

POPULAR COMMUNICATIONS

APRIL 1998

Super-Charge Your BCB Radio: Build a Loop Antenna

- Alice's Archives—TV's Hidden Pre-History
- Live Radio on Your Computer!
- New Lowe "Air Master 2000" ACARS Decoder
- Product Spotlight: RadioShack's 7-Channel Weatheradio
- Scanner Specs: Making Sense of the Numbers



wado

RADIO 1280 AM

U.S. \$3.50 CAN / INT'L \$4.95



*PLUS: CB Scene, Listening Post, Tuning Tips,
The Pirate's Den and much more . . .*

ICOM SPRING SAVINGS

Great Deals on ICOM PC Ready Scanners and Receivers

FREE DATABASE

Get a free frequency database on CD ROM when you purchase a new IC-PCR1000 by 3/31/98.

See your ICOM dealer for complete details



Like a Roadmap to the Airways



DSP

A DSP upgrade option (UT-106) is now available for your IC-PCR1000. No soldering required! Installs in minutes.

See your ICOM dealer for complete details

- 100% PC Controlled
- 100 kHz – 1.3 GHz*
- All Mode

IC-PCR1000

PC-controlled Wide Band Receiver

- 3 Selectable Screens
- Unlimited Memory Channels
- Windows™ 3.1 or 95
- Install software, plug and play!

Cable Included

FREE SOFTWARE

Get All-New RS-R8500 Windows™ Software with every new IC-R8500 from 2/1/98 to 3/31/98.

See your ICOM dealer for complete details



Save \$300

When you purchase a new IC-R8500 by 3/31/98.

See your ICOM dealer for complete details

- 100 kHz – 2 GHz*
- All Mode
- Commercial Grade
- Built-in CI-V Command
- Built-In RS-232C Port

IC-R8500

The Expert's Choice is Also Easy to Use. Advanced Performance at a Novice Price

- 1000 Memory Channels
- IF Shift & Noise Blanker
- Audio Peak Filter (APF)
- Auto Frequency Control
- 7 Different Scan Types

IC-R10

More Listening Excitement on the Go

Save \$100

When you purchase a new IC-R10 by 3/31/98.

See your ICOM dealer for complete details



Clean up this spring with these great ICOM receiver offers. Hurry, offers are valid for a limited time only. Call or visit your favorite authorized ICOM dealer today and get all the details.

Call 425-450-6088 for free brochures



Select ICOM options may be required.

- 500 kHz – 1.3 GHz*
- All Mode, Including SSB
- 1000 Memory Channels
- "Real-Time" Band Scope
- 7 Different Scan Types
- **EASY MODE** for Beginners
- Rechargeable "AA" Ni-Cds Included

Uses either **AA BATTERIES** or **Ni-Cds** your choice

CIRCLE 173 ON READER SERVICE CARD



www.icomamerica.com

*Cellular blocked; unblocked versions available only to FCC approved users. ©1998 ICOM America, Inc. 2380 116th Ave NE, Bellevue WA 98004 • 425-454-8155. All specifications are subject to change without notice or obligation. The ICOM logo is a registered trademark of ICOM, Inc. Windows and Windows 95 are registered trademarks of Microsoft Corporation. RFAM198Y



LENTINI

COMMUNICATIONS, INC.

Toll Free
1-800-666-0908
In CT 860-666-6227

ICOM

PCR1000

NEW!



Communications Receiver For Computer

- Covers .01-1300MHz.
- All Mode WFM, FM, AM, SSB, CW.
- Employs Band-Tracking RF Filters.
- Connects to Your PC Externally

CALL FOR MORE INFO & PRICING

IC-R10



- Wideband, All Mode Receive Capability From .5MHz to 1300 MHz.
- Real-Time Bandscope Shows Band Conditions And Busy Frequencies.
- VSC Function, Voice Scan Control Pauses Scan Only When Modulated Signals Are Received.
- 1000 Memory Channels With 8-Character Alphanumeric Names. Channels Can Be Grouped Into Banks With Each Bank Capable Of Holding A 10-Character Name.
- Skip Function Helps Speed Up Scanning.
- Many Other Features.

IC-R8500



Communications Receiver

- Wideband, All Mode Receive Capability From 0.1 to 2000 MHz.
- 1000 Memory Channels With 8-Character Alphanumeric Names.
- Superb High Receive Sensitivity Over Its Entire Range.
- Many More Features

CALL FOR PRICING!

UNIDEN

BC9000XLT



\$379.95
UPS Included

BC3000XLT

\$359.95
UPS Included



BC895XLT

"TrunkTracker"



\$309.95
UPS Included

BC235XLT

Handheld "TrunkTracker"

\$254.95
UPS Included

AOR

AR8000B



- .1-1900MHz
- AM, NFM, WFM, SSB, CW.
- Alpha-Numeric.
- Computer Programmable

CALL FOR MORE INFO & PRICING

YAESU

Vertex VX-10



- Ultra-Compact VHF or UHF FM Portable
- 40 Ch. 2-Key Keypad or 102 Ch. 16-Key Deluxe Keypad Option
- Alphanumeric Display
- CTCSS/DCS

VHF Version w/CS-10B Charger

..... \$ Call

UHF Version w/CS-10B Charger

..... \$ Call

FTT-15 16-Button DTMF Keypad

And Voice Encryption Option

..... \$ Call

Call For All Info

FT-50RD



Receive: 76-200MHz, 300-540MHz
590-999MHz
cellular blocked
Transmit: 144-148MHz
430-450MHz

- AM Aircraft Receive
- Digital Coded Squelch
- High Speed Scanning
- 112 Memory Channels
- Much, Much More!

VX-1R



World's Smallest Dual-Band Amateur Handheld

- Wide-Band Receive From 76-999MHz, CTCSS/DCS
- Alphanumeric, Display.
- 500mW Power Output
- 1 Watt w/External Power
- Call For More Info

RELM

HS200



- 200 Channels, 10 Banks.
- 13 Bands From 26-960MHz, includes CB and Aircraft.
- PL/CTCSS and DPL/DCS Included.

\$219.95
UPS Included

MS200 NEW!



\$239.95 UPS Included
Base/Mobile Scanner

- 200 Channels, 10 Banks
- 12 Bands From 29-960MHz (Excluding Cellular)
- PL/CTCSS and DPL/DCS
- Alphanumeric Display
- Fast Scan (100 Ch. Per second)

Drake Shortwave Radios

R8A	\$1069.95 + \$14 UPS
R8B (new)	\$1159.95 + \$14 UPS
SW8	\$779.95 + \$10 UPS
SW2	\$489.95 + \$7 UPS
SW1	\$199.95 + \$7 UPS

Cherokee CB

CBS-1000 AM/SSB Base	CALL
CBS-500 AM Base	CALL
CM-10 AM Mobile	CALL
AH-27 Walkie	CALL
AH-100 AM/SSB Walkie	CALL

10-Meter

2950	CALL
2970	CALL
2990	CALL
Northstar	CALL

SANGEAN



NEW!
AM/ FM/ SSB Shortwave
\$249.95
+ \$8 UPS

GRUNDIG
Shortwave



Yacht Boy 400
\$169.95
UPS Included

HOURS: M-F 10am - 6pm SAT 10am-4pm UPS Ground (48 states)

Conn Sales Infor. & Tech Help 860-666-6227

Web Site: www.lentini-comm.com

C.O.D.'s OK
SAME DAY
SHIPPING

21 Garfield St. Newington, CT 06111



CIRCLE 45 ON READER SERVICE CARD

POPULAR COMMUNICATIONS

APRIL 1998

VOLUME 16, NUMBER 8

FEATURES

Tuning Up Your Broadcast Band Monitoring Station 8

Building an inexpensive passive loop antenna and turntable will help you pull in those distant stations.

By Joseph Cooper, VE3FMQ

TV Or Not TV? That Is The Question 16

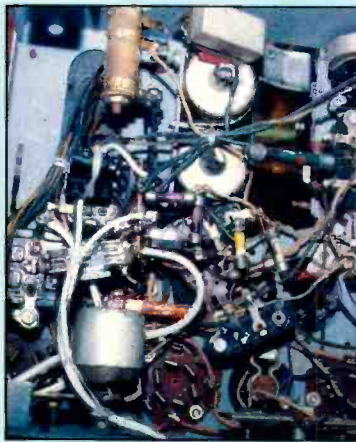
Digging up television's pre-history reveals some startling facts from the '20s and '30s.

By Alice Brannigan

Live Radio On Your Computer 54

With a few minutes of work and "Real Audio," you'll hear radio from Africa to England.

By Edward Griffin



page 22



page 28

COLUMNS

The Radio Connection: *The old Philco 89 Cathedral's Chassis Restoration*.....22

Radio Resources: *Part II — SEVEN GPS Receivers Go For A Road Test*.....28

Product Spotlight: *RadioShack's 7-Channel Weatheradio*.....33

Scanning The Globe: *Finding Just About Anything On Your Scanner*.....35



page 52

The Ham Column: *Troubleshooting In The Shack*.....38

World Band Tuning Tips: *Your Ticket To Hearing International Shortwave Broadcasters*.....40

The Pirate's Den: *The Strange, The Weird, The Pirates!*42

ScanTech: *ASP — Analog Signal Processing: New Low Tech — "ScanTech" Scanner Specs*.....44

CB Scene: *Three Great New Radios*48

The Computer Corner: *Volunteering Your Hobby & Live Radio On Your Computer*.....52

Broadcast DXing: *A Winter DX Heatwave*58

The ACARS Downlink: *What's New In ACARS Decoders?*...62

The Listening Post: *News From Africa And How To Catch North Korea*66

Communications Confidential: *All The News That's Fit To Be News — Utility Monitoring!*.....70

The Loose Connection: *\$9.95 A Month For The BBC?*.....80

DEPARTMENTS

Tuning In: *Firing Blanks At The FRS*4

Pop'Comm P.O.6

How I Got Started: *Alexander Sidorov*.....21

Reader's Market.....78

ON THE COVER: *The transmitter site of WADO, 1290 kHz in the New Jersey Meadowlands, west of New York City. If you want to pull in those distant AM BCB stations, build Joe Cooper's loop antenna and turntable on page 8. (Photo by Larry Mulvehill)*

QUALITY COMMUNICATIONS EQUIPMENT SINCE 1942

DRAKE

SW-1

- Full Coverage
- LW/MW/SW
- Digital Readout
- Keypad Entry
- 32 Memories
- RF Gain



Made in America

The Drake SW-1 sets the stage for worldwide shortwave listening with ease, simplicity and clarity. The SW-1 offers superb sensitivity, selectivity and full audio. Coverage from 100 through 30000 kHz provides solid coverage of longwave, medium wave and shortwave in the AM mode (no SSB). This makes it an ideal broadcast receiver for the desk or bed-stand. Tuning is a snap via the keypad, manual tuning knob, Up/Down buttons or 32 programmable memories. The LED display is positively huge for easy accurate frequency readout to 1 kHz. Antenna input is via a 50 ohm terminal or SO-239 jack. A 1/8" mini jack is provided for use with earplug or headphones (not supplied). Includes AC wall adapter for operation from 120 VAC 60 Hz. 10.875"x4.375"x7.625" 4.7 Lbs. One year limited warranty. Made in Ohio! Special sale price valid to 4/15/98.

List \$299.00 Order #1100 \$249.95 **Sale \$199.00** (+\$7 UPS)

COMMUNICATIONS RECEIVERS

YAESU

KENWOOD

JRC

DRAKE

AOR

ICOM



Universal Radio carries an excellent selection of new and used communications receivers. The new Japan Radio NRD-345 is shown above. Only \$799.95 (+\$10)

The new American made Drake SW-2 features SSB, Sync. Det., 100 mems., keypad and optional remote (shown).



In stock now!

WIND-UP



The BayGen Freeplay radio combines the ingenious Baylis generator with the latest in radio technology. Winding the handle for 20 seconds provides 30 minutes of listening. Here is assured radio performance, day or night without the worry (and expense!) of batteries. The analog dial covers AM, FM and SW from 3 to 12 MHz. Made in the Rep. of South Africa. #3123 \$99.95 (+\$5)

The new, smaller Freeplay 2 model covers just AM & FM. #3667 \$69.95 (+\$5)

PORTABLES

GRUNDIG

Universal has shortwave portables from Grundig, Sony, Sangean and Icom. The gorgeous new Grundig Porsche Design is shown. \$149.95 (+\$8 UPS).



SANGEAN

ATS-808A

Smart styling, compact size and great performance combine to make the Sangean ATS-808A a favorite. Coverage includes LW, MW, all SW and FM (stereo to headphone jack). Five tuning methods: keypad entry, auto scan, manual scan, memory recall and manual two-speed rotary tuning. The attractive tricolored LCD display shows: frequency to 1 kHz, signal strength, memory status, dual UTC-local clock and band. A wide-narrow selectivity switch really helps in the crowded shortwave bands. Other features include: high-low tone control, wide-narrow switch, local-DX switch, external antenna jack (mini), 54 memories (18 for SW) and dial lock. Includes stereo earphones and case. 7" x 4" x 1" 2 Lbs. Requires 6 AA cells (not supplied) or optional ADP-808 AC adapter (#1665 \$8.95). At under \$100, this is clearly the best value in a digital full coverage shortwave portable if you don't need SSB. Special sale price valid to 4/15/98.



List \$259.00 Order #0936 \$149.95 **Sale \$99.95** (+\$7 UPS)

ATS-818

The larger ATS-818 features the same full coverage as the ATS-808A plus also provides great SSB/CW reception. AC adapter included. #2754 \$139.95 (+\$7)

FREE! 1998 Universal Radio Communications Catalog
Our informative new 100 page catalog is now available on request.

RADIO BOOKS

● **Discover DXing!** By J. Zondlo *New Second Edition!*

Learn how to hear more AM, FM and TV stations. Chapters include: propagation, seasonal conditions, equipment, antennas and reference materials. Read the "best bets" for hearing all fifty states and ten countries on AM. Other topics include obtaining QSLs, keeping a log and radio clubs. Also includes a list of AM clear channel stations and a list of VHF TV stations. 90 Pages. ©1998. #0019 \$5.95 (+\$2)

● **Passport To World Band Radio 1998** *New Edition!* Graphic presentation of all shortwave broadcast stations. Equipment reviews, too. 560 Pages! #1000 \$19.95 (+\$2)

● **World Radio TV Handbook 1998** *New Edition!* All shortwave broadcast stations organized by country with schedules, addresses, power, etc. #2000 \$24.95 (+\$2)

● **Joe Carr's Receiving Antenna Handbook** Arguably the best book devoted to receiving antennas for longwave through shortwave. #3113 \$19.95 (+\$2)

● **Pirate Radio** By A. Yoder *With audio CD!* Here is the incredible saga of America's underground illegal broadcasters (with CD). #3038 \$29.95 (+\$2)

● **Worldwide Aeronautical Frequency Dir.** By R. Evans The definitive guide to commercial and military, HF and VHF-UHF aeronautical communications including ACARS. Second Edition. 260 Pages. #0042 \$19.95 (+\$2)

● **Understanding ACARS.** By E. Flynn *Third Edition* Learn the ACARS aeronautical format. #0012 \$9.95 (+\$2)

✉ Please add \$2 per title for surface shipping.

VISIT UNIVERSAL RADIO ON THE INTERNET
<http://www.universal-radio.com>

- Visa
- MasterCard
- Discover
- Prices and specs. are subject to change.
- Returns subject to a 15% restocking fee.
- Used equipment 1st available on request.

Universal Radio, Inc.
6830 Americana Pkwy.
Reynoldsburg, Ohio
43068-4113 U.S.A.

☎ 800 431-3939 Orders & Prices
☎ 614 866-4267 Information
☎ 614 866-2339 FAX Line
✉ dx@universal-radio.com

universal
radio inc.

Tuning In

AN EDITORIAL

BY HAROLD ORT, N2RLL, SSB-596

Firing Blanks At The FRS

When the idea of the Family Radio Service (FRS) was first conceived, and comments were sought by the FCC, there was such an uproar, you would have thought Billy Tauzin had appointed himself FCC Commissioner! As it turns out, nothing quite that horrible was under consideration out there in radioland (not yet, at least!)—just a lot of commotion from naysayers about how those new little half-watt FRS transceivers were going to interfere with the licensed General Mobile Radio Service (GMRS) users on nearby frequencies.

OK, I'll admit that at first I was skeptical; why on earth would the FCC allow unlicensed operation on 14 frequencies sandwiched between licensed 462/467 MHz full-power users? At first it seemed that GMRS users had a valid gripe, but after all this time, it appears the engine has run out of steam. Here's the background of the FRS and those black sheep frequencies that have some GMRS users calling foul.

The FRS is covered under Part 95 of the Personal Radio Services, for which the FCC issued a Summary of Report and Order, effective July 8, 1996, establishing the Family Radio Service. The service is designed to be for "very short distance, unlicensed, two-way voice personal radio . . . so that families, friends and associated could have the capability to communicate with one another over a very short range, typically a few city blocks." So the basic idea is for short-range, personal, unlicensed communications between folks in the same general area. Perhaps you've been reading in Gordon West's "Radio Resources" column that, like the FCC's blunder in the CB area many years ago, there are plenty of folks trying for some pretty fascinating DX records using the little half-watt FRS transceivers. And why not? Furthermore, the FCC's own rules seem pretty open-ended. Take for instance the exact wording under Sec. 95.193 (FRS Rule 3) which states: "(a) You may use an FRS unit to conduct two-

way voice communications with another person. You may use the FRS unit to transmit one-way communications only to establish communications with another person, send an emergency message, provide traveler assistance, make a voice page, or to conduct a brief test." The rules go on to say that you can't make internal modifications, attach an antenna, power amplifier or other apparatus that cancels the FCC certification.

Unless I missed something, nowhere does the FCC mention interference to licensed GMRS users: an obvious indication that the powers-that-be decided these half-watt transceivers are highly unlikely to wreak havoc to the GMRS community — or they completely overlooked the recommendations of GMRS users. At the onset, the GMRS folks weighed in with a blow torch and battering ram at the FCC's door. Even so, our colleague Bill Simpson, Chairperson GMRS Committee of REACT, said in an issue of the REACTer, "... the technology demanded by the FCC should prevent interference on the repeater channels, but users should carefully monitor the frequencies for unauthorized access from FRS users."

The Personal Radio Steering Group (PRSG), a GMRS advocacy group, was correct in their observation that the FCC's FRS rules don't prohibit obscene language, business use, the transmission of false distress calls, playing of music, etc. on the unlicensed FRS channels, but the PRSG, with its panic-button concerns about interference with licensed GMRS users, has fallen silent, as I suspected back when the FRS was created — and as we reported to you last July. Try as they did with their opposition to the creation of the FRS, the PRSG, in their Petition for Reconsideration, failed to convince Uncle Sam that their concerns were valid. In response to an article by Fred Maia, W5YI, the PRSG's August 1995 newsletter titled "The 'Family' Radio Service

(Continued on page 77)

POPULAR COMMUNICATIONS

EDITORIAL STAFF

- Harold Ort, N2RLL, SSB-596**, Editor
(Internet e-mail: PopularCom@aol.com)
Tom Kneitel, K2AES/SSB-13, Senior Editor
(Internet e-mail: K2AES@juno.com)
Nancy Barry, SSB-931, Associate Editor
(Internet e-mail: NancyPCmag@aol.com)
Richard S. Moseon, W2VU, Online Coordinator
(Internet e-mail: W2VU@amsat.org)

CONTRIBUTING EDITORS

- Richard "RD" Baker**, Utility Communications
Ed Barnat, TCA-44, CB SSB
Peter J. Bertini, K1ZJH, Restoration/Electronics
Joe Carr, K4IPV, Antennas
Bruce Conti, AM/FM Broadcasts
Joseph Cooper, Projects and Broadcast Band
Gerry L. Dexter, Shortwave Broadcast
Jock Elliott, SSB-734, Citizens Band
Bob Evans, ACARS
Ed Griffin, Computer-Aided Radio
Chuck Gysi, N2DUP, Scanning
Kirk Kleinschmidt, NT0Z, Amateur Radio
Pat Murphy, Pirate Radio
Don Patrick, CB Restoration
Bill Price, N3AVY, Humor/Communications
Ken Reiss, Technical/Scanning
Edward Teach, Pirate and Alternative Radio
J.T. Ward, Scanning
Gordon West, WB6NOA, Radio Resources
Bonnie Zygmunt, Computer-Aided Radio

BUSINESS STAFF

- Richard A. Ross, K2MGA**, Publisher
Donald R. Allen, W9CW, Advertising Mgr.
Emily Kreutz, Sales Assistant
Sal Del Grosso, Accounting Manager
Ann Marie DeMeo, Accounting Department
Catherine Ross, Circulation Manager
Melissa Kehrwieder, Operations Manager
Jean Sawchuk, Data Processing
Denise Pyne, Customer Service

PRODUCTION STAFF

- Elizabeth Ryan**, Art Director
Barbara McGowan, Associate Art Director
Edmond Pesonen, Electronic Comp. Mgr.
Dorothy Kehrwieder, Production Manager
Emily Kreutz, Assistant Production Manager
Pat Le Blanc, Phototypographer
Hal Keith, Technical Illustrator
Larry Mulvehill, WB2ZPI, Photographer

A publication of



CQ Communications, Inc.
76 North Broadway
Hicksville, NY 11801-2953 USA

Offices: 76 North Broadway, Hicksville, NY 11801. Telephone (516) 681-2922. FAX (516) 681-2926. Web Site: <http://www.popcomm.com/> Popular Communications (ISSN-073-3315) is published monthly by CQ Communications, Inc. Periodical class postage paid at Hicksville, NY and additional offices. Subscription prices (payable in U.S. dollars): Domestic—one year \$25.95, two years \$45.95, three years \$65.95. Canada/Mexico—one year \$35.95, two years \$65.95, three years \$95.95. Foreign Air Post—one year \$45.95, two years \$85.95, three years \$125.95.

U.S. Government Agencies: Subscriptions to Popular Communications are available to agencies of the United States government, including military services, only on a cash with order basis. Requests for quotations, bids, contracts, etc. will be refused and will not be returned or processed.

Entire contents copyright © 1998 by CQ Communications, Inc. Popular Communications assumes no responsibility for unsolicited manuscripts, photographs, or drawings. Allow six weeks for change of address or delivery of first issue.

Printed in the United States of America.
Postmaster: Please send change of address to Popular Communications, 76 North Broadway, Hicksville, NY 11801.

SALE PRICE

\$349

DB32 Antenna Optional



Pat. No. 5,471,408

Capture the Savings

Limited time only

SAVE \$100

No Dealer Sales

The Scout[®] is the latest advancement in hand-held frequency counters; a frequency recorder that excels at finding and recording frequencies. The Scout frequency recorder is a revolutionary device that can record up to 400 unique frequencies and store them in memory.

FEATURES

- Stores 400 Frequencies in memory
- Records up to 255 hits per frequency
- 10 digit LCD display with 16 segment RF bargraph
- Reaction Tune with AR8000, ICOM R7000, R7100, R8500, R9000, ICR10, Optoelectronics New R11 Test Receiver, and the Radio Shack Pro 2005/6 with the OS456 or OS456Lite installed or the Radio Shack Pro 2035/42 with the OS535 installed
- Download recorded frequencies to a PC using the optional OPTOLINX
- Beeper and Vibrator function will alert you when a frequency has been captured
- 10MHz - 1.4GHz frequency range
- Supplied with rapid charge NiCad batteries (8 hour discharge time)
- Recall mode: View all 400 frequencies and number of hits stored in memory
- Patented Digital Auto Filter and Digital Auto Capture
- Nearfield reception: Up to 300 feet distance with 5 watt UHF transmitter



Reaction Tune with the R11



Reaction Tune with the AR8000



Reaction Tune with the ICR10

FACTORY DIRECT ORDER LINE 800-327-5912

OPTOELECTRONICS[®]

5821 NE 14th Avenue • Ft. Lauderdale, FL 33334

Visa • MasterCard • C.O.D. • Prices and Specifications are subject to change without notice

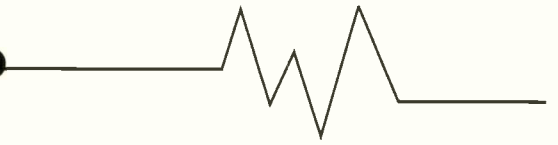
Telephone: 954-771-2050 Fax: 954-771-2052 Email: sales@optoelectronics.com

CIRCLE 149 ON READER SERVICE CARD

www.optoelectronics.com

MADE IN USA

Pop'Comm P.O.



LETTERS TO THE EDITOR

Each month we select representative reader letters for our *Pop'Comm* P.O. 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 *Pop'Comm* P.O. Address letters to: Harold Ort, N2RLL, SSB-596, Editor, *Popular Communications*, 76 N. Broadway, Hicksville, NY 11801-2909, or send e-mail via the Internet to <popularcom@aol.com>.

Look Around You, Is It Too Late?

Dear Editor:

Mr. Bob Reynolds' letter, "Call to Action," serves to remind us all that the subtle, incisive intrusions to liberty that we all experience will one day become so obvious that they cannot be ignored. The question is, "Will it then be too late?"

Look around you. If you live in the West, you're told when you can water your lawn or wash your car; neighbors are encouraged to report neighbors who have disregarded the "official decree." Smokers are told what they can smoke, when, and where. Firearms owners are told that their sport/hobby fosters crime or endangers the balance of nature, and they should give up their pleasures. Outdoor lovers in California are told that they cannot use lighter fluid on their barbecues due to the smog-enhancing fumes. Vehicle owners in New Jersey are being told that a new bill being proposed will allow the State to confiscate (yes, confiscate) older vehicles that cannot be made to meet emissions standards.

The Clinton Administration wants to censor the Internet, truly an international undertaking; only the Supreme Court had the common sense to stand in the way. Yet now, ECPA attempts to do the same, only this time it's to us, those little folks who do nothing but sit and listen.

Divide and Conquer. The government has done so. It's turned faction against faction. And it's carving a larger and larger piece of the pie for itself. Freedom is being eroded a little at a time, first yours, then a neighbors', and now mine.

I am reminded of the story of the man

of the cloth in the days before World War II, who watched as one after another of his neighbors were taken away, without any protest from anyone, until his day came. And there was no one to protest. Take heed! Listen to the others whose freedoms are also being encroached upon. We are not alone.

Andy Anderson
Midland, TX

Thoughts On The Cell Industry

Dear Editor:

The government does not want cellular scrambled. Scrambled would make monitoring harder for the three-letter agencies: FBI, DEA, etc. I would have listed the CIA, but they are not "supposed" to operate inside the U.S.

If the cellular industry did push the encrypted/digital radio/phones on their customers, would the U.S. insist on having the capability to monitor the calls as they have insisted on doing to the land-line switching systems? I believe this was part of the Crime Bill.

Increased cost to the three-letter agencies for specialized equipment for tracking encrypted/digital calls. Surely the encryption would need a back door for the government, similar to what the NSA wants, or has presently installed in other computer data-related encryption devices: PGP, Clipper, etc.

If the cellular industry was advised by Washington to solve their own problems because the technology is available and to stop blaming scanner owners for intercepting electrical waves, I'm sure the funding for politicians would dry up pretty quickly. The cellular industry pays nicely for its influence.

These are just a few thoughts. I enjoy your magazine and read it almost every month, as I have for over 10 years. I found a copy in a magazine store and broke out an old HQ-180 Hammarlund receiver that I've had since I was about 11 years old, then made a short detour to get my ham license and now split my radio time 95 percent monitoring (almost DC to daylight) and 5 percent hamming, mostly HF and mostly digital CW, RTTY, SSTV and

packet. Like most SWL/hams, I own more radios than I can possibly listen to at one time.

Rich Dalton, WD3C
Newark, DE

Not A Total Loss

Dear Editor:

Thank you for the opinion piece by Alan Dixon in the January issue. I believe Mr. Dixon said it all, except I would like to add that even though the hobby industry, ARRL, hobbyists and others worked very hard to get 2369 rewritten, WE LOST. We did not lose it all, YET! But WE LOST. I hope that our industry has come out of this stronger and more united and that we can work together and stop unfavorable attitudes and big buck businesses from taking away more of our spectrum.

H.R. 2369 has not been rewritten to EVERYONE'S satisfaction. I personally will never be satisfied when we lose radio spectrum, or anything else taken away from the people by bureaucratic bozos like Rep. Markey and Tauzin.

Michael Church

Dear Michael:

Please don't take our statement about 2369 being rewritten to "everyone's satisfaction" as the final word or a roll-over-and-play-dead attitude on this disastrous piece of legislation. Far from it — and Billy Tauzin knows it! But the fact remains that had the bill gone forward in its original form, we'd be knee deep in cellular-political manure! I suppose we should grit our teeth and be thankful.

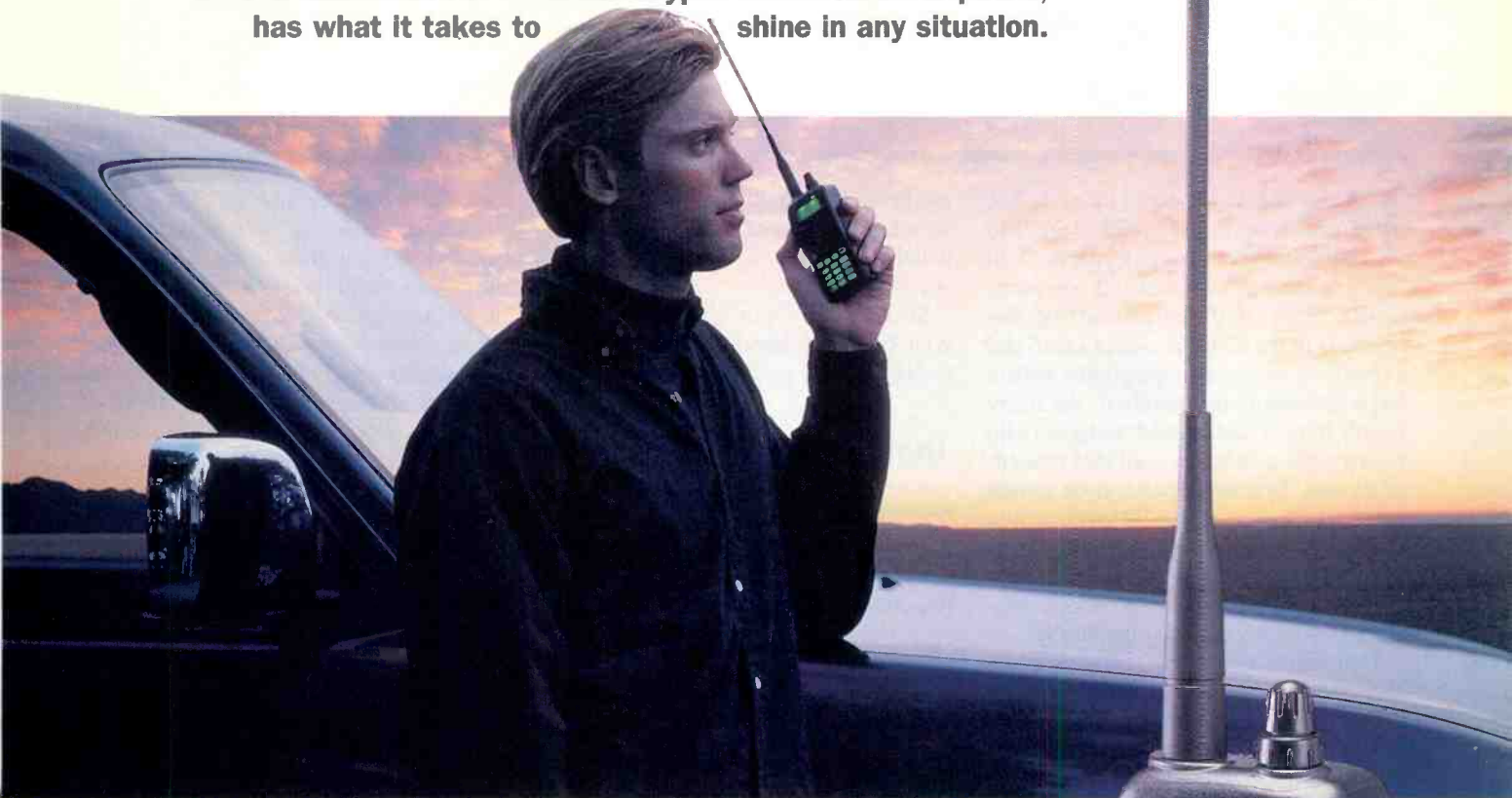
We Need Your Help

Editor's Note: We love your letters. And if the post office delivers, we'll bend over backwards to answer your questions, send along some information or photocopy an old article. But we get tons (well, not quite tons, but a whole lot!) of letters asking for help without including a self-addressed, stamped envelope (SASE).

So, please help us help you — if you ask for a reply via mail, enclose an SASE and we'll do our best to get a reply to you within a couple of weeks.

Look on the brighter side of handhelds

Kenwood's new TH-G71A dual-bander (144MHz/440MHz), with its distinctive illuminated keypad and 6 watts of power, has what it takes to shine in any situation.



TH-G71A 144/440/MHz FM DUAL BANDER

If you're looking for a compact dual-bander with all the right features, yet without the price tag that usually goes with high performance, there's no better choice than the TH-G71A.

Just hold it in your hand and it's immediately clear how well our new handheld transceiver is engineered. The ergonomic design, **illuminated keys** and **backlit display** all combine to make operation a breeze. As does the menu mode, which allows you to customize the TH-G71A by adjusting all major settings to your choice. Besides being easy to use, it also boasts extraordinary power – up to 6 watts (VHF) or 5.5 watts (UHF) of RF output (selectable) with its **high-performance antenna**. The speaker provides **powerful, refreshingly clear audio**.

Of course, power is only part of the picture. Features count. And you can count on the TH-G71A to offer what you'd only expect to find in far more expensive HTs. There are **200 memory channels** – allowing you to store transmit and receive frequencies independently. Memory data can even be edited and stored on your PC. Multiple scan functions are available, including programmable band scan, memory scan with memory channel lock-out, MHz scan and call scan. For each band there are TO (time-operated), CO (carrier-operated) and seek scan resume modes. With the Memory Name

function you can choose to identify each channel with up to **6 alphanumeric characters**. DTMF memory and CTCSS tone encode/decode are provided.

The TH-G71A also scores well for stamina and reliability, boasting long battery life – thanks to a variety of power-saving features – and **MIL-STD 810E** compliance for rain & shock resistance. So there's no need to go easy on this dual-bander. It's built better and brighter in every way.

- 6W (VHF), 5.5W (UHF) at 13.8V DC
- PC programmable
- 200 memory ch. with alphanumeric display
- MIL-STD 810E (rain & shock)
- CTCSS tone scan
- Wide-range coverage (incl. aircraft receive)*
- DTMF memory (10 ch. up to 16 digits)
- Multiple scan modes
- Key illumination
- High-performance antenna
- HI/LOW/EL power output selectable
- TM-V7A remote control (DTMF remote)

* Specifications are guaranteed for Amateur Bands only



ISO 9001
JQA-1205

KENWOOD

Amateur Radio Products Group

CIRCLE 83 ON READER SERVICE CARD 97ARD-1670

KENWOOD COMMUNICATIONS CORPORATION

AMATEUR RADIO PRODUCTS GROUP

P.O. Box 22745, 2201 E. Dominguez St., Long Beach, CA 90801-5745, U.S.A.

Customer Support/Brochures (310) 639-5300

KENWOOD ELECTRONICS CANADA INC.

6070 Kestrel Road, Mississauga, Ontario, Canada L5T 1S8

INTERNET

Kenwood News & Products

<http://www.kenwood.net>

Kenwood Bulletins

<ftp://tp.kenwood.net>

Tuning Up Your Broadcast Band Monitoring Station

Let's Build A Turntable And External Loop Antenna . . .

By Joseph Cooper, VE3FMQ

Even in today's world of cable TV, high quality FM broadcasting and the Internet, many people are still "surfing" the broadcast band for information. Part of the attraction for this hobby is in the fact that complicated and expensive receiving equipment with a large antenna is not required. As many people have found, a good portable radio with a built-in antenna is all that is needed to start. In many cases a good station will cost you less than \$100 with a little care being taken in selecting your equipment. Once you have acquired the radio there are only a few more accessories needed to help you enjoy the hobby.

This article will show you how make two important accessories yourself. By using these in conjunction with your broadcast band radio you can make a big difference in how well your monitoring station operates. These are a *turntable* and *external loop antenna*. They are easy to make, and the parts are neither expensive nor difficult to find. They are both so simple to build that you will not need to use hand tools to put them together. All of the main parts are made of pre-cut wood that is simply glued together. If you do have access to good wood working tools, then these basic designs can become the foundation for many interesting projects.

For those of you who are not inclined to make your own equipment, worry not. There are several manufacturers who make turntables and external loop antennas that you can purchase. We'll provide you with some manufactures names and addresses where they can be contacted.

And as we promised, this article will also provide you with additional information on broadcast band monitoring info that is available on the Internet. The sites provided will help you track down the location and address of your DX catch, as well as give you up-to-date information on techniques and technolo-

gy. Private individuals, clubs and government agencies support many sites which are there to help you get the most out of your hobby.

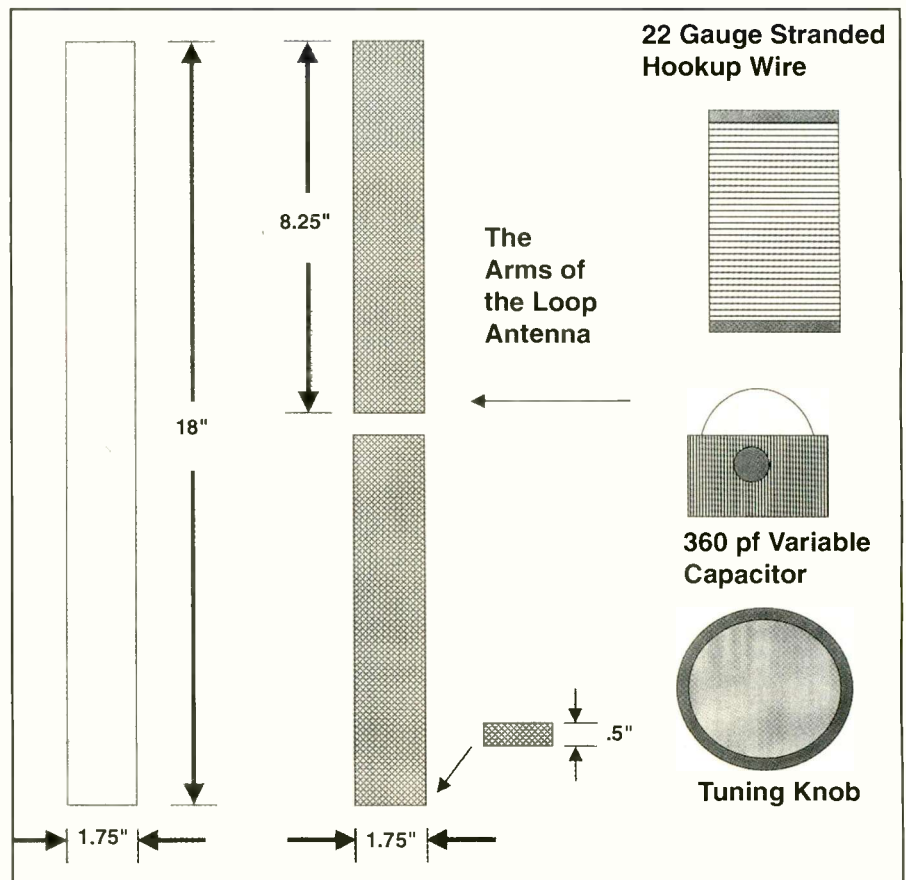
So let's show you how to "tune up" your broadcast band monitoring station to get the peak performance you want.

Using Your Broadcast Band Monitoring Station

Before we begin to tell you how to construct your accessories, there are some important things you should know about

broadcast band monitoring. The way in which the station is setup, and how it is used, is different from those used to monitor other frequencies. Most people are more familiar with the operation of shortwave monitoring stations. In most cases you would either use an outside antenna of some sort (either a random length of wire or a dipole cut to a specific length for a special frequency) or an electronically amplified "active antenna."

Those antennas that are useful for shortwave are not as effective for the broadcast band, and for this reason a different type is used. The most efficient



The parts needed to build the loop antenna.

The Loop Antenna Parts List

Amount	Part	Suggested Supplier	Part Number
65 feet (approx.)	22-gauge stranded hookup wire	RadioShack	278-1296
1	tuning knob*	RadioShack	various
1	360-pf variable capacitor	Antique Electronic Supply	CV-231
1**	18" x 1 3/4" x 1/2" wood	Home Depot	
2	8 1/4" x 1 3/4" x 1/2" wood	Home Depot	
1	bottle of wood glue or epoxy	Home Depot	

* Some people have found that wooden toy wheels that are available in many hobby and hardware stores make very inexpensive tuning knobs that perform just as well as the store-bought kind.

** You may use two of these if you have the tools to make a notch. See text.

antenna for the broadcast band frequencies is the loop, with the preferable type being one constructed using a ferrite rod. Ferrite is a magnetic material that can be formed into different shapes using molds. Once the desired shape and size has been formed, the finished rod then has a length of wire coiled around it, creating the actual loop. This loop is then attached directly to the tuning circuit of the radio.

The ferrite loop has several important advantages over a longwire or dipole antenna when used to pick up broadcast band signals. One the most important, and often the most appreciated, is its small and manageable size. Most antennas of this type are about the size of a large pencil. When you compare this to the wire antenna, which is generally several hundred feet for broadcast band frequencies, you can quickly see the advantage. What is even more important is the fact that the ferrite loop is highly directional, and can be pointed either towards or away from a signal to increase the signal strength of a station that you want. In the same way you can use the loop to reduce the strength of an undesired station, or general radio noise, by pointing the loop away from that source.

What also makes a loop antenna better for picking up a broadcast signal is that they are "quieter" than longwire antennas. At these lower frequencies, the loop antenna will be sensitive to the magnetic part of the radio wave (which carries the message), rather than the electrical part (which tends to carry noise). This type of noise reduction can be very important if you are living in an area that has high amounts of electrical noise, such as you find in an urban area or apartment building.

While the ferrite loop is a good antenna, it does have a limitation. This is the

fact that it is very broad in its tuning in order to cover the entire broadcast band. The passive loop that this article describes helps the ferrite antenna by peaking its response at certain frequencies and making it more selective.

Making A Passive Loop For Your Broadcast Band Radio

There are many types of passive loops that you can build today, but one design that is popular among BCB DXers has been chosen because of its size and simplicity. This design is easy to use because it "couples" itself to an existing ferrite loop antenna, such as those found in many of today's transistor BCB radios, by simply being placed beside it, rather than having to be directly attached to a connector on the radio.

The external loop is operated with a 365-pf tuning capacitor. When you have the radio operating, and the loop located beside it, the coupled circuit will increase the effectiveness of the radio's own anten-

na circuit. Pointing the radio and external the loop directly at the weak station increases this further. As you tune the variable capacitor on the external loop you will hear the signal strength of the radio increased if both are working properly. You can also make the loop work in the opposite way by making it *reduce* the signal strength of any other stations that are on the same frequency, but not directly in line with the antennas. This is a technique called "nulling" and, as I'll explain later, it is as important as making a signal strong when using your broadcast band station properly.

The loop antenna design uses a basic radio circuit made up of a capacitor and a loop of wire. These are held together with a form made out of two cross arms of wood. Approximately 65 feet of 22-gauge wire (roughly 16 turns) are wound around the cross arms, and then the two free ends of the wire are attached across a 365-pf tuning capacitor. When the capacitor is tuned it will create a magnetic field that is coupled to the ferrite loop.

Turntable Parts List

Amount	Part	Size	Comment
1	Top	18" x 6" x 1"	This size is approximate based on the size of your radio and the passive loop, if used
1	Bottom	8" x 8"	If it appears that this size is too small for the top, make it larger
1	Turntable	6"	Try not to make this less as it may be difficult to balance
4	Rubber feet		
1	Epoxy	small	You don't need a large amount

The center tuning frequency of the loop is roughly 940 kHz, and will tune the entire broadcast band from top to bottom. An advantage of the design is that it is able to capture the groundwave of a broadcaster at an optimal angle for a maximum signal. The loop also has surprisingly good nulling capability, and can help reduce the signal of an interfering station. The loop design also works very well without a ground attached; no particular advantage has been found when it has been used.

The Parts And Tool List

All of the parts used to make the passive loop are available through local sources, or by mail order through many electronic supply places. The parts can

also be salvaged from old broadcast band radios or surplus stores specializing in electronic parts.

The wood used in the project is available in pre-cut and finished form from many local wood supply, hobby and hardware stores. You can also use any other non-magnetic material that is suitable, such as Plexiglas.

The only important tool needed is a soldering iron with Rosin core solder suitable for an electronic projects (not acid core solder). This is used to attach the loop wire to the variable capacitor. Woodworking tools (such as a small saw and chisels) are optional and based more on the skills of the person involved. Remember that it is possible to do the project by only gluing the parts together, or by purchasing ready-made equipment

from the suppliers whose names are provided. You may also finish the wood using stain and sealer if you wish.

Constructing The Passive Loop

As with any construction project, always use caution and common sense when working. Your first consideration is to prevent accidents from occurring to yourself or others by following instructions carefully. Always read manufacturers' instructions where applicable and be certain to use eye and ear protection. Children should be supervised at all times, even if they are only watching you build this project.

1. To begin construction of the loop, start with the wooden "cross arms."

Internet Resources For The Broadcast Band Listener

There are a number of Web pages on the Internet that provide information for those who listen to the broadcast band. Here are just some of the listings that are available.

Clubs

The National Radio Club
<<http://wcoil.com/~gnbc/>>

International Radio Club of America (IRCA)
<<http://fly.hiwaay.net/~waholler/irca.htm>>

The Medium Wave Circle (British)
<<http://www.geocities.com/Hollywood/5613/mwc.html>>

Ontario DX Association (Canadian)
<<http://www.grove.net/~odxa/>>

Information For New BCB DXers

<<http://fly.hiwaay.net/~waholler/bcbinfo.htm#info1>>

Medium Wave Homepage
<<http://members.aol.com/RKDX/bcb-home.html>>

Databases Of North American Broadcasters

FCC AMQ AM Radio Database Query
<<http://www.fcc.gov/mmb/asd/amq.html>>

Spectrum Management (Canada)
<<http://spectrum.ic.gc.ca/infoback/dgse/english/baserade.html>>

Elliott Broadcast Services
<<http://www.radiostation.com/>>

Funkenhauser's Whamlog & Mediumwave DX Links
<<http://Home.InfoRamp.Net/~funk/#PAGE2>>

The Broadcast Band Logbook
<<http://members.aol.com/bcblogbook/main.htm>>

Broadcast Reception in Yardley, PA/Trenton, NJ
<<http://www.cs.wcupa.edu/~jryan/yardleyp.html>>

News About The Broadcast Band

The AM-DX News Flash
<<http://www.cybercomm.net/~slapshot/dxnews.html#AMDX>>

Radios And Accessories For Broadcast Band Listening

CC Crane Radio
<<http://www.ccrane.com/selectar.htm>>

Kiwa MW Air-Core Loop Antenna
<<http://www.wolfe.net/~kiwa/kiwaloop.html>>

GE Super Radio FAQ
<<http://www1.shore.net/~dmoisan/radio.html>>

MFJ (Active antennas and RF amplifiers)<<http://www.mjenterprises.com/>>

Related Topics

Longwave Club of America (VLF)
<<http://users.aol.com/lwcanews/index.html>>

Announcing the **All NEW** Micro RF Detector

Techtoyz

the miniature test equipment line from optoelectronics

They're Compact and Easy to Use...Featuring **Techtoyz**, the Pager Sized Test Equipment line from **Optoelectronics**.

If compact test equipment is what you're looking for, then the **Techtoyz** line is for you. All three **Techtoyz** products are built into pager style cases, small enough to fit in your palm, yet powerful enough to take on your biggest jobs. The Techtoyz line includes the new Micro Counter and Micro DTMF decoder, and now introduces the all new Micro RF Detector, a two mode (bargraph or numerical display) signal strength meter. Each mode can be set to activate a beep when signal strength reaches a selectable level from 1 -100, that also activates the hit counter which stores up to 250 hits. The Micro RF detector covers a wide, 10MHz - 2GHz, frequency range.

TMC100 Rubber Duck Antenna \$9.



Micro Counter

- 10MHZ - 1.2GHz Range
- 12 character LCD Display
- 1kHz, 100Hz and 10Hz Resolution
- 2.5mm stereo jack for optional antenna
- Store 3 frequencies in memory



Micro DTMF Decoder

- Internal microphone for audio input
- Line audio input jack
- 200 hour battery operation
- Auto blank insert after 3 second delay
- 2000 character scrollable memory



\$149.



Bargraph Mode



Numerical Mode

MADE IN U.S.A.

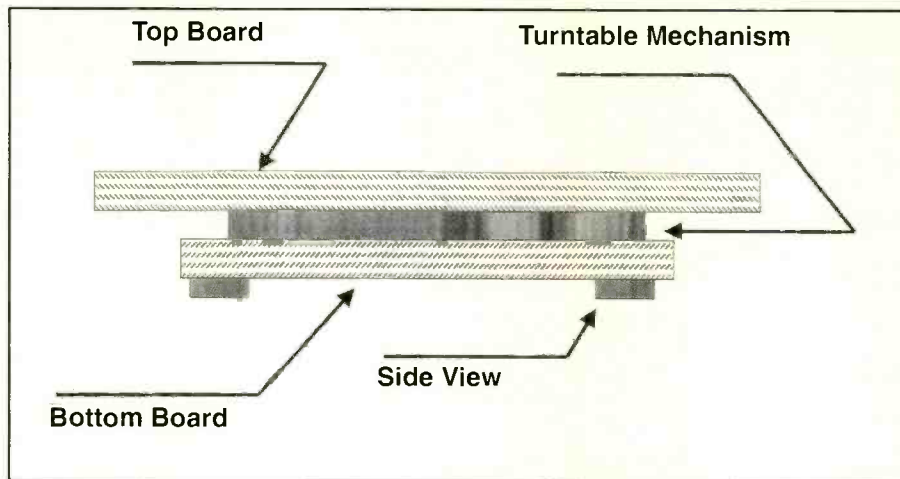
FACTORY DIRECT ORDER LINE: 800-327-5912

OPTOELECTRONICS

CIRCLE 151 ON READER SERVICE CARD 5821 NE 14th Avenue • Ft. Lauderdale, FL • 33334

Visa, Mastercard, C.O.D. • Prices and Specifications are subject to change without notice or obligation.

