

POPULAR COMMUNICATIONS

NOVEMBER 1993 \$2.95

\$3.95 CANADA

Scanning Airport Security Forces

Also in this issue:

- Selected English Language Broadcasts: Fall '93
- Check Out The Parade Of New Products
- Discover The Magic Of Kit Building
- 18 Satellites Your Scanner Can Hear!



Plus: CB, Car Phones, Nostalgia, Opinions & 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."

 *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

CIRCLE 78 ON READER SERVICE CARD

- 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 ± 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

EEB AHEAD OF THE PACK

NEW AOR AR3030

AOR, world famous for wide band scanners, has just introduced their all HF communications receiver (VHF optional). All the features you would expect in a high quality receiver, but at a surprisingly low price. Compare the AR3030 to receivers costing over \$1000.



- 30kHz-30MHz (VHF Opt.) • DDS (Direct Digital Synthesizer)
- AM/CW/FMN/LSB/USB/FAX Modes • Keyboard or knob tuning
- TCXO (Temp. Control OSC) incl. • RS232 Computer Control • 100 Mem • Syncho AM Detection incl.
- Selectivity: 2.4,6.0 (.5 CW Opt.), FMN 15kHz • Sensitivity (µV): 1.8-30MHz - SSB<.5, AM<1.5, FMN <.5
- Steps: MHz, kHz, 100Hz, 10Hz • Image/Spurious Reject.: >70dB • Dynamic Range >100dB @ 25kHz spacing
- Ant. Inputs: 50Ω, 450Ω, Hi-Z for Whip • Power: 12VDC .8A max audio, 8AA NiCad or Alk, AC Adapt. incl.
- Size: 10"W x 3.5"H x 9.5"D; 4.8 lbs.

Call For Introductory Pricing

NEW WATKINS-JOHNSON HF1000

The ultimate HF receiver! Digital Signal Processing (DSP) is now available to the public from the world renowned Watkins-Johnson Company. For years W-J has been a "household" name among professional intercept operators. The HF1000 is designed & built with the same high standards as receivers costing considerably more. A few years from now all high quality HF receivers will have DSP. The HF1000 is here today, years ahead of the competition!!



- Hear stations other receivers miss • 5kHz/30MHz in 1Hz steps • 3RD-Order Intercept Point: +30dBm typical
- Digital Filtering - 58 IF Bandwidth 56Hz-8kHz • ISB Independent Side Band (simultaneous LSB & USB)
- Synchronous Detection All Modes: AM,FM,CW,SSB,ISB • Fast Flexible Scan w/100 Memory Channels
- RS232 and CSMA (Icom Compat.) Computer Control • BFO Tuning Range: ± 8kHz w/10kHz resolution
- Low Phase Noise: -110dBc at 1kHz typical • Power: 97-253VAC 47-440Hz @ 35 watts
- Size: 5.25"W x 19"H x 20"D; 15 lbs.
- Write or FAX For Detailed Spec Sheet

Priced Under \$4000

PHILLIPS DC-777 Now SWL in Your Car!

In-Dash Mobile AM/FM/Shortwave Cassette Receiver

- 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 **\$299** +s&h

KENWOOD R5000 Owners

SAVE 40%

LIMITED QUANTITY...HURRY!

The single, most effective way to improve the R5000 is to replace the AM wide filter with a high quality 6-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

!! WARNING !!

FCC I-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 coverage scanner.... in a while, it will be too late!!

TOP SCANNING RECEIVERS

AOR-	AR1000XLT [Ⓞ]	\$419.95
	AR3000A [Ⓞ]	\$1029.95
	AR2800 [Ⓞ]	\$449.95*
REALISTIC-	PRO2006 [†]	\$359.95
	PRO43 [†]	\$299.95
	PRO46 [†]	\$189.95
BEARCAT-	BC200XLT [†]	\$229.95*
	BC760XLT [†]	\$219.95*
	BC800XLT [Ⓞ]	\$209.95*
	BC700A [†]	\$179.95
	BC2500XLT [†]	\$349.95*
	BC890XLT [†]	\$259.95*
	BC8500XLT [†]	\$379.95
ICOM-	ICR10	\$479.95
	ICR100 [Ⓞ]	\$649.95
	ICR7000 [Ⓞ]	\$1279.00
	ICR7100 [Ⓞ]	\$1329.00

[Ⓞ]Full coverage cellular, no mods

[†]Easy mod instructions for cellular incl.

*NEW LOWER PRICE

TOP SWL RECEIVERS

FREE Radio Stand from EEB! Order any SWL portable at EEB's super pricing and receive a free radio stand!

\$10 Value

SONY-	ICF-SW33	\$179.95
	ICF-SW55	\$349.95*
	ICF-SW77	\$469.95
	ICF-SW7600	\$219.95
	ICF-SW7601	\$89.95 [†]
	ICF-2010	\$349.95
PANASONIC-	RFB45	\$169.95
	RFB65	\$219.95
SANGEAN-	ATS606	\$153.95*
	ATS803A	\$173.95*
	ATS818	\$193.95*
	ATS818-SC	\$223.95*
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*
YAESU-	FRG100	\$349.95

* Temporary Price Reduction (SAVE)

[†] Super Low Price Limited to Stock

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

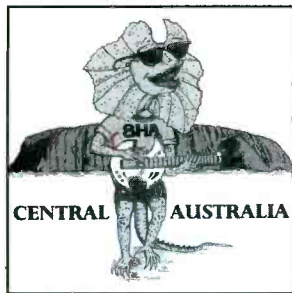
FAX: 703-938-6911

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

POPULAR COMMUNICATIONS

November 1993

Volume 12, Number 3



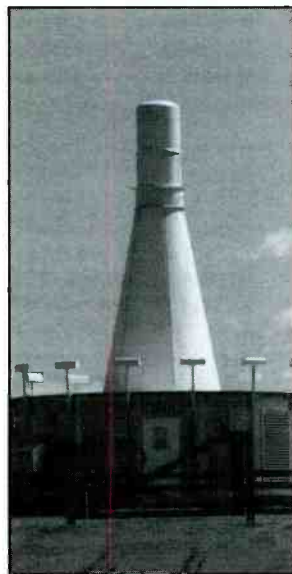
12



27



34



58

FEATURES

Scanning Airport Security **8**

How tight is airport security? Find out what special task forces do to protect passengers around the nation.
By Chuck Robertson

Selected English Language Broadcasts **10**

A representative listing helping you tune in to the hundreds of shortwave broadcasts aired daily.
By Gerry L. Dexter

Old Time Radio: When They Needed Help **14**

Sneak a peek at the past events that helped create radio history.
By Alice Brannigan

Product Parade **17**

Don't let the parade pass you by! Radio Shack invites you to jump on the band wagon and get an eyeful of it's new hobby items.

Books You'll Like **18**

An Exciting Introduction To Ham Radio, Impressive QSL's, Confidential Mail Drops and Electronic Surveillance Countermeasures.
By R. L. Slattery

POP'COMM Reviews: J & J Enterprises SCANCAT Software Program **22**

By POP'COMM Staff

COLUMNS

CB Scene	27
Communications Confidential	30
How I Got Started	35
Scanning VHF/UHF	36
You Should Know	39
Antennas 'n' Things	44
Listening Post	46
Satellite View	50
Pirates Den	53
The Ham Column	54
Emergency	58
Broadcast DXing	61
RTTY	65
Telephones Enroute	69

DEPARTMENTS

Beaming In	4
Mailbag	6
World Band Tuning Tips	40
Communications Shop	76

This month's cover: Passengers traveling through Dallas International Airport experience special security attention. The security checkpoints monitor and maintain passenger safety. 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 Kehrwieler, General Manager
Frank V. Fuzia, Controller
Catherine Ross, Circulation Director
Melissa Kehrwieler, 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 Kehrwieler, 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 \$21.50, two years \$41.00, three years \$60.00. Canada/Mexico—one year \$24.00, two years \$45.00, three years \$66.00. Foreign—one year \$24.00, two years \$46.00, three years \$69.00. Foreign Air Mail—one year \$79.00, two years \$155.00, three years \$231.00.

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 Radio 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.Zondio. 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.
- ◆ Ship 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 lator and decoder settings. The lower left corner displays five bar-graph type tuning 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-M2/4 (TDM), FEC-A, FEC-S, ARQ-E, ARQ-E3, 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

- 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.



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

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

“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.



In touch with the world.

CIRCLE 142 ON READER SERVICE CARD

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

From what I gather by reading the mail on the channels and coming across my desk here, it is a matter of some debate as to whether or not the FCC is doing any enforcement at all relating to unauthorized hobby communications in the 27.410 to 27.995 MHz range, popularly known as the "outband" or "freeband."

Some would assure us that a lack of funds and manpower, coupled with a low position on the FCC enforcement priority list allows for rather an "anything goes" atmosphere on these frequencies. Others insist that this is a misconception, and that the FCC is not only looking for unauthorized operators, but relentlessly tracking these people down and punishing them. So what's really happening?

It is true that the FCC has less field personnel than the agency feels it requires. But that doesn't mean that any single group of frequencies or operators escapes the agency's notice.

This past summer, the FCC issued Notices of Apparent Liability to several persons operating on these unauthorized frequencies. Two Idaho operators were fined \$2,000 each, and so was an operator in Hawaii. Another one in New Mexico was fined \$3,500; higher than the others because he refused to allow the FCC into his house to inspect his station.

An operator in Colorado was fined \$10,000, not only for operating on a 27 MHz unauthorized frequency, but also for refusing to allow an inspection of the station, and for using the station (located at a truck stop) to sell linear amplifiers.

Enforcement of the "freeband" most certainly is taking place. Anyone who tries to tell you that 27 MHz is a free-for-all is giving you bad advice. Granted there are thousands of operators out there yakking away on these frequencies, so the percentage of getting nailed isn't very high. However, at \$2,000 a pop, it would become a very significant statistic if one of the fish they happen to shoot at in the barrel turns out to be you. And you know how your luck is.

This controversial 27.410 to 27.995 MHz band begins where CB Channel 40 ends, and it extends to the low-frequency end of the 10 meter ham band. Although in some areas of the world, hobby comms may possibly be allowed here, they have never been authorized in the USA. Nevertheless, hobby chit-chat from across North America has been taking place there for decades. From time to time, especially in the late 1970's, the FCC undertook massive enforcement campaigns in an effort to shut down the countless thousands of illegal stations chattering away in this band.

Hundreds of operators were caught. The FCC confiscated their equipment, and almost all of it consisted of ham gear.

Strike force teams would set up shop in selected local areas, then conduct high profile raids (accompanied by the news media) in order to spread the word that the FCC was in town. Photos would appear in the press showing FCC personnel surrounded by dozens of confiscated transceivers. Things would quiet down for a few weeks, but soon enough it was back to business as usual as the strike force moved on to other localities. The end results did not appear to indicate that even a slight dent had been made in the amount of unauthorized activity taking place in this band.

On many occasions, there have been requests presented to the FCC from individuals and clubs to do something (anything!) that would give organization, and legitimacy to the communications on these frequencies. Some suggestions have included additional CB channels, and also various no-code/no-tech quasi-ham services. All such requests have been turned down cold. Most people don't realize that the frequencies from 27.540 to 27.995 MHz are allocated for federal government use and aren't within the FCC's grab-bag to give out, anyway!

One thing is particularly odd about how the FCC classifies operators using the 27.410 to 27.995 MHz band. The FCC calls them "Out of Band CB Operators." This is curious because very few of those operating on these frequencies are actual CB'ers in addition to these activities. They probably never were CB'ers. Nor do they use CB equipment. The equipment popularly used on these frequencies is 10 meter ham equipment.

In that these otherwise silent federal government frequencies are a virtual "no-man's land" situated between CB and ham bands, it seems strange to label its denizens as some outlaw form of CB operation when the stations are primarily using ham radio equipment. If some radio service's karma needs to be assigned the responsibility for these stations, perhaps the FCC could more properly consider them "Out of Band Amateur Operators."

Here's a solution to the problem of not being able to get the stations off the air. Let the FCC to determine that since they are usurping government frequencies, these people might be called "Unauthorized Government Operators." At that point, the FCC could wash its hands of the entire matter and turn it over to the Dept. of Justice to deal with.

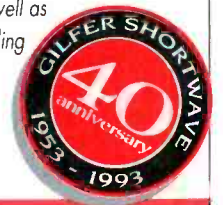
(Continued on page 74)



**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 callsign 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 64 ON READER SERVICE CARD

NOW—NO CODE!

The Ham Radio Handbook by Don Stoner gets rave reviews as the best training aid to help you earn the no-code ham license. Over 200 pages, packed with information—all the test questions, correct answers and the theory behind the questions. Only \$9.95 (\$2.00 S&H).

**YOU CAN PASS THE CODELESS
HAM RADIO TEST AND WE
GUARANTEE IT!**

It's easy and fun with the **NARA Education Package**. You get Don Stoner's *Ham Radio Handbook*, IBM or Macintosh compatible software to test your knowledge after you have studied the book; an extensive list of Volunteer Examiners you can contact, the *FCC Rules and Regulations* for ham radio, a copy of *Amateur Radio King of Hobbies*, plus a bonus copy of our journal, *The Amateur Radio Communicator*, by mail. The **NARA Education Package** is only \$29.95 for the IBM or \$49.95 for the Mac version (\$3.00 S&H).

Join NARA today and enjoy the exciting world of ham radio — and beginners don't need to know the code! A one-year **NARA** membership & subscription to *The Amateur Radio Communicator* is only \$10.00.

**NARA**
NATIONAL AMATEUR RADIO ASSOCIATION

**CALL US
TODAY!!**

**P.O. Box 201407
Arlington, TX 76006
1-800-Got-2-Ham**

CIRCLE 51 ON READER SERVICE CARD

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.

Doesn't Want to Meter

The newspaper carried a story that the FCC has now officially adopted the metric system of measurement in its rules. Most of the people in this country still relate to things in terms of pounds, ounces, quarts, gallons inches, miles, feet, and other non-metric quantities. This will definitely create considerable confusion for the members of the public who must deal with FCC rules.

Phil Randazzo,
Pawtucket, R.I.

Probably less confusion than you think, and it wasn't done to cause confusion. The USA is one of the few industrialized nations of the world where the metric system is not in general public use. The

FCC has been gradually working metric specs into its rules since 1976, anyway, and no problems have been encountered. In any event, the FCC is aware that there are a few limited circumstances where things in the rules would best not be converted to the metric system, and those rules will remain unconverted. This is also true if conversion to the metric system would cause confusion with long-established specifications practices in some particular industry. When you stop to think about it, much of what the public deals with relating to the FCC rules are things already stated in terms that will remain unchanged—like kHz, MHz, kW, and dB. The most noticeable change could be in something like antenna height rules, which would be given in meters rather than feet. As an easy rule of thumb, think of one meter as approximately three feet (one yard).—Editor.

Readers Speak

In the June issue *Mailbag*, reader Sol Hoffman wrote that "everybody" was tired of reading how people got started in the communications hobby. In your reply to him, you took him to task, asking if he was writing "on behalf of all of the inhabitants of the known universe, the world, or mere-

ly North America." You were rough on Mr. Hoffman. He was using a figure of speech. Do you know what a figure of speech is, sir?

George Fitzmaurice, Ph.D.,
Ames, Iowa

Is Ross Perot one?—Editor.

As a long-time reader of *POP'COMM*, I want to say that *How I Got Started* is one of my favorite features. I also like the CB coverage, antennas, and the ads.

