

# POPULAR COMMUNICATIONS

## Portable Satellite Telephone!

SEP 16 1993



### Also in this issue:

- Scanning Armored Car Services
- Vertical vs. Horizontal Antennas
- Security In Law Enforcement
- Monitoring M.A.R.S.



Plus: CB, Shortwave, Car Phones, Nostalgia, & More!



# NRD-535D

*"Best Communications Receiver"*

World Radio TV Handbook 1992



*"Unsurpassed DX Performance"*

Passport to World Band Radio 1992

Setting the industry standard once again for shortwave receivers, the NRD-535D is the most advanced HF communications receiver ever designed for the serious DXer and shortwave listener. Its unparalleled performance in all modes makes it the ultimate receiver for diversified monitoring applications.

Designed for DXers by DXers! The NRD-535D (shown above with optional NVA-319 speaker) strikes the perfect balance between form and function with its professional-grade design and critically acclaimed ergonomics. The NRD-535D is the recipient of the prestigious World Radio TV Handbook Industry Award for "Best Communications Receiver."

**JRC** *Japan Radio Co., Ltd.*

Japan Radio Company, Ltd., New York Branch Office - 430 Park Avenue (2nd Floor), New York, NY 10022, USA Tel: (212) 355-1180 / Fax: (212) 319-5227

Japan Radio Company, Ltd. - Akasaka Twin Tower (Main), 17-22, Akasaka 2-chome, Minato-ku, Tokyo 107, JAPAN Tel: (03) 3584-8836 / Fax: (03) 3584-8878

- Phase-lock ECSS system for selectable-sideband AM reception.
- Maximum IF bandwidth flexibility! The Variable Bandwidth Control (BWC) adjusts the wide and intermediate IF filter bandwidths from 5.5 to 2.0 kHz and 2.0 to 0.5 kHz—continuously.
- Stock fixed-width IF filters include a 5.5 kHz (wide), a 2.0 kHz (intermediate), and a 1.0 kHz (narrow). Optional JRC filters include 2.4 kHz, 300 Hz, and 500 Hz crystal type.
- All mode 100 kHz - 30 MHz coverage. Tuning accuracy to 1 Hz, using JRC's advanced Direct Digital Synthesis (DDS) PLL system and a high-precision magnetic rotary encoder. The tuning is so smooth you will swear it's analog! An optional high-stability crystal oscillator kit is also available for  $\pm 0.5$  ppm stability.
- A superior front-end variable double tuning circuit is continuously controlled by the CPU to vary with the receive frequency automatically. The result: Outstanding 106 dB Dynamic Range and +20 dBm Third-Order Intercept Point.
- Memory capacity of 200 channels, each storing frequency, mode, filter, AGC and ATT settings. Scan and sweep functions built in. All memory channels are tunable, making "MEM to VFO" switching unnecessary.
- A state-of-the-art RS-232C computer interface is built into every NRD-535D receiver.
- Fully modular design, featuring plug-in circuit boards and high-quality surface-mount components. No other manufacturer can offer such professional-quality design and construction at so affordable a price.

# EEB NATIONS LARGEST SHORTWAVE DEALER

## PHILLIPS DC-777 *Now SWL in Your Car!* In-Dash Mobile AM/FM/Shortwave Cassette Receiver

**SAVE \$200.00**

- \* Frequency: 530-1710kHz, 3.1-21.9MHz AM, 87.5-108MHz FM
- \* Modes: AM, FM, FM Stereo
- \* Selectivity: AM Wide/ Narrow
- \* Tuning steps: 1, 10kHz AM, 50kHz FM
- \* Display: Backlit LCD
- \* Antenna: Motorola jack
- \* IF: Double conversion superhet
- \* Response: 40-20,000Hz
- \* Power requirements: 13.6 VDC
- \* Size: 7"W x 2"H x 6"D ; wt. 8 lbs.



List \$499.00 **Super Summer Saver \$299** +s&h

## !! WARNING !!

**FCC 1-93 Threatens Your Freedom.....**to listen to any part of the RF spectrum you wish. A bill passed by Congress will stop the manufacturing and the importation of scanning receivers that cover or can easily be modified to cover the cellular phone band.

Now is the time to buy your full frequency coverage scanner.... after Oct. 24, 1993, it may be too late!!

## TOP SCANNING RECEIVERS

AOR-	AR1000XLT <sup>◇</sup>	\$419.95
	AR3000A <sup>◇</sup>	\$1029.95
	AR2800 <sup>◇</sup>	\$449.95*
REALISTIC-	PRO2006 <sup>†</sup>	\$359.95
	PRO43 <sup>†</sup>	\$299.95
	PRO46 <sup>†</sup>	\$189.95
BEARCAT-	BC200XLT <sup>†</sup>	\$229.95*
	BC760XLT <sup>†</sup>	\$249.95
	BC800XLT <sup>◇</sup>	\$219.95*
	BC700A <sup>†</sup>	(call)
	BC2500XLT <sup>‡</sup>	(call)
	BC890XLT <sup>‡</sup>	\$259.95
	BC8500XLT <sup>‡</sup>	(call)
ICOM-	ICR1 <sup>◇</sup>	\$479.95
	ICR1000 <sup>◇</sup>	\$649.95
	ICR7000 <sup>◇</sup>	\$1279.00
	ICR71000 <sup>◇</sup>	\$1329.00

## YAESU FRG100 "Best Communications Receiver 1992"



We agreed with WRTVH...  
This is the GREAT receiver!  
Special price and \*FREE\* 1 year  
EEB extended warranty (\$59.95 Value)....



**NOW only \$549.95** +s&h

- 50kHz-30MHz
- Multimode (FM Option)
- Tuning steps: 10,100, 1000Hz
- Filters: 2.4, 4, 6kHz(Opt. CW .5kHz)
- 50 Memory channels
- Dual ant. inputs: 50 & 450 Ohm
- Power: 11-14VDC 1.2A max.  
AC Adaptor incl.

### EEB FRG100 HP Filter Upgrade

We install on our own board, a Collins 6.0kHz AM and a new model 15 pole 4kHz ceramic filter. These 2 filters offer significant receiver upgrade, rectifying the only weak link the FRG100 exhibits.

**FRG100 HP & 2 Filter Upgrade... \$699.95** +s&h  
Opt. CW 500 Hz Collins Filter.....\$115.00

## ICOM R72A OVER 30% OFF

Hurry on this deal... A very special buy allows us to pass along these unbelievable savings. ICOM R72A list \$1145 - OUR regular discount price \$959.95.....but now our special is \$769.95. That's **WAY BELOW** dealer cost.  
**!!HURRY!!** There is a limited quantity at this price.

- 30kHz-30MHz
  - Multimode (FM Option)
  - Direct keyboard entry
  - 101 Memory channels
  - Power: 13.8VDC, 100, 120.240VAC
  - Size: 9.5"W x 3.7"H x 9"D; WT: 10.6 lbs.
- List \$1129.00



**WHILE THEY LAST \$769.95** +s&h

## KENWOOD R5000 Owners SAVE 40%



The single, most effective way to improve the R5000 is to replace the AM wide filter with a high quality 8-pole crystal filter. This filter plugs in - no soldering or special tools! This is a special offer and limited to our stock, so DON'T WAIT!!

Compare: Kenwood YK88A-1 @ \$94.95. EEB offers this same filter on our epoxie plug-in board and saves you 40%!!

**Special Sale \$57.00** +s&h



ELECTRONIC EQUIPMENT BANK  
323 MILL Street NE  
Vienna, VA 22180

We accept VISA/MasterCard/American Express/Discover  
We ship via UPS, Federal Express and Mail  
**ORDERS: 800-368-3270**  
Local Tech: 703-938-3350  
FAX: 703-938-6911

Sorry, no COD's  
Free Catalog in USA  
Prices Subject to change  
Prices do not include freight  
Returns subject to 20% restock fee

## TOP SWL RECEIVERS

SONY-	ICF-SW33	\$179.95
	ICF-SW55	\$349.95*
	ICF-SW77	\$469.95
	ICF-SW7600	\$219.95
	ICF-2010	\$349.95
PANASONIC-	RFB45	\$169.95
	RFB65	\$219.95
SANGEAN-	ATS606	\$159.95
	ATS803A	\$179.95
	ATS818	\$199.95*
	ATS818-SC	\$229.95*
ICOM-	R71A	\$1059.00
	R72A	\$769.95†
	R9000	\$5199.00
DRAKE-	R8	\$969.00
JCR-	NRD535	\$1199.00*
	NRD-535D	\$1699.95*
LOWE-	HF150	\$599.95
	HF225	\$749.95
GRUNDIG-	700	\$449.95*

\* Temporary Price Reduction (SAVE)  
† Super Low Price Limited to Stock

# POPULAR COMMUNICATIONS

October 1993

Volume 12, Number 2



12



27



34



58

## FEATURES

### Scanning Armored Cars 8

Via your scanner, monitor the high-security vaults rolling through neighborhoods as they transport valuables. *By Chuck Robertson*

### Now Hear This 10

Messages via M.A.R.S., linking service personnel to loved ones at home, date back to 1925 and are still being used in the 1990's. *By Jerry Cody*

### Tune In On Yesterday 12

Visualize the events and stations that shaped radio, as it was originally. *By Alice Brannigan*

### Scramble Ramble 16

Law enforcement communications security is a matter of life and death for agents. *By Jerry Cody*

### Portable Satellite Telephone System Becomes A Star 22

The MAGNaphone MX-2020P is a shining star as it wows audiences in its film debut. *By Deena Marie Amato*

## COLUMNS

Emergency .....	18
Broadcast DXing .....	27
Scanning VHF/UHF.....	32
Satellite View .....	34
You Should Know.....	38
RTTY.....	42
How I Got Started .....	49
Listening Post .....	50
Books You'll Like .....	54
Communications Confidential.....	58
Pirates Den .....	65
Telephone Enroute .....	66
Washington Pulse .....	68
Clandestine Communique .....	71
CB Scene .....	72

## DEPARTMENTS

Beaming In .....	4
Mailbag .....	6
New Products.....	31
World Band Tuning Tips .....	40
Communications Shop.....	75

**This month's cover:** An operator uses the MAGNaphone MX-2020P to place a phone call via Inmarsat satellite from remote areas of the world. Photo by Larry Mulvehill, WB2ZPI.

## EDITORIAL STAFF

**Tom Kneitel, K2AES/KNY2AB**, Editor  
**Deena Marie Amato**, Associate Editor

## CONTRIBUTING EDITORS

**Gerry L. Dexter**, Shortwave Broadcast  
**Robert Margolis**, RTTY Monitoring  
**Gordon West, WB6NOA**, Emergency  
**Don Schimmel**, Utility Communications  
**Edward Teach**, Alternative Radio  
**Harold A. Ort, Jr.**, Military consultant  
**Janice Lee**, Radar Detectors  
**Chuck Gysi, N2DUP**, Scanners  
**Roger Sterckx**, AM/FM Broadcasts  
**Harry Helms, AA6FW**, Thoughts and Ideas  
**Donald Dickerson, N9CUE**, Satellites  
**Kirk Kleinschmidt, NT0Z**, Amateur Radio  
**Joe Carr, K4IPV**, Antennas

## BUSINESS STAFF

**Richard A. Ross, K2MGA**, Publisher  
**Donald R. Allen, N9ALK**, Advertising Mgr.  
**Emily Kreutz**, Sales Assistant  
**Dorothy Kehrwieder**, General Manager  
**Frank V. Fuzia**, Controller  
**Catherine Ross**, Circulation Director  
**Melissa Kehrwieder**, Data Proc. Manager  
**Carol Licata**, Data Processing  
**Denise Pyne**, Customer Service

## PRODUCTION STAFF

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

A publication of



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

Offices: 76 North Broadway, Hicksville, NY 11801.  
 Telephone (516) 681-2922. FAX (516) 681-2926. Popular Communications, Inc. Second class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year \$19.95, two years \$38.00, three years \$57.00. Canada/Mexico—one year \$22.00, two years \$42.00, three years \$63.00. Foreign—one year \$24.00, two years \$46.00, three years \$69.00. Foreign Air Mail—one year \$77.00, two years \$152.00, three years \$228.00.

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 © 1993 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.

# MONITOR MORE WITH ADVANCED EQUIPMENT FROM UNIVERSAL!

## COMMUNICATIONS RECEIVERS

### ● Japan Radlo NRD-535D



The deluxe "D" version with BWC, ECSS and three filters included. .... **\$1699.00 (+\$18)**  
NRD-535 standard version ... **\$1199.00 (+\$16)**

### ● Icom R-9000

The ultimate "DC to daylight" receiver. With built in CRT. Write for details.....**\$4999.00 (+\$30)**

### ● Drake R-8

A state-of-the-art receiver for the 90's. Five bandwidths, Syncro., etc ..... **\$959.95 (+\$11)**

### ● Kenwood R-5000

A powerful receiver for the serious DXer. An exceptional value. .... **\$899.95 (+\$12)**

### ● Lowe HF-150 *NEW! Made In England.*

Finally ... a true portable communications receiver. Write for brochure. .... **\$599.95 (+\$7)**

## PORTABLE RECEIVERS

### ● Panasonic RFB-45



Keypad, 18 memories, scan and search functions, S.S.B., fine tuning knob, clock-timer, S-METER, etc. .... **\$169.95 (+\$5)**

### ● Sony ICF-SW77

Sony's finest! 94 alpha memories, dual clocks, sync. detection. .... **\$489.95 (+\$6)**

### ● Sangean ATS-818CS

Finally, a quality digital receiver with cassette, 45 mems., SSB. .... **\$249.95 (+\$7)**

### ● Grundig Satellit 700

Hi-tech with beautiful fidelity and style. Synchronous tuning. .... **\$479.95 (+\$6)**

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

## COMMUNICATIONS BOOKS

### ● Passport To Worldband Radio

By L.Magne. Graphic presentation of all SWBC stations. Equipment reviews too. .... **\$16.95**

### ● Shortwave Receivers Past & Present

By F.Osterman. Your guide to 200 receivers with new-used value, specs, features. .... **\$8.95**

### ● Aeronautical Communications Handbook

By R.Evans. A mammoth book on all aspects of shortwave aero listening. 266 pages. ... **\$19.95**

### ● Complete SWL's Handbook

By Bennett, Helms, Hardy. Nearly 300 pages on all aspects of SWL'ing. .... **\$16.95**

### ● Guide To Utility Stations

By J.Klingenfuss. The definitive guide to utility stations- CW, SSB, FAX and RTTY. .... **\$36.95**

### ● Easy-Up Antennas for Listeners & Hams

By E.Noll. Low cost, easy to erect antennas for LW, MW, FM, SW, SCAN and HAM. .... **\$16.95**

### ● World Radio TV Handbook

All SWBC stations by country with schedules, addresses, power, etc. Reviews too. .... **\$19.95**

### ● Discover DXing!

By J.Zondlo. An excellent introduction to DXing the AM, FM and TV bands. .... **\$4.95**

✓ Please add \$1 per title for shipping.

## MULTI-MODE CONVERTERS

### You can monitor:

- ◆ Coastal Station Tfc.
- ◆ Shlp Telexes
- ◆ Press Reports
- ◆ Press Photos
- ◆ Satellite Photos
- ◆ Weather Maps
- ◆ Unclass. Military Tfc.
- ◆ Diplomatic Traffic
- ◆ Ham Messages
- ◆ Weather Reports
- ◆ Research Traffic
- ◆ Packet Messages
- ◆ Radio Bulletins

If you are only listening to your shortwave radio you are missing half the fun. With the addition of a Universal decoder and monitor you can see the world. The shortwave spectrum is filled with interesting text messages and photos that you can intercept and display. If this sounds interesting to you, request our two free pamphlets: *Listening to Radioteletype and Receiving FAX on Your Shortwave Radio*. Shown above is the Universal M-900 (\$429.95) which decodes: Morse code, Baudot RTTY, Sitor A/B, FEC-A and FAX. Contact us today for information on the full line of Universal decoders.



### ● Universal M-900

## DATA AND TONE READER

### ● Universal M-400



Forget the limitations you have come to expect from most "readers". The self-contained Universal M-400 is a sophisticated decoder and tone reader offering exceptional capabilities. The SWL can decode: Baudot, SITOR A&B, FEC-A, ASCII and SWED-ARQ. Weather FAX can also be decoded to the printer port. The VHF-UHF listener will be able to copy the ACARS VHF aviation teletype mode plus GOLAY and POCSAG digital pager modes. Off-the-air decoding of DTMF, CTCSS and DCS is also supported. Big two-line 24 character LCD. The M-400 can even be programmed to pass only the audio you want to hear based on CTCSS, DCS or DTMF codes of your choosing. The M-400 runs from 12 VDC or with supplied AC adapter. The American-made Universal M-400 is the affordable accessory for every shortwave or scanner enthusiast. Specification sheet available. Only **\$399.95 (+\$6)**.

### ● Universal M-8000

The M-8000 offers tremendous intercept power to let you listen to the exciting world of radioteletype and FAX on shortwave, VHF and satellite! It includes capabilities not available in other decoders. The VGA color output permits the presentation of more information than ever before. A double status line indicates all current later and decoder settings. The lower left corner displays bars. A horizontal window at the bottom of the screen shows a continuously updated, spectral display. A square window in the lower right corner features a simulated X-Y tuning scope. The M-8000 decodes all the "standard modes" plus ARQ-M24 (TDM), FEC-A, FEC-S, ARQ-E, ARQ-S, SWED-ARQ and Piccolo used by diplomatic, military and aeronautical concerns worldwide. The M-8000 itself is automated, utilizing a microprocessor to control shift tune and selection. Manual tuning is facilitated by on-screen bargraph tuning indicators for level, mark and space plus a simulated tuning scope. Instructive LEDs for: Mark, Space, Buffer, CW Lock, Squelch, Idle, Sync., Sel-Cal, Data, Tuning Error and Data Error. Other refinements include: ATC, UOS, built-in diagnostics, bit inversion (Baudot), speed readout, external scope output plus serial and parallel printer ports. Can be 19 inch rack mounted with optional mounting kit. 9 Lbs. (15 Lbs. ship). 115/230 VAC, 50/60 HZ. Requires a VGA analog color monitor. **\$1299.00 (+\$10)**



demodulate five bar-graph type tuning

- Universal ships worldwide.
- Prices and specifications are subject to change.

- Universal in business since 1942.
- Visa, Master & Discover Card.
- Used equipment list available.

## ★ HUGE FREE CATALOG ★

Universal offers a new communications catalog covering shortwave, amateur and scanner equipment. There are also antennas, books, parts and accessories. This informative **100 page** reference covers everything for the radio enthusiast. With prices, photos and full descriptions.

Available **FREE** by fourth class mail or **\$1.00** by first class mail.

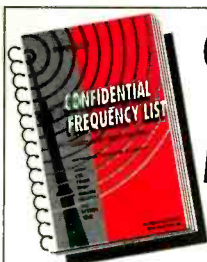


**Showroom Hours**  
Mon.-Fri. 10:00 - 5:30  
Thursday 10:00 - 8:00  
Saturday 10:00 - 3:00

**universal radio inc.**

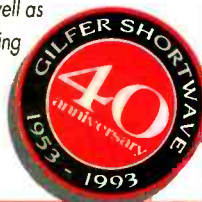
**Universal Radio, Inc.**  
6830 Americana Pkwy.  
Reynoldsburg, Ohio  
43068 U.S.A.

☎ 800 431-3939 **Orders**  
☎ 614 866-4267 **Information**  
☎ 614 866-2339 **Facsimile**



**GILFER'S FAMOUS  
"CONFIDENTIAL  
FREQUENCY LIST"  
ONLY - \$22.95**

Popular Communications magazine says: "Can't imagine anyone attempting to listen to HF voice or CW/RTTY communications without a handy copy." Most comprehensive list of SW utilities in the 1613 kHz - 30 MHz region. Over 30,000 frequencies with call sign, country, details covering across marine, embassy, weather, press, feeders, INTERPOL, time, channel markers, aero and more. Now includes voice, RTTY, CW and FAX modes as well as charts. Features spiral binding and reverse call sign list.  
**Add \$4 in USA and Canada. \$15.00 overseas.**



## GILFER SHORTWAVE

52 Park Ave., Park Ridge, NJ 07656

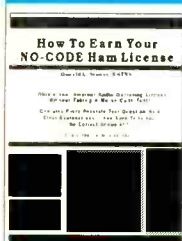
(close to GS Parkway, NY Thruway, Rt. 80 and Rt. 287. Phone for directions and hours.)

201-391-7887

SEND \$1 FOR FIRST CLASS CATALOG

CIRCLE 65 ON READER SERVICE CARD

## How To Earn Your NO-CODE License



Don Stoner, W6TNS, has done it again with the only guaranteed study material. If you fail your test, NARA will refund your money—no questions asked! The first edition was critically acclaimed—now Don has updated it for the July, 1993/ June, 1997 period. **YOU CAN DO IT!**

## We Guarantee it!!!

**How To Earn Your No-Code Ham License** is not a memorization book and it isn't loaded with material you won't be asked on your test. "Twin Noise Squelch" explains the theory behind the questions in a simple, easy-to-understand style. The actual questions that will be asked are included at the end of each chapter so you can *test yourself immediately*. Numerous photos and drawings make the information easy to absorb. Great for Novice testing too! **How To Earn Your No-Code Ham License** is an ideal classroom textbook and is supported by testing software for the IBM and Macintosh and an instructors guide, with view foils, for teachers. In stock at all major Amateur Radio dealers or call NARA toll-free for same day shipping. Now only \$9.95 (\$2.00 S&H)



Box 201407, Arlington, TX 76006  
**1-800-GOT-2-HAM**

CIRCLE 75 ON READER SERVICE CARD

# BEAMING IN

BY TOM KNEITEL, K2AES

## AN EDITORIAL

### You Be The Judge

**I**t would seem that there are certain basics about a person's rights to being fairly judged in this country. A citizen is given to believe that they are presumed to be innocent until they are charged with breaking a law, then brought into a court of law and can proven to be guilty. There are courtroom procedures, rules of evidence, legal precedents and many other factors that bear upon proving someone to be guilty. As citizens, the Fourteenth Amendment assures us all the right to this due legal process before we may be deprived of life, liberty, or property. We learned about it in school. Even people who slept through Social Studies, couldn't miss it on *People's Court* and *L.A. Law*.

In the layman's mythology we all know it to be true because it's on TV, if a person is charged with a violation of a law, they are summoned to a court of law. An attorney representing the people presents a case, along with all evidence and the testimony of witnesses, in an effort to prove the defendant guilty. The defendant is permitted to face his or her accusers. Subsequently, the defendant's attorney mounts a defense consisting of an alibi, evidence, witnesses, and possibly testimony from the defendant in the hope that these things will refute the charges and prove the defendant to have been wrongly accused. After that, a jury (or sometimes the judge) will weigh the evidence and then render a verdict of guilty or not guilty.

In a small claims court or instances of those traffic law violations where the worst possible damage would be a relatively small amount, the proceedings are usually somewhat informal. Still, the presumption of innocence until guilt which is proven before a judge, remains intact.

Therefore, I have always had a difficult time trying to buy the premise of the way they come to get someone with the hook at the FCC. Let's say that a station or individual is claimed to have done something that an FCC employee doesn't think is in line with FCC regulations.

There are lots of things they don't like at the FCC, and depending upon the radio service, they don't miss a trick. Besides the definite ones like not lighting a broadcast tower or running too much power, there are some that are fuzzy. This includes areas touching upon obscenity.

Next, consider that although you are required to follow the FCC operating re-

quirements to a tee, most of the FCC commandments are regulations, not laws. Though many people consider them all to be laws, this is giving them more status than regulations deserve. There are differences between a law and a departmental regulation.

For practical purposes, there would really be no harm for people to think of the regulations as laws. Unfortunately, when the agency perceives that one of its regulations has been violated, the Constitutional guarantees of Fourteenth Amendment vaporize. The Fourteenth Amendment assures citizens that the government can't come along and enforce any law that abridges the privileges of citizens. Well, who said the all the FCC regulations are laws?

The agency immediately pronounces the licensee "apparently" guilty, and then sends a "Notice of Apparent Liability" (NAL) demanding payment of a monetary forfeiture (read that "a fine"). That means the presumed-guilty licensee must either prove innocence, plead guilty with an explanation and beg for a reduced amount, or or else cough up the entire fine.

Attempting to prove one's innocence after having been deemed "apparently" guilty by the FCC right from the outset is bad enough. It gets worse. There is a "hearing board" made up of a panel of FCC employees. This is hardly a jury of one's peers, or impartial citizens. The officiating honcho is called an "Administrative Law Judge." Don't be too impressed by the use of the title "judge" here. This is not a judge in the sense that this is a black-robed person appointed or elected to the bench in a court of law. This "judge" is not necessarily an attorney.

This "judge" is an FCC employee the agency has assigned this job within the agency's own private internal justice system. This person is no more a court system judge than you or I. Although the end result may seem the same as a courtroom trial, these events aren't called trials, they are "hearings." Courtroom rules of evidence do not apply.

Barry A. Stevenson was sent an NAL by the FCC because the agency claimed that there were complaints filed against him, confirmed by their own investigation, that he had operated an unlicensed radio sta-

(Continued on page 74)

For superior performance  
most advanced technology  
and greatest sensitivity

# OPTOELECTRONICS

## Model M1 & 3000A

Hottest on the Market with:  
**Digital Filtering** for the fastest method to reduce false counts—no loss of sensitivity & **Digital Auto Capture** that auto holds and stores—working even near strong RF fields!

- **3000A-Multifunction HandiCounter®**
  - 15 Gate times selectable • 7 hrs. Battery life
- **M1-Full Range HandiCounter®**
  - 10 Gate times • 6 hrs. Battery life

Both offer:

- OE10—Ultra Fast & Reliable Counter IC
- Standard Backlit 10 digit LCD Display
- 16 Segment Signal Strength Bargraph
- 3 Data Storage Registers
- 1.3% of a second Measurement Rate
- 1Hz Resolution in 1 Sec. up to 250MHz
- 2 Wire Serial Output for Data Logging



Antennas not included

M1 \$229.  
3000A \$329.



## Model 8030 Bench/Portable Multifunction Counter

10Hz - 3GHz, extremely High Sensitivity, High

Resolution and Accuracy, includes Bargraph, ± 1ppm TCXO Two Inputs, Trigger Variable and Hold Button

\$579.  
Premium TXCO \$135.  
BLB Backlight Beeper \$ 75.

## DYNAMIC DUO FM Intercept, Detect, Decode Tones...CTCSS, DTMF and DCS

The R10 is a unique FM Communication Test Receiver with security and surveillance applications. The R10's full spectrum audio output interfaces directly with the DC440 to monitor CTCSS and DTMF, FM Deviation and Relative Signal Strength.

### Optoelectronics Advantages

1. Decode & Display CTCSS, DTMF or DCS & DTMF simultaneously
2. 127 Character DTMF Buffer with scrollable 10 Character Display. No Lost Data
3. LCD Display, visible in bright Sunlight
4. Serial Computer Interface
5. Activity indicator—lets operator see when unit is actively decoding
6. High Quality NiCad Battery pack option
7. Actual DTMF Characters Displayed!



R10 \$359.  
DC440 \$259.

Save! Buy Both! PACKAGE \$549.

**Model APS104** Tunable band pass filter system Covers 10MHz to 1000MHz. Tunes continuously over more than 5 octaves and maintains a constant 4MHz band width.

Use with counter or R10 Interceptor to increase pick-up distance up to 10 times. Ultimate Security Sweeper. **\$995.**

**The Model CF802** 835MHz ± 10MHz filter/amplifier for use with near field instruments such as the Model R10 Interceptor and Models 3000A and M1 HandiCounters® to extend the pick up distance by limiting the band width and adding amplification. The pick-up distance when using the CF802 with the Model 3000A or M1 will improve from 25 feet to over 200 feet. When used with a Model R10, the improvement will be from 75 feet to over 750 feet. **\$149.**

**TC200 Tone Counter** The most economical way to get CTCSS (Squelch Tone) measurement capacity. Actually measures the tone frequency! It is not limited to standard tones but has 5Hz to 300Hz continuous range with .1Hz resolution. The TC200 is fast with .2 second display update. A five pole switched capacitor filter ensures reliable counting even with voice present. **\$179.**

**Model SSB220** Directly measures the frequency of single sideband transmitters! The ideal instrument for precise net frequency control and a must for non-synthesized transceivers.

- Accuracy is 1x10<sup>-6</sup>. Optional 1 c 10<sup>-7</sup>
- Range: HF: .5 - 30MHz  
VHF: 10MHz - 3GHz
- HF antenna, VHF antenna Inputs
- Radio Audio/PTT, Serial data (I/O) Outputs **\$279.**

### Save on Antenna Packages

Ant Pak I: TA100, RD27, RD800.....\$65.00  
Ant Pak II: RD27, RD50, RD100, RD440, & RD800.....\$99.00

### ORDER LINE

**1-800-327-5912**

305-771-2050 • FAX 305-771-2052  
5821 NE 14th Ave, Ft. Laud., FL 33334  
5% Ship/Handling (Min \$5 & Max \$10) U.S. & Canada. 15% outside continental U.S.  
Visa, Master Card, C.O.D., Cash or Money Order only.



APS104



CF802



TC200



Saves on Ant Paks

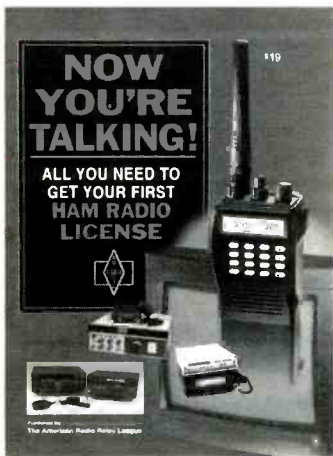


SSB220

# NOW YOU'RE TALKING!

## The Code-Free Ham License is Here

Enjoy all Amateur Radio privileges above 30 MHz without having to pass a code test. All you have to do is pass a 55-question exam on basic radio and the FCC regulations. ARRL's new book, **Now You're Talking** makes understanding what is required on the test a snap! And there are exams given all over the country every weekend.



Just think how much fun you'll have communicating through repeaters, enjoy Sporadic E skip and worldwide communications on six meters when conditions are right. There's satellite communication and you can even talk to Astronauts and Cosmonauts in orbit. Enjoy friendly local communication both direct and through repeaters. Help with disaster drills and the real thing! Sound like fun? It is! Order your copy of **Now You're Talking** below: Enclosed is \$19 plus \$4 for shipping (a total of \$23) or charge \$23 to my  VISA  Mastercard  Discover  American Express

For More Information Call  
1-800-326-3942

Signature \_\_\_\_\_

Acct. No. \_\_\_\_\_

Good from \_\_\_\_\_ Expires \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ PC

THE AMERICAN RADIO RELAY LEAGUE  
225 MAIN STREET  
NEWINGTON, CT 06111

# MAILBAG

## LETTERS TO THE EDITOR

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

### Support Public TV Stations, What?

Your witty comments in the July editorial concerning TV station fund-raising techniques were enjoyed. I can assure you that if anybody at PBS wears sackcloth, it is sackcloth with a designer label.

George Zimmerlee, N4XDC  
Marietta, Georgia

### Changing The Name of Amateur Radio

With reference to your June editorial, suggesting that the term "Amateur Radio" be discontinued and replaced by a more updated one, I would like to offer several thoughts. First, based upon the operating skills I have witnessed coming from many no-code licensees, I feel the word "amateur" is becoming more appropriate, not less. Second, if the service absolutely must have a new name, how about: "The Bright New People Who Are Too Damn Lazy To Put Out The Minimal Effort To Learn The Code Radio Service"?

Ken R. Noffsinger, AE8I  
Tipp City, Ohio

Thank you for raising the question regarding whether the term "amateur radio" has now become more of a liability than an asset. Given the meaning most people today assign to this word, the answer is "yes." In Microsoft Works Version 2, the following synonyms are listed for amateur: "nonprofessional, beginner, unskilled, inexperienced, incompetent, amateurish, bungled, unfit." Clearly, the current understanding of the word makes it inappropriate to describe our radio service. Moreover, at those times when policy makers are pressed for decisions about reallocating frequencies, this inaccurate descriptive label becomes an obvious liability. Think about how the names of other radio

services describe or imply the production of some social or economic service or product: petroleum, forest products, police, fire, manufacturer's, land transportation, highway maintenance, auto emergency, business, railroad, broadcasting, etc. The word amateur does not describe any social or economic service or product, and it even has a definitely negative connotation.

Other radio services compete with us for spectrum space, and they are always looking for more space. It is obviously a mistake to continue allowing our radio service to carry this worn-out label. We now need a terminology that indicates that our service is not-for-profit, public-domain, domestic-international, and research-developmental in nature. Sure, we can still call ourselves hams, and we can tell one another we are amateurs, but we need to go on the FCC books with something better.

In our hearts, we would always know that amateur radio operators are part of a proud tradition, and that when the word was originally applied to our radio service it was because it was derived from the Latin *amor*, to love, because we loved the beauty of the craft, science, and artistry of radio. But that was long ago. We don't love it any the less now, but we do need to get our official name changed just to stay viable.

Theodore Walker, Jr., WB4MFI  
Dallas, Texas

### Language Changes

I support you in the July editorial relating to dreadful and degrading changes in the use of language, for example the use of "go" substituted for "said." Perhaps the irritants you outlined are only secondary to the fact that AM broadcasting has also degraded to the point where it is also not worth listening to.

No longer is AM the rich source of riveting stories to stretch the imagination, nor the place to look for other imaginative programming (except for live sports). It has become the place for cheap programming that allows the station to survive in this area of stiff competition from other media. Unless you're interested in syndicated talk shows conducted by people who think they're going to succeed Father Coughlin as the radio leaders of the nation, don't bother!

Your editorial mentioned using a Diskman. My choice is an old RTR tape recorder with tapes of broadcasts from the days when AM radio was something of value. I can even listen in my car.