Telephone: 954-771-2050 Fax: 954-771-2052 EMail: sales@optoelectronics.com Internet: www.optoelectronics.com



Side view of turntable showing assembly.

a) If tools are available, cut two notches into the center of two pieces of wood board, that measure 18 inches long, by 1 1/2 inches wide, by 1/4 to 1/2 inch deep. The notches should be equal to 1/2 the width, and accommodate the depth. The result should be a snug fit that can be glued for further strength.

b) If tools are not available, use the long single piece, along with two short pieces as described in the parts list. Make certain the short pieces are the correct length as shown in the parts list. This is to keep the symmetry of the cross arms as square as possible. If it is not possible, then have two pieces that are as close to the actual length as possible.

2) Wrap the wire onto the loop.

a) If tools are available you should drill two holes in one of the arms in order to anchor the beginning and the end of the wire. Likewise, it helps to have the ends of the arms notched to keep the loops from "falling off" of the arms as it is being wound.

b) If tools are not being used, it is suggested that double-sided tape be attached to the ends of each arm in order to secure the wire as it is being wrapped on. If this is not available, you may place some "white" or carpenters glue on the ends, which is then allowed to become tacky, over which the wire is then wrapped.

When the glue is dry it will assist the wire to remain anchored to the arms.

3) Leaving a length of wire to be used later for attaching to the tuning capacitor, wrap the approximately 16 turns of wire around the ends of the two arms, making certain that the wire remains tight. Leave another small length at the end of the coil for attaching to the variable capacitor.

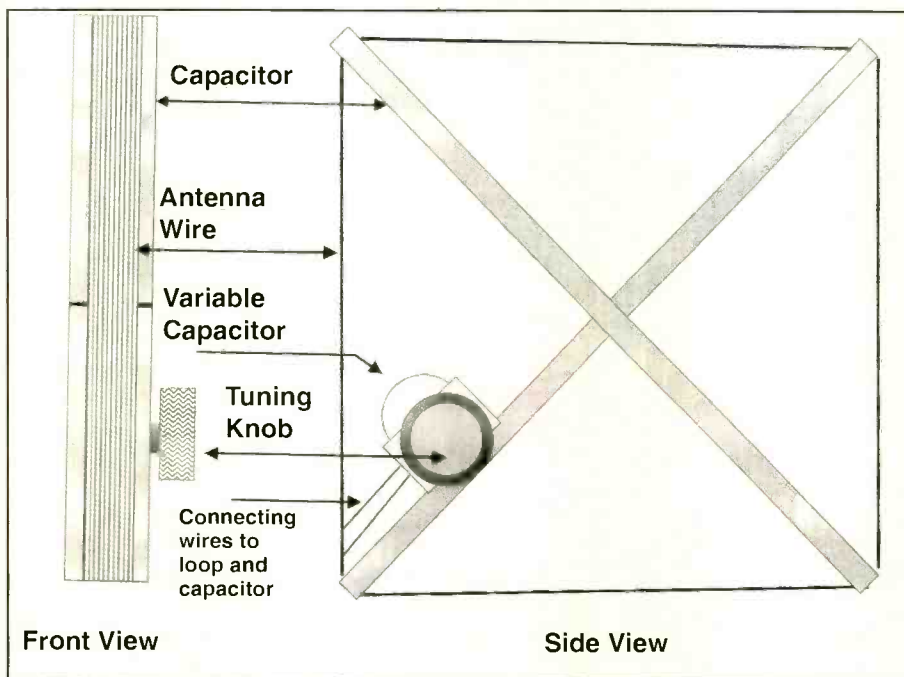
4) Attach the tuning capacitor to loop.

a) Before beginning this step it may be necessary (depending on the design of the capacitor) to remove a set of screws that hold components used for "fine tuning" (which should also be completely removed). This step allows you to tune through the entire frequency range of the broadcast band, but it is optional if you do not wish to make these changes.

b) In general it's simple to attach the capacitor to one of the arms of the loop by using epoxy glue. Use rubber bands to hold the capacitor to the arm while the epoxy is curing, but be certain to have all of the plates closed and protected during the procedure. You must also remember to place the capacitor near the center of the axis, otherwise the loop will tend to be "tipsy."

c) Give the epoxy 24 hours to cure (even for "5 minute" type) and then solder the two wires of the loop to the capacitor. Remember to attach one wire to a "lug" of the stationary plates, and the other to the lug (generally the "grounding" case) of the rotating plates.

Note: To prevent your hand from adding some capacitance to the circuit when you are tuning it you should attach a tuning knob to the rotor shaft. You can either purchase one from an electronic supply house, or use a wooden toy wheel. Remember to check the diameter of the tuning shaft in order to make certain that the knob will fit properly.



A side view of the radio with the loop and turntable.

Testing The Loop

To test the loop, place it beside your broadcast band radio that has a built-in ferrite antenna (not a telescoping type). Simply turn on the radio and tune in a station at the "low end" of the dial (around 550 kHz) and turn the capacitor rotator until you hear a change in the signal strength of the station heard. This will indicate that the loop is working at that low frequency.



A GE Super Radio III with the assembled loop and turntable.

Then tune to a station in the "high" end of the band (above 1500 kHz) and tune the loop's capacitor again. You should have the same results.

If you do not find that any effect is taking place, check the wire, capacitor and solder joints to see if any problems can be found, then fix. Likewise, use a different radio if one is available in order to see if the problem is with the radio.

Using The Loop

The loop can be placed either beside or behind the radio when being used. Remember to give yourself enough room to be able to reach the tuning knob on the loop's capacitor as well as the controls on the radio itself. When you have tuned in a station on your radio, try improving the signal by tuning the loop itself. You should hear an improvement in the signal, particularly if there is a strong station next to the frequency or some additional interference nearby.

Using The Loop With A Radio Without A Built-in Ferrite Antenna

For those readers who wish to use the loop antenna with a radio that only has an external antenna, use the method described below.

a) Cut a 10-foot length of 22-gauge wire.**

**you may have to experiment with this in order to find the proper length for your situation.

Rave Review
Pop Comm
April '96

SEE US ON THE WEB!
www.vikingint.com



Professional 10 HOUR RECORDER

"BUILT LIKE A BATTLESHIP"

- Heavy duty commercial recorder - NOT improvised from consumer models
- 12, 14, and 16 hour models also available
- BUILT-IN voice activation (add \$30)
- Applications information included
- Dimensions: 11.5 x 7.0 x 2.75"

SPECIAL
Pop Comm
Price..

FREE
REPAIR & RESTORATION
SERVICES

\$159

COD's OK Calif. residents add tax. Sorry, no credit cards. Free catalog USA only, other countries \$5.

Free Shipping on Prepaid Orders

Viking International

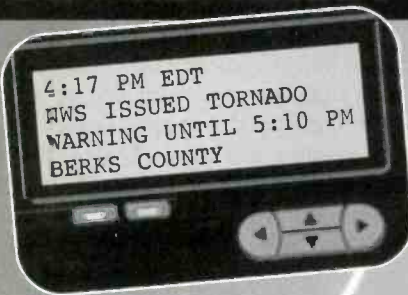
150 Executive Park Blvd. #4600 San Francisco, CA 94134

Factory Direct

Phone: (415) 468-2066 • Fax: (415) 468-2067 "Since 1971"

CIRCLE 80 ON READER SERVICE CARD

BE PREPARED! SAVE LIVES with



...Official NWS
Weather Warnings
Immediately

Works with any
alphanumeric pager

Choose from

- Tornado/T-Storm
- Daily forecasts
- Hurricanes
- Snowstorms
- Flood/Marine
- 25 other categories

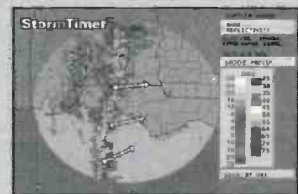
...All with county
specific coverage

(Also available by fax)

WeatherPager™
By AccuWeather®
"weather warnings to your pager"

...Real-time Radar to your PC

- Unlimited access to current Doppler Radar
- Automatic access, display and "in-motion" loops
- Internet and cellular access to your laptop or PC



See the precise location and forecasted movement of severe weather with exclusive StormTimer™

Call 800-769-2765 to start today!

ACCU WEATHER

The World's Weather Leader™

385 Science Park Road, State College, PA 16803

Call 800-769-2765 • Fax 814-231-0453 • E-mail salesmail@accuwx.com

Internet <http://www.accuweather.com>

1 © 1998 AccuWeather, Inc.



CIRCLE 86 ON READER SERVICE CARD

CONSEC.NET

Where The Internet Means Business

Web Site Hosting

Your Own Domain
Probably Cost Less
Than Your Yellow Pages Ad

Call Now

800-341-6419

CIRCLE 65 ON READER SERVICE CARD

Scanner Buffs... Look no further!

Durham Radio stocks AOR, RadioShack, Welz, Uniden and Yupiter scanners with the frequency coverage you've been searching far and wide for! Our prices are the best in Canada!



AOR AR8000 Bearcat UBC3000 RadioShack PRO-26 Welz WS1000 Yupiteru MVT7100
www.durhamradio.ca/scanners.htm Toll-Free 1-888-426-1688

Canadians Only!

Check out our 1998 Full-Line Catalog! It's 68 pages crammed with all kinds of communication gear.

Send \$3.00 to
Durham Radio
350 Wentworth St. E.
Oshawa, Ont. L1H 7R7
(905) 436-2100

Visit our web site at www.durhamradio.ca

Get online
with
DELPHI
INTERNET™
POP'COMM
on Delphi!

To sign up dial
1-800-365-4636

with your computer & modem, and enter
ELECTRONIC at the sign-up
password prompt! You can find

POPULAR COMMUNICATIONS
in the Radio & Electronics Forum
(GO HOB RADIO).

<http://www.delphi.com/electronic>

CIRCLE 67 ON READER SERVICE CARD

C. CRANE COMPANY

COMMUNICATION EXCITEMENT



The Sangean ATS 909

- Shortwave
- Scanners
- Antennas

Free Catalog

• Sangean • Lowe • Drake • Uniden

The most powerful antennas
for shortwave/MW and much more!
558-10TH ST. FORTUNA CA 95540
FAX 707-725-9060
Website: ccrane.com

800-522-8863(TUNE)

CIRCLE 63 ON READER SERVICE CARD

b) Wrap one turn around the loop so that you have two nearly equal lengths of wire remaining.

c) Where the two wires meet, begin twisting the two lengths together into a twisted pair of wires.

d) When twisted the wire together to a point where you have reached near the end of the wires, stop and clean the ends of insulation using a proper wire stripper. (Do not use a knife as it can be a danger to you, and its use does not often produce a good clean end).

e) At the radio, attach one end to the antenna terminal, and the other end to the ground post on the radio.

f) To test it, turn on the radio and tune it to a strong local AM broadcast station. Then tune the variable capacitor on the loop. You should hear an improvement in the strength of the signal. You can also try changing the direction of the loop to see if any changes occur in the level of signal strength.

Making A Turntable For Your Broadcast Band Radio

To get the strongest signal with a broadcast radio with a built-in ferrite loop antenna, you will need to point the radio in the direction of the station. If you are listening to only a few stations this can be achieved by simply turning the radio by hand in the direction you want. If you are doing some serious searching for stations you will find this to be bothersome after a short amount of time. Eventually you will reach a point when you are no longer enjoying your monitoring.

Many people have found that a radio with a ferrite loop can be turned toward (or away from) a broadcast station easier when using a turntable than by hand. This is a simple device (sometimes called a "Lazy Susan") that uses ball bearings in a track to smoothly turn a platter of some time (it can be either metal or plastic). These are purchased as a manufactured unit from most hardware or appliance stores, or they can be built from parts. There is no ideal size for this device. You should plan it according to the type of radio you will use. The plan provided here is based on the dimensions of the General Electric Super Radio III that was used in last month's article.

As with our passive loop, you do not

need to use tools, and the wood can be purchased pre-cut and finished. One possible source is found in hobby and craft stores where you can buy large finished pieces in the project wood sections. Here you will find cut and trimmed wood that would normally be used for plaques or pictures. They will cost more than unfinished wood, but they will last for years and make your monitoring station look professional. Again, you do not need to cut or drill the wood in order to attach them to the turntable mechanism, but you can use a good epoxy glue instead.

To make the turntable you must be careful to keep all of the parts properly centered. If you do not, the turntable will not rotate about the axis and your "aim" will be off to a degree. The best way to do this is to simply measure out the centers of the boards and put everything together with out gluing. Try turning the turntable with the boards attached and see how well it works. Make "eyeball" corrections and mark the position of the parts lightly with a pencil.

When you are ready, mix the epoxy according to the manufacturers' instructions and apply a light coating to one surface of the turntable mechanism. Apply this to the bottom board while carefully lining it up with the reference marks you have made. Do not attach the top until the bottom unit has cured and hardened (and this is suggested to be for 24 hours even for the so-called 3-minute epoxy). To ensure that a good bond is made you may wish to hold the turntable firmly to the surface of the wood using either elastic bands or twine. Do not hold them down so hard as to move the two parts out of alignment.

For the second step you should check first to make certain that the turntable still turns, then apply a light coat of epoxy to the top of the mechanism. Carefully apply the top part of the unit and again check to see if the marks you made are lining up properly. Again wait for 24 hours, and where possible try and hold the parts together as described above.

Your "test" of the unit should be a simple one; simply place your radio on the loop and try using it. With the radio on, tune in a strong station and then turn the radio around the axis of the turntable. If the loop in the radio is a good one then you should "hear" the distinct 'peak' and 'null' that is characteristic of that type of antenna. Once you have tried this, then add the passive loop by placing it to one side of the radio and then tuning it with its own variable capacitor. You should

Ready-Made Loops

There are at least two ready-made passive loops designed for use with broadcast band radios that have built-in ferrite loop antennas. One is currently made in the United States and has been on the market for a number of years. The other is a new model that has been recently developed in Japan and is now available in the U.S.

Select-A-Tenna

The Select-A-Tenna works in a similar way to the project described in the article, and will provide the same performance or better. It is contained in an attractive plastic case with tuning dial and sells for under \$60. This American-made product is available through Intensitronics Corporation, Box 562 Hales Corners, WI 53120, as well as through several shortwave suppliers. Ordering information can be had through their toll-free number at 1-800-382-4155. You can also see the loop (as well as hear a demonstration if your computer is properly equipped!) by going the C. Crane Website at <<http://www.ccrane.com/selectar.htm>>. There are several different models of this product available, one of which can be used with a radio that has no ferrite loop, and another that is used in conjunction with a long-wire outdoor antenna, though these are sold at higher prices.

I've used this particular product on several occasions and found all of the manufacturer claims about performance are correct. It is well made, and with proper care you can take it to remote locations to help tune in distant signals. It is also useful in urban areas where electrical interference needs to be reduced, though it will not be as effective as an electronic filter.

The Poster Loop

The Poster Loop, which will be distributed later this year by Kiwa Electronics, is a new product in a very exciting line of high-end antennas for the broadcast band. Like the loop described in the article, it is designed to be placed alongside a portable receiver with an internal ferrite loop. The company claims their product will improve signals; given the performance of their other products (such as their \$360 amplified BC band loop) this cannot be disputed. No price for the new Poster Loop was available at press time.

Kiwa Electronics' High-Performance MW Air-Core Loop Antenna features electronically-balanced circuitry, complete 360-degree rotation, tilt controls, a local/DX preamp switch, liquid-filled compass for bearing measurements of signals and tunes from 530 to 1700 kHz using a main and fine-tuning control. The control surface is separate from the antenna to facilitate adjustments. It's powered by an included AC supply or battery.

Kiwa's Pocket Loop is a 12-inch air-core loop antenna that collapses to fit in your pocket. Tuning range is from 530 kHz to 23 MHz in four bands using battery-powered low-noise amplifiers. No direct connection to your receiver is required. Slip a special coupler over the whip antenna for improved reception. For enhanced BCB reception, the coupler is placed near your radio's internal ferrite bar antenna. Powered by a 9 volt battery, (not included) the Pocket Loop costs \$120 (plus shipping/handling).

For more information contact Kiwa Electronics 612 South 14th Avenue Yakima, WA 98902 USA 509-453-5492 or for orders at 800-398-1146. You can also check their Web page at <<http://dune.wolfenet.com/~kiwa/index.html>>.

— VE3FMQ

hear a distinct change in the level of the signal. Try finding a weaker station and see the effects of using both the turntable and the passive loop.

Getting The Most From Your Accessories

As with anything worthwhile, you may need to practice using the loop and turntable get the best results. There is some art and science involved in using your radio and as the saying goes "results may vary according to your location."

Remember that the time of day, and the season may have significant effects on your monitoring results. Take advantage of the information available to you through the many clubs that promote and support the monitoring of the broadcast band. Be certain to read Bruce Conti's Broadcast DXing column in *Popular Communications* for timely tips, loggings and advice.

I have also included a sidebar with a listing of Web sites that contain important information that you can use to help you "surf the broadcast band" with greater success. Good listening and 73! ■

FREEPLAY®

...FREE POWER NO BATTERIES REQUIRED

BAYGEN is...The leader in personal power generation. **Just wind it up and turn it on!**

FREEPLAY RADIO



The World's *only* completely battery-free, wind up AM/FM and Shortwave radio!

The power source is an internal B-Motor carbon steel spring driving a generator that is powered by hand..

Put the power back in your hands and contact BayGen today.

Dealer inquiries welcome.

1 800 WIND 234

CIRCLE 62 ON READER SERVICE CARD



SNGP-2-WM
"No Ground" Plane Window Mount CB Antenna 28" High w/18' coax and PL-259 connector



SNGP-2-RM
"No Ground" Plane Roof Mount CB Antenna 22" High w/18' coax and PL-259 connector



EV-TV-4
Window Clip Mount TV Antenna Twin 16" Rabbit Ears 12' RG-59U with F-connector



MS-4
Window Clip Mount Mobile Scanner Antenna 25MHz to 1GHz coverage 12' Coax with BNC connector



We offer a full line of quality stainless steel and fiberglass mobile antennas for CB, Marine, Scanner, and Cellular

EVERHARDT ANTENNAS
6000-D Old Hemphill Road
Fort Worth, TX 76134
800-735-0176

CIRCLE 68 ON READER SERVICE CARD

TV Or Not TV? That Is The Question

We Dig Up Television's Hidden Pre-History

By Alice Brannigan

Ron Halberstrom of Minnesota has been doing some research for a high school term paper entitled "Great Inventions of the Twentieth Century: Television Broadcasting." His problem is in assigning proper credit. That's because different sources alternately credit either Philo T. Farnsworth or Vladimir Zworykin. Ron made the tragic error of asking us to settle the debate by selecting one of these distinguished gentlemen.

Actually, both Farnsworth and Zworykin built and improved upon ideas that existed at that time. Their main contribution was using a cathode ray tube (CRT) and associated circuitry to depict moving electronic television images. In fact, that was a far cry from the invention of television, or television broadcasting.

If "television broadcasting" is defined as the transmission of moving images to the public over the radio airwaves, then I'd say the credit for inventing television broadcasting should probably go to now-forgotten John Geloso, a 28-year-old Italian immigrant. Geloso was the chief engineer of the Pilot Electric Manufacturing Co., Brooklyn, New York, a manufacturer of popularly priced table-top radio receivers. Geloso was also responsible for the design, construction, and successful operation of the Pilot/WRNY television apparatus 70 years ago.

Prior to the development of the CRT, television technology consisted of rotating synchronized mechanical disc and drum image scanners offering 30- to 60-line definition (eventually standardized at 48 lines and 15 pictures per second). This system had been invented in 1923 by Scottish engineer John Logie Baird.

Considerable testing, demonstration, and experimentation had been made with mechanical drum systems using both wirelines and wireless. Charles F. Jenkins first publicly demonstrated wireless



Three giant photoelectric cells used in 1928 by WRNY/W2XAL, the first television broadcast station, are proudly displayed. Pictured here, from left to right, are WRNY's Bob Hertzberg (W2DJJ); Pilot's President, Isidor J. Goldberg; and John Geloso, the engineer who designed the pioneering television equipment.

transmission when he sent a silhouette photo image from the District of Columbia to Philadelphia in this manner in 1923. In 1925, Jenkins demonstrated transmitting a motion picture over Naval station NOF, Washington, D.C.

In February of 1928, John Logie Baird transmitted a live image from London to New York via shortwave. In late June, 1928, Geloso's prototype Pilot Radio system was taken to Chicago, Illinois, where it was connected to the transmitter of broadcast station WCFL (1500 watts, 620 kHz). During the one-day test, a receiver was set up in a club house a few miles

distant from the WCFL transmitter, located at the Municipal Pier. After that, the communications equipment was returned to the factory for upgrading.

The prototype Pilot camera used for the WCFL demo had used nine-inch photoelectric cells, but these were changed to a 22-inch size in order to provide a brighter image.

Before August of 1928, everything had merely been a series of brief demonstrations. However, as of August 12, 1928, the first experimental WRNY/W2XAL television broadcast tests were directed at New York City, using Geloso's improved

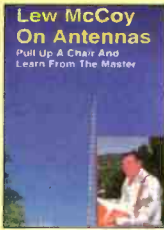
Calendars, Pins, Cards & Books

The Quad Antenna
by Bob Haviland, W4MB
Second Printing
An authoritative book on the design, construction, characteristics and applications of quad antennas.



Order No. QUAD..... **\$15.95**

McCoy on Antennas
by Lew McCoy, W1ICP
Unlike many technical publications, Lew presents his invaluable antenna information in a casual, non-intimidating way for anyone!



Order No. MCCOY **\$15.95**

The Vertical Antenna Handbook
by Paul Lee, N6PL
Learn basic theory and practice of the vertical antenna. Discover easy-to-build construction projects.



Order No. VAH. **\$9.95**

Keys, Keys, Keys
by Dave Ingram, K4TWJ
You'll enjoy nostalgia with this visual celebration of amateur radio's favorite accessory. This book is full of pictures and historical insight.



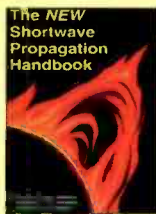
Order No. KEYS **\$9.95**

The VHF "How-To" Book
by Joe Lynch, N6CL
This book is the perfect operating guide for the new and experienced VHF enthusiast.



Order No. BVHF..... **\$15.95**

The NEW Shortwave Propagation Handbook
by W3ASK, N4XX & K6GKU
A comprehensive source of HF propagation principles, sunspots, ionospheric predictions, with photography, charts and tables galore!



Order No. SWP..... **\$19.95**

W6SAI HF Antenna Handbook
by Bill Orr, W6SAI
Inexpensive, practical antenna projects that work! Guides you through the building of wire, loop, Yagi and vertical antennas.



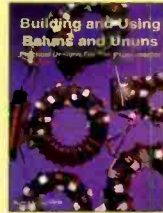
Order No. HFANT **\$19.95**

CQ Amateur Radio Almanac
by Doug Grant, K1DG
Filled with over 600 pages of ham radio facts, figures and information. 1997 edition, next volume won't be published until 1999.



Order No. BALM97..... **\$19.95**

Building and Using Baluns and Ununs
by Jerry Sevick, W2FMI
This volume is the source for the latest information and designs on transmission line transformer theory. Discover new applications for dipoles, yagis, log periodics, beverages, antenna tuners, and countless other examples.



Order No. BALUN . . . **\$19.95**

33 Simple Weekend Projects
by Dave Ingram, K4TWJ
Do-it-yourself electronics projects from the most basic to the fairly sophisticated. You'll find station accessories for VHF FMing, working OSCAR satellites, fun on HF, trying CW, building simple antennas, even a complete working HF station you can build for \$100. Also includes practical tips and techniques on how to create your own electronic projects.



Order No. 33PROJ.... **\$15.95**

Amateur Radio Equipment Buyer's Guide
This New 144-page book is your single source for detailed information on practically every piece of Amateur Radio equipment and every accessory item currently offered for sale in the United States. From the biggest HF transceiver to Ham computer software, it's in the CQ Guide, complete with specs and prices. Over 2100 product listings (3100 including transceiver accessories!).



Also includes the most comprehensive directory anywhere of Ham product manufacturers and dealers in the USA, complete with phone and FAX numbers, web sites, and E-mail addresses, with 475 dealers and manufacturers listed.

The CQ Amateur Radio Equipment Buyer's Guide is jam-packed with solid information and great reading. No Ham should be without a copy in the shack. Makes a great Holiday gift, too. Order today and get guaranteed delivery in time for Christmas.

Order No. EBG..... **\$15.95**

CQ Award Pins



If you've earned any of CQ's Awards, you can also display the corresponding CQ Award pin. Available for WAZ, 5 Band WAZ, 160 Meter WAZ, CQ DX, CQ DX Honor Roll, WPX, WPX Honor Roll, and USA-CA awards.

ONLY \$5.00 EACH.



Playing Cards

Top quality, plastic coated playing cards.

ONLY \$9.95 per deck

1998/99 Calendars



Fifteen month calendars - January '98 through March '99

Please specify Amateur Radio or Classic Radio Calendar

YES! Rush me my book(s), calendar(s), cards and pins right away!

Qty	Item #	Description	Price	Total Price
U.S. and possessions - add \$4 shipping/handling. FREE S/H on orders \$50 and over. Foreign - shipping/handling charges are calculated by order weight & destination. A \$4 credit will be applied for Foreign orders over \$50.			Shipping/Handling	
			Total	

Name _____

Call sign _____ Phone/Fax No. _____

Street Address _____

City _____ State _____ Zip _____

CQ Communications, Inc.

76 North Broadway, Hicksville, NY 11801 Phone: 516-681-2922/Fax: 516-681-2926

or call toll-free 800-853-9797



equipment. Actual daily broadcasting commenced on August 21. The audio portion of the signal was transmitted over WRNY (500 watts, 920 kHz), with the video portion going out over experimental shortwave station W2XAL (500 watts, 9700 kHz). The transmitters were located in the small community of Coytesville, at a site on Route 9W, a half mile north of Fort Lee, New Jersey. Studios were in New York City's Roosevelt Hotel. WRNY/W2XAL were both owned and operated by the Experimenter Publishing Co.

Who Was Watching?

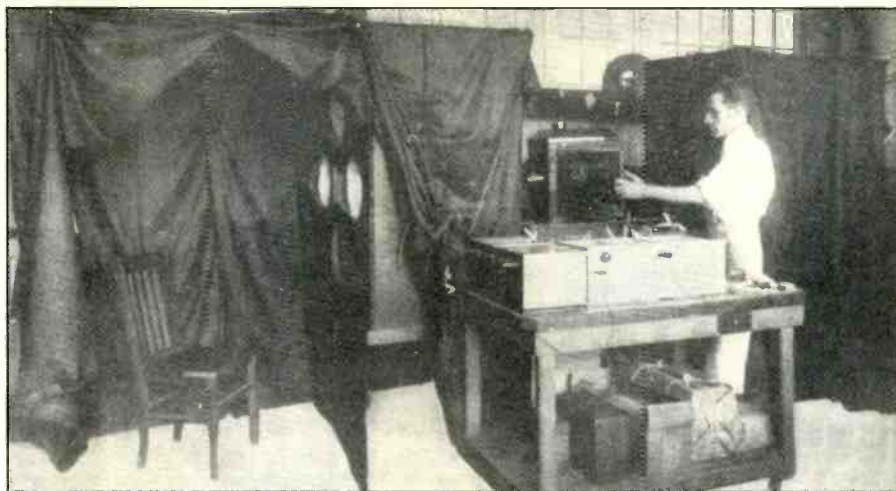
Certainly, there wasn't a large audience waiting the arrival of these broadcasts. However, remember that these were still the early years of broadcasting, when radio was looked upon by the public as a novelty and technological marvel. In September of 1928, New York's Madison Square Garden held the "Fifth Annual Radio World's Fair." Television demonstrations given by three companies at that event proved so popular that one newspaper reported, "The Garden's special police force was on the brink of mutiny. At one time the lines leading to the various demonstration chambers wrapped themselves about the floor like so many snake-dances and threatened to disrupt the good behavior of the entire floor."

No less than six companies offered television receiver kits at the 1928 Radio World's Fair. All reported briskly selling out of every kit they had brought with them and frantically pleading with their respective factories to rush them more.

Big Success

It didn't take long for others to commence television broadcasting using mechanical scanning disc or drum systems. The AM video signals were allowed to occupy a bandwidth no wider than 5 kHz. This is incredibly meager when compared with the spectrum-hungry requirements of modern-day television systems that need 6 MHz for combined FM video/audio transmission.

On September 11, 1928, General Electric's WGY in Schenectady, New York, broadcast a one-act television drama, "The Queen's Messenger," by J. Hartley Manners. It was presented live at 1:30 p.m., and repeated live at 11:30 p.m. WGY's video went out on 790 kHz (50 kW) and also W2XAF, 9555 kHz (40 kW), while the audio was transmitted only over W2XAD, 13660 kHz (25 kW).



The television studio of WRNY/W2XAL. The subject being televised went into a darkened booth (left) and sat in a chair, a few inches from the camera and bright lights. The operator is shown to the right.

By late 1928, irregular telecasts were being made at Lexington (near Boston), Massachusetts, with 500-watt video going out over W1XAY on 4878 kHz, and the audio portion sent over WLEX (50 watts, 1390 kHz, later changed to 1420 kHz). These broadcasts were made by J. Smith Dodge, of Adams Street, who owned both stations. The television equipment there was designed and operated by Alfred J. Pote, formerly in charge of the experimental labs at Raytheon Manufacturing Co.

Jenkins Laboratories, at 1519 Connecticut Ave., N.W., Washington, D.C., was also transmitting movies by late 1928 over its station, W3XK. The video frequencies used were 1605 kHz and 6420 kHz, each with 5 kW. W3XK operated every Monday, Wednesday, and Friday night from 8-9 p.m. No audio was

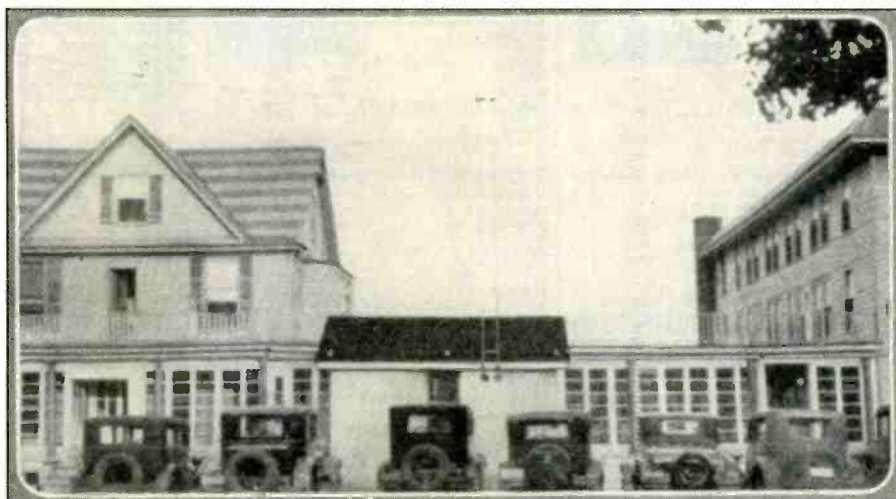
needed, even though W3XK ran recent films. Talking films didn't appear until 1927, so early television audiences didn't expect movies to talk.

Don Lee, in Los Angeles, put station W6XS (500 watts, 2150 kHz) on the air on December 23, 1931.

By 1931, there were some 26 television stations licensed in major cities to operate with mechanical scanning systems, with no fewer than seven in the metro New York/New Jersey area. Admittedly, some transmitted little more than still test patterns interspersed with brief interludes of film shorts.

Johnny Come Lately

Electronic TV technology using the CRT offered the promise of a vast improvement over mechanical scanning



Transmitter house for both WRNY and W2XAL is in the center of the photo. The lead-in can be seen to the right of the window below the roof line. The site was on the New Jersey Palisades, just across the Hudson River from New York City.



The transmitter used by W2XAL was small and simple, but it holds a place in history as the video component of the first television broadcast station.

technology. By 1927, Philo Farnsworth had been able to give a lab demonstration of his system, providing 100-line resolution at 30 pictures per second. Still, nothing practical could be done with it since the corresponding camera tube, called an iconoscope, hadn't yet been sufficiently developed. That full development was demonstrated by Zworykin in 1928.

It wasn't until October of 1931, three years after mechanical television technology broadcasting had been going full tilt, that Philco applied for an experimental license to test the Farnsworth electronic system over the air. This became



In an early brief test of Geloso's television equipment at Chicago station WCFL, someone demonstrates the way to position one's self for camera and microphone.

HF-VHF-UHF Receiver Multicouplers & Preamplifiers

Are you using several HF radios or VHF/UHF scanners at your monitoring site??
.....consider including a multicoupler or a preamplifier to your system.

SWL/Scanning - Radio Surveillance - News Rooms

Both our **Passive** and **Active Multicouplers** are commercial grade specially designed for **demanding monitoring** applications with multiple radios. Our **2 and 4 port couplers** are 50 ohms units with better than **24 dB of port-to-port Isolation**. Active couplers features wide-band **Low-Noise** distribution amplifiers with **High-Pass/Low-Pass** filtered inputs, BNC connectors standard.

Price range: \$70 to \$150 depending on model

Give us a call for data sheet, application and ordering information.



STRIDSBERG ENGINEERING, INC.
P.O. Box 5040
Shreveport, LA 71135-5040, USA.

Phone: (318) 861-0660

Fax: (318) 861-7068



World's Most Powerful CB and Amateur Mobile Antenna*

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

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

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

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

Why Wilson 1000 Performs Better

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

We have designed a new coil form which suspends the coil in air and still retains the rigidity needed for support. This new design eliminates 95% of the dielectric losses. We feel that this new design is so unique that we have filed a patent application on it. In addition, we use 10 Ga. silver plated wire to reduce resistive losses to a minimum.

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

The Best You Can Buy

So far you have read about why the Wilson 1000 performs better, but it is also one of the most rugged antennas you can buy. It is made from high impact thermoplastics with ultraviolet protection. The threaded body mount and coil threads are stainless steel; the whip is tapered 17-7 ph. stainless steel. All of these reasons are why it is the best CB antenna on the market today, and we guarantee to you that it will outperform any CB antenna (K40, Formula 1, you name it) or your money back!

*Inductively base loaded antennas
**Call for details.

Lockheed - California Company

A Division of Lockheed Corporation
Burbank, California 91520

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

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

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

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

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

Individual test results may vary upon actual use.

CALL TODAY

TOLL FREE: 1-800-541-6116
FOR YOUR NEAREST DEALER

Wilson 1000

DEALERS Exclusive dealer areas still open

Roof Top Mount.....\$995 Little Wil.....\$2995
Trunk Lip Mount.....\$6995 Wilson 2000 Trucker \$995
Magnetic Mount.....\$7995 Wilson 5000 Trucker \$7995
500 Magnetic Mount \$5995 Call About Fiberglass!!!
Wilson 5000 Baseload — NOW AVAILABLE!

Wilson
ANTENNA INC.

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



A rare QSL from one of the last mechanical scanning television stations, W9XG, West Lafayette, Indiana. It's dated May of 1937, two years before RCA's Gen. David Sarnoff curiously announced he was "inaugurating the television age." What was he thinking?

4-kW station W3XE, located at Tioga and "C" Streets, Philadelphia, Pennsylvania. Video signals were sent on 49 MHz, with SSB audio on 54 MHz. The station began its first field tests in 1935 using 345 lines. In December of 1936, it upgraded to 441 lines, 60 frames per second.

The electronic system proved far superior to the mechanical systems, which could never achieve better than 220-line definition, at about 15–20 frames per second. In 1931, RCA was sending pictures with 121 lines, which increased to 343 lines by 1935, then 441 lines by 1937. (In 1941, transmission technology was standardized in North America at 525 lines, 30 pictures per second.)

In late 1936, during the Tenth Anniversary of the Inauguration of NBC, that network opened its experimental station, W2XBS (10-kW, 343-line video on 41.75 MHz, audio on 52 MHz), atop the Empire State Building, New York City. In what became the first public demonstration of electronic television in the U.S., four 40-minute demo programs were watched by 200 persons on 15 receivers provided by NBC. NBC announced that no TV receivers could be commercially produced until the number of lines and speed of transmission could be agreed upon within the industry.

The first commercial TV receiver using CRT technology was announced by a small company in May, 1938. Although no industry or FCC standards had yet been established, most stations were then sending 441-line/60-frame pictures. This set had a 441-line picture on a Munchkin-sized three-inch screen. It sold for \$125.

In January of 1939, CBS installed its experimental electronic TV station, W2XAX (441-line, 15-kW video on 51–52.5-MHz, 7.5-kW audio on 55.75 MHz),

atop New York City's Chrysler Building.

Other similar experimental stations appeared in the late 1930s in Boston (MA), Schenectady, Albany (NY), Kansas City (MO), and elsewhere. In Los Angeles, W6XS, the old Don Lee mechanical disc station upgraded to the new technology and became W6XAO (300-line, 24-frame, 1-kW video on 42-MHz, 150-watt audio on 52 MHz).

As the 1930s ended, nearly all mechanical scanning technology stations had either modernized or gone dark. The last two old timers holding out in 1939 were Purdue University's W9XG (60 lines/20 frames, 1500 watts, 2050 kHz) from West Lafayette, Indiana, and the State College station, W9XAK (60-lines/20-frames, 2050 kHz) in Manhattan, Kansas.

Overseas, electronic stations were on the air in London, Paris, and Warsaw.

The Birth Of Television, Not!

The amazing popularity of electronic video technology has generally caused its inception to be universally regarded as the birth of television. It's the system we still use today. Of course, those pioneer commercial stations using electronic technology take credit for creating television broadcasting. But they weren't broadcasting until 1941. Before 1941, when the FCC established transmission standards, all stations were considered by the FCC as doing only "fundamental research or technical experimentation in the art of developing television apparatus." That was more than a decade after Geloso and the others.

To Confuse Matters . . .

Further confusing the issue was the

famous dedication speech at RCA's 1939 New York World's Fair exhibit, as delivered by Gen. David Sarnoff, President of RCA. In that speech, broadcast out over NBC's national radio network and telecast on W2XBS, Sarnoff proudly announced the "inauguration of the television era." What was he thinking? Those words were perceived by many as historic fact that 1939 was the birth of television. Therefore, in 1989, media dummies ran around perpetuating this myth by beating the drum about "television's 50th birthday." Too bad it caused mechanical scanning television broadcasters to vaporize from the national memory.

Epilogue

True, Geloso's images were black and white, small, sent slowly, and fell far short of the clarity provided by today's television receivers. Nevertheless, the images were live, they moved, were bright, easily recognizable, and were broadcast to the public over the airwaves on a regular daily schedule years before anyone else we know about was doing it.

And what became of our intrepid hero? Flushed with success, in October of 1929, Pilot Electric moved from their cramped quarters in Brooklyn to huge facilities at an old former cotton mill in Lawrence, Massachusetts. Unfortunately, this ex-pensive move was poorly timed and coincided exactly with the start of the Great Depression. By 1932, Pilot had gone under. Although Pilot's owner later went back into business under a similar name, John Geloso had gone back to Italy. There he became a prosperous manufacturer, although during the war years he was hunted by the Fascist Italian government because of his American ties. When the war ended, he returned to manufacturing, producing a line of TV receivers, high-fidelity equipment, and ham radio gear.

In my opinion, Geloso deserves to be rescued from obscurity and finally recognized as a star in the galaxy of television broadcast pioneers. Maybe a mention in Ron Halberstrom's term paper will help. It couldn't hurt.

We always seek input from our readers in the form of old-time radio photos, picture post cards, QSL cards, news clippings, station directories, comments, memories, anecdotes, etc. Reach us by postal mail, and you can also send along comments and column ideas directly to us by e-mail at: <Radioville@juno.com>.

How I Got Started

Congratulations To Alexander Sidorov In The Ukraine!

Popular Communications invites you to submit, in about 150 words, how you got started in the communications hobby. Entries should be typewritten, or otherwise easily readable. If possible, your photo (no Polaroids, please) should be included.

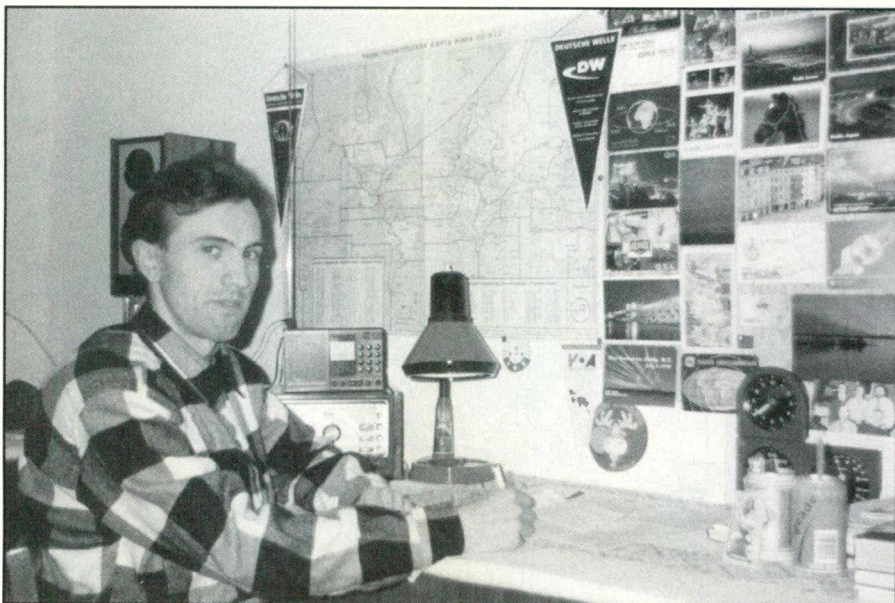
Each month, we'll select one entry and publish it here. Submit your entry only once; we'll keep it on file. All submissions become the property of *Popular Communications*, and none will be acknowledged or returned. Entries will be selected taking into consideration the story they relate, and if it is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

The person whose entry is selected will receive a one-year gift subscription (or one-year subscription extension) to *Popular Communications*. Address all entries to: "How I Got Started," *Popular Communications*, 76 North Broadway, Hicksville, NY 11801-2909 or e-mail your entry to <popularcom@aol.com>, letting us know if you're sending photos.

Our April Winner

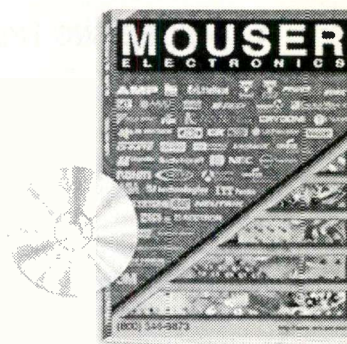
Alexander Sidorov of the Ukraine, who sent along a couple of photos, will receive a free one-year subscription to *Popular Communications*. He writes: "It all began in 1985 when my parents bought a radio for me that was a first-class unit made in the USSR; it was the most prestigious in its class. I used to sit at the radio in the evening and listen to local stereo music and often tuned in to West German MW stations which couldn't be heard in our country at the time. I also listened to pirates at 1600 kHz.

I got a license for work in the 160-meter band. For two years, I've been using a homemade transceiver. I now also own a Sony ICF SW-7600 and have started listening to stations in all bands. Now I have taken an interest in TV DXing, but so far haven't obtained great results. Last June, there was a tremendous event in the FM band here — I heard stations from all over Europe and part of the Near East. So far I have received more than 80 QSL cards and letters thanks to my Sony ICF SW-7600 and my antenna *inside* my room!



Alexander Sidorov at his monitoring post in a rural area of the Ukraine.

ELECTRONIC COMPONENTS



Visit our web site!
www.mouser.com

FREE catalog is available on the internet, CD-ROM, or in paper!

- 70,000+ Products • 145 Manufacturers
- Same Day Shipping • No Minimum Order

800-992-9943

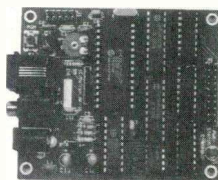
817-483-6828 Fax: 817-483-0931
www.mouser.com catalog@mouser.com

958 North Main St., Mansfield, TX 76063

CIRCLE 71 ON READER SERVICE CARD

Motron 310 Garfield St Suite 4
ELECTRONICS PO Box 2748
Eugene, Oregon 97402
<http://www.motron.com>

Control your home
from your radio!
Only
\$99.00



The Auto-Kall® AK-16 DTMF Controller Board features 16 relay driver outputs and DTMF to X-10 house control capability! Control the relay driver outputs, X-10 modules, or both with your radio keypad! X-10 operation requires the PL-513 Power Line Interface (\$20). The AK-16 mates readily with our **RB-8/I** (\$99) or **RB-16/I** (\$149) relay boards. The 0-12 digit security code is user programmable using your DTMF keypad. Additional features include reprogrammable CW ID and several modes of operation, including two with CW response. Printed circuit board, assembled and tested.

VISA, MASTERCARD, AMERICAN EXPRESS, DISCOVER. COD (\$5) ON CASH OR MONEY ORDER BASIS ONLY. S/H: \$8 USA; \$11 CANADA; \$16 FOREIGN.

Price and Specifications are subject to change without notice.
Se Habla Español. Pida por Don Moser.

Info: (541) 687-2118 Fax: (541) 687-2492

Orders: (800) 338-9058

The Radio Connection

BY PETER J. BERTINI
e-mail: <RadioConnection@juno.com>

A LOOK BEHIND THE DIALS

Chassis Restoration

This month we are going to deal with a badly rusted chassis. Now that the Philco bakelite block condensers have been dealt with, there are still a few other “potted” Philco capacitor assemblies that need restoration in the Philco 89. More on these later.

Repair Or Restore?

There are several schools of thought regarding restoration. Some folks feel that a set need only be put back in working order — only the components that are found to be defective need be changed. Others insist on changing all resistors and capacitors and replacing them with new stock components. Whether the cabinet should be refinished or left original is the subject of many heated debates.

I want my radios to look as good as they can, so I sometimes go to what may appear to some extreme measures to achieve

those goals. Some collectors may applaud my work, others may feel I am desecrating valuable artifacts. It boils down to being a personal thing. Before the hate mail starts, I want you to know that most of the radios undergoing restoration in this column were basket cases. I bought them cheap, and the work involved in bringing back these sets by far greatly exceeds their restored values. The 89 cathedral had considerable cabinet and veneer damage; its rusty chassis had missing tube shields and smashed tubes.

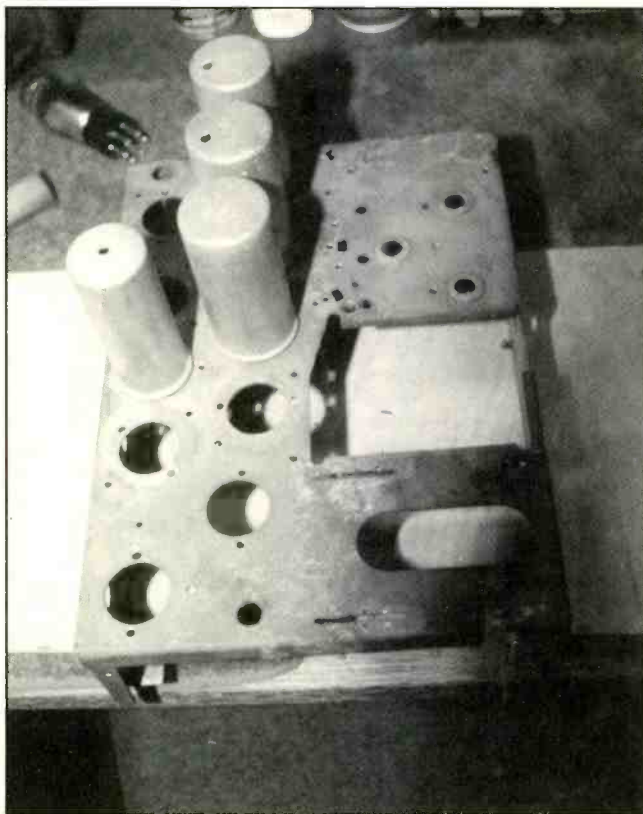
The Philco 89 Chassis

Examination of our model 89 restoration candidate revealed that sometime over the decades a mouse had set up housekeeping in the radio. This is an all too common problem. Mice love old radios; they must feel like they are checking into the Grande Hotel when they find one in a cellar or barn. They also make

very poor house guests. Various areas of the chassis were designated as the privy by the varmint, resulting in areas that are now deeply pitted with rust.

Rust Removal

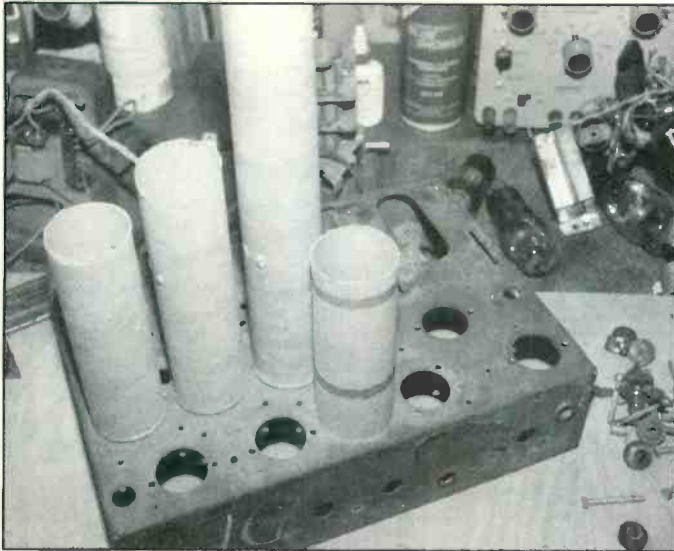
When it comes to rust removal, you have several options. Small areas of surface rust may be ignored, or lightly sanded using “Three-In-One” oil as a lubricant with a wet sandpaper. A Dremel tool equipped with a wire brush will also serve to remove small areas of rust. I have always felt the results were less than desirable; you end up with dull and bright areas on the chassis and swirl marks where the abrasion was applied. Besides, once the rust has developed, the protective factory plating is also gone. Cleaning only removes the rust, and leaves unprotected bare steel exposed to the elements. Eventually the steel will oxidize, leaving fresh rust on the chassis unless those areas



A restoration challenge! The 89 chassis is covered with rust and grime. ← This fellow needs some serious attention.

