice of the Grateful Dead" signing on at 0405. The host said he was having trouble with the CD player and gave P.O. Box 452, Wellsville, NY 14895, for reports. Roger Hehemann of Pennsylvania heard what apparently was KDED on 6955 at 0225, playing two "Dead" songs and using a heavy echo on announcements.

Pearce is 99 percent sure it was Black Rider Radio he heard on 6955 USB at 0010. He says the programming was a typical BRR mix of music, followed by a short commentary after each song, including *North to Alaska, Ring of Fire, Six Days on the Road*, etc. (See Radio Perfect from Germany, below. It seems they air similar music.)

Richards had Up Against the Wall Radio on 6958 USB at about 0122 with a parody titled *Newt in Space,* a fake EBS alert and clips from the old TV series, *The Prisoner* ("I am not a number, I am a free man!"). The QSL address given was P.O. Box 28413, Providence, RI 02908, with a proviso that QSLs wouldn't be issued unless an opinion about the broadcast was included with the report.

Radio Perfect (Perfekt) from Germany was heard by Hehemann on 6955 USB at 0015, but with weak signals so not much of it was copyable. Roger caught something about IRCs or $2 and P.O. Box 22. Unfortunately, this was a relay via the North American Pirate Relay Service, Roger, not a direct reception. Songs played included *Six Days on the Road, 500 Miles, King of the Road*, and the like.

The Voice of Free Evolution was another Dick Pearce log, on 6955 at 0028, announcing, "This is the Voice of Free Evolution, a production of Radio X." He played an unidentified song, made some comments about evolution and "three brothers" and then slid into the noise. Dick notes that there were two programs in progress on the frequency before "Evolution" appeared. One was announced as "Free Radio From Germany" and one may have been Starshine or Mirage radio, playing songs such as *Blue Bayou, Baby Come Back, See Ya Later, Alligator* and *Happy Birthday.*

George Roberts in Pennsylvania checks in with a log of The Voice of the Runaway Maharishi at 0155 on 6955, airing a variety of rock-pop things and several different sound effects, including that of a cuckoo clock. He announced the Providence, R.I., address.

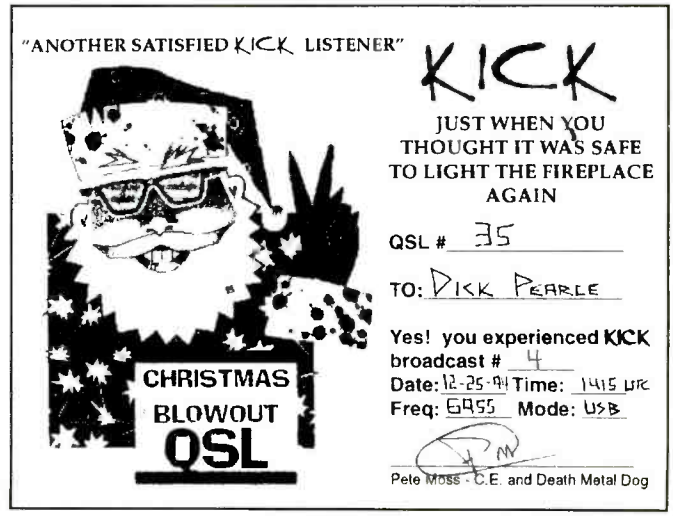
Roberts also had one calling itself Key West Radio on 6955 USB at 0325, hosted by Deputy Dan and including some station IDs given in Spanish. They also aired segments of a radio drama of some kind and said that reports appearing in the A*C*E bulletin would be QSL'd.

Dick Pearce had a couple of other unidentified stations: 6955.5 LSB at 0116 with the phrase, "I've got the power" heard in one of the songs, something that Dick has heard in pirate programming before. It also was heard on 6969 USB at 0015, again just barely audible. One song by Credence Clearwater Revival was caught, and a mention of the Wellsville address.

Richards had an unidentified on 6955 USB at 0308 with someone repeating the name "Lucy" over and over, with a reverb and some "cheesy sound effects." Later, this was supplanted with a track from one of those Gregorian Monk chant CDs. No announcements of any kind were heard.