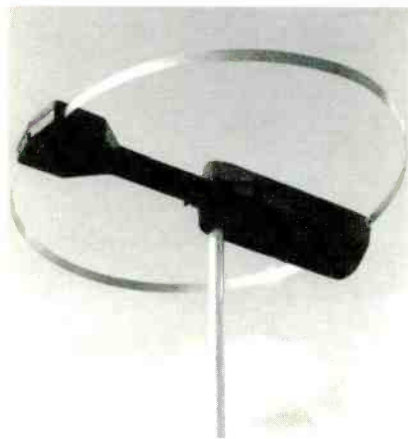
David N. Klein  
Danvers, Mass



# STEP UP YOUR SHORTWAVE SET UP.

## ISOLOOP 10-30 HF PORTABLE ANTENNA.

This is the one that gives you freedom of speech, whether you have to deal with restrictive covenants at home or in your apartment or condo, or if you are traveling in your boat, car, or RV. It features 150 watts, continuous coverage from 10 to 30 MHz, narrow bandwidth to suppress out-of-band signals. The IsoLoop antenna comes fully assembled with no mechanical joints. There is simply no better value in antennas!



## PK-232MBX DIGITAL MULTI-MODE CONTROLLER.

It can receive eight different types of data signals, including Morse code, Baudot, ASCII, Time Division Multiplex (TDM), WEFAX, NAVTEX, Packet and AMTOR. Also featured is SIAM which automatically identifies many types of digital signals, excellent software support for PC compatibles, Macintosh and Commodore 64 & 128 computers. This unit is essential for the serious digital listener.



## AEA-FAX.

Here's the superior way to decode multi-level gray fax images received by your general coverage receiver. Featured is AEA's exclusive on-screen tuning scope that allows you to simultaneously tune and receive. There is also Autolist for unattended image capture and save-to-disk, "daisy-chain" external RS-232 input allowing AEA-FAX to share a COM port with PK-232 MBX, up to 16 gray levels (VGA), support for EGA, CGA and Hercules formats. AEA-FAX prints to HP LaserJet or Epson compatible printers and includes hardware demodulator, 3 1/2" and 5 1/4" software disks plus a comprehensive instruction manual. AEA-FAX is a must for your set-up!

*To connect with the AEA dealer nearest you or for product sheets, call (800) 432-8873.*



Advanced Electronic Applications, Inc.

PO Box C2160, 2006 - 1961h St. SW, Lynnwood, WA 98036 Sales: (206) 774-5554

# Scanning Armored Cars

## *Don't Overlook The Possibilities of Monitoring the Rolling Vaults*

BY CHUCK ROBERTSON

Cash needs to move between banks and stores, and it goes to check cashing services, factories, offices, and many other types of businesses. Also, jewelry requires transportation, as does precious metal ingots, art treasures, and other valuable items. For as long as valuables of any kind have been transported, there have been those who have conspired to steal that property. Through the centuries these people have been categorized as pirates, stagecoach robbers, and train robbers. These days, they are most interested in armed cars and trucks. The stakes are high, and these thieves are often both resourceful as well as violent.

Armored vehicles provide an important service by transporting valuables. The companies providing this service have gone to considerable lengths to ensure that they do this safely and efficiently. But it isn't easy, and every trip is potentially a dangerous trip since millions of dollars may be rolling down Main Street.

Communications are a vital part of these activities. If you have a scanner, you can monitor this armor-plated action!

### **Ridin' Shotgun**

An armored vehicle is a small rolling fortress. There are trained and armed personnel inside the truck that has been constructed with walls, tires, and windows that are bulletproof. Slots are provided throughout the body of the truck so those on the inside may use firearms to defend the property they are transporting.

Special ventilation systems are impervious to attacks by gas. In the event the driver should be overpowered by robbers, a switch can be activated that will shut down the vehicle's ignition so that it can't be started again.

Some of the bags used to transfer money are dummy sacks containing alarms, homing transmitters, exploding dye bombs, or other similar surprises.

Every move the armored car makes is carefully planned, although schedules are rotated to avoid easily determined patterns. Sometimes the vehicles are dispatched over the air, or last minute pick-up stops are given by radio. Vehicles must communicate with their dispatcher to



*High security comms keep on rolling via armored trucks.*



*Some items being transported have little intrinsic value. This includes business data, cancelled checks, blood plasma, or radioactive isotopes.*

### Armored Vehicle Services Sampler

**Armored Car Co.**, Louisville, KY: 159.495; Springfield, IL: 461.925; W. Orange, NJ: 463.875  
**Armored Car of York**, PA: 462.80  
**Armored Motor Service of America**, Woodlawn, NY: 457.725 461.80; Grand Island, NY: 464.65; Pompey, NY: 463.375  
**Armored Protective Svc.**, High Point, NC: 462.05  
**Armored Svc.**, Mishawaka, IN: 464.075  
**Armored Transport**, (many locations) CA: 853.6125; El Toro, CA: 452.775; Lucerne, CA: 463.50; Palm Desert, CA: 159.93; Sacramento, CA: 851.4375; Yermo, CA: 464.15; Camas, WA: 464.05  
**Berkshire Armored Car** W. Springfield, MA/Colchester, VT: 159.555  
**Brinks**: wide use: 159.495 467.0125 467.8125; CA 44.20; Wichita, KS: 461.425; MO: 467.7625; Chatsworth, NJ: 461.075; Hopewell Twp, NJ: 461.10; Milway, NJ: 461.25; Brooklyn, NY: 461.6375; OH: 44.44; PR: 464.125; San Antonio, TX: 44.20; Richmond, VA: 461.40; Bremerton, WA: 463.275; Wheeling, WV: 461.275  
**Brooks Armored Cars**, NJ & PA: 159.81  
**City Armored Service**, San Antonio, TX: 154.515  
**Fargo Overland Protective Svc.**, Oneonta, NY: 464.725  
**Hudson Armored Car**, Hartsdale, NY: 462.725  
**Jewelers Protection**, New York, NY: 466.0125 928.0875  
**Loomis Armored Cars**, Anchorage, AK: 159.63; Wasilla, AK: 462.05; Tuscaloosa, AL: 463.575; Bisbee, AZ: 461.025; Tucson, AZ: 461.025 461.80; Yuma, AZ: 44.22; Los Angeles, CA: 508.6375; Denver, CO: 159.81; Glastonbury, CT: 159.75; FL: 43.92; Atlanta, GA 461.55; Chicago, IL: 463.50; Indianapolis, IN: 463.575; Mooringsport, AL: 461.125; New Orleans, LA: 159.99; Baltimore, MD: 150.14; Southfield, MI: 463.45; Holly, MI: 463.275; Minneapolis, MN: 463.575; Jackson, MS: 464.025; Pennsauken, NJ: 501.9625; Las Vegas, NV: 461.975; New York, NY: 463.875; OK: 159.69; Portland, OR: 461.975; Memphis, TN: 159.89 159.945; TX 159.84 466.0375; Corpus Christi, TX: 464.75; El Paso, tx: 464.45; Moody, TX: 463.475; Tyler, TX: 461.625; Bremerton, WA: 462.05; De Pere, WI: 464.25; Scrays Hill, WI: 461.30; all areas: 43.96 154.57 154.60  
**Midwest Armored Express**, Omaha, NE: 464.625  
**Purolator Courier**, USA: 154.57; Los Angeles, CA: 464.425 464.675 475.3625; Los Gatos, CA: 160.20; Baltimore, MD: 452.375; Glenola, NC: 463.725; Cedar Hill, TX: 452.675 452.70  
**Sectran Armored Transport**, Pico Rivera, CA: 464.50 469.50  
**Secured Armored & Courier Svc.**, Medford, OR: 151.775  
**Security Armored Cars**, Honolulu, HI: 159.93 160.20; St. Louis, MO: 461.925  
**Security Armored Express**, MT: 159.66 461.4375 466.4375; Helena, MT: 451.50; Missoula, MT: 462.075  
**Security Couriers**, Gary, IN: 461.05  
**Wells Fargo Armored Transport**, USA: 159.855 160.11; Mobile, AL: 463.625; Little Rock, AR 463.075; Phoenix, AZ: 461.55; Tucson, AZ: 461.825; Colorado Springs, CO: 463.65 464.25; FL: 154.57; Jacksonville, FL: 159.78 464.30; Magnolia Park, FL: 159.60; Orlando, FL: 462.65 461.475; Atlanta, GA: 452.70; Savannah, GA: 463.30; IL: 468.2125; Baton Rouge, LA: 461.75; Churchpoint, LA: 463.275; New Orleans, LA: 452.65; Boston, MA: 452.80; Pelham, MA: 464.80; Taunton, MA: 159.63; MD: 461.7625; Billings, MT: 463.95; Charlotte, NC: 160.08; Omaha, NE: 461.375; NJ: 465.8875; Albuquerque, NM: 462.175; Cleveland, OH: 463.95; Youngstown, OH: 464.60; PR: 150.905 159.69; Columbia, SC: 463.625; Oliver Springs, TN: 463.675; Nashville, TN: 464.25; El Paso, TX: 464.85; Salt Lake City, UT: 463.85; Arlington, VA: 464.65; Roanoke, VA: 452.85; Virginia Beach, VA: 464.45; St. Croix, VI 150.905 157.65

report arrival/departure from pickup/delivery stops. The driver also reports breakdowns, detours, delays, traffic jams, unusual circumstances, or suspicious vehicles.

In the event of a mechanical breakdown, the police are called to the scene until the vehicle can resume its route. If it can't be quickly repaired, its contents are transferred to another armored vehicle.

Armored services usually turn up in the trucking and business radio service bands.

### Inside Stuff

About half of the robberies of armored car services are inside jobs involving one or more former and/or present employees of the company. It's ironic, but nobody knows more about a company's security measures, work shifts, personnel assignments, customers, and times when large amounts of cash are most likely to be collected.

A few months ago, the Revere Armored, Inc., of New York, the nation's tenth largest

armored car company, abruptly shut down. The married couple who owned the company had vanished. It has been alleged that the owners embezzled \$45-million from the company. Employees suddenly found themselves unemployed, and holding salary checks that bounced. Banks, jewelers, and others whose property Revere was holding wanted to know the status of their assets, however it had been impounded.

Company records were a mess, but seemed to indicate that funds held for several different customers had been casually intermingled and then distributed around to customers as required. Millions of dollars in cash was found lying about in desk draws, paper bags, and even in unmarked packages.

The owners of Revere Armored are now facing charges.

Regulations and standards in this industry are spotty. Some states have very stringent operating and licensing requirements for armored car services and personnel, others (New York State, for instance) have none whatsoever.

The public knows very little about armored vehicle operations. We could find no books about the industry. The industry is not anxious for the public to know much about its activities or procedures.

Your scanner could probably provide you with more information than available anywhere else.

**Save on ALL** WITH MANUFACTURERS WARRANTY IN U.S. (copy available on req.)

**REALISTIC**  
Scanners & Radios

**3 WAYS TO SAVE**

**1 FREE**  
SHIPPING & HANDLING  
48 STATES

**2 BIG**  
PRICE REDUCTION

**3 NO TAX**  
COLLECTED  
49 STATES



PRO 43 S298 WITH BATT'S

  
  
Use your CREDIT CARDS

  
  
AND BEYOND POSIBLES

**CALL FREE: 1-800-433-SAVE** 9-5 Central Mon.-Fri.

FORT WORTH COMPUTERS IS NOW

USRADIO

Radio Shack 131-K

USRadio 377 Plaza, Granbury, TX. 76048

# Now Hear This

## Mission To M.A.R.S

BY JERRY CODY

**“W**e’re keeping a candle lit in the window” and “Love go with you always” were radio messages to the United States Air Force and other Armed Forces people that contributed greatly to the success in liberating Kuwait in late February 1991. Throughout the war in the Persian Gulf, United States Air Force Military Affiliate Radio System or M.A.R.S. people linked service personnel with their loved ones at home. The reaffirming of family ties helped to keep the spirit of U.S. Armed Forces people going in the wait to battle Iraqi forces that started in the Summer 1990. The U.S.A.F. Military Affiliate Radio system or M.A.R.S. was there when “Desert Shield” became “Desert Storm” on January 16, 1991.

M.A.R.S. originated in 1925, and was known as the Army Amateur Radio System.

Prior to World War II, civilian amateur members were given intense instruction from United States Army technical people on military radio operations. Shortly before the attack on Pearl Harbor, approximately 8,000 amateur radio operators had been trained.

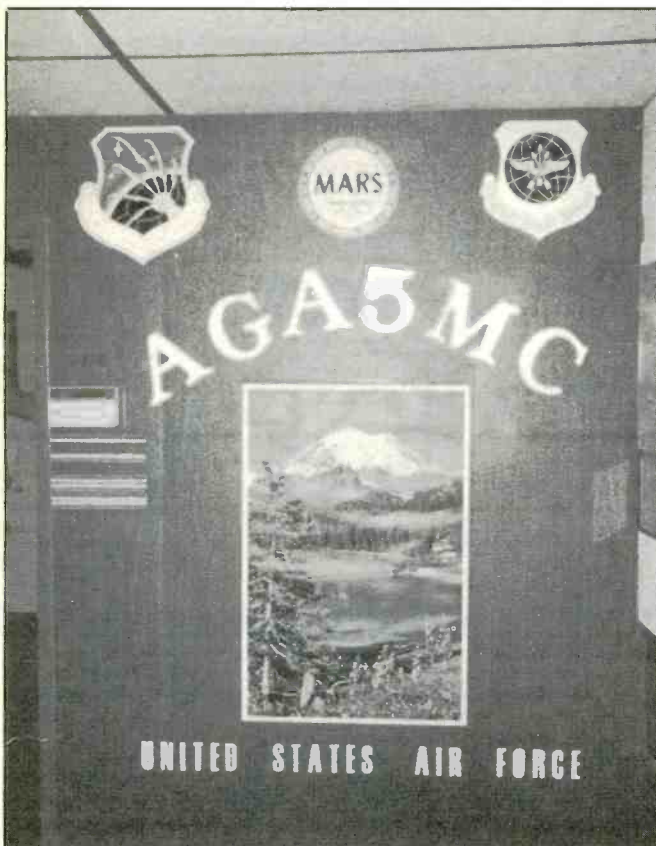
When Congress declared war on Japan in 1941, The Federal Communications Commission terminated all amateur radio operations in the United States for national security reasons. In 1948, military planners decided radio amateur enthusiasts were too valuable not to have on call in the event of a national emergency. When the Army Air Corp became the United States Air Force on September 18, 1947, the Military Amateur Radio System was born.

In 1952, the mission of M.A.R.S. grew. The Military Amateur Radio System would

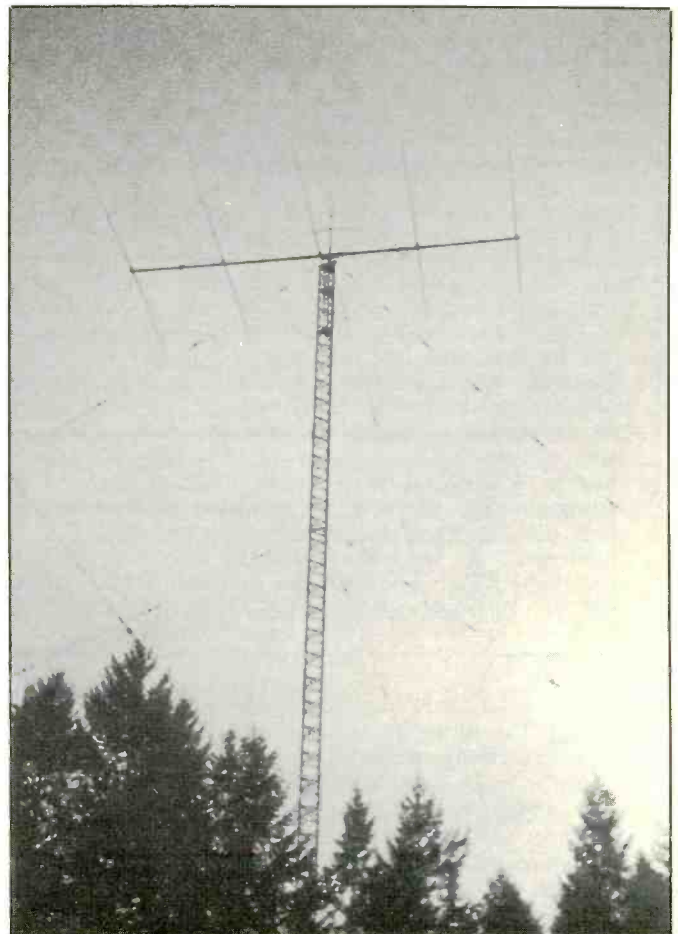
now handle official United States Air Force radio traffic when regular systems were down. Messages from the American Red Cross were now routed through M.A.R.S. systems. Emergency Communications in Civil Defense were also assisted. It was decided the word “Amateur” was no longer appropriate in the M.A.R.S. acronym, and was replaced by “Affiliate.”

In 1959, M.A.R.S. units were given the task of providing back up to United States Air Force numbered units stateside. Transportable communications equipment was acquired to provide mobility, and in 1961, the U.S.A.F. Communications Command assumed management of the Military Affiliate Radio System.

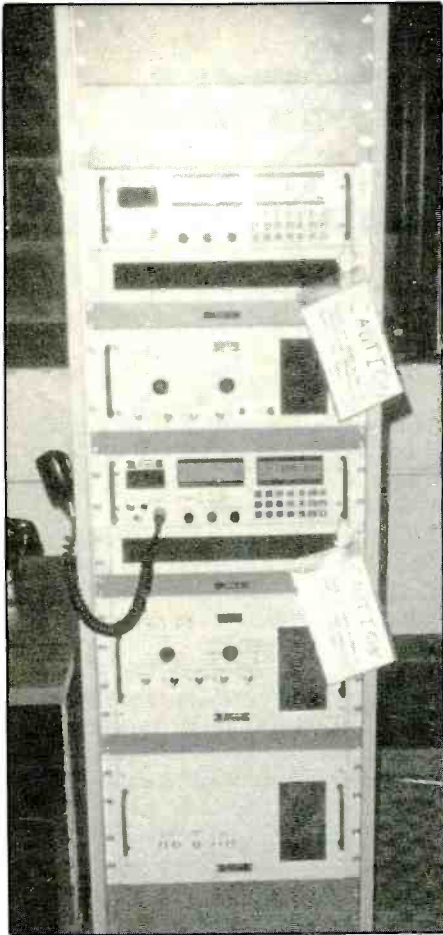
Early during the Vietnam War, commercial telephone service was extremely limited.



Lobby of United States Air Force M.A.R.S. station at McChord, Washington. McChord Air Force Base is located approximately 30 miles South of Seattle, Washington and is home for the 62nd Military Airlift Wing.



High frequency radio tower.



High Frequency transceiving equipment for regional and transcontinental radio communication.

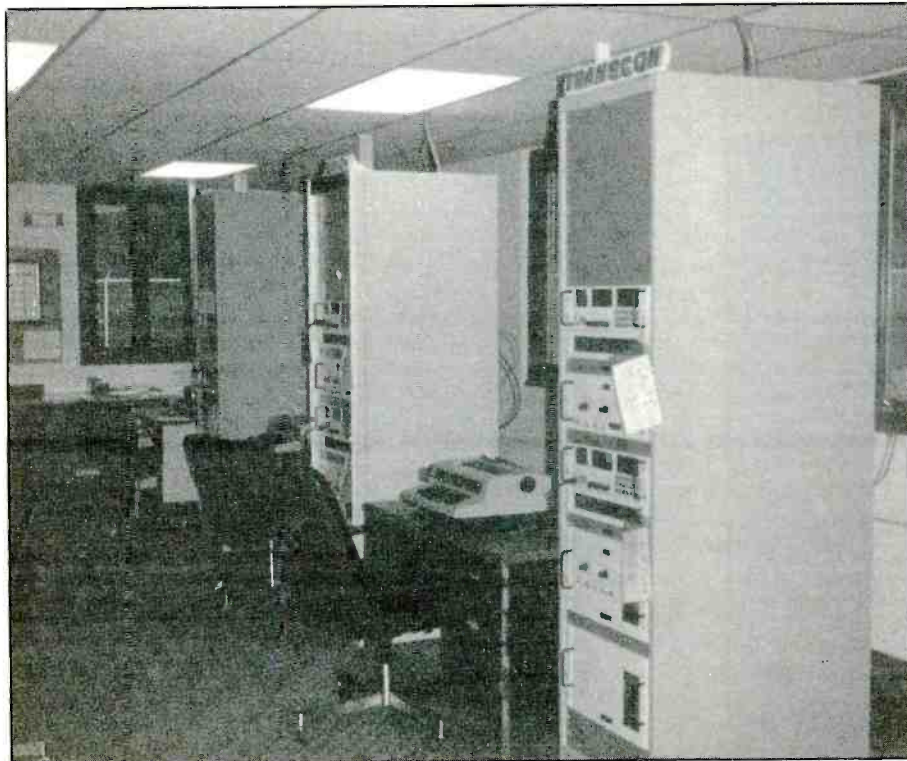
#### M.A.R.S. Frequency Ranges

3500kHz to 4100kHz  
 7300kHz to 7700kHz  
 10,000kHz to 10,300kHz  
 13,900kHz to 14,500kHz  
 15,500kHz to 15,800kHz  
 20,000kHz to 22,000kHz

In 1965, facilities could handle a maximum of 30 outgoing calls a day. With the holidays approaching, the military commanders in Vietnam had quite a predicament. Fortunately, the U.S.A.F. Chief of M.A.R.S. had portable equipment available and by December 14, began processing the 15,000 messages handled during that holiday season.

Today, the United States Air Force operates M.A.R.S. high frequency single side-band networks that stretch from the United States to Panama, the Pacific, Europe, and the Middle East. Frequencies in the 3, 4, and 7 MHz range are used regionally by M.A.R.S. Frequencies in the 10, 13, and 20 MHz range are used by gateway stations to feed overseas telephone calls into the United States. U.S.A.F. Military Affiliate Radio Stations have an operating schedule of 7 A.M. to midnight seven days a week.

Low morale can contribute greatly to a high casualty rate in combat. There is no greater satisfaction to a M.A.R.S. operator than knowing a serviceman in a war zone had their spirit boosted from a phone patch back home in the United States. Great credit should be given to people involved with the United States Air Force Military Affiliate Radio System. ■



Transcontinental high frequency transceivers of M.A.R.S. station AGA5MC.

## MFJ SHORTWAVE ACCESSORIES REMOTE ACTIVE ANTENNA

**MFJ-1024** Receive strong clear signals from all over-the-world with this 54 inch active antenna that rivals long wires hundreds of feet long.

**\$129.95** "World Radio TV Handbook" rates the MFJ-1024 as "a first rate easy-to-operate active antenna... Quiet with excellent dynamic range and good gain... Very low noise factor... Broad frequency coverage... the MFJ-1024 is an excellent choice in an active antenna."

**Remote** unit mounts outdoors away from electrical noise for maximum signal and minimum noise pickup. Mount it anywhere - atop houses, apartments, ships, buildings, balconies.

**Covers** 50 KHz to 30 MHz. High dynamic range eliminates intermodulation. Control unit has 20 dB attenuator, gain control. Lets you switch

2 receivers and auxiliary or active antenna. 'On' LED. 6x2x5 inches. Remote has 50 ft. coax and connector. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, \$12.95



## INDOOR ACTIVE ANTENNA

**MFJ-1020A** Now you'll rival or exceed the reception of outside long wires with this tuned indoor active antenna.

**\$79.95** "World Radio TV Handbook" says MFJ-1020 is a "fine value... fair price... best offering to date... performs very well indeed."

Its unique tuned circuitry minimizes intermod., improves selectivity, reduces noise outside tuned band. Functions as a preselector with external antenna. 0.3-30 MHz. Telescoping antenna.

Controls are Tune, Band, Gain, On-Off/By Pass.

6x2x6 in. Use

9 Volt battery

9-18 VDC or

110 VAC with

MFJ-1312, \$12.95



## ANTENNA TUNER/PREAMP



**MFJ-959B** Don't miss rare DX because of signal power loss between your antenna and receiver.

**\$89.95**

The MFJ-959B provides proper impedance matching so you transfer maximum signal from your antenna to your receiver from 1.6 to 30 MHz. You'll be surprised by significant increases in signal strength.

20 dB preamp with gain control boosts weak stations. 20 dB attenuator prevents overload. Select from 2 antennas, 2 receivers. 9x2x6 inches. Use 9-18 VDC or 110 VAC with optional AC adapter, MFJ-1312, \$12.95

For your nearest dealer or to order:

**800-647-1800**

Order from MFJ and try it. If not satisfied return within 30 days for refund (less s/h). Add \$5.00 s/h. One year unconditional guarantee. Free catalog.

**MFJ ENTERPRISES, INC.**

Box 494, Miss. State, MS 39762

601-323-5869 Telex: 53-4590 MFJSTKV

**MFJ... making quality affordable**

# Tune In On Yesterday

## A Look at Events & Stations That Shaped Radio

BY ALICE BRANNIGAN

**D**id you know that this year is the 50th anniversary of Motorola's development of the first practical application of FM two-way portable radio technology? This came about during World War II when the U.S. Army Signal Corps requested Motorola to come up with a two-way portable that had better range than the AM radio the U.S. Army called the SCR-536.

While the AM two-way portable radios had been a big step beyond hard-wired battlefield comms systems, they operated on a single channel, making them easy for the enemy to monitor. In addition, the battery life of the SCR-536 was short and the batteries couldn't be recharged.

The SCR-536 weighed only 5 lbs., but it had a range of only one to three miles. The U.S. Army initially ordered 3,500 of them, and just prior to the attack on Pearl Harbor in December of 1941, some 50 sets per day were being turned out. By the end of WWII, more than 130,000 would be built. The SCR-536 (which Motorola designed and built) was the first commercially produced two-way portable, or Handie Talkie.

Motorola's response for a more advanced radio became the Army's SCR-300 FM walkie-talkie backpack radio.

The SCR-300, introduced in 1943, weighed 35 lbs., and had rechargeable bat-

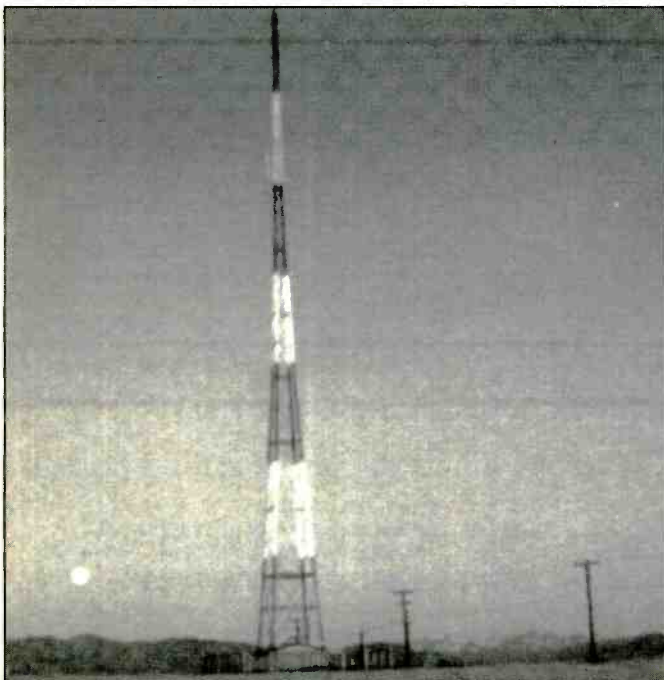
teries. It was tunable and could operate on any frequency between 40 and 48 MHz. The set had a range of 10 to 40 miles, depending upon the terrain.

One of the first places it saw combat action was during the Allies' D-Day invasion at Normandy. The SCR-300 also hit the beaches under enemy fire at Anzio, Guadalcanal, and Iwo Jima.

Motorola produced more than 45,000 of these sets during the war, and they became the foundation for Motorola's post-war designs in portable FM two-way radios. The company's first commercially available FM two-way portable after the war appeared in 1947. Motorola called it a *Han-*

*The old KPOF tower is a crumpled mass of twisted steel after being taken down. Years of exposure to the elements had weakened it to the point where the tower had become unsafe. (Photo by Patrick Griffith, Colorado.)* ▶

*KPOF, Denver, had used this tower since the 1930's. It was retired from broadcast use in the 1970's, then served as a platform for two-way antennas. Now it has been taken down. (Photo by Patrick Griffith, Colorado.)* ▼



## Station KPOF, Denver

### Verification Card

Station KPOF takes pleasure in verifying  
your reception on February 1, 1931.  
at 4 - 5 a. m. (E.S.T.) when you heard  
"The Old Rugged Cross"

Yours truly,

Station KPOF

Per R.M.H.

Denver's KPOF, owned by the Pillar of Fire Church, sent out this QSL card back in 1931.

die Talkie (a Motorola trademark, by the way) describing it as smaller than a briefcase. The transceiver weighed between 8 and 22 lbs., and put out 250 milliwatts. This was before the invention of the transistor, so the unit used miniature tubes.

Motorola's first all-transistor *Handie Talkie* pocket receiver was introduced in 1958, with its companion transmitter coming out in 1959. The first all-transistor Motorola hand-held portable two-way radio was the HT200 that was introduced in 1962. It weighed only 33 ounces.

Technology had come a long way in the 19 years between the introduction of the

35-lb. SCR-300 and its direct descendant, the Motorola HT200 *Handie Talkie*. Happy 50th birthday, SCR-300!

### Salem's First

We always enjoy hearing from readers who embark upon research projects relating to communications facilities. Douglas G. Stingley, of Salem, Oregon, told us that he researched his city's first radio station, KFCD. He did this by sorting through microfilm newspaper records in the Reference Section of The Oregon State Library. Surprisingly enough, he turned up quite a

bit of information about a relatively obscure station that existed only briefly in the very earliest days of broadcasting.

Doug's researched information was too lengthy to run here in its entirety, however he found out that KFCD started up on August 15th, 1922. The station used the common 833 kHz frequency. It was owned and operated by F.S. Barton, whose Salem Electric Co. sold Westinghouse and Magnavox radio receivers. The station was located in the Masonic Lodge building.

One problem with putting KFCD on the air was getting a licensed technician to be the station's Chief Engineer. That was solved when Barton hired C. Meredith Landaker, a 10th grade high school student who held a license and agreed to operate the station in exchange for being able to use the KFCD equipment to contact hams. He enjoyed contacts from Alaska to Louisiana via the KFCD facilities. KFCD's broadcast programming had a regular nighttime listener in Columbus, Montana.

The station operated from the ground floor, and in front of a large window in order to allow for a passerby viewing audience. There were also some seats inside. Much of the programming consisted of local entertainment, primarily amateur and semi-professional. There were weather, market, news, and religious features. Yet, all did not go well for KFCD.

The KCFD antenna, atop the Masonic Lodge on the corner of High and State Streets, proved not to be in the best of all possible locations. Surrounding the station were four motion picture theatres that used carbon arc projection equipment that interfered with the station's signal. Also work-

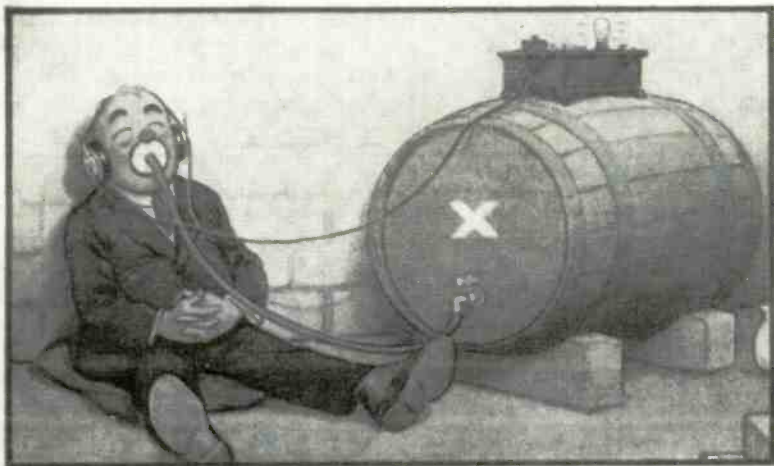


The first commercial two-way FM portable was developed by Motorola in 1947. It used miniature tubes.



Motorola's SCR-300 'walkie-talkie' was the first two-way FM portable radio. It went into service 50 years ago.

**WHAT IS HOME WITHOUT A RADIO?  
GETTING X-CELLENT RESULTS ON A ONE TUBE!**



These gag postcards relating to the radio craze were the rage in the 1920's. (Courtesy Alexander Durant, New York.)

ing against the signal was a nearby 6 kW electric transmission line, plus electric street cars and elevator motors.

Two other factors didn't help, either. The daily afternoon newspaper, *Capitol Journal*, fought the station with a scare campaign centered on the many dangers to the public created by radio waves. These complications combined to deprive the sta-

tion of support from the community, listeners, and any sponsors to keep it operating.

On January 26th, 1924, KFCD died from a lack of support. It had operated for only a year and a half. Salem was not to have another broadcasting station until station KSLM opened there eight years later, in 1932.

There were many unsung and obscure



The Motorola HT200, introduced in 1962, was the first fully transistorized FM two-way portable.

**Personal Code Explorer™**

★ Novices  
★ SWLs  
★ Veterans

**Receive Digital Signals**  
Copies FAX, RTTY, MORSE, SITOR, PACKET, and more from receiver to IBM/PC CGA, EGA, VGA screen. Easy to use and install. Extensive manual.

On-Screen Scope

Personal Code Explorer also features user friendly menus, digital noise filters, global frequency lists and a FAX to GIF file converter. NOW SEE WHAT YOU'VE BEEN MISSING!

**Personal Code Explorer - \$129 S&H \$4**  
Free Brochure. Call-Write-Order. MC/VISA.  
**Microcraft Corporation**  
Box 513PC, Thiensville, WI 53092  
Phone (414) 241-8144

**Secret Frequencies**

**The Remote Computer Scanning System™**

Turn those hours of manually searching for secret frequencies over to RCSS™. The RCSS™ significantly enhances the ICOM™ R7000 receiver capabilities by providing automated PC control over receiver scanning & memory functions.