This approach isn't for the newcomer, but sometimes stripping the chassis is the only way to do the job. That pile of wires and parts is what a radio looks like out of its chassis. ↓





Before painting, the aluminum shield cans need to be masked. I found toilet tissue tubes are an ideal size and snug fit.



The chassis was finished with two coats of gray primer, followed by two coats of zinc-bearing paint.

are sprayed with a non-gloss (matte) clear enamel finish.

The photo clearly shows the rusted areas on a model 89 chassis. Because the cabinet was brought back to "new" condition, I decided that the metal chassis also deserved some heroic cosmetic work. This was easier to do with the chassis stripped of all components. I don't advise newcomers to attempt the following procedures. Your old radio probably has existing problems, and the next several steps will most likely compound them by adding several new ones that will have to be tracked down and corrected.

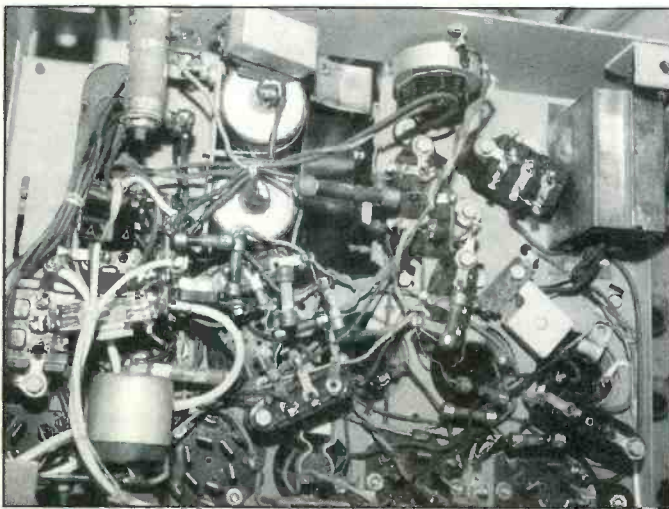
Strip the chassis!? You might think this is a tedious job involving removing each component piece by piece until the chassis is left bare. You can do this, but

chances are you will never be able to put the radio back together again. This is how I do it. Using a small electric drill and 1/8" bit, I carefully drilled out all of the rivets mounting the sockets, tube shield bases, and various other components. All of the screws used for mounting the filter capacitors, main tuning capacitor, the Philco block condensers, IF and RF transformer coils, and the power transformer were also removed.

The hardware holding the trimmer capacitors and all of the mounting nuts for the bandswitch and other controls were also removed. The power transformer leads, and those going to the pilot lamp and tuning capacitor sections, had to be cut to allow removing these components. Ditto for the tube grid clips. But

first, all of those leads were carefully labeled and sketched on paper. Some good close-up color photos of the chassis top and bottom were taken so I would know how things went back together!

The next two photos show the bare chassis and what appears to be a hodgepodge pile of wire and parts. The "hodgepodge" is the circuitry from the 89 chassis! When the time comes, the "hodgepodge" of wires and parts will easily slip back into the restored chassis. Actually, it was wishful thinking: it was a real pain. New hardware — screws, nuts and lockwashers — will replace the rivets. Use pan head screws on the sockets for the 80 rectifier and 42 audio tube. These tubes have wide bases and a high sitting screw will prevent them from fully seating in the sockets.



Underside of chassis after restoration. Blocks are rebuilt, the resistors have been checked for value and the bad ones replaced. Note the new line cord and fuse.



The 89 sports a small tin can housing several capacitors. These Philco "bypass banks" are easily restored.



ANTIQUE ELECTRONIC SUPPLY
TUBES PARTS BOOKS SUPPLIES

CALL OR FAX TODAY
FOR OUR FREE 52 PAGE CATALOG
(602) 820.5411 • Fax (800) 706.6789

ANTIQUE ELECTRONIC SUPPLY™ LIMITED PARTNERSHIP

6221 S. Maple Avenue Tempe, AZ 85283
CIRCLE 60 ON READER SERVICE CARD

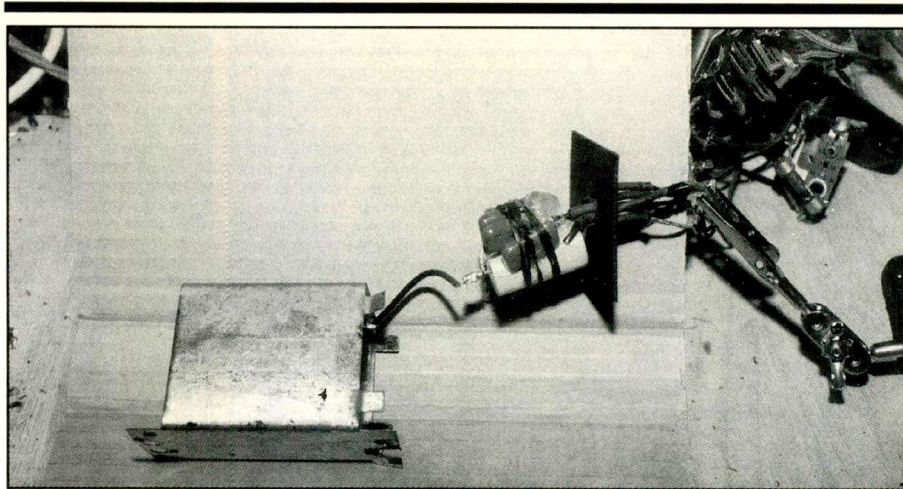
Several wires will need to be reconnected to restore the original wiring.

Because I couldn't remove the aluminum cans used for shielding the IF and RF transformer coils — they are "swedged"-mounted to the chassis — I had to leave them in place. The aluminum cans can be cleaned with steel wool and detergents. I used an abrasive cleaner such as Bon Ami or Ajax applied vigorously with an old toothbrush. A small palm sander was used to remove as much of the rust as I could from the chassis.

Replate Or Paint?

You now have two options. You may take the chassis to a commercial plating service, where the chassis will be acid stripped and a new galvanized finish applied. That can be a fairly expensive undertaking, so I decided to try painting the chassis. The chassis must be completely free of any loose rust or dirt before painting. For the first step, the aluminum cans used to house the RF and IF transformer coils must be covered. The cardboard tubes used for paper towels or toilet paper tissue provide an ideal snug fit over the cans. Once the cans are suitably masked, the chassis is sprayed with several light coats of gray enamel primer and allowed to dry for several days. Once the paint has cured, two additional finish coats of Rustoleum cold galvanizing compound were applied. Again, the chassis is left undisturbed in a warm, dry area for several days, allowing the solvents to be released and the paint to fully cure and harden. The final application of galvanized paint gives the chassis a finish that closely matched the color and texture of the original factory plating — I am very pleased with the results.

The power transformer was in better condition, having only a few rusted areas. The transformer was repainted using



And here's the "after" photo of the restored tin can and bypass banks.

three coats of glossy black enamel spray paint. This closely matched the original factory finish. The transformer shell should be vigorously cleaned before painting, using detergents and an old toothbrush. Sand the rusted areas as needed. Be careful! Don't allow liquids to get inside the transformer shell!

Cleaning The Tuning Condenser

The tuning capacitor was cleaned by soaking it in a bath of warm detergent for several hours. The celluloid dial strip should be removed prior to cleaning! This should free up most of the loose dust and dirt. The bath is followed by a good washing in hot water, followed by a second washdown using electronic tuner cleaner. Be sure to wash out the mica trimmers — the tuning nuts should be backed off to allow a good flushing of the mica and capacitor plates. I use a non-lubricating electronic cleaner called Tech Spray "Blue Shower 1677" universal cleaner/degreaser on the compression trimmers. It does not leave a residual lubricant. In the past, I have tried some other cleaners that have lubricants. This results in a set that constantly requires realignment. The solvents contained in the lubricants evaporate slowly, causing changes in the capacitances. Lubricant bearing tuner sprays are fine for switch contacts or volume controls.

The bearings must be regreased — note that the 89 tuning condenser has bearing raceways in the front and rear. You access the rear bearings by removing a small cover plate. Be careful — the bearings will be free with the plate removed! I used GC 10-2302 Lubriplate® on the

bearings. Be very, very careful when handling the capacitor, the aluminum plates are easily damaged. The dial strip is also very fragile and will crack if not handled carefully.

Putting It Together

It's easier to first slide all of the electronic guts back into the chassis and have them remounted before the bulky tuning condenser and power transformer are reinstalled. Use 6-32 hardware to replace the rivets that were used to mount the tube sockets and other small components.

I painted both the top and bottom of the chassis. In retrospect, it may have been better to just treat the outer surfaces with paint. The paint is a good insulator, which presents a problem when we need to attach a ground to the chassis. You must carefully scrape away the paint in the area where a ground lug will be attached, and using external tooth lockwashers to achieve a good low resistance "bite" into metal is strongly advised.

Philco Metal Can Capacitors

Not all Philco capacitors were hidden in bakelite boxes. The model 89 chassis revealed a small metal box with five leads emerging from it. This was identified in the Rider manual as a being a Philco "bypass bank," part number 06624. This assembly houses five capacitors, all with a common ground returned to the metal shell. It contains two .05-mfd capacitors, brought out with green colored leads; two .09-mfd capacitors (using white wires with blue tracer leads); and a lone 0.25-mfd capacitor (white lead wire).

Although the parts are tarred together, the assembly is easily slid out of the can. The replacement mylar caps can be stacked together, or mounted on a small piece of pre-drilled phenolic project board (RadioShack). The photos show how I rebuilt my capacitor bypass bank. I used heatshrink tubing over splices made between the wiring and capacitor leads. The caps were glued together and tied into a bundle using lacing cord. You will have to glue the cardboard end sections into place. C+H Sales is a good source for lacing cord. Solder the capacitor ground returns to the can body as we did on the old assembly.

The Philco Tone Control Capacitor

One last item. The Philco 89 does have a simple tone control. The set has a .01-mfd capacitor across the plate of the 42 audio output tube to ground. This forms a simple "rolloff" circuit, limiting the high frequency response of the receiver. An additional 0.15 mfd of capacitance is switched in to give even more rolloff of the high frequencies. The Philco tone

control is a switch assembly that includes a potted wax cap with a flying rubber insulated lead going to the 42 tube plate connection on the socket.

The rubber insulation is usually very friable and crumbling and must be replaced. Removing the old potted tone capacitor is fairly easy. In this set, I left it in place and simply cut the capacitor leads flush to the body. I ran a new capacitor directly from the switch contacts to the plate circuit. I've found that I like to be able to change the value of the tone capacitor to suit my personal tastes. A .1-mfd capacitor may deliver audio that I consider to be too "bassy," so I may select by ear a .082 or .05-mfd replacement instead.

Regardless of the capacitance value, remember that this rolloff capacitor is being subjected to a combined high DC plate voltage and a very high AC audio voltage. When on hand, I use capacitors with 1200-volt DC ratings in this application, especially in push-pull audio output stages.

Next time we meet let's see what we can do with that torn speaker cone, "repair" some damaged tubes, and power up the set! Will the radio work? Tune in next month . . .

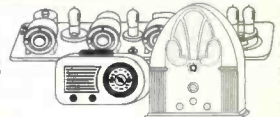
Restoration Resources

GC Electronics
Rockford, Illinois 61101
Phone: 800-435-2931

Tech Spray, Inc.
Amarillo, Texas 79015-0949
Phone: 806-372-8523

These products are carried by radio-TV and electronic supply houses.

FREE
SAMPLE
COPY!



ANTIQUE RADIO CLASSIFIED

Antique Radio's Largest-Circulation
Monthly Magazine

Articles - Classifieds - Ads for Parts & Services

Also: Early TV, Ham Equip., Books,
Telegraph, 40's & 50's Radios & more...

Free 20-word ad each month. Don't miss out!

1-Year: \$38.95 (\$55.95 by 1st Class)
6-Month Trial - \$19.95. Foreign - Write.
A.R.C., P.O. Box 802-T12, Carlisle, MA 01741
Phone: (508) 371-0512; Fax: (508) 371-7129
Web: www.antiqueradio.com

We don't make SCANNERS or the ICOM IC-R8500 RECEIVER - We make them better -

DELTACOMM I-8500 Communication Manager for the ICOM IC-R8500 communication receiver. With speed as a design goal DELTACOMM's QUICK LOG function will log signal level, frequency, mode, date, time and optional Global Positioning System (GPS) coordinates at speeds in excess of 2400 channels per minute. Here are a few examples of the many advanced features DELTACOMM I-8500 has to offer.

- Load 40 channels of information including ALPHA NUMERICIS into one of the R8500's memory banks in 3 seconds.
- Separate volume level, resume scan delay and maximum monitor delay plus 40 character information field for each scan channel.
- Priority channel operation samples at 2.5 second intervals.
- Multi-receiver control will hand off active frequency to next receiver on line. Able to control up to 125 ICOM receivers (optional).
- Traditional scanning is a thing of the past with our CYBERSCAN feature, used to track systems employing frequency hopping.
- Activity log function automatically records and calculates total spectrum usage time.
- Unique search operation stores all frequencies found active and then automatically skips those frequencies during the remaining search cycles. This feature eliminates redundant logging.

Visit our Internet Web Page or Phone/FAX us for program features, new product releases and pricing schedule. DELTACOMM is available for ICOM R9000, R7100, R7000, R71, R72, IC-735 (features vary with type of radio). Also check out our DELTATONE 2.0 repeater programmer.

<http://www.execpc.com/~deltacom>



Delta Research



Box 13677 - Wauwatosa, WI 53213 - FAX/Phone (414) 353-4567

CIRCLE 66 ON READER SERVICE CARD

CALL TOLL-FREE
(800) 292-7711
SE Habla Español

C&S SALES
EXCELLENCE IN SERVICE

CALL FOR A FREE
60 PAGE CATALOG!
(800) 445-3201

VHF & UHF By TEKK

PRO-20 VHF

- 148MHz-172MHz.
- 2 Watts Output, 1 Channel.
- Trickle Charger.
- 3 Year Limited Warranty.

\$195.00

PRO-40 UHF

- 450MHz-470MHz.
- 2 Watts Output, 2 Channels.
- Includes Wall Charger.
- Slimline Design.

\$239.00

PRO-50 VHF

- 148MHz-172MHz.
- 5 Watts Output, 4 Channels.
- Trickle Charger.
- Three Year Limited Warranty.

\$295.00

CALL FOR AVAILABLE OPTIONS

STANDARD FRS

Model FRS-14

- 1/2 Watt Output, 14 Channels.
- LCD Channel & Code Display.
- 38 Selectable Channel Codes.
- Back-Lit Display.
- No License Required!

**\$129.00 each or
2 for \$250.00**

MX-9300

- One Instrument With Four Test and Measuring Systems:
 - 1.3GHz Frequency Counter.
 - 2MHz Sweep Function Generator.
 - Digital Multimeter.
 - Digital Triple Power Supply
- 0-30V @ 3A, 15V @ 1A, 5V @ 2A.

\$450.00

UNIVERSAL COUNTERS

F-2800

- 6 Hour NiCd Battery Operation.
- High Speed 250MHz Direct Count For High Resolution.
- 16 Segment RF Signal Strength Bargraph.

F-2800
1MHz-2.8GHz
\$95.00

F-1300

- 10 Functions (F-1300 only).
- Xtal Controlled Time Base
- 9 Digit Green LED Display

F-1300
.05Hz-1.3GHz
\$225.00

OSCILLOSCOPES

Standard Series
S-1325 25MHz
\$325

S-1340 40MHz
\$475

- TV Sync
- 1mV Sensitivity
- X-Y Operation
- High Luminance
- 6" CRT



• Complete Schematic
• Plus much, much more!!

KIT CORNER over 100 kits available

Model AR-2N6K

2 Meter / 6 Meter
Amateur Radio Kit
\$34.95

Model AK-200
Stereo Cassette Player Kit
\$14.95

• Transparent case
• High resolution

Model M-1005K

Low cost, 3 1/2 digit LCD, 18
ranges, transistor test, diode
test, overload protection and
pocket size.
\$19.95

Model TT-400K
Telephone Line
Analyzer Kit
\$19.95



WE WILL NOT

BE UNDERSOLD

UPS SHIPPING: 48 STATES 5%
OTHERS CALL FOR DETAILS
IL Residents Add 8.25% Sales Tax

C&S SALES

150 W. CARPENTER AVENUE
WHEELING, IL 60090
FAX: (847) 541-9904
(847) 541-0710

15 DAY
MONEY BACK GUARANTEE
FULL FACTORY WARRANTY
PRICES SUBJECT TO
CHANGE WITHOUT NOTICE
http://www.elenco.com/cs_sales/

CIRCLE 64 ON READER SERVICE CARD

Radio Resources

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

Part II: Seven GPS Receivers Go For A Road Test

Last month we told you how GPS works. This month we'll examine some of the hot new GPS portable and fixed-mount receivers and show you how well they work for the hobby radio user who wants to combine radio positioning with radio communicating.

The U.S. Geological Survey (USGS) has available to map makers the cartographic information acquired by the government for almost any type of equipment use. About five years ago, a company called Lowrance (Tulsa, Oklahoma) painstakingly (I've been told) converted USGS highway mapping into a database that they loaded into an LCD screen GPS fixed-mount receiver called Global Map. (You see it at the bottom of the photo of my communications van.) This \$600 GPS was primarily intended for the marine market because it featured a GPS card reader that could read C-Map electronic chart cartridges. Mariners could insert a C-Map cartridge into the reader, and the Lowrance Global Map system would show them as a boat icon, somewhere out on the water. As you would cruise from one boating area to another, you would insert the appropriate \$199 chart cartridge.

But most interesting is what the Lowrance Global Map equipment would do when you put it in your car. Without any chart cartridges, an imbedded map of the United States would come up and show major highways! There were even names of towns and all sorts of rivers that could be seen from the USGS data base that got loaded into flash memory on this equipment. "We just stuck in the USGS data base because we had some room left over on one of our internal chips," comments a former manager of the Lowrance GPS division. "Five years ago, our concentration was on boating, and we were too busy coming up with boat products to even consider what our highway maps could do for the RVer," adds the Lowrance representative.

In fact, when Lowrance developed their new portable handheld GPS mapping system for C-Map chart cartridge



Lowrance Big-Screen GPS seen at bottom of the radio rack.

cartography, they once again included the internal highway maps that would automatically come up when no cartridge was inserted in the back of the unit.

"Our new twin-cartridge handheld soon became a favorite among RVers because they discovered without cartridges inserted into the back of the unit for water charting, a road map of the USA came on screen and was very accurate," adds Lowrance Corporation.

While other companies developing

portable and fixed-mount GPS sets had a "base map" that would come up when no cartridge was installed, *their* base maps had only boundaries of the coastlines and nothing else inland.

The marine use of GPS electronic charts has become so intense that you can now find boating charts on eight different types of cartridges. Of course, absolutely none of these eight are interchangeable with another cartridge system!

But one of the eight, C-Map, has become the industry "standard" for ocean as well as inland cartography. The C-Map "NT" can now work in over 10 different brands of equipment — and C-Map, the world's leading producer of marine charts, now announces their intention to go inland with their GPS mapping efforts.

"Our inland cartography consists of United States Geological Survey 1:100,000 scale maps to cover the continental United States," comments Ken Cirillo, Vice-President and General Manager of C-Map. "There are a total of 75 C cards that will cover the entire United States, showing lakes, rivers, rapids, streams, marsh areas, major highways, and state routes," adds Cirillo. "C-Map NT users can really discover, explore, and enjoy the United States out on the road in their RVs by choosing a variety of C-Map inland cards to cover them wherever they may plan their trip," adds Cirillo.

We tested the new C-Map NT cartridges in our communications van, and we specifically compared them to the flash memory imbedded cartography found in our fixed-mount and portable Global Map Lowrance products. Now keep in mind that the Lowrance equipment was working without any chart cartridges, and the C-Map trial units (several seen on the wooden holder in the communications van) were working on the \$99 C cards. We found that the C-Map NT inland cartography was much more accurate as to our real position than the flash memory cartography out of Lowrance. The Lowrance units would frequently show us going down a high-



The Lowrance GPS with built-in road maps.

way, but several hundred yards off of the actual highway lines. On the C-Map NT equipment from Raytheon, Magellan, and the C-Map proprietary road cruiser systems, our track was *exactly* over the electronic charted highway. In fact, the C-Map cartography would clearly show big highways with a center median, and you would actually see yourself going up one side of the highway and coming back down on the other side.

But seeing it on a small screen is one thing, so we focused our attention on the



Here's a universal cartridge for several brands of GPS.

C-Map cartridges running on C-Map's "Road Cruiser" highway mapping system. This unit is not exactly portable: it has a curly cord that plugs into 12 volts and a small patch antenna with a magnetic base that slaps onto the top of your car. The patch antenna is slightly larger than a silver dollar, so we're talking about a minimum-sized protrusion.

The C-Map "Road Cruiser" features a built-in, 12-parallel-channel GPS with two bottom slots for accepting the new generation C cards. Since I travel by boat as well as by car, the left slot had our local harbor and the right slot had Southern California roads. It was a nice transition—when I sailed off the electronic end of the picture from the water, I immediately saw myself traveling down the big roads on my way home.

C-Map's Road Cruiser Screen

The much larger screen on the C-Map "Road Cruiser" allows you to check your position at a glance. On the smaller equipment, you really had to let your passenger do the navigating because the

screens were diminutive. On "Road Cruiser," our vehicle position was displayed graphically on a map as well as numerically for latitude and longitude. You can set it up so that the map stays stationary, and you watch your vehicle travel up the roads and off the screen. But I like to put the map in action, where your vehicle always stays in the center, and the roads pass beneath you as you travel down the highways.

The 7-inch-high resolution LCD display with its built-in GPS and rubber rear-lit keypad also gave us real-time display of our vehicle's speed, route, distance, and time-to-go-to-destination. It was easy to create routes and display them on the electronic map. You can "guesstimate" where you plan to go and end up, but we chose to let the distant party tell us their latitude and longitude so we could navigate directly to them out on the desert. When the "Road Cruiser" showed us that we had arrived at our 400-mile-away destination, we were within 27 feet of our actual stop-spot. The C-Map "Road Cruiser" also gave us a track of the route traveled so we could show our pals exactly how we got there!

C-Map vector-data format is produced

"ATOMIC CLOCK CONTROLLED"
Precision Time Pieces Synchronized to the US Atomic Clock - Accurate to 10 billionths of a Second!

ONLY \$69.95

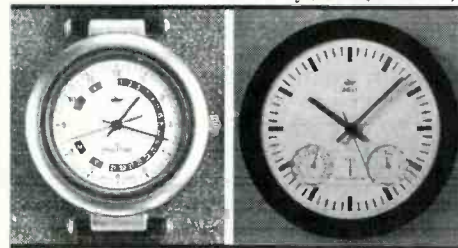


The most accurate clock on Earth. These smart clocks tune into the radio signal emitted by the US Atomic Clock in Colorado, which deviates less than 1 second over a million year period. They synchronize themselves automatically to the exact same time daily and adjust even for daylight savings time and leap seconds. You can now have the world's most accurate time 24 hours a day to be in control of time or start your day. These precision ZEIT timepieces are engineered in Germany and are easy to use using the latest in radio-controlled technology. Just set the time zone and the built-in micro chip does the rest. **ZEIT-accurate! precise! reliable! & fully automatic**

WALL CLOCKS—ALL STYLES AVAILABLE

ZEIT Atomic Wall Clock with thermometer and hygrometer great for home or office—1AA, Large 12". Only \$99.95 (below)
Arabic numeral clock Only \$79.95 (not shown)

ZEIT Atomic Dual Alarm & ZEIT Atomic PC Sleek European design with large 2 line LCD display with exact time in hours, minutes, seconds, month and date, or any two US and world times. At 8 oz even ideal for travel; includes dual alarm with nighttime illumination, time zones and lithium battery backup. Super sensitive built-in receiver. 2AA bat. included. Black arch design at 5" x 4" x 2 1/2". **ONLY \$79. Two only \$129.**



ZEIT PC with serial cable and software for WIN. Also shows UTC Time in 24hr mode. **Only \$129**

ZEIT Atomic Watch with SYNCTIME, the world's most accurate watch with hour, minute and seconds. Watch the hands spin at 80 times its normal rate until they stop at the precise time. Shock-resistant polymer case with built-in receiver for Atomic Time Signal (water-resistant). Sets itself daily and shows date with second hand. Mineral lens, black or white dial & leather band. **Only \$149.95**

Gifts Haven't Been Easier!

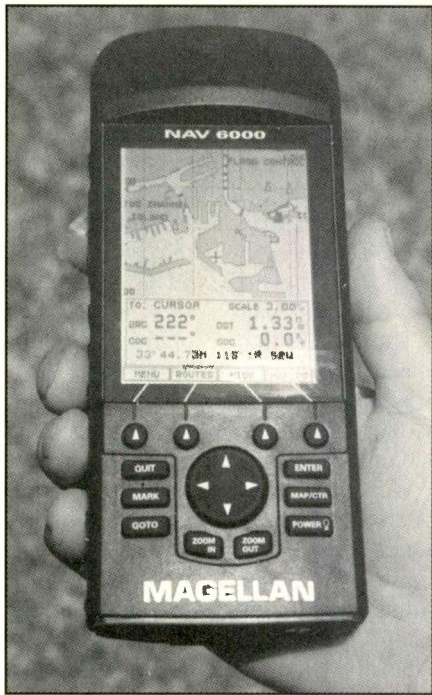
Atomic Clock Controlled Time:
Credit Card Orders

Call toll free 1-800-985-8463 24 hrs

Send checks/money orders to:

ARCRON-ZEIT

1010 Jorie #324, Oak Brook, IL 60523
fax 630.575.0220 <http://www.syncntime.com>



Magellan's NAV 6000 displays both ocean and inland roads C-Map cartography.

by identifying, classifying and storing in a digital structure the land objects relevant to navigation. With C-Map vector maps, what you may see on the screen is only a fraction of what you get. The electronic charting system's software unlocks the power of the map data, letting you bring valuable detail and information to the screen with a simple command. We could customize our map data by selectively removing layers of data according to our needs. All of our test equipment displayed the C-Map electronic charts in precisely the same way, although "Road Cruiser," available directly from C-Map,

gave us the very large screen LCD read-out. And, if we'd really wanted to go larger, they have a device called "Desert Cruiser" that offers a 10-inch-high resolution LCD display with built-in GPS, trackball, rubber rear-lit keypad, and a little external magnetic antenna.

So we found the \$99 electronic charts more accurate than the flash memory in the older Lowrance units. GPS accuracy to a known geodetic survey point was exactly the same among all GPS sets — including the little \$99 Magellan GPS which doesn't do charts.

But if you want to drive across the United States, you're looking at a handful of chart cartridges, each costing \$99; something to think about. But chances are, those \$99 chart cartridges have infinitely more detail (i.e., small streets) than flash memory, right? Wrong! At least for now. The inland cartography \$99 chart cartridges have a very long way to go before they can even get close to what you might see on your computer, running floppies or a national CD-ROM road atlas. The little 5 megabyte cartridges don't do surface streets, nor do they get down to any level other than the major interstates. And, if they do show you some slightly smaller roads, these roads may electronically vanish in the middle of nowhere, yet you are still on the highway in real life. I would say that we are going to see a lot more detail added to these \$99 cartridges soon. For \$99, we better! I expected more.

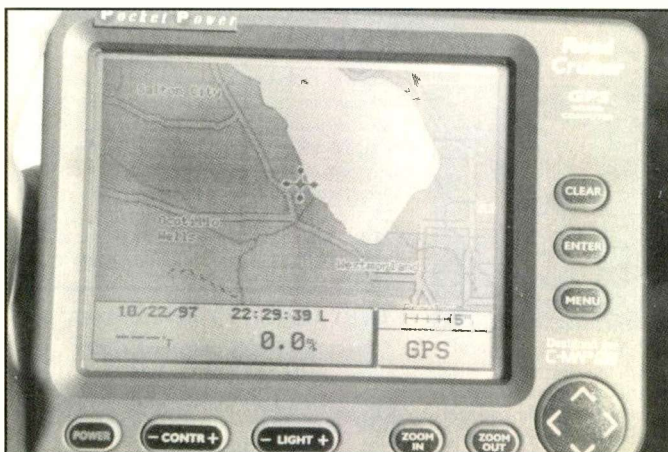
The Amazing Garmin

Well-known GPS manufacturer Garmin International (Olathe, Kansas) is also busy in the marine as well as the aviation

marketplace with GPS equipment using Navionics and aviation data bases for cartridge cartography. Instead of using C-Map "C cards," Garmin does their own thing with "G cards." The Garmin cards can hold marine charts, air charts, and even their own in-house compiled inland map charts. And when I tested the Garmin inland map cartridges against C-Map inland cartography and against Lowrance built-in flash memory, there were no major surprises. All three electronic charting systems would show all the big highways going to a favorite lake; all three systems would NOT show the smaller access roads; and all three systems would selectively list different items as points of interest. The C-Maps would show greater detail of lake underwater structure for the fishermen than the Garmin might indicate, while Garmin had launch ramps indicated on the screen that Lowrance didn't have. But Lowrance was running for free on imbedded cartography, whereas C-Map and Garmin required \$99+ chart cartridges that were not interchangeable.

But then Garmin did something that instantly moved them into the winner's circle — they took a fresh in-house data base, added various points of interest, subtracted out-of-date cities and towns, and then flash-memorized the entire United States highway data base into their newest and smallest unit, the Garmin III, selling for under \$370 *without* the need for chart cartridges.

The nine-ounce Garmin GPS III uses a 12-parallel-channel GPS receiver and, mounted on the inside dash of your vehicle, easily locks onto visible satellites. "Our GPS III features a built-in base map that requires no chart cartridges," com-



C-Map's Road Cruiser GPS mapping receiver.

ments Steve Featherstone of Garmin. "All major roads in North, South, and Central America, with seamless scrolling between cities, states, provinces and countries, come straight out of flash memory without cards," continues Featherstone. "For RV, radio enthusiasts, and campers, our GPS III built-in base map not only gives you millions of miles of interstates and highways, but also rivers, lakes, shorelines, points of interest, and every little city in the country."

Now you can drive all the way across the United States and watch yourself, on the relatively small screen, stay exactly on the roadway and pass from one town to another. No \$99 cartridges to buy! The cartographic information is also layered on the LCD screen so you can easily zoom in and out with excess data getting electronically stripped away. You can zoom in and watch yourself take the cloverleaf and head off to a new direction, or you can zoom out and see yourself traveling down the interstate halfway between state boundaries. How much further to the next big town ahead? Simply move the little icon, press a button, and it tells you how far you need to go, approximately how many minutes it's going to take, what

direction you are traveling, and the bearing to that distant spot, all the while keeping track of your driving by recording your track and your highest speed.

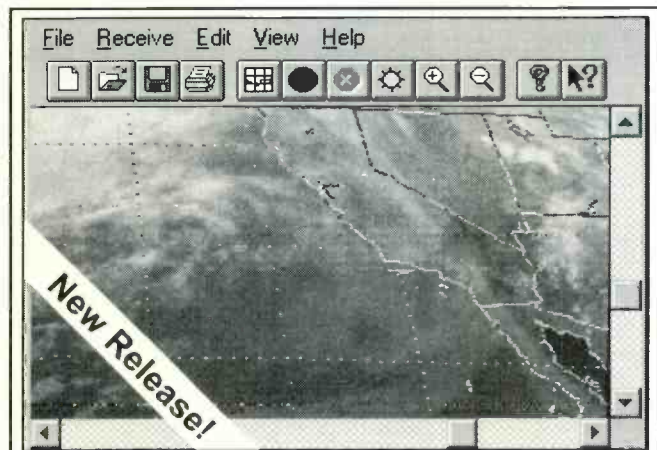
Nope, it doesn't do small roads. The only way you're going to get small roads on a GPS is to tie this type of equipment into your laptop computer that's running off of a CD-ROM street atlas of the country, or a handful of big floppy disks. Although you don't get small roads, you still get a precise track of when you got off the major road, so that if you need to thread your way back to the big highway, there it is, in living black and white, right on the screen.

Uses For The Radio Enthusiast

For the radio enthusiast, a GPS is a handy way to "navigate" to distant repeater sites or mountaintop remote base installations. Most FCC data bases will include latitude and longitude of transmitting facilities, allowing your GPS to take in this information and then display exactly how far it is to that interesting two-way radio location.



The Garmin GPS 45.



PC HF Facsimile 8.0 For Windows \$179.95

SSC's best selling Fax and Telex decoding system now runs under Windows. Connect our new Windows FSK demodulator between your PC and SSB to receive weather fax, NAVTEX, RTTY, Amtor, ASCII, Sitor, FEC and Morse code. Receive weather and radio telex while your PC runs other software. The product includes demodulator, software, manual, frequency list and broadcast schedule. SSC also makes modems and software to receive weather satellites and SSTV. Call or write for our complete radio products catalog.

Visa and Mastercard Welcome

Software Systems Consulting



615 S. El Camino Real
San Clemente, CA. 92672
Tel: 714/498-5784
Fax: 714/498-0568
<http://www.sscorp.com>

"Small in Size, Large in Performance" The "Smokin' Gunn II" two element directional beam.



For information and pricing, contact
any of the following Dealers:

Barker Electronics
Lawrenceville, IL
618-943-4236

TC Radio
Watha, NC
910-285-5841

R & R Communications
Wilmington, DE
302-475-1351

4-Way Grocery & Hobby
Galax, VA
540-236-5750

Big Buffalo's Hide
Norwich, CT
800-455-1557

Walt's CB & Scanner
Asheville, NC
704-254-3048

J.C.R.E.
Woodland Park, CO
719-687-5600

Hi Tech Repair
Montgomery, NY
914-457-3317



Route 1 - Box 32C • Old Hwy 82
Ethelsville, AL 35461
(205) 658-2229 • Fax: (205) 658-2259

Hours: 9 a.m. - 5 p.m. (CST) Tues - Friday
Answering System After Hours

Visit us at our web site at www.jogunn.com

Dealer inquires, please call.

CIRCLE 79 ON READER SERVICE CARD

Your GPS can also tie into a packet modem that would read the NMEA data-stream and "squawk" your location in a packet format. This is all part of the APRS Service—Amateur Radio Packet/Position Reporting Service. If you're into transmitter hunting, weather storm watching, or anything else where your present position information is important, the GPS with an NMEA 0183 output will be a handy addition to your radio communica-

tions system. Almost all portable GPS sets feature an NMEA output that is fully compatible with a GPS packet modem. This is the same principle behind how GPS is serving the transportation industry by keeping dispatchers up to date on where all of their motor carriers are located.

And the future is . . . the future is GPS. You have already paid for it in your tax dollars. The Department of Defense is soon to turn off Selective Availability for

even more precise position finding. Take advantage of the most modern position-finding system ever to come to private citizens like you and me in the history of radio location. Where all of the other radio location services, like Loran, Omega, RDF, Omni, Tacan, and the others, get you down to a couple of hundred yards, GPS and a companion differential beacon receiver could get you down to a couple of millimeters. And those little portable GPS sets — the ones with maps — what else can you use when you get lost in a city to instantly show you where you are and exactly where you need to go to get back onto the big interstate leading out of town?

And if you really need to get down to the street level, wait about a year for the new tiny chart cartridges from C-Map, or tie in your GPS to a laptop running on those relatively inexpensive USA street map programs.

Happy traveling and radio operating with GPS! ■



When seconds count, REACT® needs you...

...to summon help for an injured motorists, an elderly woman trapped in a fire, a trucker stranded in a blizzard, a drowning child!

As a REACT volunteer CB radio monitor you may be the only communications life-line for someone in serious trouble. You relay messages from those desperate for help to police or other emergency services.

Your REACT Team will also use CB and other radio services to provide safety communications for events like parades, marathons and even balloon races. The fellowship with other REACT members at Team meetings and annual conventions is an added bonus.

Volunteer. Join Today!

Add a New, Exciting Challenge to Your Life. Help Save Lives and Property!

REACT® International, Inc.
Tel (316) 263-2100
FAX (316) 263-2118
P.O. Box 998, Wichita, KS 67201



GPS Resources

C-MAP/USA
133 Falmouth Rd.
Mashpee, MA 02649
Phone 800-424-2627 (U.S. only) or
508-477-8010; Fax 508-477-6168

Garmin International
1200 E. 151 St.
Olathe, KS 66062
Phone 913-397-8200
Fax 913-397-8282

Lowrance Electronics
12000 E. Skelly Dr.
Tulsa, OK 74128
Phone 918-437-6881

Magellan Systems Corp.
960 Overland Ct.
San Dimas, CA 91773
Phone 909-394-5000
Fax 909-394-7050

Raytheon Marine
676 Island Pond Rd.
Manchester, NH 03109
Phone 603-647-7530
Fax 603-634-4756

Trimble Navigation, Ltd.
645 N. Mary Ave.
Sunnyvale, CA 94088-3642.
Phone 800-827-2424 or
408-481-8000
Fax 408-481-2000

CIRCLE 76 ON READER SERVICE CARD

Product Spotlight

BY KEITH BREWSTER, NØIAW
<kbrews@galstar.com>

POP'COMM REVIEWS PRODUCTS OF INTEREST

RadioShack 7-Channel Weatheradio

In the days of 8-track tapes, RadioShack brought us the Weather Cube weather band receiver. Now, in the digital age, they have launched the 7-Channel Weatheradio®. The radio has many new features, including coverage of all seven channels now being used by the National Weather Service (NWS) for its NOAA Weather Radio (NWR) broadcasting system, an external antenna jack and a remote signaling port. The radio is also capable of decoding digital transmissions known as Specific Area Message Encoding (SAME).

What's The SAME System?

The SAME system was developed to address a perception of over-warning when using the NWR tone-alert feature. For many years, the NWS has been broadcasting forecasts and weather warnings on its NWR system. The system provides a direct link to the nearest Weather Service office for anyone with a receiver. The tone-alert feature on some receivers allows you to equip your home or business with a "weather alarm." Reception of a 1050-Hz tone triggers the receiver and alerts the listener to the threat of severe weather without requiring you to continuously listen to the

audio. However, leaving an NWR receiver set for tone-alert activation at all times is a little like setting your home alarm system to notify you of security breaches in any building within a mile of your home: that is, the tone alert will be activated for warnings for any location in the transmitter's coverage area, which can be quite large (any county within 40 to 50 miles of the transmitter), but it's usually not necessary for you to be awakened for a flash flood warning for a storm 60 miles distant. If that happens often enough, you'll be conditioned to turn off the tone-alert feature at night—the time it *could* really be a life-saver.

Each urgent weather message from the Weather Service is preceded by a coded transmission that allows receivers to identify the contents of the message and the county for which it is intended. The SAME system employs audio frequency shift keying (AFSK). Sophisticated hardware has been developed for the broadcast industry and government emergency services to decode these transmissions and control functions. SAME is actually a part of the new Emergency Alert System for emergency notification of weather and other hazards that is replacing the Emergency Broadcast System across the U.S. NOAA Weather Radio is



The Weatheradio mounted on a wall.

now also a means for receiving warnings about chemical spills and other man-made hazards as well as all natural hazards, including weather threats, volcanoes and earthquakes.

The RadioShack 7-Channel Weatheradio decodes the SAME signals and uses them to control the radio's operation, such as triggering the audible alarm. The new radio comes in a desktop size, about 15 percent larger than its previous tone-alert desktop model. The additional size is needed to include a liquid crystal display and a keypad for programming. A wall mounting bracket is also included.

An intriguing feature of this unit is the 7.5-Vdc external alarm port. This signal



The RadioShack 7-Channel Weatheradio being programmed with FIPS code for SAME operation. (Photos by Keith Brewster)



Notice the "Weather Alert On" message in the display window.

could be used to either trigger visual or loud audible alarms for the hearing impaired or for use in noisy environments. It could also be used with home automation systems, through an X-10 interface, for example. I did not test this function.

Programming the radio is a new step for the weather radio user. In its default state, the radio is ready to be activated by any tone-alert warning on the frequency. The user will want to select the counties for which the radio will be activated, taking advantage of the SAME decoding feature. The user decides the counties for which warnings will activate the unit and each is entered by means of a Federal Information Processing Standard (FIPS) code, a unique six-digit number assigned to each county or parish in the U.S. The leading digit of the FIPS code indicates the sub-county area, a place for possible refinement of the system in the future (currently all FIPS codes have a zero as the leading digit). The next two digits designate the state, and the final three indicate the specific county. Up to 15 separate FIPS codes may be entered into the RadioShack radio. For the most part, the user is on his own when it comes to finding out what the FIPS codes are in his area; lists of numbers are not included with the radio.

Fortunately, there are several sources for the numbers. Each RadioShack outlet is supposed to have lists on hand for its area, and there are lists on the World Wide Web and others available by automated phone or fax through systems hosted by the National Weather Service, RadioShack and other manufacturers (see box).

The actual programming is fairly simple when you follow the steps outlined in the instruction booklet. I recommend selecting your FIPS codes and writing them down before starting the process since there is a time-out in the system that kicks back to operating mode from programming mode after any 45-second break in keypad activity. Also, it's a good idea to enter counties adjacent to yours for greater "heads-up" time in the event of a warning.

How Well Does It Work?

I monitored the unit during a recent evening of severe weather in central Oklahoma, and I also kept an eye on local TV broadcasts for radar data and warnings. The Weatheradio unit performed flawlessly, excluding warnings for counties 50 miles north, while alerting for the counties I had selected.

When a warning triggers the unit, the

Specifications For RadioShack 7-Channel Weatheradio Catalog No. 12-249

Frequencies (MHz)

Channel 1	162.400	Sensitivity (12 dB SINAD): 0.3 μ V
Channel 2	162.425	FIPS Code Sensitivity (90 percent success rate):
Channel 3	162.450	0.3 micro-V
Channel 4	162.475	Signal-to-Noise Ratio: 40 dB
Channel 5	162.500	Selectivity (+/- 25 kHz): 60 dB
Channel 6	162.525	Dimensions: 5 3/16 x 6 3/4 x 1 3/16 in.
Channel 7	162.550	Weight: 17.67 oz.

audio comes on for five minutes, ample time to hear the details of the warning and related bulletins. An LED remains lit after the audio is squelched, indicating the type of bulletin (statement, watch or warning). The liquid crystal display indicates the nature of the bulletin (severe thunderstorm, for example, as opposed to tornado, hurricane, etc.).

When another message triggers the unit, it supersedes the previous alert in the displays (up to three alerts are retained in memory and can be reviewed using a keypad function). After the bulletin has expired, the unit returns to its default message of "WEATHER ALRT ON." And if the 9-volt backup battery is low, the LCD will also flash "REPLACE BATTERY."

Drawbacks?

One problem is that the FIPS codes have only been assigned for counties. There are no FIPS codes for offshore areas, even though the Weather Service issues severe weather warnings and other bulletins for offshore areas; marine interests form a large population of Weather Radio listeners. Also, people living in coastal areas might normally monitor for activity offshore, providing them longer lead times for weather that might later

affect their county. It is possible that this oversight could be rectified by assigning FIPS codes for offshore areas or by using the leading FIPS digit to identify the offshore area adjacent to each county.

Another thing to consider is that if you are relying on a SAME alert, there are additional points of possible failure in the warning system. The proper FIPS digits have to be entered into the transmitting radio by the operator when a warning is issued (a step that will soon be automated), and poor reception in the home or a programming error on the part of the user could prevent decoding of a warning signal.

Programming can be checked by scrolling through the LCD listing of FIPS codes in program mode, and reception problems may be identified by checking for activation during the weekly test time (10:00 a.m. to noon on Wednesdays).

The Weather Service has addressed a source of perceived over-warning by the Weatheradio, and it may now be more practical for people to leave their tone-alert radios on-guard in their homes and businesses without concern about unnecessary interruption of sleep or work. The RadioShack unit seems very well designed and is recommended for home, business or school use at a cost of \$79.99.

Sources For NWR-SAME Information And FIPS Codes

Automated Telephone, NOAA Weather Radio SAME line: 1-888-NWR-SAME

Automated Facsimile, RadioShack Fax-Back Service: 1-800-323-6586.
Document No. 40465

World Wide Web, NOAA Weather Radio Home Page: <<http://www.nws.noaa.gov/nwr/>>

NWS Local Offices, <<http://www.nssl.noaa.gov/~nws/otherservers.html>>

NIST FIPS Code List, <<http://www.nist.gov/itl/div897/pubs/codes/states.htm>>

Radio Shack NWR-SAME Support, <http://support.tandy.com/support_audio/40465.htm>

Thunder Eagle, Inc. SAME Page, <<http://www.thuneagle.com/same.html>>

Scanning The Globe

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900-MHz "ACTION" BANDS

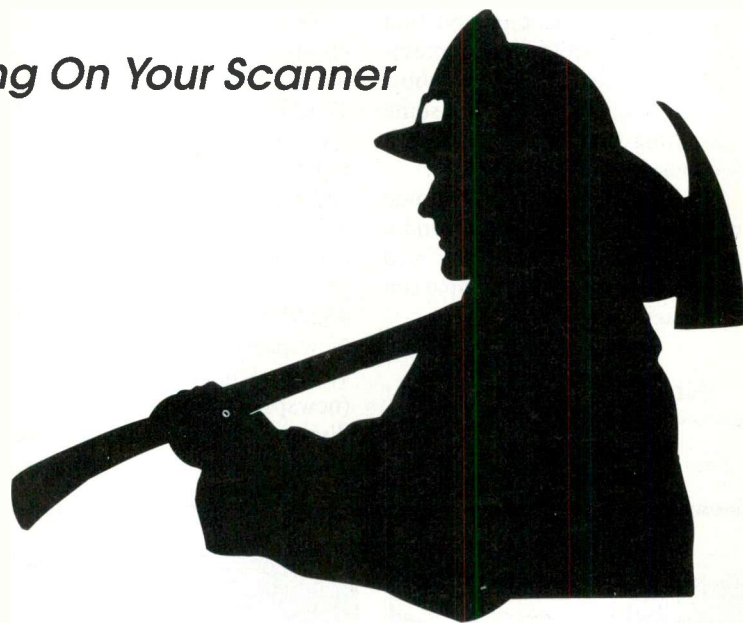
Finding Just About Anything On Your Scanner

One of the more frequent requests I get in the mail here at *Pop'Comm* is for specific frequencies. People want to know the channel used by the medical helicopter or cable TV operator that serves their area. I'd love to sit and look up each and every request for our readers, but the limitations of family, friends, other hobbies and a real job keep me from even considering such a feat. What I have done successfully within this column in the past is to give readers the power to find the frequency on their own.

Going by the responses I receive from those who have attempted the tricks on their own and have been successful, I'm convinced that's the way that helps everyone — the inquirer and the reader who is similarly inquisitive. What I thought I would do this month is to offer some tips to help you become proficient in finding frequencies, even if you don't have a CD-ROM, regional frequency directory or Internet access. With a little understanding of how the radio spectrum is set up for scanner listeners, you can find just about anything.

Searching

How do you use your scanner? Do you listen to the same frequencies every day? Do you search for new channels that may prove interesting? While there's nothing wrong with using your scanner to hear routine public safety communications in your community, there are plenty of other things to be heard. Except for low-priced radios, most scanners have the capability to search through frequency ranges. For instance, if you search from 153.740 to 156.240 MHz, you'll find not only police, fire, local government, school buses, veterinarians, rescue squads and ambulances, but also trauma helicopters, businesses, hospital security and maintenance, park police, business paging, mall and store security, police mutual aid, police point-to-point broadcasts, street crews and highway workers and more.



For the most part, the types of communications you will hear on your scanner depend upon where you live. If you live in a major metropolitan area, you'll hear the entire range of communications suggested here. However, if you live in a rural area, you'll hear only a handful of these types of communications. The point is, however, that you will hear all kinds of things, if you go looking for them.

In the example above, we limited our search between two frequencies spaced about 2.5 MHz apart. The less the range you search between, the higher the chances you have of finding active communications without passing over them. For instance, if a station transmits on 155.190 MHz on a sporadic basis (and you don't know the frequency), you stand a better chance of finding it if you are searching from 155.000 to 155.400, than you would if you were searching from 150.000 to 160.000. That's because the search function will pass over the target frequency more often in a search range that has less range to search through.

Figuring It Out

If you stumble across new stations, how do you determine what it is you are hearing? First, check your local scanner

directory. Most radio stores carry one version or another of a local scanner guide. In the rear of most scanner guides, licensees are shown sorted by frequency. For instance, if you heard hospital security on 155.175, you could look under that frequency to find what nearby hospitals might be licensed on that frequency. While callsigns aren't always used, you should jot down any you hear. These begin with a W or K and have a combination of anywhere from two to four letters and three to five numbers, such as: KA3002, KB91235, WXJ42, WYR333 and KNJJ244. Typically, callsigns with just two letters, in the first two examples above, are for stations that are licensed for mobile operation only. Those stations with three letters and two numbers are usually for fixed stations, such as control stations that are at base stations and operate through repeaters or perhaps are used for point-to-point communications only. Stations with three or four letters and three numbers are used for base stations and all associated mobiles and handhelds.

By catching the callsign, you can figure out not only what type of station you are hearing, but also perhaps who it is, by matching the callsign in a scanner directory. That's part of the trick to being a successful frequency detective. By knowing

how to search for new frequencies, you can find all kinds of new stations that might prove interesting to monitor. Sure, you may prefer to keep an ear on your local police and fire departments on a day-to-day basis, but on a rainy day, you might find it more interesting to tune across a range of frequencies and find new stations you weren't aware of previously. It all adds up to enhance the hobby. As long as you are willing to invest some time in searching for new frequencies, it will prove beneficial in the long run.

And don't forget, when you come across exciting new frequencies, send a list to us here at "Scanning the Globe" and we'll tell others in your area of some fun new frequencies.

Nosy For News

Dave Fenton of Plymouth, Minnesota,

says he has an older Realistic PRO-2005 scanner as well as a Uniden Bearcat 200XLT handheld scanner at his listening post in the Minneapolis area. John said he is looking for frequencies used by newspapers, not just in his area, but also in others where he might be traveling.