Trevor Fletcher,
Edmonton, Alberta, Canada

Wanted to comment on two things in the July issue. First, I really enjoyed your thoughts on our domestic broadcasters (*Beaming In*). It was the first time I laughed out loud reading a radio related publication. Second, one of my favorite things in *POP'COMM* is *Mailbag*. I admire the way you have opinions and aren't afraid to give ridiculous letters appropriate answers they richly deserve, like the letter someone wrote you regarding the April issue's cover photo. I wish other communications magazines weren't stuffy. Keep it up and maybe they'll catch on.

Eric T. Forsland, KD6LLA,
North Cape May, New Jersey

Thank you for your July editorial regarding practices of broadcasters. It should be required reading for broadcasters everywhere. It would also be a good idea to draw it to the attention to people involved in education.

David D. MacLeod,
Calgary, Alberta, Canada

I took the liberty of sending copies of *POP'COMM*'s perceptive July editorial comments to several of my area's broadcasting stations. You pointed out many common broadcast annoyances that other media don't bother to criticize.

Arthur Simone,
Houston, Texas

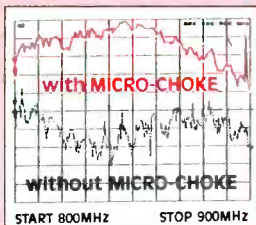
Since a friend showed me a copy of *POP'COMM* in 1986, I have never missed an issue, and I have saved every one. I wanted to let you know how much a non-tech person like myself views your publication. The best thing is your easy-to-read style and format. Most important is that the magazine is not "intimidating." I was a USN radio operator in the Far East in the 1960's, and am a casual SWL. I'm very interested in radio, and your magazine holds that interest very well. I particularly like the historic coverage and shortwave frequency information. In addition, I would like to mention that those of your advertisers I have dealt with have been most helpful.

Don Meno,
Wallingford, Conn.



MICRO-CHOKE™ grabs those 800MHz signals you've been missing.

Antenna Specialists all-band scanner antennas, with our exclusive MICRO-CHOKE, offer pinpoint resonance at 800MHz and excellent performance from 25 to 1000MHz. Now—base or mobile—all police, fire, emergency and other FM communications (even portables) are within earshot. Start hearing more by sending for the FREE 16-page A/S Personal Communications Antennas catalog today!



Tenfold signal improvement at 800 MHz!



MON-53 Mobile Roof/Deck-Mount Antenna



MON-52 Mobile Trunk Lid Mount Antenna



MON-58 Base Station Antenna

the antenna specialists co.

30500 Bruce Industrial Parkway • Cleveland, OH 44139-3996
TEL: 216/349-8400 • FAX: 216/349-8407

© Copyright 1990 by The Antenna Specialists Co.

a member of The Alien Group Inc.



Stripes of Quality

CIRCLE 53 ON READER SERVICE CARD

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 TCXO \$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 1x10⁻⁶. Optional 1 c 10⁻⁷
 - Range: HF: .5 - 30MHz
VHF: 10MHz - 3GHz
 - HF antenna, VHF antenna Inputs
 - Radio Audio/IPTT, 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



SSB220



Save on Ant Paks

Scanning Airport Security

Homing In On Special Security Forces Required At Airports

BY CHUCK ROBERTSON

Special task forces comprised of federal agents, private members of municipal and county police agencies, as well as private security patrols are patrolling the large airports around the nation. Among their missions: to detect and confiscate contraband, drugs, weapons, and explosive devices; detect and deter theft, pilferage, illegal aliens, and terrorism; to protect the safety of passengers and property; to maintain the peace.

In the process, they can stop, question, search, and detain persons they have reasons to believe are carrying contraband, or who give them reason to believe they are terrorists, or illegal aliens. Behind the scenes, they patrol and check cargo and hangar areas for breeches of security. At some larger airports there are V.I.P. lounges and areas that receive particular attention. At international port of entry airports, there are cargo storage areas requiring special security attention.

Of course, all airport employees from baggage handlers to maintenance workers are trained to spot and report suspicious persons, packages, and events.

For the scanner owner at an airport, or within monitoring range of one, these activities offer many things of interest.

Broken Down Mule

Last year, 1,000 US citizens traveling overseas were arrested and put in jail trying to smuggle narcotics into the USA on international flights. Most were "mules," or low-level couriers who earn a risky living transporting illegal drugs on behalf of druglords. Mules are often college students, welfare mothers, senior citizens, or even children.

Most of the mules who get snagged meet their fate after their plane lands in the USA. Airports where international flights arrive are therefore particularly busy ones when it comes to security forces. In 1992, federal agents seized more than \$1-million in drug money taken from passengers arriving at Lambert Field, St. Louis, Missouri. In addition to this, the airport police on duty there confiscated an additional \$100,000 in drug money!

If a passenger matches a certain suspicious profile, he or she might be stopped and questioned, even asked to permit a voluntary search of their luggage. If permis-



The sign above the X-Ray machine cautions passengers not to make false reports of hijackers, bombs, or hidden weapons. It even points out that they won't even laugh at jokes regarding these matters. The FBI gets called in, regardless.

sion is denied, the person might be detained and the search made without their permission. If more than \$1,000 in cash is found, it might be assumed that it is drug money. If nothing "illegal" is found, the person can go on their way—minus their cash!

Search the 414 to 420 MHz band for federal comms around airport areas.

We Have Our Customs

People often think that US Customs is limited to operations along the borders and in coastal areas. But the agency has offices



Just because a "local" airport doesn't normally get airline flights, it doesn't mean there's no federal attention paid. Any flight from overseas summons the arrival of US Customs agents, and possibly other federal personnel.

in almost every state, and it is active at all international airports. Customs agents will even show up at smaller airports at such times as aircrafts land after taking off from any location outside the USA. So far as US Customs is concerned, landing at any airport from an overseas point is the same as crossing an international border.

Customs agents look for contraband of all kinds, including drugs, stolen art objects, exotic animals, or expensive items being smuggled in with the hope of avoiding import tariffs. In actuality, there is a lengthy list of things they look for.

Among the frequencies that you might hear US Customs activities are 165.2375 and 166.4625 MHz.

The Terrorist Question

While the war on contraband keeps airport security personnel busy, hijackings and terrorist acts are the most feared activities, and the ones that pose the most sudden danger to the life and property. And all is not well.

In 1990, a Presidential Commission reported, "The US civil aviation security system is seriously flawed and has failed to provide the proper level of protection for the traveling public."

The metal detectors and other screening equipment used to check passengers and luggage at many airports was okay 25 years ago. However, they are no match against today's plastic explosives, non-metallic weapons, biological agents, and other items in the terrorists' arsenal. New generation equipment, such as "bomb sniffers" exists only at a few of the largest airports.

In the US, civil aviation security rests on the shoulders of the air carriers, the FAA, and the FBI. The FAA establishes the standards for luggage and passenger screening, but the job itself is up to airline and airport personnel.

Airlines have been so pressed for cash that their ability for doing the best of all possible jobs in this particular area could be open to some question. Furthermore, many airport security personnel simply don't have the latest automated detection hardware or sufficient manpower to be as thorough as they would like. As for small airports, their ability to protect themselves or their passengers is virtually nil.

A "skyjacker profile" provides airport security officers with typical suspicious characteristics and actions to watch for. Relevant information, such as criminal histories of particular suspects, is freely provided by the FBI.

Watching Over All

Because security activities at airports are within so many different categories of agencies and companies, frequencies spread out over several bands and services may be in use at any given larger airport.

A worthwhile band to search for at or near larger airports is 460.65 to 460.875

Airport Security Sampler (Check 5 Standardized Trunked Channels At All Airports.)

Baltimore-Washington Int'l. Apt., MD: 154.98 453.30 453.435 453.75 453.80 453.90
Chicago O'Hare Int'l. Apt., IL: 158.88 453.625 858.7125 859.7125 860.7125
Dallas-Fort Worth Int'l. Apt., TX: 154.95 15540 155625 453.05 453.225 453.525 453.80 460.30 460.45 851.5625 852.1625 852.8875 852.9875 853.2875 853.6625 855.9125 856.8875
Dulles Int'l. Apt., DC: 165.6375 165.7125
Greater Pittsburgh Int'l. Apt., PA: 453.825
Hartsfield Atlanta Int'l. Apt., GA: 852.4625 853.4625
John F. Kennedy Int'l. Apt., New York, NY: 453.40 453.375 453.65
LaGuardia Airport, New York, NY: 453.40 453.65
Logan Int'l. Apt., Boston, MA: 856.2625 857.2625 858.2625 858.2625 859.2625 860.2625 856.4375 857.4375 858.4375 859.4375 860.4375
Los Angeles Int'l. Airport, CA: 460.10 460.525
Miami Int'l. Apt., FL: 155.07
Minneapolis-St. Paul Int'l. Apt., MN: 460.475
Nashville Int'l. Apt., TN: 453.25
Newark Int'l. Apt., NJ: 453.40 453.65 851.6125 852.0125
New Orleans Int'l. Apt., LA: 453.55
Philadelphia Int'l. Apt., PA: 155.04 155.835 453.45 453.85
Port Columbus Int'l. Apt., OH: 453.55
San Francisco Int'l. Apt., CA: 488.3875 859.4375 860.4375 860.4625
Seattle-Tacoma Int'l. Apt., WA: 453.20
Stapleton Int'l. Apt., Denver, CO: 860.4375
Washington National Apt., DC: 165.6625

MHz. These frequencies are used (only) at airports by airlines for their own ground activities, such as cargo handling, passenger service, maintenance, fueling, public relations (V.I.P.) personnel, security, etc. However, since all 460 MHz airport airline stations use only 3 watts, their range is quite limited. Beyond a 50 mile range from those airports having these stations, these channels are in general full-power Business Radio use.

Trunked 800 MHz radio use is increasing at airports. Interesting to note that one

particular 5-frequency trunked sequence appears to have become almost standardized at many international airports around the nation. This sequence is: 856.8875, 857.8875, 858.8875, 859.8875, and 860.8875 MHz. There may well be additional trunked frequencies at some of the large international airports. These seem to be in wide use, in any event. When in doubt, try them!

Along with this story, there's a sampler chart showing some of the airport security frequencies being reported. ■



At larger airports, airlines have their own frequencies in the 460 MHz band for low-power ground communications related to their activities on the field.



Selected English Language Broadcasts

Fall—1993

BY GERRY L. DEXTER

There are hundreds of English language broadcasts aired every day on shortwave. This is a representative listing and is not intended to be a complete guide. While every attempt is made at making the list as up-to-date as possible, stations often make changes in their broadcast hours and/or frequencies with little or no advance notice. Some broadcasters air only part of a transmission in English or may run the English segment into the next hour or more. Some stations have altered schedules on weekends. Numbers in parenthesis indicate an English start time that many minutes past the hour. All times are in UTC.

Time	Country/Station	Frequencies	Time	Country/Station	Frequencies
0000	China Radio Int'l	9770, 11715	0300	Radio Canada Int'l	6120, 9535, 9755, 11845, 11940
	R. Vilnius, Lithuania	11750		R. Cairo, Egypt	9475,
	R. Pyongyang, N. Korea	11335, 13760, 15130		(30) R. Portugal	9570, 9600, 9705, 11840
	Radio Havana Cuba	6010, 9815		R. Tirana, Albania	9580,
	(30) VOIRI, Iran	9022, 11790, 15260		(45) R. Finland Int'l	11755, 15185
	R. Moscow	9815, 11805, 15470, 17560, 17860, 21625		(50) Vatican Radio	9605, 11930
	Radio Canada Int'l	5960, 9755			
	(30) R. Korea	15575			
	REE, Spain	9530			
	(40) R. Nacional Venezuela	9540			
	Czech Radio	5930, 7345, 9485, 9810, 11990, 13715			
	(30) Radio Netherlands	6020, 6165, 11835			
	BBC	5975, 6175, 7325, 9590, 9915, 11750, 15260			
	R. Norway (Sun)	9675, 15165			
	R. Yugoslavia	9580, 1870			
0100	R. Slovakia Int'l, Slovak Rep	5930, 7310, 9810	0400	China Radio Int'l	9690, 9770, 11715
	Radio Sofia, Bulgaria	7225, 9700, 11720, 15330		Radio Japan	11725, 15210, 15230, 15325, 17810
	R. Ukraine Int'l	7180, 7195, 7240		R. Budapest, Hungary	5975, 9585, 11910
	(30) Voice of Greece	9375, 9420, 11645		(40) Voice of Greece	9375, 9420, 11625
	R. Sweden	9695, 11820		Radio New Zealand Int'l	17770
	Deutsche Welle, Germany	6040, 6085, 6145, 9595, 9700, 9765, 11810, 11865, 13610, 13770, 15105		Deutsche Welle, Germany	6085, 6145, 9640, 9700, 11810, 11890, 13610, 13770, 13790, 15205
	RAI, Italy	9575, 11800		V of Free China, Taiwan	5950, 9680, 9765, 11745, 15345
	R. Bosnia (part), via WHRI	7315		HCJB, Ecuador	9745, 15155, 17490SSB, 21490SSB
	R. Japan	11815, 1840, 15195, 17835, 17845		R. For Peace Int'l, Costa Rica	7375, 7385USB, 13630USB, 15030
	(30) R. Austria Int'l	6015, 9870, 9875		(30) UAE Radio	11945, 13675, 15400, 17890
	(30) R. Tirana, Albania	9580, 11840		(30) R. Tirana, Albania	9580, 11840
	R. Yugoslavia	9580		R. Cultural, Guatemala	3300
	REE, Spain	9530		Radio Netherlands	6165, 9590
				Radio Japan	5960, 15210, 15325, 17810
				R. Yugoslavia	9580
0200	RAE, Argentina	11710	0400	Radio Havana Cuba	6010, 6180, 9655
	R. Sweden	9695, 11705		R. New Zealand Int'l	15120
	Channel Africa, S. Africa	9730		V of Turkey	9445
	Swiss Radio Int'l	6135, 9650, 9885, 12035		R. Romania Int'l	5990, 6155, 9510, 9570, 11830, 11940
	R. Romania Int'l	5990, 6155, 9510, 9570, 11830, 11940		SLBC, Sri Lanka	9720, 15425
	V. of Free China, Taiwan	5950, 9680, 9765, 11740, 11860, 15345		CSM World Service	7455, 9840, 9870, 13760, 17780
				China Radio Int'l	11680, 11840
				(Sun) R. Norway Int'l	9740, 11865, 11870, 15175
				R. Prague, Czech Republic	7345, 9485, 9810, 11990, 13715, 17535
				Swiss R. Int'l	6135, 9650, 12035, 13635



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.

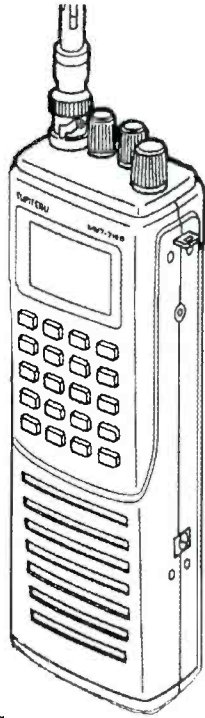
PEACEMAKER SPECIAL

**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 3/8H x 1 7/8W x 2 1/3D. Wt: 14oz. NFM I.F. filter ≈ ±3KHZ. SSB filter ≈ ±3KHZ. More information: Fax fact doc. # 277

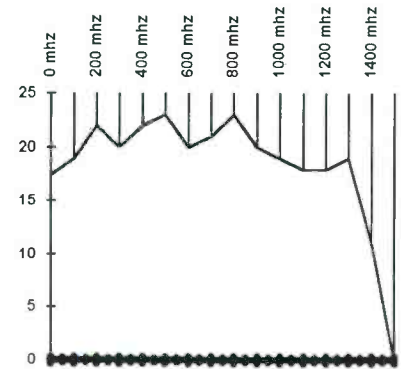
Go ahead, get one of those do everything receivers. Then try and explain the reasons for your purchase to the person who shares your checkbook or credit card. No fun, huh? Don't look forward to that prospect, do you? Well, maybe we can help a little by making it real easy for you to make a peace offering.