- Features**
- Automatic detection and storage of active frequencies & other info while scanning.
  - User specified Tuning Steps from 10-100 MHz.
  - Scan Mode, Class of Service, or Type of Unit.
  - Scanning resumes upon loss of carrier.
  - Memory capacity: 1,000 frequencies.
  - Monitor half-duplex communications.
  - Mouse/Keyboard driven graphic user interface.

**SYSTEMS & SOFTWARE INTERNATIONAL LTD.**

4639 Timber Ridge Drive, Dumfries, VA, 22026-1059 USA  
(703) 680-3559, Fax: (703) 878-1460. RCSS™ is available for both IBM compatible & Macintosh computers.

little pioneer stations such as KFCD at the dawn of broadcasting. They opened and closed in a twinkling, and were just as quickly forgotten. Thanks to Doug Stingley, who went to a library and researched the broadcast history of his own city, one more of these unremembered stations was recalled for the first time in 70 years. It's fun. Try it yourself!

**Tower of Power**

Last May, a piece of Denver's broadcasting history came to an end. The old KPOF/910 265-ft. tower was razed. This tower had overlooked metro Denver from one of its northern suburbs since 1935. Before that, it had been owned and used by a radio station in Philadelphia, but was taken apart and trucked to Denver for reassembly.

The tower served as KPOF's main tower until 1977, but at that time it was replaced by a new tower 1/4-mile east of the old one. The older tower remained in use only as a platform for several two-way radio antennas, but it was found to have become a problem.



Due to its position near the newer tower, the older tower was causing unwanted radiation patterns. The older tower had to be equipped with a detuning device to eliminate this. Eventually, however, after so decades of exposure to the elements, the older tower had started to deteriorate. Technicians said it was no longer safe to climb. The only course of action was to take it down.

The top 5 ft. of the historic old KPOF tower was salvaged for placement in a history museum at the nearby Belleview School. The newer tower continues to operate with 5 kW on 910 kHz from high atop the station's hillside location overlooking the mile-high city.

KPOF is a religious station that began operating in 1928. The station is owned by the Pillar of Fire Church.

Events surrounding the demise of the KPOF tower were sent to us by Patrick Griffith, N0NNK, Federal Heights, Colorado. Patrick has been a long-time supporter of POP'COMM, and we appreciated his sharing this information with our readers.

## Octoberfest

Just in time for Octoberfest, a humorous 1926 radio-related postcard is submitted by another old friend, Alexander Durant, Albany, New York. This card depicts a contented radio listener in the era of one tube household radios. A pair of headphones connects his ears to his one tube receiver. In his mouth there's one tube, too. It's a rubber tube that connects his mouth directly to the tap on a wooden keg we presume is beer. The caption reads, "What is home without a radio? Getting X-cellent results on a ONE TUBE!"

In 1926, this card would have been thought of as 'naughty.' That's because Prohibition (18th Amendment, 1921) had made alcoholic beverages illegal. After broadcasting began in earnest (1922), one-tube receiving sets remained popular for several years. Therefore, the opportunity had become ripe for this clever double-whammy pun. It capitalized on the new broadcasting craze that was sweeping the nation, coupling it to a reference to the general public's virtually open and scornful disregard for Prohibition, and opposition to the law.

The hidden message: Notice that the man on the postcard is not a street person or derelict. He is well groomed, well fed, wears a suit and tie. He rests comfortably on a soft cushion. Thus, the card's artist was subtle in pointing out that dislike of Prohibition was the realm of the middle class.

Why not join us here next month? We thank you for helping us out with old time radio and wireless QSL's (photocopies or originals), clippings, station listings, questions, anecdotes, and what-have-you. ■

# FROM HOOKING IT UP TO HAMMING IT UP, WE OWN THE AIRWAVES

## Radio Shack®

America trusts Radio Shack for the products and advice needed to hook up almost anything electronic. You've made us number one in CB, scanners and shortwave. Come see our new 440 MHz Ham transceiver, our popular 2M Ham handheld, plus 15 scanners, nine shortwave radios, new GMRS and business handhelds, and 17 CBs. Fact is, when it comes to selection and real value in electronics, we've always made waves.



CIRCLE 80 ON READER SERVICE CARD

# The Scramble Ramble

## Communications Security in Law Enforcement.

BY JERRY CODY

Law enforcement people face situations that are more complicated and dangerous than in years past. Investigation and seizure of illegal drug, protection of witnesses in criminal prosecution, and security of government officials while travelling pose new challenges for law enforcement radio communications. With scanners available to the general public, police officers may face serious injury or even death if some of their radio communications are not kept secure *under certain conditions*.

In November of 1985, indisputable evidence was given to Congress that a group of drug smugglers in Southern Florida had the "unlisted" radio frequencies used by local and federal law enforcement officials. An *L.A. Times/Washington Post* story reported a local official in Florida asserted these smugglers had ties to a Columbian terrorist group known as M-19. One hundred people including twelve justices are murdered on November 6, 1985, when M-19 seized the National Palace of Justice in Bogota.

In June of 1989, *The Associated Press* reported 3,685 pounds of cocaine destined for the United States was seized along with fourteen smugglers arrested by authorities in Mexico. These smugglers used communications equipment along with a computer to intercept telephone calls and operate a clandestine air traffic control center to aid in the transporting

of drugs from Columbia. Evidence linked these smugglers to the infamous Medellin cartel.

In January 1992, another *L.A. Times/Washington Post* story revealed the F.B.I. had cracked a cocaine ring involving Los Angeles street gangs and the Medellin drug cartel. A continuous supply of high quality cocaine originating in Columbia, was transported to Mexico and then brought by automobile to Los Angeles. From that point, delivery was made to Anchorage, Dallas, Detroit, Honolulu, Houston, and Seattle. According to the F.B.I., the ring had distributed fifty tons of cocaine and made \$30 million profit during the past ten years. The Los Angeles street gangs and Columbian drug dealers had easy access to portable "scanners" and cellular telephones to aid them in their operations. The Medellin as well as Cali drug cartels are responsible for approximately 80% of all cocaine coming into the United States.

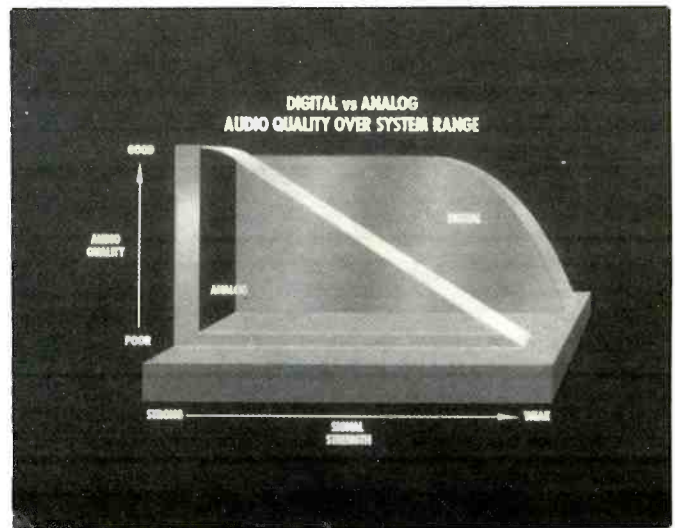
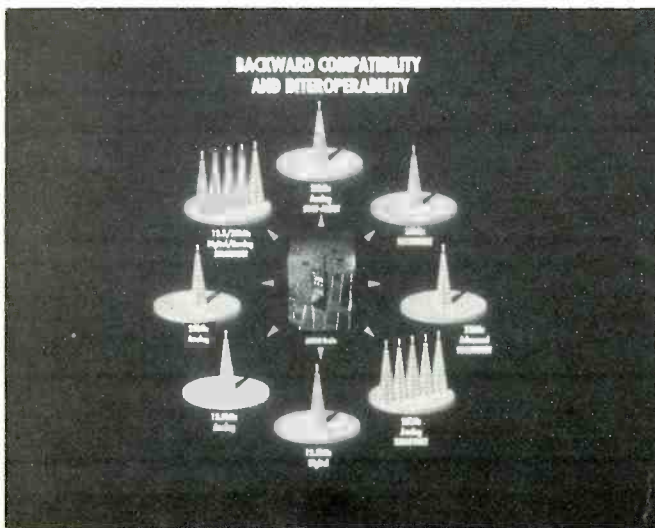
Many law enforcement agencies are using digital voice protection to secure sensitive radio communications. Police officers no longer have to rely on code words or crib sheets for communications security. A listener not having digital encryption equipment will only hear a rushing noise similar to a radio with the squelch not set and a tone.

One voice protection system available to law unlighted is Motorola's "Securenet." "Securenet" uses a sophisticated encryption technique which is virtually impossible to break. The codes are mathematically unrelated and cannot be partially broken. To break into the "Securenet" system would require a computer checking every available code. At a rate of one million codes per second, the computer would take 75 million years to find the correct one. If a radio is lost or stolen, a "Securenet" code inserter can be used to insure the integrity of the system by changing the codes of the other radios in the network.

On August 29, 1991, Motorola announced a digital encryption platform known as "Astro." Previous encryption techniques required a slight reduction in audio quality for effective voice security because of variations in the RF signal. The "Astro" system will correct signal errors throughout the coverage area.

If a radio is lost or stolen in the "Astro" system, it can be remotely disabled and other radios in the network rekeyed. Over the air rekeying by computer could save lives in a critical law enforcement situation. Utilizing a computer in the "Astro" system allows the operator to know the status of every radio in the network.

In the heart of the "Astro" system is the





Motorola's ASTRO technology provides compatibility with existing Motorola analog conventional, Securenet digital and SMART-NET trunked radio systems

Vector Sum Excited Linear Predictive code process that takes the human voice and converts it into digital information. The V.S.L.E.P. voice coder actually simulates the human voice and creates digital information to allow the receiver to reproduce the voice sounds. "Astro" divides the voice message into small samples and extracts essential vocal parameters which describe how the sound was made. The pitch (created by the vocal cords), the filtering (created by the shape of the mouth), the energy (how loud the person is speaking), and other information describing the human voice are extracted and digitally encoded. V.S.L.E.P. compares the original voice sound with the digitized information from each sample and estimates the error or residual. The error describes the parts of the voice sound the digitization process could not recreate. Instead of ignoring the error as with previous encryption systems, "Astro's" vice coder uses a method that describes these residuals with a series of digital vectors. By matching the error with a series of digital vectors, the voice coder can develop a code word to describe the missing information. At the receiver, V.S.L.E.P. reconstructs the voice from the digital parameters and adds the coded error information to complete the reconstruction of the voice. Higher audio quality results.

Without secure communications in law enforcement, disaster could easily strike. An important government official could be assassinated or a dangerous criminal could go free because of a prosecution's witness being murdered. Secure radio systems such as "Astro" prevent tragedy from befalling police officers facing hostile times in our world today. ■

### VIDEO SYNC GENERATOR

**Restores Horizontal and Vertical Sync Lines from Distorted Analogue Video Formats**

For Free Information Package on Completed Units and Pricing

• Call 219-236-5776 •

R.C. Distributing • PO Box 552 • South Bend, IN 46624

CIRCLE 76 ON READER SERVICE CARD

### SHOCKING MANUALS!!

Survival Electronics, Computers, Security, Weapons, Rocketry, Phones, Energy, Financial, Medical. 100+ offers include Special Projects and Technical Research Services, and hardware Confidentiality Guaranteed! Send \$5 for new Combined Catalog. By John Williams, former Senior Engineer (Lockheed), Professor of Computer Science (NMSU). As seen on CBS "60 Minutes" Since 1971

**CELLULAR PHONE MANUAL:** Detailed manual on how cellular phones are re-programmed (ESNs and NAMS) and scanned 30+ cellular phone mods described. Specific scanner mods \$39

**VOICE MAIL BOX HACKING:** Step-by-step descriptions of how 8 popular voice mail PBX systems are hacked \$29

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

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

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

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

### CONSUMERTRONICS

2011 CRESCENT, P.O. DRAWER 537, ALAMOGORDO, NM 88310  
 VOICE: (505) 434-0234, 434-1778 (8AM-9PM MST, Mon-Sat.)  
 FAX: 434-0234 (orders only 24-hours 7 days/week if you get answering machine press #, then \*1 any time)

CIRCLE 59 ON READER SERVICE CARD



## 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

Aug. 21, 1987

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

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

We have completed relative gain measurements of your model 1000 antenna using the K40 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	1.75	50
27.265	1.95	57
27.315	2.00	58
27.365	2.00	58
27.405	2.00	58

Individual test results may vary upon actual use.

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

**CALL TODAY**  
 TOLL FREE: 1-800-541-6116  
 FOR YOUR NEAREST DEALER  
**Wilson 1000**  
 Available in Black or White

Roof Top Mount ..... 59<sup>95</sup>  
 Trunk Lip Mount ..... 69<sup>95</sup>  
 Magnetic Mount ..... 79<sup>95</sup>  
 Wilson 2000 Truckster ..... 59<sup>95</sup>  
**DEALERS Exclusive dealer areas still open**

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

# EMERGENCY

BY GORDON WEST, WB6NOA

## COMMUNICATIONS FOR SURVIVAL

**P**rofessional communicators will regularly inspect the facilities of other emergency communications agencies to pick up valuable ideas and innovations on how to improve their own comm-center. "This is a great way to learn from other agency's mistakes," comments William Alber, an emergency communications specialist from the San Francisco Bay area.

In my own personal travels throughout the country working with emergency command posts, I never saw anything as elaborate and functional as one amateur operator's Dodge M37 military weapons carrier. Mounted on the vehicle is a communications shelter designated "AN/MLQ-24" counter measures receiving unit, capable of detecting frequencies from 30 MHz to 10.2 GHz and provided spectrum analysis, direction finding, and pulse-width/pulse-repetition rate, and rotation rate information on front line enemy battlefield radars.

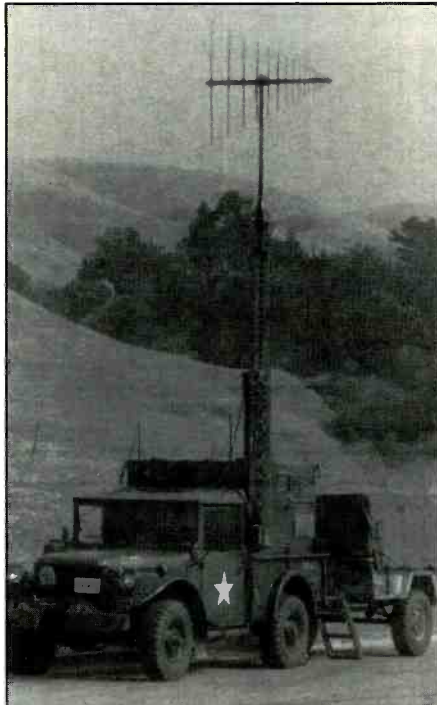
This vehicle took 3 1/2 years of restoration by amateur and commercial radio operator Patricia Gibbons, senior communications technician for the City of San Jose (WA6UBE/ N6LDL), California.

"Most of the original equipment in the shelter was an interesting curiosity. The power required to run it was very specialized. 28 VDC, 110 V 60 Hz AC, and 110 V 400 Hz AC was required to run the original gear," comments Patricia Gibbons. With ideas gleaned from the Military Vehicle Collector's Club and campouts with other military vehicle users, she converted the older military equipment over to the following line-up:

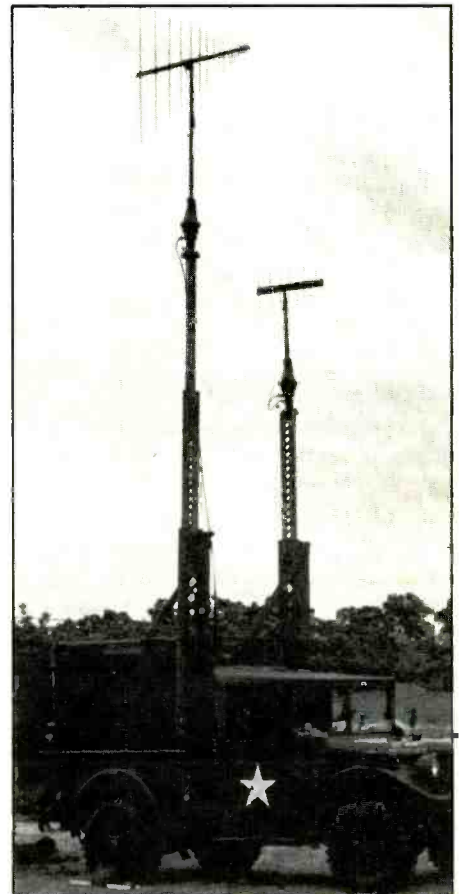
- RF Harris and SGC automatic antenna couplers.
- Two Yaesu 4700 dual—band mobile radios.
- Kenwood 3530A 220 MHz mobile radio.
- Yaesu FT70/G "Man Pack" radio for portable HF.
- Tandy 1400 LT laptop computer on military shock mounts.
- Kantronics TNC Kam unit.
- Dual crank-up towers with full rotator capabilities.
- Military log-periodic beam antenna.
- Create CLP5130 log-periodic antenna.
- ICOM portable handheld transceivers.

The towers collapse down and fold into the sides of the radio shelter. The tower bases have hinged mounts so that they stay attached to the shelter and are bolted down parallel to the truck bed when driving.

Motorola antennas are used throughout for the VHF and UHF bands. The vehicle



*The military radio command post, converted over to civilian use.*



*The log periodic beams can cover from 50 MHz—1296 MHz. They could also be phased for 3 db more gain.*

trails an Army MEP16 3 KW generator and fuel supply for 24 hours of emergency operation.

This vehicle was converted from 24 volts to 12 volts including two huge alternators and a battery isolator to keep the dual batteries fully charged.



*An inside view of the military command post layout of ham and emergency radio equipment.*



**ACE**  
COMMUNICATIONS  
ACE Communications 800-445-7717  
6975 Hillsdale Court Indianapolis, IN 46250



## Get instant tech information FREE from your Fax or Computer!

You can obtain specs, freq. info, software and more from our automated services. For fax facts, call from your stand alone fax machine and follow the voice prompts. Use the BBS from your modem of fax/modem equipped computer. Dial 317-849-8683 for fax back service, or dial 317-579-2045 for our computer bulletin board service

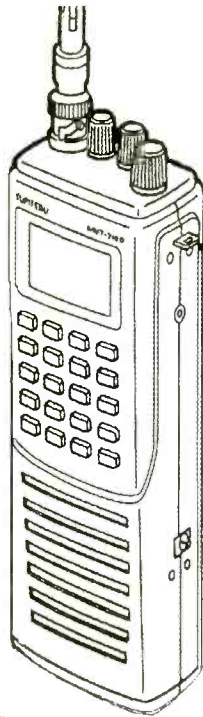
# PEACEMAKER SPECIAL

## AOR GW-2 GaAs FET Wide Band RF Pre-Amp

The GW-2 Wide Band Pre-Amp is designed to increase the signal levels present at the input to receivers, frequency counters, spectrum analyzers, etc. There are three basic advantages to the GW-2 design. 1. Wide range, low noise. Use of a GaAs Field Effect Transistor instead of the silicon FET's normally used in comparable devices for far less noise. 2. Variable Gain. Unlike many other signal amplifiers, the GW-2 allows you to vary the amount of gain it produces. 3. Portability. The GW-2 is completely powered by an internal 9 Volt DC standard transistor battery. The chart below shows typical maximum gain figures achieved by GW-2 over complete operating range. Specifications: Input/Output Impedance: 50 Ω.



# NEW



**Yupiteru  
MVT7100.  
1000 Channels,  
530KHz to 1650MHz with  
AM/FM/WFM/LSB/USB.  
\$599.00**

This is probably the best performing hand held receiver you can get, bar none. It combines great RF performance with full featured memory functions and *automatic* SSB selection. Other features include: lockout on search and scan, bank lockout, Backlighted LCD display, 1 year warranty, earphone jack, attenuator switch, delay, hold, priority and keylock controls. Plus a battery save function and a VFO tuning knob. Supplied with AC charger, Antenna with BNC connector, & rechargeable batteries. Size: 6 3/8" x 1 7/8" x 2 1/3". Wt: 14oz. NFM I.F. filter ≈ ±7KHz. SSB filter ≈ ±3KHz. More information: Fax fact doc. # 277

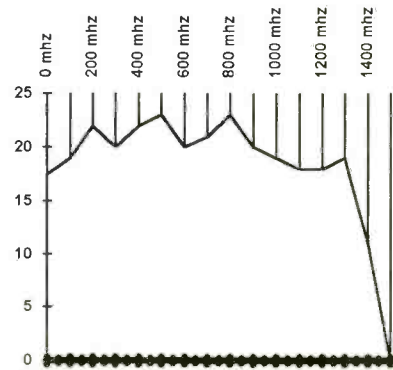
Go ahead, get one of those do everything receivers. Then try and explain the reasons for your purchase to the person who shares your checkbook or credit card. No fun, huh? Don't look forward to that prospect, do you? Well, maybe we can help a little by making it real easy for you to make a peace offering.



Here's the deal. When you order any unit over \$250 from us, we'll kick in this nifty \$49.95 SRP portable radio for only a paltry \$19.95 extra. It features AM/FM Stereo and VHF TV audio, 19 memories, auto-scan, and the stereo sound from the headphones is excellent. Plus, your mate can catch all the soaps in the afternoon, no matter where she is. So give us a call, order the receiver of your heart's desire and our peacemaker special.

## On Glass Scanner Antenna

Covers 25-1300MHz. Easy to install, no holes to drill. Includes all hardware for installation. Supplied with 15 feet of coax and BNC connector. Adjustable whip angle. Very good performance with an easy to install permanent antenna for car or home. SGM-1  
**\$32.95**



Gain: 20 dB nominal (-3 to +20 adjustable). Input level: -5dbm max. Output level (1dB compression) +4 dbm. Noise figure (typical): 1.5db. Size: 3 1/4" x 4 3/4" x 7/8". Wt 5 oz. Fax Facts #805 **\$89.00** Also, if you have too many of the wrong kind of signals use our:

## AOR MPIE-1 Interference Filter

Designed to reduce image and intermod in three areas: FM broadcast/TV, paging, and cellular. Small, convenient case with BNC connectors. Paging intermod filter is switchable. Fax facts # 905. Same size & wt. as GW2 above. **\$59.00**

**Toll Free, 24 Hours! 800-445-7717 Fax Orders 800-448-1084 Fax Facts 317-849-8683**

Computer BBS Modem & Fax/Modem, 317-579-2045. Toll Free Tech Support, Dial 800-874-3468

International Fax: en Espanol, en Francais, und auf Deutsch, or just fax in plain English to: 317-849-8794



**ACE Communications 6975 Hillsdale Court, Indianapolis, IN 46250**

Service & Support hours: Mon.-Fri. 9AM to 6PM, Sat. 10-4 EST. Mastercard, Visa, Checks, Approved P.O.'s & COD (add \$5.50) & AMEX, Discover. Prices, specifications and availability subject to change. Flat rate ground shipping and handling charge only \$5.95 per unit. Express Air only \$8.95, for most units, to most locations. One week trial, no returns accepted two weeks after original receipt without substantial restocking charge. All units carry full factory warranty. Indiana residents add 5 per cent sales tax.



**FLY IT! ONLY \$8.95**

# The Toughest Little "GUNN" in Town!

3 + 3 STAR

UPS SHIPPABLE



Other Models & Sizes Available in 10 or 11 Meters



Call or send \$2.00 for Complete Catalog and Pricing of Antennas.



Route 1 - Box 32C, Hwy. 82  
Ethelsville, AL 35461  
**(205) 658-2229**  
**FAX: (205) 658-2259**  
Hours: 9 am - 5 pm (CST)  
Monday - Friday

DEALER INQUIRIES, PLEASE CALL

## SUPER 12 HOUR RECORDER CALL TOLL FREE

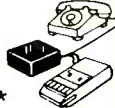


Modified Panasonic Slimline. 6 hrs per side. 120 TDK tape furnished. AC/DC Operation. Quality Playback. Digital Counter. Durable Lightweight Plastic.

**\$119.00\***

### PHONE RECORDING ADAPTER

Starts & Stops Recorder Automatically When Hand Set is Used. Solid State!



**\$28.50\***

### VOX VOICE ACTIVATED CONTROL

Solidstate Adjustable Sensitivity. Voices & Sounds Activate Recorder. Adjustable Sensitivity. Provisions for Remote Mike.



**\$28.50\***

\*Add for ship. & handling. Phone Adapter & Vox \$2.00 each. Recorders \$5.00 each. Colo. Res. add tax. Mail Order, VISA, M/C, COD's OK. Money Back Guar. Qty. Disc. available. Dealer inquiries invited. Free data on other products.

**ALL MAIL TO: Box 20100, Boulder, CO 80308**  
AMC SALES INC., 193 Vaquero Dr.,  
Boulder, CO 80303  
Phones (303) 499-5405 • 1-800-926-2488  
FAX (303) 494-4924 • Mon-Fri 8-5 MTN. TIME



The utility trailer also contains the generator.



The twin towers are always retracted when the vehicle is in motion.

"I am a firm believer in having HF radio capabilities in an emergency situation," comments Patricia. "Another major quake in the Santa Clara Valley area like our Loma Prieta quake of 1989 could knock out strategically located 2-meter and 440 MHz repeaters that are relied upon by our county-wide ARES/RACES program," she adds, backing up the need for HF communications which will not require repeaters.

Her vehicle and antennas may also operate near vertical incident skywave, ideal for

staying in close contact on 40 and 80 meters. NVIS techniques have been emphasized in the design of the equipment layout, and are essential for emergency communications.

"This vehicle was not put together for the purpose of working DX on field day—this vehicle is outfitted for emergency drills and the real thing," adds Gibbons.

All Photos Courtesy Of Marc Goldman, WB6DCE

**“The R8 is a highly sophisticated receiver. We'd call it professional grade, or about as close to it as receivers get these days.”**

*Staff review  
Popular Communications*

**“The R8 is like a breath of fresh air, with its ground-up engineering and up-to-date digital control from the front panel. I am very pleased to see a quality HF receiver of American manufacture that should successfully compete on the world market.”**

*Bill Clarke  
73 Amateur Radio Today*



**“Overall, the Drake R8 is simply the best radio we have ever tested for quality listening to programs...”**

**There's nothing else quite like it.”**

*Lawrence Magne  
Monitoring Times*

**“The best of the best for high-quality listening to news, music and entertainment from afar.**

**Superb for reception of faint, tough signals, too.”**

*Editor's Choice  
Passport to World Band Radio  
Tabletop Receivers for 1992*

# The ears have it!

When we introduced the American-made R8 Worldband Communications Receiver, we knew it would be judged by some very discerning ears, experts accustomed to the finest in short-wave listening equipment from around the world. After listening to the world on the Drake R8 loud and clear, they have delivered a decisive verdict.

They appreciated the R8's sensitivity, clarity, simplicity, and all-around versatility so much that many of them declared the R8 simply the best of its class. High praise, indeed, from very well-traveled ears.

But why take the word of mere experts? Put the Drake R8 to the test yourself with a 15-day money-back trial period on factory direct purchases, and let your ears be the judge. If you're not impressed by Drake's quality, performance and ease of operation, all in a receiver costing less than \$1,000.00, return the R8 Receiver within 15 days, and we'll refund your money in full, less our original shipping charge. To order your R8 factory direct, for more information, or for the dealer nearest you, call **1-800-937-2538** today. We're confident that once you've listened to the R8, your ears will hear of nothing else.



R.L. Drake Company  
P.O. Box 3006  
Miamisburg, OH 45343  
U.S.A.

**DRAKE**

In touch with the world.

CIRCLE 142 ON READER SERVICE CARD

# Portable Satellite Telephone System Becomes A Star

BY DIENA MARIE AMATO, Associate Editor

**M**agnavox introduced the *MAGNA phone MX-2020P*, the world's most compact and lightweight single case Inmarsat-A, Class 1 SATCOM terminal. Using this 42 lb. transceiver, with its 3 ft. collapsible umbrella antenna, it is possible to use the keypad to dial up any telephone in the world for a full duplex conversation, or send electronic mail at 9600 bps.

Inmarsat communications satellites offer worldwide coverage. The uplinks are in the 1635.5 to 1645.0 MHz band. Downlinks are in the 1535.0 to 1543.5 MHz band.

MAGNAphone MX-2020P received nationwide exposure when it appeared "on-screen" with actor Steven Seagal in the Warner Brothers

1992 high-tech thriller, *Under Siege*.

"It is a MAGNAphone MX-2020P....It has satellite security uplinks....it's like a carphone....," Mr. Seagal explains to his female co-star during a scene in the fast-paced motion picture.

Steven Seagal, the 6 ft. 4. in. star portraying highly decorated US Navy SEAL Casey Ryback in the film, was often seen on the deck of a US Navy ship making ample use of the satellite phone. The communications device was also handy after hours, as it was actually used by both the film's cast and crew during breaks in the shooting schedule.

The film's story concerns terrorists aboard the battleship *USS Missouri*.





W R T H  
BEST RECEIVER 1992

## Don't wait for "film at eleven"!

### Introducing the award-winning FRG-100 Communications Receiver.

Why wait for someone else to tell you what's happening in the world when you can find out first hand?

Have all the hottest news – not just "bites". Listen to music pulsating through Europe. Monitor economic trends in industrialized nations. Eavesdrop on Third World country survival efforts. Track vital crisis developments during conventional communications breakdowns. Or "drop in" to your old neighborhood – even if it's 12 time zones away.

The FRG-100 is loaded with technical advancements like industry-exclusive adjustable SSB carrier offset and user selectable 10Hz,

100Hz or 1 KHz tuning steps. The exciting Broadcast Band mode with 16 pre-programmed international broadcast bands. 50 Memory Channels and twin 12/24 hour clocks to keep you tuned in where and when you like day or night!

Consistent with Yaesu's world-renown reputation for radio communications achievements, the FRG-100 won the prestigious *World Radio TV Handbook* award for "Best Communications Receiver" upon its introduction in December, 1992. But you're the *real* winner! Priced lower than receivers costing much more but with fewer features, the FRG-100 delivers extraordinary and affordable performance. Ask about the FRG-100 and it's remarkable low price at your Yaesu dealer today. Make up your own mind about world events. Find out first hand!

# YAESU

*Performance without compromise.<sup>SM</sup>*



VFO 11845.00 50CH AM

YAESU  
COMMUNICATIONS RECEIVER FRG-100

POWER

6dB ATT 12dB VFO/MEM MEM CLEAR VFO/MEM MEM VFO LOCK  
NB AGC-F CLOCK TIMER SEL SET DIM

PHONES

DWN

MEM

UP

SQL

VOL

SSB

CW/N

AM/N

FM

SCAN

SCAN SEL

UP

DOWN

FAST



"The Largest Dealer of Scanners in the World"

# SCANNER WORLD, USA®

10 New Scotland Ave., Albany, NY 12208 • 518-436-9606

## SCANNER WORLD EXCLUSIVE

### UNIDEN BEARCAT BC205XLT

**\$239.99** (\$8.00 shipping)



Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHz.\* Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16" W x 1-3/8" D x 7-1/2" H.

\* Excludes Cellular  
#CC-008 Heavy Duty Leather Carry Case \$27.99

### RELM RH-256NB HIGH BAND TWO-WAY RADIO

SPECIAL PACKAGE DEAL

**\$339.99**

(Plus \$9.00 Shipping Each)



16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without returning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back-lighted keyboard, message light, time out timer, scan delay, external speaker jack. Size is 2 1/4" H x 6 1/2" W x 10 1/4" D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, 1/4 wave body mount antenna, mobile mounting bracket and mobile power cord, all for the low price of \$339.99.

## RADIO SCANNERS

BEARCAT BC55XLT	99.99	(7.00)
BEARCAT BC70XLT	129.99	(7.00)
BEARCAT BC100XLT	159.99	(7.00)
BEARCAT BC142XL	83.99	(6.00)
BEARCAT BC148XLT	104.99	(7.00)
BEARCAT BC200XLT	279.99	(7.00)
BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BC2	149.99	(7.00)
BEARCAT BC350A	129.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC700A	199.99	(7.00)
BEARCAT BC760XLT	249.99	(7.00)
BEARCAT BC800XLT	229.99	(8.00)
BEARCAT BC855XLT	179.99	(8.00)
BEARCAT BC2500XLT	369.99	(9.00)
BEARCAT BC890XLT	284.99	(8.00)
COBRA SR901	74.99	(6.00)

CB Radios	In Stock
Two-Way Radio Batteries	In Stock
Scanner Antennas	In Stock
Power Supplies	In Stock

## SCANNER ACCESSORIES

BCAD70	14.99	BP4	24.99
BCAD100	14.99	BP55	16.99
BCAD140	14.99	MA917	26.99
BCAD 580	16.99	MA518	14.99
BC003	7.99	ESP25	16.99
BC002	59.99	GRE8002	79.99
PS001	12.99	GRE-HH	54.99
UA502A	12.99	GRE9001	89.99
BP205/200	34.99	GRE 3001	62.99
BP70	16.99	FBE	5.99
VC001	12.99	FBSW	5.99

★ ALL MERCHANDISE NEW, IN FACTORY SEALED CARTONS

## BOOKS

Scanner Master	29.95
Covert Intelligence	8.95
Air Scan Directory	14.99
Betty Bearcat	5.99
Top Secret (8th)	18.99
Covert Techniques	9.95
Tomcat's Big CB	13.95
World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Monitor America	24.99
Police Call	9.29
Scanner Modification	17.99

**ORDERING INFORMATION:** Call (518) 436-9606 to place orders or mail orders to Scanner World, USA®, 10 New Scotland Ave., Albany, N.Y. 12208. Orders will be shipped within 24 hours by United Parcel Service if order is accompanied by MasterCard, Visa, cashier's check, money order, COD (COD shipped by United Parcel Service will be cash or money order only). (If a COD package is refused, customer will be billed for shipping and COD charges.) Mail orders with personal or business checks enclosed will be held 4 weeks for bank clearance. Prices, specifications, and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World® warehouse in Albany, N.Y. We are not responsible for typographical errors. All merchandise carries full manufacturer's warranty. Bid proposals and purchase orders accepted from government agencies only. Free full line catalog mailed 4 times per year. Merchandise delivered in New York State add your local sales tax. No returns accepted after 7 days of merchandise receipt. \* Add (\$5) per item, and \$4.00\* for all accessories ordered at same time. COD orders will be charged an additional \$4.95 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service to street address only. (No P.O. Box). Shipping charges are for the 48 continental US States only; Alaska, Hawaii and all others ask for quote on shipping charge.

## SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER



### SR-901

AVAILABLE ONLY FROM SCANNER WORLD



**ONLY! \$74.99** Each

(Plus \$6.00 Shipping Each)

**\$69.99** (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7 1/4" W x 2" H x 7 1/4" D. One year factory warranty.

Optional mobile cigarette lighter cord #901MPC \$4.99

## UNIDEN MR 8100A



**SPECIAL SALE PRICE ONLY \$289.99**

(Plus \$10.00 Shipping Each)

100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back-lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage: 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.8" W x 5.8" H x 1.9" D. Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning, 10 banks of 10 channels in any combination.

MODEL: FB-911

## FIRE BOX PHONE

**\$45.99** (\$5.50 Shipping Each)



13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/wall mount, front door closes for authentic fire box appearance. FCC approved. Size 16" H x 8 1/2" W x 7" D.

## UNIDEN BEARCAT BC-400XLT



**\$99.99**

(Plus \$7.00 Shipping)

Our best selling mobile scanner. 16 channel AC-DC programmable digital, AC-DC cords, telescopic antenna, mobile mounting bracket, weather search priority, 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jacks.

## BEARCAT BC-100XLT 100 Channel Digital Programmable Hand-Held Scanner



**\$159.99**

(Plus \$7.00 Shipping)

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz). 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout. AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes the following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

## Uniden®/Bearcat BC-142XL 10 Channel Base/Mobile Programmable Scanner



**\$83.99**

(Plus \$6.00 Shipping)

Programmable, digital, AC or DC operation, weather button, priority, lockout button, squelch, memory backup, 2 digit LED display, track tuning, 2 second built-in delay. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Sizes 9"x6 1/2"x2 1/4". Includes AC adapter and telescopic antenna.

Optional Cigarette Lighter Cord #142MPC \$4.99

## Bearcat BC-148XL

**\$104.99**

(Plus \$7.00 Shipping)

16 channel with Automatic Weather Alert (similar to BC-147XL).

## UNIDEN BEARCAT BC 800XLT



DIGITAL BASE SCANNER  
**\$229.99**

(Plus \$8.00 Shipping)

Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous), 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9 1/4" D x 4 1/2" H x 12 1/2" W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

## UNIDEN BEARCAT BC-760 XLT



**\$249.99**

(Plus \$7.00 Shipping)

### Digital Programmable 100 Channel Scanner

BC760 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16" W x 1-5/8" H x 7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police, fire, emergency, aircraft, weather, and marine services puts exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$34.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA.

Optional cigarette lighter plug #760MPC \$4.99

## GM-1™ GLASS MOUNT SCANNER ANTENNA

Frequency coverage 25-1200 MHz — only 22 inches tall. — No holes to drill — includes contact glue pads for easy installation. Complete with 17 foot cable, Motorola connector, and mounting hardware. Swivels to vertical position — performance unaffected by moisture on the window. Made in USA.

**SPECIAL \$39.99**

(Plus \$4.00 Shipping Each)

## GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

Includes mounting kit and cable. Low band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector.

GM-27 27 MHz Low Band for CB	\$39.99	(\$4.00)
GM-155 144-174 MHz High Band	\$39.99	(\$4.00)
GM-450 450-470 MHz UHF Band	\$39.99	(\$4.00)
GM-800 Cellular Telephone Band	\$34.99	(\$4.00)

Scanner World, USA® • 10 New Scotland Ave., Albany, NY 12208 • 518-436-9606

# BROADCAST DX'ING

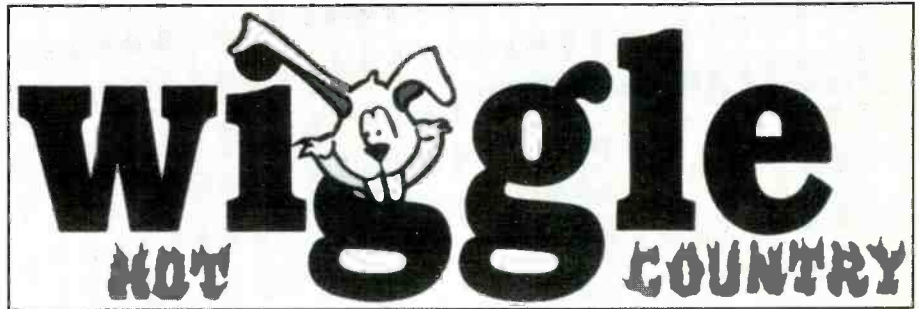
BY ROGER STERCKX, KVT1JH

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

**Radio Soleil d'Haiti:** A few issues back we mentioned that Radio Soleil d'Haiti, Brooklyn, N.Y., operates on 97.7 MHz, but that we couldn't find it listed in any station directories. We assumed it wasn't licensed. That was only sort-of correct.

A letter from Louis Sicilia, Fairview, N.J., advises that he has monitored 97.7 MHz for the French/Creole language station and has not been able to pick it up. It is Louis' information that the station is transmitted on the 67 kHz subcarrier of a New York City Spanish language station, WSKQ-FM/97.9. Thanks for providing us with this information. Louis!

Louis further tells us that New York City's WMXV/105.1 (*Mix 105*) carries WHTZ/100.3 on their 92 kHz subcarrier during the WHTZ "Love Phones" program (10 p.m. to Midnight, Monday to Thursday). WHTZ runs the lively program with a 10-second delay, but the WMXV subcarrier plays it while it's happening. No delay or bleeped words.



A clever bumper sticker from WYGL ("Wiggle"), Selinsgrove, Penna. doesn't show a frequency. Not enough room for its 3 frequencies, 1240 kHz, 92.3 FM, and 100.5 FM. (Courtesy Larry Gotts, Richfield, Penna.)

**Our Opinion:** John Alldredge, Buffalo, N.Y., dropped us a letter to ask if we can tell him anything about the mediumwave signal improving device called the *Select-A-Tenna* and if it does what is claimed.

The *Select-A-Tenna* is intended to improve mediumwave (530 to 1705 kHz) re-

ception. It is designed for and best used with receivers having their own built-in antennas, such as all-band or AM/FM portables, and household clock and table-radios. It may not do much, or anything, for communications receivers and other types of sets requiring external antenna systems.

### Applications Filed For New FM Stations

AK	Tetlin	103.3 MHz	
AL	Dothan	90.3 MHz	3kW
FL	Crystal River	90.3 MHz	3 kW
FL	Monticello	91.9 MHz	3kW
IA	Decorah	104.7 MHz	4.5 kW
ID	Boise	88.7 MHz	6 kW
IL	Arlington Hts.	88.3 MHz	1 kW
IN	Walton	93.7 MHz	6 kW
LA	Ruston	99.5 MHz	3.1 kW
MI	L'Anse	106.1 MHz	50 kW
MN	Proctor	107.7 MHz	770 watts
MO	Cuba	90.3 MHz	7 kW
MO	Wheeling	105.9 MHz	6 kW
NE	Chadron	94.7 MHz	50 kW
NM	Grants	92.7 MHz	50 kW
NY	Mexico	103.9 MHz	3 kW
NY	Norwood	96.1 MHz	6 kW
OR	Canyon City	94.5 MHz	19 kW
PA	New Castle	90.1 MHz	4.6 kW
PR	Culebra	89.3 MHz	30 kW
WA	Leavenworth	97.7 MHz	6 kW
WI	Reedsburg	102.9 MHz	3.6 kW

### Permits Issued to Construct New FM Stations

AR	Maumelle	96.9 MHz	3 kW
AR	Osceola	107.3 MHz	3 kW
CA	Santa Ynez	105.9 MHz	3 kW
CA	Seaside	103.5 MHz	3 kW
DE	Fenwick Isl.	92.1 MHz	3 kW
FL	Jupiter	99.5 MHz	3 kW
GA	Greenville	95.7 MHz	6 kW
GA	Tennille	99.9 MHz	8 kW
IA	Des Moines	107.5 MHz	50 kW
IA	New Sharon	99.9 MHz	25 kW
IN	Chandler	93.5 MHz	3 kW
IN	Walton	93.7 MHz	
KS	Andover	93.9 MHz	25 kW
KS	Horton	93.7 MHz	25 kW
LA	Baker	107.3 MHz	3 kW
LA	Richwood	100.9 MHz	6 kW
MI	Bay City	89.1 MHz	2 kW
MI	Pickford	105.5 MHz	6 kW
MS	Starkville	91.1 MHz	14.1 kW
MT	Kalispell	106.3 MHz	3.9 kW
NC	Harkers Isl.	100.3 MHz	3.9 kW
NC	Orcacoke	92.9 MHz	1 kW
NY	Binghamton	91.5 MHz	1.5 kW
OH	Reading	89.3 MHz	340 watts
WI	Appleton	91.9 MHz	3.3 kW
WI	Whitewater	106.5 MHz	3 kW

### Changed AM Facilities

KAMD	Camden, AR	910 kHz	Now 1 kW/125 watts.
KDOV	Phoenix, OR	1300 kHz	Increased days to 20 kW.
KDYL	Salt Lake City, UT	1280 kHz	Increased to 10/6 kW.
KENO	Las Vegas, NV	1460 kHz	Increased days to 30 kW.
KKMC	Gonzales, CA	880 kHz	Moved to Del Rey Oaks, 50/25 kW.
KOJY	Costa Mesa, CA	540 kHz	Use 240 watts daytime.
KOQI	Soquel, CA	1200 kHz	Increased to 50/11 kW.
KXEM	McFarland, CA	1590 kHz	Moved to Bakersfield, 750 kHz, 6/3 kW.
WASG	Atmore, AL	550 kHz	Increased daytime to 25 kW.
WGOC	Blountville, TN	640 kHz	Increased daytime to 10 kW.
WQBS	San Juan, PR	870 kHz	Dropped to 9.6 kW.

### Applied to Change AM Facilities

KCTY	Salinas, CA	950 kHz	Seeks to increase to 10 kW.
KFFA	Helena, AR	1360 kHz	Seeks to drop to 90 watts (nights).
KORC	Waldport, OR	850 kHz	Seeks move to 820 kHz, 1 kW/100 watts
KTBR	Roseburg, OR	950 kHz	Seeks 180 watts (nights).
KYLR	Huntsville, TX	1400 kHz	Seeks 1 kW.
WSCR	Chicago, IL	820 kHz	Seeks 1 kW.
WWGM	Nashville, TN	1560 kHz	Seeks move to Gallatin, 1.5 kW (days).
WXLI	Dublin, GA	1230 kHz	Seeks drop to 700 watts.

## Requested AM Call Letter Changes

Now	Seeks	
WLVX	WRDM	Bloomfield, CT
WSMA	WIFN	Marine City, MI

## Changed AM Call Letters

New	Was	
KBBA	KEYJ	Abilene, TX
KBIL	KSTB	Breckenridge, TX
KEYQ	KFSO	Fresno, CA
KRXX	KMZZ	Minneapolis, MN
KBBI	WKMW	Madison, AL
WBEB	WEAZ	Philadelphia, PA
WCMF	WRMM	Rochester, NY
WEZK	WIMZ	Knoxville, TN
WFRG	WZLB	Rome, NY
WKDR	WDOT	Burlington, VT
WNCM	WQBR	Atlantic Beach, FL
WNXW	WKDR	Plattsburgh, NY
WWPG	WNPT	Tuscaloosa, AL
WWSN	WDJX	Louisville, KY

## Requests For Changed FM Call Letters

Now	Seeks	
KFAY-FM	KREB	Huntsville, AR
KGKO-FM	KMVK	Benton, AR
KMXI	KKBK	Lake Oswego, WI
KNJM	KSND	Lincoln City, OR
KQEZ-FM	KAZR	Coolidge, AZ
WJZE	WBIG-FM	Washington, DC

## Applied to Change FM Frequency

WNHU Renovo, PA 101.5 MHz Seeks 106.9 MHz, 5.8 kW.

## Changed FM Frequencies

KAYZ	El Dorado, AR	103.1 MHz to 103.3 MHz, 100kW.
KBST	Big Spring, TX	95.3 MHz to 95.9 MHz, 7 kW.
KMTB	Murfreesboro, AR	95.3 MHz to 99.5 MHz, 20.5 kW.
KXFE	Dumas, AR	107.1 MHz to 106.9 MHz, 25 kW.
WDYL	Chester, VA	92.1 MHz to 93.1 MHz, 1.35 kW.
WKZC	Scottsville, MI	95.9 MHz to 94.9 MHz, 17 kW.
WSOS	St. Augustine, FL	105.5 MHz to 94.1 MHz, 10 kW.

The *Select-A-Tenna* comes fully assembled. It is about 11-in. round, by 2-in. deep, and you are supposed place it next to the receiver. It doesn't require any power or batteries, nor wiring connections to the receiver. Depending slightly upon receiver antenna size and frequency, the field effect gain at typical at mid-band from the *Select-A-Tenna* is +13 dB.

We have found that the *Select-A-Tenna* works fine and significantly improves reception when used with receivers having internal antennas. It boosts night reception when local stations sign off and distant stations aren't strong enough to be pulled in, or when fading is severe. Enhances AM stereo signals by helping signals without significant noise. It also improves adjacent channel rejection.

The *Select-A-Tenna* works by creating a powerful localized RF energy field immediately surrounding itself. It may be peak-

tuned to specific frequencies by using the dial on the device.

The *Select-A-Tenna* is sold nationally. Several *POP'COMM* advertisers offer this useful device.

**Classic Radio:** New York City's WQEW/1560 plays old time recordings and radio programs on Saturdays from 7 to 11 p.m. Eastern, also Sundays, 8 to 11 p.m. Eastern Time. The recordings are from the 1925 to 1955 era.

We thank Charles Emanuelli, Sauger-ties, N.Y., for passing this along.

**St. Louis Blues:** Two shock radio deejays at St. Louis, Mo., FM station WKBQ 9 Q-106 found themselves in the center of a controversy. Ultimately, they also found themselves unemployed.

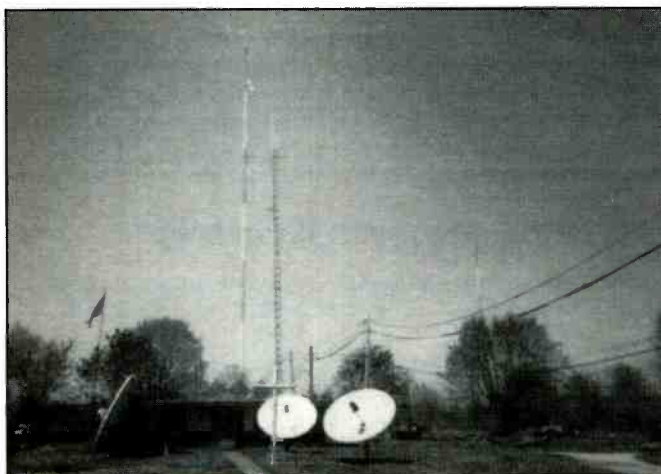
These air personalities were the hosts of a popular morning program called "The Steve and D.C. Show." The problems began after a listener who phoned the show

was called an offensive word with an ethnic context. After this went out over the air, civil rights and religious leaders complained so loudly that a number of sponsors decided to withdraw their support of the program.

People said that the use of ethnic slurs was nothing new to the program, and that it had been going on for many months. At least 16 previous complaints regarding this had been sent to the FCC. Still, the team had attracted a large audience with their show.

With the loss of the sponsors, the firings followed soon after. The two deejays expressed regret for insulting the caller, saying that they came to realize that what they had said was hurtful. They wanted to apologize to any listeners who had been offend-

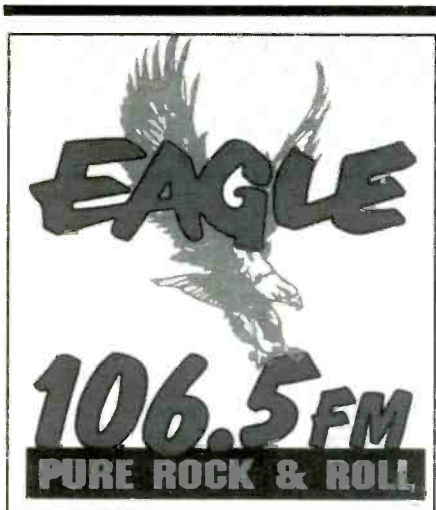
The station announced it was suing the two deejays, alleging that their ethnic slur



Exterior of WSLM, Salem, Ind. This station operates on 1220 kHz and 98.9 FM. (Photo by R.C. Watts, Louisville, Ky.)



Becky Coomer, a staffer at WSLM, Salem, Indiana. (Photo by R.C. Watts, Louisville, Ky.)



KEGX ("The Eagle") is formerly KOTY-FM. It plays classic rock in Tri Cities, Washington. (Courtesy S. M. Kesterson Pasco, Wash.)

to the listener had cost listeners and advertisers. The station estimated its losses at \$50,000.

The FCC said it was looking over the complaints that had been filed. Some observers pointed out, however, that while FCC regulations trigger problems for broadcasters as the result of certain vulgar or lewd references, the regulations do not prohibit the use of racial or religious slurs or degrading epithets.

We appreciate this information from Phil Starks, KBOFFW, Old Monroe, Mo., who furnished us with some of the clippings from the coverage on this that ran in the *St. Louis Post-Dispatch*.

Very Fine: Houston FM'er KLOL is apparently liable for a forfeiture of \$33,750.

## The Best\* Just Got Better!

The Eavesdroppers™ now includes our new Zap Trapper™ Electronic Gas Tube Lightning Arrestors. Receive-only design shunts damaging transients to ground at only 1/7th the voltage buildup of the available 200 watt transmit-type arrestors, providing maximum solid state receiver protection.

Protect your investment - combine an excellent shortwave receiving antenna with the best receiver protection money can buy.



- Completely assembled and ready to use
- Only 42' overall length
- 8 trap circuits permit reception on all shortwave bands, 11-90 meters.
- All connections soldered and enclosed in ultrasonically-welded, hermetically-sealed trap covers
- Includes 50' of 450 lb. test nylon rope

- Model T includes 100' twinlead feedline
- Model C includes weatherproofed center connector for your coax & coax sealant
- Either model \$79.95
- UPS-for lower 48 states \$5.00
- COD add \$4.50, IL add 7% sales tax
- Foreign shipping quoted

\* "The best...built like an antenna should be." -Larry Magne in *World Radio TV Handbook*

\* "Our best seller." -EEB in their recent ads and catalogs

\* "Now in use in 45 countries." -Gilfer Shortwave in 1983

## Antenna Supermarket

P.O. Box 563 Palatine, IL 60078 Tel (708) 359-7092 Fax (708) 359-8161

At your dealer or direct • Visa & Mastercard accepted

That's for broadcasting indecent material during a call-in "sex survey" that ran during several mornings in March, 1991.

The FCC said "the language was lewd and vulgar" and was broadcast "at times of day when there was a reasonable risk that

children may have been in the audience." A year earlier, the station had been fined \$6,000 for the same call-in survey during the same time slot.

Upon the request of the stations involved, the FCC reviewed three forfeitures

### Changed FM Call Letters

#### New

KBEW-FM  
KBOC  
KCDX  
KERX  
KIXB  
KJTA  
KKMX  
KMXX  
KRXX-FM  
KYJX  
KXTJ  
KYNU  
KZLZ  
KZMS  
WAHC  
WAZZ  
WBBS  
WBCS  
WBEB-FM  
WCMF-FM  
WCTU  
WDKC  
WELH  
WEZK-FM  
WGXL  
WHPN

#### Was

KQEI  
KWCS  
KOYF  
KCCL-FM  
KAYZ  
KOYG  
KTRQ-FM  
KCBD  
KRXX  
KVTY  
KWIC-FM  
KQDJ-FM  
KCDX  
KAAW  
WTLT  
WMXF-FM  
WKFM  
WCDJ  
WEAZ-FM  
WCMF  
WFSM  
WHMU  
WUFG  
WEZK  
WTSL-FM  
WRTQ

Blue Earth, MN  
Bridgeport, TX  
San Carlos, AZ  
Paris, AR  
El Dorado, AR  
Flagstaff, AZ  
Tri City, OR  
Imperial, CA  
Minneapolis, MN  
Mission, TX  
Beaumont, TX  
Jamestown, ND  
Kearny, AZ  
Patterson, CA  
Circleville, OH  
Laurinburg, NC  
Fulton, NY  
Boston, MA  
Philadelphia, PA  
Rochester, NY  
Tazewell, TN  
Covington, PA  
Providence, RI  
Knoxville, TN  
Hanover, NH  
Harrisburg, PA

#### New

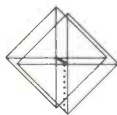
WJNX  
WJYL  
WKOR-FM  
WZKA  
WMMA  
WMSU  
WNCN-FM  
WNOG-FM  
WQBB-FM  
WQKK  
WQLW  
WQQZ  
WRLD-FM  
WRTQ  
WSCY  
WTIF-FM  
WTKS  
WUBJ  
WWBV  
WWDX  
WWFG  
WXXM  
WXRG  
WYIQ  
WZIQ  
WZQQ

#### Was

WRRH Franklin Lakes, NJ  
WJTE New Washington, IN  
WKIR Columbus, MS  
WVSU Stevenson, AL  
WAAR Lebanon, OH  
WKOR-FM Starkville, MS  
WNCM Jacksonville, FL  
WRGI Naples, FL  
WEMQ Knoxville, TN  
WIYQ Ebenburg, PA  
WIDO Eutaw, AL  
WREI Quebredillas, PR  
WUAF Valley, AL  
WJTF Ocean City, NJ  
WNHX Moultonborough, NH  
WQBX Omega, GA  
WWNZ-FM Cocoa Beach, FL  
WKJW Jamestown, NY  
WYHA Beaver Springs, PA  
WXXM St. John's, MI  
WKHI Ocean City, NJ  
WKNW-FM Canaan, VT  
WQFX-FM Gulfport, MS  
WHRH Warner Robins, GA  
WXAA Smithville, GA  
WRNG Hyden, KY

**SE SIGNAL ENGINEERING'S**  
High Performance CB Antennas

**SUPERHAWK**  
\$114.95



**Goldenrod  
45 Mobile  
Antenna**



**SPYDER A**  
\$35.95

**WHITE LIGHTNING**  
\$199.95



**LIGHTNING 6**  
\$359.95

**THE most POWERFUL  
CB base in the world today!**

ALL SE PATENTED rotary beams are true quads and OUTPERFORM their counter parts (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.

**SIGNAL ENGINEERING**

2624 Fayette Drive, Mountain View, CA 94040  
(415) 948-3833

**YOU  
AIN'T HEARD  
NOTHIN' . . . YET**

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 Frequency Guides
- Military/Federal Communications
- Broadcast Station Registries
- Undercover Communications
- Survival Communications
- Covert Operations
- Electronic Espionage
- Surveillance
- Monitoring
- Cryptography & Codes
- Bugging
- Wiretapping
- Communications Antennas
- Computer Technology!
- & Other Related Topics!

**Ask for Big  
Free Catalog**

Business Hours: 9 am to 3 pm Eastern (Mon., Tues., Thurs., Fri.),  
Closed Wed., and Holidays

**CRB RESEARCH**

P.O. Box 56

Commack, NY 11725

Phone: (516) 543-9169/FAX: (516) 543-7486

**RS-12/13 ORBIT CONFIGURATION**

Polar circular orbit with average height 1000 km (621 miles), inclination 83 degrees and period 105 minutes.

**FREQUENCY GUIDES**

	RS 12	RS 13
Mode A Uplink	145.910 - 145.950	145.960 - 146.000
Downlink	29.410 - 29.450	29.460 - 29.500
Mode K Uplink	21.210 - 21.250	21.260 - 21.300
Downlink	29.410 - 29.450	29.460 - 29.500
Mode T Uplink	21.210 - 21.250	21.260 - 21.300
Downlink	145.910 - 145.950	145.960 - 146.000
Mode KA Uplinks	21.210 - 21.250	21.260 - 21.300
Downlink	145.910 - 145.950	145.960 - 146.000
Mode KT Uplink	21.210 - 21.250	21.260 - 21.300
Downlinks	29.410 - 29.450	29.460 - 29.500
Beacons	145.910 - 145.950 29.408 29.454	145.960 - 146.000 29.458 29.504
	145.912 145.959	145.862 145.908

**AUTOANSWER ROBOT**

Modes	A; K; T; KA; KT	A; K; T; KA; KT
Uplink	21.129 and/or 145.831	21.138 and/or 145.840
Downlink	29.454 and/or 145.958	29.504 and/or 145.908

**TECHNICAL DATA**

DC POWER		
All system OFF	4.6 W	3.5 W
All system ON (max)	35 W	25 W
RF output power		
Beacon and Robot (1/h)	0.45/1.2 W	0.45/1.2 W
Transponder TX (29 or 145)	about 8 W	about 8 W

*RS-12/13 orbit configuration.*

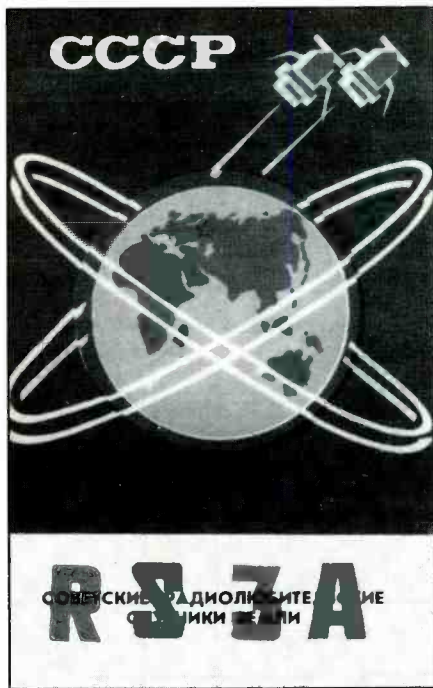
erably. The older RS-3 through RS-8, which are no longer operational, gave U.S. Amateurs a good window into Central Europe on the 2/10 meter bands. This A-mode window will again be possible with the launch of the next RS satellite. I will call it RS-15 for now. It is due to be launched by mid-94. It will have the same frequency band combinations used on RS-10 through 13. It may have a couple of UHF experi-

mental transponders as well. The best news about this satellite is that it will be in a considerable higher orbit (in the range of 1,000 miles, RS 10/11 is at 625 miles) and a lower inclination near 65° (RS 10/11 is at 83°). Don't forget, you read it HERE first.

One final note: you satellite operators who are equipped for the Packet satellites will be pleased to know the Soviets have a data satellite in orbit. Full operational de-

Satellite	Mode	Uplink	Downlink	
RS-10	A	145.860 - 145.900	29.360 - 29.400	
	T	21.160 - 21.200	145.860 - 145.900	
	K	21.160 - 21.200	29.360 - 29.400	
	K/A	21.160 - 21.200	29.360 - 29.400	
		145.860 - 145.860		
	K/T	21.160 - 21.200	29.380 - 29.400 & 145.880 - 145.900	
	ROBOT	21.120 &/or 145.820	29.403	
	BEACONS		29.357, 29.403, 145.857, 145.903	
	RS-11	A	145.910 - 145.950	29.410 - 29.450
		T	21.210 - 21.250	145.910 - 145.950
K		21.210 - 21.250	29.410 - 29.450	
K/A		21.210 - 21.250 & 145.910 - 145.950	29.410 - 21.450	
K/T		21.210 - 21.250	29.410 - 29.450 & 145.910 - 145.950	
ROBOT		21.130 &/or 145.830	29.453	
BEACONS			29.407, 29.453, 145.907, 145.953	

*RS-10/11 modes, uplinks and downlinks.*



tails on RS-14 have been included.

RS-14 (AO-21) is the latest offering from Russia. It carries two J-mode transponders (435 uplink and 145 downlink). These standard transponders operate SSB/CW only. RS-14 also carries a RU-DAX (Packet) transponder which operate several modes at various baud rates. There are four uplink channels in the 435 MHz band. The downlink can be switched to operate in any of the uplink variations or modes.

This spacecraft is unique in another way. Its main beacon downlink has been used to broadcast messages about world peace. These broadcasts are made with the aid of FM voice synthesizer. These messages are the result of cooperation between Russian Brazilian Amateur Radio communities. Dr. Junior De Castro of BRAMSAT (Amsat Brazil) was the moving force behind the DOVE satellite. It was designed to carry voice synthesized messages of world peace and the peaceful use of space. This task has now been taken over by the RS-14 beacon.

This satellite also uses the 145.983 MHz downlink in conjunction with a 435.016 MHz uplink to provide the first standard FM voice transponder ever used on an Amateur satellite. It is a single channel and is on for a limited amount of time during each orbit. All you need for this satellite is a 2-meter and 70 cm FM rig. Simple vertical antennas will work fine.

Now that you know space communications is much simpler and inexpensive than you first thought, you have no excuse for not jumping in and getting your feet wet. You will find, as I did, that rare tingle of excitement as you make your first satellite contact. Go ahead, take that first step into the final frontier. See you next month ■

RS-14  
AMSAT-DL/AMSAT-U Joint Project

Linear Transponder 1:

Uplink: 435.102 - 435.022 MHz (80 kHz)  
 Downlink: 145.852 - 145.932 MHz (Inverted)  
 Output power: 10 watts maximum.  
 Beacon CW telemetry (8 parameters): 145.822 MHz 0.2 watts  
 Beacon digital telemetry (30 parameters): 1200 bps PSK  
 R+Scrambler 2 kHz deviation: 145.952 MHz 0.4 watts

Linear Transponder 2:

Uplink: 435.123 - 435.043 MHz (80 kHz)  
 Downlink: 145.866 - 145.946 MHz (inverted)  
 Output power: 10 watts maximum  
 Beacon CW telemetry (8 parameters): 145.948 MHz 0.2 watts  
 Beacon digital telemetry (30 parameters): 1200 bps PSK  
 R+Scrambler 2 kHz deviation: 145.838 MHz 0.4 watts  
 Beacon digital telemetry (30 parameters): 1100 bps PSK  
 R+Scrambler 2 kHz deviation: 145.800 MHz 2 watts

Regenerative Transponder RU-DAX 2:

Two onboard computers with IP'S operating system for packet radio (AX.25) (Mailbox, telecommunications experiment with digital signal processing up to nearly 20 kHz, etc.) 1 MegaByte RAM disk. Four separate uplink channels.

UPLINK:

SAT-RX-1:	435.016 MHz +10 kHz	1200 bps, FSK, NRZIC/Biphase-M (JAS, PACSAT)
SAT-RX-2:	435.155 MHz +10 kHz	(AFC) 2400 bps, BPSK, Biphase-S
SAT-RX-3a:	435.193 MHz +10 kHz	(AFC) 4800 bps, RSM, NRZIC/Biphase-M
SAT-RX-3b:	435.193 MHz +10 kHz	(AFC) 9600 bps, RSM, NRZIC (NRZ-S)+Scrambler
SAT-RX-4:	435.041 MHz +10 kHz	(digital AFC) RX for RTX-DSP experiments

Output signals of RX-4 are the In-phase and Quadrature components, I(t) and Q(t), which are sent to the DSP-RX immediately after analog/digital conversion with 8 bit resolution. This supports various modulation modes depending on the software. All other receivers provide data (D) and clock (C) at their outputs.

DOWNLINK:

The downlink can be switched to the following operating modes:  
 Transmit frequency: 145.983 MHz  
 Output Power: 2 watts nominal (10 watts maximum)

Mode 1: 1200 bps, BPSK, NRZIC (NRZ-S) (like FO-20)  
 Mode 2: 400 bps, BPSK, Biphase-S (AMSAT mode for OSCAR-13 beacon)  
 Mode 3: 2400 bps, BPSK, Biphase-S (planned for OSCAR-13)  
 Mode 4: 4800 bps, RSM, NRZIC (Biphase-M) (like 4800 bps uplink)  
 Mode 5: 9600 bps, RSM, NRZIC (NRZ-S) + Scrambler (like 9600 bps uplink)  
 Mode 6: CW keying (only for special events)  
 Mode 7: FSK (F1 or F2B), e.g. RTTY, STIV, FAX, etc (only for special events)  
 Mode 8: FM modulated by D/A signals from DSP-RISC processor (e.g. speech)

RS-14 AMSAT-DL/AMSAT-U joint project.

**Use Your Free Reader Service Card  
 For More Information On Companies  
 Advertising In This Issue.**



**Touch Tone Decoder**  
**MoTron Electronics**  
**310 Garfield St., Suite 4**  
**Eugene OR 97402**

**\$60 Off!**

**Orders: (800) 338-9058 • Info: (503) 687-2118 • Fax: (503) 687-2492**

Decode and display Touch-Tones from a telephone, tape recorder, scanner, or nearly any audio source.  
 ✓16 digit LCD display, 80 digit scrollable buffer  
 ✓ Built-in speaker ✓ 9V battery ✓ Metal case  
 ✓ TM-16 PLUS includes RS-232 output and Software for optional automatic date/time/number logging using your IBM Compatible computer

TM-16 Standard Model \$169 ~~\$229~~  
 TM-16 PLUS RS-232 Model with Software ~~\$299~~  
 PS-12 AC Power Adaptor \$10 ~~\$239~~

S/H \$5 USA/Canada, \$15 Foreign.

**30 day money back guarantee! Try at no risk!**  
**Visa, MasterCard & American Express Accepted**

(Touch-Tone® is a registered trademark of AT&T)

## Is It Vertical? Horizontal? Does It Matter?

**J**ust how should you install a receiving antenna—in a horizontal or vertical position? There's a lot of confusing and sometimes contradictory advice and "information" out there. Some SWLs swear that antennas work best for DX when they're mounted vertically. Yet a lot of hams who work DX use horizontally mounted antennas like Yagis and dipoles. Some SWLs claim their DX reception really improved when they switched from a vertical antenna to a horizontal antenna, while other SWLs say they got better reception when they traded their horizontal antenna for a vertical one.