Newspapers are allocated two basic groups of frequencies. The first one is a block of four VHF frequencies: 173.225, 173.275, 173.325 and 173.375 MHz. The second group is on UHF. Base stations, repeaters and mobiles can use 452.975 and 453.000 MHz, while mobiles can use 457.975 and 458.000. In addition, a handful of frequencies is reserved for low-power handheld use: 452.9625, 452.9875, 457.9625 and 457.9875. Newspapers use these frequencies for a variety of functions, including circulation (newspaper delivery), administrative and dispatch (delivery of advertising materials) and news (both reporters and pho-

tographers). Some newspapers even might use the frequencies for advertising sales representatives, vehicle maintenance, paging and more.

While a lot of newspapers use these few channels, many smaller papers can't afford to invest in all the equipment needed to put a major radio system on the air and instead may use conventional business band frequencies (after all, a newspaper is a business, and thus qualifies for that radio service as well). Most newspapers using business band will show up on shared repeaters in the 461 to 465-MHz band, or on T-band frequencies in the top 20 metropolitan areas. In addition, some newspapers also use 800-MHz repeaters and trunked systems, and the 935 to 940-MHz trunked systems in major cities. In fact, some larger newspapers may use a variety of radio systems in their operations.

For instance, a newspaper might use one or two VHF channels at 173 MHz for news photographers, a UHF frequency at 453 MHz for circulation deliveries, a UHF business band frequency at 461 MHz for outlying circulation units, an 800-MHz trunked system for reporters on assignment and low-power frequencies at 453 and 458 MHz for building security and data transmission for press operations monitoring. Check around and see what you can find.

However, don't fret if you know your local newspaper must have a way to contact its personnel and you aren't hearing anything over the air. There's a good chance key personnel are using cellular or wireless phones. Many newspapers use cell phones for photographers and key reporters, especially police reporters. Not only does it make it harder for the competition to monitor, it's quieter for the staffer on assignment, too (no noisy radio, just a phone that might ring).

VIDEO SYNC GENERATOR



Restores Horizontal and Vertical Sync Lines from Distorted Video

For Free Information Package and Pricing

Call 219-236-5776
www.south-bend.net/rcd

R.C. Distributing, P.O. Box 552, South Bend, IN 46624



Lost Sync



Restored Sync with VSG

CIRCLE 75 ON READER SERVICE CARD

Quality Microwave TV Systems

**WIRELESS CABLE • ITFS • MMDS
ATV • INTERNATIONAL • S-BAND**

Amplifiers • Antennas • Books • Components
Filters • Systems • Video Products

- RF Frequency 1990 - 2700 MHz
- Cable Ready - VHF - UHF Outputs
- SASE For "FREE" Catalog or Send \$1

PHILLIPS-TECH ELECTRONICS
PO Box 8533 • Scottsdale, AZ 85252

ORDER LINE 800-880-MMDS
CATALOG/INFO 602-947-7700
FAX LINE 602-947-7799

CHALLENGER SYSTEM 33-Channel 52dB Gain Complete Grid \$265 Five Year Warranty FREE SHIPPING

Visa • M/C • Amx • Disc • COD's • Qty Pricing

CIRCLE 73 ON READER SERVICE CARD

FRS HEADQUARTERS!



FR-465

Ideal for reliable communications up to two miles. Cherokee's new FRS radio offers the most useful features at the lowest price!

\$109.99
Free Shipping

QUEMENT COMMUNICATIONS
PHONE TODAY 1-800-998-8070

CIRCLE 7 ON READER SERVICE CARD

PAY TV AND SATELLITE DESCRAMBLING 1998

Pay TV and Satellite Descrambling 1998 includes all satellite fixes \$15.95. Satellite Hacker Package \$39.95. Hacking Digital Satellite Systems Video \$39.95. One year subscription to Scrambling News, includes web \$29.95.

BEST DEAL. Everything here only \$99.95.
C.O.D. is O.K. \$6. FREE CATALOG

SCRAMBLING NEWS
1060 NIAGARA FALLS BLVD., #110, TONAWANDA, NY 14150-9300
Voice/FAX (716) 283-6910 BBS (716) 871-1915
http://www.scramblingnews.com

CIRCLE 77 ON READER SERVICE CARD

Those IDs

Ben Kirklin of Pleasantville, New Jersey, writes to inquire about the Registered Monitor program. "Scanning the Globe" usually gets quite a few requests for this information every year. Registered monitors receive a distinctive identifier, such as my own, KPA3CA, which helps identify them as serious monitors when writing to others, especially when seeking verification letters or QSLs. The Registered Monitor call starts with a "K" and then contains the state abbreviation, the amateur radio call district numeral and a suffix. As you can see,

We Have Scanners with 800MHz Coverage!

ICOM R9000, R8500, PCR1000, R100, R10, R1
Yupiteru MVT-9000, MVT-7100, MVT-8000
AOR AR-5000, AR-5000+3, AR-3000, AR-8000
OPTOELECTRONICS Xplorer, R11
(Nearfield Receivers)

New Icom R-10 Wide Range Receiver
500KHz~1300MHz coverage AM/NFM/WFM/USB/LSB/CW
1000 Memory Channels (18 x 50 and 1 x 100)
Computer Interface • Selectable Step Size

ATLANTIC HAM RADIO LTD
(416) 636-3636 ahr@interlog.com 368 Wilson Ave
(416) 631-0747 fax Downsview, ONT
www.interlog.com/~ahr/scan.htm Canada M3H 1S9

R10



WS 2000



Welz/Standard WS2000
5-1300MHz 800 Memories
Almost the size of a Pager
Amazingly Low Price.

All U.S. Orders Shipped Air

my Registered Monitor ID was issued when I lived in Pennsylvania long ago.

For more information on the Registered Monitor program, write to CRB Research Books Inc., P.O. Box 56, Commack, N.Y. 11725, and tell them *Pop*Comm* sent you!

Send Your Letters, Photos And Questions!

What are your favorite frequencies?

Do you have any scanner-related questions? Do you have any listening tips worth passing along to your fellow readers? How about sending in a photo of your listening post or antenna farm? Write to Chuck Gysi, N2DUP, "Scanning the Globe," *Popular Communications*, Box 11, Iowa City, Iowa 52244-0011, fax to (516) 681-2926, or e-mail to <SCAN911@aol.com>. Make sure you indicate in your e-mail that you are writing regarding this column. ■

Home On The Ranges

For those who want to get a start in searching, here are a few ranges to check out and the primary types of communications you'll hear:

33.00 to 34.00	Fire, ambulance and school buses
39.00 to 40.00	Police
45.00 to 46.50	Police, fire, ambulance, school buses
46.61 to 46.97	Older cordless phones
49.67 to 49.99	Older cordless phone bases
52.00 to 54.00	Hams (FM mode)
118.000 to 137.000	Aircraft (AM mode)
137.000 to 144.000	Military
145.110 to 147.390	Hams, FM simplex and repeaters
148.000 to 150.750	Military
150.995 to 151.475	Tow trucks, parks and environmental
151.625 to 151.955	Businesses
153.035 to 153.395	Manufacturing
153.410 to 153.725	Utilities
153.740 to 156.240	Police, fire, local government, ambulances, rescue units, school buses, business
156.275 to 157.425	Marine
158.130 to 158.265	Utilities
158.730 to 159.465	Police, local government, parks and environmental, streets and highways
159.495 to 160.200	Trucking
160.215 to 161.565	Railroads
162.000 to 174.000	Federal government, weather broadcasts, wireless microphones
222.000 to 225.000	Hams
225.000 to 406.000	Military aviation (AM) and satellites (FM)
406.000 to 420.000	Federal government
420.000 to 450.000	Hams (except public safety in the 420 to 430-MHz band in U.S. areas near Canada)
450.000 to 451.000	TV and radio stations' news crews, remote broadcasts
451.000 to 453.000	Industrial, utilities, buses, trucking, tow trucks, taxis
453.050 to 454.000	Police, fire, local government
454.000 to 455.000	Mobile telephone, paging
455.000 to 456.000	TV and radio stations' news crews, remote broadcasts
460.000 to 460.625	Police, fire
460.650 to 461.000	Airlines, alarm companies
461.000 to 465.000	Businesses, industrial, paramedics, General Mobile Radio Service, Family Radio Service, paging.

FACT:

Transmit antennas should always be fine-tuned after installation to ensure maximum performance.

FIRESTIK:



Firestik makes the only antenna with a patented bare-hands tunable tip for the easiest tuning method available.

FREE
PRODUCT
GUIDE

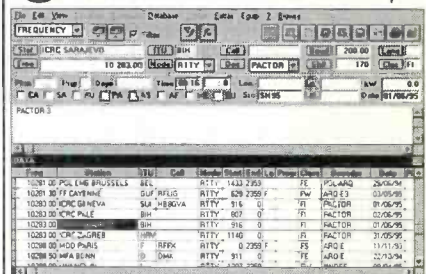
FireStik

ANTENNA COMPANY

602-273-7151 • facts@firestik.com
http://www.firestik.com

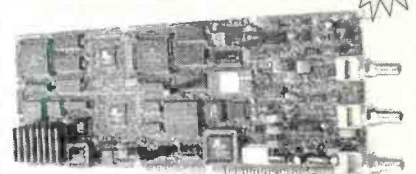
CIRCLE 69 ON READER SERVICE CARD

shoc RadioManager ^{\$98}



RadioManager 4.2E includes all radio drivers and an actual, professional database with more than 57,000 records (37,000 Broadcast/Utility, 20,000 VHF/UHF center Europe). Database-Scanning, Station Identification, Multiple search filters, Channel control and Timer mode. Other versions: RM4.2S Standard and RM4.2P Professional. RadioManager supports most radios and decoders.

WAVECOM Decoder ^{\$3500}



W41PC Data Decoder and Analyser. DSP technology with two 56002-66 and one TMS34010 processor. More than 70 modes (HF, VHF/UHF and Satellite) supported, new modes under preparation. Real-time FFT and code analysis. Source code/training for professionals available. Up to 4 cards in one PC. Standalone version: W4100-DSPI

shoc, Weiherhof 10, CH-8604 Volketswil, Switzerland
Phone +41-89-421 5037 FAX +41-1-997 1556
E-Mail: support@shoc.ch Web: http://www.shoc.ch

CIRCLE 78 ON READER SERVICE CARD

The Ham Column

GETTING STARTED AS A RADIO AMATEUR

Troubleshooting In The Shack

Now that space-age amateur transceivers are standard equipment in most shacks, many hams don't fix their own gear. Even some technicians are reluctant to play around with the subminiature surface-mount components found in modern rigs. Who can blame them?

Sooner or later, however, every piece of gear will need attention. So, if the thought of grabbing a toolbox and a digital multimeter is frightening, rest assured that there's a lot of troubleshooting power in the "tool" between your ears. Nobody's found anything better than common sense, especially when it comes to beating ol' Murphy.

When something goes wrong, eliminate the simplest possibility right away: Is the radio plugged in? Don't laugh! As any professional technician can tell you, a lot of service calls could be avoided by covering the basics.

Beyond checking out the power cord, simply asking someone for advice is often a good way to solve a frustrating problem. Chances are good that one of your ham friends has had a similar encounter with Murphy and can probably suggest a reasonable cure. And don't be afraid to ask for help. Two brains are almost always better than one!

When you have a problem with your rig, don't be in a hurry to "open the hood" and look inside. There's probably not going to be a big arrow pointing to the problem. You might spot a burned resistor or a loose wire, but you're just as likely to break a wire in the process of getting the thing opened up. Sit back and analyze the problem before you dig in. What are the possible causes?

Your thoughts should go from general to specific. For example, if your rig is completely dead, don't open it up and start testing the transistors in the speech processing circuit! Here are a few things for you to consider:

- ✓ Did the rig fail when you were using it, or was it dead when you tried to turn it on? If it's dead today and it wasn't yesterday, what's different? Could someone have tweaked a control? Was there an overnight electrical storm? Extreme cold? Think! Analyze!
- ✓ If the failure occurred right in front of you, were there any obvious symptoms? Did you hear any crackling noises or see any sparks? Were there any strange smells? What exactly were you doing when the failure occurred?
- ✓ If it's not a complete failure, can you localize the problem. Is it confined to one band? Do you use a different antenna on that band?
- ✓ If the rig's completely dead, make sure there's 120 Vac at the wall socket. A popped circuit breaker in the basement may be the culprit.
- ✓ Have you read the equipment manuals yet? You know—the ones nobody likes to read from cover to cover.
- ✓ Is your coax or feedline intact? There's no chance of water contamination, is there? Are the connectors on right? (One subset of Murphy's Law deals exclusively with connectors!)
- ✓ If you have two VFOs, are you switched to the right one? Many older rigs with outboard VFOs require a shorting plug if the secondary VFO is not connected. Read the fine print!
- ✓ Check the front panel. Is the squelch turned down? RF gain up? Is the preselector tuned correctly? Any problems here can make even the best receiver seem dead.
- ✓ How about your keyer? Some require different settings for tube and solid-state rigs. Again, read the manual.
- ✓ Make sure you're not plugging your headphones into the microphone jack, and vice versa. Headphones always make lousy microphones!
- ✓ If your rig has tube finals, is the filament power on, or did you merely turn on the high voltage? You can't get out that way!
- ✓ Trouble with your antenna tuner? Is the correct antenna attached? Is the antenna selector switch set correctly? If you're using an internal balun or are matching open-wire feeders, many antenna tuners require an external jumper to function properly. Does yours?

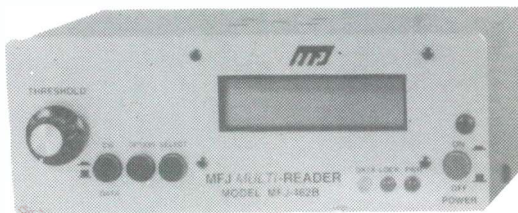
Before Murphy Strikes

- ✓ When your rig is functioning properly, take a few minutes to make a chart of the front-panel control settings. When you have problems later, you can quickly compare settings. This is especially useful if you have children who like to "play" with your radios when you're not around. (Make sure the power to such radios is disabled — for your children's protection and yours.)
- ✓ Don't skimp on labels. If you bring more than one feedline in from the outside, label them. If you build your own equipment, label the controls. You may remember what everything does today, but will you remember forever? Murphy loves poorly labeled boxes!
- ✓ Try to use standard connectors for RF, audio and power. Don't use PL-259s for power connectors, and don't use RCA jacks for RF. Sooner or later you'll connect something improperly and Murphy will be right there.

All of these ideas may seem like common sense, but most of us have had to learn them the hard way. Believe me, when it comes to Murphy, a little prevention is worth a lot of troubleshooting!

Tap into secret Shortwave Signals

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



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

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

You'll read interesting commercial, 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, Iraqi News in Iraq -- all on RTTY.

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

\$129⁹⁵ MFJ-1024 MFJ-1312, \$124.95.

Indoor Active Antenna

MFJ-1020B Rival outdoor 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 miniizes 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. 5x2x6 in. Use 9 volt battery, 9-18 VDC or 110 VAC with MFJ-1312, \$124.95.

Compact Active Antenna

MFJ-1022 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, \$124.95. 3 1/4x4 1/4x4 in.

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 on 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. 5 1/4x2 1/2x5 1/4 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.

Receive Color News Photos, Weather Maps, RTTY, ASCII, Morse Code

MFJ-1214PC 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 High-Q Passive Preselector

MFJ-956 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 pos. 2x3x4"

Mobile Scanner Ant.

Cellular MFJ-1824BB/BM 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 Antenna Matcher

MFJ-959B 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, \$124.95.

High-Gain Preselector

MFJ-1045C 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-1312, \$124.95.

Dual Tunable Audio Filter

MFJ-752C Two separately tunable filters let you peak desired signals and notch out interference at the same time. You can peak, notch, low or high pass signals to eliminate heterodynes and interference. Plugs between radio and speaker or phones. 10x2x6 in.

Easy Up Antennas Book

How to build and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before.

Covers receiving antennas from 100 KHz to almost 1000 KHz. Includes antennas for long, medium and shortwave, utility, marine and VHF/UHF services.

Easy Up Antennas Book

How to build and put up inexpensive, fully tested wire antennas using readily available parts that'll bring signals in like you've never heard before.

Covers receiving antennas from 100 KHz to almost 1000 KHz. Includes antennas for long, medium and shortwave, utility, marine and VHF/UHF services.

MFJ 12/24 Hour LCD Clocks

MFJ-107B \$9⁹⁵

MFJ-108B \$19⁹⁵

MFJ-105B \$19⁹⁵

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!

MFJ-105B, accurate 24 hour UTC quartz wall clock with large 10 inch face.

MFJ Antenna Switches

MFJ-1704 \$59⁹⁵

MFJ-1702B \$21⁹⁵

MFJ-1704 heavy duty antenna switch lets you select 4 antennas or ground them for static and lightning protection. Unused antennas automatically grounded. Replaceable lightning surge protection device. Good to 500 MHz. 60 dB isolation at 30 MHz. **MFJ-1702B** for 2 antennas.

World Band Radio Kit

MFJ-8100K \$59⁹⁵ kit

MFJ-8100W \$79⁹⁵ wired

Build this regenerative shortwave receiver kit and listen to shortwave signals from all over the world with just a 10 foot wire antenna. Has RF stage, vernier reduction drive, smooth regeneration, five bands.

Free MFJ Catalog

Write or Call tollfree . . . 800-647-1800

Nearest Dealer/Orders: 800-647-1800
Technical Help: 800-647-TECH(8324)

• 1 year unconditional guarantee • 30 day money back guarantee (less s/h) on orders from MFJ • FREE catalog

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
(601) 323-5869; 8-4:30 CST, Mon.-Fri.
FAX: (601) 323-6551; Add s/h

WEB: <http://www.mfjenterprises.com>
MFJ . . . making quality affordable
Prices and specifications subject to change © MFJ Enterprises, Inc.

Pop'Comm's World Band Tuning Tips

April 1998

This listing is designed to help you hear more shortwave broadcasting stations. The list includes a variety of stations including international broadcasters beaming programs to North America, others to other parts of the world, as well as local and regional shortwave stations. Many of the transmissions listed here are not in English. Your ability to receive these stations will depend on time of day, time of year, your geographic location, highly variable propagation conditions and the receiving equipment used.

AA, FF, SS, GG, etc. are abbreviations for languages (Arabic, French, Spanish, German). Times given are in UTC, which is five hours ahead of EST, i.e. 0000 UT equals 7 p.m. EST, 6 p.m. CST, 4 p.m. PST.

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0000	5930	Radio Prague, Czech Republic		0315	7305	Vatican Radio	SS
0000	7350	Voice of Russia		0330	9840	Radio Budapest, Hungary	
0000	7375	Radio Bulgaria		0345	7340	Voice of America via Botswana	
0030	5013	Radio Cristal, Dominican Republic	SS	0400	4775	Trans World Radio, Swaziland	GG
0030	5905	Radio Vilnius, Lithuania, via Germany		0400	4976	Radio Uganda	
0030	6055	Voice of Islamic Republic of Iran		0400	7385	RFPI, Costa Rica	
0030	7115	Radio Yugoslavia, Bosnia	EE/Serbian	0400	9730	China Radio Int'l, via French Guiana	
0030	7250	All India Radio, Panji	vern.	0400	9745	HCJB, Ecuador	
0030	9022	Voice of the Islamic Republic of Iran		0430	5060	Radio Nacional Progreso, Ecuador	SS
0030	11905	Radio Thailand Int'l		0430	5077	Caracol Colombia	SS
0050	11800	RAI, Italy		0430	7300	Voice of Turkey	
0100	4719	Radio Abaroa, Bolivia	SS	0430	9570	Radio Portugal Int'l	
0100	4850	Radio Luz y Vida, Ecuador	SS	0430	9725	Adventist World Radio, Costa Rica	
0100	4955	Radio Nacional, Colombia	SS	0450	9770	VORGAN, Angola	PP
0100	5030	Radio Rebelde, Cuba	SS	0500	3290	GBC-Voice of Guyana	
0100	5040	Georgian Radio, Georgia Rep.		0500	4770	Radio Nigeria	
0100	5930	Radio Slovakia Int'l, Slovak Rep.		0500	4904.5	Rdf Nationale Tchadienne, Chad	FF
0100	6025	Radio Amanacer, Dominican Republic	SS	0500	4950	Radio Nacional, Angola	PP
0100	9705	Radio Mexico Int'l	SS	0500	5960	China Radio Int'l, via Canada	
0100	11810	Radio Brazil Central, Brazil	PP	0500	6165	Radio Netherlands via Bonaire	
0200	4820	La Voz Evangelica, Honduras	SS	0500	7255	Voice of Nigeria	
0200	4830	Radio Tachira, Venezuela	SS	0500	7465	Kol Israel	
0200	4835	Radio Tezulutlan, Guatemala	SS/vern	0500	9835	NHK-Radio Japan	
0200	4840	Radio Amazonas, Venezuela	SS	0500	9905	Swiss Radio Int'l	
0200	4885	Radio Clube do Para, Brazil	PP	0530	6250	Radio Nacional, Equatorial Guinea	SS
0200	5055	TIFC/Faro del Caribe, Costa Rica	SS	0530	6900	Voice of Meterology, Turkey	TT
0200	6000	Radio Havana Cuba		0545	3366	Ghana Broadcasting Corporation	
0200	6120	Croatian Radio		0600	4960	Voice of America via Sao Tome	
0200	9510	Radio Romania Int'l		0600	5100	Radio Liberia	
0200	9580	Voice of Russia		0600	6980	RFPI, Costa Rica	USB
0200	9645	Radio Bandeirantes, Brazil	PP	0600	9445	Voice of Turkey	TT
0230	4920	Radio Quito, Ecuador	SS	0600	9600	BBC via Ascension	
0230	11710	RAE, Argentina		0600	9665	Korean Central Bc.System, No. Korea	KK
0245	5840	Voice of Greece via VOA		0600	9810	Radio Kiribati	EE/vern.
0250	4820	Radio Botswana	vern.	0600	9935	RS Macedonia, Greece	GG
0300	3200	Trans World Radio, Swaziland	vern.	0630	3400	Star Radio, Liberia	
0300	4980	Ecos del Torbes, Venezuela		0630	6015	Radio Austria Int' via Canada	
0300	5050	Radio Tanzania	vern.	0630	6115	Radio Union, Peru	SS
0300	5895	Voice of Greece	GG	0630	7270	Adventist World Radio, Italy	FF
0300	9690	Radio Exterior de Espana, Spain		0700	4960	Radio Vanuatu	

UTC	Freq.	Station/Country	Notes	UTC	Freq.	Station/Country	Notes
0700	5020	Solomon Is. Broadcasting Corp.		1430	9640	Radio Canada Int'l	
0700	9965	KHBN, Palau		1500	9415	Radio Australia	
0730	6040	Radio Clube Paranaense, Brazil	PP	1500	9430	Trans World Radio, Guam	
0800	4755	Radio Educadora Rural, Brazil	PP	1500	9535	NHK-Radio Japan	
0800	5950	GBC-Voice of Guyana		1550	11640	Vatican Radio	
0800	6070	CRFX, Canada		15600	11570	Radio Pakistan	
0900	9700	Radio New Zealand Int'l		1600	9810	Radio New Zealand Int'l	
0900	15225	Radio Finland Int'l		1600	11615	Radio France Int'l	
0930	6064	Colmundo Bogota, Colombia	SS	1600	13630	UAE Radio TV, Dubai	
1000	3251	Radio Comas, Peru	SS	1600	13750	Adventist World Radio, Costa Rica	
1000	3280	La Voz del Napo, Ecuador	SS	1700	9810	Far East Bcst. Assn., Seychelles	
1000	4790	Radio Atlantida, Peru	SS	1700	9955	WRMI, Miami	SS/EE
1000	4840	Radio Andahuaylas, Peru	SS	1730	11680	Radio Vlanderen Int'l, Belgium, via Germany	
1000	5629	Radio Ilucan, Peru	SS	1800	13650	Radio Canada Int'l	
1030	4460	Radio Norandina, Peru	SS	1830	9200	Radio Omdurman, Sudan	
1030	5025	Radio Quillabamba, Peru	SS	1830	9510	Trans World Radio, South Africa	
1100	3315	Radio Manus, Admiralty Is, Papua New Guinea		1830	9580	Africa Number One, Gabon	FF
1100	3925	Radio Tampa, Japan	JJ	1830	11810	Detutsche Welle, Germany, via Rwanda	
1100	4860	Radio Federacion, Ecuador	SS	1830	15244	La Voix du Congo, Dem. Rep. of the Congo	FF
1100	6570	Defense Forces Bc. Stn, Myanmar	Burmese	1850	9260	Icelandic State Broadcasting Service	
1100	11787	Radio Iraq Int'l	AA				
1100	15115	HCJB, Ecuador					Icelandic; USB
1130	4000	Radio Republik Indonesia, Kendari	II				
1130	7420	Trans World Radio, via Russia	various	1900	9895	Radio Netherlands	
1200	4753	Radio Republic Indonesia, Ujung Pandang	II	1900	13610	Radio Damascus, Syria	FF
1200	4890	NBC, Papua New Guinea		1900	15275	Radio Jamahiryah, Libya	AA
1200	5005	Radio Malaysia, Sarawak		1900	15315	Radio Netherlands via Bonaire	
1200	6950	China Radio Int'l		1930	17830	BBC via Ascension	
1200	7285	Radio Korea Int'l		2000	9885	Swiss Radio Int'l	
1200	9660	Voice of the Mediterranean, via Italy	AA/EE/II	2000	17755	Voice of America via Ascension	
1200	9715	Radio Tashkent, Uzbekistan		2030	15186	Radio Africa, Equatorial Guinea	
1200	9805	Radio France Int'l		2030	66620	VORGAN, Angola	PP
1200	11904	National Voice of Cambodia		2100	5975	BBC via Antigua	
1230	6120	NHK-Radio Japan, via Canada		2100	9505	Radio Record, Brazil	PP
1230	7215	UAE Radio, Abu Dhabi	AA	2100	9735	Radio Oman	AA
1230	9865	Radio Thailand Int'l	LSB	2100	15550	HCJB, Ecuador	AA
1230	9930	Radio Free Asia via KWHR, Hawaii	Khmer	2130	5985	Radio Congo Liberte, Rep. of Congo	FF
1230	11650	Radio Sweden		2130	9805	Radio Canada Int'l	
1230	11755	Radio Finland Int'l		2130	11785	Radio Iraq Int'l	
1230	15240	Radio Sweden		2130	15485	Kol Israel	AA
1300	5050	All India Radio	Hindi	2200	7520	Radio Moldova Int'l, via Romania	
1300	5260	Kazakh Radio, Kazakhstan	Kazakh	2200	9830	Radio Havana Cuba	SS, USB
1300	7265	Radio Veritas Asia, Philippines	Vietnamese	2200	9855	Radio Kuwait	
1300	7285	Radio Korea Int'l		2200	9900	Radio Cairo, Egypt	AA
1300	9500	Radio Australia		2200	9965	Voice of Armenia	
1300	9515	BBC via Canada		2200	9985	Radio Taipei Int'l, Taiwan	via WYFR
1300	11660	Radio Australia		2200	15140	HCJB, Ecuador	SS
1300	11740	Vatican Radio		2230	7150	Radio Ukraine Int'l	
1300	11815	Polish Radio, Poland		2230	9790	Radio France Int'l	FF
1300	15220	BBC, via WYFR		2230	9875	FEBC, Philippines	
1300	21455	HCJB, Ecuador	USB	2230	11795	Deutsche Welle, Germany, via Antigua	GG
1330	9580	Radio Australia		2230	11835	BBC via Ascension	
1330	12105	Voice of Greece	GG/EE	2300	4409	Radio Eco, Bolivia	SS
1330	13730	Radio Austria Int'l		2300	4850	CRTV, Cameroon	FF
1400	7200	NHK-Radio Japan		2300	5940	Voice of Russia	
1400	9565	Radio Republik Indonesia	II	2300	11780	Radio Nacional Amazonia, Brazil	
1400	9630	Radio Exterior de Espana, Spain		2300	11915	Radio Gaucha, Brazil	PP
1400	11690	Radio Jordan		2300	11925	Radio Bandeirantes, Brazil	PP
1400	13800	Radio Norway	NN (Su EE)	2330	6135	Voice of Turkey	
1400	15565	BBC		2330	9905	Swiss Radio Int'l	
1430	7400	Adventist World Radio, Guam		2330	4775	Radio Liberal, Brazil	PP

The Pirate's Den

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

Have YOU Heard Them? Pirate Action Abounds . . .

The hold is chock-full of bounty again this month. So off we go into the Den's mailbag.

Radio Free Euphoria, 6955 USB heard at 0320 with special program. Also at 1525 and 2336. (Lee Silvi, OH) 2330 with talk of and songs about pot. (William T. Hassig, IL)

Radio Free Speech, 6955 at 1339. Also 1525. (Silvi, OH) 1420 to 1448 close. (Jerry Coatsworth, ON) 1535 sign on with "Bill O' Rights" hosting & plugs for pirate publications. (George Zeller, OH — welcome, George! — Editor)

Radio Metallica Worldwide, 6955 at 1530 with Dr. Tornado calling himself "Sr. El Nino." (Dean Burgess, MA) 6952.8v at 1522 to 1537 close. Dr. Tornado with YL "Jade" in studio and doing a capella singing. (Zeller, OH) 6955 at 2356 opening with "In the



Take It Easy Radio sent this certificate QSL to William Flagel in Michigan for his reception of a 1997 broadcast.

Mood." (Silvi, OH) 6951.5 at 1500 "Chattanooga Choo-choo" IS, ID and info by Jane. (Coatsworth, ON) 0210 Said running 10,000 watts. My first pirate

log. (John E. Jenkins, WV) (Congrats — Editor) 6951.47 at 0115 and 6958.7v at 0205. (Hassig, IL)

Take It to the Limit Radio, 6955 USB at 0300 with DJ "Don Pardo" electronically altered voice. Talk radio recordings. Also at 2255 with rock and country. (Hassig, IL)

Take It Easy Radio, 6955 USB at 1000. QSL via Belfast address. (Hassig, IL) 2010 with hard rock, comedy, talk about other pirates, blues and talk about politics (including the Tauzin Privacy bill). Off at 2113. (Dave Jeffery, NY)

Partial India Radio, 6955 USB at 0317 with letters. Also at 1639, possible Unshackled program (Coatsworth, ON) 1617 to 1659 close with DX banter between Sanjay and Harold Krishna. Stoneham address. (Zeller, OH) 1618 with Beavis and Butthead clips. (Burgess,

DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST. WE'RE MORE THAN JUST SOFTWARE!

CAT-5000

SPECTRUM ANALYSIS ON YOUR PC

- With the addition of AOR's SDU-5000 Spectrum Analyzer and this NEW Windows Software any radio that has a 10.7MHz IF output will give you full computer controllable spectrum analysis.
- Plus, with the listed radios below, you can have a complete computerized control of receive frequency, direct frequency readout, and a spectrum bandwidth (variable from 500KHz to 10 MHz).
- Just use your mouse to "arm chair" the controls. Never touch the radio once the software is running.



Only \$99.95 + S & H

- AR3000A, (Requires Installation of IF output).
- AR5000
- R7000 ICOM
- R7100 ICOM
- R9000 ICOM
- R8500 ICOM
- Most ICOMs that support user programmable addresses. (Must have 10.7MHz IF Output)

Features

- Variable bandwidth, up to 10.7 MHz.
- Variable Peak Readout.
- Instant Readout of Frequency any place on the PC's Display.
- Automatic Scanning of programmable ranges (up to 100 available).
- Instant change of center frequency with a simple mouse click.
- Selectable Audio Alert of frequency signal peaks.
- Recording of incoming Spectrum data to disk.
- Direct (Variable) Threshold readout of all peaks on display.
- Playback of Recorded Spectrum data from disk, even without connecting the Radio/SDU!
- Signal Averaging, PLUS our exclusive "VARI-COLOR" Analysis.
- THREE different graphical analysis modes for detailed analysis.

Minimum Requirements

- IBM Compatible PC with 8 meg ram.
- Windows 3.1 or later.
- 8 meg Hard Drive space.
- AOR SDU-5000 and a radio with 10.7 MHz "IF" output.

CAT-WHISKER

TIRED OF YOUR HANDHELD SCANNER ALWAYS FALLING OVER JUST TO KEEP THE ANTENNA "VERTICAL"?



Try our unique, swivel base, telescopic scanner antenna. Our new CAT-WHISKER lets you lay your handheld scanner on its back and still keep the antenna vertical!

- Swivels to ANY angle.
- Easily adjusts to any length AND frequency.
- Fits ANY scanner with a BNC antenna connector.
- Fits on BACK or TOP mount scanner antennas inputs.

CAT-WHISKER #1 (5 to 23 inches) \$19.95
 CAT-WHISKER #2 (6 to 36 inches) \$24.95
 (plus \$2.50 S & H)

HOKA CODE-3 USA Version

"The Standard Against Which All Future Decoders Will Be Compared"

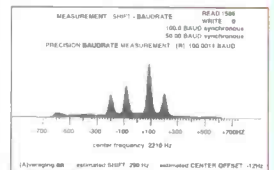
Many radio amateurs and SWLs are puzzled! Just what are all those strange signals you can hear but not identify on the Short Wave Bands? A few of them such as CW, RTTY, Packet and Amtor you'll know - but what about the many other signals?

There are some well known CW/RTTY Decoders but then there is CODE-3. It's up to you to make the choice, but it will be easy once you see CODE-3. CODE-3 has an exclusive auto-classification module that tells YOU what you're listening to AND automatically sets you up to start decoding. No other decoder can do this on ALL the modes listed below - and most more expensive decoders have no means of identifying ANY received signals! Why spend more money for other decoders with FEWER features? CODE-3 works on any IBM-compatible computer with MS-DOS with at least 640kb of RAM, and a CGA monitor. CODE-3 includes software, a complete audio to digital FSK converter with built-in 115V ac power supply, and a RS-232 cable, ready to use.

CODE-3 is the most sophisticated decoder available for ANY amount of money.

26 Modes included in STANDARD package include:

- Morse
- RTTY/Baudot/Murray
- Sitor CCIR 625/476-4
- ARO - Navtex
- AX25 Packet
- Facsimile all RPM (up to 16 gray shades at 1024 x 768 pixels)
- Autospec - Mk's I and II
- DUP-ARQ Artrac
- Twintex
- All modes in typical baud rates with possibility of changing to any desired value of speed and shift.
- User can save incoming data to disk in either ASCII or raw bit form.
- ASCII
- ARO6-90/98
- SI-ARQ/ARQ-S
- SW-ARQ-ARQ-SWE
- ARO-E/ARQ1000 Duplex
- ARO-N-ARQ1000 Duplex Variant
- ARO-E3-CCIR519 Variant
- POL-ARQ 100 Baud Duplex ARQ
- TDM242/ARQ-M2/4-242
- TDM342/ARQ-M2/4
- FEC-A FEC100A/FEC101
- FEC-S • FEC1000 Simplex
- Sports info 300 baud ASCII
- Hellscreiber-Synch/Asynch
- Sitor • RAW (Normal Sitor but without Synch.
- ARO6-70
- Baudot F788N
- Pactor *
- WEFAX *



Simulated Speed Measurement Module

EXTRA OPTIONS

	REG. PRICE
Piccolo	\$85.00
Coquelet	\$85.00
4 special ARO & FEC systems: TORG-10/11, ROU-FEC/RUM-FEC, HC-ARQ (ICRC) and HNG-FEC	\$115.00
SYNOPSIS decoder	\$85.00

STANDARD CODE-3 DECODER

\$595.00 + S & H

Includes: ALL Modes, Plus Oscilloscope*, ASCII Storage, Auto Classify*, and PACTOR* Options

with ALL EXTRA OPTIONS \$795.00 + S & H

CODE 3 - GOLD VHF/SW DECODER

\$425.00 + S & H

includes POCSAG & ACARS Plus * Modes/Options

with ALL EXTRA MODES/OPTIONS \$595.00 + S & H

ALSO AVAILABLE - HOKA CODE-30 DSP-based Professional Decoder - CALL FOR PRICE

INTERNET WEB ADDRESS - <http://www.scancat.com> WEB E-MAIL - scancat@scancat.com

(S & H \$10 US, \$15 Foreign)

Order direct or contact your favorite dealer

COMPUTER AIDED TECHNOLOGIES

P.O. Box 18285 Shreveport, LA 71138

Phone/Orders: (318) 687-4444 FAX: (318) 686-0449

Info/Tech Support: (318) 687-2555 (9 am - 1 pm Central M-F)

FREE DEMOS ON THE WEB



Toll-Free Orders
888-SCANCAT
 888-722-6228

MA) Anteatr Radio, 6955 USB at 0550 with short program, then a short QS). (Coatsworth, ON)

Radio Eclipse, 6954.8 at 1552 to 1602 sign off. Steve Mann with music and hellos to specific pirate stations. Also on **6953v** at 1537, probably via Metallica transmitter. (Zeller, OH) 2300 with a tribute to Take It Easy Radio, on top of Radio Azteca. Another day at 0205 with a repeat show. (Hassig, IL) 1430 with Captain No-Beard. (Coatsworth, ON) 2144 with news items and rock. Providence address given. (Jeffery, NY) 1543. (Jenkins, WV)

He Man Radio, 6955 USB at 1706 to 1711 sign off. He Man gives IDs while He Man Jr. plays terrible piano music in background. Off suddenly. (Zeller, OH) 2105 to 2136 off with music and letters. (Coatsworth, ON) 2116 to 2146 off. Blue Ridge Summit address. (Jeffery, NY)

One Voice Radio, 6955 USB at 1813 with replies to letters. The host called himself "Joe." (Jenkins, WV) 2330 with talk on health topics, chocolate "high." Was on top of Radio Euphoria. (Hassig, IL) 1621 with usual program of info from various magazines and journals. Also at 2830. (Silvi, OH)

Voice of Communism, 6955 at 1700

with music from '60s and '70s TV shows. Hard to copy. (Coatsworth, ON) 1542 sign on to past 1624. Clever old Radio Moscow parody, complete with exaggerated echo effect in voices just like the old USSR transmitters. (Zeller, OH)

Friday Radio, 6955 at 2150 with hard rock. Tinny audio. QSL via Providence. (Hassig, IL)

Radio Nonsense, 6955 USB at 0010 with Twilight Zone stuff. Different date at 2337. DJ Joe Mama? (Hassig, IL) 0020 to 0030. (Silvi, OH) 0001 to 0033 close with Beavis and Butthead. (Coatsworth, ON)

Radio Azteca, 6955 USB at 2300 with usual program; clobbered by Radio Eclipse. Also at 0242. Program 27 (?) with rock and Bullwinkle music. (Hassig, IL) Separate days at 2223 and 0137 but faded after 20 minutes or so. (Silvi, OH) 1419 to 1435 sign off with Bram Stoker wondering what it's like in hell. (Coatsworth, ON) 2042 with funny news items, top 10 all-time joke punch lines. (Jeffery, NY)

Voice of Shortwave Radio, 6955 USB at 1820 with hard rock, Blue Ridge Summit address. (Jeffery, NY) 0430 with tape about radio bands, rap version of

"Gilligan's Island" theme. (Hassig, IL)
Hotel California Shortwave, 6955 USB at 1825 with ID, "Hotel California" IS, rock, parodies. Providence address. Off at 1925. (Jeffery, NY)

WQSL, 6955 USB at 2247 with usual slogan of "the verification station." Belfast address. (Zeller, OH) 1441 over Howard Stern Experience before moving to **6960** where it had splatter from Radio Metallica. (Coatsworth, ON)

Voice of Indigestion, 6955 USB at 1500 to 1528 close, songs and novelty ads, talk by a hard-to-copy computer vox. Belfast address. (Zeller, OH)

Radio Freedom, 6955 at 1730. Test announcements and songs. (Silvi, OH)

Up Against the Wall Radio, 6955 USB heard at 1627. (Jenkins, WV) 2221 signing on with a klaxon horn sound effect. (Hassig, IL)

Reefer Madness Radio, 6955 USB heard at 1455. Host said he was Harry N. Swinger, Jr., pro-pot advocate, but acted like he was against it. (Jenkins, WV) 0251. (Silvi, OH)

Howard Stern Experience, 6955 USB at 1436 with tape of Stern program. Over WQSL and covered by Metallica at

(Continued on page 77)

DEDICATED TO THE SCANNING AND SHORTWAVE ENTHUSIAST. WE'RE MORE THAN JUST SOFTWARE!



NOW SUPPORTS FULL TRUNKING ON UNIDEN BC-895

SCANCAT GOLD for Windows

Since 1989, The Recognized Leader in Computer Control

NOW SUPPORTS ICOM IC-PCR1000

Once you use SCANCAT with YOUR radio, you'll NEVER use your radio again WITHOUT SCANCAT!

SCANCAT supports almost ALL computer controlled radios by: AOR, DRAKE, KENWOOD, ICOM, YAESU and JRC (NRD) Plus PRO-2005/6/35/42 (with OS456/535), Lowe HF-150, and Watkins-Johnson.

SCANCAT'S WINDOWS FEATURES

- Unattended Logging of frequencies
- Scan Create Disk Files.
- Spectrum Analysis to Screen OR Printer.
- Supports PerCon & Mr. Scanner CD Rom's.
- LINK up to 100 Disk files or ranges.
- Scan VHF & HF Icom's Simultaneously.
- MULTIPLE search filters for Diskfile Scanning.
- Search by CTCSS & DCS tones with OS456/535 or DC440 (ICOM only).
- INCLUDES several large shortwave and VHF/UHF databases
- UNIQUE database management system with moveable columns. Even SPLIT columns into doubles or triples for easy viewing of ALL Important data on one screen.
- Exclusive "SLIDE RULE" tuner. Click or "skate" your mouse over our Slide-Tuner to change frequencies effortlessly! OR use our graphical tuning knob.
- VERSATILE "Functional" spectrum analysis. NOT just a "pretty face". Spectrum is held in memory for long term accumulation. Simply "mouse over" to read frequency of spectrum location. "CLICK" to immediately tune your receiver. You can even accumulate a spectrum from scanning DISKFILES of random frequencies! DIRECT scanning of most DBASE, FOXPRO, ACCESS, BTRIEVE files WITHOUT "importing".

SCANCAT GOLD FOR WINDOWS.....\$99.95 + S & H*

UPGRADE from any version.....\$29.95 + S & H*

*\$5 U.S. \$7.50 FOREIGN

INTRODUCING SCANCAT GOLD FOR WINDOWS "SE"

ADDITIONAL FEATURES

- Selective Sound Recording using PC-compatible sound card.
- "Point & Shoot" playback by individual hits.
- Demographic search for frequency co-ordination and 2-way Usage Analysis.
- Detailed logging to ASCII type files with DATE, TIME, Sig Str, Air Time.
- UNLIMITED file sizes with our exclusive SCANCAT filing method.
- Exclusive "MACRO" control by frequency of Dwell, Hang, Resume, Sig, Treshold and even 6 separate programmable, audible alarms.
- Command line options for TIMED ON/OFF (Unattended) logging/searches.
- Run as many as 6 different CI-V addressable radios as "Master/Slave".



SEVERAL GRAPHICAL ANALYSIS MODES AVAILABLE

- With ScanCat Gold for Windows "SE", your spectrum never looked so good! Load virtually "any" database and ScanCat "SE" will examine your database, plot each and every frequency, no matter what the range...and "paint" the entire analysis on your screen.
- By Signal Strength per frequency in a "histograph".
- By Signal Strength plotted in Individual dots.
- By Number of hits per frequency in a "histograph".
- IF THAT ISN'T ENOUGH, try this...Multicolored, 3-D "Spatial/Landscape" (Depicted at left).

SCANCAT GOLD "SE".....\$159.95 + S & H*

UPGRADE from SCANCAT GOLD FOR WINDOWS.....\$59.95 + S & H*

*\$5 U.S. \$7.50 FOREIGN

MAGIC for Windows

PUT SOME ORDER IN YOUR LIFE!

If You're Not Using MAGIC, You're Only Enjoying Half The Hobby.

Magic is a super conversion utility that will read and write to over 10 database formats

- Creates databases from plain ASCII text.
- Finds single or multiple frequencies located anywhere in source files and creates perfectly aligned database files.
- Converts: SCANCAT, ASCII text, comma delimited, HTML, DBase, ScanStar, RadioManager, ScannerWear and WINRADIO files.

MAGIC for Windows \$34.95

(plus \$5.00 S & H)

INTERNET WEB ADDRESS - <http://www.scancat.com> WEB E-MAIL - scancat@scancat.com

LIMITED TIME OFFER!

Limited Time Thru 3/1/98

MAGIC FOR WINDOWS PACKAGE

Purchase MAGIC for Windows (Retail) \$34.95

with any of our software programs

and receive a \$10 discount from

your total purchase price. Plus, you

will also receive our Disk Full of

Frequencies (Retail \$15) FREE!

Please Ask For Special "MGC-PKG"

"UNI-VERSATILE" INTERFACE

- Supports ICOM/IC-R10, AR8000, YAESU and SCOUT.
- Comes with 6 FOOT cable, and adapters to fit all units within a single package (Must Specify Yaesu)
- Unlike "single radio" adapters, can be used with ANY radio supported, simply change the adapter, then "Plug and Play."
- Expandable in future with a simple add on adapter.
- No external power required. Draws power from computer.
- "Reaction Tune" scout with NO modifications to radio.



NOW IN STOCK

CAT-232C "UNIVERSAL INTERFACE"

\$99.95 + s & h

DEALER INQUIRIES INVITED

Order direct or contact your favorite dealer

COMPUTER AIDED TECHNOLOGIES

P.O. Box 18285 Shreveport, LA 71138

Phone/Orders: (318) 687-4444 FAX: (318) 686-0449

Info/Tech Support: (318) 687-2555 (9 am - 1 pm Central M-F)

FREE DEMOS ON THE WEB



Toll-Free Orders
888-SCANCAT
888-722-6228

ASP — Analog Signal Processing: New Low Tech

Oops!

Back in January we told Optoscan 456 owners about the Tape Pause Adapter that's required to use the OS-456 safely with a tape recorder to control start and stop of the recording function. It's a great device, and we told you that Optoelectronics will give you one for free, which they will, but they do have to charge shipping and handling. Sure can't blame them for that. Sorry about any misunderstandings that this may have caused.



Some older units like this B-6 could have excellent specs because they were crystal controlled and only had to operate in a narrow band. It's more challenging for the broadbanded receivers of today to maintain performance over the wide range of frequencies that we listen to nowadays. In the early days of the programmable receiver, selectivity wasn't much of a concern...there wasn't any.

Acronyms always make you sound smart. Like you're in the know, so to speak. But they have a way of coming back to haunt you, too. It's very easy for us to get caught up in the "lingo" and forget what it is we're trying to accomplish. One of my favorites is "PCMCIA" (People Can't Memorize Computer Industry Acronyms). I invented "ASP" so that we could be part of the in-club too . . . no sense in the computer nerds having all the fun.

Your scanner is a radio receiver. That shouldn't surprise anyone, but it does get forgotten as we start looking at the myriad of information that is published on various models. What we want the radio to do is receive signals that are coming through the air, process them in some fashion and turn that into audio that's not too harsh on the ears. Right? So what we need to know is what specifications make for a really good radio, versus features and other hype that goes along with marketing scanners and other receivers.

The basic function of the radio is to pull a signal out of the air, convert it down from radio frequency energy to something manageable by the internal circuitry of the unit, and finally, extract the audio. Simple. Analog — at least mostly. There might be some digital control over the frequency the unit is tuned to at any given time, but that's about it.

Scanner Specs: Is It Really In The Numbers?

Scanner specifications are the most important part of choosing a new scanner. Or at least some folks would make you feel that way. In reality, detailed specifications are not available on most consumer grade scanners, and the ones that are can be misleading. My advice is to look at scanner specs if you're interested, but let your ears make the decision about what radio works best for you. Having said that, if you're not interested in what all that stuff means, you can stop reading here and we'll see you next month. However, if you're curious about what all those numbers refer to, and just what your receiver is up to, keep reading.

So what's all the hype? Well, it turns out, of course, that there are a multitude of ways to get the signal decoded and out the speaker, with slightly different results based on the choices of the designer. By choosing slightly different components in the design of the circuitry, there can be a major impact on the performance of the overall receiver, or a major impact on the cost of manufacture, which has a major

bearing on most of the component and design choices that are selected.

The specifications are a way of measuring and calibrating how successfully a radio can achieve the objective of extracting signals from the ether. But the problem is that all specs are not created equal. The specifications of one manufacturer may or may not be based on the same criteria as another, and therein lies the real problem with using specs to make any kind of comparison between consumer receivers. To make things worse, some specs (like filters in particular) may be published as the specs of the original component manufacturer based on the stand-alone component, not how it performs in the circuitry of your radio. Depending on how the surrounding electronics are configured, there may or may not be any relevance to the original manufacturer specs.

There are, however, some basics of receiver operations and specifications that are useful to understand. Once you have a feel for what the radio is up to, it can help in reading specifications, if you can get them, or in evaluating by ear any radio that you may be considering. Of course, you won't be able to get any

detailed information or detect slight variations by ear, but ultimately it's how the receiver works that is important. If you can get detailed specs, great. By all means, use them as a tool to help with your evaluation of the radio.

Antenna Crowding

If you think about it for a second, your antenna is the gateway to the whole process. Lots of radio energy is arriving at the antenna all the time. Some is from the VHF/UHF public safety channels that we want to hear, but a lot from other sources as well. The AM and FM broadcasters in town are putting out fairly strong signals that arrive at your antenna, too. Of course, it's up to the receiver to pick out what we want to hear and ignore the rest, but this can be a major accomplishment, especially if you're in an area of dense RF with lots of strong signals to sort through.

Your antenna is actually the first line of defense. We make scanner antennas so that they are more sensitive to the frequencies that we want to hear. So, hopefully, it will also be less sensitive to the frequencies we don't want to hear and less likely to pass those signals on to the receiver. Depending on the antenna, however, this may not always be exactly the case. Many of us use disconses precisely because they perform over a broad frequency range and allow us to listen to lots of signals in the different bands. Guess what? That same discone is also passing energy you don't want going into your receiver, precisely because it's so broad banded. The antenna can't tell what's important and what's not, so it passes along everything it hears. Now, I'm not trying to pick on disconses, I use a few myself. But if you're having trouble with AM and FM broadcasters (or TV signals), you might consider a more "tuned" antenna to help out the situation a bit.