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 1/4D x 4 3/4H x 7/8D. Wt 5 oz. Fax Facts #805 \$89.00 Also, if you have too many of the wrong kind of signals use our:

AOR MPIF-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

Time	Country/Station	Frequencies	Time	Country/Station	Frequencies
	Trans World Radio, Swaziland	5055		(20) Vatican Radio	7250, 11740, 15210, 21670
	Kol Israel	9435		Radio Jordan	13655
	Channel Africa, S. Africa	9695		NBC Papua New Guinea	4890
0500	V of Nigeria	7255		(30) R. Austria Int'l	6155, 13730
	Deutsche Welle, Germany	5960, 6130, 6130, 9515, 9535, 9670 11705, 13610	1200	(30) R. Korea	9750
	HCJB, Ecuador	11925, 21455		China Radio Int'l	9715, 11660, 15210, 15440
	China Radio Int'l	11840		(30) Radio Bangladesh	15208v
	(30) R. Austria Int'l	6015, 6155, 13730, 15410, 21490		(30) Radio Yugoslavia	17740
	Radio Havana Cuba	6010, 9510		(30) Radio France Int'l	9805, 11670, 15365, 17650, 21645
	REE, Spain	9530		(30) Voice of Greece	15635, 15650, 17515
	Channel Africa	11745		R. Tashkent, Uzbekistan	7325, 9540, 15470, 17745
	Vatican Radio	6245, 7250		Radiobras, Brazil	125445
0600	Radio Korea	7275, 11945, 15155		Radio Sofia, Bulgaria	11630
	GBC, Ghana	4915		HCJB, Ecuador	11925, 15115, 17490SSB, 17890, 21455SSB
	V of the Mediterranean, Malta	9765		(30) All India Radio	9615, 11770, 15145
	V of Hope, Lebanon	6280		(30) Voice of Vietnam	9840, 12020, 15010
	Vatican Radio	6245, 7250, 9645, 11740	1300	R. Ulan Bator, Mongolia	11850, 12015
	R. Australia	11720, 11880, 15240, 17670, 17880		R. Finland	15400, 21550
	(30) R. Vlanderen Int'l, Belgium	5910, 9925		China Radio Int'l	7405, 9715, 11660, 15440
	AWR Europe	7210		(30) R. Tashkent, Uzbekistan	9540, 15295, 17745
	R. Georgia, Georgian Rep	11805		R. Pyongyang, N. Korea	9345, 9640, 13650, 15230
	TWR, Swaziland	7200		Polis Radio	6135, 7145, 9525, 11815
0700	Radio New Zealand Int'l	9700		Radio Romania Int'l	11940, 15365, 17720, 17850
	V of Free China, Taiwan	5950		FEBC, Philippines	11995
	HCJB, Ecuador	9745, 11925, 21455		R. Finland Int'l	15400, 21550
	(40) TWR, Monaco	9480		R. Austria Int'l	13730, 15450, 17730
	(45) R. Finland Int'l	6120, 9560, 1175		R. Vlanderen Int'l, Belgium	15530, 17740
	Croatian Radio	6210, 9830, 13830		BBC	9515, 12095, 15070, 15220, 17640, 17705, 21470
	(45) KTWR, Guam	15200		All India Radio	11760, 15120
	CKFX, Canada	6080		Kol Israel	15640, 17590
	BBC	5975, 7150, 9410, 9640, 12095	1400	China Radio Int'l	11815, 11855, 15135
	R. Netherlands	9630, 11895		Radio Japan	9535, 11735, 11815, 11835, 11865
0800	R. Australia	15160, 15240, 17630, 17750, 21775		R. Iraq Int'l	15250
	SIBC, Solomon Is.	5020, 9545		Radio France Int'l	11910, 15405, 17650
	(30) R. Austria Int'l	6155, 13730, 15450		V of the Mediterranean, Malta	11925
	(40) Voice of Greece	15450, 17525		RTV Morocco	17595
	KNLS, Alaska	7365		R. Canada Int'l	11935, 15315, 15325, 17820
0900	CFRX, Canada	6070		Radio Pyongyang, N. Korea	9325, 9640, 9977, 13785
	China Radio Int'l	11755, 15440, 17710		HCJB, Ecuador	11925, 17490SSB, 17890, 21455SSB
	R. Australia	5995, 9510, 9580, 13605, 17695		BBC	6195, 7180, 7215, 9410, 9515, 9660, 9740, 9750, 9760
	FEBC, Philippines	9800, 11685			11750, 11940, 12095, 15070, 15260, 15310, 15400, 15420, 17640, 17705, 17790, 17840
	KTWR, Guam	11805		Radio Japan	9750, 11815, 11865, 15355
	(10) R. Ulan Bator, Mongolia	11850, 12015		KTWR, Guam	15610
	R. Vlanderen Int'l, Belgium	5910, 9905, 13675		(30) R. Finland Int'l	6120, 11755, 11820, 15240, 21550
1000	V of Vietnam	9840, 12020, 15010		(30) Voice of Greece	15630, 15650, 17525
	All India Radio	15050, 17387, 17895		(30) R. Portugal	21515
	R. Australia	5995, 9580, 21725	1600	Channel Africa, S. Africa	5960, 17710
	NBC, Papua New Guinea	4890		AWR, Guam	11980
	(30) R. Korea	11715		Radio France Int'l	6175, 11705, 12015, 15530, 17620, 17850
	China Radio Int'l	11755, 15440, 17710		R. Sweden	15270, 21500
	AWR Latin America	13750		Voice of Vietnam	9840, 12020, 15010
	CSM World Service	9455, 9495, 13770, 17555		Radio Jordan	9560
	(30) UAE Radio, Dubai	13675, 15320, 15345		BSKSA, Saudi Arabia	9705, 9720
1100	Radio Japan	6120, 11910, 15240		R. Iraq Int'l	15250
	(30) R. Sofia, Bulgaria	11630, 11720, 13670, 17780, 17825		R. Pakistan	11570, 13590, 15550
	VOIRI, Iran	9525, 9685, 11715, 11790, 11930	1700	Radio Japan	9750, 11815, 11865, 17775
	V of Vietnam	7416, 9732		Radio Pakistan	11570, 15550
	Swiss Radio Int'l	6165, 12030		R. Canada Int'l	5995, 7235, 13650, 15325, 17820, 21545
	R. Pyongyang	6576, 9977, 11335			

Time	Country/Station	Frequencies
	R. Algiers, Algeria	9535, 17745
	KSDA, Guam	13720
	(30) Radio Netherlands	21515, 21590
	Voice of Azerbaijan	15240
	Vatican Radio	11625, 15090, 17790
	All India Radio	7412, 9950, 11620, 11860, 11935, 15080
	(30) R. Bulgaria	11720, 15330
1800	RAE, Argentina	15345
	Radiobras, Brazil	15265
	R. Iraq Int'l	13680, 15210
	Radio Kuwait	13620
	Radio Moscow	9880, 11770, 12015, 15290, 15355, 21670
	R. Kuwait	13620
	R. Portugal	11745
1900	Radio Japan	9640, 9750, 11815, 11865, 11875
	(30) VOIRI, Iran	9022, 15260
	(Sun) Radio Norway Int'l	15355, 15365
	R. Portugal	17790
	HCJB, Ecuador	17490SSB, 17790, 21455SSB
	(30) R. Austria Int'l	6155, 9880, 13730
	(30) Radio Netherlands	17605, 21590
	AWR Latin America	5980, 9725, 11795, 13750, 15400
	Kol Israel	7465, 9435, 11587, 11603, 11675, 17575
	VOA, United States	11920, 11995, 13710, 15410, 15580, 17800
2000	CSM World Service	13770, 13840, 15665, 17510, 17555
	Radio Kuwait	13620
	Vatican Radio	9645, 11625, 15090
	Swiss Radio Int'l	9885, 12035, 13635, 15505
	R. Canada Int'l	5995, 7235, 11945, 13650, 17820, 17875
	R. Portugal	15250
	V of Indonesia	9675, 11750, 11785
	(05) R. Damascus, Syria	12085
	R. Moscow	9610, 11630, 11770, 15480
2100	(10) R. Damascus, Syria	15095
	Voice of Turkey	9445
	REE, Spain	6125
	(15) R. Cairo, Egypt	9900
	(40) R. Nacional, Venezuela	9540
	R. Portugal	15250
	R. Sweden	6065, 9655, 11995
	Radio Havana Cuba	17760
2200	(30) Kol Israel	9435, 11587, 11603
	(45) R. Sofia, Bulgaria	7225, 9700, 11720
	R. Ukraine Int'l	7150, 7240, 9685, 15195
	V of the UAE	9770, 11710, 11885
	R. Yugoslavia	9505
	Swiss Radio Int'l	6030, 9810, 9885, 12035
	R. Budapest, Hungary	6110, 9835, 11910
	R. Vilnius, Lithuania	9675, 9710
	(45) All India Radio	9910, 11745, 11785, 15110, 17830
	Radio Moscow	9480, 9815, 11905, 11975, 17560, 17570
	Radio Canada Int'l	5960, 9755,
2300	AWR, Guam	15610
	Voice of Turkey	9445
	(30) R. Netherlands	6020, 6165, 11835
	AWR, Costa Rica	5030, 9725, 11870
	(30) R. Austria Int'l	9870, 13730
	R. Pyongyang, N. Korea	11700, 13650
	BBC, England	5975, 6175, 7325, 9590, 9915, 12095, 15070
	(35) V of Greece	7450, 9425, 11645

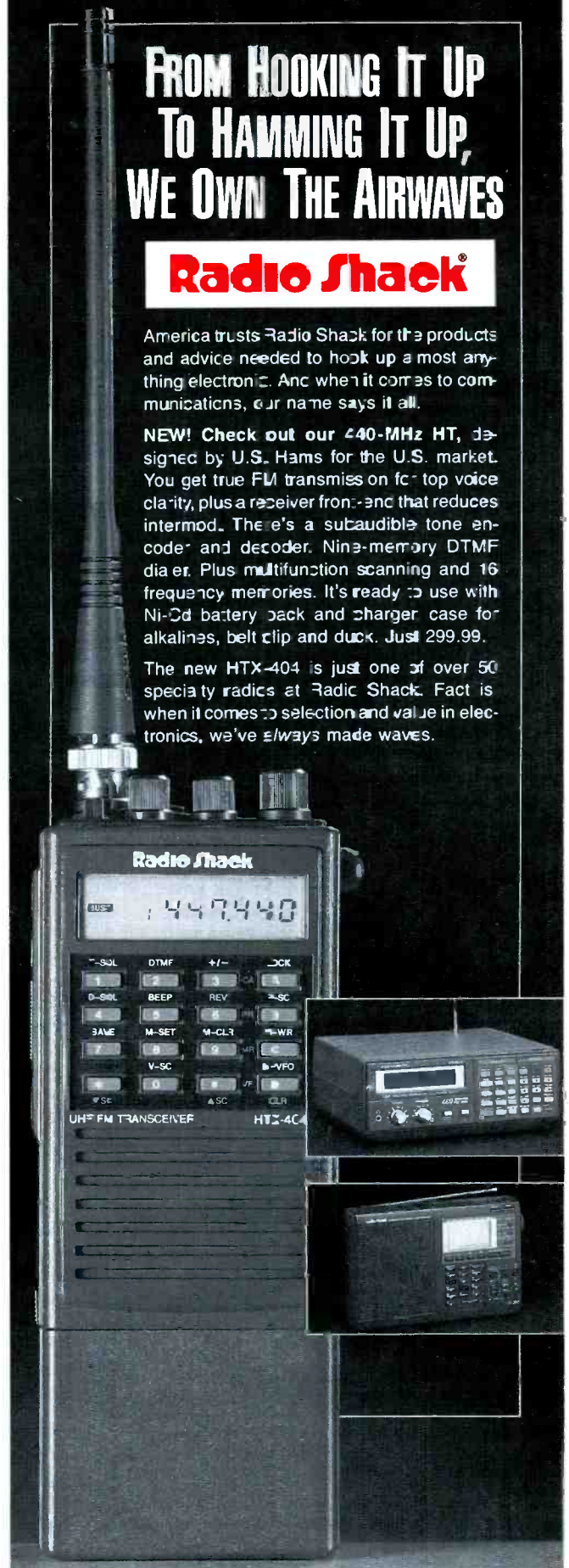
FROM HOOKING IT UP TO HAMMING IT UP, WE OWN THE AIRWAVES

Radio Shack®

America trusts Radio Shack for the products and advice needed to hook up a most anything electronic. And when it comes to communications, our name says it all.

NEW! Check out our 440-MHz HT, designed by U.S. Hams for the U.S. market. You get true FM transmiss on for top voice clarity, plus a receiver front-end that reduces intermod. There's a subaudible tone encoder and decoder. Nine-memory DTMF dialer. Plus multifunction scanning and 16 frequency memories. It's ready to use with Ni-Cd battery pack and charger case for alkalines, belt clip and duck. Just 299.99.

The new HTX-404 is just one of over 50 specialty radios at Radio Shack. Fact is when it comes to selection and value in electronics, we've always made waves.



Old Time Radio: When They Needed Help

Let's Peek At The Past

BY ALICE BRANNIGAN

In July we had a history of the development of the use of call letters, explaining how many seagoing call letters become reassigned to the broadcasting service. As was pointed out, many of the first American broadcasters were given retread call letters that had previously been used by ship wireless stations, and that the practice continues.

Looks as though many people didn't realize this. They wrote to tell us that they had never thought about the fate of former call signs of ships. They free up when vessels have been "lost" through accident, war, scrapping, transfer to a foreign flag, or go out of registration.

One of the most interesting letters that arrived in response to the July story came from John J. Lee, W6BEB, of Canoga Park, Calif. John was one of three radio officers on the T2 class tanker *Fort Lee*. In November of 1944, while loaded with diesel fuel from the Persian Gulf, the vessel was in the Indian Ocean. At that time it was torpedoed and sunk by the German sub, U-181. History records that it was next to the last ship sunk by U-boats in the Indian Ocean!

John recalls that the official call letters of the *Fort Lee* were KKVV. He says it was "a beautiful CW call," but observes that during wartime KKVV couldn't be used. The tanker's wartime tactical identification was KC2MV. Still, John has always had a special place in his memory for KKVV, and he was wondering if those call letters were ever reassigned to a broadcaster.

John can rest easy. KKVV is still in use, and in good hands. In May of 1990, the FCC finally reassigned the call letters, and they went to a broadcaster. KKVV is now an AM station in Las Vegas, Nevada. This station runs 5 kW on 1060 kHz, with plenty of religious programming.

Summoning Help

Inquiries that came in relating to our mention of abandoned ship wireless call signs included several from readers who asked if we would explain the infancy of the famous maritime telegraphy distress signal, "SOS," and when it was originally sent into use.

SOS was first officially adopted for inter-



RMS Titanic's Chief Wireless Officer, Jack Phillips, had started sending out CQD. That unofficial distress signal had been officially discarded several years earlier.

national use at the 1906 International Radio Conference at Berlin. The signals CQ and CQD had been unofficially employed during certain periods after 1900 when the Marconi International Marine Communication Company, Ltd., began equipping ships for wireless communication.