So who's right and who's wrong? What's better, a horizontal antenna or a vertical antenna?

Well, it definitely depends.

### It All Starts With Polarization

The position of the antenna—whether horizontal or vertical—is called its *polarization*. And polarization of an antenna is important because radio waves are also polarized. Take a look at Figure 1. A radio wave consists of interlinked electrical and magnetic force fields, and these two fields are located at right angles to each other. The position of the electrical field determines the polarization of the radio wave. For example, if a radio wave is traveling so that its electric field is parallel to the Earth's surface, the wave is said to be "horizontally polarized."

So what determines whether a radio wave is horizontally or vertically polarized? The answer is the transmitting antenna! A radio wave from a vertical antenna will be vertically polarized; and a radio wave from a horizontal antenna will be horizontally polarized.

However, a lot of things can change the polarization of a radio wave once it leaves the antenna. Anything that reflects or refracts the signal, such as the ionosphere or the ground, will alter the original polarization of a radio signal. The polarization of a radio wave arriving at your location via ionospheric propagation is a scrambled mess of constantly changing horizontal and vertical polarization. Such a signal is said to be *cross-polarized*.

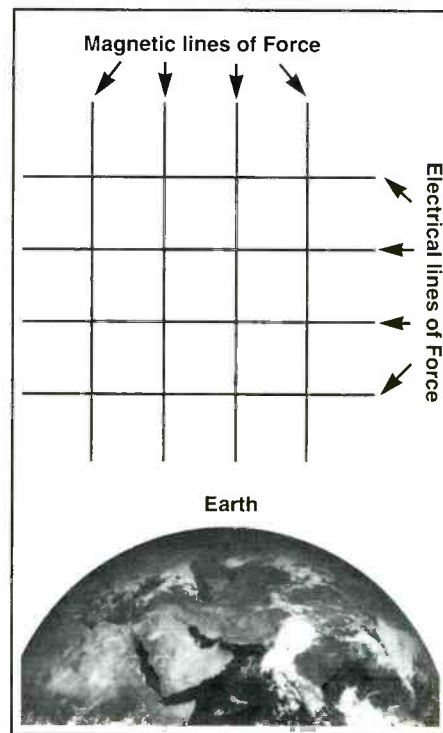
The polarization of a radio signal can have a big impact on how well you receive higher frequency radio signals. You may be familiar with the concept of "polarized light" and "polarized sunglasses." When

you turn the lens of polarized sunglasses, you'll notice that the amount of light that passes through the lens varies greatly. This is because the lens polarization compared to light will change as you rotate the lens. Light and radio waves are both forms of electromagnetic energy and behave the same way. An antenna can best receive a radio wave when it has the same polarization as the radio wave. If the antenna has different polarization, then the antenna is "blind" to the radio wave.

This effect increases with frequency. At frequencies below 30 MHz, it's generally not significant enough to be noticeable. Above 30 MHz, it becomes increasingly important as the frequency rises. Once you get into the microwave range, an antenna will not be able to "see" a signal of opposite polarization. On the 2-meter ham radio band (144 to 148 MHz), trying to use a horizontal antenna to communicate with another station using a vertical antenna will make a difference of several S-units in signal strength. To overcome this, some antennas for over 30 MHz transmit (and receive) horizontal and vertically polarized ways simultaneously. This is known as *circular polarization*, and it's used by several FM broadcast stations and land mobile radio systems where handheld units are an important part. Circular polarization sounds terrific, so why isn't that the standard for above 30 MHz? Well, you don't get something for nothing in radio, and the trade-off you make with circular polarization is a *loss* in the strength of the transmitted signal compared to a vertically or horizontally signal of the same transmitter power. Moreover, circularly polarized antennas aren't very practical for most portable and mobile operations. As a result, vertical polarization rules above 30 MHz.

### Ya Gotta Be Tuned

But the polarization of an antenna only has importance if it is a tuned resonant type, like a dipole, quarter-wavelength vertical, Yagi, Quad, etc. If you are using an untuned random length of wire or an active antenna, then it really doesn't matter whether you install it vertically or horizontally. All antennas will exhibit some polarization and directivity characteristics even if they're not tuned resonant types, but predicting these in advance is impossible unless you're an engineering whiz with a lab full of test and measurement gear. So don't think you're getting advantages (or disadvantages)



of a certain polarization just because you run a random length of untuned wire in a vertical or horizontal direction. And don't get too concerned about whether an active antenna is installed vertically, horizontally, or somewhere between those two positions.

### So Why Are Verticals Better DX Antennas?

A lot of people swear by their vertical antennas for DX work, especially if unable to erect some sort of beam or other directional antennas. I've used a vertical for my ham radio operating for several years and have been very pleased with the results; I managed to earn such awards as DXCC and WPX in two years while running only 70 watts of power.

Verticals (remember, we're talking about tuned quarter-wavelength types here) work because they exhibit a *low angle of radiation*. That's engineering talk meaning that verticals transmit signals that have a narrow angle relative to the Earth's surface. Such signals travel further away from the transmitter site before reaching the Earth's ionosphere and being refracted back to Earth. On receive, verticals are most sen-



sitive to signals arriving just above the horizon as seen from your location. Such signals are typically the most distant ones you can receive. As a result, you might find a vertical to be a less effective performer than a horizontal half-wavelength dipole for less distant communications (such as within 200 miles on 75 meters or within 500 miles on 40 meters) but the vertical will deliver better results on more distant signals.

Now keep in mind this improved DX performance for verticals is a consequence of their low angle of radiation, not the polarization of the signals they transmit. Since the signals will become cross-polarized, as they are refracted off the ionosphere, the polarization of a vertical antenna below 30 MHz is almost irrelevant.

### Going Against The Crowd

If you're interested in monitoring the world above 30 MHz, it would seem your antenna choice is simple: just install a vertical and start listening. That's true if you're just interested in hearing local communications, but it is not necessarily so if you're after DX.

Here's why. A horizontal antenna will reduce the strength of local signals significantly, even on the VHF Low (30 to 50 MHz) band. However, DX propagation via the F-layer of the ionosphere or sporadic-

E will generally not be as affected since such signals will be cross-polarized anyway. Thus, a horizontal antenna for 30 to 50 MHz can be a handy DX tool, letting you reduce QRM from local stations and sometimes even catch skip DX on the same channels where you have local and semi-local stations. This same trick also applies to TV DX on channels 2 through 6 and the FM broadcast band. Some DXers for those frequencies even have two sets of antennas—one horizontal, the other vertical—for those frequencies.

Even though the effects of polarization are less pronounced below 30 MHz, separate vertical and horizontal (dipoles, etc.) antennas are useful DX tools if you have the room for them. Although the skywave cross-polarization is normally constantly changing, sometimes a signal will be received that is more "horizontal" than "vertical" (or vice-versa). Being able to switch between antennas can make a big difference in some cases in how well you can receive a given station. If nothing else, two different antennas will have different receiving patterns, and that can make a big difference in many situations.

So unless you're using a tuned resonant antenna above 30 MHz, polarization usually isn't too crucial. But the more antennas of different polarization you can't get into the air the better! ■

## 18th Annual Va. Beach HamFest / Computer Fair™ and Popular Communications SWL Convention

ARRL Virginia State Convention

Oct. 2 & 3, 1993  
Va. Beach, VA



- ✓ Major Commercial Exhibitors & Dealers
- ✓ Amateur Exams & Upgrades
- ✓ Special Guests - Gordon West, WBNOA and Roy Neal, K6DUE
- ✓ DX Forums - Technical Forums
- ✓ Major Computer Dealers
- ✓ Excellent Food Service
- ✓ Held at the Va. Beach Pavilion
- ✓ Plenty of FREE Parking
- ✓ It's still Vacation Time at the Beach!
- ✓ Lots of Nearby restaurants, museums, historic sites - Williamsburg, Busch Gardens, Norfolk Naval Base & more!



General Admission -  
\$5 Advance - \$6 At The Door  
Tickets Good for Both Days!

Send SASE -Checks  
Payable to TRC, Inc.

**Tickets & General Info**  
Manny Steiner, K4DOR  
3512 Olympia Lane  
Va. Beach, VA 23452  
(804) 340-6105

**Exhibitor info**  
Lewis Steingold, W4BLO  
1008 Crabbers Cove Lane  
Va. Beach, VA 23452  
(804) 486-3800

CIRCLE 89 ON READER SERVICE CARD

# THE FUTURE OF AMATEUR COMMUNICATIONS

Once in a lifetime, a transceiver is introduced that's so extraordinary and innovative that it opens a totally new era in HF communications. ICOM's pacesetter IC-781 proudly exhibits that hallmark achievement with futuristic designs and features of true legendary proportions. Whether DX'ing, contesting, pioneering new interests or enjoying unquestionable top-of-the-line performance, the IC-781 is indeed today's standard of excellence!



**Multi-Function Five Inch CRT.** Displays frequencies, modes, memory contents, operating notes, RIT, two menu screens, plus panoramic view of all signals in a selected range. A portion of the screen also serves as a display for data modes like RTTY, AMTOR, and PACKET.

**Dual Width Noise Blanker** includes MCF filter plus **level and width controls** to eliminate pulse and woodpecker noise with minimum adjacent-signal interference.

**Unique Spectrum Scope.** Continuously indicates all signal activities and DX pileups with your operating frequency in the center. Selectable horizontal frequency spans of 50, 100, and 200kHz for each side of the frequency you're listening to. Vertical range indicates relative signal strengths. A contesteer's dream!

**Incomparable Filter Flexibility.** Independent selection of wide and narrow SSB filters plus CW filters. Second and third CW IF filters are independently selectable!

**Dual Watch.** Simultaneously **receives two frequencies in the same band!** Balance control adjusts VFO A/B receive strength levels. You can check additional band activity, even tune in your next contact, while in QSO without missing a single word!

**DX Rated!** 150 watts of exceptionally clean RF output. Easily drives big amplifiers to maximum power.

**Twin Passband Tuning** with **separate controls for second and third IF stages!** Increases selectivity and narrows bandwidth, independently varies low and high frequency response, or functions as IF shift.

**A Total Communications System!** Includes built-in 100% duty AC supply, high speed automatic antenna tuner, lambdaic keyer, semi-automatic or full QSK CW break-in to 60 wpm, Audio Peaking Filter (APF), RF speech processor, multiscanning, 105dB dynamic range, all-band/all-mode receiver with general coverage, and much more!

**ICOM Dependability.** The phenomenal IC-781 is built for action and backed with the most extensive warranty in the industry.

See the IC-781 at your local ICOM dealer.

**ICOM**  
First in Communications

ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004  
**Customer Service Hotline (206) 454-7619**  
3150 Premier Drive, Suite 126, Irving, TX 75063  
1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349  
ICOM CANADA, A Division of ICOM America, Inc.,  
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4  
All stated specifications subject to change without notice or obligation.  
All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 781188.

CIRCLE 66 ON READER SERVICE CARD

# POP'COMM'S World Band Tuning Tips

## October—1993

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
2325	VL8T, Australia	1100		6060	R. Nacional, Argentina	0530	SS
3200	TWR, Swaziland	0355	s/on	6070	CFRX, Canada	0800	
3215	R. Oranje, South Africa	0300	EE/Afk	6075	R. Super, Colombia	1000	SS
3220	HCJB, Ecuador	0400	SS	6075	Deutsche Welle, Germany	0030	
3250	R. Luz y Vida, Honduras	0200		6088v	R. Esperanza, Chile	1000	SS
3255	BBC Lesotho Relay	0300		6100	Deutsche Welle, Germany	0400	GG
3270	Namibian Bc Corporation	0300		6116	LV del Llano, Colombia	0130	SS
3280	LV del Napo, Ecuador	0305	SS, close	6120	R. Japan	1130	via Canada
3290	R. Central, Papua New Guinea	0930		6135	Swiss Radio Int'l	0230	
3300	R. Cultural, Guatemala	0200		6150	Caracol, Colombia	0400	SS
3316	SLBS, Sierra Leone	0600		6155	Radio Austria Int'l	0830	
3320	R. Suid Afrika, S. Africa	0400		6165	R. Netherlands, via Bonaire	0030	
3330	CHU, Canada	0300	time sigs	6185	R. Nacional Amazonia, Brazil	0000	PP
3356	R. Botswana	0300		6185	R. Educacion, Mexico	1000	
3365	R. Rebelde, Cuba	0300	SS	6205	R. Quisqueya, Dominican Rep.	0230	SS
3365	R. Cultura Araquara, Brazil	0130	PP	6219	Radio Bosnia-Hercegovina	0200	irregular
3384	Icelandic State Broadcasting Serv.	0330	Icelandic	6245	Vatican Radio	0640	
3395	Channel Africa, S. Africa	0400		6305	La Voz del CID (anti-Castro)	0800	SS
3810	HIZIOA time station, Ecuador	0200	SS	6576	R. Pyongyang, N. Korea	1100	
3985	Swiss Radio Int'l	0500		6628	La Voz de San Antonio, Peru	0100	SS
4000	R. Cameroon, Bafoussam	0430	FF	6825	China R. Int'l (feeder)	1000	CC
4470	Voice of the Mojahed (clandestine)	0300		7100	Voz Res. Galo Negro (clandestine)	2300	PP
4474	R. Movima, Bolivia	0000	SS	7105	REE, Spain	0430	SS
4485	R. Tikhiv Okean, Russia	1200	RR	7125	RTV Guinea	0700	FF
4552	Rdf. Tropico, Bolivia	1000	SS	7140	R. Italia Int'l	0700	
4649	R. Santa Ana, Bolivia	0030	SS	7150	R. Vilnius, Lithuania	0000	
4755	Educadora Rural, Brazil	0230	PP	7170v	ORTS, Senegal	0600	s/on, FF
4760	R. Frontera, Venezuela	0130	SS	7170	Voice of America	0500	
4765	RTVC, Congo	0355	s/on, FF	7195	R. Ukraine Int'l	0100	
4770	R. Nigeria, Kaduna	0500		7210	AWR, Italy	0800	
4770	R. Centinela del Sur, Ecuador	1030	SS	7215	R. Norway	0500	NN
4783	RTV do Mali	0500	FF	7225	R. Bulgaria	0100	
4800	R. Lesotho	0330		7235	Deutsche Welle, Germany	0400	AA, via Malta
4805	Rdf. Amazonas, Brazil	1000	PP	7250	Vatican Radio	0600, //6245	
4820	LV Evangelica, Honduras	0200	SS	7255	V of Nigeria	0500	
4830	R. Tachira, Venezuela	0200	SS	7260	R. Netherlands via Russia	1327	s/on, Dutch
4845	ORTM, Mauritania	0630	FF	7275	ELBC, Liberia	0700	
4850	Cameroon Radio TV	0500		7285	RT Malienne, Mali	0700	FF
4855	R. Aruana, Brazil	0000	PP	7290	TWR, Swaziland	0255	s/on
4865	La Voz del Cinaruco, Colombia	0200	SS	7315	R. Zagreb via WHRI	0515	
4870	ORTB, Benin	0500	FF	7370	R. Flanders Int'l, Belgium	0030	
4875	Super R. Roraima, Brazil	0000	PP	7375	R. For Peace Int'l, Costa Rica	0000	(USB)
4895	LV del Rio Aruca, Colombia	0200	SS	7380	Idea Radio, Italy	0800	II
4904.5	R. Nat. Tchadienne, Chad	0430	FF	7395	WRNO	0330	
4915	R. Cora, Peru	1030	SS	7475	RTT Tunisienne, Tunisia	0500	AA
4915	GBC, Ghana	0600		7580	R. Pyongyang, N. Korea	0900	JJ
4920	ABC, Australia	1100		7705	RAI, Italy, SSB feeder	0400	II
4935	R. Tropical, Peru	1000	SS	9022	VOIRI, Iran	0030	EE
4940	R. Ukraine	0500	Ukrainian	9165	R. Omdurman, Sudan	0255	sign on, AA
4960	R. Cima Cien, Dominican Rep.	0600	SS	9275	Icelandic State BC	2300	Icelandic
4970	R. Rumbos, Venezuela	0200	SS	9345	R. Pyongyang, N. Korea	1300	
4975	R. Tupi, Brazil	0800	PP	9420	Voice of Greece	0130	GG/EE
4985	R. Brazil Central	0100	PP	9445	Voice of Turkey	2330	TT
4990v	R. Apinte, Surinam	0330		9455	KHBI, No. Marianas	1000	
5010	R. Garoua, Cameroon	0600	FF	9475	R. Cairo, Egypt	0200	
5015	R. Brazil Tropical, Brazil	0700	PP	9480	TWR, Monaco	0730	
5020	Solomon Is. Bc. Corp.	0730		9505	R. Prague, Czech Rep.	0600	
5025	R. Rebelde, Cuba	0100	SS	9510	R. New Zealand	0930	
5030	R. Continente, Venezuela	0330	SS	9510	R. Havana Cuba	0600	
5035	R. Aparecida, Brazil	0200	PP	9525	R. Marti, USA	2300	SS
5047	RTV Togolaise	0524	s/on, FF	9535	Swiss Radio Int'l	0700	
5050	La Voz del Yopal, Colombia	0200		9540	R. Educadora Bahia, Brazil	0900	PP
5055	TIFC, Costa Rica	0300		9545	Solomon Is. Bc Corp.	0700	
5075	Caracol Bogota, Colombia	0400	SS	9560	Radio Finland	0300	
5850	WCSN, USA	0600		9565	R. Universo, Brazil	0900	PP
5882	Vatican Radio	0030	Italian	9570	R. Portugal	0230	
5920	Croatian Radio	0030		9570	R. Romania Int'l	0230	
5930	Slovak Radio	0100		9575	Radio Medi Un, Morocco	0730	FF
5930	R. Prague, Czech Rep.	0000		9575	RAI, Italy	0100	
5950	Guyana Broadcasting Corp.	0930		9580	R. Tirana, Albania	0230	
5990	R. Romania Int'l	0400		9600	Vatican Radio	2245	
5995	R. Australia	1100		9600	HCJB, Ecuador	0500	
6010	R. Havana Cuba	0430		9605	UAE Radio, Abu Dhabi	2200	s/on
6015	R. Austria Int'l, via Canada	0645		9615	KNLS, Alaska	0800	s/on, CC
6055	R. Prague, Czech Rep.	0600		9615	R. Veritas Asia, Philippines	1500	CC

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
9625	CBC Northern Service, Canada	0300		13650	R. Pyongyang, N. Korea	0000	
9630	R. Aparecida, Brazil	2300	PP	13655	R. Flanders Int'l, Belgium	2300	Dutch
9640	BBC via Antigua	0600		13660	R. Havana Cuba (USB)	0200	USB, EE
9645	R. Bandeirantes, Brazil	0000	PP	13675	UAE Radio, Dubai	1630	
9650	Swiss Radio Int'l	0000		13685	Swiss R. Int'l	0700	
9660	ABC, Australia	0900		13710	VOA Botswana	2130	
9660	R. Rumbos, Venezuela	0230	SS	13750	AWR Latin America, Costa Rica	1200	s/on
9690	China Radio Int'l, via Spain	0300		13755	R. Australia	1200	
9695	R. Sweden	0200		15020	All India Radio	1400	EE, others
9700	R. New Zealand	1030		15084	VOIRI, Iran	0430	Farsi
9705	BSKSA, Saudi Arabia	2030		15085	R. Damascus, Syria	2100	
9705	R. Portugal	0230		15090	Vatican Radio	2245	s/on
9715	VOA via Thailand	1400	CC	15100	FEBC, Philippines	1400	EE, others
9735	R. Nacional Paraguay	0000	SS	15110	REE, Spain, via Costa Rica	1900	
9740	R. Canada Int'l	0630		15120	R. New Zealand Int'l	0530	
9750	R. Korea, So. Korea	1200		15140	R. Nacional de Chile	0000	SS
9750	R. Canada Int'l	0530		15170	R. Australia	0900	
9760	R. Canada Int'l	0600		15175v	Radio Tahiti	0500	FF/TT
9765	R. Moscow	0530		15185	R. Finland Int'l	2300	
9770	UAE Radio, Abu Dhabi	2159	s/on	15200v	R. Bangladesh	1230	EE
9790	R. France Int'l	0130		15220	Channel Africa, S. Africa	0600	(ex R. RSA)
9815	Radio Havana Cuba	0200	USB	15240	Voice of Azerbaijan	1700	
9830	Croatian Radio	0700	Croatian	15250	Iraqi Radio	1400	EE
9830	R. Jordan	1800	AA	15260	VOIRI, Iran	2100	
9840	R. Kuwait	2100	AA	15270	HCJB, Ecuador	0730	
9845	FEBC, Philippines	1600		15325	Radio Canada via Portugal	1500	
9860	R. Netherlands via Russia	1100		15335	R. Romania Int'l	1430	
9885	BSKSA, Saudi Arabia	2100	AA	15340	R. Japan, via Gabon	2000	RR
9885	Swiss Radio Int'l	0200		15345	RAE, Argentina	2130	
9930	R. Vlanderen Int'l, Belgium	0030		15345	RTM, Morocco	1400	Berber
9935	RS Makedonias, Greece	2000	GG	15355	R. Japan via Gabon	1500	
10030	R. Cario, Egypt	2130	AA	15360	Deutsche Welle, Germany	2100	
10234	RAI, Italy, feeder	0100	II	15365	Radio Australia	0330	
11335	R. Pyongyang, N. Korea	1100		15415	Libyan Jamahiriya Broadcasting	1500	AA
11550	RTT Tunisia	1800	AA	15435	UAE Radio, Dubai	0530	
11603	Kol Israel	2230		15425	ABC, Australia	0130	
11620	All India Radio	2000		15445	Radio Nacional, Brazil	1245	EE
11645	Voice of Greece	1600	Greek	15470	R. Tashkent, Uzbekistan	1200	
11650	China Radio Int'l	0200	SS	15475	Africa Number One, Gabon	2100	FF
11685	FEBA, Seychelles	0300		15505	Swiss Radio Int'l	1500	
11695	Rep. of Iraq Radio	2230	AA	15505	R. Kuwait	2245	AA
11695	Radio France Int'l	0530	FF	15555	R. Pakistan	1600	
11705	R. Sweden	2330		15570	R. Ukraine Int'l	1500	
11710	UAE Radio, Abu Dhabi	2330		15575	R. Korea, S. Korea	0030	
11710	RAE, Argentina	0100		15603v	V of Iraqi People (clandestine)	1900	Farsi
11720	R. Bulgaria	0400		15635	V of Greece	1230	
11725	R. Korea, S. Korea	1000	SS	15640	Kol Israel	1400	
11740	Vatican Radio	0700		15770	INBS, Iceland	1430	Icelandic
11740	R. Moscow	0800		16000	VNG, Australia (time strn)	0800	
11745	Channel Africa, S. Africa	0200		17490	HCJB, Ecuador	1900	USB
11755	R. Finland Int'l	0130		17500	RTT Tunisienne, Tunisia	1400	AA
11785	VOA Thailand relay	1300		17550	R. Flanders Int'l, Belgium	1400	
11790	VOIRI, Iran	1200	Urdu/EE	17595	R. Cairo, Egypt	1200	
11795	UAE Radio, Dubai	1600		17605	R. Vilnius, Lithuania	0000	
11795	Deutsche Welle via Rwanda	0200	GG	17630	Africa No. One, Gabon	1430	FF
11800	SLBC, Sri Lanka	0045		17650	R. France Int'l	1400	
11800	Channel Africa, South Africa	0430		17670	R. Cairo, Egypt	1800	AA
11805	R. Globo, Brazil	0830	PP	17690	R. Ukraine Int'l	0100	
11815	Polish Radio Warsaw	1245	GG	17710	Channel Africa, S. Africa	1700	
11820	R. Sweden	0100		17720	R. Romania Int'l	1430	
11827	R. Tahiti	0300	FF/TT	17740	R. Yugoslavia	1200	
11835	HCJB, Ecuador	0700		17740	R. Sweden	1300	EE
11835	R. El Espectador, Uruguay	2330	SS	17745	R. Algiers, Algeria	1930	
11860	R. Iraq Int'l	0400		17750	Voice of Free China, Taiwan	2200	
11870	R. Yugoslavia	0040		17760	R. Havana Cuba	2030	FF
11870	AWR, Costa Rica	0100	SS	17770	R. New Zealand Int'l	0300	
11880	R. Australia	1600		17790	Radio Norway Int'l	1900	
11885	UAE Radio, Abu Dhabi	2330		17815	RTV Morocaine	1200	AA
11890	R. Oman	2100	AA	17825	R. Japan	0300	
11925	R. Canada Int'l	0400		17860	Qatar Bc Service	1300	AA
11940	R. Romania Int'l	1300		17870	R. Sweden	1500	
11955	R. Nacional, Angola	0600	PP	17875	R. Canada Int'l	2130	
11960	RTV Maliene, Mali	0900	FF	17880	R. Finland Int'l	1300	
11970	R. Havana Cuba	0130		17900	R. Portugal	2000	PP
11980	AWR/KSDA, Guam	1600		17955	V of Iraqi People (clandestine)	1930	Farsi
11985	UAE Radio, Dubai	2100	AA	21490	Radio Austria Int'l	1430	
11995	R. Sweden	2200		21500	Radio Sweden	1600	
12005	R. Moscow	1100		21505	BSKSA, Saudi Arabia	1600	AA
12025	R. Netherlands, via Khazakstan	0300		21545	R. Canada Int'l	1500	
12035	Spanish National Radio	1130	SS	21550	R. Finland Int'l	1430	
12050	R. Cairo, Egypt	0300	AA	21590	R. Netherlands	1845	
13508.5	Australian Armed Forces Radio	1400		21605	R. Yugoslavia	1230	
13595	WJCR, Kentucky	2300		21625	Radio Sweden	1330	
13605	Radio Australia	2300		21655	R. Portugal	1830	PP
13620	R. Kuwait	2000		21675	R. Kuwait	1500	AA
13630	RFPI, Costa Rica	2300		21700	Radio Japan, via Gabon	1600	JJ
13635	Swiss Radio Int'l	2130		25820	R. France Int'l	1430	FF

## THE EXCITING WORLD OF RADIOTELETYPE MONITORING

**T**une to 19502.0 kHz and you'll find another packet radio link between Andrews Air Force Base, Md., and the Air Forces of Central and South America. You may recall discussion here several times before (most recently in the April issue) about this linkup, heard on another frequency, which provides communications coordination between member countries for the defense of the Western Hemisphere.

The linkup is called the SITFAA net and comms are entirely in Spanish. It is on two circuits, one northern, the other southern. The northern one consists of Andrews AFB; Bogota, Colombia; Santo Domingo, Dominican Republic; Quito, Ecuador; San Salvador, El Salvador; Guatemala City, Guatemala; Tegucigalpa, Honduras; Managua, Nicaragua; Panama City, Panama; Caracas, Venezuela; and Albrook Air Station, Panama. The southern circuit is made up of Buenos Aires, Argentina; Brasilia, Brazil; La Paz, Bolivia; Santiago, Chile; Asuncion, Paraguay; Lima, Peru; and Montevideo, Uruguay.

Several stations in the United States are part of the network. At this time last year they were AFA01, Washington, D.C.; AFA02, Key West, Fla.; AFA03, Bonita Springs, Fla.; and AFA05, Homestead AFB, Fla. The Federal Communications Commission says AFA01 is the callsign for Andrews AFB. Homestead AFB was devastated by Hurricane Andrew in August, 1992, when the net was heard on 14646.5 kHz. When I listened in on the net in June, when it was on 19502.0 kHz, I found that Homestead's callsign had been reassigned to Miles City, Montana, which is on the Yellowstone River, northeast of Billings. (On June 24, the Defense Base Closure and Realignment Commission, which recommends to Congress which American military bases should remain open or be closed, recommended that Homestead be kept open.)

Time out for a thought: Why does the U.S. Air Force have AFA05 way up in Montana, apparently in the middle of nowhere, when all the other U.S. SITFAA stations are located on the East Coast a lot closer to Central and South America?

Now back to our story: Monitoring the net for 10 days straight in June, from 1300 to 2100 UTC, I found the active participants to be AFA01; CAKQN, Santiago, Chile; CX2XA, Montevideo, Uruguay; and ZWU26, Brasilia, Brazil. Once in a while AFA02 and AFA05 would poke their noses into the net and announce their presence, but would send no messages (a message is called a "sitfagrama"). Other stations were occasionally heard, but their signal



*Agence France-Presse faxphoto of US Secretary of State Warren Christopher was sent by AZG641, Buenos Aires, Argentina on 11480 kHz at 2309 UTC, 60/288 (From Robert Margolis.)*

strengths for the most part were too weak for my RTTY decoder to notice them. Their callsigns popped up now and then, and looked strangely out of place to be part of the net. Most of those callsigns had missing characters, probably because the radio signals were zapped by atmospheric disturbances. Here are some of those call-

signs: HN\_HQT, 99G\_CY, 3B\_MCO, 0YFA0\_, \_YU1/W, ZV41\_F, QOR\_LA LUB\_RE, PGA1C9, JA\_M5, 8HT\_3\_, 583S5A, \_RBVGA, Z4W\_O, OIF\_2\_, 3WQUEM, O\_G16Y, 5I\_1/0, O3OC3L, R\_A\_LO, GI5E4B, \_Q9KU\_, L2M65H, 6\_N5W\_, and 6/LDX4. Most of them sent no traffic; what supposed messages there

```
0000500000 m00285264 p00097040 p00512918 sparespare
apt 137.50 mhz, hrpt 1698.0 mhz, bcn dsb 136.77 mhz. apt day/night
2,4. vis ch 2 /0.725 to 1.0/ and ir ch 4 /10.5 to 11.5/ xmtd
continuously. dcs clk yr/day/time 91 257 45712.8818.
last tip clk corr 12/08/92. clk err aftr corr plus 0.40 sec.
clk err as of =#/09/+. minus 00.50 sec. err rate as of 04/05/93
minus 7 msec/day. next clk corr 05/24/93.
note: the noaa 10 avhrr instruments data may not be usable due
to scan motor problems. noaa is investigating.
note: effective 11/11/92, apt channel switching during s/c night
discontinued u.f.n.
nnnn
```

*Problems with the NOAA 10 weather satellite are mentioned in this notice from GFL22, Bracknell Meteo, England. It ran at 50 baud on 6835 kHz, at 1956 UTC. (From Ary Boender of The Netherlands.)*

were seemed to have nothing to do with the SITFAA net. Twice I saw AFA02, Key West, Fla., send an ident to AFQ through repeater station ADW. AFQ and ADW are legitimate callsigns for U.S. Air Force bases, but I don't know which ones, or their roles with the SITFAA net. It appears that the callsign for Quito, Ecuador, is HD1FAE. It was mentioned in a message between Andrews AFB and Santiago, Chile, but no location was given for it.

"Bunky" from Illinois writes, "In the June issue, you showed a copy of a message you copied from WNY on 16448 kHz. There are a bunch of similar stations that I have copied. They are BAR on 18128, 50 baud at 1215; GMN on 18128, 75 baud at 1650; KRN on 18196, 75 baud at 1730; KRN on 14468, 75 baud at 1740; and SPK on 18846, 50 baud at 1610. "Bunky" says he "recently found that when KRN is finished with his 1730 transmission on 18196, he immediately tunes up on 14468 and repeats the same thing."

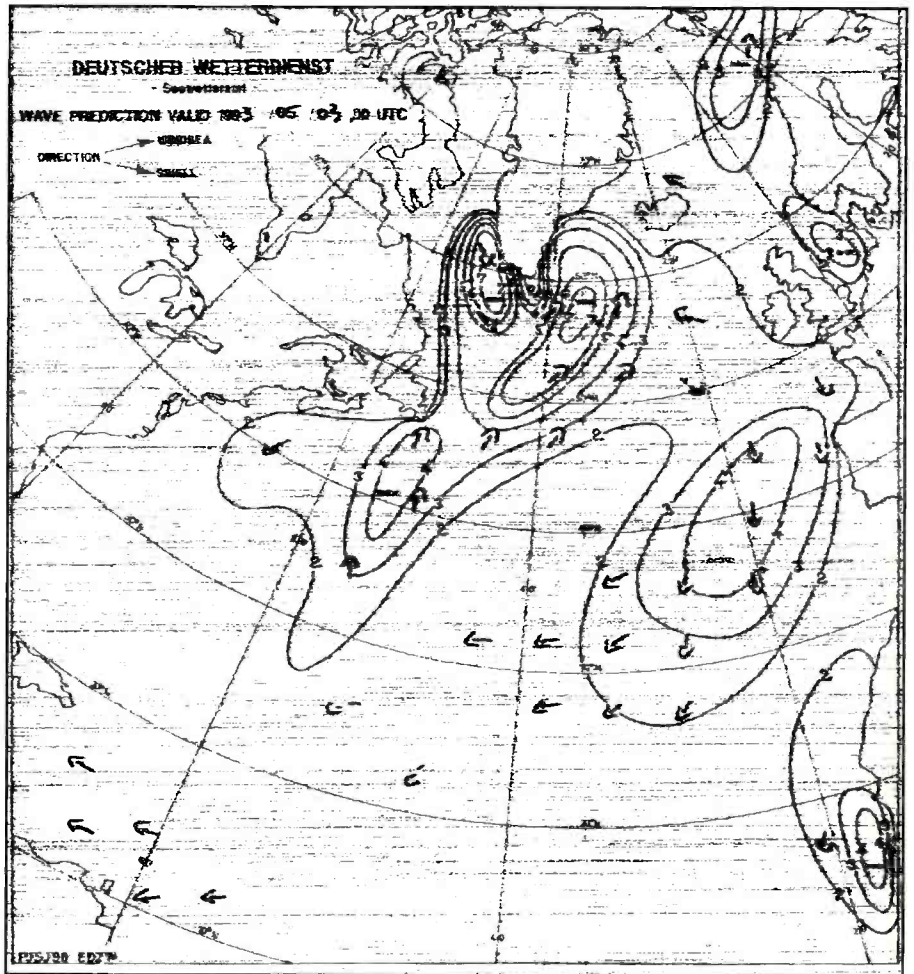
"The numbers after the callsign (at the beginning) indicate the number of messages and the number of blocks 'KRN 1/50' would mean one message with 50 groups I have seen both five-digit and five-letter crypto groups. I wonder how many of these stations use more than one frequency as KRN does. They seem to be on most days except Sunday. BAR is perhaps the least active (not on every day) and seldom sends many messages," says "Bunky."