How Many Conversions Does It Take To Receive A Signal?

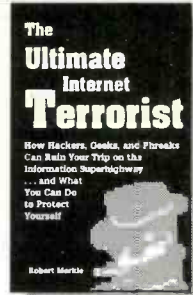
One of the main specifications you'll see discussed regarding scanners is this notion of double conversion or triple conversion reception. This isn't really a "specification," but rather a short summary of how the receiver is built. It can be pretty important in certain circumstances, but there's a lot of confusion. Let's take just a minute (OK, half a col-

PALADIN PRESS®

THE ULTIMATE INTERNET TERRORIST

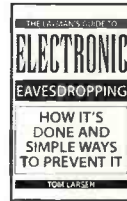
How Hackers, Geeks, and Phreaks Can Ruin Your Trip on the Information Superhighway... and What You Can Do To Protect Yourself
by Robert Merkle

This is an owner's manual to the "Darkside" of the Web — the one that will open your eyes to the hard realities of the Highway, including what your e-mail address reveals to cyberterrorists, how electronic stalkers can find you and make your life hell, the dangers of chat rooms, the m.o. of "cybergangs" and "codeslingers," the art and science of downloading information off the 'net, and the intrigue of black archives and forbidden files from the Darkside. Once you know just how ugly it can get, you'll learn the extreme countermeasures to employ if you plan to survive in this electronic war zone. Soon you'll be surfing the 'net with the baddest of badboy hackers to find information on anyone — or stop someone from doing it to you! For academic study only. 5 1/2 x 8 1/2, softcover, 152 pp. **\$15.00**



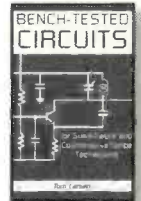
THE LAYMAN'S GUIDE TO ELECTRONIC EAVESDROPPING
How It's Done and Simple Ways to Prevent It
by Tom Larsen

Phone lines, video cameras and room bugs are just a few of the tools nosy neighbors, angry spouses, private investigators and even the government can use to get the goods on you. This book will show you some simple, inexpensive ways to foil their efforts *right now!* 5 1/2 x 8 1/2, softcover, photos, 112 pp. **\$17.00**



BENCH-TESTED CIRCUITS FOR SURVEILLANCE AND COUNTERSURVEILLANCE TECHNICIANS
by Tom Larsen

If you're hungry for updated, practical electronic circuits, this is a beggar's banquet. Not only do these ingenious circuits — some never published — really work, but they're simple, inexpensive and fun. Includes clear explanations and schematics plus real-life applications. 5 1/2 x 8 1/2, softcover, photos, illus., 128 pp. **\$20.00**



THE WHOLE SPY CATALOG
by Lee Lapin

The Whole Spy Catalog shows you exactly how to hire an ex-KGB agent, order a photo of anyone on earth anytime during the last 20 years, get an instant background check on anyone, open a door from 100 feet away, subscribe to an in-house FBI newsletter, order and install the latest electronic surveillance gear and many more tricks to trace, track, surveil and investigate anyone or anything. 8 1/2 x 11, softcover, photos, illus., 448 pp. **\$44.95**



SPYCOMM
Covert Communication Techniques of the Underground
by Lawrence W. Myers

Guerrillas, fugitives and other members of the "underground" must exploit existing resources to communicate secretly. This book tells you how they use improvised microfilm, steal phone service, create unbreakable codes and more. For information purposes only. 5 1/2 x 8 1/2, softcover, illus., 256 pp. **\$19.95**



SWATCOM
Tactical Communications Manual for SWAT Operations
by Tony L. Jones

When SWAT teams rely too heavily on radios, operations are subject to compromise. This book covers radio operating procedure and equipment as well as hand signals, telephones, pyrotechnics, light signals, messengers and other alternatives that help ensure clear, secure communications under any circumstances. 5 1/2 x 8 1/2, softcover, photos, illus., 144 pp. **\$18.00**



THE HOME WORKSHOP SPY Spookware for the Serious Hobbyist
by Nick Chiaroscuro

Here are all of the circuit-board patterns, parts lists and building tips needed to build a sneaky array of bugs, taps, mics and other forbidden spy toys. These simple designs are for "wire specialists" or anyone interested in knowing about the clandestine sciences. For academic study only. 8 1/2 x 11, softcover, photos, illus., 104 pp. **\$25.00**



RUNNING A RING OF SPIES Spycraft and Black Operations in the Real World of Espionage
by Jefferson Mack

Running a ring of spies is no mission impossible with this tell-all primer. Find out the secrets of the world's best spies and peep into the real world of a Bangkok madam-turned-secret agent, Aldrich Ames, U.S. Embassy guards, Kim Philby and garden-variety corporate spies. Find out how to get the goods on the bad guys. 5 1/2 x 8 1/2, softcover, 216 pp. **\$20.00**



SURVEILLANCE COUNTERMEASURES
A Serious Guide to Detecting, Evading, & Eluding Threats to Personal Privacy
by ACM IV Security Services

Learn to detect and evade surveillance efforts that threaten your personal security. These time-tested tactics of observation, detection and evasion are proven effective against the most sophisticated surveillance techniques used in the world. 5 1/2 x 8 1/2, softcover, illus., 192 pp. **\$20.00**



ORDER



PALADIN PRESS®
P.O. Box 1307-8PCO • Boulder, CO 80306
303-443-7250 • FAX 303-442-8741
E-MAIL: service@paladin-press.com



CREDIT CARD ORDERS CALL TOLL FREE
1-800-392-2400 USA and CANADA
Call 24 hours a day, 7 days a week. Send \$2.00 for 72-page catalog of over 750 titles (free with order).

RESPONSE CODE: 8PCO

VISA MASTERCARD DISCOVER CHECK / MONEY ORDER CARD # _____ EXP. DATE _____

NAME _____ SUBTOTAL _____

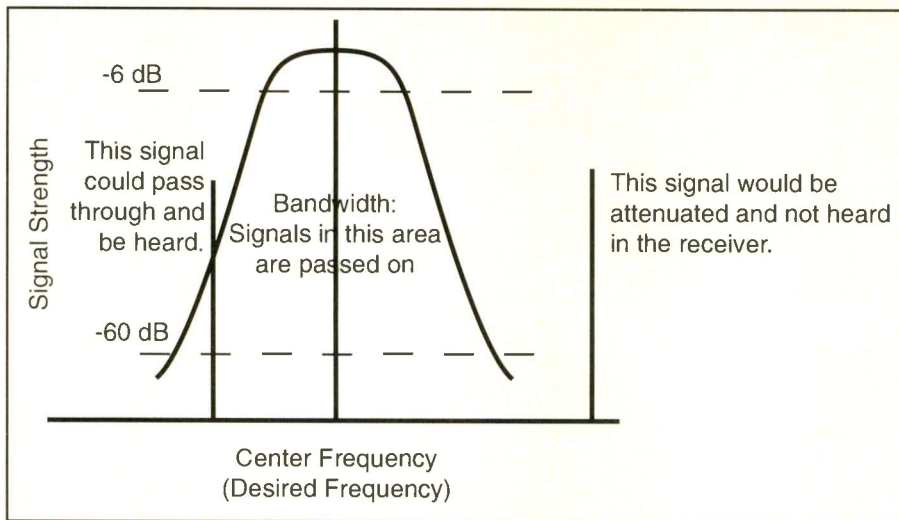
ADDRESS _____ PLEASE INCLUDE POSTAGE & HANDLING \$ 5.00

CITY _____ STATE _____ ZIP _____ PLEASE ALLOW 2-4 WEEKS FOR DELIVERY

MONEY-BACK GUARANTEE

TOTAL _____

CALL US TOLLFREE: 1-800-392-2400, AND VISIT OUR WEB SITE AT www.paladin-press.com



The ideal filter would be shaped like a rectangle with a brick wall at each end that wouldn't allow signals other than the desired one through. In the real world, if we could get those filters we couldn't afford the scanner. The "shape factor" is found by taking the bandwidth at the -60 dB level and dividing it by the -6 dB level. This will result in a number like 2:1. The closer to 1:1 it is, the better the filter.

umn) and discuss exactly what this is, and why is it so important?

Simply put, once the signal enters your receiver through the antenna jack, it has to go through a lot of processing to convert it back into the audio signal that we're interested in hearing. If you'll remember, that's our primary objective. In order to do this, most modern receivers (99.99 percent) use a system called superheterodyne reception. This fancy radio term is a lot like saying that most cars use gasoline engines.

The first thing that usually happens is amplification of the weak signal that is coming from the antenna. This stage is called RF, or Radio Frequency, amplifi-

cation. I said *usually* happens because there are some receivers designed without this "front end" handling. They tend to be much more susceptible to overload and other forms of interference, but also are much cheaper to build.

Once we have the signal amplified up to the point where we can begin to work with it, we then have to set about the task of extracting the audio. To accomplish this, we send the amplified signal to a mixer. This mixer takes the RF signal, mixes it with something called the local oscillator, and produces a new frequency called an Intermediate Frequency, or IF. There are numerous advantages to processing the signal through this interme-

diated frequency, but the main one that concerns us is that we can build a circuit that filters and otherwise processes this IF frequency because we know exactly what it should be, regardless of the frequency being received. The process we just described is called a "conversion."

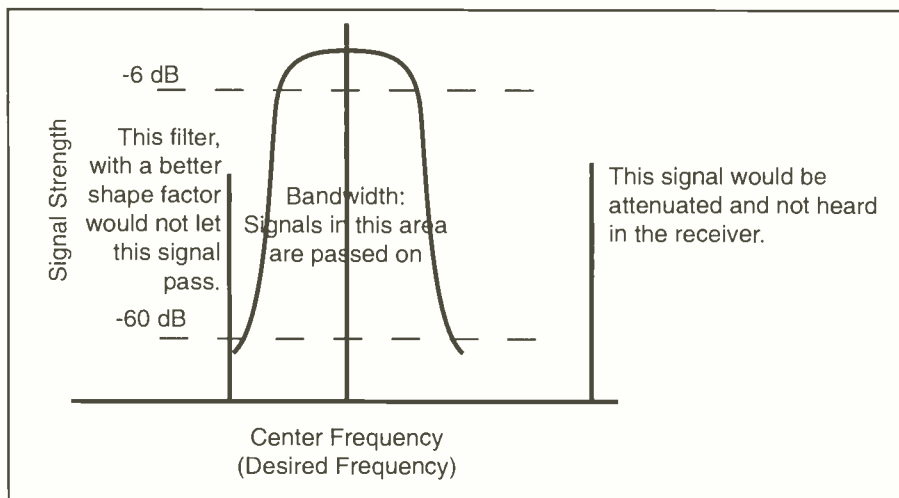
So, if you think about it for a second, what you'd expect to happen in a double conversion receiver is that we go through this process again. And that's exactly right. The second mixer produces what's called the *second IF*, and, if we stop there, we have a double conversion receiver with a processed signal that's ready to send on to the discriminator (part of the circuit that actually extracts the audio signal from the last IF circuit).

If we do this whole thing one more time, we get a triple conversion receiver. Why bother? Well, it turns out that one of the problems with the superheterodyne design is that in these mixer stages we get not just the IF that we want, but also another stray frequency as a result of the mixing. If you're up for a bit of math, we'll try to explain.

The local oscillator, which we mentioned earlier, has to be tuned along with the frequency that you're actually trying to receive. Remember, we need to extract the IF, so we don't tune the local oscillator to the same frequency, but rather a different one. Some designs tune the IF lower than the actual frequency, and some tune it higher. By tuning the local oscillator to a frequency that is different from the actual frequency we are trying to receive, we can make sure that the intermediate frequency we're trying to extract stays constant — let's say 10.7 MHz.

So, following our example, if you're trying to receive a signal on 450,000, the local oscillator would be tuned to 460,700 (assuming a receiver that converts 10.7 MHz higher; it could also be 10.7 lower), and the mixer would look for the difference. However, a strong signal 10.7 MHz above the local oscillator might also find its way into the circuit and produce a difference of 10.7 MHz — the exact frequency we're looking for — oops. So, in our example, the local oscillator is at 460,700, a strong signal on 471,400 (10.7 higher than the local, or 21.4 higher than the desired) would also produce a difference of 10.7, which the radio could not tell apart from our desired signal. This is called image reception, and sometimes it is used deliberately to receive things the radio wasn't supposed to. But, more often than not, it is a problem.

So the answer to our original question



Here's a filter with a better "shape factor." Notice how the lower frequency signal is now outside the "passband" of the new filter. Unfortunately, making the filter too narrow also results in a dramatic reduction in audio fidelity, so sometimes you have to accept compromise.

of why bother with triple conversion is that the more stages of mixing and filtering the signal is put through, the more likely it is that the image frequency will be eliminated before the audio is extracted. If the math works, it is still possible for stray frequencies to enter the triple conversion receiver at various points and make it through, but it is much less likely. Of course, triple conversion means more parts, and therefore more cost in the manufacture of the receiver.

Having said all that, and having outlined the basics of the design, we can now begin to understand a little bit more of where these specifications come from. They are all just measurements of how effectively the receiver is doing the jobs that were outlined above.

The Big Three

How well can it pull the signals out of the air? This is probably the most basic question that we can ask, and the measurement for this is *sensitivity*. Sensitivity is usually expressed as so many microvolts (millionths of a volt of signal at the antenna terminal). Most modern scanners have no problem in the sensitivity range. In fact, quite the opposite can be true, particularly in metropolitan areas. A radio that is too sensitive (if there is such a thing) can be prone to interference if the other circuitry in the receiver can't process the signals correctly.

Can It Pick Out Just One Signal?

This is selectivity, and it probably causes more problems than sensitivity for most of us. Selectivity is the ability of the receiver to pick out just the one signal that we are interested in from all of those that are arriving at the antenna at once. Selectivity is largely a function of the IF filters. Frequently, you'll see a specification for the width of the filters, or the shape factor.

The job of the filter is to allow the signals that we're interested in to pass on to the next stage of the receiver, but to block any signals outside of that range. Filters have a certain "bandwidth," which specifies the range of frequencies that will be passed through them. If you're listening to normal FM broadcast signals, that filter needs to be about 150 kHz wide. In that same width with narrow band FM commonly used in two-way radio transmission, 10 signals would fit. So we need

a narrower filter to pick out the one of the 10 that we're interested in hearing. A filter of about 15 kHz is more appropriate in this case.

The reality is that filters are not on/off switches that can stop a certain frequency signal, but allow one just a few hertz higher to pass through. Digital signal processing shows some promise for being able to do this, and the Watkins Johnson shortwave receiver is an excellent example of this technology implemented in a receiver. However, for scanners, we're still using analog systems. And analog filters are not nearly this selective.

Most analog filters have a shape that looks more like a triangle on each end of the desired box shape we discussed before. Signals that are very strong can get through the filter even at some distance away in frequency. The measure of how sloped the lines are is called shape factor, and the closer to 1:1 the shape factor is, the better the filter.

Dynamic Range: How Versatile Is The Receiver?

Dynamic range is the weakest signal the radio can process versus the strongest signal the radio can process, expressed as a ratio. In reality, you'll probably never see it published. Most manufacturers don't publish a dynamic range figure because most of these figures are relatively poor. The range of signals a scanner can encounter over the range of frequencies it covers is quite extensive.

Very weak signals can tax the ability of the amplifiers to even detect the signal, and then the circuitry must pull that signal out of the noise. Very strong signals can lead to overloading, which can make signals appear in places where they don't exist. It can also cause the receiver to shut down its amplifier circuitry so that weaker signals are lost, or cause distortion somewhere in the process that leads to noise coming through the speaker that you can't understand. Of course, none of these is a good thing. Metropolitan listeners are more likely to have problems at this end than at the other.

That's it. Those three specifications will tell you more about the makeup of a receiver than any of the rest of the gobbledygook that you are likely to encounter. This is not to say that some of the other specs aren't relevant, but they tend to be more like gravy than essential specs. Pay attention to frequency coverage, number of memories, audio output and those things that you

Listening Post The Advanced Scanning Solution

Features:

- Easy-to-use Explorer-type interface
- Full-featured scheduler
- Advanced reporting engine
- Audio Processing Plug-In support for ACARS, inversion, etc.
- Digital audio logging to database

Scanner Support:

Opto OS456, 535, ICOM 7000, 7100, 8500, 9000, AOR3000 & 8000, WinRadio

Includes frequency database

- FCC database
- Aviation database
- Fed frequencies
- Cut 'n paste or drag and drop into LP
- Sort, search and proximity search

All for \$99.95 on CD

\$79.95 on diskettes w/o database

For more information see www.lpcm.com

LP Communications, Inc., 5114 Balcones Woods Dr. Ste. 307-305, Austin, TX 78759
Phone (512) 260-3478

Tune In With... **CQ VHF** Ham Radio Above 50 MHz



The magazine for all ham radio operators who are active or interested in operating on the bands above 50 MHz!

In every issue you'll find: Operating articles, Technical articles, Beginner's articles, Product reviews, Projects you can build, News and columns and New things to try. All year long, each issue of **CQ VHF** guarantees to show you **WHAT, WHY and HOW** to do more above 50 MHz.

	USA	VE/XE	Foreign Air Post
1 Year	<input type="checkbox"/> 24.95	<input type="checkbox"/> 34.95	<input type="checkbox"/> 44.95
2 Years	<input type="checkbox"/> 45.95	<input type="checkbox"/> 65.95	<input type="checkbox"/> 85.95

If mailing in subscription order, please enclose check or credit card information with expiration date (MasterCard, Visa, Amex and Discover accepted).
Please allow 6-8 weeks delivery

CQ VHF

76 N. Broadway, Hicksville, NY 11801
Ph: 516-681-2922 FAX: 516-681-2926

can touch and feel. There is merit to looking at the specifications if you can get them, but the numbers won't tell you nearly as much as a few minutes with the receiver listening to the frequencies you want to hear. Good luck!

Your Input Needed!

We're always looking for your input. After all, "ScanTech" is your column. I still need pictures of your shack for our upcoming article on putting a shack together, but I'd also like any other pictures you might have of scanner-related topics. And, of course, your questions are always welcome via e-mail or through the post office. See you next month! ■

27-MHz COMMUNICATIONS ACTIVITIES

Three Great New Radios!

Every once in a while, I get a letter from one of the many folks who have been involved in CB for a long time who says something like this, "Ya know, they just don't make 'em like they used to. Those Brownings and Trams were just terrific."

In some ways, I have to agree: those Brownings and Trams were terrific. And they don't make 'em like they used to — in a lot of ways, they make 'em better than CBers even five years ago would have dreamed about.

Right now, it seems there are three companies — in alphabetical order, Cherokee, Cobra, and Midland — competing to see who can come up with the most innovative new CB technology. So this month, we'll review one radio from each of the companies: a base station from Cherokee, a mobile rig from Cobra, and a hybrid CB from Midland. Each is very different from the others, yet each is terrific in its own right.

Cherokee's CBS-500 AM Base Station

The Cherokee CBS-500 is a 40-channel, AM-only base station that delivers a whole lot of radio in an attractive package for the person who wants to get started in base station operation.

The front panel is molded out of an attractive gray plastic. The entire case measures just under three inches high,

just over 11 inches wide and 8.25 inches deep. At the upper left corner, there is a rocker-style on/off switch; below that, a headphone jack, and beneath that, a 4-pin connector for the standard hand microphone. To the right of that, a small (approximately two-inch diameter) front-firing speaker provides audio.

Almost in the center of the front panel is a signal strength/power output meter, and under that are four buttons: one for instant channel 9 or 19, another for activating dual-watch or decreasing power for local conversation, another for activating the automatic noise limiter and noise blanker, and a fourth button for controlling scanning or memory scanning.

Full use of these four buttons is enabled by a pair of additional buttons — the FUNCTION button and the ML/MS button — located between the signal strength/power output meter and the CBS-500's liquid crystal display. Here's how it works: press the No. 3 button, and you turn on the automatic noise limiter, but press the FUNCTION button first and then the No. 3 button, and you turn on the Noise Blanker. Each of the buttons has a secondary feature that is activated by the FUNCTION button.

If you press the FUNCTION and ML/MS buttons, you can store the currently selected channel in any of the four memory presets; just press the 1, 2, 3, or 4 button to make your selection. If you want to recall a memory preset, poke the ML/MS button and then the 1, 2, 3, or 4 button.

At the upper right of the CBS-500's front panel is an LCD information center that displays frequency, channel number, plus indicators for function mode, scan, dual-watch, noise blanker, automatic noise limiter, memory store, memory retrieval, and transmit.

Underneath the LCD are four knobs: volume control, squelch control, RF gain, and a rotary channel selector. The first three each have a blue dot on the front surface that makes it easy to tell at a glance where the control is set.

On the back panel is a power cord, an antenna connector, a socket for connecting to DC power and a jack for an external speaker. That's it. This radio has a really simple control set: just four knobs, six buttons, and an on/off switch.

There were two features that I particularly liked. One was the ability to scan all 40 CB channels by simply squelching out the noise and pressing the SCN/MSCN (scan) button. The CBS-500 then scans the channels until it finds one with a signal strong enough to break the squelch. It then hangs on that channel until the signal drops below the squelch threshold, at which point the scan resumes. If you want to scan the memory channels — you guessed it — you press the FUNCTION button, then the SCN/MSCN button.

A second cool feature is not documented in the operating instructions: if you press the channel 9 button, you go instantly to channel 9. Turn the channel selector knob one click to the right and



Cherokee's CBS-500 is a 40-channel, AM-only base station that delivers a whole lot of radio in an attractive package.



If you need a radio for your long hours behind the wheel, the Cobra 29 WX ST is a great choice and it has weather channels, too.

— shazam! — you go instantly to channel 19. You can go back to channel 9 with just a click to the left.

The performance of the Cherokee CBS-500 is right where it should be in every way. The receiver is sensitive and offers good adjacent channel rejection. In on-the-air tests, I got consistent reports of good signal strength and clear audio with good modulation.

The bottom line: for the operator looking for an AM base station, the Cherokee CBS-500 delivers a wealth of features and performance in a good-looking package at a suggested retail price of \$199.95.

Cobra's 29 WX ST


The Cobra 29 is the quintessential trucker's radio. Big (8 5/8" deep x 7 9/32" wide x 1 13/64" high), beefy, the 29 is built to withstand the rigors of long-haul travel in a big rig. What's more, Cobra is famous for delivering clear, crisp audio on both transmit and receive. Check out the CB on any 18-wheeler, and there's a good chance you'll find a Cobra ready to provide communications on the open road.

With the 29 WX ST, the folks at Cobra Electronics have taken the trucker's classic and made it even better. Along the bottom of the front panel, there's a front-mounted four-pin microphone connector with a heavy-duty dynamic microphone. Next to that, is a pair of concentric knobs; the inner knob controls On/Off and volume, the outer knob sets the squelch. Then you'll find another pair of concentric knobs for adjusting microphone gain and receive gain. Next, a Delta Tune knob can be used to fine tune stations that are slightly off frequency.

To the right, another knob is used to select any of seven NOAA weather channels or to turn off the weather alert function. The SWR CAL knob allows exact calibration of the SWR meter, and the last knob in the row is the channel selector.

Immediately above the channel selector is a large green digital channel indicator, which I found easy to read day or night. To the left of that is a pair of indicator lights: one turns red when the SoundTracker system is on; the other turns green when receiving, red when transmitting. Beneath these two indicators is a button for activating the SoundTracker.

Cobra's claim is that the SoundTracker "cuts static coming in . . . adds punch going out." I can testify that it does both. Under certain conditions — at medium range in particular — I got reports that pushing the SoundTracker button boost-




4091 Viscount Street
Memphis, TN 38118
(901) 794-9494
Fax: (901) 366-5736

ANTENNAS • POWER SUPPLIES • CABLE ASSEMBLIES

HIGH PERFORMANCE and MADE IN U.S.A.

ALL MACO BASE STATION ANTENNAS are made of aircraft alloy 6063-T5 aluminum tubing—.050 wall. Elements are made of harder 6005 alloy.
NOTE! To prevent fatigue failure, no holes are made in any boom or element.

**MACO
V-Quad
Beam**



**V-Quad
Specifications:**

Boom Length 6'
Boom OD 1.5"
Number Elements 2
Longest Element 12"
Turn Radius 7'
Surface
Area 3.2 (sq. ft.)
Wind Survival 90 mph
Tuning (MHz) 26.5-30
Gain 11 dB
VSWR 1.1-1 or less
Power Multiplication .. 14X
Front-to-Back
Separation 25 dB
Weight 8 lbs.
Stacking Kit VQSK

PERFORMANCE EQUAL TO M103C IN A SMALL PACKAGE FOR PUSHUP MOUNTING

Directional-Combined Vertical-horizontal polarization plus high gain of 11dB (14 dB stacked) makes the V-Quad an ideal inexpensive beam for push-up mounting (stacks, too). Weighs only 8 lbs. (stacked complete 24 lbs.)

Call or write for free catalog and name of reseller near you.

CIRCLE 70 ON READER SERVICE CARD

ed audio punch on transmit. And on receive, it sometimes made the receiver so quiet that I couldn't tell if the squelch was on or not. Now, that's quiet!

To the left of the SoundTracker button is a row of five switches; one for instant channel 9/19, another for selecting between CB and weather functions, a CB/PA switch, a switch for the automatic noise limiter/noise blanker functions, and a switch for controlling the functions of the meter, including transmitted and received signal strength, SWR measurement, and SWR calibration. The meter indicates power output, received signal strength, and SWR readings.

The Cobra 29 WX ST also has a weather alert function. If the weather channel selector knob is tuned to an NOAA weather radio channel that is active in a particular area, and if the Weather Service issues a severe weather alert, the alert function will sound even if the radio is turned off. So if you're booking down the road, singing along with the Eagles' greatest hits and unconcerned about those dark clouds in front of you, a squawk from the weather alert will remind you to turn on the 29 WX ST and listen to the weather bulletin. Of course, you can defeat the

alert function by simply turning the weather channel selector to OFF.

Ultimately, what really sets the Cobra 29 WX ST apart is its crisp clear audio on transmit and receive. No wonder it's the number one choice of professional drivers. If you need a radio for your long hours behind the wheel, at \$199.95 suggested retail price, the Cobra 29 WX ST is a great choice.

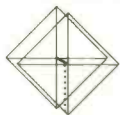
Midland's Innovative Model 75-822

Midland Consumer Radio, you'll remember, is the company that brought out that terrific model 79-290 mobile AM/SSB transceiver that also has 10 weather channels. In doing so, they made their mark as an innovative CB company. Now they've come up with what I think might be the perfect rig for the "casual" CB user — the model 75-822.

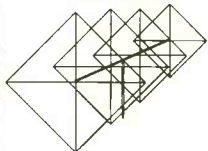
But first, who is the casual CB user? Well, somebody like my brother-in-law; a guy who isn't a big-time CBER but who wants to have one in his car for occasional on-the-road communication. He goes camping a lot, so he might want to have

SE SIGNAL ENGINEERING'S
High Performance CB & 10 Meter Antennas

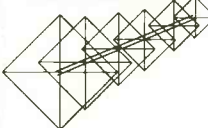
SUPERHAWK



WHITE LIGHTNING
THE Four Element
Antenna



LIGHTNING 6



Goldenrod
45 Spyder A+
Broadband Hi
powered MOBILE

THUNDER 8
Hi Gain
Bi-Directional
OMNI
Electronically
Steerable

And, also,
NEW QUAD
LIGHTNING 8
THE most
POWERFUL
CB base in the
world today!

ALL SE PATENTED rotary beams are true quads and OUTPERFORM their counterparts (quad/yagi types). SE's patented SFS matching system makes SE QUADS the most technologically advanced antennas in the world today.

If your dealer doesn't have SIGNAL ENGINEERING, write or call for full specs. DEALER inquiries invited.

MasterCard, VISA, AMEX, Discover

SIGNAL ENGINEERING

1172 Aster Avenue, #E, Sunnyvale, CA 94086
 Phone: (408) 247-2300

a weather radio. In addition, a pair of walkie-talkies for communicating between the campsite and his favorite fishing spot would be in order.

Enter the Midland model 75-822. The heart of it is a tiny handi-talkie that measures five inches high by 2 3/4 inches wide by 1 1/4 inches deep. There's a rubber duckie antenna on top, along with knobs for volume and squelch and jacks for a speaker mic. On the back, there's a beefy metal belt clip.

On the left side, as you're looking at the face of the unit, there's a push-to-talk switch, a pair of buttons for changing channels, and a slide for releasing the battery pack which holds six "AA" batteries. On the right side, there's nothing but a protrusion for fastening a wrist strap. On the front, there are nine soft pushbuttons and a liquid crystal display that displays 18 functions or modes, including channel memory or frequency.

And, boy, is this radio loaded with goodies. It has 40 CB channels with full 4-watt output, plus a built-in 10-channel weather/all hazard receiver. There's instant access to five user-selected memory channels, plus instant CB Ch. 9 access. Poke the Ch. 9 button a second time, and

you're on Ch. 19. A memory scan function allows you to rapidly scan your most-used channels, and another function allows scanning of all 40 CB channels for any activity. A single button offers fast access to the last CB channel used.

Dual-watch capability permits monitoring of any two user-selected channels. Another button toggles between CB and weather frequencies, while yet another button locks the keyboard to prevent accidental activation of other functions or mode keys. High/low power settings and an auto power save mode prolong battery life. As I said, this radio packs a lot of cool stuff into a small package.

But here's the really cool part: if you disconnect the rubber duckie antenna and slide off the battery pack, you can connect a special vehicle adapter — a kind of docking station for the handi-talkie. This adapter slides on to the bottom of the radio (where the battery pack goes) and has two "pigtailed" attached to it. One plugs into the cigarette lighter of your vehicle, and the other provides an SO-239 connector so you can hook up to a full-sized CB antenna on your vehicle.

So, like superman stepping into a phone booth, this pint-sized handi-talkie transforms, in a few seconds, into an "everything-in-the-speaker-microphone" mobile CB transceiver that requires no permanent mounting whatsoever. But what's really surprising about this hybrid radio is its performance.

My brother-in-law and I tested a pair of these radios between vehicles — without even hooking up external antennas on our vehicles. We loaded in some fresh batteries and took off in our vans to see how far we could talk between them using just the rubber ducky antennas inside the vehicles. The result: at any distance up to 1/4 mile, communications were crystal clear. Beyond that, noise increased until, at about 1/2 mile, noise overwhelmed the signals. So, for caravanning between vehicles on a trip, these handi-talkies would work just fine without the vehicle adapter.

Next, I hooked up the vehicle adapter and my external vehicle antenna and talked to my co-columnist Ed Barnat from my driveway. His base station is about five miles from my house, and we know each other's signals like the back of our hands. Switching between the Model 75-822 and the Model 79-290 — both using vehicle power and the same antenna — Ed reported no substantial difference between the AM signals of the two radios (of course, the 79-290 also has



Here's the Midland 75-822 ready to be connected to a vehicle's lighter socket and a rooftop antenna. Note that even though the photo shows "75-820" on the radio, it is indeed a 75-822, according to Midland when the package includes the slide-on mobile adapter.



The Midland model 75-822 just might be the perfect rig for the "casual" CB user. Here it is as a handi-talkie.

sideband). And, on receive, I found the two radios performed very similarly. Considering that one radio costs more than twice as much as the other, that's really impressive.

If you need a CB radio that can double as a handi-talkie and a mobile rig and also has weather channels, the Midland model 75-822 delivers worthy performance. And the suggested retail price is only \$159.95.

As you can see, each of these radios has its own set of capabilities. But one thing I am sure of: I can heartily recommend each for its intended purpose. ■

THE NEXT GENERATION BASE STATION CB MICROPHONE

Echo to the Max!



EchoMax 2000
DIGITAL EFFECTS PROCESSING MICROPHONE

The Astatic EchoMax 2000 is the next generation base station CB microphone with microprocessor controlled digital echo.

EchoMax 2000 features an Astatic exclusive we call "Slapback Echo." Slapback provides you with an entirely new range of

unique sounds... ranging from a "duet" effect to the sound of an announcer at a major league baseball stadium.

EchoMax 2000 also features master gain control, heavy-duty steel construction, two digitally synthesized ETS tones, and dual relays which eliminate annoying receiver "pop."

The affordable EchoMax 2000 is made in the U.S.A. by Astatic, leaders in CB microphone technology, and comes with a one year limited warranty.

ASTATIC
MADE IN U.S.A.
www.atic.com



Contact your local Astatic Dealer today!

To find the Astatic Dealer nearest to you, call 1-440-593-1111.

CIRCLE 160 ON READER SERVICE CARD

The Computer Corner

BY BONNIE ZYGMUNT/ED GRIFFIN

RECEIVER CONTROL, SOFTWARE AND MORE

Volunteering Your Hobby

By Bonnie Zygmunt

The radio hobby lends itself to more uses than just passive listening. It can be applied very well for getting active in volunteerism.

It would seem that communicating is essential during times of emergency and disasters. Radio users are sought at that point to volunteer because of their skills and abilities. Volunteer radio groups use the Internet to advertise themselves and attract new members. The variety of radio uses in volunteering include SKYWARN programs, Search & Rescue, missing persons, Health & Welfare reports after disasters, and highway safety.

If someone were looking for a volunteer group to join, searching the Internet would be an easy way to check into what's available. I used the search engines of Yahoo, Alta Vista, and Excite, with "volunteer radio" as my criteria.

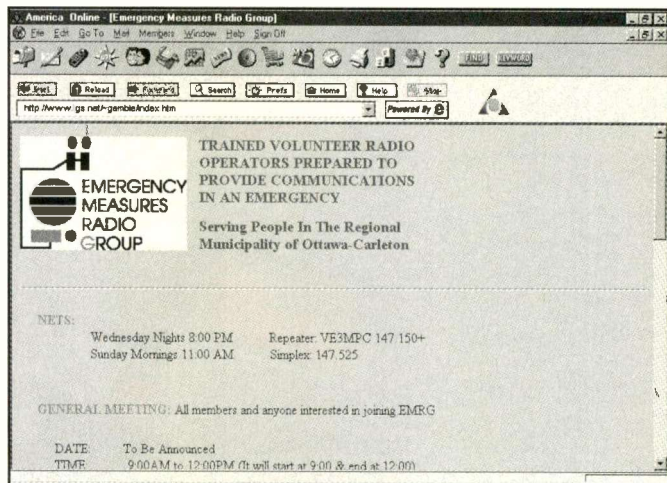
One of the first Web pages I checked out was <http://acs.oes.ca.gov/other.htm> which is the Auxiliary Communications Service for the State of California. The Affiliated Organizations they list include the Web pages for each organization. They list Radio Emergency Communications Teams (REACT), Civil Air Patrol, Amateur Radio Emergency Service (ARES), Radio Amateurs in Civil Emergency Service (RACES), and the Military Affiliate Radio System (MARS). Contacting any of these groups is one way to get started as a radio volunteer. You can go to the home pages of each organization to learn more about what each does and to see if you'd be interested in joining. You can then leave an e-mail message for them to contact you with more information.

ARES Groups

I found St. Charles County Amateur Radio Emergency Service at <http://www.win.org/county/depts/emergenc/sccg275s.htm>. In St. Charles County, radio amateurs are organized, meet, and train on a routine basis to help in major emergencies, such as the Great Flood of 1993. The group is a branch of ARES and serves St. Charles County in Illinois.

Another ARES group can be found in Mason County in Washington. Their Web page can be found at <http://mobilradio.com/ares/about.htm>. This group is also affiliated with RACES. With a RACES membership, a licensed amateur radio operator will be provided with State liability insurance when he or she responds to an authorized mission. This group offers various training listed on their "Training" link and includes Basic Operator Training, EVAP Training, First Aid Classes, ICS Training, EOC Training Strike Team, Map Reading, Message Handling, HAZMAT, Net Control Station, and VE Testing.

The Midlands Amateur Radio Emergency Service (MARES) in Douglas County, Nebraska, is also an ARES/RACES organization. Their membership provides assistance to counties around the Omaha metro area and their coverage includes, in addition to Douglas County, the counties of Dodge, Sarpy, Saunders, and Washington, as well as Western Pottawattamie



Canadian volunteers can also use their interest in radios to get involved. Check out <http://www.igs.net/~gamble/index.htm>.

in Iowa. MARES will also provide communications for special events, such as parades, foot or bicycle races, etc., whenever appropriate, for the purpose of training and enhancing the communications skills of its members. The MARES group holds a Sunday night net that meets on the 146.940 KØUSA repeater at 0200 UTC, and the members are expected to make a commitment to participate in the net and in the meetings and activities as often as possible.

Weather And Radios

Do you have an interest in weather as well as radios? How about becoming a SKYWARN Storm Spotter? Almost every National Weather Service office has a volunteer spotter program. You can check out the Web page of the San Angelo, Texas, organization at <http://www.srh.noaa.gov/FTP/ROOT/SJT/HTML/Preparedness/spotting.html>. They provide training sessions in late winter and occasionally in the fall. It's the first step to becoming a SKYWARN spotter. The San Angelo spotter organization uses amateur radio and General Mobile Radio Service (GMRS) frequencies that are operated by REACT.

Outside The U.S.?

For those readers outside the United States, there are also volunteer radio groups in Canada. One can be found at <http://www.rac.ca/index.htm>, which is the Radio Amateurs of Canada. Another Canadian radio group can be found at <http://www.igs.net/~gamble/index.htm>. This is the Emergency Measures Radio Group (EMRG), which is made up of Federally licensed radio operators located in the Ottawa-Carleton region. EMRG members are either licensed amateur

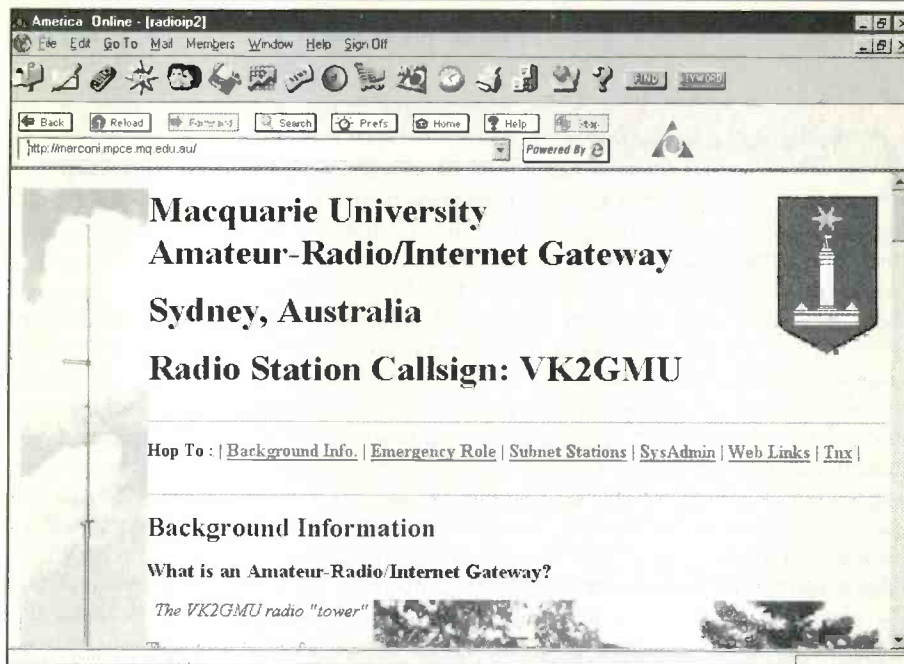
radio operators or are members of the licensed XM49 Emergency Radio Squadron. EMRG acts as the interface between the amateur radio and XM49 communities in Ottawa-Carleton and the Regional Municipality of Ottawa Carleton (RMOC) Emergency Measures Unit (EMU). As an organization, EMRG provides three main functions:

- Organizational structure for contacting volunteers
- Training of volunteers
- Advanced planning for emergencies:
 - a. Frequencies to use, operating locations, procedures
 - b. Identification of locations which could benefit from permanent equipment, such as an outside antenna at a hospital or remote fire station.

For something completely different, check out Macquarie University's Amateur Radio/Internet Gateway at <http://marconi.mpce.mq.edu.au/>. Macquarie University is in Australia and the Web master explains that the

"... gateway is part of an experimental network supporting the investigation of digital data transfer using TCP/IP links over a hybrid network of remote computers linked by both radio and internet links. The radio links use various radio frequencies within the VHF, UHF and HF Amateur-Radio bands (note particularly that the word amateur is used here to indicate that no financial rewards are received for the use of those bands!). In this way remote computers are linked to the university gateway by radio, where the gateway encapsulates the data within the normal Internet traffic and then passes it on to similar experimental stations throughout the world. The internet provides a wormhole completely firewalling the traffic on this experimental network from other internet traffic."

They are investigating the possible uses for the gateway during civil emergencies, such as occurred during the Sydney brush fires. The Wireless Institute Civil Emergency Network (WICEN) was activated during these brush fires, providing communications and assisting in air traffic control for water-bombing helicopters. WICEN (NSW), a division of the Volunteer Rescue Association, provides backup emergency communications during crises when the standard communications systems break down or are overloaded. At Macquarie University, they are investigating the role their



Brushfires have been life-threatening in Australia. Macquarie University in Sydney has combined amateur radio and the Internet to help create an emergency network of communication at <http://marconi.mpce.mq.edu.au/>.

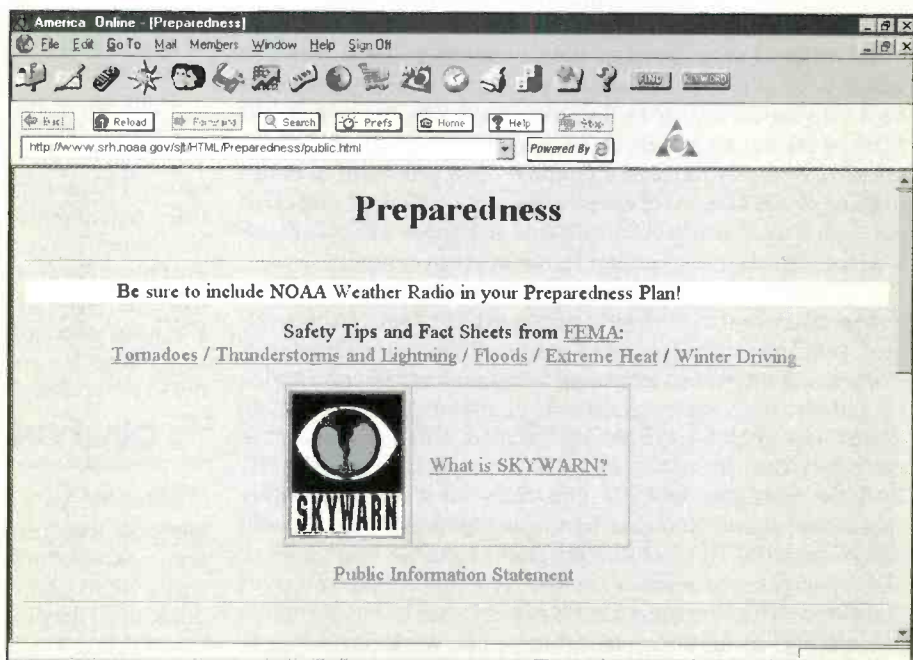
Internet/Packet gateway can play as an emergency link for WICEN to other parts of the city and state.

Why Not Start Your Own Organization!

I'm sure there are even more opportunities to find a group to join if you are

interested in "volunteering your hobby." If there isn't a group near you, there is always the possibility of starting your own field organization or team. Very rarely will communities turn away skilled and trained volunteers who wish to help keep their area safe and secure.

Until next time, happy clicking — and don't forget to let us know about any interesting radio Web sites you've found.



Joining the SKYWARN program of the National Weather Service is a great way to use your radio skills as a volunteer. Their Web site is at <http://www.srh.noaa.gov/FTP/ROOT/SJT/HTML/Preparedness/public.html>.

Live Radio On Your Computer!

By Edward Griffin

How To Do It

Computers attached to the Internet can emulate radios via software that lets you hear audio and sometimes see video from places that can be near or far from your location. Ordinary radio reception has always been dependent upon the signals transmitted reaching your receiver. These signals are sometimes blocked by the terrain or poor propagation. Sometimes the signals reach you, but they suffer from poor quality due to natural and man-made noise, in addition to a weakening with distance.

When computers emulate a radio, the medium that transports the information normally carried by the transmitter's RF is a telecommunications network. The program content is digitized at the source, and a network, like the Internet, carries the data. Your computer needs to have a connection to the network, which is most commonly via a normal telephone line and modem. You also need to have the software required to convert the digitized data back into sound and video, a soundcard, and some speakers or headphones to create the sound. Some software will also support *sending* sound and video if your system also has a microphone and/or camera attached.

The quality of the audio and video depends on many things, but most critical is the amount of bandwidth, or, in other words, the speed at which you can send and transmit data to the network. A 14.4 modem is typically the minimum needed to listen to audio, and, at that rate, audio quality will be similar to an AM radio broadcast. Faster modems, such as 28.8 and 33.6, will support audio broadcasts at a higher rate and sound quality is much better, sometimes in stereo. This isn't quite as good as what you're used to hearing on your FM stereo, but it's certainly pleasant listening. This is also the slowest speed that will work with video, but the screen will be small and the pictures don't change nearly as fast as regular video. Users with 56k modems, ISDN, or faster connections will likely enjoy listening and watching broadcasts this way.

Secondary to the speed of your connection is the speed at which your computer's processor can convert the digitized data back into sound and video. For instance, a 486 running at 100 MHz or greater should be fine for audio, but audio and video together typically requires a Pentium class processor or better running at 200 MHz or faster to achieve acceptable results. I've got such a setup, using 33.6 modems and either a Pentium 166 MMX notebook or a Pentium II 266 desktop computer.

I've had fun experimenting with listening to radio broadcasters from around the world who make their programs available. I can imagine that some of you are already wondering why in the world I would do this when I've got plenty of good radios I could use. Well, there are a couple of answers to that question. Sometimes my job takes me on the road, and most hotels are not good places for setting up antennas, especially ones for HF. With the computer, which I must carry for work, I can enjoy shortwave, music, and entertainment broadcasts that I would otherwise miss. The software programs I use for hearing these audio and video broadcasts are The Real Player and Microsoft Net Show. This software can be run on your computer while you are also using it for other things, like work or reading e-mail. You will find that the broadcasters typically use one or the other format, and you need the corresponding application installed on your system. If you like this as much as I do, you will want to have both.

The Real Player can be downloaded from <<http://www.real.com>> at no cost (other than your normal Internet access costs). There are versions for both Windows™ and Macintosh Systems. A version that supports additional features, such as programmable preset buttons for your favorite stations, is called The Real Player Plus. The Plus version was selling for \$29.99 at the time this article was written. I especially like the ability to SCAN the presets in the Plus player. I suggest you download the regular Player and use it for a while before making a decision about purchasing the Plus version.

Microsoft's Net Show can be downloaded from <<http://www.microsoft.com>> without additional cost and is available in versions for Windows 95 and NT. If you ordered Internet Explorer version 4 on CD, it may be there and so it will not be necessary to download it. Both The Real Player and Net Show integrate with your Web browser, so that when you click on a link to audio or video, the system recognizes the appropriate player and launches it for decoding the data. This makes listening to or watching things that are placed on Web pages as simple as clicking on them. Depending upon your setup, sounds and images may start playing after a short delay, which is known as *streaming*.

I have a friend who is an avid DXer and gets great pleasure out of tweaking and tuning in a weak signal from thousands of miles away. He recently told me that using the net to listen to shortwave broadcasts has enhanced his hobby in two ways. The first is that he can easily verify a poor signal by listening to the same feed on his computer. The second is that, while he enjoys using his skills to tune in the weak signals, they are often not much fun to listen to for content. With the computer, he's now able to really enjoy the programs, understand what they are saying, or hear the music like never before.

I've used it to monitor a broadcast that I normally wouldn't be able to hear due to poor propagation. Some shortwave broadcasters also make programming that's not normally available over the air, available via the net.

If police, fire, and aircraft monitoring is of interest to you, take your Web browser and click over to <<http://www.policescanner.com>>. This is the address for Audionet's page, where you can listen to live police scanners in Los Angeles, California, Dallas and Plano, Texas, and New York City, as well as a fire scanner in Dallas. There was an announcement for an upcoming weekly live and interactive talk show about scanners, and I know that I'll keep checking back to see what additional details are announced. It's an opportunity to add yet another running scanner to those already running in your shack.

Other Great Places And Things To Do!

Gene McAvoy has created a Web page with scanner type audio sources listed on it at <http://www.oz.net/~gmcavoy/sw_scan_audios.html>. Once you get The Real Player installed, surf over to <<http://www.timecast.com>>, which has an online guide to all the programs available via The Real Player. The different things available to be seen or heard are both categorized and searchable. I've found that many of the stations that I've heard while travelling are also on the net and can be listened to in advance of another trip so I can find information on items of local interest.

While the two programs discussed above simulate some of the aspects of radio monitoring, you may be thinking, "What about talking or sending pictures from your shack? Can I do that?" The answer is yes, you can! There are two common programs that support both audio and video connections. As mentioned above, the system and bandwidth requirements for video are greater than those for audio. CU-SEEME (pronounced See You See Me) can be downloaded from <<http://www.cuseeme.com>> and is probably the most common PC-based conferencing software in use today. The download is a demo copy that times-out and can no longer be used after an evaluation period. If you find it worthwhile, it can be purchased for \$69.99.

Microsoft's Net Meeting is available for Windows 95 and NT systems and can be downloaded from the Internet at <<http://www.microsoft.com>>, without additional cost. If you purchased Internet Explorer version 4.0 on CD, it may also be on that disk. Though you can use these programs with no camera attached to your PC, and will be able to hear and see others, the real fun is when you have a camera attached, like the QuickCam from Connectix (<<http://www.connectix.com>>)—then others can see you and you can show off your shack. Cameras are either black and white grayscale or color. Costs start around \$99 and go up, depending upon the image quality. The conferences are very similar to those you hear when hams make contact with others, introduce themselves, tell where they're located, and ask folks how good their equipment is functioning. You can conference with one other person directly and privately, or you can connect to a "reflector" or server that combines multiple users into a conference. To conserve bandwidth, it's common practice to not send audio when taking part in a large conference. These programs support a small window for seeing others' video and a copy of what your camera is sending. There's also a small area where you can type words and a window where those words, as well as those typed by other conference participants, will be displayed and gradually scrolled. This method of conferencing is similar to the popular text-based online chat programs. Depending on your system's sound card, you may be able to speak *and* listen in full duplex mode, which is similar to using a speaker telephone. If your soundcard only supports half duplex, you'll have to use your mouse or a keyboard entry to toggle between listening and speaking, much like push-to-talk is used on radio microphones.