To be sure, some use of the unofficial CQ and CQD signals continued until some years after the official adoption of the SOS signal in 1906.

Second Wireless Officer Harold Bride, of the RMS Titanic, in telling of the ship's notable sea disaster in April, 1912, gave an example of this. He said that the ship's captain stuck his head through the door of the radio shack and said to First Wireless Officer Jack Phillips, "Send the call for assistance."

Phillips asked him, "What call should I send?"

"The regulation international call for help. Just that."

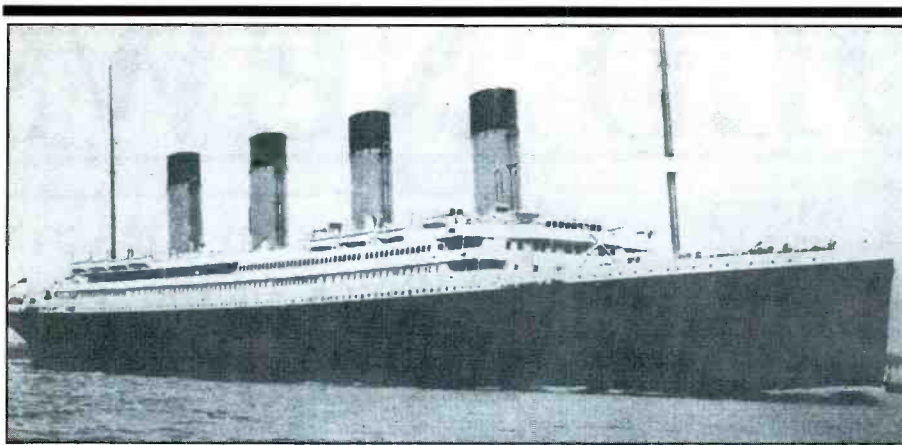
As soon as the captain left, Phillips went to the operating position and began to send CQD. Nobody in the wireless shack realized the seriousness of the damage to the vessel, and the operators were all joking



The Captain of the RMS Titanic, Edward J. Smith, knew that a call for help had to be sent, but he wasn't specific.



After he was rescued, the RMS Titanic's Second Wireless Operator, Harold Bride, recalled that he jokingly told the head operator to stop transmitting the old CQD distress call and use the newer SOS signal because this might be the last chance he would ever have to send it.



The RMS Titanic, despite utilizing no less than two distinctly different formats of distress signals, still sank after colliding with an iceberg in the North Atlantic during the spring of 1912.

around. Phillips had sent out the CQD signal for five minutes, and then the captain returned.

The captain asked, "What are you sending?"

Phillips answered, "CQD."

Second Officer Bride thought this was humorous, so he offered a comment that made everyone laugh, including the captain. He said, "Send SOS. It's the new call, and it may be your last chance to send it."

Phillips smiled, then began to send SOS.

The distress call for voice was proposed by the British delegation at the Berlin conference. The word Mayday, corresponding to the French pronunciation of the expression "m'aider" (meaning "help me") was approved in 1927 for use in radiotelephony at the International Radiotelegraph Convention, Washington. Guiding factors in the choice of the spoken word Mayday were its similarity in meaning to SOS used in radiotelegraphy, and the prevalence of the use of the French language in international matters during the 1920's.

It has been speculated that the letters CQ originally represented "Seek You," while CQD has been said to mean "Seek

You—Distress." There have also been other interpretations. Contrary to popular belief, SOS does not represent actual words (such as Save Our Souls). It was selected because the three-letter grouping is easily sent, distinctive sounding, and instantly recognizable.

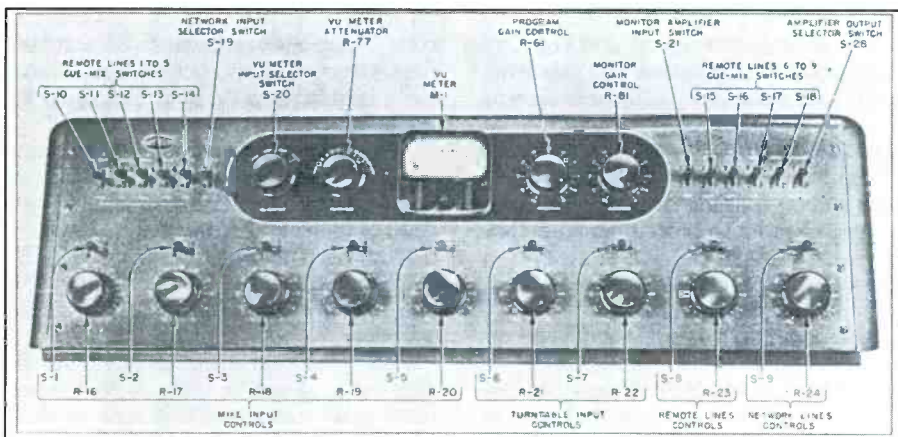
Radio regulations have always specified the manner in which voice and telegraphic distress signals may be used over the radio. Article 24 of the General Radio Regulations, International Telecommunications Conference, Cairo, 1938, provides (in part) that:

"...furthermore, a mobile station which becomes aware of another mobile station in distress, may transmit the distress message in either of the following cases:

(a) when the station in distress is not in a position to transmit it;

(b) when the master (or his relief) of the vessel, aircraft, or other vehicle carrying the station which intervenes, believes that further help is necessary."

Sending false, fraudulent, or deliberately deceptive distress calls have always been specifically prohibited in the radio laws and regulations of all nations. This is mentioned



An illustration of the Raytheon RC-11 broadcast console, as it appears in its instruction manual. (Courtesy Rick Goodwin, Illinois.)

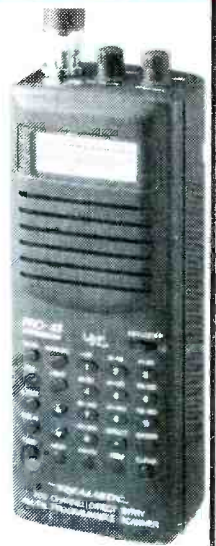
Save on **ALL** **REALISTIC** Scanners & Radios WITH MANUFACTURERS WARRANTY IN U.S. (copy available on req.)

3 WAYS TO SAVE

1 FREE
SHIPPING & HANDLING
48 STATES

2 BIG
PRICE REDUCTION

3 NO TAX
COLLECTED
49 STATES



PRO 43, \$298 WITH BATT'S

CALL FREE: **1-800-433-SAVE** 9-5 Central Mon.-Fri.
Since 1981

The Difference Is The Price

USRADIO Radio Shack DTR

USRadio 377 Plaza, Granbury, TX. 76048

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*



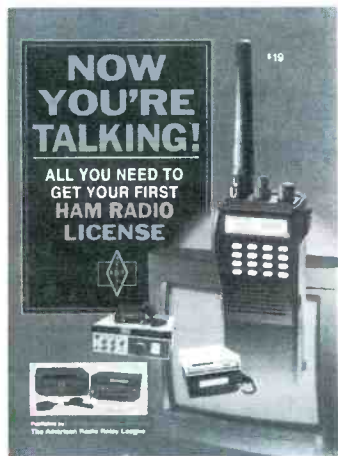
*Add for ship. & handling. Phone Adapter & Vox \$2.00 each, Recorders \$5.00 each. Colo. Res. add tax. Mail Order, VISA, M/C, COD's OK. Money Back Guar. Qty. Disc. available. Dealer inquiries invited. Free data on other products.

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

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

CIRCLE 52 ON READER SERVICE CARD



In the center, Frank Wilburn tries the hand-crank of a "Gibson Girl" emergency transmitter during WWII. The others in the photo are unidentified, but are probably Bendix engineers.

in the US Communications Act of 1934, as amended, which is a federal law. In the USA, such activities are vigorously investigated by the FCC, USCG, FAA, and other agencies. Violators receive heavy fines, plus possible prison sentences.

A Collector to Console

A letter from Rick Goodwin, 4260 Harper, Gurnee, IL 60031, lets us know that he's a record and transcription collector. He once located a brand new Raytheon RC-11 broadcast console which has never seen service. It is of sufficient condition to be described as museum quality. Because of their age, some of the resistors and capacitors had aged badly, so Rick replaced every one in the unit with new one, and in the exact duplicate. He says there are 21 switches, each one is nickel palladium. All that needs to be done to clean one of these switches is toggle it back and forth a few times. Tells us he'd be willing to sell the unit to someone interested in such items.

Rick recalls that he had the use of his father's disc recorder in the 1940's and 1950's, and he made transcriptions of many programs and commercials. He fondly recalls Let's Pretend, and The Little Theatre Off Times Square, and asks if any other readers also enjoyed those programs.

An Arizona First

The first broadcaster in Arizona was a small station that the owner's wife never thought of as much more than an outlaw. The station was KFBQ. It operated beginning in 1922 from the Park Ave., Prescott, home of Frank Wilburn.

KFBQ was on the air for about an hour a day, usually between 7 and 8 a.m. The programs consisted of local news, live cowboy music, stories, and sometimes listeners would phone in and their comments would be mentioned over the station.

When the Prescott Journal-Miner wanted to open a broadcasting station, they

hired Wilburn to build their station, KPJM. By 1928, he owned the KPJM.

In 1929, Wilburn went to Flagstaff, where he built and installed the first transmitter for KFXV, which was that city's first station.

Wilburn went on to construct other broadcasting stations throughout Arizona. His most notable contribution to the world of radio, however, did not come until World War II. As an engineer working for Bendix, in 1943 he was contracted out to be the project engineer in charge of war contracts for Frank Reiber, Inc., West Los Angeles, Calif. A year later, he was transferred to the Walter L. Schott Co., Beverly Hills.

It was while working for Bendix during the war that Wilburn developed the Gibson Girl transmitter. This was a waterproof, portable, relatively lightweight unit that could be packed into survival craft deployed with combat ships, subs, and some aircraft.

The Gibson Girl was designed to be held in place between the operator's knees, using a wire antenna suspended from a balloon. A hand-crank was then employed to generate the power for the unit to automatically send out distress and homing signals. No other skills were needed to make it work. The range was between 25 and 500 miles, depending upon conditions. It also had a blinking beacon light that could be activated.

This device is given credit for summoning the rescue help that saved the lives of thousands Allied military personnel from 1943 until the end of the war in 1945.

A thousand thanks to Sid Miller, NH6TB, for passing this along. It's from an item he came across in *The Traveler*, of Congress, Arizona.

Happy to have had you join us this time. Won't you please be with us next time? Thank you for your kind help in assembling this material. We always appreciate your input in the form of clippings, old QSL's (originals or good copies), photos of past stations, anecdotes, and old station listings.

Product Parade

Radio Shack Releases Flock of Interesting Hobby Items

The *Realistic Amplified Shortwave Antenna* (Cat. 20-280) is an indoor active shortwave antenna. This is a small device that is intended to be placed on top of your communications receiver and used in place of an outdoor antenna, or as a preselector to boost the signals from an outdoor antenna. The unit has its own 28-in. telescoping whip.

The device operates by connecting it to the antenna terminal of the receiver. It is powered from either a 9-volt battery, or an optional AC power supply. Frequency coverage is 3 to 30 MHz, with a maximum signal amplification gain of 20 dB. The amount of gain is adjustable by a front panel control, and you can also peak the unit's frequency response.

The *Realistic PRO-44* is a new handheld scanner with 50 memory channels. It covers the following frequencies: 30 to 54 MHz; 108 to 174 MHz; and 308 to 512 MHz. Among the features are one-hour memory backup, monitor memory during search, and an operating speed of 16 c.p.s. (in scan and search modes). Sensitivity is 1.0 uV on all bands, 2.0 uV in the VHF aero band.

Realistic's PRO-37 is a hot 200-channel handheld scanner with *Hyperscan*. That means it scans at 25 c.p.s., and searches at 50 c.p.s. The frequency ranges are 30 to 54 MHz; 108 to 174 MHz; 380 to 512 MHz; and 806 to 960 MHz (except for the 2 cellular bands). This scanner features crystal and ceramic IF filters to sharpen selectivity. It has memory back-up.

The *Realistic PRO-2028* is a desktop scanner offering 50 channels in 10 storage banks. Frequency coverage is: 29 to 54 MHz; 108 to 174 MHz; 406 to 512

(Continued on page 74)



The *Realistic HTX-404*, for the 440 MHz ham band, has easy operation. The unit offers many programmable features.



Realistic's PRO-37 is a hot 200-channel handheld scanner with "Hyperscan," plus 800 MHz coverage.



Realistic Amplified Shortwave Antenna (and preselector).



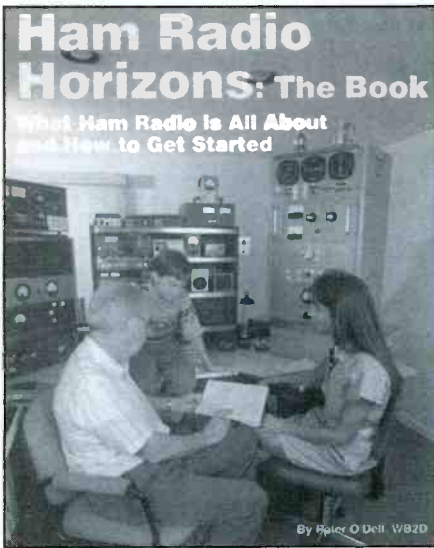
The *Realistic PRO-44* offers 50 channels.



The *Realistic PRO-2028* is a desktop scanner offering NOAA channels in addition to the action bands.

BOOKS YOU'LL LIKE

BY R.L. SLATTERY



Broaden Your Horizons

Ham Radio Horizons, by Peter O'Dell, WB2D, is a sprightly and enticing introduction to ham radio pointing out the excitement, enjoyment, and benefits of the hobby. It is available as both an illustrated book, and also a professionally produced VHS-format video.

Pete explains what ham radio is all about, and why it has captivated the imaginations of so many adventurous people, beginning with the dawn of wireless, and continuing right through to the latest computer and satellite comms technologies. It's a hobby that has attracted people of all age groups and from every profession—including royalty, politics, the news media, the space program, and major show business personalities.

He tells about the thrills of communicating with other hams around the nation and the world, of contesting, public service facets of the hobby, experimenting, and learning about the latest methods of communication. Whether a person's interest is ham-TV or gabbing only with local pals, whether it is communicating via packet radio (computers) or seeing how many nations of the world they can contact—there's a place for them in ham radio. And *Ham Radio Horizons* tells all about it!

Best of all, Pete explains how recently revised regulations allow people to enter the hobby easier than ever before with a code-free license that allows hamming on any band above 30 MHz. The book and the video both show hamming very well, and we would say that they should serve their intended purpose in providing sufficient valid information to let a prospective ham know what the hobby is about. If you're a ham who knows someone who would like ham radio but hasn't yet been

fully sold, either the book or the video should be the clincher. Maybe a friend or neighbor, your spouse, or parents, or the kids, are candidates.

Ham Radio Horizons, the book, is \$12.95, plus \$3.50 shipping and handling. The VHS video is \$19.95, plus \$3.50 shipping and handling. Club quantity and dealer discounts available upon request. Order from CQ Communications, 76 North Broadway, Hicksville, NY 11801. VISA/MC/Discover/AMEX accepted. Phone orders: (516) 681-2922; FAX orders (516) 681-2926.

About QSL Cards

According to Bill Welch, W6DDB, it takes a certain amount of savvy to get a good percentage of returns on ham QSL's.