NARC ARQ Dept.: An unidentified station, whose radio signal suffered from deep fadeouts, was seen sending the selcal "NARC" in ARQ on 14452.9 kHz, from 1428 to 1441 UTC in June. Spotted among a lot of garbling was "KHA950," which might be a callsign. Three federal agencies, Federal Emergency Management Agency, National Aeronautics and Space Administration, and Nuclear Regulatory Commission, are noted to be on assigned frequencies near the one in use. Is it one of those three or something else? Please send your thoughts to us.

Pecked FEC Dept.: A strange looking pile of FEC messages appeared on 10765.8 kHz at 1700 UTC on June 11. They were either all in numbers or letters grouped in threes and with some groups repeated a few times (see figure 1). The transmission by the unidentified station ended with a signoff in CW at 1722.

Last November, I wrote about two stations, CHA and CHC, who sent messages loaded with cuss words to each other. This took place on June 25, 1992, at 1745 UTC on 13415.5 kHz, 85/50N. I mentioned that "Pronto" broke in on their transmission and ordered the two to quit "fooling around." Later, "Acorn" came up and told them that the use of their communications equipment was "not for some kind of game."

Jim Devine of Ontario, Canada, sent a letter in June in which he says he believes he can "help identify some of the personalities involved." "The code name 'Pronto'



Wave prediction chart of DDK6, Pinneberg Meteo, Germany, ran on 13882.5 kHz at 2141 UTC, 120/576. (From Robert Margolis.)

and 'Acorn' referred to in the text," Devine says, "are known as Appointment Titles. (They) are unclassified names used to refer to branch or corps representatives within the Canadian Army. They are meant only to conceal the person's function and do not equate to the level of command. Therefore, the soldier referred to as 'Ironsides,' the Armor representative, could be a sergeant or a colonel—one would never know."

"'Pronto' refers to the Signals representative and 'Acorn,' the Intelligence representative," Devine says. "Being that the stations were in RTTY, this is likely a Brigade or higher net, and, being that this was logged on 25 June (1992), CHA and CHC were likely units participating in Exercise Rendezvous '92 at Canadian Forces Base, Wainwright, Alberta." "Now your readers can know why Pronto and Acorn were correct and had every right to dump on CHA and CHC for their X-rated traffic," he says.

Hello, Europe. Are you there? Throughout most of Spring 1993, hardly any RTTY or FAX stations from Europe were heard at my listening post at The RTTY Ranch because of poor propagation. Radio signals from the other continents were barely disrupted, however. This is the longest

length of time that I've witnessed bad listening conditions in the 10 years I've been monitoring utility stations. A couple of years ago there was a signal drought that lasted for about six weeks. This recent spell, however, was twice as long. Judging from the loggings sent in by our contributors, many of you didn't fare much better.

One station in Europe, however, always managed to be strongly heard on this side of the ocean—the foreign affairs ministry at Belgrade, Yugoslavia. It seems that the Serbs were intent on telling their side of the story surrounding the huge civilian war casualties in Bosnia and Herzegovina, and they pumped macho wattage into their radio transmitters so the whole world could hear them.

Stax of Fax Dept.: On June 20 at 1635 UTC, GFE23, Bracknell Meteo, England, released a radiofax notice on 14436.0 kHz about a planned change in its transmission schedule. The notice was sent horizontally instead of vertically and streaky lines caused by atmospheric noises covered parts of many words, making it somewhat difficult to read on the video monitor. The notice, where readable, read, "Notice to recipients of GFE. The future of the GFE ser-



the radiofax notices, appeared at around 2130 UTC.

Text in Chinese was seen in a newsfax broadcast on 13900 kHz at 1520 UTC. The text was split into two columns and ran at 120/576 There's no ident yet for this station.

Two issues ago I said that I was going to buy a spectrum analyzer as an aid to finding RTTY and fax stations on the satellites I now have one and find it to be a valuable tool in determining which transponders carry the data transmissions I seek. Better yet, I find it extremely helpful for monitoring RTTY stations on shortwave radio. I wish I bought one 10 years ago, when I began this hobby. As I monitor a RTTY station I can easily see when another one comes up on a nearby frequency. I can then quickly jump to the new station and log it at the start of its transmission.

During the first couple of weeks I had the instrument, when propagation was terrible, I saw hardly any radio activity of any kind on the 18, 19, and 20 MHz bands. I would then devote most of my time to viewing the lower bands where a few RTTY stations could be found. Even with a spectrum analyzer, however, there's still a need for finding RTTY stations the old fashioned way—laboriously turning the tuning knob. That's because the transmitting power of many stations is so weak that a spectrum analyzer will hardly notice them.

My spectrum analyzer gives a frequency readout that very accurately matches the

one shown on the shortwave receiver. I feel like a fox in a hen house as I chase the many frequencies that pop up on the instrument's gridded green screen. Spectrum analyzer's are expensive—mine cost well over \$2,000—but for what it can do, saving time by cutting down on all knob twirling that goes with hunting the numerous RTTY stations, the price is worth it.

The model I use is from JTC Instruments Inc. of San Diego, Calif., and was purchased through B & B Instruments of El Cajon, Calif. (1-800-527-5439).

#### RTTY Intercepts

**2137.5:** WLC Rogers City R., Mich., w/Great Lakes wx, FEC at 0115. ("Bunky," Ill.)

**4004.6:** LRO2, Telam. Buenos Aires, Argentina, w/nx in SS. 837/50 at 0252. (Robert Hall, RSA)

**5738.0:** 9GC. Accra Air, Ghana, w/RURY at 0144. 425/50. (Harold Manthey, N.Y.)

**5848.0:** TUH55, ASEENA, Abidjan, Ivory Coast, w/RURY at 0316, 410/50. (Hall, RSA)

**7713.2:** TJK, ASEENA, Douala, Cameroon, w/coded wx on both TDM channels. ARQ-M2/96 at 2357. (Ed.)

**7715.5:** Un-ID chitchatting in SS, ARQ, 0054-0110. (Ed.)

**8961.8:** "Lima 2 Alfa" w/5L msgs to "Delta 5 Charlie." 850/50 at 0429. Might be LOR, Puerto Belgrano Navrad, Argentina, because coded grps began w/SYNCB UNCFE & ended w/ENDSY NCUGV. SYNC & ENDSYNC letter strings are characteristic of Argentine cipher system Sta also sent "rutina" msgs in SS & meteo msgs (Ed.)

**9040.8:** 5YE, Nairobi Meteo, Kenya, w/coded wx, 850/100 at 0352. (Ed.)

**9193.0:** BAA23, Beijing Meteo, China, w/coded wx, 854/50 at 1835. (Ed.)

#### Abbreviations Used in The RTTY Column

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

**9330.2:** XVN26, VNA, Hanoi, Vietnam, w/nx in EE, 518/50 at 1525. (Hall, RSA)

**9395.1:** HMF84, KCNA, Pyongyang, North Korea, w/nx in EE at 1510. 258/50. (Hall, RSA)

**10257.8:** AFRTS w/AP nx on one FDM channel at 1750. 50 baud. ("Bunky," Ill.)

**10268.5:** Un-ID w/encryption, ARQ at 1945. (Ed.)

**10280.5:** Un-ID French Mil. w/"controle de voie," ARQ-E3/96 at 0025. (Manthey, N.Y.) It's RFLIG. Cayenne, French Guiana—Ed.

**10399.0:** Tanjug, Belgrade, Yugoslavia, w/nx in EE at 1442. 425/75. (Ed.)

**10460.0:** Un-ID sending HCGI selcal 1533-1600, ARQ. Msgs in SS seen at 2057. (Ed.)

**10521.7:** RFLI, French Navy, Fort de France, Martinique, w/a poor sig & constant fadeouts, ARQ-E3/192 at 1432. Using new freq. (Ed.)

**10536.0:** CFH, Canadian Forces, Halifax, Nova Scotia, w/coded wx at 2225. 75 baud. ("Bunky," Ill.)

**10580.1:** HMK25, KCNA, Pyongyang, North

## YOU AIN'T HEARD NOTHIN' . . . YET

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 Frequency Guides
- Military/Federal Communications
- Broadcast Station Registries
- Undercover Communications
- Survival Communications
- Covert Operations
- & 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. Ask for our latest FREE catalog.

Business Hours: 9 am to 3 pm Eastern (Mon., Tues, Thurs., & Fri.). Closed Wed. and Holidays.

### CRB RESEARCH

P.O. Box 56, Commack, NY 11725  
Phone: (516) 543-9169/FAX: (516) 543-7486

CIRCLE 11 ON READER SERVICE CARD

## HALLELUJAH!

### UNLOCK FULL 800 COVERAGE

Cellular Security Group Announces. . .  
New-800MHz RESTORATION SERVICE  
(for your factory blocked scanner)

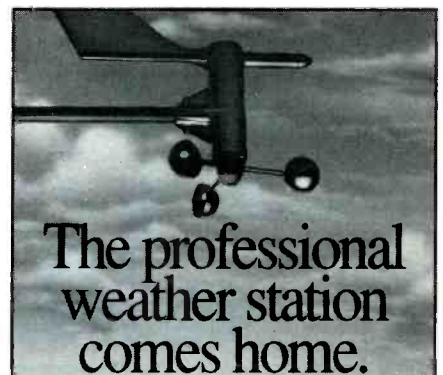
Warranty and Service Plan Protection  
Same Day Service — Free Insured UPS Return Shipping  
Unconditional Satisfaction Guarantee (refund and free relock)

Call for details: 508-281-8892

Ship to: Cellular Security Group  
106 Western Avenue, Essex, MA 01929

See our ad on page 61 for details on other products!

**\$40<sup>00</sup>**



Thanks to the Weather Wizard II, now you can have a fully sophisticated weather monitoring system right in your own home. Weather Wizard II has all it takes to watch the weather like the pros. All for only \$250.

- FEATURES INCLUDE:
- Inside & Outside Temp
  - Wind Speed & Direction
  - Wind Chill
  - Time & Date
  - Alarms
  - Highs & Lows
  - Instant Metric Conversions
  - Rainfall Option
  - Optional PC Interface



## WEATHER WIZARD II

THE PROFESSIONAL HOME WEATHER STATION

Only \$250. Add \$75 for self-emptying rain collector.  
Order today: 1-800-678-3669 • key code CM634H

M - F 7 a.m. to 5:30 p.m. Pacific Time • FAX 1-510-670-0589  
M/C and VISA • Add \$8 for shipping. CA residents add sales tax.  
One-year warranty • 30-day money-back guarantee

DAVIS INSTRUMENTS 3465 DIABLO AVE., HAYWARD, CA 94545

CIRCLE 60 ON READER SERVICE CARD

Korea, w/nx in EE. 260/50 at 1508. (Hall, RSA)

**10600.2:** XVN37, VNA, Hanoi, Vietnam, w/nx in EE at 1521. 505/50 (Hall, RSA)

**10894.0:** LRB39, Telam, Buenos Aires, Argentina, w/nx in SS at 0000. 50 baud. (Ed.)

**11118.5:** AFS, Ofutt AFB, Elkhorn, Nebr., w/KAWN wx data. 75 baud at 2220. ("Bunky," Ill.)

**11270.5:** "V52" and "Magic 52" (both w/NATO Geilenkirchen) w/encrypted msgs. 75 baud at 1053 and 1218 respectively (Ary Boender, NLD)

**11537.0:** HDN, Quito Navrad, Ecuador, w/RURY & SGSG. 1340-1345. 850/75 (Manthey, N.Y.)

**11606.2:** BZS21, Xinhua, Yuryumqi, China, w/nx in EE at 1500. 430/75 (Hall, RSA)

**12212.5:** YZ07, Taniug, Belgrade, Yugoslavia, w/nx in FF. 425/50 at 1609. (Ed.)

**12220.5:** RPFRW, Portuguese Air Force, Madeira, Portugal, w/msgs to Ponta Delgada, Azores, ARQ at 2050. (Hetherington, Fla.)

**12228.5:** BZR62, Xinhua, Yuryumqi, China, w/nx in EE. 295/75 at 1616 (Ed.)

**12480.0:** 9HWF2, ship "Giovanna," w/Telex saying it arrived at Lagos, Nigeria, and held comms w/"East Mole station" there "on CH 12 of VHF." Was ARQ at 2126. (Ed.)

**12741.3:** HWN, Paris Navrad, France, w/RURY & SGSG at 1540. 850/75. (Manthey, N.Y.)

**13365.8:** 5YD, Nairobi Meteo, Kenya, w/RURY, 50 baud at 2210 ("Bunky," Ill.)

**13372.8:** 5YD w/RURY, 250/50 at 1936. (Ed.)

**13392.0:** DFZG, MFA, Belgrade, Yugoslavia, w/AP, Taniug, Reuters & Izvestia nx in SC. FEC-A/144 at 0010. (Hetherington, Fla.)

**13527.2:** Un-ID w/long periods of ARQ idling or w/TVMY selcal. at 1322. (Ed.)

**13530.0:** RVW53, Moscow Meteo, Russia, w/coded wx. 1000/50 at 1320. (Ed.)

**13562.8:** 3MA22, CNA, Taipei, Taiwan, w/RURY, 850/50 at 1317 (Ed.)

**13580.0:** HMF36, KCNA, Jungsan, North Korea, w/nx in FF at 1313. 250/50. (Ed.)

**13916.5:** Un-ID w/5L grps. ARQ at 1710. (Ed.)

**13927.0:** Un-ID w/several 5L grpd msgs. 1120-1135. 850/75. (Ed.)

**13927.7:** DMK, MFA, Bonn, Germany, w/tfc at 0950. ARQ E/96(Hetherington, Fla.)

**13940.0:** KCNA, Pyongyang, North Korea, w/nx in FF. 250/50 at 1210. (Ed.)

**13941.5:** "L3 de S1 BV BSR INT QSA INT QRU KKK" seen in FEC at 1818. & "S1 de L3" + RURY seen at 1821. Probably Tunisian diplo stas. (Ed.)

**13950.0:** CLP65, Cuban Emb., Managua, Nicaragua, w/telegrams to CLP1. 425/100 at 1512. (Ed.)

**14352.8:** Swedish Emb., Caracas, Venezuela, w/350 5L grps at 1447. SWED-ARQ. (Ed.)

**14356.0:** GFL24, Bracknell Meteo, England, w/RURY at 2345. 50 baud. ("Bunky," Ill.)

**14367.0:** BZP54, Xinhua, Yuryumqi, China, w/nx in EE at 1225. 75 baud. ("Bunky," Ill.)

**14478.5:** OEC, MFA, Vienna, Austria, w/nx in GG at 1300. ARQ-S6/96. (Ed.)

**14481.7:** RFTJ, French Forces, Dakar, Senegal, w/worldwide monetary exchange rates list at 0245. ARQ-E3/48. (Ed.)

**14485.7:** RFLIG, French Mil., Cayenne, French Guiana, w/"non protege" tfc to Paris. ARQ-E3/192 at 1449. (Ed.)

**14524.0:** Possibly SAM, MFA, Stockholm, Sweden, w/5L grps. SWED-ARQ at 1428. (Ed.)

**14607.8:** PWN, Natal Navrad, Brazil, w/navar-eas in PP. 850/75 at 1436. (Ed.)

**14633.2:** 9UA, Bujumbura Air, Burundi, w/RURY. 406/50 at 0755. (Hall, RSA)

**14736.0:** "TLH" w/RURY, foll by 2 5L-grpd msgs, one headed w/11177 00125 65703 21808 03409, the other w/11177 00125 26613 21809 01039. Was 425/75 at 1421. A couple of readers who study RTTY numbers stas, asked me to include the header info w/my loggings, so here they are! (Ed.)

**14762.2:** NNN0ICE, USN MARS, McMurdo Sta., Antarctica, w/MARSgrams in FEC at 2345 & 0200. (Hetherington, Fla.)

**14731.0:** NMF, USCG, Boston, Mass., w/unclas tfc to NRCB, the sail training cutter "Eagle" (WIX 327), at 1920 & 2215. ARQ. Was on 18336.7 kHz at 1915 before moving down to this freq. (Ed.)

**14764.0:** A9M70, GNA, Manama, Bahrain, w/nx in EE at 1550. 425/75. (Manthey, N.Y.)

**14786.5:** 9PL, Kinshasa Air, Zaire, w/RURY, 50 baud at 2330. ("Bunky," Ill.)

**14805.0:** "BPA BPA BPA 1/3" + RURY, foll by 5F msg headed w/11177 00116 00000 13121 00031. 5F msg read "73932 11111" & was foll by QRU QRU SK SK. Xmsn ran 1522-1524. 425/75. (Ed.)

**14806.0:** Un-ID sending 5F msgs. 500/75 at 1532. Last msg w/header "11177 00116 61531 03114 01479" QRU QRU SK SK at 1533. (Ed.)

**14808.0:** GXQ, British Army, London, England, w/foxes, 10 count, & RYI's, FDM 170/50 at 1355. (Ed.)

**14880.0:** JMG4, Tokyo Meteo, Japan, w/coded wx, 850/50 at 1830. (Hetherington, Fla.)

**14983.0-14985.0:** Un-ID w/all 12 FDM channels encrypted. 170/75 at 1640. (Ed.)

**14989.0:** TNL, ASEENA, Brazzaville, Congo, w/coded wx at 1605. ARQ-E3/96. (Ed.)

**15011.7:** MFA, Cairo, Egypt, w/msgs in AA, ARQ at 1927. (Ed.)

**15633.0:** HMF26, KCNA, Pyongyang, North Korea, w/nx at 1312. 50 baud. (Boender, NLD)

**15655.0:** CNM66, MAP, Tanger, Morocco, w/nx at 1314. 50 baud (Boender, NLD)

**15897.8:** AFRTS w/AP/UPI nx on one FDM channel. 50 baud at 2150. ("Bunky," Ill.)

**15922.4:** DGP92H3, PIAB, Bonames, Germany, w/nx in GG to South America, FEC-A/96 at 2000. (Hetherington, Fla.)

**16017.4:** DFQ21, PIAB, Bonames, Germany, w/nx in GG, FEC-A/96 at 1908. (Ed.)

**16067.0:** IRO30, ANSA, Rome, Italy, w/nx in EE. 425/50 at 1830. (Ed.)

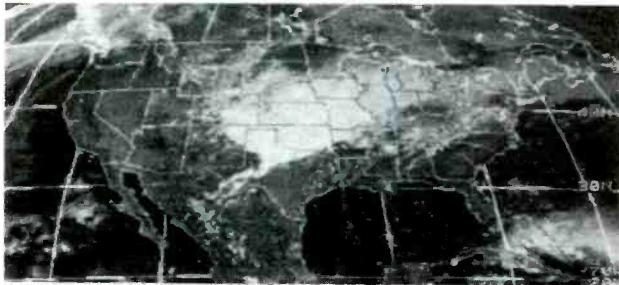
**16081.7:** Un-ID Egyptian diplo w/tfc in AA. ARQ at 1404. (Ed.)

**16098.0:** HBD80, Swiss Emb., QTH unknown, w/"This is HBD80. We are QRU. Tks for your call." Was ARQ at 1311. (Ed.)

**16117.0:** 6VK317, PANA, Dakar, Senegal, w/nx in EE & FF. 350/50 at 1315. (Manthey, N.Y.)

**16119.9:** HBD64, Swiss Emb., Bonn, Germany, idling in ARQ. 1412-1500, then sends "VON BONN QSL AND ERE QRU QRU???" (Ed.)

## PC HF FACSIMILE 6.0 \$99



## NOW EVEN BETTER!

Version 6.0 has just been released. It is the most comprehensive fax image reception system for the IBM PC and compatibles. It includes an FSK demodulator, advanced signal processing software, tutorial cassette, and complete 250 page reference manual. The software includes the following advanced features:

Menu Driven  
Start/Stop Tone Recognition  
Unattended Operation  
Tuning Oscilloscope  
Resolution up to 1280x800x256 Levels  
Programmable Colorization  
Brightness and Contrast Control  
Transmit Option Available  
Image Zoom, Scroll, Pan, Rotation

CGA,HGA,EGA,VGA & Super VGA  
Time Lapse Frame Looping  
Slide Shows  
Export to PCX & GIF Files  
Grayscale on all Popular Printers  
Programmable IOC & Line Rates  
Online Broadcast Database  
Image Cropping  
True Color Press Photos

## PC GOES/WEFAX \$250

PC GOES/WEFAX 3.0 is our finest fax imaging system. It is compatible with both HF and direct satellite broadcasts from GOES, METEOSAT NOAA, SOVIET APT and C-Band services. It includes all of the above features plus a complete prediction system and advanced multispectral analysis software.  
Call or write for our catalog of products. Visa & MasterCard welcome.

**Software Systems Consulting**  
615 S. El Camino Real, San Clemente, CA 92672  
Tel. (714) 498-5784 Fax. (714) 498-0568

CIRCLE 6 ON READER SERVICE CARD

## AR-33B VHF FM RECEIVER

THE AR-33B IS A LIGHTWEIGHT, MINIATURE VHF FM RECEIVER. IT INCLUDES MANY PROFESSIONAL COMMUNICATION QUALITY FEATURES FOR THE SERIOUS USER.

- Runs on 2 "AA" batteries.
- 140-170MHz coverage in 5kHz steps.
- Easy to use digital thumbwheel tuning.
- Microprocessor controlled solid state design.
- 2 memory channels for instant frequency recall.
- 4 varactor tuned stages in front end that track with frequency selection.
- .22uv sensitivity, 12db SINAD
- Adjacent channel rejection 65db at ± 25kHz.
- Spurious rejection is better than 60db in band, and 70db out of band.
- No birdies 140-170MHz.
- Size 5.2"x2.5"x1.0" - Weighs 7.3 oz.
- Supplied with batteries, earphone, rubber flex antenna, antenna adapter, and manual.
- F.C.C. approved.
- Full 1 year warranty.
- Same day delivery.



**COMMUNICATIONS SPECIALISTS, INC.**  
426 WEST TAFT AVENUE • ORANGE, CA 92665-4296  
(714) 998-3021 • FAX (714) 974-3420  
Entire U.S.A. (800) 854-0547 • FAX (800) 424-3420

A QUALITY PRODUCT OF  
**AOR**

CIRCLE 96 ON READER SERVICE CARD



# Scanners/Shortwave/GMRS/Ham

## COMMUNICATIONS ELECTRONICS INC.

### Emergency Operations Center

We're introducing new Uniden Bearcat scanners that are just what you've been searching for. Order your Bearcat scanner today.

## Radio Scanners

### NEW! Bearcat® 2500XLT-F

List price \$649.95/CE price \$344.95/SPECIAL  
400 Channels • 20 Banks • Turbo Scan  
Rotary tuner feature • Auto Store • Auto Sort  
Size: 2-3/4" Wide x 1-1/2" Deep x 7-1/2" High

Frequency Coverage	Default Steps
25.000 - 25.995 MHz (AM)	5.0 KHz
26.000 - 28.995 MHz (AM)	5.0 KHz
29.000 - 53.995 MHz (NFM)	5.0 KHz
54.000 - 71.995 MHz (WFM)	50.0 KHz
72.000 - 75.995 MHz (NFM)	5.0 KHz
76.000 - 107.995 MHz (WFM)	50.0 KHz
108.000 - 136.995 MHz (AM)	12.5 KHz
137.000 - 173.995 MHz (NFM)	5.0 KHz
174.000 - 215.995 MHz (WFM)	50.0 KHz
216.000 - 224.995 MHz (NFM)	5.0 KHz
225.000 - 399.995 MHz (AM)	12.5 KHz
400.000 - 511.995 MHz (NFM)	12.5 KHz
512.000 - 549.995 MHz (WFM)	50.0 KHz
760.000 - 823.995 MHz (NFM)	12.5 KHz
849.0125 - 868.995 MHz (NFM)	12.5 KHz
894.0125 - 1,300.000 MHz (NFM)	12.5 KHz

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

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

## Great Deals on Bearcat Scanners

- NEW! Bearcat 8500XLT-F base/mobile ..\$379.95
- NEW! Bearcat 890XLT-F base/mobile ...\$254.95
- NEW! Bearcat 2500XLT-F handheld .....\$344.95
- Bearcat 855XLT-F base .....\$159.95
- Bearcat 800XLT-F base/SUPER SPECIAL \$199.95
- Bearcat 760XLT-F base/mobile/SPECIAL \$229.95
- Bearcat 700A-F info mobile .....\$169.95
- Bearcat 560XLA-F base/mobile .....\$89.95
- Bearcat 350A-F info mobile .....\$119.95
- Bearcat 210XLT-F base/SPECIAL .....\$119.95
- Bearcat 200XLT-F handheld/SPECIAL ....\$208.95
- Bearcat 148XLT-F base w/ weather alert. \$94.95
- Bearcat 147XLT-F base .....\$83.95
- Bearcat 100XLT-F handheld .....\$149.95
- Bearcat 70XLT-F handheld/SPECIAL .....\$119.95
- Bearcat 65XLT-F handheld/SPECIAL .....\$99.95
- Bearcat BCT2-F info mobile .....\$139.95

## New FCC Rules Mean Last Buying Opportunity for Radio Scanners

On April 19, 1993, the FCC amended Parts 2 and 15 of its rules to prohibit the manufacture and importation of scanning radios capable of intercepting the 800 MHz cellular telephone service. Supplies of full coverage 800 MHz scanners are in very short supply. When this inventory is exhausted, there will be no more full coverage scanners available to our U.S. customers. If you have an inquiring mind that wants to know, today could be your last opportunity to own a Bearcat 800XLT scanner. Call Communications Electronics now to order your scanner.

### Bearcat® 800XLT-F

List price \$549.95/CE price \$199.95/LAST CHANCE  
40 Channels • 12 bands • 2 banks • Priority  
Wide 800 MHz. coverage • Search/Scan • AC/DC  
Bands: 29-54, 118-174, 406-512, 806-912 MHz.

The Uniden 800XLT receives 40 channels in two banks. Call CEI now at 1-800-USA-SCAN before they're gone.

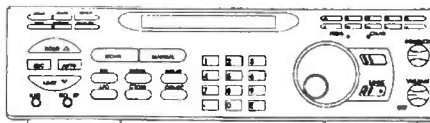
### NEW! Bearcat® 8500XLT-F

List price \$689.95/CE price \$379.95/SPECIAL  
500 Channels • 20 banks • Alphanumeric display  
Turbo Scan • Weather Alert • Priority channels  
Auto Store • Auto Recording • Reception counter  
Frequency step resolution 5, 12.5, 25 & 50 KHz.  
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High

Frequency Coverage:

25.000 - 28.995 MHz (AM), 29.000 - 54.000 MHz (NFM), 54.000 - 71.995 MHz (WFM), 72.000 - 75.995 MHz (NFM), 76.000 - 107.995 MHz (WFM), 108.000 - 136.995 MHz (AM), 137.000 - 173.995 MHz (NFM), 174.000 - 215.995 MHz (WFM), 216.000 - 224.995 MHz (NFM), 225.000 - 399.995 MHz (AM), 400.000 - 511.995 MHz (NFM), 512.000 - 549.995 MHz (WFM), 760.000 - 823.9875 MHz (NFM), 849.0125 - 868.9875 MHz (NFM), 894.0125 - 1,300.000 MHz (NFM).
--

The new Bearcat 8500XLT gives you pure scanning satisfaction with amazing features like Turbo Scan. This lightning fast technology featuring a triple conversion RF system, enables Uniden's best scanner to scan and search up to 100 channels per second. Because the frequency coverage is so large, a very fast scanning system is essential to keep up with the action. Other features include VFO Control - (Variable Frequency Oscillator) which allows you to adjust the large rotary tuner to select the desired frequency or channel. Weather Alert - Lets your scanner function as a severe weather warning radio. Auto Store - Automatically stores all active frequencies within the specified bank(s). Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. 20 banks - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; M8001 Mobile mounting bracket \$14.95; M8005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from CEI now.



## CB/GMRS Radios

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

- NEW! Uniden GMR100-F GMRS Handheld ..\$159.95
- NEW! Uniden GRANTXL-F SSB CB Mobile ..\$149.95
- NEW! Uniden PC76XL-F SSB CB Mobile .....\$99.95
- NEW! PRO320XL-F CB Handheld/Mobile .....\$69.95
- Uniden PRO330E-F CB Remote .....\$99.95
- Uniden PC122-F SSB CB Mobile .....\$107.95
- Uniden PC66A-F CB Mobile .....\$78.95
- Uniden PRO510XL-F CB Mobile .....\$36.95
- Uniden PRO520XL-F CB Mobile .....\$49.95
- Uniden PRO538W-F CB & Weather .....\$69.95

## Shortwave

ICOM R1-F ultra compact handheld .....	\$459.95
ICOM R100-F mobile .....	\$629.95
ICOM R71A-F base (add \$39.00 shipping) .....	\$1,029.95
ICOM R72A-F base (add \$39.00 shipping) .....	\$944.95
ICOM R7000-F base (add \$39.00 shipping) .....	\$1,199.95
ICOM R7100-F base (add \$39.00 shipping) .....	\$1,259.95
ICOM R9000-F base (add \$89.00 shipping) .....	\$4,934.95
Grundig Satellit 700-F portable with AC adapter .....	\$459.95
Grundig Satellit 500-F portable with AC adapter .....	\$359.95
Grundig Cosmopolit-F with cassette recorder .....	\$179.95
Grundig Yacht Boy 230-F portable .....	\$139.95
Grundig Traveler 2-F portable .....	\$79.95
Sangean ATSG06F ultra compact .....	\$149.95
Sangean ATSG06F radio with antenna & AC adapter .....	\$169.95
Sangean ATSR800-F portable .....	\$79.95
Sangean ATSR803A-F portable with AC adapter .....	\$159.95
Sangean ATSR808-F portable .....	\$159.95
Sangean ATSR818-F portable without cassette recorder .....	\$189.95
Sangean ATSR18CS-F with cassette recorder .....	\$209.95
Sangean ANT60-F portable shortwave antenna .....	\$9.95

## Weather Stations

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

## Other neat stuff

ICOM GP22-F Global Positioning System .....	\$739.95
WR200-F Weather Radio with storm alert .....	\$39.95
RELM RII256GNB-F VHF synthesized transceiver .....	\$289.95
Ranger RCI2950-F 25 watt 10 meter ham radio .....	\$244.95
Ranger RCI2970-F 100 watt 10 meter ham radio .....	\$369.95
Uniden LR9000W-F Laser/Radar Detector .....	\$159.95
PWB-F Passport to Worldband Radio by IBS .....	\$12.95
LIN-F Latest Intelligence by James Tunnell .....	\$12.95
NPD-F Uniden National Police Directory .....	\$12.95
FBE-F Uniden Eastern Frequency Directory .....	\$12.95
FBW-F Uniden Western Frequency Directory .....	\$12.95

## Buy with confidence

It's easy to order from CEI. Mail orders to: Communications Electronics Inc., Emergency Operations Center, P.O. Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add \$15.00 per radio for U.P.S. ground shipping and handling in the continental U.S.A unless otherwise stated. Add \$6.00 shipping for all accessories and publications. Add \$6.00 shipping per antenna. For Canada, Puerto Rico, Hawaii, Alaska, P.O. Box, or APO/EPO delivery, shipping charges are two times continental U.S. rates. Michigan residents add state sales tax. No COD's. 10% surcharge for net 10 billing to qualified accounts. All sales are subject to availability, acceptance and verification. Prices, terms and specifications are subject to change without notice. We welcome your Discover, Visa, American Express or MasterCard. Order toll-free by calling 1-800-USA-SCAN. For information or if outside the U.S.A. call 313-996-8888. FAX anytime, dial 313-663-8888. Order your electronic equipment from Communications Electronics Inc. today.

Scanner Distribution Center and CEI logos are trademarks of Communications Electronics Inc. Sale dates 9/1/93 - 1/2/94 AD #080793EN Copyright © 1993 Communications Electronics Inc.

## For credit card orders call 1-800-USA-SCAN

Communications Electronics Inc.

Emergency Operations Center

P.O. Box 1045, Ann Arbor, Michigan 48106-1045 U.S.A.

For information call 313-996-8888 or FAX 313-663-8888

## The HB-232 SCANNER/COMPUTER INTERFACE

PRO-2004  
PRO-2005  
PRO-2006  
PRO-43  
THREE ANNUAL



### REVOLUTIONIZES THE ART, SCIENCE & PLEASURE OF SCANNING!

The HB-232 is the long awaited RS-232 scanner controller and data acquisition system brought to you by *Bill Cheek*, author of the *Scanner Modification Handbooks*.

The HB-232 Scanner/Computer Interface Kit + includes:

- printed circuit board and essential electronic parts
- Control Program on Disk (specify disk size)
- detailed documentation & photos on assembly, installation & operation
- wide area network technical support
- Requires PC/XT/AT clone w/MS-DOS 3.1 or higher & 512-K RAM min; HD recommended.