In my last column, I quoted from a reader's letter and asked other readers to comment on computers and radio. I got one response that suggested the best thing to keep in mind was a sense of balance between the two things.

Another reader took the occasion to send me an e-mail message after reading my column in his car while out on a job site. He is an amateur radio operator and used packet radio to send the message to me! He's one who thinks that computer and radio work well together and proved it! I think balance is an important thing, and, while I may cover subjects that can involve significant cost, I also include items that are more modest in price when selecting topics for this column.

Here's a tip: If you're looking to purchase a newer, faster computer, ask the computer manufacturers if they have an outlet for refurbished or excess stock. Sometimes you can save a bundle on a system that's been reworked to "like new" condition.

And if you have something related to computers and radios that you'd like to see covered, please drop me a line at either the *Pop'Comm* HQ address, or via e-mail at <griffined@sprynet.com>. If you'd like to schedule a chat using the software mentioned above or know of a good Internet broadcaster and want to share that information with others, include that in your note, too. ■

CHEROKEE™

WHO SAYS SIZE IS NOT IMPORTANT?

Introducing the new
CHEROKEE FR-465
Hand Held
Family Radio
Less than 4" tall



Once again, Cherokee leads the way with today's new technology. Unbelievable range and performance in a super small design. Only from Cherokee!

"Now You're Talking"™

For more information on all the Cherokee radios and where you can purchase them, call us at 1-800-259-0959, or visit us on the web at <http://wirelessmarketing.com>.

Cherokee is a trademark of the Wireless Marketing Corporation, Schaumburg, Illinois

Broadcast DXing

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING



A Winter DX Heatwave

The low A and K indices of late December produced some excellent conditions for transatlantic mediumwave DXing. Some great DX catches were reported by Neil Kazaross in the Chicago area: "The superb conditions continue here in Illinois, as I fell asleep 0530 UTC December 27 listening to Finland on 963 kHz, which had music and talk audible about 25 percent of the time. Also **Denmark on 1062 kHz** and several more from the UK were heard. German on 531 kHz must have been Switzerland. Tonight (UTC December 28) early evening I had **RNE5 (Spain) on 531** with an ID and bits of audio seemingly parallel 1107 kHz. Also copied some of **Croatia on 1125** parallel the big gun on 1134 kHz, and had **Slovakia on 1098**. At sunset, I heard Saudi Arabia on 1521 and a big signal from TWR on 1467 kHz. Many other carriers were in well at near audio levels including 1188 kHz."

Mark Connelly in Massachusetts followed up on Neil's report; "Neil Kazaross mentioned 'absolutely the best ever' European DX from his home near Chicago. He listed stations that he hadn't even heard during the Newfoundland, Canada DXpedition a month earlier! His report spurred me to do some listening during the 0500 to 0800 UTC time period (midnight to 3:00 a.m. local). Generally, I've neglected this time block because I usually like to sleep then, and with cold weather and meddling non-DXers (police, etc.), operation from the car at high-quality shore locations doesn't usually work out too well. Neil's report of good high latitude propagation, and some really good sunset-period reception here of stations such as **Sweden on 1179 kHz**, gave me the idea to do some tuning from my home QTH (25 km from the seashore) between 0500 and 0800 UTC on December 27.

It paid off! I had my best ever reception of **Finland on 963**, and at 0715 UTC a nice sign-on from the Faroes on 531 kHz, a station I'd heard only once before from a U.S. site (Harwich, MA; a much better site than home for Euro's). Finland had a great signal for over an hour (before 0630 to after 0730 UTC). **Kaliningrad**

on 1386 blasted in with a great "This is the Voice of Russia World Service" ID at 0600 UTC. Of course, the usual Scandinavian big guns (Norway-1314, Denmark-1062, Sweden-1179) were booming in at near local quality. Even at 0800 UTC, when I did decide to 'pack it in' for a night's sleep, Norway and Denmark were putting in good signals."

I came in at the tail end of the late December Scandinavian feeding frenzy with only a glimpse of Finland on 963 and an early morning het on 531 that could have been from the Faroes. Argentina on 1620 hasn't been definitely heard yet at my New Hampshire QTH, due to PCH and a number of TIS stations on the frequency. But a January 3-4 Saturday night mini DXpedition at the Parker River NWR coastal salt marsh in Rowley, Massachusetts, produced some interesting logs, although conditions were back to normal by then with Spain dominant across the dial.

Patrick Martin in Oregon also reported reception of transatlantic carriers during late December, including audio from **Norway-1314**, and at 0535 UTC December 24 an interval signal from Sweden on 1179 kHz cutting through 1180 QRM. Both the A and K indices were at zero toward the end of December. The low indices usually result in good high latitude reception of transatlantic signals that would otherwise be subdued by the north polar auroral dome. Conversely, listen for Latin American and sub-equatorial transoceanic DX when higher indices and increased solar activity are present. Listen to WWV at 18 past the hour for the latest numbers and solar activity forecast.

Regarding the February edition of "Broadcast DXing," Martin reports the following correction: "Mark Connelly wasn't the first in the U.S. to receive India on MW. I have heard that India was received back in the '20s/'30s. I QSL'd Shillong, India, 864 kHz, 100 kilowatts, back in 1992 from Seaside, Oregon. I also logged and QSL'd Vietnam-1010 in 1984, Bangladesh-558 in 1994, and two from Nepal on 576 and 792 in 1993. I just

QSL'd Oman-1413; the QSL took a couple of years. I have many QSL cards and letters from Asians." Martin is an avid MW DXer and QSLer and a member of the International Radio Club of America, with a total of 2,425 MW QSLs collected in Oregon since 1965.

Radio News/Talk

AM radio is still top dog in many of the larger markets, according to the results of last fall's ratings. For example, in Boston, long-time leader WBZ "Newsradio 1030" remained ahead of number two WXKS "Kiss 108" 107.9 FM and number three WJMN "Jam'n 94.5" FM. CBS sister station KDKA 1020 AM followed suit in Pittsburgh, holding first place well ahead of rocker WDVE 102.5 FM, with country WDSY "Y-108" 107.9 FM in third. News/talk KMOX 1120 AM maintained a commanding lead over second place WIL 92.3 FM, while urban contemporary KMJM 107.7 FM held onto third place in St. Louis.

Listen for **WQTH Hanover, New Hampshire**, to be signing on soon (if not already) with 50,000 watts daytime power on **720 kHz**. This might be a good sunrise/sunset target for DXers needing to add New Hampshire to their logs. There's a new station in Colombia that's being widely heard. Listen for Radiodifusora Nacional de **Colombia on 610 kHz**. According to a report from Play DX relayed via Renato Bruni and Hard Core DX, the station is located in Uribia, on the Guajira peninsula overlooking the Caribbean, making it an easy target for North American DXers.

Station CHOM 97.7 FM in Montreal and CILQ "Q-107" 107.1 FM in Toronto risked license suspension due to their broadcast of the Howard Stern show. Interestingly, as reported in the December edition of "Broadcast DXing," CILQ had been using a 60-second delay to enable censoring of offensive material. But the CILQ Stern show broadcast was cited to be in violation of the Canadian broadcast code of ethics. CILQ has responded by

Applied For Permits To Construct New FM Stations

AK	Valdez	93.3 MHz	
AL	Bessemer	88.1 MHz	
AL	Selma	89.5 MHz	6 kW
AR	Batesville	99.5 MHz	
AR	Danville	105.5 MHz	6 kW
AR	Fayetteville	88.3 MHz	470 watts
AR	Horseshoe Bend	106.5 MHz	
AR	Nashville	90.5 MHz	32 kW
AR	Springdale	88.5 MHz	2.5 kW
AR	Stamps	104.3 MHz	
AZ	Parker	93.9 MHz	
CA	Baker	94.9 MHz	
CA	Eureka	89.3 MHz	250 watts
CA	Lenwood	96.9 MHz	
CA	Lodi	89.7 MHz	
CA	Pescadero	89.3 MHz	
CA	Rohnert Park	93.7 MHz	(KJZY-FM booster)
CA	Santa Maria	90.7 MHz	3 kW
CA	Selma	88.5 MHz	
CA	Truckee	101.5 MHz	
CO	Rocky Ford	95.5 MHz	
CO	Rye	90.9 MHz	5 kW
CO	Sidney	91.3 MHz	
CO	Walsenburg	90.9 MHz	
CO	Westcliffe	89.9 MHz	
FL	Lady Lake	90.3 MHz	
FL	Sebring	88.3 MHz	
IA	Marion	89.9 MHz	
IA	Ottumwa	88.3 MHz	380 watts
IA	Vinton	107.1 MHz	
ID	McCall	106.7 MHz	
IL	New Berlin	88.9 MHz	
IL	Sherman	88.9 MHz	
IL	Taylorville	88.9 MHz	
IN	Frankfort	90.7 MHz	250 watts
IN	Valparaiso	91.1 MHz	
KS	Cawker City	96.3 MHz	
LA	Atlanta	106.5 MHz	
LA	Grand Isle	104.5 MHz	
LA	Mansure	95.9 MHz	
MI	Fife Lake	95.9 MHz	
MI	Freeland	90.9 MHz	
MI	Hesperia	91.7 MHz	35 kW
MI	Muskegon	91.7 MHz	6 kW
MN	Deer River	105.5 MHz	
MN	Esko	88.7 MHz	450 watts
MO	Deerfield	100.7 MHz	
MO	Kirksville	91.9 MHz	1 kW
MO	Macon	99.9 MHz	
MO	Moberly	97.3 MHz	
MO	Thayer	92.7 MHz	
MS	Kosciusko	103.3 MHz	20 kW
MT	Baker	100.5 MHz	
MT	Billings	90.7 MHz	
MT	Collstrip	93.7 MHz	
MT	Great Falls	90.7 MHz	50 kW
NC	Jacksonville	90.1 MHz	20 kW
NC	Roanoke Rapids	91.1 MHz	2kW
NC	Sneads Ferry	89.9 MHz	1.5 kW
NC	Wake Forest	91.1 MHz	
NE	Hastings	91.7 MHz	
NE	Imperial	102.9 MHz	
NM	Alamogordo	107.9 MHz	
NM	Cloudcroft	97.9 MHz	
NM	Kirtland	102.9 MHz	100 kW

NM	Lordsburg	105.7 MHz	
NM	Las Vegas	96.7 MHz	
NM	Tatum	107.1 MHz	
NV	Beatty	100.3 MHz	
NV	Las Vegas	91.1 MHz	
NV	Smith	92.3 MHz	
OH	Canton	90.1 MHz	500 watts
OK	Ada	89.9 MHz	
OR	Bend	90.5 MHz	
PA	Coatesville	89.3 MHz	
PA	Pocono Pines	105.9 MHz	
SC	Cross Hill	94.1 MHz	
SD	Rapid City	90.5 MHz	
TX	Aransas Pass	88.1 MHz	
TX	Callisburg	91.9 MHz	
TX	Idalou	107.7 MHz	
VA	Shawsville	102.5 MHz	
WA	Ellensburg	88.1 MHz	50 kW
WI	Mount Horeb	106.7 MHz	
WI	Random Lake	91.3 MHz	
WI	Sturgeon Bay	88.5 MHz	50 kW
WI	Wautoma	102.3 MHz	
WY	Cheyenne	88.1 MHz	900 watts
WY	Fort Bridger	99.1 MHz	
WY	Glendo	100.1 MHz	
WY	Glen Rock	98.3 MHz	
WY	Log Cabin	99.1 MHz	
WY	Midwest	107.9 MHz	
WY	Orchard Valley	89.7 MHz	68 kW
WY	Thermopolis	98.3 MHz	
WY	Thermopolis	101.7 MHz	

Granted Permits To Construct New FM Stations

CA	Coalinga	88.3 MHz	
CA	Hollister	90.7 MHz	1.4 kW
CA	Livingston	88.3 MHz	
CA	Pleasanton	103.7 MHz	(KKSF booster)
CO	Milliken	107.1 MHz	(KSIR-FM booster)
CT	Huntington	88.1 MHz	(WMNR booster)
FL	Bellevue	91.3 MHz	2.18 kW
FL	Keystone Hts.	91.5 MHz	
FL	Tampa	106.1 MHz	(Experimental FM/DAB)
FL	Tavervier	96.9 MHz	6 kW
IA	Forest City	91.9 MHz	(Reinstated)
ID	Burley	88.5 MHz	
IL	Taylorville	97.3 MHz	
MD	Ocean City	90.7 MHz	
MI	Negaunee	101.9 MHz	2.1 kW
OH	Beach City	88.7 MHz	21 kW
TN	Lawrenceburg	89.7 MHz	
TX	Portland	91.1 MHz	
UT	Salt Lake City	92.1 MHz	(KMGR booster)

Applied For Permits To Construct New AM Stations

HI	Honolulu	1130 kHz	
NY	Casper	1400 kHz	1 kW

Seeking To Change AM Facilities

KMCA	Burney, CA	1450 kHz	Seeks move to Shasta, 260/250 W
------	------------	----------	---------------------------------

KREH	Oakdale, LA	900 kHz	Seeks move to Pecan Grove, TX, 2.5 kW
KRRA	W. Covina, CA	900 kHz	Seeks to change power
KTRB	Modesto, CA	860 kHz	Seeks night increase to 50 kW
KXTA	Los Angeles, CA	1150 kHz	Seeks night increase to 44 kW
WACB	Taylorsville, NC	860 kHz	Seeks to add 130 W nights
WFLA	Tampa, FL	970 kHz	Seeks power increase to 25/11.9 kW
WGLB	Pt Washington, WI	1560 kHz	Seeks change city and power
WHJB	Greensburg, PA	620 kHz	Seeks 1.3 kW/400 W
WHOO	Orlando, FL	990 kHz	Seeks to increase night power
WINR	Binghamton, NY	680 kHz	Seeks night increase to 5 kW
WJCM	Sebring, FL	960 kHz	Seeks move to 105 kHz, 1 kW
WNBN	Meridian, MS	1290 kHz	Seeks increase to 2.5 kW/91 W
WNFO	Ridgeland, SC	1430 kHz	Seeks move to Hilton Head, 213 W
WNWI	Valparaiso, IN	1080 kHz	Seeks move to Oak Lawn, IL 1.9 kW
WRKL	New City, NY	910 kHz	Seeks night increase to 900 W
WTMP	Temple Terrace, FL	1150 kHz	Seeks move to Egypt Lake, 500 W nights
WVSR	Charleston, WV	1240	Seeks move to Dunbar
WWBG	Greensboro, NC	1470 kHz	Seeks to change night power
WWTL	Walkersville, MD	700 kHz	Seeks move to Poolesville, 25 kW
WXGI	Richmond, VA	950 kHz	Seeks to reduce power

Changed AM Facilities

KVSN	Tumwater, IA	1500 kHz	Changed freq., added nights
------	--------------	----------	-----------------------------

preparing some Canadian-content inserts and providing local talent to supplement the show.

As of this writing, Philadelphia has continued to be without a full-time classical music station since the demise of WFLN 95.7 FM last fall. The owner of classical music stations WCRB 102.5 FM in Boston and WFCC 107.5 FM in Chatham, Massachusetts, indicated an interest in expanding into Philadelphia to fill the void. WCRB is presently being promoted as the highest rated major market classical music station in the nation.

Here's a collector's item for those who grew up listening to Norm Nathan. "Sounds in the Night." An audio tape commemorating this Boston personali-

ty's 52-year radio career is now available. Jordan Rich, who is Norm Nathan's successor overnights on WBZ, and Sarah Nathan (Norm Nathan's daughter) compiled the tape from WHDH, WRKO, and WBZ air checks. The tape is on sale at the Berklee College of Music bookstore in Boston, or it can be ordered by phone at 1-800-670-0023.

A brief simulcast of WJMN "Jamn' 94.5" on WNFT 1150 AM in Boston wasn't supposed to happen. Janitors didn't want to listen to rock music on WAAF 107.3 while cleaning at the WNFT transmitter site. So they simply tuned the radio to urban contemporary 94.5 not realizing that it was the same radio used to receive the WAAF signal for

WGIL	Galesburg, IL	1400 kHz	Dropped to 740 W
WMBI	Chicago, IL	1110 kHz	Changed day power

Requesting Changed FM Frequencies

WAAI	Hurlock, MD	100.9 MHz	Seeks move to 100.5 MHz
WJZB	Houston, MS	88.7 MHz	Seeks to change frequency
WKMD	Loogootee, IN	94.1 MHz	Seeks move to 94.5 MHz

Changed FM Facilities

KCDX	Florence, AZ	103.1 MHz	Changed city and frequency
KSFH	Mountain View, CA	88.1 MHz	Changed frequency
WAOY	Gulfport, MS	91.7 MHz	Changed city

New AM Call Letters Issued

KAYK	Arvada, CO
KBLI	Blackfoot, ID
KCJK	Iowa City, IA
KHFS	Fort Smith, AR
KKJC	Lake Oswego, OR
WCGR	Canadaigua, NY

Pending AM Call Letter Change

New	Old	
KNNS	KANS	Larned, KS

Changed AM Call Letters

New	Old	
KBAI	KJQY	Morro Bay, CA
KBBC-FM	KBBC	Lake Havasu City, AZ
KBMB	KRYR	Sacramento, CA
KDVE	KGRI-FM	Henderson, TX
KFRY	KVFX	Manteca, CA
KFQX-FM	KCWS	Merkel, TX
KJQY	KKBH	San Diego, CA
KKCH	KZGO	Glenwood Spgs., CO
KKRY	KMAY	Miles City, MT
KNKI	KDVE	Sherman, TX

simulcast on WNFT. "Nifty 1150," the former home of the Kid Star network in Boston, has been simulcasting WAAF while seeking a new format.

Christian radio is undergoing some changes in down-east Maine. WMSJ 91.9 has moved to 89.3 FM, with IDs as "WMSJ, Freeport, greater Portland, Lewiston-Auburn, the all new Joy 89.3." WYFP Harpswell, owned by the Bible Broadcasting Network, is now on the air at 91.9 FM. And the Carter network's stations, WRUM AM and WWMR FM, have changed calls to WLLB AM and WLOB FM, simulcasting WLOB 1310 AM in Portland.

The One-On-One Sports network continues to grow across the AM dial. The

latest stations to join the sports talk network include WXLX Newark, New Jersey, on 620, WKBR Manchester, New Hampshire, on 1250, WNRB Boston on 1510, WWKB Buffalo on 1520, and KXED 1540 Los Angeles.

Flying To The Windy City?

Chicago airport information stations have moved from 870 to 800 AM. Listen for "Chicago Midway Parknet" KPD456 and "Chicago O'Hare Parknet" both on 800 kHz. O'Hare International Airport also has a "parknet" parking and traffic information station on 88.1 FM.

And here's an interesting DX note. The Sunday radio section of the Orange County Register, Santa Ana, California, lists the Bruce Williams show on KOMO Seattle 1000 AM, with the qualifying statement, "Signal can be heard in Orange County." Does that mean Bruce Williams isn't broadcast locally in LA?

X-Band Files In Brief

New stations on the air: KGXL Costa Mesa, California, on 1650, and WTDY Madison, Wisconsin, on 1670. Listen for the vintage KDIA call letters replacing KXBT on 1640 from Vallejo, California. 1310 in Oakland dropped the KDIA calls when they changed their format from classic soul to Radio Disney.

Loggings

Some Saturday morning logs from Klaus Spies in Illinois, an interesting report from New Zealand via Cumbre DX, and selected logs from Connelly in Massachusetts and myself for this month's loggings . . .

531 FAROE ISLANDS, Utvarp Foroya, Akraberg, at 0705-0718 UTC, a BIG carrier came on at 0705, xylophone IS started at 0713, then Scandinavian-language talk by man (sign-on) at 0715 was followed by religious music at 0718 (Connelly). At 0712 UTC heard with a good het against 530, but no audio for positive ID (Conti).

610 COLOMBIA, R.Dif.Nacional, Uribia at 0300 UTC with cultura, nacional, and de Colombia mentions, accordion and romantic music, through difficult WGIR null (Conti).

612 MOROCCO, RTM Sebaa-Aioun at 0135 UTC, good signal over Ireland,

discussion by man and woman in Arabic and music // 207 LW (Conti).

837 AZORES, RDP Barrosa at 2210 UTC, football (soccer) in Portuguese // 9570 SW (Conti).

846 ITALY, RAI Roma 0105 UTC, news briefly in English about Italian parliament and prime minister, then news in French, Notturmo Italiano ID, good signal // 6060 SW (Conti).

963 FINLAND, R. Finland (YLE), Pori, at 0630 UTC, woman said a few words in Swedish, then a man spoke in Finnish; very good, the best signal I've ever noted from this one. This was still coming through quite well when rechecked at 0736 UTC (Connelly).

1062 DENMARK, Danmarks Radio, Kalundborg, heard at 1928 UTC, hetting daytimer WJLT-1060 with an early fade-in, and 0517 absolutely BLASTING in! (Connelly).

1062 TURKEY, TRT Diyarbakir at 2355 UTC, tentative with Middle Eastern style music, and at 0245 with Koranic recitations, presumed Turkey with no parallels found for positive ID (Conti).

1130 WISM, Milwaukee, WI, at 1400 UTC, news, weather, and talk, with no interference (Spies).

1179 SWEDEN, Solvesborg, at 2147 UTC, man in Swedish with a documentary about the history of Islamic fundamentalists and the Ayatollah Khomeini, good signal (Connelly).

1230 WJLB, Hammond, IN, at 1404 UTC, news, weather, and traffic report, S1 signal strength, interference from unID with SSB (Spies).

1280 WBIG, Aurora, IL, at 1408 UTC, radio shopping show (sounded like the radio version of the Home Shopping Network), S0 weak signal but with no interference (Spies).

1314 NORWAY, NRK, Kvitsoy, at 0015 UTC, man in Norwegian, then Eric Clapton's "You Look Wonderful Tonight"; excellent at S9+35, slightly better than adjacent CKEC-1320 and much stronger than WLOB/CHGB/CIWW-1310 (Connelly).

1360 WLBK, DeKalb, IL, heard at 1410 UTC, Saturday Sports Special, no interference (Spies).

1386 RUSSIA-KALININGRAD, V.O. Russia, Bolshakovo, at 2330 UTC, good with talk in English mentioning "1386 medium wave," audio from this appeared as early as 2015, and at 0600 just about blowing the house down with chime and ID, "This is the Voice of Russia World Service" (Connelly).

1395 NETHERLANDS, Talk Radio, Lopik at 0440 UTC, telephone talk with strong het on low side assumed to be from Albania (Conti).

1520 "KNRK," Portland, OR at 2300 UTC with rock music and 94.7 FM IDs. I recall hearing KFXX Oregon (1540 AM) around this frequency a year or two back, so maybe the stations are connected. As yet this summer, no audio detected from more frequently heard WFLA on 25870 (Bryan Clark, New Zealand, via Cumbre DX).

1530 SAO TOME E PRINCIPE, VOA Pinheira at 0300 UTC, weak under WSAI with Yankee Doodle IS and news in English // 7340, 7415, and 9575 SW, and 0435 UTC with Portuguese program // 5745 (Conti).

1620 WNWZ, 910 Bensenville, IL, with repeating program similar to weather broadcasts on 160 MHz, sponsored by Bensenville ESDA (Spies). (Klaus is interested in a mailing address for QSLing this station. If you know their address, please forward the info to "Broadcast DXing." Thanks.)

1620 ARGENTINA, R. Esmeraldas, Buenos Aires at 2340 UTC with folkish Spanish religious vocal with Afro-pop influences, to fair peaks (S7) with stronger (S9+20) PCH Netherlands in loop null (Connelly).

1685 COLOMBIA, MER Mercaderes at 0215 UTC, CW beacon with MER code IDs separated by a lone E, weak through an unID utility station (Conti).

Some great DX reports this time around! Thanks to Mark Connelly, Bob Gilbert, Steven Hildebrand, Neil Kazaross, Patrick Martin, Klaus Spies, and Edwin Tulowitzki. Keep in mind that FM/TV DX should improve as summer approaches. Help keep the DX reports going by submitting your logs, QSLs, and radio items of interest to "Broadcast DXing," c/o *Popular Communications*, 76 North Broadway, Hicksville, NY 11801, or check out our Web site at <<http://www.popcomm.com>>. 73!

The ACARS Downlink

BY BOB EVANS

YOUR LINK TO DIGITAL AIRCRAFT COMMUNICATIONS

What's New In ACARS Decoders?

Lowe Electronics of the UK was one of the first companies to offer a DOS-based dedicated ACARS Decoder for the personal computer (ACARS stands for Aircraft Communications Addressing and Reporting System). Their new Windows™ versions, the Air Master 2000, while still maintaining its original decoding excellence, now embraces a plethora of additional enhancements.

The Lowe Air Master 2000

The Air Master 2000 is Lowe's newest decoding software/hardware package. The hardware consists of a small demodulator built into a 25-way D-type plug, which is connected into the Com port on the back of a PC and takes its power from the PC. The software is then installed onto the computer's hard drive and is ready to run. The scanner is tuned to the appropriate frequency, and within a few minutes you should see your first ACARS messages being decoded! You can see from the screen shot the sort of messages that you will be able to decode. All the decoding of the data stream is handled by software running on the PC, which also enables some analysis of the messages to take place before they are displayed on the screen; hence items such as the registration number of the aircraft, its flight number, and the type of message are shown separately from the message text.

Options in the decoding software allow you to log to a data file or to a printer or both. In either case, data also appears on-screen in real time. ACARS data comes in particularly fast, especially if you are in a busy location, and the screen soon fills up and scrolls over.

The display of message contents can be suppressed. If both the labels and the contents are displayed, the individual messages only have the separator line drawn between them every minute. Up to six strings of "alert text" can be specified. If one of these is received anywhere in the message, the program beeps. This is designed to help in spotting particular flight or registration numbers.

What Does The Lowe Air Master 2000 Do?

The Lowe Air Master 2000 is a program for receiving ACARS transmissions from aircraft. To use it, you must have a suitable air band receiver which covers the frequencies used for ACARS. In Europe, the primary frequency is 131.725 MHz; in the U.S., it is 131.550 MHz. The mode of the transmission is AM.

The sound received on your air band radio is input to the PC using the specially designed Air Master demodulator. It is then decoded by the Air Master software and the messages are displayed.

Air Master 2000 allows you to view live data as it is received, to view recently received data that is held in your PC's memo-

ry, to view data that has been saved in log files or to view a list of aircraft that the system has heard. Because it is a Windows program, it even allows you to do all four at the same time if you wish!

Finally, Air Master supports Windows Dynamic Data Exchange (DDE), so it can pass data to other add-on applications which can use Air Master as an ACARS-receive "front end." When Air Master is receiving data, the demodulator generates an enormous number of hardware interrupts — several thousand each second — which put a significant load on the PC's processor. Windows 95 tends to handle hardware interrupts more efficiently than Windows 3.1, so, if you have a choice, I would recommend using Windows 95, but only if the PC hardware spec is up to it!

I would not recommend running the program on a PC which has so little memory that it does a lot of swapping to disk. Exactly how much memory that depends on what version of Windows you are using, but I would say 8 Mb is an absolute minimum for Windows 3.1 and 12 Mb for Windows 95.

Setting Up The Air Master 2000

Setting up Air Master 2000 is very simple: you plug the 3.5-mm jack plug on the demodulator into the external speaker socket on your air band radio, you plug the demodulator into a COM port on your PC, you run the Air Master software and tell it which COM port to use. That's it! Let's take it one step at a time, in a bit more detail.

The Main Screen

Air Master uses a Windows Multiple-Document Interface (MDI). This means that it can have several different displays open at the same time. Four different types of display are available: **Live Data**, **Data Review**, **File Review**, and **Aircraft List**. There can only be one Live Data, Data Review, or Aircraft List display open at any time, but up to six File Review Displays may be open.

You open new displays using the "Display" menu options. Because an MDI is used, the menu options and the status bar will change according to which display is currently active. (The "active" display has an active, usually dark blue caption bar and is the last display you opened or the last display on which you clicked the mouse).

Live Data Display

This shows the data as it is being received. The colors used in the display can be configured from the Options menu. There is an indicator at the top end of the scroll bar which flashes if any sort of data is being received (it will flash even if only noise

is being received); this indicator can be disabled from the Options menu.

Air Master attempts to differentiate between uplink (ground-to-air) and downlink (air-to-ground) messages. Any message that is regarded as an uplink is marked "[Uplink]." (Uplink message identification is only enabled when "Label The Data" is checked on the Options menu).

As data is received, it is held in a series of buffers so it can be reviewed using the Data Review display. It can also optionally be saved in a log file.

When Live Data is the active display, the status bar shows which buffer is currently being used to save data and whether the scrolling is locked.

Data Review Display

The Data Review display allows you to page through the buffered data. You can change the buffer using the "Next Buffer" and "Previous Buffer" menu options, or simply by using <Ctrl> plus the right and left cursor keys. The Home key will take you to the start of the current buffer, the End key will take you to the end.

When Data Review is the active display, the status bar shows which buffer is currently being viewed, and the date/time of the start of the data in the buffer.

File Review Display

The File Review display shows the contents of a saved log file. You select the file when first opening the display and you can change the file using the "Load" menu option. You can page through the parts of the file using the "Next Part" and "Previous Part" menu options, or simply by using <Ctrl> plus the right and left cursor keys. The Home key will take you to the start of the current part, the End key will take you to the end.

When File Review is the active display, the status bar shows which part of the file is currently being viewed, and the date/time of the start of that part of the file.

Aircraft List Display

The Aircraft List display shows a list of the aircraft that Air Master has heard during the current program session. For each aircraft, the registration number, flight number, and time last heard are shown. If more than a specified number (default 100) of aircraft have been heard, Air Master attempts to discard the oldest entry from the list when a new entry needs to be added. Entries in the list older than a specified number of minutes are automatically discarded.

There are menu options available for specifying the sort order of the list, whether or not you want the latest entry in the list to be automatically highlighted, the maximum number of aircraft to keep in the list, and the age in minutes for automatically discarding old entries. Clicking the "Clear" button will clear all entries from the list.

Common Menus

Some items on the Air Master menus vary according to which type of data display window is currently active, while other items are common to all types of data display. The display menu has options for opening new display child windows within the

main Air Master window, and it also has an Exit option for closing down the program. The available options on the menu are:

Live Data — This opens the Live Data display window, which shows data as it is received. Only one Live Data display can be open at one time. If you select this option when the Live Data display is already open, then the display is simply brought to the front.

Data Review — This opens the Data Review display window, which allows you to review the data currently held in the receive buffers. Only one Data Review display can be open at the same time, so if you select this option when the Data Review display is already open, then the display is simply brought to the front. Each receive buffer is about 25,000 characters in length.

You can change the buffer currently being viewed by using the "Next Buffer" and "Previous Buffer" menu options, or simply use the right and left cursor keys. You can move around within a buffer by using the scroll bar, or the PageUp and PageDown keys.

The Home key takes you to the start of the buffer; the End key takes you to the end of the buffer.

File Review — This opens a File Review display window, which allows you to review the data currently held in a log file. Up to six File Review windows can be open at the same time.

When you first open a File Review window, you will be prompted to select a log file to view. A different file can later be selected using the "Load" menu option. Files are viewed in parts or pages of about 25,000 characters in length.

You can change the file part currently being viewed by using the "Next Part" and "Previous Part" menu options, or simply use the right and left cursor keys. You can move around within a part by using the scroll bar, or the PageUp and PageDown keys. The Home key takes you to the start of the part; the End key takes you to the end of the part.

Aircraft List — This opens a window showing a list of the aircraft that the system has heard since it was started. The list can hold up to 100 entries. There are menu options for sorting the list by registration, by flight number, or having it unsorted.

"Extras" — If you have any Air Master "Extras" installed, these will appear on the display submenu between "Aircraft List" and "Exit."

Exit — This option closes down Air Master 2000.

The Window Submenu — The Window menu has options for arranging the child windows within the main Air Master window and for selecting a child window. (A Window menu is a normal part of any MDI application).

Cascade — This option arranges the child windows in an overlapping cascade.

Tile Horizontally — This option puts the child windows in a tiled arrangement which fills the main window. The tiles will be arranged in a pattern which favors horizontal rather than vertical divisions.

Tile Vertically — This option puts the child windows in a

tiled arrangement which fills the main window. The tiles will be arranged in a pattern which favors vertical rather than horizontal divisions.

Arrange Icons — If you minimize the child windows within the main window, this options will arrange the Air Master icons in a neat row.

Record Favorite and Restore Favorite — If you have an arrangement of Air Master child windows which you regularly use, then you can record it as your favorite setup by using the "Record Favorite" option. You can return to this setup at any time by selecting "Restore Favorite." Air Master will open the windows and arrange them exactly as they were when you recorded the setup. The only restriction is that you cannot record a setup which has more than one File Review window open.

Window Selection Options — For every child window that's open, there will be a menu option to select that window.

The Help Submenu — This menu has options for displaying the on-line help contents page and also for displaying some information about the Air Master 2000 program.

Live Data Menu

When the Live Data display is the currently selected child window, all the Common Menu items are available as well as the following options.

The Options Submenu — This submenu has various options for setting up the Live Data display.

Setup — This option allows you to configure the COM port used by Air Master and also some other aspects of the Live Data display.

Alert List — This option allows you to configure the list of alert texts. Ctrl+A is a shortcut for this option.

Allow Parity Errors — If this option is checked, received ACARS messages will be displayed, even if they contain parity errors.

Suppress Repeats — If this option is checked, each time a message is received, it is checked against the previous 50 messages to see if it is a repeat. If it is, then it isn't displayed.

Label The Data — If this option is checked, labels are added to received data. "ACARS mode:," "Aircraft reg:," etc.

Show Message Content — If this option is checked, the contents of the ACARS message are displayed. If the option isn't checked, only the message header is displayed.

Show Data Indicator — If this option is checked, an indicator at the top of the scroll bar on the Live Data window will flash if any data, even noise, is being received. This gives a good indication that the output from the demodulator is getting through to the program, but it can become annoying!

Raw Data Mode — Raw Data Mode is only useful for anyone who wants to study the technical structure of an ACARS

message exactly as it is transmitted. You will see that some characters will appear on the screen as small black rectangles. These are non-printing control characters which are used in ACARS messages, but which are normally removed when Air Master processes the message. The only way to view exactly what is in the message is to enable logging and then view the log file with a hex editor. Separator lines are still inserted between messages, but no checking is done for alert texts.

The Logging Submenu

Log Everything To File — If this option is checked, all received data is written to the log file.

Log Alerts To File — If this option is checked, only messages containing alert texts are logged. (If neither of the options is checked, nothing is logged).

Only One Log Per Day — If this option is checked, Air Master uses one log file per day, named in the format MMDD0000.LOG. For example, the log file for 12 May would be called 05120000.LOG. If this option is not checked, a new log file is started each time the program is run or logging is enabled. The file is named in the format MMDDHHNN.LOG. For example, if the program was started at 14:56 on 15 May, then the log file would be called 05121456.LOG.

Delete Log Files — This option allows you to delete log files which you no longer want to keep. When the dialogue box opens, you can select a single file, or you can hold down the Ctrl key and select several files in one go.

Output To Printer — If this option is checked, all received text is output to the printer. Air Master will use the default Windows printer with the default settings.

Beep On Alert — Checking this option causes the program to beep each time an alert text is received.

The Colors Submenu — This submenu has options for setting the color of the various types of text in the Live Data display. Note that the same colors are used in the Data Review display.

Data Review Menus

When the Data Review display is the currently selected child window, all the Common Menu items are available, along with the following options:

Refresh — Air Master saves received data in a series of buffers. Most buffers contain old data, but one will contain the data that Air Master is currently receiving. If you are reviewing this buffer, the contents will be changing while you are viewing it. Selecting "Refresh" updates the review display with the current contents of the buffer. The number at the left-hand end of the status bar shows the number of the buffer to which Air Master is currently writing.

Previous Buffer — Selecting this option causes the contents of the buffer previous to the one you are viewing to be displayed

in the Data Review window. For example, if you are currently viewing buffer 2, you will then move to buffer 1. Pressing the left cursor key has the same effect as this menu option.

Next Buffer — Selecting this option causes the contents of the buffer after the one you are viewing to be displayed in the Data Review window. For example, if you are currently viewing buffer 2, you will then move to buffer 3. Pressing the right cursor key has the same effect as this menu option.

The Options Submenu — This submenu has various options for setting up the Data Review display.

Setup — This option allows you to configure the COM port used by Air Master and also some other aspects of the Live Data display.

Alert List — This option allows you to configure the list of alert texts. Ctrl+A is a shortcut for this option.

The Colors Submenu — This submenu has options for setting the color of the various types of text in the Data Review display. Note that the same colors are used in the Live Data display.

File Review Menus

When a File Review display is the currently selected child window, all the Common Menu items are available as well as the following options.

Load — This option allows you to load a different file into the 2000's File Review window.

Previous Part — Selecting this option causes the part of the file previous to the one you are viewing to be displayed in the File Review window. For example, if you are currently viewing part 2, you will then move to part 1. Pressing the left cursor key has the same effect as this menu option.

Next Part — Selecting this option causes the part of the file after the part you are viewing to be displayed in the File Review window. For example, if you are currently viewing part 2, you will then move to part 3. Pressing the right cursor has the same effect as this menu option.

The Options Submenu — This submenu has various options for setting up the File Review display.

Setup — This option allows you to configure the COM port used by Air Master as well as some other aspects of the Live Data display.

Alert List — This option allows you to configure the list of alert texts. Ctrl+A is a shortcut for this option.

Colors Submenu — This submenu has options for setting text color and background in the File Review window.

Print File — Selecting this option will print the file currently being viewed. If this will result in more than a few pages of output, you will be asked to confirm that you really do want to print it!

Aircraft List Menu

When the Aircraft List display is the currently selected child window, all the Common Menu items are available as well as the following options.

The Options Submenu — This submenu has various options for setting up the Aircraft List display.

Setup — This option allows you to configure the COM port used by Air Master as well as some other aspects of the Live Data display.

Alert List — This option allows you to configure the list of alert texts. Ctrl+A is a shortcut for this option.

List Setup — This options allows you to specify the maximum number of entries in the aircraft and the maximum age of entries in the list before they are automatically disregarded.

Save The List — This option allows you to save the current aircraft list. By default, it will be put in the LIST subdirectory with an extension of ".LST," but the file dialogue lets you save the file with a different name in a different directory.

Highlight Latest — If this option is checked, the latest entry in the Aircraft List will be highlighted. This causes the list to reposition itself so the latest entry is always visible — which can be annoying if you are trying to read it! Ctrl+H is a shortcut for this option.

Only List Alerts — If this option is checked, aircraft will only be shown in the Aircraft List if a message is received from them which contains an alert text.

Colors Submenu — This submenu has options for setting text color and background in the Aircraft List window.

Sort Order — This submenu has options for specifying the order in which the aircraft in the list are sorted.

Air Master 2000 supports Windows Dynamic Data Exchange (DDE). This means that it can pass received data to other programs in real time and so acts as an ACARS receive "front end" for them. It also can output a selected registration number and flight number from the Aircraft List so that an external database can display information.

The Air Master is available directly from Lowe Electronics at \$125 plus shipping charges. It should be available soon from dealers nationwide. For more information, contact Lowe Electronics, Ltd., Chesterfield Road, Matlock, Derbyshire, DE4 5LE, UK. Phone +44 1629 580800 or Fax +44 1629 580020.

Users of the earlier Air Master DOS-based product can upgrade to Air Master 2000 for \$55. The same hardware interface is used and you will be supplied with a new program diskette and manual.

You can order the Air Master 2000 with a credit card by e-mail at <orders@lowe.demon.co.uk> or you may request additional information at <info@lowe.demon.co.uk>. Their Web page is found at the following URL: <<http://www.lowe.co.uk/index.html>>. ■

The Listening Post

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

News From Africa And How To Catch North Korea . . .

Government stations in each of the two Congos — Congo-Kinshasa (officially the Democratic Republic of) and Congo-Brazzaville (Republic of) — which face each other across the Congo River, have been making sporadic appearances lately as both countries deal with ongoing problems resulting from internal conflicts.

Radio Congo (or Radio Congo Liberte as it is now announcing itself) from Brazzaville is being heard occasionally on **5985**, although usually quite poorly. It's scheduled on this frequency from 0400 to 0700 and 1700 to 2130 (though heard recently until 2200). Also active on occasion is **4765** (your best chances are nearer to 0400 and 2130). Address: B.P. 2241, Brazzaville.

Across the river in Kinshasa, La Voix du Congo is a daytime target listed on **15245**, but is actually on **15244** and a fraction. Don't put too much faith in the listed 100 kW actually being true. It's probably considerably less than that. Currently, the best time to hunt for this one is between 1700 and 2000 UTC or later. The station doesn't appear to be in regular operation. The address is B.P. 3164, Kinshasa.

The Voice of Free China has been renamed Radio Taipei International. Next time you write to them use this new address: 55 Pei'an Road, Taipei 104, Taiwan, Republic of China.

You can now hear HCJB via England! The station is using transmitters of the BBC (which are, actually, now operated by a private company) as follows: 1700 to 1800 in Uzbek and Tajik on **7175**; 1800 to 1900 in Russian and Ukrainian on **6150**; and 2100 to 2200 in Arabic on **6090**.

WHRA, the newest of LeSea Broadcasting's shortwave outlets has this (somewhat tentative) initial schedule: 0300 to 0500 on **7465**; 0500 to 0800 on **9400**; 1800 to 2000 on **17655**; 2000 to 2200 on **15460** and 2200 to 0000 on **13760**. The first segment is broadcast to the Middle East; all the rest are beamed at Africa.

The Swiss are pulling the switch on two of their transmitter sites. The old, almost



Radio Tirana sent this QSL for a 1996 reception on 7160.

historic site at Schwarzenburg has been closed for environmental reasons, and Lenk will be shut down later this year. The powerhouse installation at Sottens will remain active. Transmissions formerly carried by the two silent sites will be aired via German sites.

Not many of our readers report logging Cyprus. Other than carrying BBC programs, the BBC Cyprus relay also carries programs of the Cyprus Broadcasting Corporation. These are aired in Greek on Fridays, Saturdays, and Sundays from 2215 to 2245 on **6180, 7105 and 9760** and are intended for Cypriots living in the United Kingdom.

Various sources are noting a reduction in broadcasts from Radio Pyongyang, involving both the length of the schedule and the strength of the signals. The assumption is that precious wattage is being diverted to the government's efforts to jam international broadcasters carrying Korean language programming. But one has to wonder how many people have electricity to operate radios, or can afford — or find — batteries for them. If you'd like to keep an ear on the plight of

Pyongyang, try their English to North America schedule (one of many target areas they try to reach) scheduled at 1800 to 1900 and 2100 to 2200 on **11700 and 13760** and 2300 to 0000 on **11335, 11700, 13760 and 15130**. Mornings are actually the best, but they don't see fit to beam to us during that period. Other frequencies in use at various times, carrying various languages, are **3250, 3560, 4405, 6070, 6125, 6575, 7200, 7580, 9345, 9640, 9975, 11680, 11735, 11740, 11845, 13650, 15180, 15230, 15340, and 17735**. Remember that we always welcome your informational input. Log reports should be listed by country, double spaced between items, and tagged with your last name and state abbreviation. Besides your loggings, we're always in need of such things as info about station address changes or QSL policies, photographs of shortwave stations or personalities, photos of you and your shack (or, if you're the shy type, of just your shack), spare/sample QSL cards, station brochures, schedules and any other informative or illustrative items you care to send. Thanks so much for your continued interest and support!

Here are this month's logs. All times are in UTC, which is five hours ahead of EST, i.e. 0000 UTC equals 7 p.m. EST, 6



Two staffers at RAE, Argentina. Seated (we believe) is the director, Perla Damuri, with Silvana Licciardi. (Thanks: Brian Webb)

조선민주주의인민공화국라디오 및 텔레비전방송위원회

The Radio-Television Broadcasting Committee of the D.P.R. of Korea
Le Comité de Radiodiffusion-Télévision de la R.P.D. de Corée

Dear sir,

We thank you very much for your reception report.

We believe that you will regularly listen to our Radio Pyongyang English Service in the future, too, and send us your detailed opinions and impressions on it.

We are sure that this will help towards the work of our Radio Pyongyang.

Waiting for your reply, we wish you a success in your work and happiness in your future life.

Yours sincerely,

English Service Section
Radio Pyongyang, DPRK

In addition to all its other problems, Radio Pyongyang needs to be more politically correct in its use of gender! (Thanks

Jill Dybka)

Yet another of the dozens of colorful QSL cards issued by Radio Japan.



"Transmitter row" at the Caribbean relay station on Antigua which relays BBC and DW programming.

p.m. CST, 5 p.m. MST and 4 p.m. PST. Double capital letters are language abbreviations (FF = French, AA = Arabic, SS = Spanish, etc.). If no language abbreviation is included, the broadcast is assumed to have been in English.

ANGOLA — VORGAN, 6220 at 2025 to 2102 off with Afro and Euro-pops. PP talk, echo announcements, VORGAN ID. Off with instrumental anthem. Also 9770.01 heard at

0452 with instrumental and choral anthems. PP talk, echo announcements and VORGAN ID at 0500. (Alexander, PA). (Welcome, Brian! — Editor).

ANTIGUA — BBC relay, 5975 heard at 2109. (Harris, TN) 0000 with "Newsdesk." (Jeffery, NY)

ASCENSION ISLAND — BBC relay, 11835 at 2257. (Harris, TN) 15400 at 1918, 17830 heard at 2019 to Africa. (Jeffery, NY) VOA via Ascension, 17755 at 2019 to Africa. (Jeffery, NY)

AUSTRALIA — Radio Australia, 6020 (presumed to Pacific and WCNA) //6080 to East Asia and //11660 to SE Asia from 1300 to past 1445. (Silvi, OH) 9415 at 1524. (Miller, WA) 9580 at 1350 with music program from National Radio. Off suddenly at 1358. (Jeffery, NY)

AUSTRIA — Radio Austria Int'l via Canada, 6015 at 0640 with program on industry in Austria. (Harris, TN)

BOLIVIA — Radio Eco, 4409.4 at 2310 in SS with Andean flute and drum. ID by man at 2322. (Rausch, NJ) Radio San Miguel, 4923.68v presumed, 0230 to 0300. Too weak to catch ID. SS talk and ballads. Gone at 0309 re-check. Varying between 4923.6 and 4923.8. Presumed to be the one down from their nominal 4926 area, with their usual trademark wobbly carrier. Not usually heard this low in frequency. (Alexander, PA)

BOTSWANA — Voice of America relay, 7340 heard at 0346 with "Studio 38," ID, news. (Jeffery, NY)

BRAZIL — Radio Liberal, 4775 at 0350 in PP with sambas, Brazil pops, canned IDs at 0353 and 0357. (Rausch, NJ) 0714 in presumed PP.

Music and female announcer, announcements by a man, more music. Poor. (Jeffery, NY) Radio Nacional Amazonas, 11780 in PP at 2309. (Harris, TN) Radio Clube do Para, Belem, 4885 in PP at 0256 with pops. (Miller, WA) Radio Bandeirantes, Sao Paulo, 11925 at 2323 in PP with sports news. (Miller, WA) Radio Gaucha, Porto Alegre, 11915 at 2315 with talk show in PP. (Miller, WA)

BULGARIA — Radio Bulgaria, 7170 at 0134 in Slavic language with folk music. Also 7375 at 0014 with news. (Casses, PA)

CAMEROON — CRTV, Yaounde, 4850 at 2120 to 2359 close, with Afro-pops, FF announcements, local folk music. Off with national anthem. Strong carrier but weak modulation. (Alexander, PA)

CANADA — Radio Canada Int'l, 9640 at 1430 and 13650 at 1759 with IS and sign on announcement. (Wilden, IN) 9805 at 2134. (Harris, TN) 11945 at 2151 with "Mailbag."