This means QSL's exchanged between two stations that contact one another on a ham band, as opposed QSL's listeners hope to receive after sending reception reports to AM and SW broadcasting stations.

In *PSE QSL!*, his 63-page illustrated book, Welch covers a wide range of aspects including how the design and appearance of the card itself can impact either positively or negatively the chances of getting a QSL in return. Are cartoon cards good? What about cards with lots of color, or photos? How important is heavy card stock? Will a "stock" design pull as well as a custom designed card?

Then, there are other things to deal with that Welch discusses. These are things like selecting a QSL printer, how many cards to order and how much to spend, whether you need to use envelopes to mail cards, if

you need to include return postage, sending "green stamps," IRC's, SASE's, QSL bureaus, QSL managers, postage rates, cards to DX'peditions, storing and displaying cards, etc., etc.

You may be surprised to learn that some ham QSL cards probably don't bring results because the information regarding the contact on the QSL is either incorrect or too vague. Many people seem to stumble over the fact that, in the world of international comms, the day and date changes simultaneously all over the world at 0000 UTC, and not at midnight in their own local time zone.

What with postage rates being what they are, this is a most worthwhile book for the ham seeking to learn how to substantially increase the chances of seeing something in return for QSL's sent out.

PSE QSL!, by Bill Welch, is \$9.95, plus \$2 shipping and handling (\$3 foreign) from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. VISA/MC are accepted. Phone: (414) 248-4845.

Getting The Drop on Mail

A confidential mailing address is one approach to privacy. Mail drops have worked effectively over the years for underground broadcasters, people who constantly travel, people with sensitive positions, celebrities, and many others who wish to send and receive correspondence at an address different than their home or sometimes, office.

The Directory of U.S. Mail Drops, by Michael Hoy, is a comprehensive directory listing of more than 850 companies all over the world that will (for a fee) provide

DIRECTORY OF U.S. MAIL DROPS

- Mail Receiving Agencies
- Mail Forwarding Services
- Private Postal Boxes
- Unlisted Addresses
- Remailing Services
- Accomodation Addresses
- With An Appendix for Foreign Countries

Compiled by Michael Hoy

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-F 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-F 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 banks • 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.

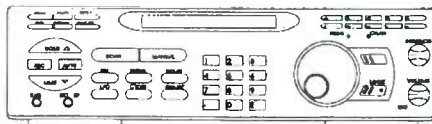
NEW! Bearcat® 8500XLT-F

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 banks. Auto Recording - This feature lets you record channel activity from the scanner onto a tape recorder. You can even get an optional CTCSS Tone Board (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. 20 banks - Each bank contains 25 channels, useful for storing similar frequencies in order to maintain faster scanning cycles. For maximum scanning enjoyment, order the following optional accessories: PS001 Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter \$14.95; PS002 DC power cord - enables permanent operation from your vehicle's fuse box \$14.95; MB001 Mobile mounting bracket \$14.95; BC005 CTCSS Tone Board \$54.95; EX711 External speaker with mounting bracket & 10 feet of cable with plug attached \$19.95. The BC8500XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited warranty from Uniden. Order your BC8500XLT from CEI now.



CB/GMRS Radios

The new Uniden GMR100 is a handheld GMRS UHF 2-way radio transceiver that has these eight frequencies installed: 462.550, 462.725, 462.5875, 462.6125, 462.6375, 462.675, 462.6625 and 462.6875 MHz. This one watt radio comes with flexible rubber antenna, rechargeable ni-cad battery, AC adapter/charger, belt clip, FCC license application and more. NEW! Uniden GMR100-F GMRS Handheld \$159.95
NEW! Uniden GRANTXL-F SSB CB Mobile \$149.95
NEW! Uniden PC7GX1-F 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 Traveller 2-F portable	\$79.95
Sangean ATSG06-F ultra compact	\$149.95
Sangean ATSG06P-F 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 ATSR18-F portable without cassette recorder	\$189.95
Sangean ATSR18CSF 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 #DAV1-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	\$339.95
RELM R11256NB-F VHF synthesized transceiver	\$289.95
Ranger RC12950-F 25 watt 10 meter ham radio	\$244.95
Ranger RC12970-F 100 watt 10 meter ham radio	\$369.95
Uniden LRD1900W-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/FPO 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. Sair date: 9/1/93 1/2-94 AD #08703CEI 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



Gift Ideas

PASSPORT TO WORLD BAND RADIO 1994 EDITION

Completely revised and updated. Stations, frequencies times are all at your fingertips. Great Value. ©1993

IBS-RDI94 \$17.95

SCANNER RADIO GUIDE

Confused by when and where to listen to your scanner? This book helps you get the most from your equipment. Includes info on scanning the President!

HT-SRG \$14.95

COP TALK

Learn all about the police and how they use their radios to protect you. De-mystifies jargon and codes.

TP-CT \$19.95

MASTER FREQUENCY FILE

The largest database of frequencies from 25-2500 MHz. "National Scanning Report" says this is a "killer book."

T-4131 \$29.95

CITIZENS GUIDE TO SCANNING

Covers all aspects of scanners, services and radio usage. Covers 30-1000 MHz.

TP-CGS \$19.95

1994 M STREET DIRECTORY

Complete guide to AM & FM stations. Includes formats, power, frequencies and much more. ©1993

MST94 \$32.95

TOP SECRET REGISTRY OF US GOVERNMENT FREQUENCIES

8th edition of a best seller! Up-to-date listings for all US government offices. © 1993.

CRB-TS \$21.95

Shipping and handling: US \$4.00 by US Mail, \$5 by UPS ground. Canadian add \$2 to US Mail rate. Foreign orders add \$3 to US Mail rate.

Call or write for a **Free** (US & Canada) 16 page Catalog \$2 overseas, stuffed with books for Ham, SWL, BCB and CB radio

(800)457-7373

Radio Bookstore



PO Box 209



Rindge, NH 03461-0209

unlisted addresses for receiving and sending correspondence.

Includes a detailed list of the services each company provides, such as secretarial support, FAX service, telephone answering, and more. A dozen Canadian drops are listed, as well as more than three dozen mail drops in 18 overseas nations.

Directory of U.S. Mail Drops is \$14.95, plus \$3 shipping and handling, from Loompanics Unlimited, P.O. Box 1197, Port Townsend, WA 98368. Washington State residents please add sales tax.

Don't Bug Me About It

Electronic surveillance, in these times, can take many insidious forms. Sophisticated equipment installed and used by professionals is in wide use in offices, stores, factories, also homes. Relatively inexpensive and far less elaborate devices are now so readily available, simple to conceal, and use that they can be (and are) freely employed by untrained non-professionals who want to snoop on employees, co-workers, customers, neighbors, family members, friends, enemies, and competitors.

Various commonly employed devices might be "hard wired," or utilize radio transmissions. For whatever the reasons these things may have been installed, and by whom, they were put into someone's private space without the knowledge and consent of those whose conversations and actions they have gained access. Who knows where that information and those conversations will end up? Who knows what purposes the material might be put to the disadvantage of those who had every reason to believe they were speaking within the privacy of an enclosed area?

Lee Lapin's fine book, *Hands-On Countermeasures*, addresses this situation head-on with a blunt, no-nonsense, and realistic approach. This is not a book of theoretical information, but is (as it's name

implies) a true hands-on manual for electronics countermeasures the average person can employ to gain protection from electronic surveillance. It is brimming over with useful information, photos, specs, names, addresses, sources, ideas, and techniques.

The book concentrates on room and telephone surveillance, showing what equipment to use to locate bugs and taps, and where to look for them. Also, exactly what you can do to end the threat to your privacy, then the effective measures you must take to correct those weak points to prevent future electronic surveillance assaults.

Lapin is a recognized authority on electronic surveillance matters. He is the author of many highly regarded books on this and related security subjects.

Hands-On Countermeasures is \$22.95, plus \$4 shipping and handling (\$5 to Canada) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. NY State residents please add \$2.30 tax. VISA/MC are OK. Phone orders: (516) 543-9169; 24-hour FAX order line: (516) 543-7486.

In Addition...

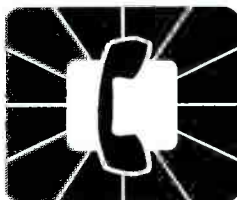
Chatham Research released a software product for IBM PC's called *FM Scan*. This provides information on FM stations at nearly 1,000 cities and towns along US highways. This program acts like a "smart radio," showing the frequency, call, format, location, relative strength, signal range and compass heading. The data covers the Interstate system from I-5 to I-605 (N/S routes); and I-8 to I-710 (E/W routes). This is \$33.95. Residents of VA please add \$1.35 sales tax. Order by mail from Chatham Research, P.O. Box 439, Oakton, VA 22124. Or, you can call if you need more info. Their phone for more info is: (703) 281-9699.

The Radio Station, 3rd Edition, by Michael C. Keith, and Joseph M. Krause, is a guide to the internal workings of a radio broadcast station. We were sent only a press release, so we can't offer any opinions. But the release says the book explains the details of all job functions at a station. This is a 315-page book, costing \$34.95. It comes from Focal Press, 80 Montvale Ave., Stoneham, MA 02180.

Milestone Logmaster II is an update of Milestone's ham/SWL log keeping software for DOS computers. The company tells us it is a complete redesign, containing many changes suggested by customers, especially in the areas of interface, performance, contesting, and reporting. This is an easy program to use, and it costs only \$29.95. For more information, or to order, write Milestone Technologies, 3140 South Peoria Street, Unit K-156, Aurora, CO 80014-3155. If you need more information, you can phone Milestone's Marshall Emm at (303) 752-3382. ■

Hands-on Countermeasures

- lee lapin



State-of-the-art electronic surveillance countermeasures



INTRODUCING THE AR3030 HF Receiver



AOR offers leading edge technology in receiver design with the introduction of the AR3030! Unbelievable design & price tag...nothing has been spared! Compare AR3030 features with other receivers costing over \$1000....The AR3030 is the winner!



Superior Performance & Unsurpassed Value!

- DDS (Direct Digital Synthesizer) with patented NCO (Numeric Controlled OSC) that improves carrier to noise ratio dramatically
- 10Hz tuning accuracy • RIT control CW/SSB
- High sensitivity & excellent Selectivity
- Synchronous detector improves AM signals under severe fading conditions
- Tuning via keyboard or large smooth main tuning shaft encoder and knob
- COR (Carrier Operated Relay) for remote start/stop of recorder only when signal is present
- TCXO (Temp. Compensated Crystal OSC); not optional 5PPM (-5°F+130°F)
- Wide dynamic range using DBM (Double Balance Mixer) in 1st mixer. Over 100dB with higher intercept point than other receivers in this class
- AGC control with AGC off position • Large amber backlit LCD
- Accurate analog S meter • Dual VFO for increased flexibility
- RS-232C serial interface for computer control (Software available; see options)
- 13.8VDC and internal batteries (8AA NiCad or dry cell required); AC adapt.
- Processed aluminum enclosure and chassis for a lifetime of rugged use
- 2 year factory warranty. EDCO is the factory authorized U.S. service center
- Ask your dealer about EDCO's Extended Warranty available thru your dealer

SPECIFICATIONS

Frequency: 30-kHz-30MHz plus optional internal VHF converter 108-174MHz
Memories: 100 programmable w/scan **Modes:** AM, LSB, USB, CW, FAX, FMN
Tuning Accuracy: 10Hz **Image & Spurious rejection:** >70dB
Dynamic Range: >100dB @ 25kHz spacing
Antenna inputs: (1) Coax 50Ω unbal. (2) 450Ω bal. (3) Hi-Z for whip
Audio output: External speaker, FAX, Record
IF Output: 455kHz **Computer:** RS-232C
Power: 12VDC -800mA (max. audio); 8AA Nicad or Alk (not incl.)
Size: 10"W x 3.5"H x 9.5"D; 4.8 lbs.

OPTIONAL ACCESSORIES

Filters: User plug-in upgrade Collins Torsional mechanical filters
 CW-500Hz; Shape Factor 3, SSB-2.3kHz; Shape Factor 1.8,
 AM- 6kHz; Shape Factor 1.6
VHF Converter: 108-174MHz **RS-232C:** Software
 NiCad Pack 8AA NiCad 500MA (set of 8)

CONTACT YOUR FAVORITE DEALER FOR DETAILS!

TSC-100 LOW COST SSTV

Cover SSTV over your Audio Circuit!

NEW!

Totally new SSTV system using DSP for superior pictures! Send and receive Robot color 12, 24, 36, 72 second mode, no computer required. VHF/UHF audio bandwidth is all that is needed to send/receive fantastic color pictures. Plug your camcorder into the TSC 100 from your mobile, base or HT and send color pictures to your friends using TSC100, monitor and transceiver. Its that simple. Operates on 13.8VDC (11 to 16VDC), computer port DB9P, RS232C (D) interface, 8 bit data format, 19,200/38,400bps (selectable) and memory 1 screen (up to 4 optional).

TDF320 DIGITAL AUDIO FILTER

Computer technology is now available in Audio filters.

NEW!

Digital Signal Processing (DSP) is the wave of the future....but here today!

The TDF320 Audio Filter (DSP) reduces or eliminates noise, interference and heterodynes, has 12 modes for voice and data, AGC function, bypass circuit, built-in speaker, ext. speaker jack, SSTV, Wfax, auto notch, SSB, CW, and PKT/RTTY. Bring your radio into the 21ST century, with the DSP320!

Call for full information!

210 TERMINAL NODE CONTROLLER

The AR-210, updated TNC-2 (Tiny) originally by Heath, offers full size features such as BBS, Diagnostic, Calibration, TCP/IP KISS mode, Mail indicator, Special monitor command, Enhanced command to meet growing needs for packeteers.

- Highly reliable multi-layer PC board
- Built with latest Surface Mount Technology
- Built-in NiCad batt. (Optional)
- Low power consumption; ideal for field use
- Improved CPU speed (4.9152 MHz)
- Convenient hand-held jacks and DIN type radio port
- High performance MODEM LSI - TCM3105NL
- Built-in real time clock • Multi-task BBS - While connecting to MYCALL
- Default settings: 1200 baud/ 7 bit/ Even/ 1 stop bit • DE-9 computer connector
- Detailed command manual in diskette with sample terminal software
- Extremely compact & lightweight; 3.94" x 2.37" x .83"; 3.3 oz.

Call Your Favorite Dealer Today!

LA320 ACTIVE LOOP ANTENNAS

These ultra compact active loops cover VLF thru SW (.2-15MHz). Loop may be rotated for max signal and minimum noise. Vari-cap tuning adds valuable selectivity to your receiver front end to help pull in antenna systems. Easy to demo with almost any receiver right on your sales counter!!

- BNC Output Connector • 9V Battery Power incl. • BNC - BNC Patch cable incl.
- Opt. BNC VHF adaptor



Available At Your Favorite Dealer, or Call, FAX or Write Electronic Distributors Co. for nearest dealer!



Dist. by: Electronic Distributors Co.
 P.O. Box 1936 • Vienna • VA 22180
 Ph 703 • 938 • 8105 FAX 703 • 938 • 6911
 Contact your favorite Dealer today!



J & J ENTERPRISES SCANCAT™ SOFTWARE PROGRAM

The design evolution of shortwave receivers, HF transceivers, and scanners continues to provide the communications enthusiast ever increasing performance and capability. Thanks to J & J Enterprises, their SCANCAT™ computer aided receiver/transmitter software program makes operation of the latest radios even easier.

SCANCAT™ is a DOS-based program for IBM™-compatible computers. At press time, two versions of the program are available: standard SCANCAT™ Version 5.0 and the more exotic SCANCAT-PRO™ Version 5.0. This overview will concentrate primarily on the features of the standard version, but SCANCAT-PRO™ enhancements will be noted.