Designed for the PRO-2004/5/6 scanner series, the HB-232 features AutoLog, AutoProgram, Data LookUp, Scripts & much more with nearly unlimited variations of computer control & data collection from the scanner. Facilitates maximum performance *without* compromise. Easy to install & use; minimal invasion to scanner! Discover a new dimension of radio scanning! Order today! \$194.95 + \$5 S&H, ck, m.o. MC/VISA. SEE FOR MORE INFO

\* Reduced capability for PRO-43

**COMMTRONICS Engineering**  
P.O. Box 262478-P  
San Diego, CA 92196-2478  
(619) 578-9247

1:30pm-5:30pm, PST: Voice Only  
6:00pm-1:00pm, PST: BBS & FAX Only

CIRCLE 56 ON READER SERVICE CARD

**16138.0:** BZR66. Xinhua, Yuryumqi. China, w/nx at 1328. 75 baud. (Boender, NLD).  
**16203.0:** RCF, MFA, Kupavna, Russia, w/continuous RYRY w/o ID. 425/75 at 1435, foll at 1440 w/CQ CQ CQ de RCF & RYRY. At 1443: "QRU SK GA" then went QRT. (Ed.)  
**16987.0:** GYU. Royal Navy, Gibraltar, w/available channels list, 850/75 at 1843. (Ed.)  
**17018.0:** EBA. Madrid Navrad, Spain, w/navar-eas, 170/75 at 1840. (Hetherington, Fla.)  
**17020.0:** UDK2, Murmansk R., Russia, w/tfc at 1334. 50 baud. (Boender, NLD)  
**17135.0:** UJQ. Kiev R., Ukraine, w/tfc for UDTI, ship Sovietskaia Oukraina, 50 baud at 1341. (Boender, NLD)  
**17140.0:** UMN7, Murmansk R., Russia, w/RYRY & telegram tfc. 170/50. 1503-1522. (Ed.)  
**17215.4:** LOR. Puerto Belgrano Navrad, Argentina, w/marine wx in SS. 425/75 at 0030. (Hetherington, Fla.)  
**17432.0:** DFZG, MFA, Belgrade, Yugoslavia, w/RYRY at 1400. (Boender, NLD). & w/Tanjung nx in EE, at 1534. 425/75. (Ed.)  
**17441.3:** 5YE, Nairobi Meteo, Kenya, w/coded wx, 850/100 at 0030. (Ed.)  
**17474.0:** "V5G," MFA, Bucharest, Romania, w/encryption at 1537. ROU-FEC/164.5. (Ed.)  
**17550.8:** RFTJ, French Navy, Dakar, Senegal, w/5L msgs to Paris. ARQ-E3/192 at 1630. (Ed.)  
**18173.5:** STK, Khartoum Air, Sudan, w/RYRY, 50 baud at 2350. ("Bunky," Ill.)  
**18230.0:** GFL25, Bracknell Meteo, England, w/coded wx, 425/50 at 1400. (Ed.)  
**18264.8:** CNM78, MAP, Tanger, Morocco, w/nx in FF. 372/50 at 1638. (Hall, RSA)  
**18320.0:** Un-ID w/5F grps, 425/100 at 1535. (Ed.)  
**18336.7:** NMF, USCG, Boston, Mass., w/unclass tfc to NRCB, cutter "Eagle," ARQ 1545-1620. (Ed.)  
**18416.7:** MFA, Jakarta, Indonesia, w/nx in Indonesian at 1201. 430/50. (Hall, RSA)  
**18450.0:** Un-ID w/5L grps, 425/75 at 1459, foll by QRU SK QRU SK at 1500. (Ed.)  
**18593.0:** CLP12, Cuban Emb., Lima, Peru,

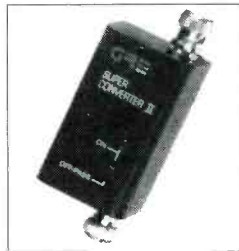
w/5F msgs, 425/75 at 1616. (Ed.)  
**18648.5:** SOT265B, PAP, Warsaw, Poland, w/nx in Polish, FEC at 1406. (Ed.)  
**18702.3:** DFS70, PIAB, Bonames, Germany, w/nx in GG at 1900, FEC-A/96. (Ed.)  
**18872.0:** BZR68, Xinhua, Yuryumqi, China, w/nx in EE, 425/75 at 1241. (Ed.)  
**19067.4:** CLP1, MFA, Havana, Cuba, w/5F grps to Congo at 2125. 50 baud. ("Bunky," Ill.)  
**19086.8:** CLP1 w/prensaminrex, 50 baud at 2128. ("Bunky," Ill.)  
**19117.5:** MFA, Jakarta, Indonesia, w/tfc at 1349, FEC-S/96. (Ed.)  
**19418.5:** RFFA, Mindefense, Paris, France, w/nx re French Polynesia, ARQ-E3/192 at 1130. (Ed.)  
**19693.0:** URD, St. Petersburg R., Russia, w/msgs to ship c/s URV-F. ARQ at 1647. (Ed.)  
**19718.0:** UDK2, Murmansk R., Russia, w/marine info in RR, 170/50 at 1315. (Manthey, N.Y.)  
**20133.5:** DFZG, MFA, Belgrade, Yugoslavia, w/nx in SC, 425/75 at 1717. (Ed.)  
**22378.1:** FTT91, St. Lys R., France, w/a marine msg & tlc list, FCC at 1206. (Hall, RSA)  
**22960.0:** HBD20, MFA, Berne, Switzerland, w/msgs in GG, ARQ at 1525. (Manthey, N.Y.)  
**23052.4:** CLP45, Cuban Emb., Luanda, Angola, w/RYRY, 425/75 at 1625. (Manthey, N.Y.)  
**23273.0:** IPG20, MFA, Rome, Italy, w/2.5L msgs to Buenos Aires, Argentina & a circular re an inquiry by Scotland Yard into the alleged execution of a British soldier in Argentina during the Falkland Islands war 10 years ago. Was ARQ-E/96 at 1531. (Ed.)  
**23358.5:** RFFA, Mindefense, Paris, France, w/5L grps & msgs at 1555, ARQ-E3/192. (Manthey, NY)  
**23387.5:** LOR, Puerto Belgrano Navrad, Argentina, w/wx & radioadvisories at 1920, 170/75. (Hetherington, Fla.)  
**24300.0:** AFS, Offutt AFB, Elkhorn, Nebr., w/KAWN wx data, 75 baud at 1500. ("Bunky," Ill.)  
**25030:** FDY, French Air Force, Orleans, France, w/lebricks & RYRY, 400/50 at 1500. (Manthey, N.Y.)  
**25136.0:** Un-ID w/encrypted msgs & RYRY,

## Improve Your Scanning Coverage!

GRE America is proud to introduce a new family of products to enhance your scanning pleasure! First, GRE has designed the new **Super Converter 9001** for base model scanners. The 9001 converts 810 MHz - 950 MHz down to 410 MHz - 550 MHz. The 9001 is the perfect alternative to buying a new, expensive scanner covering the 800 MHz band. Next, GRE announces the new **Super Amplifier 3001** for base model scanners. The 3001 will increase gain by as much as 20 dB, and is engineered to help scanners with low sensitivity pull in weak signals. Both products use BNC connectors, (1) 9 volt battery and have an off/pass switch for returning to normal operation.



Super Converter 9001 & Super Amplifier 3001



Super Converter II



Super Amplifier



All-Band Antenna

U.S. & International Distributorship inquiries welcome. Please call GRE for further information!

### Let GRE Manufacture Your Radio Products!

GRE America, Inc. is a leading OEM developer and manufacturer of radio telecommunications products such as:

- Cordless Telephones
- CB & Marine Radios
- Spread Spectrum "engines"
- Remote Monitoring Systems

If you need a high quality, cost competitive, reliable manufacturer, GRE will provide you with a free production quotation.

For more information, please call GRE at (800) 233-5973. GRE is a subsidiary of General Research of Electronics, Inc.

# GRE America, Inc.

GRE America, Inc.

425 Harbor Blvd., Belmont, California 94002  
(415) 591-1400 Outside California: (800) 233-5973

CIRCLE 64 ON READER SERVICE CARD

# HOW I GOT STARTED

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

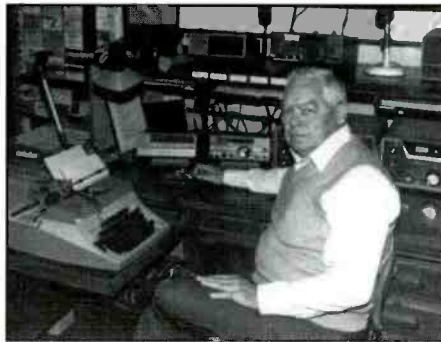
Each month we will select one entry and run it here. You need submit your entry only once, we'll keep it on file. All submissions become the property of *Popular Communications*, and none can be acknowledged or returned. Entries will be selected for use taking into consideration if the story they relate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

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

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

## Our October Winner

This month our winner is Peter T. Hulth, Jr., N4SXG, of Smithfield, N.C. Peter told us:



*Peter T. Hulth, Jr., N4SXG, is active in various ham radio organizations and traffic handling networks.*

"In 1936, when I wasn't quite 13, my radio hobby began. That's when my friend and I built a crystal radio. The crystal cost us a dime. We wound the coil from transformer wire around a 5-in. length of broom handle, using a piece of spring brass as a slider to (theoretically, at least) change the wavelength. A clothesline served as the antenna, and we were able to pick up the 40 meter ham band.

"When I entered the U.S. Navy in 1941, I exaggerated and said I was very deeply involved in the radio hobby. That earned me

a five month course at the Navy's school. There were two years of combat communications service in the Amphibious forces that included landings in southern France and Okinawa. Later, when the Korean War erupted, I served in the Navy for an additional two years.

"Since 1944, I have taught hundreds of people Morse Code, in the Navy, as well as in Civil Defense, Boy Scouts, and ham radio classes.

"In 1986, as a feature writer for the *Smithfield Herald*, I suggested to the editors that I might do a story about ham radio in our community. They agreed, and I interviewed the instructor of a ham radio class, also his pre-teen student. This was a course sponsored by the Johnston County Amateur Radio Society, Benson, N.C.

"At the class I attended for the purpose of snapping photos for my story, the instructor knew of my background in radio and suggested that I take the Novice code and written tests. I passed the Novice requirements. Since then, I have obtained my General Class ticket, and am active on the 2, 10, 15, 20, 40, and 80 meter bands. I am also Registered Monitor KNC4CP."

"It took me 50 years in radio to realize it was time to get my ham ticket!" ■



## Popular Communications

### Worldwide SWL Conference! October 2-3, 1993

*Hurry, Time Is Running Out!*

- \* Meet major SW broadcasters
- \* EXPERT Speakers on Current topics include:

Gerry Dexter, Bill Price, Dr. Harold Cones, Dick Robinson, Pat Murphy, Don Dickerson and Ian McFarland, PLUS . . . Speakers from the VOA, BBC and more!!!

**PLUS – Speakers from the VOA, BBC and more!!!**

Our KEYNOTE SPEAKER, Roy Neal, K6DUE, will talk about SAREX (Shuttle Amateur Radio Experiment) and Tuning the Space Shuttle Comms. He's the Chairman of SAREX, for ARRL-AMSAT and former NBC News Correspondent.

Dozens of manufacturers and dealers of SWL and amateur radio equipment will be on hand demonstrating their equipment and ready to answer your questions on the spot -- including -- Kenwood, Yaesu, JRC and more!

The SWL Conference will be held in conjunction with the 18th Annual Virginia Beach Hamfest and Computer Fair (the areas LARGEST hamfest and computer exhibit). The first Popular Communications Worldwide SWL Conference, held at the Radisson Hotel, Virginia Beach, Virginia has something for everyone!

**Make Plans Now to attend both days – October 2 - 3, 1993 at the Virginia Beach Pavilion; minutes from the beach, Navy bases and historic sites!**

**Radisson Hotel is across parking lot from Pavilion. You can walk between both!**

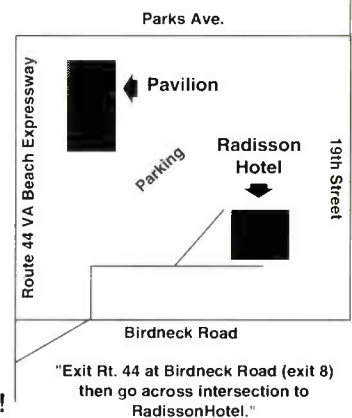
"Talk-in frequency 146.970 MHz."

**To acquire room reservations at the Radisson Hotel Virginia Beach call 1-800-333-3333 and ask for Virginia Beach Hamfest rates.**

**Each Ticket is \$25 payable by check, money order, Mastercard, VISA, AMEX, Discover  
(Pick up tickets and info. pack at the Radisson Hotel on October 1 between 2 and 8 p.m.)**

Mail your order to:

**Popular Communications, 76 North Broadway, Hicksville, NY 11801 Telephone 516 681-2922; FAX 516 681-2926**



# LISTENING POST

BY GERRY L. DEXTER

## WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

This is one of those months when there's no obvious place to begin, no item that jumps up and screams "me first!" So let's just step back a few paces and throw a dart at the world map on the shack wall and see what we hit.

Australia? Good enough. You can now hear broadcasts of Australian Armed Forces Radio. They're being carried on shortwave for Australian service personnel in both Somalia and Cambodia. The broadcasts for Somalia come from a transmitter at Exmouth in northwest Australia at 0300 on 19037.5, 0900 on 25322.5 and 1400 on 13508.5, all upper sideband. A transmitter at Canberra is used for broadcasts to Cambodia at 0300 on 23678.5, 0900 on 20418.5 and 1200 on 12070.5, all upper sideband. In both cases the program is one hour long, with the first broadcast repeated for the rest of the day.

Adventist World Radio has announced the availability of a glossy, full color QSL card being issued for reception of AWR broadcasts via Russia. Reports go to AWR-Europe, Box 383, I-47100 Forli, Italy. You can listen for another AWR outlet—Adventist World Radio—Africa, which is beamed to west Africa via Africa Number One in Gabon and is on the air daily in French from 1700 to 1800 on 9625 and on Sundays with English at 1200 on 17890.

The new Voice of America relay station at Udorn, Thailand is being jammed by mainland China. 11785 is being particularly hard hit. By now the VOA should have a second transmitter in operation from Thailand.

Incidentally, the planned VOA relay from Israel has been cancelled by the Clinton administration, but the Kuwait and Sao Tome relay bases are still on.

Every month it seems we hear about another shortwave broadcaster that's just felt the ground tremble under its feet.

In the past few weeks the government of Sweden cut the budget of Radio Sweden by a full one-third. The word is that Radio Sweden will drop broadcasts in both Spanish and French and discontinue its own programs in Swedish, relying instead on relaying the home service.

U.S. religious broadcaster KCBI, Dallas, is also having problems and the station may well be off the air by the time you read this, for reason or reasons which haven't been announced. KCBI has a troubled history. Its first effort was short lived and was followed by years of silence. The station was finally purchased by a new group and it returned to the air only last year.

Spain's Costa Rican relay (at Cariari de Pococi) should have its Ibero-American Service in full bloom by now, running 12 hours per day and beamed to the US, the Caribbean, Central and South America, all in Spanish. The programming is largely news, with an emphasis on Western Hemisphere events. Main frequencies are 5970, 9630, 9740, 11815, 11880, 15125, 17870 and 17890 at various hours between 1100 and 0400.

Radio Sofia has followed in the footsteps of stations in most of the former communist nations. It has dropped its old name and now uses Radio Bulgaria.

Watch for the return of longtime religious broadcaster ELWA, which was destroyed in the Liberian civil war. The station plans to resume, using a 20 kw transmitter and may even open up a second station in another African country sometime in the future.

The former clandestine station Radio Miskut is now a legitimate Nicaraguan



TWR Bonaire's Chuck Roswell, hosted the station's DX program. He and his wife, Barbara, will transfer to TWR's station in Monaco.

broadcaster and has returned to shortwave. It's being noted on 5770, in Spanish, running a schedule that sometimes ends as early as 2320 or runs as late as 0205.

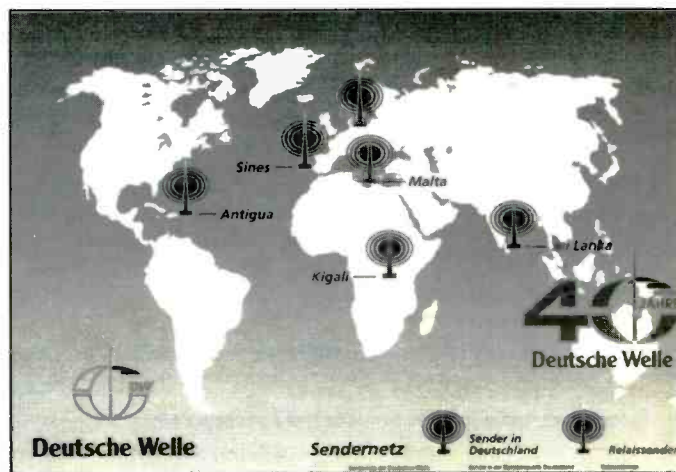
The broadcasts are in upper sideband. NOTES FROM THE MAIL—Larry Zamora sends what he terms a "pseudo QSL" he clipped from Deutsche Welle's 1993 calendar.

Larry says the card notes that DW began in 1953 using a single 20 kw transmitter broadcasting only in German. Today DW uses 35 languages on a total of 43 transmitters. Thanks, Larry. And congratulations to Deutsche Welle, celebrating its 40th anniversary this year.

Jill Dybka in Tennessee sends a note



Here's "Col. DX," aka R.C. Watts in his Louisville, Kentucky DX shack



Germany's Deutsche Welle celebrates 40 years of shortwave broadcasting this year.

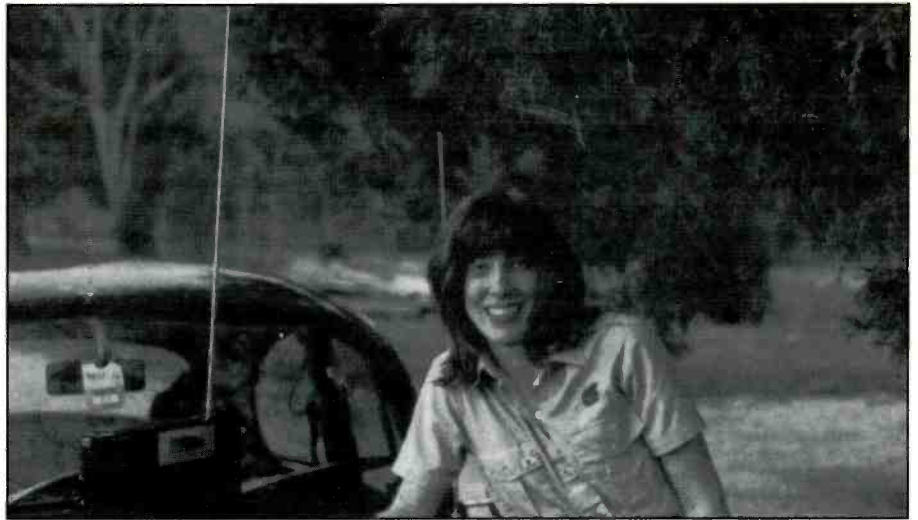
saying she got a good response from normally hard-to-QSL Radio Pyongyang. The package included an LP record and two books. Her report was sent to her brother in England who then mailed it to the station, a technique which usually works with this station. As for getting replies out of the BBC, Spain, Egypt and South Africa...the BBC doesn't really QSL reports. The others just take time, and perhaps a second try.

Let's have your input! Shortwave loggings should be arranged by country, be double spaced and must—repeat, must—include your last name and state abbreviation after each. Open arms will also welcome your shack photos, station photos and spare QSLs we can use as illustrations as well as program schedules, station background information, news clippings, letters and whatever else you'd care to share!

Here are this month's logs. Remember, all times are in UTC, which is 5 hours ahead of EST (0000 UTC = 7pm EST). Broadcast language is assumed to be English unless specified otherwise (SS = Spanish, RR = Russian, FF = French, etc.)

**Loggings**

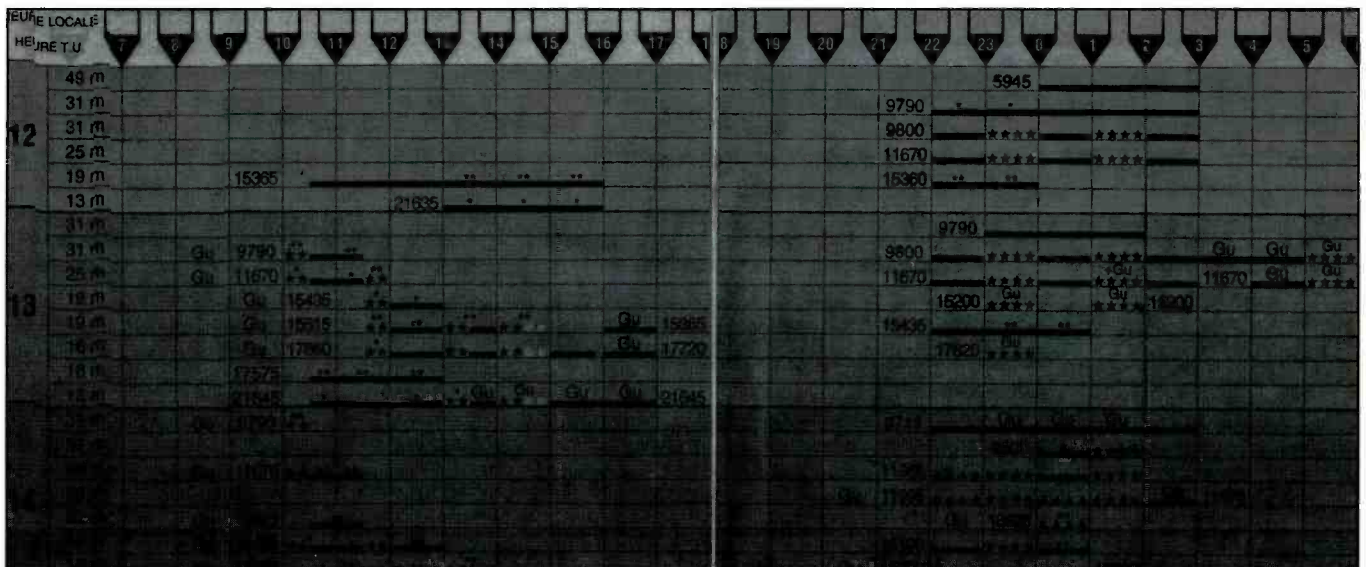
**ANTIGUA**—BBC relay, 15220 at 1235 with interview. (Pappas, SD)  
**ARGENTINA**—RAE heard on 11710 at 0220 with news. (Sooy, NJ)  
**ASCENSION ISLAND**—BBC relay on 15260 at 1650. (Low, TX)  
**AUSTRALIA**—Radio Australia, 9510 in CC at 1011 with EE lessons. Also 15240 at 0400 and 15365//17715 at 0342 with an interview. (Lamb, NY) 17795 at 0410. (Seefeldt, WI) Here and //21740 at 0236. (Low, TX)  
 ABC, Brisbane, 4920 at 1052 with big bands and ABC news.  
 9660 at 0700 with ABC news. (Lamb, NY)  
 ABC, Perth, 6140//9610 at 1133 with old pop music, ABC news, promo for ABC Regional Radio. (Lamb, NY)  
**AUSTRIA**—Radio Austria International, 6015 (via Canada) at 0523 in GG and EE, frequency announcement at 0530. (Sooy, NJ) 0530 with plans for the coun-



Listening Post reporter Jill Dybka of Nashville, TN, here with 1969 VW Beetle and DX-440 of unspecified vintage.

try's 1,000 birthday celebration. (Pellicciari, CT)  
**BELGIUM**—Radio Vlaanderen Int'l, 15540 at 1756 with IS, ID "Brussels Calling". (Lamb, NY)  
**BOLIVIA**—Radio Santa Ana, 4649 at 2342 with ID, time checks, announcements, all SS. (Rausch, NJ)  
 Radio Frontera, 4450 at 0930 with ID and into SS music. (Rausch, NJ)  
 Radio Metropolitana, 6195 at 0933 in SS with echo announcements, medium wave frequency announcement, Bolivian folk and Latin pops. (Lamb, NY)  
**BOTSWANA**—VOA relay on 7265 at 0440. (Rogen, WA) New 12080  
 at 0503 with business report. (Lamb, NY)  
**BRAZIL**—Radiobras, 15445 at 1229 with special program on next day's elections, songs, IDs, "Girl From Ipanema" at sign off. (Pappas, SD)  
 Radio Educadora Rural, 4755 at 0145 in PP with ID, mention of Campo Grande. Heard in SS, not Portuguese. (Rausch, NJ)  
 Radio Cultura Sao Paulo, 9615//17815 at 0041 in PP with Brazilian tunes. (Lamb, NY)  
 Swiss Radio Int'l relay, 17730 at 0009 with "Date-line" and site ID. (Lamb, NY)  
 Radio Cancao Nova, 4825//6105//9675 at 0632 in PP with religion, ID, address and "Madrugada"

religious program. (Lamb, NY)  
**BULGARIA**—Radio Bulgaria (new name) 11720//15330 at 0038 with economic and sports programs. (Lamb, NY) 15330 at 2030; 2209. (Pellicciari, CT; Rogen, WA)  
**CANADA**—CFRX relaying CFRB, Toronto, 6070 with news at 1730. (Seefeldt, WI)  
 CKZN, St. John's 6160 at 2119 with CBC children's show. (Lamb, NY)  
**CHAD**—4905 at 0429 with flute-like music, anthem, man in FF and into African language. Possible Chad. (Sooy, NJ) (Would seem so, editor)  
**CHINA**—China Radio Int'l, 9690 (via Spain) at 0330 to close at 0356. (Sooy, NJ) 11855 at 1323 with news features. (Zamora, CA) 15210 at 1242 about Chinese musical instruments. (Foss, AK)  
 CPBS, 15880 at 0624 in CC with vocals. (Foss, AK)  
**COLOMBIA**—Caracol Bogota, 5075 in SS with news, IDs, promos, commercials, music at 0247; 0402; 0735. (Lamb, NY; Sooy, NJ; Pellicciari, CT)  
 Ondas de Orteguaaza, 4975.8 at 1000 sign on in SS with ID "Ondas del Orteguaaza transmito en banda tropical..." (Rausch, NJ)  
**CONGO**—RTV Congolaise, 7105 at 0503 with



The RFI schedule of broadcasts beamed to the Americas.

man and woman with news in FF, lost in QRM at 0530. (Sooy, NJ) 0641 with uptempo jazz and FF announcer. (Foss, AK)

**COSTA RICA**—Radio For Peace Int'l. 15030 at 0257 with ID and program about self sufficiency in food production. (Sooy, NJ)

Adventist World Radio/TIAWR. 13750 at 0506 with IS til EE/SS ID at 0520. anthem and into EE program, but then "La Vie Abundant" program in French! (Lamb, NY)

**CROATIA**—Croatian Radio. 13830 at 2009 in Croatian with easy listening music. EE news at 2102. a new time. (Lamb, NY)

**CUBA**—Radio Havana. 6010 at 0228 with chimes and ID by woman at 0229 9655 at 0415 with news. (Sooy, NJ) 9510 at 0600. (Pellicciari, CT)

Radio Rebelde. 3365 in SS at 0415 with news. (Sooy, NJ)

**CZECH REPUBLIC**—Radio Prague. 7345 at 2358 with IS. ID. EE news and "Off The Wall" program. Also new 15606 at 1659 with IS, ID, news, Czech jazz. (Lamb, NY)

**DENMARK**—Radio Denmark, via Norway. 9560 at 0430 with chimes. EE ID. (Sooy, NJ) 15165//15175 at 2130 sign on with EE ID, then into Danish. (Vaage, CA)

**ECUADOR**—HCJB. 9745 at 0100 with "Ham Radio Today." (Seefeldt, WI) 11925 at 0502 and 15155 at 0231, both times with news. (Sooy, NJ) 11790//21455USB//21480 at 2133 with "Blues, Rags and All That Jazz." (Lamb, NY)

**EGYPT**—Radio Cairo. 12050 in AA at 2141 (Low, TX)

**ENGLAND**—BBC. 3955 at 0458. 5975 (via Antigua) at 0450 and 9410 at 0211, all with news. 11920 at 0246 with Swahili into slow English. (Sooy, NJ) 9515 (via Canada) at 1408 with soccer and 11750 (via Singapore) at 1430 with "Anything Goes" (Zamora, CA) 9915 at 0306. (Low, TX) 11955 at 0009. (Vaage, CA) 15070 at 2000. (Pellicciari, CT)

**FINLAND**—Radio Finland Int'l. 15185 at 0156. (Foss, AK)

**FRANCE**—Radio France Int'l. 21580//21620/

/21635 in FF at 1312. (Low, TX)

**FRENCH GUIANA**—Radio France Int'l relay. 11670 at 0444 with news in FF. (Sooy, NJ) 21645 in FF at 1342. (Low, TX)

RFO Guyane. 5055 in FF at 0802 with news, country, comedy and laughter. (Lamb, NY)

**GERMANY**—Deutsche Welle. 6025, possibly via Canada, at 0400 with AA/GG ID. Also 9545 at 0303 with EE news. (Sooy, NJ) 17860 at 2104 in GG. (Vaage, CA) 21540//21560 in GG at 1310. (Low, TX)

**GHANA**—GBC-1. 4915 at 0600 with news in EE. (Pellicciari, CT)

**GREECE**—Voice of Greece with news in EE at 1529 and Swedish at 1540 on 15630//15650//17525. (Pappas, SD)

RS Makedonias. 9935//11595 at 0514 in Greek, playing jazz, then ID and religious service. (Lamb, NY) VOA Kavala relay on 9700 at 2008 with Willis Conover. (Lamb, NY)

**GUAM**—KTWR on 11805 at 0900 with IS, ID and "Plain Truth" program, targeted to Papua New Guinea. (Rausch, NJ)

KSDA on 13720 at 1716 with radio drama and music. (Pappas, SD)

**GUINEA**—RTV Guineenne. 7125 at 0630 in FF with ID, news, talks, music. (Pellicciari, CT)

**HAWAII**—WWVH. 10000 at 0600, woman with time announcement. (Seefeldt, WI)

**HUNGARY**—Radio Budapest. 9835 at 0333 with sports news. ID. (Sooy, NJ)

**ICELAND**—INBS. 13855 at 1948 in Icelandic. (Foss, AK)

**INDONESIA**—Radio Republik Indonesia at Kenari, Sulawesi on 4000.2 at 1026 with native choirs. (Foss, AK)

**ISRAEL**—Kol Israel. 9435 at 0421 with news in FF, weather, ID, Israeli pops. (Lamb, NY)

**ITALY**—RAI feeder. 10234USB at 0407, Italian, "Radio Due" ID, news, Handel's "Largo." (Lamb, NY)

**JAPAN**—Radio Japan. 5960 via Canada. 0112 with "Hello From Tokyo" announcement. (Seefeldt, WI) 11735 via Canada with news at 1400 and 17810 with

**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

mailbag at 2324. (Zamora, CA) 11860 at 0559. (Vaage, CA) 11865 at 1550. (Rogern, WA) 17810 at 0530. (Foss, AK)

Radio Aum Shinriyko. 9865 via Radio Moscow at 0420. Heavy accent. (Sooy, NJ)

**KUWAIT**—Radio Kuwait. 15605 at 0120 in AA with Kuwaiti and pop music, IDs, radio play, off 0200. (Lamb, NY)

**LESOTHO**—Radio Lesotho. 4800 at 0345 with ID, talk in local language, EE ID and news at 0500. (Rausch, NJ) 0504 with news and a few commercials, 0507 music, then into an African language. (Zamora, CA)

# ICOM™ IC-R7100

## Sweeping 1800 Channels/Minute

DELTA COMM™ I-7100 communication manager and your MS-DOS computer gives you a custom interface integrated with optimized software that will not just control but will maximize the potential of your R7100. Here are a few (there are many more) examples of the advanced features DELTA COMM™ I-7100 has to offer.

- DELTA COMM™ I-7100 CYBERSCAN feature for monitoring systems employing cluster or frequency hopping techniques.
- Individually programmable database volume levels (by channel) while scanning.
- Spectrum log function will sweep a frequency spectrum, generate a histogram and log frequency/activity to screen and/or disk in real time.
- Dual squelch detect electronics integrated with DELTA COMM™ I-7100 software guarantees optimum speed and performance during a frequency search or database scan.
- Programmable signal strength threshold limits with full 8-bit accuracy allow selective monitoring and logging. Only stations having signal strength less than or greater than or within upper/lower user defined signal strength window limits will be monitored and/or logged.
- Continuously updating activity information window displays the last 19 active channels.
- Channel activity status is displayed in real time with activity log function. To determine system loading when first 5 channels are simultaneously busy, "All Trunks Busy" message is logged to disk.
- Receiver characterization with DELTA COMM™ I-7100 birdie log function automatically logs any receiver birdies prior to a frequency search operation. Birdie channels are then locked out during a frequency search operation, thus eliminating false channel logging.
- Custom interface allows selective program control of relay contact. Possible uses include activating an operator alert, switching antennas via coax relay or turning on a tape recorder when user defined frequencies are found to be active.

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





## Delta Research



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

# Why buy a TNC?

## PC HF FAX + PC SWL \$179.00

### SPECIAL COMBINATION OFFER

For a limited time, if you order PC HF FAX \$99 (see our other ad in this issue), you can add our new and improved PC SWL 3.0 for \$80.00 instead of our regular low price of \$99.00.

PC SWL contains the hardware, software, instructions and frequency lists needed to allow you to receive a vast variety of digital broadcasts transmitted over shortwave radio. All you need is any IBM PC or compatible computer and an SSB shortwave receiver. The product consists of:

- Demodulator
- Digital Signal Processing Software
- 200 Page Tutorial Reference Manual
- World wide Utility Frequency List
- Tutorial Audio Cassette with Samples

PC SWL automatically decodes Morse code, Radio Teletype, FEC (forward error correcting code), SELCAL (selective calling transmissions), and NAVTEX.

PC SWL lets you tune in on world press services with up to the minute news, meteorological broadcasts, ham radio operators, coastal shore stations, aviation telex and much more digital action on the shortwave bands. Find all the utility station action you have been missing. PC SWL software uses the processor in your PC to do the work, why pay for another expensive box when a simple interface and your PC can do the job?

**ADVANCED FEATURES:**

- Tuning Oscilloscope
- Digital Waveform Presentations
- Auto Calibration and Code Recognition
- Continuously Tunable Filter Frequencies
- Variable Shift
- Adjustable CW Filter Sensitivity
- Unattended Capture and Printing
- Integrated Text Editor
- Integrated Log and Database
- Shell to DOS applications
- RTTY/NAVTEX Background Operation
- Seamless Integration with PC HF Facsimile

Call or write for our complete catalog of products. Visa & MasterCard welcome.