(Miller, WA) CFRX relaying CFRB, Toronto, 6070 at 1529 with talk show about whether CFRB is fair in its talk show coverage of current events and the way it treats callers. (Jeffery, NY) 2143. (Harris, TN) BBC Sackville relay, 9515 at 1300 with "Newshour." (Jeffery, NY)

CHAD — Radiodiffusion Nationale Tchadienne, 4905 at 0534 with news sound bites and music "bumpers" in between, all in FF. Numerous IDs. (Dybka, TN)

CHINA — Xinjiang People's Broadcasting Station, Urumqi, 4974 at 1340 with EE lesson. (Miller, WA) China Radio Int'l, 6950 at 1205. (Silvi, OH) 1235 to 1256 sign off with EE news features. Parallel weaker 7385//9715//11660. (Alexander, PA) 2201 in

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



This Radio Beijing QSL was issued in 1990.

presumed CC with news read by a woman. (Jeffery, NY)

CONGO (Kinshasa) — La Voix du Congo, **15244.45** in FF at 1830 with patriotic songs about Mobutu and ID at 1900. (Rausch, NJ)
CONGO (Brazzaville) — Radio Congo Liberte, **5985** in FF from 2105 to 2200 close. hi-life music, talks by woman, speech by man about the reconstruction of Brazzaville and the nation. Mention of Mobutu, ID, anthem and off. (Rausch, NJ)

COSTA RICA — RFPI, **7385** at 0351 and **15050** at 2017. (Jeffery, NY) Radio Mundial Adventista (AWR Costa Rica) **9725** at 0458 with religious program. (Miller, WA) Faro del Caribe, **5055** at 0238 with pops. (Miller, WA) (*Presumed in SS. — Editor*)

COLOMBIA - Caracol Colombia, **5077** at 1413 in SS. (Miller, WA)

CROATIA — Croatian Radio, new **5840** at 0200 to 0207 with EE news, ID, into Croatian and local folk music. Parallel **6120** fair. EE also aired at 0300-0305. (Alexander, PA) **6120** at 0206 with news. (Casses, PA)

CUBA — Radio Havana Cuba, **6000** at 02138 and 0246. **9820** at 0201. (Casses, PA) 6000 at 0320 with letters. (Wilden, IN) 0323 with news feature and 9820 at 0333. (Jeffery, NY) **9830 USB** at 2216. (Harris, TN) Radio Rebelde, **5030** at 0100 in SS. (Wilden, IN)

CZECH REPUBLIC — Radio Prague, **5930** at 0018 with history piece, classical music. (Casses, PA)

DOMINICAN REPUBLIC — Radio Amanecer, **6025.03** heard at 0045 in SS with light instrumental music. They put a harmonic (2x 1570) on **3139.95** so beware of this if you are looking for Madagascar on **3140**. (Alexander, PA)

ECUADOR — HCJB, **9745** at 0422 and **15140** in SS at 1752. (Harris, TN) **9745** at 0209 in EE, 15140 in SS at 2204 and **15550** in AA at 2122. (Jeffery, NY) Radio Quito, **4920** with pops at 0248, SS. (Miller, WA) Radio Federacion, Sucua, **4860.03** at 1105

with unknown vocal anthem, repetitive melody on harp-type instrument, chants, talk in local language, generic SS pops. (Alexander, PA) La Voz del Upano, Macas, **4870.02** at 0100 to 0142 sign off. Mostly continuous SS talks by man and woman. Brief breaks of Ecuadorian music. Off with national anthem. Weak. Irregular. Also heard tentatively in SS with religious recitations on **5040.05** at 2230, Ecuadorian style music, children's chorus, plus some unusual sounding music similar to what is heard on Radio Federacion. (Alexander, PA) Radio Luz y Vida, Loja, **4850.61** at 0115 to 0129 sign off with SS announcements, ballads and Ecuadorian music. ID. Clean audio on this occasion but was distorted for several weeks previous. (Alexander, PA) Radio Nacional Progreso, Loja, **5060.19** at 0350 to 0500 close with Ecuadorian folk music, SS ballads, commercials, echo announcements, IDs. Irregular. (Alexander, PA)

EGYPT — Radio Cairo, **9900** in AA at 2208 with call to prayer. (Miller, WA)

ENGLAND — Radio Korea Int'l, via Skelton, **3970** from 2115 to 2230 close, talks in unidentified language. Beware of this one when looking for Cameroon or Nigeria, both on **3970**. (Alexander, PA) Radio Canada Int'l relay, **6050** in FF at 0648 with sports news. (Harris, TN) BBC, **15220** heard at 1310 with news hour. (*via WYFR — Editor*) and **15565** at 1400. (Wilden, IN)

EQUATORIAL GUINEA — Radio Africa, **15186.2v**, 2030 to 2259 sign off with religious programs in EE. Strong but muffled audio. (Alexander, PA)

FINLAND — Radio Finland Int'l, **11755** at 1258 with discussion. (Miller, WA)

FRANCE — Radio France Int'l, **7740** at 0057 to past 0205 with IS, FF programs, ID, news at 0100. Spur or new frequency? **Parallel 5920 and 9800**. (Alexander, PA) **9790** at 2226. Off air and returned twice. (Harris, TN) **11615** at 1654. (Miller, WA)

FRENCH GUIANA — China Radio Int'l relay, **9730** at 0400 with ID, world news and news about China. (Jeffery, NY)

GABON — Africa Number One, **9580** at 1846 in FF with news. (Miller, WA)

GEORGIA REP. — Georgian Radio, tentative, **5040** at 0100 to 0320, with talk in uniden-

tified language, light instrumental music, choral and religious music, gongs at 0145. Some music with a Mid-East flare. Very tentative and irregular. Possibly only on the air on UTC Sundays. (Alexander, PA)

GERMANY — Deutsche Welle, **6070** at 0335 in GG. (Wilden, IN)

GREECE — Voice of Greece, **5840** at 0244. (Miller, WA) New **12105** at 1325 to 1351 close. Greek music, EE news at 1335-1348, back into Greek. **Parallel 15175 and 15630**. (Alexander, PA)

GUAM — Trans World Radio, KTWR, **9430** heard at 15145 with religious broadcast. (Miller, WA)

GUATEMALA — Radio Tezulutlan, Coban, **4835** at 0226 in SS. (Miller, WA)

GUYANA — Voice of Guyana/GBC, **3290** at 0510 with "Alexander's Ragtime Band." Good but ute QRM. (Dybka, TN) **5949.42** at 0805 to 0930 with local religious music, Hindi vocals, promos, time checks, commercials, U.S. pops. Heard only after WYFR sign off at 0800. Also presumed them at 0640 and 2130 on **5950.51** with adjacent channel splatter. No longer hearing them on **3290**. (Alexander, PA)

HONDURAS — La Voz Evangelica, **4820** at 0252 with religious programs. (Miller, WA)

INDIA — All India Radio, Aizwal, **5050** at 1323 with popular music. AIR **7410** with EE to Northern Europe from 1830 to 1945 when switched to another language. (Miller, WA)

INDONESIA — Radio Republik Indonesia, **9565** at 1459 in II with announcement, IS and sign off. (Miller, WA) **11755** at 1045 with local pops, talk in Indonesian, Song of the Coconut Islands at 1058. Fair but mixing with China. // **9565**. (Alexander, PA)

IRAN — Voice of the Islamic Republic of Iran, on new **6055 (ex-6050)** at 0030 sign on to 0128 close with IS, opening announcements in EE, sked, Koran, news, commentary, local music. Weak under Spain. // **9022 and 9685**. (Alexander, PA)

IRAQ — Radio Iraq Int'l, **11787** at 1122. AA talk, many mentions of Iraq and Baghdad. Good, clean audio for a change. EE heard at 2132 on **11785** but distorted audio. (Alexander, PA)

ISRAEL — Kol Israel, **7465** heard at 0505 with news. Also, presumed Kol Israel, **15485** at 2129 in presumed AA. No ID. Off at 2200. (Jeffery, NY)

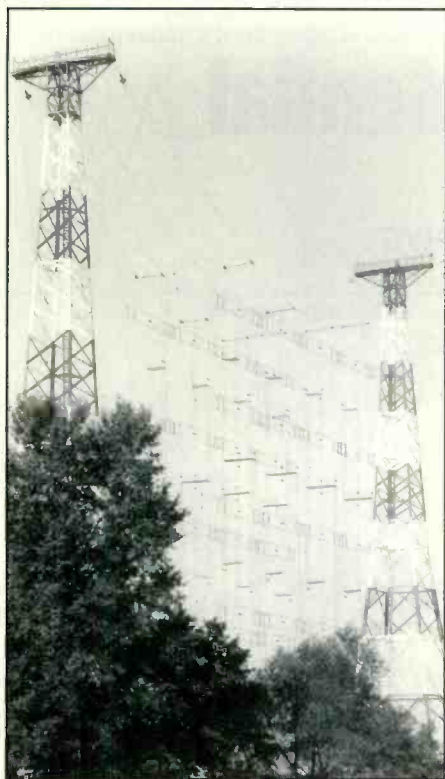
JAPAN — NHK Radio Japan, **9535** at 1503 and **9835** at 0500. (Miller, WA)

KUWAIT — Radio Kuwait, **9855** at 2214 in AA. (Harris, TN) 2206 with AA music. (Miller, WA)

LITHUANIA — Radio Vilnius, via Germany, **5885/5905** but 5885 drifted to **5883**, 0030 to 0059 with EE to North America. Severe ute QRM on **5905**. (Silvi, OH) 5905 at 0032 with world and local news. (Casses, PA)

MADAGASCAR — Radio Netherlands, **9860** at 0234 with news, "Newline." (Jeffery, NY) Here and // **11660** at 0030 to 0125 to South Asia. (Silvi, OH)

MALAYSIA — Radio Malaysia, Sarawak, **5005** at 1319 with pop music. (Miller, WA)



These impressive antennas belong to Radio Austria International.

The Amazing Blue Lagoon



The "Blue Lagoon" pictured on this INBS (Iceland) QSL is near Keflavik International Airport.

MEXICO — Radio Mexico Int'l, **9705** at 2226 in SS. (Harris, TN) 0100 with folk music. (Miller, WA)

NETHERLANDS — Radio Netherlands, **9895** at 1903. (Jeffery, NY)

NETHERLANDS ANTILLES — Radio Netherlands via Bonaire, **6165** at 0503. (Miller, WA) **15315** at 1939. (Jeffery, NJ)

NIGERIA — Voice of Nigeria, **7255** at 2241. (Miller, WA)

NEW ZEALAND — Radio New Zealand Int'l, **9810** at 1651 with IS and ID "This is the Pacific Service of Radio New Zealand International." (Miller, WA)

PAPUA NEW GUINEA — NBC Port Moresby, **4890** at 1318 with commercials, music. (Miller, WA)

PERU — Radio La Hora, Cusco, **4855.5** at

2250 in SS with kids choir, time check, ID and long string of comunicados. (Rausch, NJ) Radio Quillabamba, Quillabamba, **5025** at 1025 with SS announcements, folk music. Poor and mixing with Radio Rebelde. (Alexander, PA) Radio Ilucan, **5629.82**, 1008 with SS announcements, Peruvian folk music, IDs. (Alexander, PA) Radio Union, Lima, **6115** at 0150 in SS with Peruvian pops. (Miller, WA) Radio Chota, Chota, presumed, in SS at 1206 with continuous South American music. Lost at 1210. (Jeffery, NY)

PHILIPPINES — FEBC, **9875** at 2241 with music. (Miller, WA)

RUSSIA — Voice of Russia World Service, **5940** at 2159 with IS, ID and news. (Jeffery, NY) 2251 with program about the future of Russia. (Harris, TN) **9580** at 0211 with news. (Miller, WA)

RWANDA — Deutsche Welle via Kigali, **6015/9565** with EE/GG lesson, ID 0443 and woman with frequencies for Africa. Off at 0450. (Dybka, TN) **11785** at 2244. (Harris, TN) 11810 at 1825. (Miller, WA)

SAO TOME - Voice of America relay, **4950** heard at 2040 with Afro pops, health and welfare messages, ID and sign off at 2100. (Alexander, PA)

SEYCHELLES — Far East Broadcasting Assn., **9810** at 1702 with IS. (Miller, WA)

SLOVAKIA — Radio Slovakia Int'l, **5930** at 0057 with IS, ID, time and frequency info and sudden interference from WWC-**5935** at 0102. (Jeffery, NY)

SOUTH AFRICA — Trans World Radio via Meyerton, **9510** at 1837 with children's chorus, prayers. (Miller, WA)

SOUTH KOREA — Radio Korea Int'l, **7285** at 1200. (Silvi, OH)

SPAIN — Radio Exterior de Espana, **9630** at 14500 with program info. (Wilden, IN) China Radio Int'l relay, **9690** at 0300 with ID, world news, news about China. (Jeffery, IN)

SWAZILAND — Trans World Radio, **4775** at 0400 with "This is Trans World Radio, Swaziland" and into program in GG. (Dybka, TN) **9600** at 1823 "You are tuned to the international voice of Trans World Radio" and into FF. (Miller, WA)

SWEDEN — Radio Sweden, **11650** at 1255. (Miller, WA)

SWITZERLAND — Swiss Radio Int'l, **7280** at 1429 and into Italian. **9905** at 0502 with news. (Miller, WA) **9885** at 2013, 9905 at 0117, **13635** at 1420. (Casses, PA)

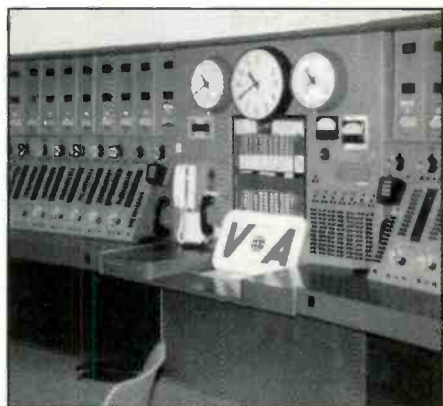
TAIWAN — Voice of Free China via WYFR, 9985 heard at 2215 with ID, "Music Box." (Jeffery, NY) (Now calls itself Radio Taipei Int'l. — Editor)

TANZANIA — Radio Tanzania-Zanzibar, **11734.1** at 1960 to 2000 close with local music, man and woman announcers, talk in language, anthem at 1959 and off. Thanks to Jay Novello for the tip. (Alexander, PA) Radio Tanzania, Dar-Es-Salaam, tentative, **5050.6** heard at 0258 to 0345 with Afro-folk music, Afro-pops. Talk in language. Weak. (Alexander, PA)

THAILAND — Radio Thailand, **9805** at 1236



One of the control room/studios at Swiss Radio International's headquarters in Berne.



This Voice of America master control now serves only as something for touring visitors to look at and, hopefully, be properly impressed by.

with regional and international news. (Wilden, IN) **11905** at 0047 with news. (Miller, WA)

UKRAINE — Radio Ukraine Int'l, **7150** at 2240, 0101. (Casses, PA)

UNITED ARAB EMIRATES — UAE Radio, Abu Dhabi, **7215** at 1249 in AA. (Miller, WA)

VATICAN — Vatican Radio, **7305** at 0313 with IS, into SS, off at 0315. (Wilden, IN) **11740** at 1257 with IS. (Miller, WA)

VENEZUELA — Radio Tachira, San Cristobal, **4830** at 0225 in SS with news. (Miller, WA) Ecos del Torbes, San Cristobal, **4980** in SS at 0231 with pops. (Miller, WA)

And now, a monster thank you to the following who did their part this month:

Paul Harris, Columbia, TN; Ed Rausch, Cedar Grove, NJ; Michael J. Miller, Issaquah, WA; Jill Dybka, Nashville, TN; Brian Alexander, Mechanicsburg, PA; John Casses, Johnstown, PA; Dave Jeffery, Niagara Falls, NY; Lee Silvi, Mentor, OH and Sue Wilden, Columbus, IN. Thanks to each of you!

Until next month, good listening! ■

Communications Confidential

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

All The News That's Fit To Be News . . .

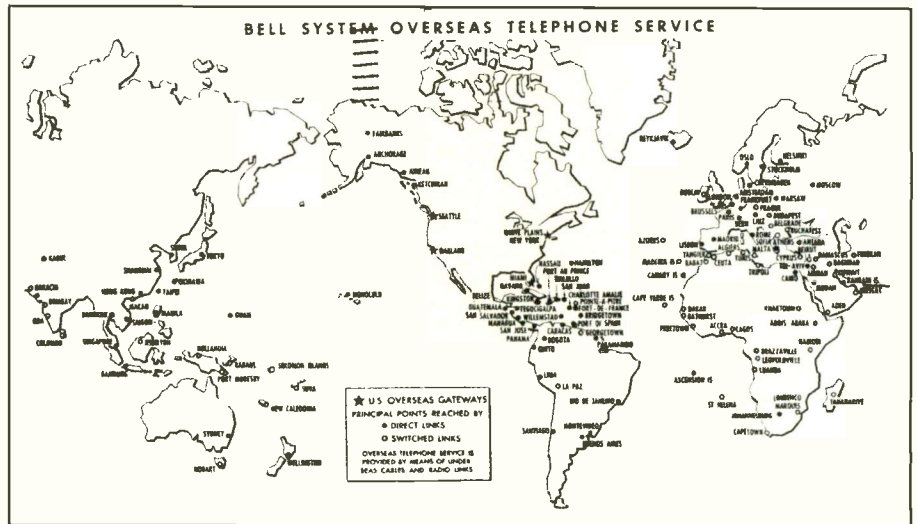
We have a lot of news and information to pass on this month, so I thought we would just jump in with it. First, several new offerings for ute fans have come out. Klingenfuss Publications has released several updated titles. The *1998 Guide to Utility Radio Stations* (16th Edition); *1998 Shortwave Frequency Guide* (2nd Edition); and their 1998 Super Frequency List CD-ROM are now available.

The *1998 Guide to Utility Radio Stations* is over 550 pages (softbound) sorted by frequency. It also has a section with stations sorted by country, a station call sign list, a Meteo station section with WEFAX schedules, a listing of NAVTEX stations, codes and times of broadcasts, and much more.

The *1998 Shortwave Frequency Guide* is also over 550 pages (softbound) and includes utility and broadcast stations as well as Clandestine stations. The CD-ROM contains three databases: Formerly Active Frequencies, Utility Stations, and Broadcast Stations. Each is completely searchable by mode, frequency, call sign, etc. Check for these updated publications anywhere where hobby publications are normally sold.

Also just out is The Cornet Project CD-ROM. This is a four-CD-ROM collection of shortwave numbers station broadcasts from Irdial Discs, England. If you aren't sure what the Swedish Rhapsody sounds like, or would like to hear what the Lincolnshire Poacher sounds like, they are all here. Although aligned towards the European-based ENIGMA club format/classifications, fortunately they also included the "known also as" names of the stations in most cases to permit use by non-ENIGMA members. For further information write: Irdial Discs, P.O. Box 424, London, SW3 5DY, England, or by e-mail at <irdial@irdialsys.win-uk.net>.

Speaking of Spooks, Chris Smolinski has released a Macintosh shareware program called MultiMode. It presently decodes CW, RTTY, SITOP, WEFAX, ACARS, DTMF, and WWVB time codes. The URL to download a copy is: <<http://www.access.digex.net/~cps/sss1>



Back side of Bell QSL card showing station locations.

4.html>. MultiMode allows you to de<None>code and display morse code, RTTY, fax, and many other modes on your Mac, without any extra hardware. The current version of MultiMode is 0.9.0, released on January 2, 1998. The program also has an audio spectrum display to aid in properly tuning in stations, and it features sophisticated digital filters for pulling weak signals out of the noise. MultiMode requires a color Macintosh with sound input. A model with a PowerPC (PPC) processor is highly recommended, although several modes can be decoded with reasonably fast models using the 68040 processor. You also need a radio capable of tuning in the frequency ranges of interest. You can contact Chris by e-mail at his site listed above with any questions or for more information.

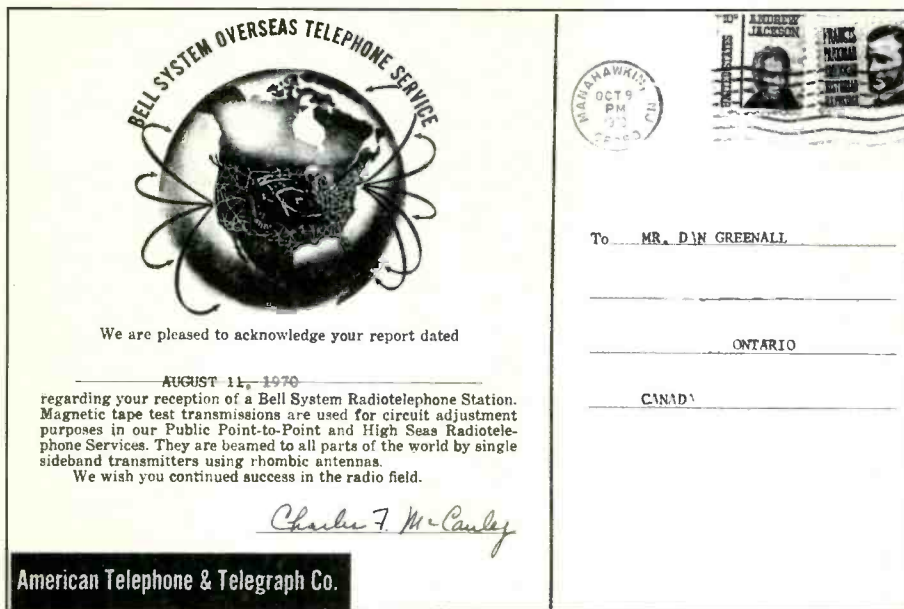
The National Institute of Standards and Technology has announced they have more than doubled the power of station WWVB, near Fort Collins, Colorado, which has operated at 10000 watts for more than 30 years. It has now been boosted to 23000 watts, and plans call for an increase to between 40000 and 50000 watts. The current upgrade made use of spare radio transmitters and other components provided by the U.S. Navy.

Longtime coastal station FFL, St. Lys Radio, France, has closed the doors as of January 16, 1998, ending a long period of maritime radio history. I'll certainly miss their voice marker, which was almost a nightly visitor into Ohio.

Reader Mail

Sue Wilden (IN) reports a new TIS (Travelers Information Station) on line for those who are interested in DXing them. The Indiana Department of Highways, in conjunction with the Columbus (IN) Area Visitor's Center, has sent up a TIS at the Intersection of I-65 and U.S. 31 to provide travelers with information about the Columbus area. Traffic information is also posted, especially during the peak leaf weeks at Brown County State Park. Indiana State Police can interrupt the broadcast for emergency weather and/or traffic reports. It's on 540 kHz and has a range of 15 listed miles. Sue has heard test loops in the past at her house 10 miles away, but nothing more than "Indiana Department of Highways" over and over again. The station itself is a five-foot green cube.

Ken Alexander (Ontario, Canada) editor of Ontario DX Association's (ODXA)



QSL card from the collection of Dan Greenall, dated August 1970, was for a voice mirror in use by Bell System/AT&T Radiotelephone circuit, as discussed in the January column.

MW column "DX Ontario," checks in this month. Ken had operated the now closed ODXA BBS for years, which was one of the early places where you could find additional ute logs. Ken reports hearing his first ever "MAYDAY" call on the international distress frequency 2182.0 kHz recently (see the logs area).

Dan Greenall, also from Ontario and the FM/TV DX column editor for ODXA, checks in regarding the voice mirrors information from the January column. Dan collected many of these markers on tape and ended up with a pretty good assortment. Dan is going to try to get some of these to me and we'll make arrangements to pass them along somehow. Dan also has a number of QSL cards from voice mirrors, the Bell System/AT&T Radiotelephone card pictured was for the service heard by Mike Scott a few issues back. Dan uses a Panasonic RF-3100 portable and a 100-foot longwire (random wire). Thanks to both Ken and Dan for their efforts with ODXA.

Gary Van Sant (OR) uses a Sangean ATS-909A along with a 40-foot longwire antenna inductively coupled to the receiver. He also uses a Kenwood R-5000, and a Sangean ATS-803A, but the 909 is his favorite. His listening includes numbers stations, civil aero and sometimes Russian fishing fleet ops and marine radio-telephone calls from/to Murmansk and Nikolaev.

Alan Gale (UK) checks in with his usual great information from his part of

the world. Alan reports that the UK Coastguard plans on giving four stations the axe and merging two others. Again, a new high-tech comms system and "remoting" appear to be the reason. The coasties "for the chop" are Liverpool Coastguard, Oban Coastguard (Argyleshire, Scotland), Pentland Coastguard (Orkney) and Tyne Coastguard (Northeast England). Stations to be merged are Lee-on-Solent and Portland. Alan suggests that anyone who hasn't got these stations verified should keep a lookout for them on 2182 or 2596 kHz.

Some other UK Coastguard stations also use 2226 kHz for weather reports to fishing vessels and storm warnings during bad weather. Sadly, a winchman from the Shetland Coastguard helo was killed while helping to rescue a stricken crewman from a distressed ship recently. Alan also reports that the big news there was the close down of the UK Coastal Radio service CW operations on the 31st of December. Alan was able to catch all of this on tape and was able to get down a good list of stations which called in for a final QSO, too. He has already received a QSL from one of the stations endorsed with "Final CW Broadcast" on it and promises to forward a copy soon. He also received a phone call from the operator at Land's End Radio, who told Alan they'd filmed the event, and that a video would be available soon. I agree it was a sad moment indeed, and one that looks like-

ly to be repeated often over the next 12 months or so.

Finally, Alan reports that since Kinloss became the sole UK SAR station, they have called all stations every afternoon and told them that if QRM (jamming) is present on 5680.0 kHz, they should use 4718.0 kHz. SAR fans should keep an ear open on this channel for evening/night activity. Also, 8971.0 kHz has been reported as being used while the jamming of 5680 reported by Alan a few months back continues.

Nolan Tucker reports being stationary "for now" in Oregon. In regards to the 6683-kHz log in the January column Nolan reports the term "DV2 plus 7" is a passenger list: DV2s are Distinguished Visitors, plus 7 non-VIPs.

Thanks for the info and the reminder Nolan. The Distinguished Visitor codes are as follows: DV-1, President or head of state of foreign county; DV-2, Vice President, Prime Minister, Foreign Ambassador, Secretary of State or Defense, Speaker of the House, Chief of staff, General of Army, or Air Force, Commandant of the Marine Corps, Fleet Admiral, etc; DV-3, Under Secretary of Cabinet, Attorney General, Under Secretary of Army Navy and Air Force, etc.; DV-4, Lt. General, Vice Admiral and foreign Ambassador out of jurisdiction; DV-5, Major General and Rear Admiral (upper half); DV-6, Brigadier General, Rear Admiral (lower half), and Commodore; DV-7, Captain, USN or USCG, Colonel, USAF, Army or USMC, and comparable rank officer of friendly foreign nations.

David Wright (TX) and I maintain a list of aircraft tail numbers for U.S. Coast Guard aircraft, listing aircraft type and where it is based, for the WUN club. For quite awhile, one that had eluded updating was the HU-25A #2117. Dave discovered that in June, 1994, the 2117 was transferred to the Federal Aviation Administration's Airworthiness Assurance Nondestructive Inspection (NDI) Validation Center (FAA AANC), located at the Sandia National Laboratories in Albuquerque, New Mexico. This aircraft serves as a test-bed to develop new maintenance and inspection techniques for the USCG Aircraft Repair and Supply Center (ARSC). If you would like a free copy of this list, visit the WUN Web site at: <<http://www.gem.net/~berri/wun>> or drop me an SASE to my address, P.O. Box 4222, Youngstown, Ohio 44515-0222.

Dwight Simpson (WI) uses a Kenwood TS-430S, ICOM IC-706 and R71A, and

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)

End Radio, GLD (G) at 0023 close down msg followed by final QSOs w/EJM/EJK (IRL), EAF/EAO/EAS (E), GCC/GKR (G), VCM (CAN), SPE (POL), IAR (I), OST (BEL) (not all worked in that order, but grouped together to save space!). (AG)

1740: Texas? "IS1HT" beacon at 1331 in CW, strong. (AWH) Unid, "IS1HI," at 0202 in very raspy CW. (BF) (*poss a oil rig in the Gulf of Mexico—Ed.*)

2182: First MAYDAY ever hrd, Christmas night at 0235 from the M/V Aruba, call sign PJSL. They reported an engine room fire & were abandoning ship. 14 people on board. Coords were reported as 1 deg 13' North & 31 deg 20' West. Stations responding were CamsPac San Francisco, Commsta Kodiak, Halifax CG Radio, Land's End Radio, CG Cape May, NJ, Coast Guard San Juan, & a station ID'ing as LAUQ2. (KA) (*LAUQ2 is the Norwegian bulk carrier M/V Spar Jade—Ed.*) PINBALL wkg SLINGSHOT 12 at 0045 re poss smugglers landing at FL airstrip. a/c landed, could not get speed for takeoff, units directed by PINBALL to where smugglers were hiding to 0145. (RK) (*PINBALL calls are reportedly used by USCG RG-8/RU-38 surveillance a/c, which are pretty much powered gliders. SLINGSHOT is reportedly a USCG command in Miami—Ed.*) All stations were in USB mode.

2390: P3ZL5, m/v Batavier, at 0024 wkg/Heerenplein. PDXP, m/v Eemsdiep, at 0107 w/m/v Mercator. (AB)

2598: VOJ, CCG, Stephenville CG Rdo, NF 0709 w/scheduled marine bdst. VOM, CCG, St Anthony CG Rdo, NF, Canada 0753 w/gail warning ann. Both in USB. (Ed.)

2608.4: FUU, Toulon in 75/850 RTTY RY's at 0100. (FH)

2643.5: SPS, Witowo, Pol w/"DE SPS/TOR K" marker in CW at 2244. (DG)

2743: ULX, Mossad, Israel, hrd in USB heard at 2103. (TY)

2780.7: GND4, Stonehaven, Scotland, w/repeating call letter ID marker in CW heard at 2240. (DG)

2863: Tokyo VOLMET in USB mode heard at 1610. (DS)

2872: KVV 301 wkg Shanwick at 0610 in USB w/posrep, 51N20W, FL 410. (TO)

2932: Tokyo wkg CATHAY-89 in USB mode at 1607. Advised this freq primary, 6655 secondary. (DS)

3034: Unid Latin American military station, 1015 on w/CW net. Cuban-like format, but seemed to be accompanying voice net on 3035 LSB that sounded more Mexican. Latter more likely. (AWH)

3150: PCD, Mossad, Israel, hrd in USB heard at 2030. (TY)

3245: Cuban "Atencion" spook at 1510 in AM, SS w/5FG tfc in progress. (AWH)

3417: ART, Mossad, Israel, hrd in USB heard at 2130. (TY)

3455: Qantas-60 wkg Tokyo Radio at 1352 in USB, reporting posn VASKO (N25-00.0/E142-02.4), FL 310, est OMLET (N21-00.0/E142-59.4). (DS)

4025: OM/EE w/5FG's 0200 to 0300 in USB Sat/Sun, the word "bok" is used as a figure but is not a "0". (DJ)

4034: Unid at 0400 w/CW 5FG cut numbers. (CS)

4051: Southbound Net at 0200 to 0300 in USB w/various yachts, 1 acting as net control w/wx reports & contacts, use 4003 (up x 3) and 4024 for extended QSO's. Mention of Mex Navy on 5005.0 kHz USB, but nothing hrd there so far. (DJ)

4219: A9M, Hamalia Rdo at 0115 w/ARQ ready signal & CW ID along w/PPQ, & LZW & UDB2! (FH)

4270: PCD, Mossad, Israel, hrd in USB at 1500. (TY)

4295: HWN, Paris tuned at 0159 in 75/850 RTTY. (FH)

4325.8: Russian Navy, Ustinov at 2155 w/"R" Beacon ID. (AWH)

4420: Jamming over Royal Navy UKMACCS station and also 2 OM, u/i language using speech inversion scrambling heard at 0331 in USB. (RK)

4466: FDI8, un'ID Air, France, w/VVV marker in CW at 2210. (DG) (*FAF, Nice—Ed.*)

4470: "Counting Station" spook, at 1520 in USB, YL/EE w/3+2FGs, //5046. (AWH)

4515: FDG, Bordeaux Air, France w/VVV marker in CW at 2123. (DG)

4665: YL/EE Mossad repeating "Victor Lima Bravo Two" heard at 2117 seemingly in AM mode. (DG)

4666: Tokyo Radio wkg various flts operating in the Central West Pacific area in USB mode from 0900-0927. (DS)

4724: USAF Offutt GHFS in USB mode at 1919 w/EAM traffic. "... I say again ... KTQJ2RQE5TW2XVQTEIR Offutt, out." //6379, but a bit weaker up there. (DS)

4739: A3J, unid prob USN asset heard at 0231 in USB clg SPANGLE 71 FOXTROT (P-3C) no joy here. This is USN Safety of Flight alternate. (Ed.)

4780: KPA2, Mossad, Israel, hrd in USB at 1515. (TY)

4786.5: Unid military tactical at 1550 in USB w/EWC clg DEUCE, noresp. (AWH)

4856.3: YL/Korean passing intermittent, ran-

dom number groups in AM at 0837. (DS)
4880: YL/EE in USB mode at 2017 w/SLG's voiced in NATO phonetics. Heard on other occasions this freq at 1808, 1942. Previously noted as MOSSAD "ULX" channel. (DS)

5000: Time signal stn WWV in AM. (CB)

5135: Cuban on early w/a few numbers at 0050 in a.m., then stopped, then started at 0100 w/Atencion 96602 03061 06421, 3 finals. (CS)

5136: Spook stn hereby christened "Der Kleine Korpral," OM/EE w/strange Euro-accent 0525 rptng "315 315 315 000 000". Also noted earlier same day at 1330 on 13360 for 325. (AWH)

5184.3: YL/Korean passing intermittent, random number groups in AM mode at 0859. Quiet after a couple of sets of 3-digit groups at 0900. (DS)

5230: MIW2, Mossad, Israel, hrd in USB at 1715. (TY)

5295: CLP32, unid Cuban Embassy, w/hand sent VVV & clg CLP1 in CW at 0332. (DG)

5305.4: Unid, French Polynesia? at 0945 in ARQ-E 72/115 to 1230 lost synch. (FH)

5320: Man repeating 3-1-4 over and over at 2015. S7 here. (TB)

5422: "Lincolnshire Poacher" numbers broadcast kicks off in USB mode at 1806 with "LR" jingle followed by YL repeating "04046." Noted //6485 at 1807. (DS)

5440: Cuban "6589 type" net at 1400 on w/control station RAZ staying on continuously while others use the frequency. RAZ clg WST. 1416 WST came up w/posn report as "21 55 | Norte, 84 05 | Oeste, al frente Cabo Frances" which is in the water, so WST presumably a vsl of some sort. Cabo Frances is southwest of Pinar del Rio city on the south coast. The location is inside aero danger area MUD50 (surface to FL 450) on WAC CJ-26, if that means anything. 9756 ROMANO clg WST, noresp. At 1723 RAZ clg WST, noresp. (AWH)

5447.9: Unid at 1023 in ARQ-M2 128.5/115, off 1027, RFHMMGW Mururoa reported here. (FH) (*reportedly a Mururoa return link, these 128.5 baud stms tend to be associated with the Mururoa test site—Ed.*)

5468.9: RFHWWCOM Papeete in ARQ-M2 128.5/115 idle tuned at 1025. (FH) (*link to Mururoa—Ed.*)

5535: Speedbird 6711 at 0010 in USB wkg Speedbird London for actual wx for UGEE, selcal BR-AP. (TO)

5541: Air France 095 at 0455 in USB w/pp thru Stockholm to Air France Operations-patch was in FF. (TB)

5544: Unid a/c "310" at 2034 in USB getting assorted wx from "Dispatcher," gave minimum overhead Nairobi of 250. (TB)

5568: Russia? at 0535 in USB, weak tx w/multiple RS pp's. (AWH)

5628: Cathay-888 w/posn report in USB mode at 1303 to Honolulu Radio, a/c reported 1302 posn 44N 170W, FL 370, estimating 45N 160W at 1349, next 46N 150W. (DS)

5643: United 862 at 0943 in USB wkg San Francisco w/selcal check FG-LP. (TO)

5655: Manila w/unanswered calls to

- Singapore-998 in USB mode at 1711. (DS)
- 5667:** All Nippon 006 at 1114 in USB w/kg San Francisco w/ARP 39N170E F330. (TO)
- 5670:** Lumpur Radio w/kg Singapore-322 in USB mode at 1729. (DS)
- 5673:** Presumed Beijing VOLMET in USB mode from 1528-1530; strong & over modulated w/YL computer voice. Weaker station came on at 1531, probably Guangzhou. (DS)
- 5680:** At 1542 SMG01 in r/check with Kinloss Rescue (G). 1514 Shanwick (IRL) asking Kinloss to QSP message to Rescue 11 and ask him to call them on 8879. At 1116 Rescue 11, Rescue 140, Rescue 141, Rescue 177 w/kg Kinloss, searching Irish Sea for missing yachtsman who had called on a cellular phone saying that he was sinking. This turned out to have been a hoax, and a/c were stood down at 1340. (AG)
- 5686.5:** Poss non-military, 1339 to 1509 in USB, RL Base, RL1, RL2 & RL5 running some sort of radio or computer tests, mentioned LST5C & CPS system, one a/c was said to be on the ground at "Drum" (Ft. Drum, NY?). also mentioned sending info to several USAF generals. (AS)
- 5692:** At 1445 YIE w/pp to Miami ops thru CAMSLANT in USB re a vsl near 28N 65W, passed info to Miami ops who adv them to RTB. (DS2)
- 5693:** NOI, AirSta Detroit, Mi, USA at 1740 in USB w/kg CG 6585 who reports en route to Detroit River light. Ltr w/kg 6596 w/lt ops. (Ed.)
- 5696:** At 2136, CG 6009 w/kg CAMSLANT Chesapeake, 6009 rescued a 61 year old male & gave posn report. Req CAMSLANT contact Public Relations and find out if they wanted video of rescue. (RM) Culdrose Ops at 2028 clg Rescue 11 w/no reply for 15 minutes. (TB) (*Royal Navy—Ed.*) REACH 232 at 0316 w/kg Kodiak COMSTA for rdo ck. (DW) STINGRAY 41, U.S. Customs a/c at 0315 w/USCG 12-CHARLIE, 33-CHARLIE, & 63-ALPHA w/kg PANTHER chasing a boat running dark thru the Caribbean, ltr report PIW's (Persons In Water) & afterwards inbound w/prisoners, interesting comms. (Ed.) All in USB mode.
- 5746:** Mexico, presumed Navy at 1235 in ARQ 100/400 online crypto; CW at 1238, voice on 5745 USB at 1305 w/radiogramas. All rather typical. (AWH) YL/EE in USB mode at 1937 passes 5FG's, each 2x. (DS) (*should be the Lincolnshire Poacher—Ed.*)
- 6485:** YL/EE in USB mode at 1938 passes 5FG's, each 2x //5746. (DS)
- 6532:** Air Mike 958 at 1045 w/kg San Francisco in USB w/ARP, dep Truk 1025/35 est Pohnpei 1139, selcal BK-GJ. (TO)
- 6535:** Air Afrique 9921 w/kg Dakar at 2253, reg. 9G-ADS, selcal DF-AM. VDA 9651 at 2257 w/kg Canarias, reports now maintaining FL 270, QSY 133.0. Both in USB. (TO)
- 6586:** Accra R. at 2318, t/c rpt to Abidjan re: RK102, both blasting in! Abidjan Radio at 2319, t/c rpt to this time to Accra w/revise est's. Tourjet 012 at 0012 w/kg New York, selcal check AP-DS. All in USB. (TO)
- 6617:** Russian VOLMET at 0523 in USB w/wx report. No idea of which one it was. (TB) (*this is a NCA-VOL Russian Network A freq. w/Kiev, Ukraine at H+20—Ed.*)
- 6637:** FEDEX 056 at 0048 in USB w/pp thru Houston to Dispatch, re had been given a faulty flight plan while in Panama, when it had been corrected they had been given a new route & wanted to know why. Dispatch adv it was due to wx. (TB)
- 6640:** American 2115 at 0022 in USB w/kg New York ARINC. (DW)
- 6658:** KPA2, Mossad, Israel, hrd in USB at 1415. (TY)
- 6673:** Japanair 6081 at 1149 in USB w/kg San Francisco w/QSY at KANUA 135.2 YVR CTR, selcal GM-BH. (TO)
- 6683:** At 2255, SAM 60201 in USB w/pp to Andrews Base Operations for a parking spot via Andrews VIP, SAM 201's ETA at Andrews was 0130Z. Ck related URL's at: <<http://www.au.af.mil/au/database/projects/ay1996/acsc/96-004/hardware/docs/c20.htm>> & <<http://www.aon.af.mil/89cg/89thcgm.htm>>. (TT)
- 6691:** At 1618 PETTIBONE in USB passing coded msg for Command Center Senior Duty Officer to BOOMTOWN. BOOMTOWN advised time of delivery was 1619Z. PETTIBONE then advised they'd be monitor-only for 1.5 hrs. Ck URL <<http://www.tacamo.navy.mil/cscw-1/Default.html>>. (TT)
- 6692:** AAA3USA, U.S. Army MARS, Ft. Meade at 0055 in PACKET 300/200 w/kg AAA0USA, US Army Mars, Ft Lewis. (DW)
- 6739:** At 0642, 4ZY in USB w/pp to COMSUBGRUTEN (Commander Submarine Group Ten) at DSN 573 DSN via MacDill Global. Patch was for "Esteem Highly Alpha" ck w/Group 10 Communications Watch Officer (King's Bay, Georgia). TOR 0644Z. These EHA checks are nothing more than GHFS connectivity checks requested by senior staff aboard the sub, or by upper echelon via incoming message. Ck <<http://www.subasekb.navy.mil/csgpage.htm>> for related URL. (TT) Offutt in USB mode from 1533-1534 w/EAM traffic "for BANLON," //8968//11175//11244. Followed by at least two other stations who echoed message simultaneously; one of them was McClellan. All down at 1535. (DS)
- 6754:** At 0222 unid w/Metar reports for Canadian cities in USB, OM w/very pronounced Canadian accent & he spoke very fast, poss Edmondton? (SW) (*Trenton Military at this time—Ed.*)
- 6802:** SS/YL Counting Station at 0300 in AM, msg to "622," both weak //8418. (CS)
- 6815.6:** At 1837 HOTEL 3 JULIETT in USB clg FOXTROT 6 GULF. (MF) (*USCG—Ed.*)
- 6850:** North Korean Embassy, Cuba at 0216 in RTTY 50/1050, w/5FG crypto t/c. (AWH) UNID Pacific Island TELECOM at 0445 in USB, 2 OMs in Pacific Island Language. (IJ)
- 6851:** Unid heard at 0400 w/CW 5FG cut numbers. (CS)
- 6863.5:** Unid Russian TELECOM at 0805 in LSB w/OM in RR. (IJ)
- 6871:** HEP7, Interpol, Zurich, Switzerland, w/VVV marker in CW at 2110. (DG)
- 6959:** "Lincolnshire Poacher" broadcast signing on at 2001 w/YL repeating "92188" 10x, alternating w/12 repeats of the "LP" jingle played in electronic tones. At 2010, 3 sets of glockenspiel chimes, & into 5FG's, each 2x. Strong! Noted //9251 (weak jammer on it) at 2006 & //11545 at 2007. (DS)
- 6960:** Nicaragua, seeming government net, local late afternoons/early evenings in USB, EE talk about arrangements for delegates to some conference in Managua, SS also noted. Most stations vary around the freq. (AWH)
- 6975:** Female SS 5F digit by digit transmission starting before 1800 & ending at 1846 w/"finai?". Carrier down at 1846. (GVS)
- 6985:** Unid man in FF at 2020 in USB w/multiple lat/long posns, nothing listed here so assume a well-organized fishing fleet. (TB)
- 7000:** Cuban MINFAR CW net, 23 clg 36, others at 1300, cross-band operation, keying //6927. 6546 noted previously as return link for 6927. (AWH)
- 7002:** V-Russian Navy single letter HF CW marker at 1330. Haven't hrd this frequency for a long time. Where is the "V" station? (TY) (*reportedly Tashkent—Ed.*)
- 7484:** Cherry Ripe nbr stn hrd in USB at 1300. Also noted on 13866/11570kHz. (TY)
- 7547:** YL/EE in AM mode at 1325 w/3/2F grps. Strong. //10529. (DS)
- 7583:** Cuban Atencion stn in progress at 0028 in AM, 3 finals. (CS)
- 7612:** Caribbean-accented man heard at 1314 in USB giving lat/long posns of 7 vsl's in fleet, all were around Jamaica, assume fishing ops. (TB)
- 7646:** Possible Australian 4x4 Wheel Drive Club Station at 0845 in USB, 2 OMs w/chat about 4x4 vehicles, GPS, Radios, Satellite phones etc. (IJ)
- 7710:** MKK, RAF London, G at 1118 in RTTY 50bd RY, foxes. (AB)
- 7918:** YL/EE in USB mode at 1403 repeats, "YHF" in NATO phonetics, then announces two upcoming msgs, followed by 5LG's. Heard on another occasion at 1334. (DS)
- 8031.5:** NNN0COL, unid NAVMARCOR-MARS ship call (ID?) at 2321 in USB w/kg NNN0YNR w/pp t/c, rare use of this 8 mHz freq. (Ed.)
- 8122:** BAF36, Beijing Meteo at heard 1147 in FAX 120/576 w/chart. Weak w/fading. Royal Australian Navy, Canberra Control at 1142 in USB w/kg WARRNAMBOOL; HMAS Warrnambool, Fremantle-class Patrol Boat 204. IPSWICH: HMAS Ipswich, Fremantle-Class Patrol Boat 209 at 1148 w/kg DARWIN Control.
- 8125:** Unid OM/EE in heavily accented EE at 0915 in USB w/long litany of plain text msg t/c faintly-heard second stn. Very similar to t/c heard in Oct '91 on 8925 khz & in Sep '96 on 6908 khz. Ref's to "station commander," persons aboard vsls, & retirement orders; and reports of departures & arrivals of personnel. Called this a probable Philippines inter-island police net on previous occasions based on traf-

fic & place names referenced. (DS)

8157: Cuba, SVR "Russian Man" (actually EE woman), 1358 on testing w/tones, then "00000 00000 00000 00000 . . ." then "11111 11111 11111 . . .," working its way up the digits. (AWH)

8170: Portishead Radio at 0102 in USB wkg unid a/c w/wx for London-Gatwick (TB)

8176: SS/YL 5 digit # station at 0722 in AM (Sun). (PB) Darwin Radio at 1821 in USB w/traffic list & standing by for traffic, the time of this logging is what makes it interesting. (TB) (yes, for VA!—Ed.)

8186: SS 5 digit # station at 0222 in AM (Mon). (PB)

8258: Trinidad? 1545 on, long EE QSO between Hindi-trinidadjans about shipping stuff, engine parts, etc. (AWH)

8294: At 1410, HOPPER CONTROL wkg HOPPER 44, 56, 62, 73, 79 & PROUDEAGLE on "primary LCS net" w/military exercise, reference to points CCA, CCP, CDP & CPP, poss Sea Stallion's? (DJ) (close guess, HOPPER's are the USN's Landing Craft Air Cushioned (LCAC's) of Assault Unit 4 & 5—Ed.) Hibiscus 2 at 1213 wkg unid shore stn, requested sked at 6:45 local, told to adjust ETA for (Bell?) Pilot to 2400. (TB) Both in USB.

8297: WHU959 at 2000 in USB wkg M/T Epic who was requesting a pp, 959 didn't have Epic on subscriber list, adv they only handle vsls w/prior billing requests with & to try WLO. (TB)

8300: Presumed "New Star Radio Station #4" heard in AM mode variously at 0118, 0705, 1524. YL/CC w/4F grps passed 2X, tho' have also hrd her w/5F 2X. (DS)

8320: "Cherry Ripe" jingle (12x) in USB mode at 1206 alternates with YL/EE repeating "93724" (10x). At 1210, 3 pairs of glockenspiel chimes & into 5FG's, each 2x. At 1245, 3 more glockenspiel chimes, the "Cherry Ripe" jingle 6x. & down. (DS)

8433: 8PO, Bridgetown, Barbados ARQ ready & signing CW at 2148. (FH)

8435: 4XZ, Haifa Navy, Isr w/ID in CW @ 1800. (CH)

8435.5: OST, Oostende R. at 0328 in ARQ w/CW id and free idle. (DW)

8446.5: A9M Hamala Radio, Bahrain w/ID in CW @ 1803. (CH)

8461: PKR, Semarang, Indonesia, w/CQ marker in CW at 1333. (DG)

8465: CIO2, Mossad, Israel, hrd in USB at 1745. Also noted on 10352 kHz. (TY)

8492: P, Russian Navy Kaliningrad, RUS at 0859 in CW w/Channel marker. (AB)

8526: JMC4, Japan Meteorological Agency, Tokyo, w/VVV marker in CW at 1329. (DG)

8532: LZW42, Varna Radio, BUL at 0908 in CW w/Tfc list. (AB)

8541: UIW, Kaliningrad Radio, RUS at 0903 in RTTY 50bd, Tfc in Cyrillic. (AB)

8655: UAI3, Nakhodka, Russia w/VVV/CQ marker at 2031 in CW. (DG)

8700: 9AR, Rijeka Radio, HRV w/QSX 3/5/7 CH 3/4/7 K in CW @ 1723. (CH)

8705.5: PKC, Palembang, Indonesia, w/CQ marker in CW at 1216. (DG)

8855: Frenchline 502C wkg Piarco at 0810 in USB 10N48W. FL 330, selcal BL-EG. (TO)

8867: New Zealand 87 at 0933 wkg Auckland, descending from FL 245 into Norfolk Isl; heard at 0944 rptng on the ground at Norfolk Island. (TO)

8885: Unid fishing vessels in LSB at 0005 talking amongst ea other, lots of heavy duty complaining. (SW)

8894: At 0116 Tamanrasset Radio in USB wkg SR265 overhead Tamanrasset 0116; QSY 118.1. (TO)

8903: At 0017 Air France 6603 in USB wkg Lagos w/ARP, Windhoek-Ouagadougou, FL 390, est IRAVA at 0016, ONKOR next at 0043. (TO)

8906: Reach 7152 wkg New York at 1545, weak but readable being told to go to 129.9 primary & 13306 backup. Reach Gulf 3 called by Gander & NY centers, no reply at 1539. Both in USB. (HO)

8930: Stockholm Radio at 2345 in USB being called by "63" who was over Germany (TB)

8933: Cedar Rapids w/Connie 818 at 0610 for pp to Operations. (IJ) ROYAL 171 at 0352 w/pp through New York to Operations. Were told to report monitoring 6553 kHz. 171 told them that their antenna was broken & could only monitor & not talk. (TB)

8971: At 1254 BLUE STAR <<http://www.netspr.navy.mil/tscomm.html>> clg FALCON 01 & requesting their off-deck time. Response not heard, due to typical chaotic cacophony of stuck emitters on freq. Radio communication on this messy USN channel is the epitome of the Navy's recruitment pitch "It's not just a job, it is an adventure." (TT) At 1918 CARD-FILE 712 clg QUEBEC 6ROMEO & requesting they switch green. (MF)

8974: Air Force Sydney at 1150 in USB wkg unid a/c. (DW)

8983: 1515 thru 1930 in USB SAR comms involving rescue of 28 crew members from sinking freighter in Atlantic 270 miles east of FL. CG Rescue 1719 (C130) on scene commander. CG helo's 6033, 6039, 6010 (HH60's) used for hoisting crew from water. Air Force Rescue 833 (C130) & helo's 231, 232 (HH60's) on scene also. The 231 also hoisted crew from water. The 231 & 232 could be refueled from the 833 so were used towards the end of the hoist operation. Some comms on 5696 (CG) & 11181 (AF) also. (DS2)

9009.5: Unid "FDY" in CW at 0047 w/"VVV" marker. (RK) (French Air Force, Orleans, F—Ed.)