What SCANCAT™ Does

SCANCAT™ allows complete computer-control of all functions supported by a specific radio. For example, some of the universal features include computer-controlled tuning to a specific frequency, and

scanning by any tuning increment and time delay. SCANCAT™ can create frequency databases with up to 400 frequencies per file and share these files with any radio. A feature called SCANPORT™ allows you to download programs from your favorite BBS (Bulletin Board System) or import frequency lists. SCANCAT™ even offers a built-in TNC communications program (called QUICKTERM™), a feature for Packet Radio use.

SCANCAT-PRO™ operates faster than the standard version of the program, and includes the following enhancements: multiple scanning banks, unlimited file sizes, D-Base™ support for full compatibility with other databases, including CD-ROMs, dual radio simultaneous scanning for ICOM™ radios, and many others.

Using SCANCAT™

The program includes a comprehensive and well written user's manual, but you may never have to read it as the program's user interface is so intuitive. The "Pop-Up"

interface and help files make operating SCANCAT™ easy. This feature of the program makes computer-controlled shortwave listening and scanner monitoring a pleasure.

Throughout the testing process, SCANCAT™ proved that it was up to the task of enhancing a monitoring station's capabilities without a substantial "learning curve." If you want to try computer-controlled communications, SCANCAT™ is worthy of consideration.

For more information on SCANCAT™, please contact J & J Enterprises, P. O. Box 18292, Shreveport, LA 71138. Phone (318) 683-2518, FAX (318) 686-0449. At the time this review is written, SCANCAT™ Version 5.0 is priced at \$49.95; SCANCAT-PRO™ Version is \$79.95. Special upgrade prices and policies exist, so contact J & J Enterprises for latest pricing information and a list of radios supported by SCANCAT™.

Reviewed by POP' COMM Staff

**Computer Control Your Radio With
SCANCAT 5.0 and SCANCAT-PRO!**

Once you use the newest version of the SCANCAT 5.0 or SCANCAT-PRO computer program with your radio, you will never operate your radio again without it! SCANCAT controls the following radios:

- AOR 2500, 3000, 3000A
- DRAKE R-8
- ICOM R-71, R-7000, R-7100, R-9000
- JRC NRD-525, NRD-535
- KENWOOD R-5000, TS-50, TS-440, TS-450, TS-850
- YAESU FT-757GX, FRG-100, FRG-9600
- REALISTIC PRO-2004/5/6 with HB-232 Interface

Windows Compatible

SCANCAT 5.0 FEATURES

- Create frequency databases
- Scan between ANY frequencies
- Up to 400 frequencies per file (unlimited with SCANCAT-PRO)
- Scan by ANY increment and delay
- QUICKTERM built-in TNC comm program with programmable macros
- Share any radio's file
- Faster Performance

AOR / KENWOOD 450-850 / DRAKE / YAESU* / ICOM* / NRD535

*Must have squelch detect cables for ICOM and YAESU (not required for R-7100, R-9000 ICOM OR YAESU FRG-100)

- Auto signal detection/scan stop
- Auto logging to disk files
- Spectrum analysis with spectacular graphics
- Save/load radio's memories to disk

SCANCAT-PRO ADDITIONAL FEATURES

- Multiple scanning banks
- Comma delimited conversion
- D-Base file support
- Unlimited file sizes
- Dual radio simultaneous scanning with ICOM radios

SCANCAT comes ready to run ALL supported radios within only ONE program. With an easy to use "POP-UP" interface, SCANCAT makes your listening hobby a breeze! Plus, the included SCANPORT feature allows you to download your favorite BBS, D-Base files, or import most columnar frequency lists to a running SCANCAT file. Requires MS-DOS compatible computer w/RS-232C serial port - hard disk recommended for SCANCAT-PRO. **Manufacturer's interface not included.** CALL or WRITE for FREE information or our \$5.00 FULLY OPERATIONAL DEMO DISK (includes shipping/handling). Once you see it, we're so convinced that you will buy either SCANCAT 5.0 or SCANCAT-PRO, that with your purchase of either version, we will refund the cost of the demo package and even pay the postage! FOR A LIMITED TIME, if you ORDER NOW, we'll include as a BONUS, FOUR SCANCAT FREQUENCY FILES!

SCANCAT 5.0	\$49.95	UPGRADE	\$14.95
SCANCAT-PRO	\$79.95	UPGRADE	\$24.95

SQUELCH DETECT CABLES \$24.95
PLUS \$5.00 SHIPPING & HANDLING \$7.50 FOREIGN

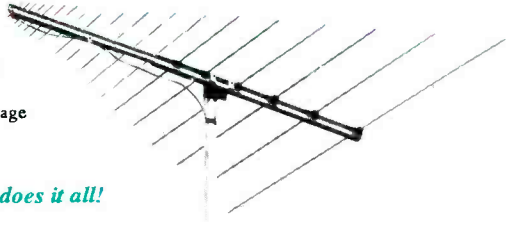
Charge Cards and COD Welcome - Please Call

COMPUTER AIDED TECHNOLOGIES
dba J & J Enterprises
P.O. Box 18292, Shreveport, LA 71138 • 3030 Hollywood Ave., Shreveport, LA 71112
Phone: (318) 636-1234 (8 a.m.-5 p.m. Central) FAX (318) 686-0449 (24 hours)
BBS (SCANCAT File Area) (318) 631-3082 (6 p.m.-9 a.m. Central)

HOKA CODE 3 available starting at \$495. For information write or call ONLY:
4001 Parkway Drive, Bossier City, LA 71112 (318) 747-6456

CREATE ONE ANTENNA ALL VHF AND UHF BANDS!

CLP 5130-1
LP YAGI BEAM
50-1300 MHz
Continuous Coverage



One antenna does it all!

The CLP 5130-1 covers 50, 146, 222, 440, 902, 1296MHz Ham bands, VHF/UHF, 800MHz Public Service bands, Military, Aircraft bands, even complete Television and FM broadcast band coverage!

- Outstanding performance with high forward gain, VSWR below 2.0:1 over entire frequency range!
- Compact and lightweight, all aluminum design, multi purpose horizontal or vertical mounting.
- Extra strong, commercial grade construction withstands the worst weather for unsurpassed reliability.
- Can pass as a conventional TV antenna! Perfect for apartment dwellers, those with limited space or antenna restrictions.
- Attention Future Hams: High performance, continuous coverage scanner reception now, all band transmitting beam ant. when you get your ticket!
- Also available: Create model CLP5130-2 LP Yagi Beam with continuous 105-1300MHz coverage in a smaller size.

If you could only have one antenna for complete VHF/UHF coverage, this would be it!

EDCO

Electronic Distributors Co.
P.O. Box 1936 • Vienna • VA 22180
PH 703-938-8105 FAX 703-938-6911

Place your order today with your favorite dealer!

EDCO

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.SM



New From **CQ** . . . Radio T-Shirts!!

High-Quality T-Shirts, made in U.S.A., pre-shrunk 100% cotton.

Special Introductory Offer \$2 off each shirt!

\$15.95 per shirt plus shipping & handling regularly \$17.95



Yes! Rush my CQ T-Shirt(s) to me right away! Here's my order below

Qty	Item #	Description	Size	Price	S & H	Total
Grand Total						

Available sizes: L, XL, XXL (add \$2) Please add \$2 shipping and handling per item ordered. Order 4 or more and receive free shipping.

Make your check or money order payable to: CQ Communications, Inc., 76 North Broadway, Hicksville, New York 11801

Please charge my:

MC/VISA/AMEX/Discover # _____

Expires _____

Signature _____

For Fastest Service Call CQ at (516) 681-2922 or FAX (516) 681-2926

27 MHz COMMUNICATIONS ACTIVITIES

A unique new design in mobile CB's is presented by Cobra, and it includes all controls (plus the mic and speaker) in the part you hold in your hand—that means it even has the display! This part isn't a big and bulky thing you've got to hang onto as you drive, it's no larger than the average mobile rig microphone.

Now that you mention it, the microphone contains the entire radio works! A simple three-wire installation through a 5-ft. coil cord carries the power and antenna connections to a small box which is remote mounted. This remote-mount module features an external feature jack.

The LCD display is back-lit and multi-function. There are up/down tune buttons, and an "Instant Channel 9" button, plus a key-lock switch to prevent accidental setting changes.

We liked this, particularly at its average selling price of \$109.95. Would make a good gift selection for the holidays. And here's some more news about Cobra. The company's name is now Cobra Electronics Corporation (changed from Dynascan Corp.). The address is 6500 West Cortland Street, Chicago, IL 60635.

Cobra's toll-free consumer assistance number, 1-800-COBRA-22, has expanded its service and operations. It's now available on weekday evenings and weekends. You can get product information, dealer locations, and you can also place credit card orders for Cobra products. If you call or write Cobra, please mention *Popular Communications*.

Historic CB of The Month

Our historic CB radio of the month was submitted by Klaus Spies, Niles, Illinois, who sent a photo of the one he owns and it is in working condition. This is the Tram Diamond 60, manufactured beginning in 1976 by Tram/Diamond Corp., which was then in Winnisquam, New Hampshire.

This was an excellent AM/SSB mobile unit designed for 23-channel operation. It had relay switching instead of the solid-state T/R switching that was beginning to appear in some CB units. In the old 23-channel system, present channels 24 and 25 did not exist, even though the frequencies presently used for them were between Channels 22 and 23. Although these were non-channels at the time, and off limits, more than a few CB sets came from the factory able to operate on one or both of these frequencies. Operators called the frequencies Channels 22A and 22B.

The Tram Diamond 60 was one of these radios, although (as usual) the dial bore no



Cobra's new HH-70 mobile radio has all of its works in the palm of your hand.

marking to indicate the extra channel. Still, if you clicked the channel knob past Channel 22, you found that it locked into a spot midway between 22 and 23. The instruction manual did not mention it. Some operators ignored the extra channel, or didn't realize the equipment had the potential to operate there. Others used these channels for shooting skip because they were less crowded than the legal 23 channels.

Cracking Problems in Mobile Antennas

A plastic antenna base for a mobile antenna is an unsung hero. It does a great job, and the only time you are likely to have it come to your attention is if and when something goes wrong with the thing. Larsen Electronics, Inc., maker of *Kulrod* antennas, tells us they were attempting to end problems caused when antenna bases cracked due to chemical or environmental exposure.

The company discovered the injection-molded polycarbonate bases often used for mobile antennas were susceptible to cracking due to the variable quality of solvents in the epoxy used to glue metal inserts into the bottom of the base's interior. To increase the base's chemical resistance, the compa-



The Tram Diamond 60, a great AM/SSB radio from the 1970's era. (Courtesy Klaus Spies, III.)



An impressive collection of historic receivers, as owned by Errol, 7AT198, and SSB Network member SSB-6721, of Kings Park, New York.

ny determined that a polycarbonate/PET resin sold under the trade name *Makroblend* should work as an effective substitute.

A comprehensive testing program verified that *Makroblend* UT-1018 would do just what Larsen had hoped. The tests included intense UV exposure, severe physical stress and shock, soaking in strong chemicals, being placed in high salt environments, and repeated temperature cycling between -20 degrees and 120 degrees (F). Tests were done to MIL standards.

Makroblend is now being used for the bases of one full line of Larsen antennas made for mounting in 3/4-inch holes. Eventually, Larsen will switch over its entire line to this material.

These bases for Larsen mobile antennas are made up in black or gray, and in various sizes. For more information about Larsen CB antennas, contact Larsen Electronics, Inc., 3611 N.E. 12th Ave., Vancouver, WA 98668. Be certain to mention that you read about the antennas in *Popular Communications*.

Makroblend is made by Polymers Marketing Communications, Miles Inc., Mobay Rd., Pittsburgh, PA 15205-9741.

From Readers

John Reiners, KG-226, writes to tell us

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Sometimes the scanning can be so exciting that it is downright scary. If a disaster or large-scale incident takes place in your community, are you prepared for all the monitoring you can handle?

If you have a scanner that has a capacity of hundreds of channels, use it as a tool. In fact, take at least one full bank and store in it frequencies you hope you never need to listen to. These may be frequencies that would become active, for instance, if a plane crashed in your community or rioting or flooding required the activation of units such as the National Guard. You may very well never hear any activity on frequencies reserved for the National Transportation Safety Board, or the National Guard, but when the incident happens, you don't want to find yourself twiddling with dials and fumbling through frequency lists. The time you spend searching and programming may lead to the loss of important calls that may provide you with the information you need to know in your own community.

To determine what types of emergencies your community faces, do what the emergency planners do. Most counties and larger towns across the United States have emergency plans that have been written and implemented. These plans are put together typically by a person designated as the local government's emergency management coordinator. Sometimes this position is a full-time job, and othertimes it may be carried out by someone who functions in another role, such as the mayor, fire chief or police chief.

Before drawing up the emergency plans for your community or county, the emergency management coordinator was required to assess what types of emergencies the area had the most potential to deal with. For instance, if an interstate highway traverses your area, there might be nuclear waste that travels on the highway on a regular basis. Perhaps there is a path in the sky over your town that commercial aircraft fly over many times each day. There may be a factory or business that has hazardous materials on site. A river or stream may lead to possible flooding after heavy rains. If you sit down and think about it, you probably could draw up a hazard assessment for your own community. The emergency management plan for your community is a public document and you may want to trot off to the town hall or county courthouse in search of the guide to review and learn of other potential hazards, too.

After you determine the hazards you face in the area in which you live, think about the frequencies that might become active. For instance, you probably already have all the local police and other emer-



Frequency counters help snoop out transmitter frequencies. But be careful walking around with one—they look like they could set off a stack of TNT!

gency services frequencies programmed into your scanner, so you're safe there. However, if a factory deals in hazardous materials, perhaps there is a security frequency that might become active in an emergency. Most day-to-day communications would prove routine and uninteresting. But when there's an emergency, having the frequency programmed in may mean the difference of being in the know and depending on the local news media to keep you informed.

If there is the potential for an aerodisaster in your town, you should have programmed in frequencies that might be used at local airports, as well as the Civil Air Patrol (122.9, 123.1, 148.15 MHz for starters). If you have access to frequency lists that show what might be used by investigators, such as the National Transportation Safety Board, punch those in as well, as they would become active when the agency's "go team" arrives on site.

Plug in news media channels, particularly those used by reporters and photographers. You can easily fill up a bank of 20 to 40 channels with frequencies that you don't want to listen to on a daily basis, but they will prove the most exciting listening when something happens. Keep in mind, too, that what you are hearing is raw information. You don't want to cause any unnecessary panic by misinterpreting the communications you overhear. Remember, having a scanner or communications receiver is a right and using one's head goes

with the freedom. And don't forget to tell us hear at *POP'COMM* after such an incident so we can pass on your listening tips.

From the mailbag comes a letter from Sue Wilden of Columbus, Indiana. Sue says that the Bartholomew County Sheriff's Department in her area has a new frequency, referred to on the air as "B-4." She wants to know what the new frequency is, as she already monitors their dispatch (155.535) and tact (155.910) channels. Without being there, it's hard to figure out what's going on. However, the scanner guides show several mobile-only channels licensed for police in that county. Any one of those frequencies would be a possibility.

In addition, the county has a new license on 159.21, however, the number of mobiles is a lot less than the number of mobiles licensed on the other police frequencies. It still bears checking out. In some areas, the police also may make use of other routine frequencies for their chatter channels. For instance, you may want to check out the road department frequency on 151.085 MHz in your county, Sue. It's not uncommon to find police pop up on roads and local government frequencies, especially at night when those agencies may not be using those frequencies anyway.