That's it for this month. Thanks to first-time reporters Roger Hehemann of Pennsylvania and Terry Richards of Georgia and, of course, our regulars. Whether you're a newcomer to the pirate chase or an old hand at it, please keep sending in your station loggings and QSL info. It can't happen without your help! ■

Dick Pearce received this QSL for KICK Radio's fourth broadcast. ►



Dick Pearce got this nice QSL from Starshine Radio, based in Germany. ▼

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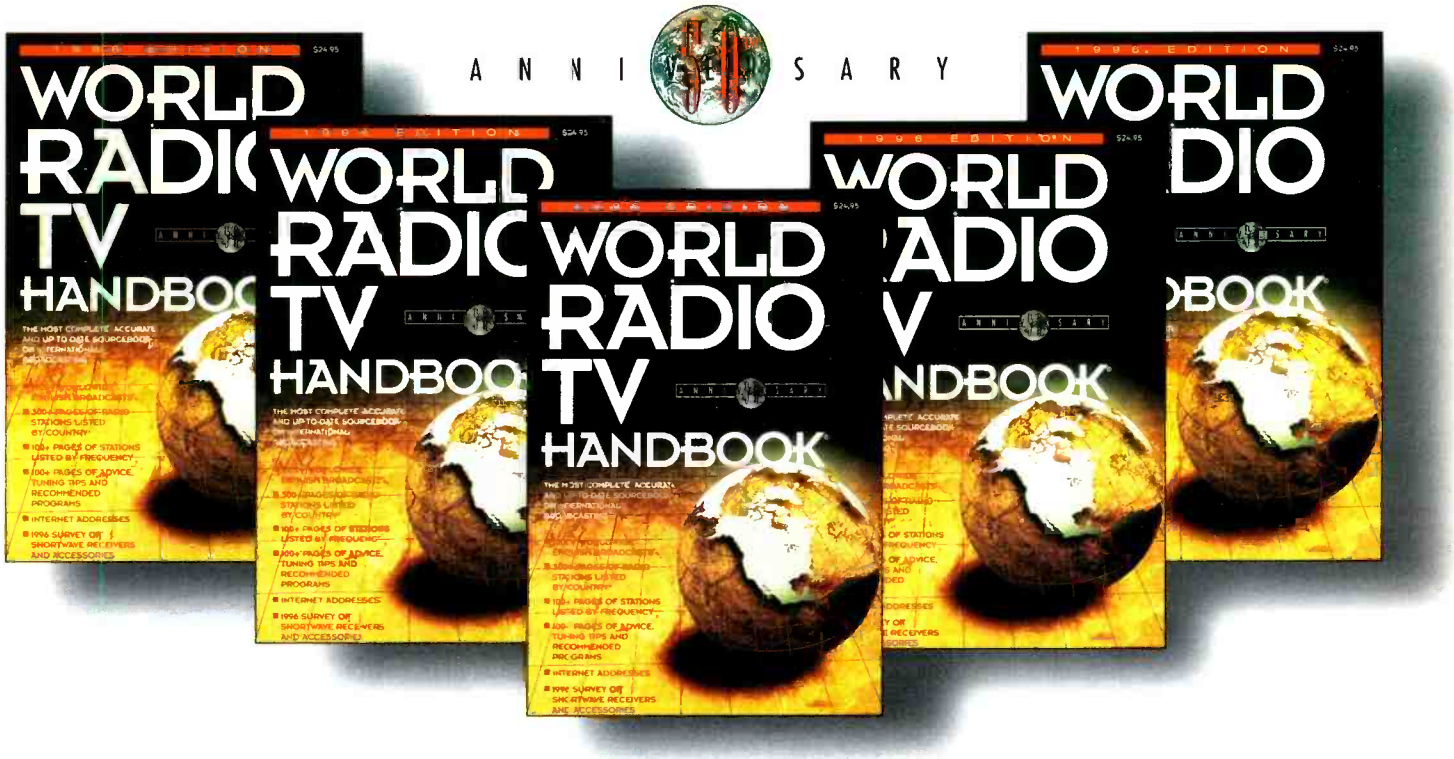

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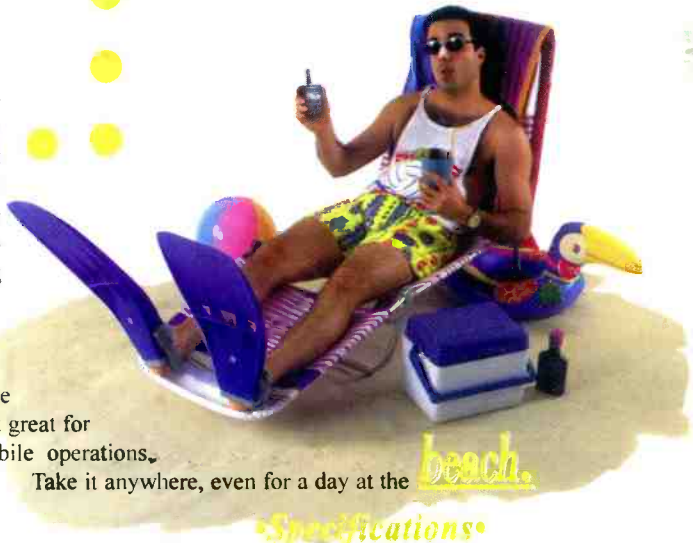

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