9016: REINDEER at 2023 in USB wkg NIGHTWATCH 01 w/authentications into net on Christmas Eve, who sez they have no sense of humor? (Ed.) At 2033 GLADIOLA confirming P175S211 w/NIGHTWATCH 01. (MF)

9035: Unid a/c "0035" at 2045 in USB in Cartagena wkg unid LDOC in SS, made patch through "Dispatcher." (TB)

9041: 5YE Nairobi METEO Kenya at 0430 in RTTY 100/850 w/RYRY, & CQ CQ. (IJ)

9120: CACTUS, Camp David Comms Center at 1646 in USB att. to work NIGHTHAWK

14, USMC Executive Flt Detachment-1 (HMX-1) helo, MCB Quantico, Va or Det.1, Anacostia, DC, no joy between the two. (Ed.)

9219: SS/YL Counting Station at 0200 in AM, msg to "185." (CS)

9274: YL/EE in AM mode at 1537 passes 3/2F groups. //8014. (DS)

9378.5: 3BZ, Plaisance Air, Mauritius at 1320 in ARQ-E3 48/850 w/msg from Plaisance to Antananarivo. (FH)

9397: SS/YL 5 digit # station (Thu) at 0602 in a.m. (PB)

9467: The Counting stn hrd in AM at 1200. Also noted on 10559 kHz. (TY)

9725: Presumed "New Star Radio Station #3"; YL/CC in AM mode at 0707 broadcasts msg addressees passed as numbered "units" (danwei) until 0710, then into 5FG's, ea 2x. Strong carrier, but weak modulation. (DS)

10075: At 1922, Biscayne Dispatch in USB w/pp for Biscayne 615 enrt KTUL. (MF)

10204: At 1931, NEWSCAST in USB clg NIGHTWATCH 01, nothing hrd. (MF)

10412: SA & 7B, Tongan Defence Forces, at 2030 in USB w/tfc in Tongan. (IJ)

10426: "Lincolnshire Poacher" sign-on in USB mode at 1502; YL/EE repeats "39441," then "LP" jingle. //7755. (DS)

10467.7: RFTPA, N'Djamena at 2216 in ARQ-E3 200/400, was ARQ-M2 200/400 Dec.95. (FH)

10532: Mossad CIO2 in AM at 2343 w/2 quick calls, a pause, and then going again at 2345. (CS)

11175: Prob USN a/c PW-470 w/unsuccesful calls to Yokota to pass modem traffic at 0430. (DS) HAWK 85 at 1600 w/MacDill re pp for wx at 1628Z. (HO) HOIST 27 (KC-10) at 2206 wkg Ascension GHFS w/pp Cherry Point op's. (RK) NAVY JA05 at 1442 w/pp thru Thule to Patrick Base Ops, JA05 was a "P-3 w/PPR," left Antigua w/ETA to Patrick of 1330 Local, need customs, agg & 25K of fuel, had 6 civilians & 16 crew on board. Then pp to CONUS Duty Officer at Patuxent River NAS reporting ETA Pax River of 1830 Local. (TB) All in USB mode.

11181: At 2129, CHALLENGE in USB radio-checking NIGHTWATCH <<http://www.mich.com/~ttyler/RADIO/NW.html>> in the clear, passing some ANDVT <<http://www.monmouth.army.mil/prj/bk97/dmm/34-27.html>> traffic, then switched to data mode. (TT)

11202: CG 1705 w/CAMSPAC at 0330 in USB w/pp to RCC regarding flying to Christmas Island to pickup a sick person. (IJ)

11205: At 1700, ARCHITECT in USB w/wx broadcast for various RAF bases. (TT)

11214: At 1508 SAM 60202 & SAM 20375 wkg Andrews. QSY 8026. (PB)

At 2020 Trenton Military w/pp for SENTRY 51 to 884-DSN, RAYMOND 24. (MF)

11217: At 1824, PACAF 01 in USB wkg MacDill w/pp Andrews, reports has DV3 + 9 pax (pass.). (PB)

11226: At 0118, SAM 50049 in USB on the ground in Argentina (SAZB) wkg Andy. (PB)

11232: At 2346 Ausy 283 (C-130 aircraft) in

USB w/pp Comox Wing Ops via Trenton Military. (PB)

11235: ZKX, RNZAF Auckland, New Zealand w/KIWI 992 at 0635 in USB w/wx for Auckland. (IJ)

11244: Several stns at 1349 in USB clg SKY-MASTER, none made contact, but several worked BASS DRUM. Units included HORDE 04, ICER 21, ICER 20, HORDE 03, TURBO 35, PETRO 61, TURBO 38 & HORDE 32. BASS DRUM also worked NIGHTWATCH w/AKAC groups mentioned. (AS) (SKYMASTER call was hrd used in several strategic exercises in late 97—Ed.)

11288: Rockwell Flight Test at 1530 in USB w/kg "WRL" (Warner-Robins Lab, Warner-Robins AFB) w/selcal ck's. & returning to "scan". (Ed.)

11297: Russian VOLMET at 1305 in USB w/wx. (TB)

11330: Cuban Bubble jammer, 1735-2130 on, grinding away at dead air here. (AWH) KING 86 at 2102 in USB w/kg New York on nav flight cleared by SEALORD to this freq. (TO) (SEALORD is the USN FACSAC or Fleet Area Control & Surveillance Facility, Jacksonville, FL—Ed.)

11342: World 117 at 2231 in USB w/kg New York radio w/sc ck (CM-BD) & departure msg. Destination is Frankfurt. (DW)

11387: Sydney Volmet heard at 2003 in USB w/wx. (TB)

11453: IMB3, Rome Meteo, Italy at 0705 w/RTTY 50/425 wx synopsis. (IJ)

11460: At 0303, SAM 29000 (as AF-1 back-up plane) in USB clg Andrews. (PB)

12056: Cherry Ripe nbr stn hrd in USB at 1200. Also noted on 8320/13866 kHz. (TY)

12220: "MUH1A.5" & "MUH7" Australian Army Net at 1910 in USB w/rdo cks. (IJ)

13002: KPH, San Francisco rdo, at 1756 w/CW wheel. (SW)

13061: CLA, Havana rdo at 1757 w/traffic list in CW. (SW)

13282: "Hong Kong Radio" VOLMET broadcast heard in USB mode from 0848 to 0849. Auckland followed from 0850 to 0854. (DS)

13306: Continental 63 w/Gander posn report & wx at 1542 in USB. (HO)

13438.6: DGN43, PIAB Bonn Germany at 0900 in FEC-A 96/400 w/nx in GG. (IJ)

13527.8: Unid stn w/"C" & "S" almost at the same time in CW @1126 (Russian Navy?). (CH) (yes, "C" is Moscow, "S" is Arkhangelsk actually on 13527.8, 13527.9—Ed.)

13750: "New Star Radio Station #5" in AM mode at 0630 joined in progress w/YL/CC intro text, traditional Chinese music from 0632-0633, id as "Xinxing Guangbo Dientai Di Wu Tai," msg header info, & then 4F msg text, each group 2x. "Zaihui" (good-bye) at 0640. Similar heard this freq at 0118, 0816, 1512, 1605. (DS)

14372: Cuba, SVR, w/"Fast CW" spook at 2201 w/callup for "307" (cut zero), at 2204 in 5FG t/c. (AWH)

14486: P6Z, MFA Paris, F at 0835 in FEC-A 192/400 w/5LG's. (IJ)

14487: Lincolnshire Poacher lady passes

5FG's in USB at 1100. Also noted on 16084/15682kHz. (TY)

14686: ATLAS, Rockwell/Collins Comm Center at 1636 in USB w/kg unid. (DW)

14699: YIX70, INA Baghdad, Iraq at 0710 in RTTY 75/425 w/nx in AA. (IJ)

14810: Presumed OMZ66, MFA Bratislava Slovak Republic at 0710 in IRA-ARQ 213/500 w/"TELAGRAMMA, TELAGRAMMA, TELAGRAMMA." (IJ)

14970.3: SAM, Stockholm at 1407 in SWED-ARQ w/msg to embassy in Managua, curious mix of EE/Swed. (FH)

15043: At 1426, SPAR 67 in USB w/kg Thule, QSY to 11175. (PB)

15448: At 1720 BANGER, LOVEJOY, CHEERIO, CITY BOSS, D7J91 (TACP/ALO) et al in USB w/tactical air control net. Warning net of incoming strikes & setting up U.S. strikes against hostile targets, etc. Enemy du jour was North Korea. BANGER advised LOVEJOY that LOVEJOY had an incoming enemy attack & adv "You have forty five seconds to live. Anything you want to say to your wife & children?" (TT) (Tims abbrev. TACP is Tactical Air Control Party, ALO is Air Liaison Officer—Ed.)

15867: At 1959, Customs COTHEN net in USB active w/"Turkey talk" scrambled voice. (MF) (system is called "Parkhill"—Ed.)

15897.9: RFGW, Paris at 1420 in FEC-A 192/390 w/FF msg to REVIPP, St Denis Air, Reunion, then 1 to ZEN/Air Djibouti. (FH)

15980: EZ12, Mossad, Israel, hrd in USB at 1300. Also noted on 13533 kHz. (TY)

16098: HDB20, Berne, at 1400 in ARQ w/5LG's, off after "end of message." (FH)

16167.7: FDX, Paris at 1430 in ARQ-E3 200/400 FF/nx to RFFVAEA Alysse, C.I. was FDX. (FH)

16184.9: CLP18, EMBACUBA Dar-es-Salaam, Tanzania at 1820 in RTTY 50/850 w/SS t/c & 5FG's to MFA Havana. (JR)

17050.4: ASK, Karachi, Pakistan, w/lengthy "DE ASK..." marker in CW at 1340. (DG)

17162: PWN33, Natal in RTTY 75/850 monitored at 2140 w/CQ & coastal wx in Portuguese/EE. (FH)

17590: HZN48, Jeddah Meteo, Saudi Arabia at 2000 in RTTY 100/850 w/wx synopsis (IJ)

17925: San Francisco Aeradio w/kg various a/c in USB at 0255. (TY)

18039.7: TCY4, Ankara at 1415 in RTTY 50/1200, Arabic Turkish nx w/some items in EE, some FF. (FH) (Anadolu Ajansi or "AA" nx—Ed.)

18636: CLP27, EMBACUBA Pyongyang, N. Korea at 1555 in RTTY 50/425 w/SS t/c & 5FG's to MFA Havana. (JR)

18641.4: CLP44, EMBACUBA Harare, Zimbabwe in RTTY 50/425 at 1613 relaying msgs fm EMBACUBA Baghdad. (JR)

19048: CLP1, MFA Havana, Cuba at 1440 in RTTY 50/425 w/SS circulars to CLP8, EMBACUBA Conakry. (JR)

19517.6: CLP23, EMACUBA Lagos, Nigeria at 1640 in RTTY 50/425 w/SS t/c & 5FG msgs. (JR)

19706.5: LSD836, Buenos Aires Radio,

Argentina w/ARQ ready signal & signing CW at 2230. (FH)

19884: Cherry Ripe Station at 0120 in USB, YL w/numbers. (IJ)

20020: Cuban mixing product heard at 1623 in LSB, audio from the "Atencion" station audible here whenever CLP1 was keying CW on 20017.5. Same thing noted at 1633 on 18630 LSB. Fair level & intermittent, CW very strong. Guess that means CLP1, RHC, & the numbers are all coming from the Bauta site. (AWH)

20841.7: CLP8, Conakry, Guinea at 1418 in RTTY 50/425 w/SS msgs. (JR)

22646.5: JOS, Nagasaki radio, Japan at 0420 w/CW marker. (IJ)

28285: Adelaide Is. (Antarctica) VP8ADE, at 1815 w/CW piggy beacon, fair/good, listed 8 watts! (AWH)

This month's contributors: (AB) Ary Boender, The Netherlands; (AG) Alan Gale, UK; (AS) Andy Salamone, PA; (AWH) Albert W. Hussein, FL; (BF) Bill Farley, NM; (CB) Charles Boyd, MO (while camping); (CH) Chris Halinar, Germany; (CS) Chris Smolinski, MD; (DG) Dan Greenall, ON, Canada; (DJ) Doug Jarrard, NM; (DS) Dave Sabo, S. Korea; (DS2) Dwight Simpson, WI; (DW) Dave Wright, TX; (FH) Fred Hetherington, FL; (GVS) Gary Van Sant, OR; (HO) Harold Ort, NJ; (IJ) Ian Julian, New Zealand; (JR) Joe Richard, FL; (KA) Ken Alexander, ON, Canada; (MF) Mike Fink, FL; (MT) Matt Thompson, PA; (PB) Paul Bunyan, U.S. mid-west; (PK) Richard Klingman, NY; (RM) Roland "Mac" McCormick, GA; (SW) Sue Wilden, IN; (TB) Tim Braun, VA; (TO) Tony Orr, VA; (TT) Tim Tyler, MI; (TY) Takashi Yamaguchi, Japan; and (Ed.) ye editor in Ohio. Thanks to all for another great turnout. ■

Alan Gale (UK) logged this final message from *Land's End Radio* on 500 kHz ending an era:

From Lands End Radio/GLD - tor 0023z, CQ CQ de GLD GLD = this is the final w/t transmission from Lands End Radio. Since 1901 GLD has listened continuously on 500 kHz and is proud to have assisted many ships in distress both in peacetime and in war stop but now the time has come, ours is not to reason why, the satellites are calling, our morse transmitters die. Marconi if you can hear us we salute you = de GLD 31/12/97 2359z ar ar de GLD

CQ de GLD good luck and 73s de GLD now QRT on 500 kHz forever ar ar GLD va

Tuning In (from page 4)

and the Politics of Misinformation" reported, "... the claim that FRS would have no impact on current users is especially ridiculous — the proposed FRS use of the 467 MHz band would decimate existing repeater operations." Really? It's a good thing the PRSG doesn't have its finger on the launch buttons in the Defense Department!

There's no question about it: the FCC should have included more strict rules for FRS users; after all, in the ever-chaotic CB bands, the rules are in place — what's good for one Part 95 service should be good for all. We've talked with quite a few FRS users and they all seem to love their transceivers and take them wherever they go; even some hams are getting on the FRS bandwagon. Some radio enthusiasts even see FRS as a stepping stone to ham radio. I don't think so.

Talk to the person on the street and you'll find that most know less about FRS than they do about their TV remote control. Both just work — and quite well, for their intended purpose. Folks know they can't use an FRS radio to talk to Uncle Wes 500 miles away, nor can they use a TV remote control as a garage door opener. If they're shopping for clear, reliable communications for use over a few blocks around town or a couple of miles or so over open water, they'll choose FRS or a comparable handheld CB, whichever is less expensive and has more options.

So are these FRS radios interfering with licensed GMRS users? Yes and no. In the great majority of instances, there just isn't a problem; reminds me of the uproar many years ago over those old channel 14 "toy" walkie-talkies that were going to torture all those law-abiding CBers — the ones talking skip with 500 watts. Yet in a handful of other areas, certain locations in California and Chicago, specifically, GMRS repeaters have been clobbered by the little half-watt FRS transceivers. I doubt the problem is terribly widespread. So what to do? Since the FRS is here to stay, the answer is simple: Operators should PL tone their repeaters. Pretty easy, wouldn't you say? Once again, the people have to do what Uncle Sam couldn't.

But even as FRS use grows, it still seems to me that there's more sand in the PRSG's socks than the FRS's; the battle between the PRSG and the FCC and radio manufacturers has been going on long before the

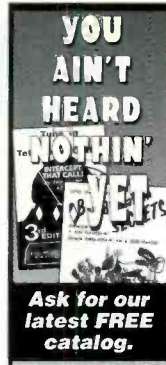
creation of the Family Radio Service. Other GMRS problems — real problems — unlicensed, new business users on the personal GMRS frequencies, for example, are concerns that need Uncle's attention, but with the downsizing at the FCC, it's doubtful it will get the focus it deserves. And, frankly, I suppose if I were a licensed GMRS user, the FCC's green light for unlicensed FRS operation on my GMRS turf could be considered a slap in the face or indifference toward GMRS users, but haven't all radio services been smacked once or twice by Uncle Sam? So we pick up the pieces and move on, because, guess what, it won't be the last time Uncle dumps in our living room.

Giving Credit, Where Credit Is Due: The FCC's Stuker, Monie and Moffitt!

Unless you're their family or friends, you've probably never heard of these three fellows, but they've done a good thing. We Americans have a field day criticizing our government from time to time (alright, most of the time). And, to be sure, very often the government has, shall we say, a field day with us. But when something goes particularly smoothly with Uncle Sam, we should applaud the effort. After all, those government employees are our friends, family and neighbors.

Such is the case with the FCC's not-so-new toll-free phone number. I've called the 888-225-5322 number several times in the past few months, and guess what? The phone menu is short, to the point, and I've never been on hold more than a couple of minutes. You can't say that after calling the Army or IRS where you'll wait for an eternity to get through, and frequently until the millennium to get an answer, and when you do it usually isn't correct. No sir, it's hats off to the FCC for polite, informed customer service representatives on their toll-free line. And they don't play music; Don't get me wrong, I like good music, but, unless it's elevator music, I don't want to hear it on the phone.

I've got to admit (*Pop'Comm* Confession number 99) that I called the toll-free line a couple of times with a dumb question for which I already knew the answer. Without putting me on eternal hold, or getting handed off to 35 specialists, the FCC folks knew the answer, or got me to the person who did — the FIRST time! The rest of the bureaucracy should stand up, take notice and applaud!



YOU AIN'T HEARD NO THIN' 30 YEARS

Ask for our latest **FREE** catalog.

Since 1967, CRB Research has been the world's leading publisher and supplier of unique hobby and professional books and information including:

- Scanner Frequency Guides
- Shortwave Freq. Guides
- Military/ Federal Comm.
- Broadcast Station Registries
- Undercover Communications
- & Other Related Topics!

New titles are constantly being added to our exciting catalog. If it's interesting and unusual, we've got it. **YOU'LL SEE.**

CRB RESEARCH

P.O. Box 56, Commack, NY 11725
Ph: (516) 543-9169 FAX: (516) 543-7486
e-mail: crbbooks@aol.com www.crbbooks.com

CIRCLE 11 ON READER SERVICE CARD

Pirates Den (from page 43)

1500. (Coatsworth, ON) At 0329 opened with "Oh Canada." (Silvi, OH)

WREC — Radio Free East Coast, 6955 USB at 2044 with rock, funny ads, ID, off at 2059. (Jeffery, NY)

Radio Tellus, 6955 USB at 2211 with hard rock, talk about other pirates. (Jeffery, NY) Hard rock, ads for LSD-based aspirin, Jo-Bob's restaurant. Off at 2008. Wellsville address. (Jeffery, NY)

Omega Radio, 6955 USB at 1842 sign off. (Coatsworth, ON)

Rocket 99, 6955 USB at 1820. (Coatsworth, ON)

Voice of Intoxication, 6955 at 2021. (Coatsworth, ON)

Jerry Rigged Radio, 6955 USB heard at 2136. Said they'd soon be using "8 megs" and 21 and 31-meter bands. (Coatsworth, ON)

Voice of the Atlantic, (frequency?) 2219 with Black Magic woman and Born to Be Wild. No address given. (Coatsworth, ON)

Farmers From Holland, 6300 at 2331. Mostly polkas. (Coatsworth, ON)

Radio 3, 6955 at 1722 to 1747 close. ID as "totally awesome Radio 3." (Coatsworth, ON)

Pirate Radio Boston, 6955 at 2003. (Coatsworth, ON)

WMPR?, 6955.4 at 2140 with electric songs; over modulated. (Hassig, IL)

WBIG, 6955.9 at 1905 "WBIG — the large one." Off with song "Mexican Radio." Belfast address. (Hassig, IL)

Voice of the Longrun, 6955 at 2118 with backwoods comedy, music. Unreadable address. (Jeffery, NY)

Good goin' guys! Keep at it and keep those logs coming my way! ■

Readers' Market

Advertising Rates: Non-commercial ads are 30 cents per word, including abbreviations and addresses; minimum charge \$6.00 per issue. Ads from firms offering commercial products or services are \$1.00 per word; minimum charge \$20.00 per issue. Boldface words are \$1.20 each (specify which words). Leading key words set in all caps at no additional charge. All ads *must be prepaid in full* at time of insertion; a 5% discount is offered for prepaid 6 time insertions. All ads must be typewritten double spaced.

Approval: All ad copy is subject to Publisher's approval and may be modified to eliminate references to equipment and practices which are either illegal or otherwise not within the spirit or coverage scope of the magazine.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Readers' Market have not been investigated, the Publisher of *Popular Communications* cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: PC Readers' Market, 76 N. Broadway, Hicksville, NY 11801, Attn: Nancy Barry.

VHF AERO SCANNER GUIDE: Kneitel's Air-Scan, sixth edition. Great new edition of the new comprehensive and popular USA/Canada VHF aero band directory ever published: Civilian, Military, Private Airports, Heliports & Seaplane Bases, Control Towers, ARTCC, Weather, Approach/Departure, FSS, Ground Control, ATIS, Unicom, National & Air National Guard freqs., etc. Many listings for airport security, fire/rescue, airline ground services & more beyond the aero band. One "must have" guide to tens of thousands of aero related monitor frequencies! Only \$18.95, plus \$5 s/h (\$6 to Canada) from CRB Research, P.O. Box 56, Commack, NY 11725. VISA/MC accepted. Phone orders: (516) 543-9169. (NYS res. add \$2.04 tax.)

LEARN MORSE CODE IN 4 HOURS! Taught the military method. Send \$9.95 to: J.L. Steiger, 375 Hillside, Seven Hills, OH 44131.

GE SUPERADIO III with up to four SCS bands is the DX'ers choice. AM modification included. Low as \$85. 800-944-0630.

POOR RECEPTION ON YOUR AM RADIO? Our signal booster will help. Guaranteed! Version 1701 tunes 530-1700 kHz. \$48 + \$5.50 s/h. If not satisfied within 30 days, we'll refund your money, less s/h charge. FALA ELECTRONICS-5, P.O. Box 1376, Milwaukee, WI 53201-1376, 414-671-5203.

CABLE DESCRAMBLERS FROM \$99.00. TEST DEVICES FROM \$15.00. CALL US WITH YOUR QUESTIONS. 1-800-449-9189. NO FLORIDA SALES. ANYONE IMPLYING THEFT OF SERVICE WILL BE DENIED ASSISTANCE.

SCANNER MODIFICATION HANDBOOK VOL. 1 by Bill Cheek. The famous original 160-page books. Performance improvement modifications. Simple step-by-step instructions, many photos. Primarily PRO-2004 & PRO-2005, some for PRO-34, BC-200/205XLT, BC-705XLT, BC-705XLT. Speed up scanning rate, disable "beep," increase number of channels, improve squelch action, add an S-meter, interface with shortwave receivers, etc. Make the PRO-2004 & 2005 into a 6.400 channel scanner, put 3,200 channels into the PRO-341 Plus, cellular frequency charts, antenna info & mods, inside info on frequency management, operating hints, emergency power supplies, scanners & the law, lots more! Only \$18.95, plus \$5.00 s/h (Canada \$6). Residents of NY State add \$2.36 tax. Big 220 page **VOL. 2** with more mods for PRO-2004/5/6, PRO-34, PRO-2022, BC-760/950XL, BC200/205XL, also available. \$18.95 plus \$5.00 s/h (Canada \$6). NY State residents include \$2.36 tax. **NEW! The Ultimate Scanner, VOL. 3.** Giant 240-page edition. Many more mods! Picks up where the first two books ended. \$29.95 plus \$5 s/h (Canada \$6), residents of NYS add \$2.97 tax. Order from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. Visa/MC welcome. Tel: (516) 543-9169.

RadioShack SCANNERS LOWEST PRICES all catalog items. NEW-FRS 105 Family Radio Service 2-way HT reg. \$180—OUR PRICE \$150. Join our buying club and save. No tax. Call 1-800-848-3004 (orders only). **COTRONICS, Inc.**, 2250 S.E. Federal Hwy., Stuart, FL 34994.

CB MODIFICATION SECRETS, big new 200-page guide by Kevin Ross, author of "CB Radio Hacker's Guide." More great easy-to-do Am/SSB CB equipment upgrades and enhancements applicable to Cobra, Realistic, Uniden, President, etc. Freq. expansion, VFO, clarifier unlock, VOX, Roger Beep, anti-theft device, receive signal preamp, much more. Only \$21.95, plus \$5 s/h (\$6 to Canada) from CRB Research Books, P.O. Box 56, Commack, NY 11725. NYS residents add \$2.22 tax. VISA/MC orders call: (516) 543-9169.

MILITARY RADIOS: Easily made battery adapters for military radios & other electronics. Get **POWER UP!** Big new 96-page manual of instructions, diagrams. Use readily available commercial batteries in PRC-6, -8, -9, -10, -25, -28, -47, -74, -77, TRC-77, AN/PRC-9, AN/PRT-4, RT-77, URC-68, more; also mine detectors, night scopes, radiacs, field telephones, etc. Only \$14.95, plus \$5 s/h (\$6 Canada). NYS residents add \$1.53 tax. CRB Research Books, Box 56-PC, Commack, NY 11725. VISA/MC accepted. Phone (516) 543-9169.

CABLE TV DESCRAMBLER. Build your own. Complete plans. Parts list. Diagrams. Circuit board. Schematics. Send \$9.95 to A. Gray, P.O. Box 1223-E Station 28, Route 6, Halifax, NS B3L-4P4. **Michael Faraday**, Relativity, Free Energy, UFO's, a biography. Also strange relationships in electromagnetic fields, unipolar motors, free energy devices, UFO's. 221 pages. \$20.00 to Frank Fite, 1914 Billy Drive, Fort Wayne, IN 46818.

START YOUR OWN COMMERCIAL RADIO STATION WITH ONLY \$5000 OR LESS! Yes it's possible & legal. Part 15 of FCC rules allows low power AM radio stations to operated without a license!! Cover an entire town & bill \$1500 a month!! It has been done!! Order the newsletter booklet that tells you all you need to know to get started for \$29.99. Send check or money order payable to: WCTD AM 1620, 4 Canal St., Westerly RI 02891 or call 401-348-9222 for information.

WORLD'S MOST UNUSUAL Communications Books! A large selection of outstanding titles covering scanners, "confidential" frequency registries, bugging, wire tapping, electronic surveillance, covert communications, computers, espionage, monitoring, and more! New titles being added constantly! Ask for our big FREE catalog. CRB Research, BOX 56-PC, Commack, NY 11725.

RADIO STUFF SALE: Books, magazines, club bulletins, radio station items, old time radio & more. \$1 for list. G. Dexter, 213 Forest St., Lake Geneva, WI 53147.

WANTED: Schematics or books for: Heath CB-1, EICO-147 Signal Tracer, R-122A/ARN-12 receiver. Will pay reasonable copying costs. W8MIA. FAX questions 805-498-3424.

POPULAR COMMUNICATIONS, 1983-present. \$75. Callbooks, US/DX, 1979/80/84, \$10 All. U ship. W9STB, 2608 West 1000 North, Michigan City, IN 46360.

CB MODIFICATIONS! books, plans, kits, high-performance accessories. The best since 1976. Find out why! Catalog \$3. CBC INTERNATIONAL INC., Box 31500A, Phoenix, AZ 85046.

CABLE DESCRAMBLER! Build for \$12 with seven RadioShack parts. Instructions \$8. F.A.S.T., Box 369-U74, Pt. Salerno, FL 34992-0369.

Cable Television equipment — Replacement converters and accessories for most major brands. Call for unbeatable prices. Quantity discounts. Same day shipping UPS or FedEx. COD's allowed. **QB Video 1-800-249-3025.**

TOP DOLLAR PAID. WANTED. used (but not abused) Regency MX-3000 scanners (30 channel communications receiver) for back-ups and parts bins. Check your shack and vehicles for surplus or unused units (MX-3000's only). Advise condition and price wanted to Jan D. Lowry, 28243 Royal Road, Castaic, CA 91384-3028. (No calls please).

WANTED: NORWOOD XLP 4-track tape recorder. Must be in good working condition. Contact RLN, P.O. Box 238, Chicopee, MA 01014-0238.

WANTED: EARLY MILITARY RADARS. Aviation, marine, fire control, bombing, missile. Also parts, training courses, TM's. **RADAR:** Box 10215, Bloomfield, PA 15232.

TOMCAT'S BIG CB HANDBOOK, by Tom Kneitel. 221 large pages, fully illustrated. Complete guide to worldwide AM, SSB, Freeband, 27 MHz operations. Everything they never told you (legal & otherwise) from world's leading CB authority. Only \$15.95 plus \$5.00 s/h (Canada \$6.00) from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. (NYS residents add \$1.78 sales tax). Visa/MC orders call: (516) 543-9169.

FOR SALE: SONY CRF-V21 visual World band receiver with built-in printer. One year old, rarely used. Price as of 1991 \$7,000. YOURS FOR \$1500. Call Yassin Abdela: (808) 841-1793 or write to: 963 Robello Lane #46, Honolulu, Hawaii, 96817.

WANTED: CB RADIO EQUIPMENT—I'm looking for all types of old/vintage CB radios, amps, manuals, magazines, mics, etc. **PLEASE CALL** anytime. **WALTER** 818-297-7249.

NEED HELP! RadioShack can't repair/replace band switch and FET amp on analog geezer's like-new Realistic DX-200. Can anyone? Joseph Burgess, 407 Hiawatha, Frankfort, KY 40601, (502) 695-3016.

LEARN CODE BY HYPNOSIS — <<http://www.qth.com/cweasy/>>; or 1-800-425-2552.

DX TOOLS for the serious radio listener. Quantum Loops, Q-Sticks, more. Stamp for catalog. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504. (904) 434-3635.

CABLE DESCRAMBLER anyone can build for under \$12 in 7 easy steps with RadioShack parts! Plans \$10. R.L. International, 12917 Jefferson Ave., Suite H-162, Newport News, VA 23608.

CB and 10 METER equipment: Ranger, Galaxy, Mirage, Super Star, and Much More! Send 3 stamps to EDS, P.O. Box 343, Howell, NJ 07731.

DRAKE SW8, MINT CONDITION, MANUAL \$495.00, SONY ICF-2010 AS NEW BOXED ALL LITERATURE \$275. KENWOOD R-300 MINT, \$95.00. CALL JERRY, 954-720-1972.

FREE DISK CATALOG! Electronics, IBM Shareware and CD-ROMS. MOM 'N' POP'S SOFTWARE, P.O. Box 15003-HI, Springhill, FL 34609-0111. 1-352-688-9108.

Advertisers Index

ARCRON-ZEIT	29
ASTATIC	51
AccuWeather, Inc.	13
Antique Electronic Supply	24
Antique Radio Classified	27
Atlantic Ham Radio.....	36
BayGen USA.....	15
C. Crane Company.....	14
C & S Sales, Inc.	27
CQ Merchandise.....	17
CQ VHF Magazine	47
CRB Research	77,79
COMSEC.NET.....	14
Computer Aided Technologies.....	42,43
Delphi Internet	14
Delta Research	27
Durham Radio Sales & Ser., Inc.....	14
Everhardt Antennas	15
Firestik Antenna Company	37
ICOM America, Inc.	Cov II
Jo Gunn Enterprises	31
Kenwood Communications Corp.....	7
LP Communications, Inc.....	47
Lentini Communications, Inc.....	1
MACO Mfg. /Majestic Comm.	49
MFJ Enterprises, Inc.	39
MoTron Electronics.....	21
Mouser Electronics.....	21
Optoelectronics, Inc.....	5, 11, Cov IV
Paladin Press	45
Phillips-Tech Electronics	36
Quement Communications.....	36
R.C. Distributing	36
REACT International, Inc.	32
Scrambling News	36
shoc	37
Signal Engineering, Inc.....	50
Software Systems Consulting	31
Stridsberg Engineering	19
Universal Radio, Inc.....	3
Viking International	13
Wilson Antenna, Inc.....	19
Wireless Marketing Corp.	57
Yaesu U.S.A.....	Cov. III

Reach this dynamic audience with your advertising message, contact Don Allen, W9CW at 217-344-8653, FAX 217-344-8656, or e-mail: PopComAds@aol.com

WANTED: Square four blade socket power connectors or power cords for old type Bearcat III or IV scanners. Gary Jones, P.O. Box 467, Buckeye Lake, OH 43008.

FOR SALE: ICOM R71A SW receiver. \$575.00. Contact R. O'Donnell, 314-296-4673.

FOR SALE: Terminal Node Controller (TNC) AEA PakRatt PK232 MBX. \$200.00. Contact R. O'Donnell, 314-296-4673.

1997 WUN UTILITY FREQUENCY GUIDE CD-ROM from the Worldwide UTE News Club. Contains over 50 megs of data including actual members logs of utility stations from 1995/Feb. 1997. Also all past WUN newsletters, .WAV files of digital modes and shortwave sounds, free-ware text string search program and MUCH MORE. U.S. \$16.95 mailed anywhere. If you're a utility/digital/numbers fan, this CD is for you. IBM/PC only. Mail money order or Visa, MasterCard, Discover or American Express required information and clear mailing address to "WUN," P.O. Box 4222, Youngstown, OH 44515-4222 (USA); or FAX orders to 330-799-5766.

SERVICE AND MODIFICATION HANDBOOKS: Cobra, Uniden, RCI, Galaxy, Motorola. CB/HAM/MARINE/COMMERCIAL Radios, antennas, mics, meters, and accessories. Plus Night Scopes and Tons more Stuff. 28 pg. Catalog \$3.00. **MAXTECH**, BOX 8086, N.Y., N.Y. 10150 USA; 718-547-8244.

CABLE TV DESCRAMBLER!! ANYONE CAN BUILD IN SEVEN EASY STEPS WITH RADIO SHACK PARTS. PLANS/KITS FROM \$5.00 PLUS FREE BONUS. 1-800-818-9103.

For Sale: Universal M-7000 ver. 7. All mode decoder like new. Must sell \$620.00 or best. Satellite Dishes offset 2-4 feet in box - sell cheap. Bill 203-288-4477.

SCANNING USA—unique monthly magazine. Get the most enjoyment from your scanner. All the latest news, product reviews, what's new, written by the nation's top acclaimed hobbyists. Subscriptions \$19.95, sample issues \$3. Write: 2054 Hawthorne, Joliet, IL 60435; or phone: 1-800-651-0922.

LORD WYATT COMMUNICATIONS IMPORT/EXPORT RADIO HOBBYIST CATALOG—Everything for the CB & RADIO HOBBYIST—from SOUP TO NUTS—send \$5.00 to LWC, P.O. Box 30J28CBPJ, Brooklyn, NY 11203-0128 (718-789-7329 press ext. 1).

Radio Stuff Sale: Books, magazines, club bulletins, radio station items, old time radios & more, \$1 for list. G. Dexter, 213 Forest Street, Lake Geneva, WI 53147.

FREE CABLE DESCRAMBLER PLANS! For Details Write: Sierra Publishing, 909 E. Yorba Linda Blvd., Suite H-181, Dept. PCD, Placentia, CA 92870.

WANTED: ICOM IC-03AT FM TRANSCEIVER IN GOOD WORKING CONDITION. CONTACT CARROLL DRAKE, 30077 MEHERRIN ROAD, BOYKINS, VA 23827 1-757-654-6505.

WANTED: Uniden model 8100A Scanner. Top Dollar paid for working units. Phone (403) 864-2432 Canada.


ILLEGAL POLICE SURVEILLANCE by Goerge Roberts. The ultimate book on how Big Brother spies on innocent citizens. This is the most complete book ever written on surveillance techniques and countermeasures. The 152 page book is 8 1/2" x 11" with 20 pages of pictures. Order from Comet Press, P.O. Box 31421, Dayton, OH 45437. Only \$24.97 plus \$2.00 shipping.

CB - FRS - ANTENNAS - JCRE International, on the web, <http://www.jcre.com/>. Cherokee AH100 \$214.95, JoGunn Smokin GunnII \$169.00, Midland 79290 \$189.95, Wilson W1000 \$49.00, Kenwood Freetalk \$109.95, BC235XLT \$243.99.

SPORADIC WAVES: If you like SSB, CB, then my newsletter you must see! Free sample issue for all who ask. C/O Keith Herzig, PO Box 751, Chester, MA 01011.

OPTO XPLORER with case and two ant. MINT \$650. 614-624-3549 (9-6 EST), 614-766-9938 (after 6 EST).

YOU AIN'T HEARD NOTHING BUT THE BEST



Ask for our latest FREE catalog.

Since 1967, CRB Research has been the world's leading publisher and supplier of unique hobby and professional books and information including:

- Scanner Frequency Guides
- Shortwave Freq. Guides
- Military/ Federal Comm.
- Broadcast Station Registries
- Undercover Communications
- & Other Related Topics!

New titles are constantly being added to our exciting catalog. If it's interesting and unusual, we've got it. YOU'LL SEE.

CRB RESEARCH
P.O. Box 56, Commack, NY 11725
Ph: (516) 543-9169 FAX: (516) 543-7486
e-mail: crbbooks@aol.com www.crbbooks.com

CIRCLE 11 ON READER SERVICE CARD

GALAXY, SATURN, RCI, MIRAGE, COBRA, UNIDEN SCANNERS, MICROPHONES, POWER SUPPLIES, HARD TO FIND PRODUCTS!! MORE!! PICTURES AND PRICES \$1.00 (REFUNDABLE) GALAXY, BOX 1202, AKRON, OH, 44309... OVER 10 YEARS IN BUSINESS.

SONY IFC-6800W Receiver in excellent condition. \$500.00. Will send UPS COD. FAX: 512-857-0066 or E-Mail <dnatt@electrotex.com>.

PRC-74B Military radio - 2 to 18 MHz USB 25 watt transmitter, outstanding receiver - unit powered by 12 volts DC—manual, spare modules and spare parts available—serious inquiries only at FAX 512-857-0066.

For Sale: To highest bidder. Delivery upon demise. Equipment used in producing "Old CB Shack" column must be retained until I can no longer continue series due to terminal illness. It comes from the oldest CB business (part of a commercial two-way radio business) in the USA and the longest continuous CB operation Sales and Service. Radios consist of many units dating back to 1960. Some have been restored per the magazine articles, others need restoration. Some are so rare that they are most likely the only ones still in existence. ONE UNIT is so rare (with authentication by Edgar Johnson himself who tried to buy it from me) that I guarantee that it is unequalled. The Johnson Co. only built 250 of them including a special box. It is the Gold Award Messenger III. This unit and mic is plated with 24kt. pure gold. This radio has NEVER been fully out of its box! Sale also includes a 100 percent full set of Sam's CB series radio manuals, plus full factory set of service manuals from the Johnson Co., Polysonics and others. Also, schematics gleaned from many other sources (customers, trade magazines, etc.) Also included are various items of test equipment for CB radios dating back to the 60's. The higher will place a 20 percent deposit with payment in full upon delivery in approx. two years or less. An itemized list and some pictures will be provided to serious bidders upon payment of \$25 fee. I am not interested in mailing stuff all over the US to curious people! Sale is all or none. All items will be boxed and shipped by UPS to successful bidder at the appropriate time by company personnel. COD cash unless other arrangements have been made. Inspection can be arranged by appointment. Contact Don Patrick at 3701 Old Jenny Lind Rd., Ft. Smith, AR (501) 646-6141. **SERIOUS BIDDERS ONLY!**

WANTED: SONY ICF-6800W—WITH ORANGE LETTERING. WILL PAY \$600.00, PLUS SHIPPING. CALL PAT—PHONE (330) 702-9722 OR (330) 533-1643.

VHF GE RADIOS: Used GS MastrII Comb. EX76KKP66C. These are 8 channel 100 watt units in double cases with the PLL exciters. Units are good condition but as is, radio w/o acc. \$80, with acc. \$150 plus s/h. Call David (205) 553-3059.

"USED and New CB Radios, Scanners, Antennas, and accessories. For list and prices, send \$1.00 to: 103 Mount Olympus Ct., St. Peters, MO 63376".

The Loose Connection

BY BILL PRICE, N3AVY

RADIO COMMUNICATIONS HUMOR

\$9.95 A Month For The BBC?

One of the joys (did he say joys?) of being down with pulmonary hobi-hobi, or whatever it is that I have, is that I can listen to the radio. Not just the AM part, which gets me to work every day with *Harden, Brant & Parks* on WMAL, I mean the *whole spectrum* — from 100 kHz to 30 megs — and the interesting stuff they're trying to prevent us from listening to, bit by bit.

I'm sure you all have certain things you anticipate before actually turning on a shortwave radio. With many, it's logging a rare, never-before-heard station or triangulating on a numbers station and assisting your government track them down — at least until you start running into people who look like Scully and Mulder. Today, with barely enough strength to spin the dial, I would listen till I was completely filled with static and with dits and dahs. As I lay there thinking about tuning all the way through the shortwave spectrum on this otherwise non-productive day, I realized I'd need to have someone open the bedroom window, reach out in the chilly air, and grab the lead-in for my longwire antenna. I keep it fastened to the ground rod when I'm not using it.

My wife, the extremely lovely and talented Shannon (not her real name) affectionately known as "Pinkie" (her real nickname) has developed a talent for blowing holes through my logical explanations of radio phenomena, in much the same way that a medium gauge shotgun would perforate a wet two-ply facial tissue. It really does drain a guy's testosterone when that happens, and she does it so casually, too. I wonder if she took Ed Hammond's crash course in ham radio when I was away last weekend.

I drew some lines on the pages of my notebook and made places to record TIME, FREQ, RST and CONTENT, then asked if she'd mind reaching out to bring my antenna lead to my bedside. "Why don't you just use the cable?" she asked. "I can take it off the back of the TV, and we don't have to open the window."

"Aahruuurh?!" I said, allowing Tim Taylor's psyche to take over for just a moment. "Honey, I know that to a non-

"I should have just gone to the corner of the room, sat on the stool, and put on the pointed cap."

technical person your suggestion would seem logical, but there are no shortwave signals on the cable. You see, it's not just a broadband antenna shared by many sets in the community — cable TV brings us a bunch of signals that have been received, demodulated, then remodulated onto specific frequencies designed to play through the box on top of our set.

"There are no shortwave radio signals mixed in there with them. It's quite a logical assumption, though — it's just that the guys at the cable company spend a lot of time making sure no unwanted signals get into their system. Shortwave signals would sure be unwanted among all that TV stuff. Really."

"OK. Tell you what. Why don't you just show me the difference. I've seen enough of your 'A-B' tests that I'm ready for you to move on through the alphabet. Why don't you just connect your antenna, listen to a station, then connect the cable and see if it still receives the station — better or worse. I know you love a logical demonstration of stuff like that. I'll get your box of adapters."

Here I was, hovering near death's door, and this poor victim was not only going to reach out in the cold to get my antenna lead, she was then going to help me demonstrate my technical superiority by bringing the tools of the trade to my sickbed! It was too much to bear.

"No, honey — really — there's no need for that. It really won't work."

"Well, let's just see." She walked off, returned with my adapter kit, and fastened the RCA adapter onto the cable's "F" connector. "Do *your* antenna first," she said.

I tuned to three commercial broadcast stations around 15 MHz. and noted that each one lighted three LEDs on the radio's bar-graph display. Shannon watched, intently. She handed me the TV cable with the adapter tightened in place.

"OK," I said, "now watch the meter. I

haven't turned the tuning knob at all." I connected the cable to the set's antenna jack and prepared to be gracious about her hopes being dashed. The signal blasted through with equal intensity as it had from my longwire.

She smiled to herself. She never once looked my way — trying hard *not* to rub it in. Not satisfied with a single proof, I went on to verify the other two stations I'd tuned. I should have just gone to the corner of the room, sat on the stool, and put on the pointed cap. I knew that any attempt at explanation would make me look sillier, but that didn't stop me. "There's probably a dead short in my antenna — that's why it's not working very well," I said.

"Sounds fine to me," she said.

I just smiled. There was nothing left for me to say. I don't know if the shortwave reception provided by our cable company is astounding, or if yours is not. I'm certainly not going to call them and ask about it, and I recommend you don't either. It's much the same as the wonderful reception we used to get by clipping an antenna lead to the finger-stop on the old dial telephones.

Naturally, I don't recommend that anyone does what I do. This is, after all, a humor column. Besides, CATV operators, once they find out they're providing you with shortwave reception, will immediately want you to pay \$29.95 a month for basic shortwave service (numbers stations and BBC), then a 10-tier structure for SSB, Coast Guard, AMTOR, WEFAX, etc. at \$9.95 per tier.

They'd probably call your unauthorized use of the shortwave signals "theft of service," and back-charge you with a per-radio monthly fee, even though they never intended for the signals to be there. But wouldn't it be curious if some of the shortwave signals you could tune on that RG-59 are some that you're not supposed to listen to? ■

"The VX-1R is smaller than most pagers!"



"Over 19 hours* of use from the rechargeable lithium ion battery!"

"VHF, JHF, AM, FM, Air Band, Police, Fire-TV" too? Wow"

"Looks like Yaesu did it again!"

VX-1R

Ultra-Compact
Dual-Band Handheld

The world's smallest HT with all the high-tech features you'd want in the world!

The ultra-compact size of the VX-1R Dual-Band is the first thing you notice as you cradle it in your palm. But the high-tech features make this radio one you must have now! Simple combinations, using seven buttons and one knob, control this marvel of engineering. One soft key touch, and wide receive VHF/UHF--76~999 MHz RX (except cellular); 144~148, 430~450 MHz TX, or AM/FM Broadcast, Aircraft, Police, Fire--even TV, spring to life! Touch again for Yaesu-exclusives, SmartSearch™ and ARTS™, or Priority Channel Alarm. Built-in CTCSS and DCS Encode/Decode for 2m/440 amateur bands, CTCSS/DCS Tone Search, and Dual Watch, are included along with 291 Memory Channels in 9 banks with 500 mW power output. Backlit LCD Display shows 6-character alphanumeric capability; backlit keypad makes operation easy in dim light. And, although the VX-1R is the world's smallest dual-band HT, you get over 19 hours* of use with just a 1 hour recharge from its long-lasting lithium ion battery! Big features, small size--the most satisfying combination in the world.



Actual Size
Shown
1 7/8" X 3 1/8" X 1 5/16"

Features

- Frequency Coverage
 - Wide Multi-Band Receive RX: 76~999 MHz**
 - TX: 144~148, 430~450 MHz
 - AM/FM/TV Broadcast Receive
 - AM Aircraft/Public Safety Receive
 - CTCSS Encode/Decode
 - DCS Encode/Decode
 - CTCSS/DCS Tone Search
 - Dual Watch
 - SmartSearch™
 - Auto Range Transpond System™ (ARTS™)
 - Priority Channel Alarm
 - ADMS-1D Windows™ Programmable
 - 1 Watt External Power Supply
 - 80 Minute Rapid Charger
 - Flexible Antenna, Belt Clip, Hand Strap
- **Cellular blocked

FT-50RD
MIL-SPEC
Heavy Duty
Dual-Band
Handheld



FT-51R
Dual-Band
with Dual
Receive
and Help
Menu
Function

YAESU

...leading the way.™

©1997 Yaesu USA, 17210 Edwards Road, Cerritos, CA 90703. (562) 404-2700
Specifications subject to change without notice. Specifications guaranteed only within amateur bands.
Some accessories and/or options are standard in certain areas. Check with your local Yaesu dealer for specific details.

*Battery Life: 5-5-90 duty cycle.

For the latest Yaesu news, hottest products,
visit us on the Internet! <http://www.yaesu.com>

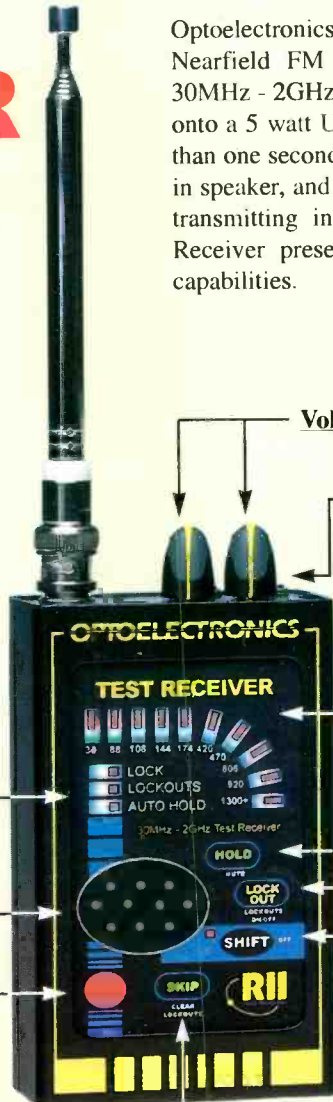


R11 TEST RECEIVER

.....
30MHz - 2GHz
.....

**Handheld
Receiver**

Optoelectronics is pleased to introduce the all new R11 Nearfield FM Test Receiver. Capable of sweeping 30MHz - 2GHz in less than one second, the R11 can lock onto a 5 watt UHF signal as far away as 500 feet in less than one second, demodulate the signal through its built-in speaker, and display the general band the frequency is transmitting in on its LED indicator. The R11 Test Receiver presents all new performance, features, and capabilities.



Instruction Indicators:

LED's will illuminate which mode the R11 is configured for.

Volume & Squelch Control Knobs

CI-V and Headphone jacks:

CI-V jack allows for connection to the Scout for Reaction Tune. The Headphone jack connection also allows for external speaker.

Frequency Band Indication:

Displays what band the received frequency is transmitting on.

Built - in Speaker :

Instantly demodulate any receiver frequency between 30MHz - 2GHz (Cellular Blocked).

Hold / Mute Button:

The Hold button allows the R11 to stay locked on the received signal.

Power

Lockout / Lockouts on-off:

The R11 allows for 1000 user activated lockouts.

Shift / Off:

The Shift button controls all of the R11's secondary functions.

U.S. Patent No. 5,471,402

Skip / Clear Lockouts:

Press the Sk button to continue sweeping. Clear Lockouts will empty the lockout memory.

CIRCLE 152 ON READER SERVICE CARD

**MADE
IN
USA**

COPYRIGHT © 1998 Optoelectronics, Inc.

\$299

FACTORY DIRECT ORDER LINE: 800-327-5912

OPTOELECTRONICS®

5821 NE 14th Avenue • Ft. Lauderdale FL • 33334

Telephone: 954-771-2050 Fax 954-771-2052 Email: sales@optoelectronics.com

Visa • Mastercard • C.O.D. • Prices and Specifications are subject to change without notice or obligation.

Check Out Our Web Site: www.optoelectronics.com

This device has not been approved by the Federal Communications Commission. This device may not be sold, or offered for sale, until the approval of FCC has been obtained. Contact Optoelectronics for information on availability.