Sue also asks where she can obtain instructions for restoring the cellular portion of her Realistic Pro-46 scanner. Most cellular restoration modifications have been written up a couple of different publications that detail scanner modifications. Most scanner and ham radio shops stock these modification guides. I'd recommend you check out one. If you haven't done much soldering either, it is recommended that you find a qualified technician to make the modification to your scanner so you don't damage the delicate circuitry inside the radio. Also, keep in mind that any modification may void your warranty, if still in effect, but routine practice by most manufacturers has been to ignore any modifications as long as the modification doesn't cause a problem that requires service. And should we remind folks that monitoring cellular phone calls is illegal under federal law? Naw, we know you knew that already!

Ray Gromek of Ortonville, Michigan, says he has two handheld transceivers on 154.570 that he uses. He says that it seems that almost every city he goes to he hears communications on the frequency. He asks for a short list of licensed users on this frequency for southeast Michigan. Actually, such a list would be prohibitive because there are so many users on this frequency. While power output on 154.570 is restricted to 2 watts for businesses, almost all use it for walkie-talkies.

Usage in any given area might include

store security, drive-through window order boards at fast-food eateries, surveyors, tower climbers and construction crews. While licenses for this frequency would restrict the user to using the channel within a certain designated geographic area, it doesn't prevent a user from moving around. Thus, you can see that an inclusive list would be impossible to publish within the confines of this column. The best bet is to monitor the frequency and try to identify who you are hearing. Listen for locations and names. Sooner or later someone may say something that helps identify the user.

Ray also asks for a list of frequencies used at Cedar Point amusement park in Sandusky, Ohio. The "Scanner Master Ohio Pocket Guide" (available at 1-800-SCAN-701) lists these frequencies for Cedar Point: 464.5125, security; 464.6125, lifeguards; 463.825, maintenance; 464.4125, parking and traffic; 464.575, ride operators; 464.2125, vendors; 461.300, fire and EMS. Good listening.

Chad Cessna of Ebensburg, Pennsylvania, passes along a tip that Cambria County police in Pennsylvania now are using 453.200. The old frequencies, 155.250 and 155.490, are used only occasionally now for chit-chat.

Andrew Collins of Tampa, Florida, writes to inquire as to how he can become a "registered monitor" with a distinctive call sign much like my own—KPA3CA. These identifiers can help in showing your intent when corresponding with other monitors and those stations you may write to for information or QSLs. Registered monitor call signs can be obtained from CRB Research Books Inc., P.O. Box 56, Com-mack, N.Y. 11725. Tell them Scanning VHF/UHF sent you!

Andrew also passes along several of his favorite frequencies: 466.2375, Tampa Airport Marriott Hotel security; 469.6125, Tampa Airport Marriott Hotel catering; 463.675, Tampa Airport Marriott Hotel paging; 154.515, Busch Gardens security, operations and food service; 154.540, Busch Gardens maintenance.

From Pasadena, California, a letter comes from Ben Sterling, who asks how scanner buffs can use frequency counters. These devices are designed to measure the frequencies of nearby transmitters. For instance, if you are in the vicinity of a walkie-talkie, the frequency counter will display its transmitting frequency on an LED or LCD readout.

The transmitter's power output and its band (VHF low or high, UHF or 800 MHz), will vary the distance from which the frequency counter will detect the transmitting frequency. Frequency counters can prove valuable at determining a specific frequency in use, especially when all other methods (such as frequency guides) have been exhausted. But, users of frequency counters should exercise common sense when using these devices. To the uninitiated, they



In addition to business band frequencies that are active at Busch Gardens in Tampa, Florida, this performer uses a wireless microphone, which probably operates in the 169-216 MHz band.

may look like devices that could detonate a bomb by remote control. For instance, you wouldn't want to alarm shoppers by walking around a shopping mall with such a device while trying to track down the mall's security frequency.

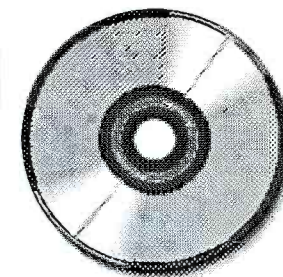
We welcome your frequency lists and

questions here at POP'COMM. We also encourage readers to send in photographs of their listening posts and antenna farms as well as transmitter sites. Write to: Chuck Gysi, N2DUP, Scanning VHF/UHF, Popular Communications, 76 N. Broadway, Hicksville, N.Y. 11801-2909. ■

FCC MASTER FREQUENCY DATABASE CDROM

All frequencies within the FCC Master Frequency Database for the entire US on CDROMS, Floppy Disk and Printouts

- Dbase File Structure (ASCII Avail)
- Exporting Available
- Frequency, Callsign, DBA Name, Licensee, City, State, Zip
- Transmitter Lat & Long, Elevation, Antenna Height Address and County
- Radio Service Code, Issue & Expiration Dates and more
- Custom Databases Available



Full Master Frequency Database Available on CDROM
Call for more information and pricing on our complete product line.
New Pricing!!! All CDs \$99.95. All State Floppy Disk \$35.00

PerCon Corporation CD Applications Division

Bemus Point, NY 14712
4906 Maple Springs / Ellery Road
(716) 386-6015 (716) 386-6013 FAX



EEB

Nation's Largest Shortwave Dealer

PRESENTS

SANGEAN

A WORLD OF LISTENING

THE WORLD'S MOST POPULAR SHORTWAVE RECEIVERS



MS-101

ATS-818CS

One of Sangean's ultra-compact shortwave receivers

WORLD'S ONLY PORTABLE SHORTWAVE RECEIVER WITH BUILT-IN PROGRAMMABLE CASSETTE RECORDER

- PLL Synthesized Receiver
- All SW Bands from 120m to 11m
- Radio/Buzzer Clock Alarm
- BFO for Single Side Band & CW
- Continuous AM Coverage from 150-29999kHz plus FM
- 45 Memory Presets
- Dual Conversion Receiver
- AM Wide/Narrow Filter
- Dual Time Display
- Adjustable Sleep Timer
- Five Tuning Methods
- RF Gain Control

REG ~~\$359.00~~

Holiday Special

\$223.95

ATS-818: Identical to ATS-818CS without cassette recorder

REG ~~\$299.00~~ Holiday Special \$173.95

TOTALLY DIGITAL, ULTRA-COMPACT WORLD BAND RECEIVER WITH PRESET AUTO-TUNE SYSTEM

- Auto-Tune (ATS) scans and automatically presets all memory by signal strength
- All SW Bands from 120m to 11m
- Dual Time Display
- Dual Alarm for Radio/Buzzer
- 5 Tuning Methods
- Continuous AM coverage from 150-29999kHz plus FM
- 45 Memory Presets
- DX/Local Switch
- Count Down Timer
- Sleep Timer



ATS-606

REG \$249.00

Holiday Special \$153.95

ATS-606P: Attractively boxed ATS-606 Shortwave Receiver with ANT-60 Portable Shortwave Antenna and Multi-Voltage Power Adapter

ATS-606P \$173.95



ATS-800

REG \$149.00

Holiday Special \$89.95



ATS-803A

REG \$249.00

Holiday Special \$173.95



ATS-808

REG \$259.00

Holiday Special \$169.95



"THE GIFT THAT KEEPS ON GIVING ALL YEAR LONG"

EEB

Electronic Equipment Bank 323 Mill Street N.E. Vienna, CA 22180

We accept VISA/MasterCard/American Express/Discover

We ship via UPS, Federal Express & Mail

Orders 800-368-3270

Local Tech 703-938-3350

FAX 703-938-6911

Sorry no COD's Prices subject to change Prices do not include freight Returns subject to 20% restock fee

Writer Thinks He's Psychic

One way to make sure that you'll look ridiculous in a few years is to make predictions about the future. If half the stuff I read as a kid back in the 1950s had actually come to pass, today I would be driving my supersonic, atomic-powered car and taking vacations on Mars. And no one predicted some really major developments, like cable television or the personal computer I'm writing this column on.

Clearly, divining the future is a risky business. But it is interesting to speculate where certain trends and emerging technologies might take us. Some fascinating stuff is underway that I think is going to change the monitoring and radio hobbies in major ways. At the risk of looking really stupid in the future, here are my predictions of what the November, 2013 issue of *POP'COMM* will be covering!

The End Of International Shortwave Broadcasting?

Well, international shortwave broadcasting won't be completely gone. But I do think it will be greatly scaled back and a big chunk of international broadcasting will be done via direct broadcast satellites.

Major international broadcasters are already turning their thoughts to broadcasting from satellites. In a recent edition of "Media Network" over Radio Nederland, Hans Hoeschnakels, the chairman of Radio Nederland's board of governors, said "We are all sure that in 10 to 20 years we will have to use direct broadcasting satellites." Mr. Hoeschnakels pointed out that broadcasting from satellites would be cheaper than operating the current Radio Nederland relay sites at Bonaire and Madagascar as well as the Flevo site in Holland itself. Direct satellite broadcasts would be made from geosynchronous satellites on frequencies in the gigahertz range.

Not every major international broadcaster thinks direct satellite broadcasts are the wave of the future; some people at the Voice of America have been publicly dubious about the idea. I think those VOA people have been hanging around Washington too long. The technology is ready now for such satellite broadcasting; the big hang-up is getting international agreements in place on technical standards and frequency allocations. Some skeptics point out that receivers for direct satellite broadcasts will be expensive and thus limit the listenership for satellite broadcasts. This objection overlooks the inexorable trend for the prices of

electronics goods to fall rapidly while performance increases (compare the price and performance of personal computers today to those of a decade ago if you don't believe me—or today's shortwave receivers to those of 30 years ago!). New technologies—like color television, VCRs and camcorders, and compact disc players—all started out expensive but soon got really cheap and moved into the mainstream. I'm convinced direct satellite receivers will be no exception, and will be available in 15 to 20 years for about the same prices (adjusted for inflation) as today's most popular shortwave receivers. And you won't need a monster dish in your yard to receive these satellite broadcasts; the sets and antennas won't be any more elaborate than those you need for shortwave reception.

And once international broadcasts are available by satellite, few people will want to look for the same signals on shortwave. Think about it. . . wouldn't it be great to hear your favorite international broadcaster—like the BBC, Radio Japan, or Radio Moscow—in glorious, fade-free stereo with sound quality equivalent to a compact disc? A lot of people have gotten into shortwave listening recently because of the inexpensive digital readout receivers now available. But a lot of these same people complain about how lousy shortwave broadcasts sound due to interference, fading, noise, and the limitations of amplitude modulation. How long would it take such people to switch to direct satellite listening?

International shortwave broadcasting won't vanish overnight when the first direct broadcast satellites go into service. There will doubtlessly be an extended phase-in period when you'll have your choice of hearing a station via shortwave or satellite. Services direct to listeners in more affluent areas like North America, Europe, Australia, New Zealand, and Japan would probably be the first to go satellite. As satellite listenership increases, I expect international services directed to those areas will be phased out or greatly curtailed (maybe with only one frequency in use). It wouldn't surprise me too much if more nations got involved in international broadcasting; after all, it's a lot cheaper to produce a half-hour English program and uplink it to a satellite than it is to build the necessary transmitting facilities to ensure reliable reception in the intended target area.

International shortwave broadcasting will never entirely disappear even when satellites serve every part of the world.

There will be places where satellite reception will be marginal or difficult, and international broadcasters will doubtlessly want to keep some shortwave frequencies active as a back-up to their satellite services. But we will see satellites take over the bulk of international broadcasting. Listeners will win in two ways. One will be the more reliable reception and better sound quality of satellite broadcasts. The other will be relief from the terrible congestion and overcrowding of today's shortwave broadcasting bands, allowing domestic shortwave stations and weaker international services to be heard. However, it is possible that many domestic and smaller international broadcasters will also leave shortwave; this trend is already well underway. The lessened demand for shortwave broadcasting frequencies might result in their reallocation to other services, like the subject of my next prediction.

Codeless Hams Conquer The World!

Back in 1991, the U.S. ham radio establishment was dragged kicking and screaming into a new era when the FCC decided that a knowledge of Morse code was not required for operation above 30 MHz. The code-free Technician class license has since become the most popular "entry point" for new hams and sparking a gain of over 20 percent in the number of U.S. ham licenses. Technician class licensees are currently the largest single group of U.S. ham licensees and—if current trends continue—the majority of U.S. hams will hold code-free Technician licenses in about a decade.

To say the ham radio establishment that fought the entire concept of a code-free license is perplexed by this demographic inevitability is an understatement. They're oblivious to the tidal wave that's headed their way, which is namely the removal of a code test requirement for any class of ham radio license.

There are moves toward this already underway. In a few years, a World Administrative Radio Conference (WARC) will be held. WARCs are international meetings where the nation of the world agree on such things as frequency allocations and technical standards. The current requirement for a knowledge of Morse code for hams operating below 30 MHz comes from decisions made at earlier WARCs. These WARC agreements have permitted code-free licenses above 30 MHz since the late 1940s,