## Software Systems Consulting

615 S. El Camino Real, San Clemente, CA 92672  
Tel: (714) 498-5784 Fax: (714) 498-0568

BBC Lesotho, 3255, weak at 03330. (Rausch, NJ)  
**MALAYSIA**—Voice of Malaysia at Kajang on 6100 at 1255 with IS, sign on in Malayan language at 1300. (Zamora, CA)

**MONACO**—Radio Monte Carlo, via Canada, on 9760 at 0436, in AA with singing prayers, into EE at 0445.

**MOROCCO**—VOA Tangier relay on 15205 at 1606 with ID and news. (Lamb, NY)

RTV Morocco, 17595 at 1448 with EE with "Wind and Weather" feature. (Lamb, NY)

**MEXICO**—Radio Educacion, 6185 at 0600 in SS. (Pellicciari, CT)

**MONGOLIA**—Radio Ulan Bator, 12015 at 1220 in Mongolian. (Northrup, MO) 0927 in EE with Mongolian music. (Foss, AK)

**NEW ZEALAND**—Radio New Zealand, Int'l, 9700 at 0630 with early opening for rugby coverage. Gave sked as 1650-1850 on 6035, 1850-2140 on 11735, 2140-0700 on 15120 and 0700-1200 on 9700. (Rausch, NJ) 15120 with entertainment news. (Zamora, CA) 0420 with music. (Rogen, WA)

**NETHERLANDS**—Radio Netherlands, 11950 at 2127 with IS and into Dutch at 2130. (Low, TX) 17610 at 1435 with news. (Lamb, NY)

**NETHERLANDS ANTILLES**—Radio Netherlands relay, 11720 at 0425 with sign off. (Sooy, NJ)

**NIGERIA**—Voice of Nigeria, at 0500 with ID, African music. (Sooy, NJ) 0530 with news, "Wheels of Progress." (Pellicciari, CT)

**NORTH KOREA**—Radio Pyongyang, 6576 at 1100 with news, choral music, political programs. (Pappas, SD) 7580 at 1109 in JJ. (Foss, AK) 11335 at 1215. (Northrup, MO) 13650 at 2306. (Rogen, WA) Korean Central Broadcasting Station, 2850 at 1019 with Korean music and KK. (Foss, AK)

**NORTHERN MARIANAS**—KHBI, 9425 at 1335. (Low, TX) 9530//13625 at 1448 with sports, letters. Also on 11580 at 1600. (Pappas, SD)

KFBS, 9465 at 1927 with music in RR, EE ID at 1930. (Foss, AK)

**NORWAY**—Radio Norway Int'l, 9560 at 0400 with news in Norwegian. (Sooy, NJ) 15165 at 2101 with news in NN. Also 15175 at 2105 with sports in NN. (Vaage, CA)

**OMAN**—BBC relay, 11955 at 0401 with news, ID 0407. (Sooy, NJ)

**PAKISTAN**—Radio Pakistan, 11570 at 1700 with IS, ID, national anthem, international news, Koran, in EE. (Rausch, NJ)

**PAPUA NEW GUINEA**—Radio New Ireland, 3905 at 1018 with rock. (Foss, AK)

Radio Morobe, 3220 at 0953 with music. (Foss, AK)  
 Radio Madang, 3260 at 1002 with news in Pidgin. (Foss, AK)

Radio East Highlands on 3395 at 1011 with local music. (Foss, AK)

Radio East New Britain, presumed, 3385 at 1025 in presumed Pidgin with country, local "sing-sing" music, talk. (Lamb, NY) 0900 with news in EE, pops with woman in Pidgin from 0911. (Foss, AK)

**PERU**—Radio Tarma, 4775 at 0441 in SS with pops, IDs, organ music to closing at 0459. (Lamb, NY)  
 Radio Eco, 4505 at 0806 in SS with Peruvian music, echo announcements, ID. (Lamb, NY)

Radio Eco, 5097 at 0232 in SS with Latin pops, possible ID, heavy CW QRM. (Lamb, NY)

Radio Satellite, 6724.3 at 0145 in SS with futbol match to ID at 0200. (Rausch, NJ)

Radio San Martin, 4810 at 0937 in SS with ID, huayno music, US rock. (Rausch, NJ)

**PHILIPPINES**—FEBC, 11690 at 0915 with "Computer Corner" program. (Seefeldt, WI)

VOA relay, 15425 at 1406 with news, ID, "Concert Hall" and then blocked by WRNO sign on at 1430. (Lamb, NY)

**PORTUGAL**—Radio Portugal, 9570 at 0232 with news. (Sooy, NJ) New 17900 at 1918 with "Portugal Past and Present" feature. (Lamb, NY)

Radio Free Europe, via Portugal transmitters, 11815 at 0400 with IS, ID, news in Romanian. (Lamb, NY)

**ROMANIA**—Radio Romania Int'l, 5990//11830 at 0400 with frequencies and ID. (Sooy, NJ) 11830 at 0200. (Pellicciari, CT)

**RUSSIA**—Radio Moscow on 9640 at 0501, 9685 at 0340, 9750 at 0605 and 11770 at 0325, the latter in RR. (Sooy, NJ) 15290 at 1800. (Pellicciari, CT) 17860 at 0232. (Low, TX)

Radio Pamyat, list, 11650 at 1225 in Russian or Ukrainian. (Northrup, MO)

**RWANDA**—Deutsche Welle relay, 7225 at 0456 with IS, ID. (Sooy, NJ)

**SEYCHELLES**—BBC relay, 15420 at 0332 with "Network Africa" and African music. (Lamb, NY)

FEBA, 11810 at 0314 with IS, ID, African Christian music, religious program in Swahili. (Lamb, NY)

**SINGAPORE**—SBC Radio One, 11940 at 1400 with news, ID "You are listening to the news from Radio One." (Zamora, CA)

BBC relay, 11750 at 1608 with news and sports. (Lamb, NY)

**SLOVAKIA**—Radio Slovakia Int'l, 5930 at 0102. (Lamb, NY)

**SOLOMON ISLANDS**—SIBC, 5020//9545 at 1050 with pops, local music, relay of Radio Australia, sign off announcement with frequencies and anthem at 1128. (Lamb, NY)

**SOUTH AFRICA**—Channel Africa, 9695 at 0430 with news and music. (Sooy, NJ) 15220, ex-17710 at 0600 with sign on, news and sports. (Lamb, NY)

**SOUTH KOREA**—Radio Korea, 5975 at 1400 sign of. news. (Zamora, CA)

**SPAIN**—Spanish National Radio, 9530 at 0010; 0510. (Seefeldt, WI, Sooy, NJ) 11880 in SS at 1310. (Northrup, MO)

**SUDAN**—Radio Omdurman, 7200 at 0545 in African language, music, into possible AA at 0350. (Sooy, NJ) 0309 in AA with Korean, ID, anthem, news. (Lamb, NY)

**SWAZILAND**—Trans World Radio, 7215 at 0413 in Chewa with religious service, into EE at 0430. (Lamb, NY)

**SWEDEN**—Radio Sweden, 15240 at 1509 with report on 105 year old sailing ship. (Pappas, SD)

**SWITZERLAND**—Swiss Radio Int'l, 6135//9860//9885//12035 at 0425 with ID and business news. (Sooy, NJ) 9885 via China with IS to 0000. (Vaage, CA)

**TAIWAN**—Voice of Free China, via WYFR, 21720 at 2240. (Low, TX)

**THAILAND**—VOA relay, 11820 at 1100 in Mandarin. (Rausch, NJ)

**TAHITI**—Radio Tahiti, 11826.7//15168 in FF at 0652 with songs in FF and EE during "Te Vevo" program. (Pappas, SD)

**TUNISIA**—RTV Tunisienne, 7475 at 2058 in AA and mid-East music, ID, possible Islamic religious program. (Lamb, NY)

**UNITED ARAB EMIRATES**—UAE Radio, Dubai, 11945 at 0245 in AA with singing prayers. (Sooy, NJ) 11945//13675 at 0329 with ID, frequencies, news, historical feature. Also on 15435 in AA at 1400 sign on. (Lamb, NY)

**VATICAN RADIO**—7305 at 0250. (Seefeldt, WI) 11625 at 0544 in PP with religious talks, classical guitar, ID, IS. (Lamb, NY)

**VIETNAM**—Hanoi 1, 10059 at 1220 in VV. (Northrup, MO)

**YUGOSLAVIA**—Radio Yugoslavia, 9505 at 2059 with IS, ID, sports, and musical heritage program. (Lamb, NY)

And that's it. A big round of applause for the following reporters who did their thing this month:

Marie Lamb, Brewerton, NY; Marty Foss, Pitkas Point, AK; Larry R. Zamora, Highland, CA; Steve Pellicciari, Norwalk, CT; Brad Low, Jacksonville, TX; Mark Northrup, Gladstone, MO; Ed Rausch, Cedar Grove, NJ; Marina Pappas, Huron, SD; Bjorn F. Vaage, Granada Hills, CA; Jeff Seefeldt, Wausau, WI; Kenneth G. Sooy, Sr., Oceanville, NJ and Marti Rogen, Jr., Camus, WA. Thanks to each of you!

Until next month, good listening! ■

## IMPROVE RECEPTION

### SUPER SCANNER STICK

Only \$80



Get great scanner reception with our SUPER SCANNER STICK. Covers all scanner bands (25-1200MHz) Only 35" long. Powerful 15db amplifier. 25' of cable supplied with connector for your scanner.

SCANNER STICK Same as above but without booster amplifier \$40

CEI LULUAR reception unsurpassed! Our new SUPER DANA antenna combines a 9db gain antenna with 15db amplifier for a fantastic 800-950MHz reception. SUPER DANA \$80

### ANTENNA PLUS

\$90

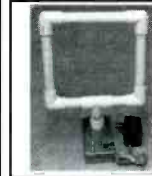


Make your receiver spring to life! Receives like the large antennas yet sits on your table! Strong internal 15-22db amplifier! 115VAC pwr. Cable to revr. INCLUDED!

ANTENNA PLUS-1 0.5-1000MHz "All Bands" (for wide coverage revrs.)  
 ANTENNA PLUS-2 0.3-30MHz "Short-Wave" (packed for SWLs)  
 ANTENNA PLUS-3 25-2000MHz "Scanner" (packed for VHF-UHF)

### AM BROADCAST LOOP ANTENNA

Fantastic AM (.5-2MHz) reception without bothersome noise! Easily null out interference! Compact desktop unit with internal amplifier. BCL-1 \$125



### CAR ANTENNA RECEIVES SCANNER/SWL!

Yes, with our MSW-1 amplified coupling box your car antenna can provide outstanding reception for your scanner or worldband radio. Existing car AM/FM is unaffected (unlike similar devices that reduce AM reception) Covers 0.5-1000 MHz with 10db amplifier. Only \$70

Concurrent US Shipping/Handling \$5, Canada, AK, HI, PR \$8, NY and MT add sales tax.

MANY NEW PRODUCTS CALL FOR DETAILS!

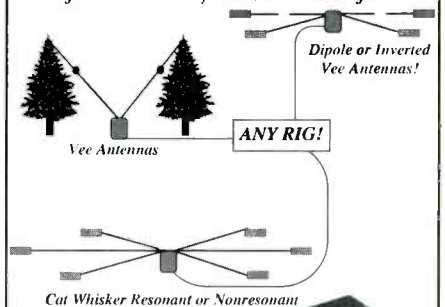


E-lectron PROCESSING, INC.  
 PO BOX 68  
 CEDAR, MI 49621

(616) 228-7020

## 3 to 12 dB MORE FROM YOUR DIPOLE, VEE OR LONGWIRE BASE STATION ANTENNA!

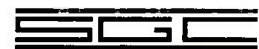
SGC's SG-230 computer controlled coupler works with any radio and any antenna system - fixed or mobile, marine or aircraft.



### SG-230 SMARTUNER™



SGC's SG-230 Smartuner™ will outperform any built-in antenna coupler on any radio. The reason? The SG-230 mounts AT THE ANTENNA! This means you're matching the precise condition of the antenna - not just loading up a feedline and shunting power to ground. Ask any Smartuner user - this unit delivers great performance on any frequency from 1.8 to 30 MHz. Call for a free package of information from SGC, 1-800-259-7331 or circle our Reader Service number.



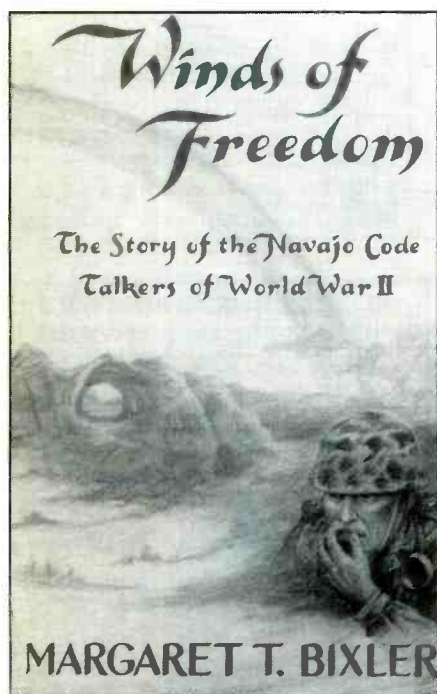
P.O. Box 3526, Bellevue, WA 98009 USA  
 Tel: 206-746-6310, Fax: 206-746-6384

# BOOKS YOU'LL LIKE

BY R.L. SLATTERY

## Navajo Code Talkers

During World War II, if there was any hope of sending military communications with any degree of security at all, it meant complicated encryption systems designed for the written word. Encoding and decoding encrypted written traffic was usually slow going and required a lot of hardware. At best, this wasn't as fast as exchanging voice traffic, but then there were no encryption systems designed for voice communications. The languages of the world were too widespread to use in order to achieve any security. In a combat situation, however, voice encryption would be the only realistic approach for troops in the field.



A wonderful book, *Winds of Freedom*, by Margaret T. Bixler, is the fascinating story of the Navajo Code Talkers of World War II. Their own unique language was the basis for a secret code the Navajos developed and used during the Pacific war. Navajo happens to be a language that is extremely difficult for other cultures to learn or understand.

During World War II, complex written crypto systems like Enigma and The Purple Code were broken, along with many others. Yet, the spoken Navajo code was so effective that it was never cracked by the enemy. This amazing code, and the Navajos who went into battle for their country

to provide the secure voice communications, played a vital role in military communications throughout the war in the Pacific. This was especially true at Iwo Jima.

Bixler's 185-page book is filled with maps, photos (color and black/white), documentation, interviews, memories, and history. The declassified Navajo code is also provided. Each specific battle in which the Navajo Code Talkers were vital is discussed. There's much more to this worthwhile and well-written book, including very interesting general information on the Navajo culture. Bixler spent a sufficient amount of time with the Navajos in researching this book to gain a meaningful perception of their feelings towards the creation of the code and its use.

*Winds of Freedom* is \$16.95 in softcover, or \$21.95 in hardcover. It's from Two Bytes Publishing, 219 Long Neck Point Rd., Darien, CT 06820.

## Inside Information

Designed to be like a private consultation with surveillance and security specialist Lee Lapin, his book, *Hands-On Electronic Surveillance*, consists of high-intensity, hard information presented to someone seriously interested in the subject.

*Hands-On Surveillance*, which is illustrated with diagrams and photos, is a report on the design, placement, and use of audio surveillance systems; cutting edge trans-

mitters, receivers, and integrated systems. It covers mic placement and hardwiring tips; wireless units; gain antennas; wave propagation; placement considerations and planning; prefabricated systems; correct use of body mikes; setting up a listening post. Equipment tests, sources, and step-by-step instructions to maximize any intelligence gathering effort.

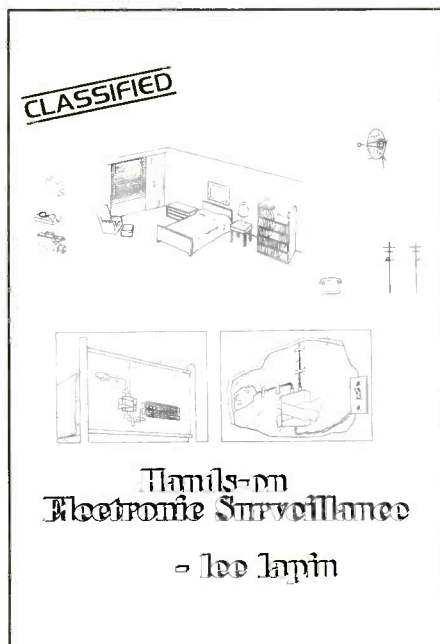
Lapin's book contains the latest equipment and techniques for particular applications. Utilized by professional investigators and law enforcement agencies, over the years Lapin's many books have been invaluable to anyone involved or interested in intelligence collection and surveillance equipment and techniques. As is often the case, much of Lapin's information simply doesn't exist in print elsewhere.

*Hands-On Electronic Surveillance* is \$22.95, plus \$4 shipping and handling (\$5 to Canada) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State, please add \$2.29 tax. VISA/MC welcomed. Phone orders: (516) 543-9169. FAX orders (24-hour line): (516) 543-7486.

## In addition...

SWL's, scanner users, and hams will appreciate a new do-it-yourself antenna compendium that reprints W. Clem Small's antenna writings from past issues of *Monitoring Times* then adds new material as well. There are 112 pages in *The Antenna Handbook* explaining how to build a wide variety of receiving and transmitting antennas. This book is \$12.95 from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902-0098.

*Ham Radio Contesting* by Robert J. Halprin, K1XA, is a 73 page comb-bound how-to treatise on the fine art of contesting. Whether you are just getting into this aspect of hamming, or if you would like to improve your results, this is worth a look since it's written by an operator who is a well-known tester. Halprin is a former ARRL staff member whose duties included overseeing the ARRL contest program. Good book that looks like it covers its topic thoroughly. It's \$14.95, plus \$2 s/h (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. VISA/MC are OK. Phone orders: (414) 248-4845.





**HERE NO MAN  
HAS GONE  
BEFORE**



**NEW**

**OPTOELECTRONICS' New  
HandiCounters® are Light Years Ahead!**

*Shown with optional  
TA100S antenna—Actual  
frequency measurement shown  
(not simulated).*

**Only Our New 3000A & M1  
HandiCounters® Can Give  
You THESE Numbers!**

- 15 Gate Times selectable from 100 micro sec. to 10 sec.
- 7 Hour Battery Life (3000A)
- 6 Hour Battery Life (M1)
- 10 Digit LCD Display
- 16 Segment Bargraph
- 3 Data Storage Registers
- 13 Mili Second (1.3% of a second) Measurement Rate
- 1 Hz Resolution in 1 Second for frequencies below 250MHz
- 2 Wire Serial Output for Data Logging
- 19 Years of Dependability & Service
- 10 Hz Resolution in .4 seconds for frequencies below 1GHz
- 10 MHz Industry Standard Time Base



**Plus all these incredible features:**

- OE10 INSIDE**  
Ultra Reliable—Ultra Fast Counter IC
- DIGITAL FILTERING** *pat. pend.*  
Fastest Method to Reduce False Counts—No Loss of Sensitivity
- DIGITAL AUTO CAPTURE** *pat. pend.*  
Auto Holds & Stores—Works Even Near Strong RF Fields

**LCD BACK LIT DISPLAY**  
Day/Night Visibility

**FULL RANGE COUNTER**  
Includes High Impedance 50ohm Amplifier for 10Hz and up Coverage

**HI-TECH EXTRUDED ALUMINUM CABINETY**  
No Sheet Metal

**ENVIRONMENTALLY SAFE**  
No Soldered in NiCads

**MADE IN THE USA**



*PC Data Logging with optional CX12 RS232 Converter (\$89.)*

	<b>3000A</b>	<b>M1</b>
Digital Filter	•	•
Digital Auto Capture	•	•
Computer Interface (Serial TTL)	•	•
10 Digit LCD	•	•
Multi Function	•	•
Back Light	•	•
Battery Life	6-7 hrs	5-6 hrs
Range	10Hz - 3GHz	10Hz - 2.4GHz
Size	5.4' x 4'	3' x 5'
<b>OPTIONS</b>		
Back light	standard	standard
TCXO ± .2ppm	\$100.	\$100.
<b>PRICE</b>	<b>\$329.</b>	<b>\$229.</b>

**OPTOELECTRONICS**

**Factory Direct Order Line  
1-800-327-5912**

**305-771-2050 • Fax 305-771-2052**

5821 NE 14th Ave, Ft. Lauderdale, FL 33334  
5% ship/ Handling (Max \$10) U.S. & Canada. 15% outside continental U.S.  
Visa, Master Card, C.O.D., Cash or Money Order only.

## Total Coverage Radios



### AOR AR1000XLT

AM Broadcast to Microwave 1000 Channels  
500KHz to 1300MHz coverage in a programmable hand held. Ten scan banks, ten search banks. Lockout on search and scan. AM plus narrow and broadcast FM. Priority, hold, delay and selectable search increment of 5 to 995 KHz. Permanent memory. 4 AA ni-cads and wall plus cig charger included along with belt clip, case, ant. & earphone.

Size: 6 7/8 x 1 3/4 x 2 1/2. Wt 12 oz.

Fax fact document # 205

**\$449.00**

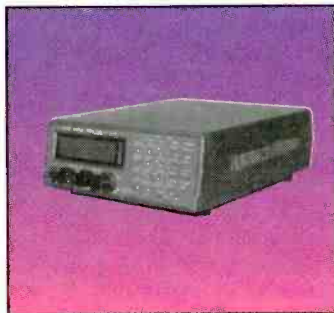
### AR2500

2016 Channels  
1 to 1300MHz  
Patented Computer Control  
62 Scan Banks, 16 Search Banks, 35 Channels per second. Patented Computer control for logging and spectrum display. AM, NFM, WFM, & BFO for CW/SSB. Priority bank, delay/hold and selectable search increments. Permanent memory. DC or AC with adapters. Mtng Brkt & Antenna included.

Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

Fax fact #305

**\$499.00**



### AR3000

400 Channels  
100KHz to 2036MHz Patented computer control. Top rated receiver in its class, offers AM, NFM Wide FM, LSB, USB, CW modes. 400 scan memories. 4 priority channels. Delay & hold & Freescan. AC/DC pwr cord and whip ant.

Size: 3 1/7H x 5 2/5W x 7 7/8D. Wt 2lbs., 10oz.

Fax fact document #105

**\$1195.00**



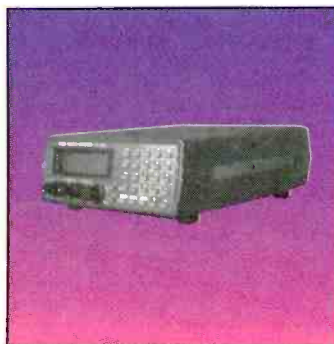
### AR2800

1000 Channels  
.5 to 1300MHz  
AM Broadcast to Microwave 1000 Channels 500KHz to 1300MHz coverage in a programmable mobile. Ten scan banks, ten search banks. Lockout on search and scan. AM plus narrow and broadcast FM. Priority, hold, delay and selectable search increment of 5 to 995 KHz. Permanent memory. DC or AC with adapters. Mtng Brkt & Antenna included.

Size: 2 1/4H x 5 5/8W x 6 1/2D. Wt. 1lb.

Fax fact #350

**\$449.00**



### AOR AR1500

Full Coverage with SSB and 1000 Channels.  
500KHz to 1300MHz. Ten scan banks, ten search banks. Search lock and store. BFO. 2 Antennas. AM/NFM/WFM. Selectable increments. Tons of features, small size:

5 7/8 x 1 1/2 x 2.  
Wt 14 oz.

Fax fact document # 250

**\$499.00**



## Scanners with Shortwave



Yupiteru 8-1300MHz Mobile or Hand Held Units.

**\$399.00** each.



Top rated receivers from Japan now available in the USA. Tune down to 100KHz Sensitivity guaranteed from 8MHz up. 200 scan channels. AM/NFM/WFM. No caps no cut-outs. Mobile is super slim line. AC/DC. Order MVT8000, includes antenna, mbl mnt. Order MVT7000 for the handheld. Complete with Ni-Cads Charger, antenna & earphone.

Fax fact document #275



New Bearcat mobile/desktop offer continuous coverage of VHF/UHF/800 bands! The Bearcat 890XLTB covers 29-956 MHz with 200 scan channels, Turbo scan, WX search, VFO tuning, 10 priority channels and more! The Bearcat 8500XLTB covers 25-300MHz in AM/NFM/WFM modes with 500 channels, turbo scan, 10 priorities, VFO tuning, and more. Fax fact documents 477 & 475.

Fax fact document #420

**Bearcat 8500XLTB .....\$389.00**  
**Bearcat 890XLTB .....\$259.00**

### Mobile Scanners

**\$209.95**

Bearcat 760XLTM



100 Channel 800 MHz

Five banks of 20 channels each. Covers 29-54, 118-174, 406-512 and 806-954MHz (with cell lock). Features scan, search delay, priority, CTCSS option, lockout, service search, & keylock. Includes AC/DC cords, mounting bracket, BNC antenna. Size: 4 3/8 x 6 15/16 x 1 5/8. Weight: 4.5lbs.

Fax fact document #55C

### Other Mobile Scanners

**BC590 .....\$159.95**  
**BC560XLTZ .....\$99.95**

Fax fact on above: #560

### Scan/CB/Highway Patrol/WX, X,K,Ka, Wide & Laser

**\$399.99**

Scans police pre programmed by state chanre plus full radar and laser alerts in one small unit. Weather, CB receive & mobile relay.

Size: 5 5/8 x 4 7/8 x 1 3/4. Wt: 1.5lbs.  
Fax fact #580



Trident T7-33WL

### Other Pre-Programmed Scanning Receivers

**BC350AS .....\$129.00**  
**BCT2 .....\$149.00**  
**BC700AS .....\$169.00**

Fax fact on all above: #580

## Hand Held Scanners

**NEW!**

### Bearcat BC2500XLTA **\$349.00**

400 Channels 25-1300MHz

Hand held digital programmable receives in AM/NFM/WFM modes. Features turbo scan, WX search, VFO tuning, search, 10 priorities, lockout, frequency copy, frequency count, and more.

### Bearcat 200XLTN **\$229.95**

200 Channels 800 MHz

Ten scan banks plus search. Covers 29-54, 118-174, 406-512 and 806 956MHz (with cell lock). Features scan, search, delay, 10 priorities, mem backup, lockout, WX search, & keylock. Includes NiCad & Chrgr.

Size: 1 3/8 x 2 11/16 x 7 1/2. Wt. 32 oz.

Fax Facts # 450

#### Other hand held scanners

**Bearcat 100XLTN 100Ch H/L/U .....\$159.95**

**Bearcat 70XLTP 20Ch H/L/U .....\$139.95**

**Bearcat 55XLTR 10 Ch H/L/U .....\$99.95**

Fax facts on all above: #475



## Table Top Scanners



### Bearcat 800XLX

12 bands and 40 channels with 800MHz and nothing cut out. AC or DC.

Fax facts #690

**\$209.95**

#### Other Table Top Scanners

**Bearcat 855XLTE 50Ch w/800 .....\$159.95**

**Bearcat 142XLM 10Ch H/L/U .....\$84.95**

**Bearcat 147XLJ 16 Ch H/L/U .....\$89.95**

**Bearcat 172XM 20Ch H/L/U/Air.....\$99.95**

**Bearcat 210 16Ch H/L/U/Air .....\$129.95**

Fax facts on all above: #675

#### \* Here's the fine print you've been looking for:

\$8.95 air freight is available for packages weighing 8 pounds or less sent to destinations within the Continental U.S. Overnight service is available to most urban areas at little or no surcharge. Outlying areas may require two days or more for delivery. Please call toll free if you have questions regarding ACE Communications radio receivers are manufactured under and/or licensed under one or more of the following United States patents: 3,961,261 3,962,644 4,000,468 4,027,251 4,092,594 4,270,217 4,455,679 4,461,036 4,627,100 4,932,074 5,163,161. AOR, ACE Communications and Yupiteru are trademarks of C.O. Corporation, an Indiana corporation. All other trademarks remain the property of their respective companies. We make no claims of ownership or interest to any trademarks other than those listed above. We make every effort to insure the accuracy of these contents, but disclaim responsibility for typographical errors. We make every effort to stay current, but prices & specs are subject to change without notice. Please call toll free to confirm prices, delivery and specs before you order.

## Shortwave Receivers



### ATX-818CS

**\$224.95**

16 Band digital receiver with programmable cassette recorder, BFO for SSB, AM/FM Stereo, 45 preset memories LCD display with dual time. Signal & Btt. strength indicator. Sleep timer & tone control.

Fax Fact #505

**ATX-818 .....\$194.95**

Same as 818CS but without cassette.

Fax Fact #506

**ATX-803A .....\$174.95**

The perennial best buy receiver. 16 band digital receiver with Am/FM/FM Stereo modes. 9 memory presets. Auto/Manual and Scan modes. BFO RF Gain and Dual Filter controls. Complete with adaptors and headphones.

Fax Fact #507

**ATX-808 .....\$184.95**

Compact size, great performance in a 16 band digital receiver. AM/FM/Stereo with 45 memory presets. LCD display with dual time clock. Complete with adaptors and headphones.

Fax Fact #508

**ATX-606 **\$154.95****

16 band ultra compact digital receiver with auto tuning and scan system. 45 memory presets cover AM/FM/Stereo. Dual time display, alarm timer, adjustable sleep timer.

Fax Fact #509.

**ATX-606P .....\$174.95**

**SG-621 .....\$79.95**

Compact 10 band receiver with AM/FM/Stereo. Analog tuning with a digital display.

Fax Fact #513.

**ATX-800 .....\$94.95**

**SG-631 .....\$99.95**

10 band analog tuning with digital display which shows time and day for 260 cities throughout the world.

Fax Fact #511

**SG-789 .....\$54.95**

10 band analog tuning. Super compact and very economical.

Fax Fact #512

**SG-700L .....\$49.95**

12 band AM/FM compact portage analog receiver.

Fax Fact #514



**800-445-7717**

**Fax Facts 317-849-8683**

Fax Orders 800-448-1084

Computer BBS Modem & Fax/Modem, 317-579-2045.

Toll Free Tech Support, 800-874-3468

International Fax: en Espanol, en Francais, und auf Deutsch, or just fax in plain English to: 317-849-8794



10707 East 106th Street, Fishers, IN 46038



#### Service & Support hours:

Mon.-Fri. 9AM to 6PM, Sat. 10-4 EST.

Mastercard, Visa, Checks, Approved P.O.'s & COD (add \$5.50) & AMEX. Prices, specifications and availability subject to change. Flat rate ground shipping and handling charge only \$5.95 per unit. Express Air only \$8.95, for most units, to most locations. One week trial, no returns accepted two weeks after original receipt without substantial restocking charge. All units carry full factory warranty. Indiana residents add 5 per cent sales tax.

#### Fax Facts Service

Get instant tech information Free from your Fax or Computer! You can obtain specs, freq. info, software and more from our automated services. For fax facts, call from your stand alone fax machine and follow the voice prompts. Use the BBS from your modem of fax/modem equipped computer. Dial 317-849-8683 for fax back service, or dial 317-579-2045 for our computer bulletin board service.

#### No fax, no computer?

Call our Tech Talker from your touch tone phone and hear automated messages giving you complete spoken detail on all of these products and more! Key in the Fax Fact number, or follow the prompts. Try it today! Dial 317 579-2047





# YOU EXPECT THE WORLD FROM ICOM RECEIVERS

ICOM's IC-R71A and IC-R7000 are the professional's choice for receiving international broadcasts, aircraft, marine, business, emergency services, television, and government bands. These people demand the finest in communications and so do you. ICOM puts the world at your fingertips with the IC-R7000 25-2000MHz\* and IC-R71A 0.1-30MHz commercial quality scanning receivers.

### Incomparable Frequency Control.

Both the IC-R71A and IC-R7000 feature **direct frequency access** via their front keypad, main tuning dial, optional infrared remote control and/or computer interface adapter. **Incredible Flexibility!**

### Full Coverage, Maximum Performance.

The superb IC-R71A is your key to worldwide SSB, CW, RTTY, AM and FM (optional) communications plus foreign broadcasts in the 100kHz to 30MHz range. It features IF Notch, low noise mixer circuits and a 100db dynamic range. The pacesetter **IC-R7000** receives today's hot areas of interest, including aircraft, marine, public services, amateur, and satellite transmissions in the 25MHz

to 2000MHz\* range. It includes **all mode operation** low noise circuits plus outstanding sensitivity and selectivity. The IC-R71A/R7000 combination is your window to the world!



The IC-R71A is a shortwave listener's delight. Its **32 tunable memories** store frequency and mode information, and they are single-button reprogrammable **independent of VFO A or VFO B's operations!** Dual width, an adjustable noise blanker, panel selectable RF preamp, and selectable AGC combined with **four scan modes** and all-mode squelch further enhance the IC-R71A's HF reception!

The IC-R7000 features 99 tunable memories and **six scanning modes**. It even scans a band and loads memories 80 to 99 with active frequencies without

operator assistance! Additional features include selectable scan speed pause delays, wide/narrow FM reception and high frequency stability.

**Options.** IC-R7000: RC-12 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket. IC-R71A: RC-11 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket, FL-32A 500Hz, FL-63A 250Hz and FL-44A filters.

See these **quality ICOM receivers** at your local authorized ICOM dealer today or call **1-206-450-6088**.

\*Specifications of the IC-R7000 guaranteed from 25-1000MHz and 1260-1300MHz. No coverage from 1000-1025MHz.

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004  
**Customer Service Hotline (206) 454-7619**  
 CUSTOMER SERVICE CENTERS  
 18102 Skypark South, Ste. 52-B, Irvine, CA 92714  
 ICOM CANADA, A Division of ICOM America, Inc.,  
 3071 - #5 Road, Unit 9, Richmond, B.C. V6X2T4 Canada

All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. The ICOM logo is a registered trademark of ICOM America, Inc. Receivers793V



# ICOM®

*Experience the Quality®*

CIRCLE 68 ON READER SERVICE CARD