POP'COMM's World Band Tuning Tips

November—1993

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
2325	VL8T, Australia	1100		6075	R. Super, Colombia	1000	SS
3200	TWR, Swaziland	0355	s/on	6075	Deutsche Welle, Germany	0030	
3215	R. Oranje, South Africa	0300	EE/Afk	6088v	R. Esperanza, Chile	1000	SS
3220	HCJB, Ecuador	0400	SS	6100	Deutsche Welle, Germany	0400	GG
3250	R. Luz y Vida, Honduras	0200		6116	LV del Llano, Colombia	0130	SS
3255	BBC Lesotho Relay	0300		6120	R. Japan	1130	via Canada
3270	Namibian Bc Corporation	0300		6135	Swiss Radio Int'l	0230	
3280	LV del Napo, Ecuador	0305	SS, close	6150	AWR/V of Hope, Costa Rica	1000	
3290	R. Central, Papua New Guinea	0930,		6160	R. Malargue, Argentina	1000	SS
3300	R. Cultural, Guatemala	0200		6165	Swiss R. Int'l	0600	
3316	SLBS, Sierra Leone	0600		6185	R. Nacional Amazonia, Brazil	0000	PP
3320	R. Suid Afrika, S. Africa	0400		6185	R. Educacion, Mexico	1000	
3326	R. Nigeria, Lagos	0430		6205	R. Quisqueya, Dominican Rep.	0230	SS
3356	R. Botswana	0300		6219	Radio Bosnia-Herzegovina	0200	irregular
3365	R. Rebelde, Cuba	0300	SS	6245	Vatican Radio	0640	
3365	R. Cultura Araquara, Brazil	0130	PP	6280	King of Hope, Lebanon	0500	
3384	Icelandic State Broadcasting Service	0330	Icelandic	6571	R. Tacna, Peru	0030	SS
3395	Channel Africa, S. Africa	0400		6628	La Voz de San Antonio, Peru	0100	SS
3810	HI2IOA time station, Ecuador	0200	SS	6825	China R. Int'l (feeder)	1000	CC
3985	Swiss Radio Int'l	0500		7100	Voz Res. Galo Negro (clandestine)	2300	PP
4000	R. Cameroon, Bafoussam	0430	FF	7105	REE, Spain	0430	SS
4470	Voice of the Mojahed (clandestine)	0300		7125	RTV Guinea	0700	FF
4474	R. Movima, Bolivia	0000	SS	7125	Italian R. Relay Service	0630	
4485	R. Tikhiv Okean, Russia	1200	RR	7150	R. Vilnius, Lithuania	0000	
4552	Rdf. Tropico, Bolivia	1000	SS	7170v	ORTS, Senegal	0600	s/on, FF
4649	R. Santa Ana, Bolivia	0030	SS	7170	Voice of America	0500	
4755	Educadora Rural, Brazil	0230	PP	7195	R. Ukraine Int'l	0100	
4760	TWR, Swaziland	0400		7210	AWR, Italy	0800	
4765	RTVC, Congo	0355	s/on, FF	7215	R. Norway	0500	NN
4770	R. Nigeria, Kaduna	0500		7225	R. Bulgaria	0100	
4783	RTV do Mali	0500	FF	7235	Deutsche Welle, Germany	0400	AA, via Malta
4790	R. Atlantida, Peru	0200	SS	7250	Vatican Radio	0600, //6245	
4800	R. Lesotho	0330		7255	V of Nigeria	0500	
4805	Rdf. Amazonas, Brazil	1000	PP	7260	R. Netherlands via Russia	1327	s/on, Dutch
4820	LV Evangelica, Honduras	0200	SS	7275	ELBC, Liberia	0700	
4832	R. Reloj, Costa Rica	0300	SS	7285	RT Malienne, Mali	0700	FF
4845	ORTM, Mauritania	0630	FF	7290	TWR, Swaziland	0255	s/on
4850	Cameroon Radio TV	0500		7315	R. Zagreb via WHRI	0515	
4855	R. Aruana, Brazil	0000	PP	7315	R. Bosnia, via WHRI	0100v	
4865	La Voz del Cinaruco, Colombia	0200	SS	7375	R. For Peace Int'l, Costa Rica	0000, (USB)	
4870	ORTB, Benin	0500	FF	7395	WRNO	0330	
4875	Super R. Roraima, Brazil	0000	PP	7412	All India Radio	2200	
4885	R. Clube do Para, Brazil	0100	PP	7475	RTT Tunisienne, Tunisia	0500	AA
4905	R. Relogio Federal, Brazil	0000	PP	7469	Kol Israel	2230	
4915	R. Cora, Peru	1030	SS	7580	R. Pyongyang, N. Korea	0900	JJ
4915	GBC, Ghana	0600		9022	VOIRI, Iran	0030	EE
4920	R. Quito, Ecuador	0200	SS	9165	R. Omdurman, Sudan	0255	sign on, AA
4935	R. Tropical, Peru	1000	SS	9275	Icelandic State BC	2300	Icelandic
4940	R. Ukraine	0500	Ukrainian	9345	R. Pyongyang, N. Korea	1300	
4960	R. Cima Cien, Dominican Rep.	0600	SS	9420	Voice of Greece	0130	GG/EE
4970	R. Rumbos, Venezuela	0200	SS	9445	Voice of Turkey	2330	TT
4980	Ecos del Torbes, Venezuela	0300	SS	9455	KHBI, No. Marianas	1000	
4985	R. Brazil Central	0100	PP	9475	R. Cairo, Egypt	0200	
4990v	R. Apinte, Surinam	0330		9480	TWR, Monaco	0730	
5010	R. Garoua, Cameroon	0600	FF	9505	R. Prague, Czech Rep.	0600	
5015	R. Brazil Tropical, Brazil	0700	PP	9510	R. New Zealand	0930	
5020	Solomon Is. Bc. Corp.	0730		9510	R. Havana Cuba	0600	
5025	R. Rebelde, Cuba	0100	SS	9525	R. Marti, USA	2300	SS
5030	R. Continente, Venezuela	0330	SS	9535	Swiss Radio Int'l	0700	
5035	R. Aparecida, Brazil	0200	PP	9540	R. Educadora Bahia, Brazil	0900	PP
5047	RTV Togolaise	0524	s/on, FF	9545	Solomon Is. Bc Corp.	0700	
5050	La Voz del Yopal, Colombia	0200		9560	Radio Finland	0300	
5055	TIFC, Costa Rica	0300		9560	V of Ethiopia	1300	Amharic
5075	Caracol Bogota, Colombia	0400	SS	9570	R. Portugal	0230	
5770	R. Miskut, Nicaragua	0000	Miskito	9570	R. Romania Int'l	0230	
5882	Vatican Radio	0030	Italian	9575	Radio Medi Un, Morocco	0730	FF
5920	Croatian Radio	0030		9575	RAI, Italy	0100	
5930	Slovak Radio	0100		9580	R. Tirana, Albania	0230	
5930	R. Prague, Czech Rep.	0000		9600	Vatican Radio	2245	
5960	R. Japan, via Canada	0100		9600	HCJB, Ecuador	0500	
5975	BBC via Antigua	0200		9605	UAE Radio, Abu Dhabi	2200	s/on
5980	R. Ropa Info, Czech Rep.	0300	s/on, GG	9615	KNLS, Alaska	0800	s/on, CC
6010	R. Mil, Mexico	1100	SS	9615	R. Veritas Asia, Philippines	1500	CC
6015	R. Austria Int'l, via Canada	0645		9625	CBC Northern Service, Canada	0300	
6045	R. Melodia, Colombia	1000	SS	9630	R. Aparecida, Brazil	2300	PP
6060	R. Nacional, Argentina	0530	SS	9640	Ecos del Torbes, Venezuela	1100	SS
6070	CFRX, Canada	0800		9645	R. Bandeirantes, Brazil	0000	PP

Freq.	Station/Country	UTC	Notes	Freq.	Station/Country	UTC	Notes
9650	Swiss Radio Int'l	0000		13660	R. Havana Cuba (USB)	0200	USB, EE
9660	ABC, Australia	0900		13675	UAE Radio, Dubai	1630	
9660	R. Rumbos, Venezuela	0230	SS	13685	Swiss R. Int'l	0700	
9690	China Radio Int'l, via Spain	0300		13710	VOA Botswana	2130	
9695	R. Sweden	0200		13750	AWR Latin America, Costa Rica	1200	s/on
9700	R. New Zealand	1030		13755	R. Australia	1200	
9705	BSKSA, Saudi Arabia	2030		13790	Deutsche Welle, Germany	1730	
9705	R. Portugal	0230		15084	VOIRI, Iran	0430	Farsi
9715	VOA via Thailand	1400	CC	15085	R. Damascus, Syria	2100	
9735	R. Nacional Paraguay	0000	SS	15090	Vatican Radio	2245	s/on
9745	HCJB, Ecuador	0730		15100	FEBC, Philippines	1400	EE, others
9750	R. Korea, So. Korea	1200		15110	REE, Spain, via Costa Rica	1900	
9750	R. Canada Int'l	0530		15120	R. New Zealand Int'l	0530	
9760	R. Canada Int'l	0600		15120	R. Nedezhda, Rusia	0600	RR
9765	R. Moscow	0530		15165	R. Tashkent, Uzbekistan	1300	local
9770	UAE Radio, Abu Dhabi	2159	s/on	15175w	Radio Tahiti	0500	FF/TT
9795	R. Alpha & Omega, Russia	1500	RR	15185	R. Finland Int'l	2300	
9815	Radio Havana Cuba	0200	USB	15185	R. Stn Centre, Russia	1530	RR
9830	Croatian Radio	0700	Croatian	15220	Channel Africa, S. Africa	0600	(ex R. RSA)
9835	R. Budapest, Hungary	0200		15240	Voice of Azerbaijan	1700	
9840	R. Kuwait	2100	AA	15250	Iraqi Radio	1400	EE
9845	FEBC, Philippines	1600		15260	VOIRI, Iran	2100	
9870	BSKSA, Saudi Arabia	2030	AA	15270	HCJB, Ecuador	0730	
9880	China Radio Int'l	2200	via Russia	15305	UAE Radio, Abu Dhabi	2200	
9885	Swiss Radio Int'l	0200		15320	UAE Radio, Dubai	1630	
9930	R. Vlanderen Int'l, Belgium	0030		15340	R. Japan, via Gabon	2000	RR
9995	R. Miami Int'l	due to test		15345	RAE, Argentina	2130	
10030	R. Cario, Egypt	2130	AA	15345	RTM, Morocco	1400	Berber
10234	RAI, Italy, feeder	0100	II	15355	R. Japan via Gabon	1500	
10330	All India Radio, Bombay	1330		15385	R. Yerevan, Armenia	2245	
11470	V of Human Rights & Freedom for Iran	1630	Farsi	15400	BBC via Ascension Is.	1500	
11570	R. Pakistan	1600		15410	VOA, Morocco relay	2200	close
11620	All India Radio	2000		15415	Libyan Jamahiriya Broadcasting	1500	AA
11625	Vatican Radio	0630		15435	UAE Radio, Dubai	0530	
11645	Voice of Greece	1600	Greek	15445	Radio Nacional, Brazil	1245	EE
11660	R. Varna, Bulgaria, HS relay	0400	Bulg.	15470	R. Tashkent, Uzbekistan	1200	
11695	Rep. of Iraq Radio	2230	AA	15475	Africa Number One, Gabon	2100	FF
11705	R. France Int'l	1600	EE	15505	Swiss Radio Int'l	1500	
11705	R. Sweden	2330		15505	R. Kuwait	2245	AA
11710	RAE, Argentina	0100		15555	R. Pakistan	1600	
11715	KJES, New Mexico	1300	s/on	15570	R. Ukraine Int'l	1500	
11720	R. Bulgaria	0400		15575	R. Korea, S. Korea	0030	
11725	R. Korea, S. Korea	1000	SS	15603V	V of Iraqi People (clandestine)	1900	Farsi
11740	Vatican Radio	0700		15635	V of Greece	1230	
11740	R. Moscow	0800		15640	Kol Israel	1400	
11745	Channel Africa, S. Africa	0200		15770	INBS, Iceland	1430	Icelandic
11755	R. Finland Int'l	0130		17440	R. Kiribati	0600	
11785	VOA Thailand relay	1300		17500	RTT Tunisienne, Tunisia	1400	AA
11790	VOIRI, Iran	1200	Urdu/EE	17515	R. Vlanderen Int'l, Belgium	1600	
11795	UAE Radio, Dubai	1600		17550	Vatican Radio	1230	RR
11795	Deutsche Welle via Rwanda	0200	GG	17595	R. Cairo, Egypt	1200	
11800	SLBC, Sri Lanka	0045		17575	R. France Int'l	1230	EE
11805	Iraqi Radio	1800	AA	17630	Africa No. One, Gabon	1430	FF
11805	R. Globo, Brazil	0830	PP	17605	R. Alma Ataa, Kazakhstan	1830	
11815	Polish Radio Warsaw	1245	GG	17670	R. Cairo, Egypt	1800	AA
11820	R. Sweden	0100		17690	R. Ukraine Int'l	0100	
11827	R. Tahiti	0300	FF/TT	17705	R. Havana Cuba	2130	SS
11835	HCJB, Ecuador	0700		17720	R. Romania Int'l	1430	
11835	R. El Espectador, Uruguay	2330	SS	17740	R. Yugoslavia	1200	
11840	FEBA, Seychelles	1600	local	17745	R. Algiers, Algeria	1930	
11870	R. Yugoslavia	0040		17750	Voice of Free China, Taiwan	2200	
11880	R. Galaxy, Russia	2100		17760	R. Havana Cuba	2030	FF
11880	R. Australia	1600		17770	R. New Zealand Int'l	0300	
11885	UAE Radio, Abu Dhabi	2330		17790	Radio Norway Int'l	1900	
11890	R. Oman	2100	AA	17815	RTV Marocaine	1200	AA
11910	R. Tbilisi, Georgia	1530		17830	R. Bulgaria	1100	
11925	R. Canada Int'l	0400		17860	Qatar Bc Service	1300	AA
11955	R. Nacional, Angola	0600	PP	17870	R. Sweden	1500	
11960	RTV Malienne, Mali	0900	FF	17880	R. Finland Int'l	1300	
11970	R. Havana Cuba	0130		17895	R. Canada Int'l	1330	
11980	AWR/KSDA, Guam	1600		17900	R. Portugal	2000	PP
11985	UAE Radio, Dubai	2100	AA	17955	V of Iraqi People (clandestine)	1930	Farsi
11995	R. Sweden	2200		21455	R. Canada Int'l	1345	
12005	R. Moscow	1100		21500	Radio Sweden	1600	
12025	R. Netherlands, via Khazakistan	0300		21505	BSKSA, Saudi Arabia	1600	AA
12035	Spanish National Radio	1130	SS	21545	R. Canada Int'l	1500	
12050	R. Cairo, Egypt	0300	AA	21550	R. Finland Int'l	1430	
12070	Australian Armed Forces Radio	1230		21605	R. Yugoslavia	1230	
12984	VNG, Australia	1100	time sigs	21625	Radio Sweden	1330	
13605	Radio Australia	1200		21655	R. Portugal	1830	PP
13620	R. Kuwait	2000		21675	R. Kuwait	1500	AA
13625	KHBI, Saipan	1200		21700	Radio Japan, via Gabon	1600	JJ
13635	Swiss Radio Int'l	2130		21820	Swiss Radio Int'l	1500	
13650	R. Canada Int'l	2030		25740	Deutsche Welle, Germany	1300	GG
13655	R. Flanders Int'l, Belgium	2300	Dutch				

and as a result many nations have had code-free licenses for decades. In most such nations, code-free hams are a large majority. It's hardly surprising that such nations have floated the idea of removing the Morse code requirement for all ham licenses at the next WARC.

The ham radio establishment has reacted predictably to this idea. For example, the American Radio Relay League (ARRL) board of directors approved a resolution in late 1992 calling for the FCC to oppose any move to remove the Morse code requirement at the next WARC. But how long can the establishment hold out when an increasing percentage—and eventually a majority—of U.S. hams have a Technician license? Eventually, Technicians will be able to elect ARRL directors more to their liking or even support a new organization that better represents their interests. Either way, the ham radio establishment is picking a fight it can't win.

The code test requirement might survive the next WARC if the FCC supports its retention (if you think the FCC should instead support dropping the requirement, why not drop a letter to your senators and congressional representative?). But that will be the last stand for the ham radio establishment. Twenty years from now you'll be able to get any class of ham radio license without a Morse code test. And expect to see a simplified ham license system in place in the United States. The Novice class, which

did honorable service in introducing newcomers to ham radio for decades, has drastically fallen out of favor since the code-free Technician license became available. And why do we need a General class license when the Advanced class requires only another written exam? If for no other reason than to save tax dollars, look for only two or maybe three classes of ham licenses to be available in the future.

Whither AM Radio? And FM?

These are tough times for all broadcasters, but in particular things are rough for AM band broadcasters. Twenty years ago, AM radio was still king but FM was making some inroads, especially with rock and roll format stations. Today, music stations have largely migrated to FM because of its superior sound quality. AM is left with talk, sports, ethnic programming, and simulcasts of FM stations. But looming ahead is a very serious challenge to FM that might well be the death knell for many AM broadcasters.

The technology is in place right now for using digital modulation schemes to broadcast sound with the quality and noise suppression of compact discs. There is a great deal of wrangling over how this should be done, with different parties pitching approaches ranging from direct satellite broadcasts to variations of cellular technol-

ogy. Regardless of which method is eventually implemented, it's a virtual certainty that digital broadcasting will be widespread twenty years from now.

It's logical to expect music programming to largely migrate from FM to a new digital broadcasting band. Much of the current programming found on AM would then move to FM. So where does that leave AM radio?

That's a good question. AM radio is inherently a "low fi" medium, and no amount of gimmicks (AM stereo, expansion to 1700 kHz, etc.) can obscure such facts as AM's vulnerability to noise and skywave interference. These natural disadvantages are compounded by the FCC's early 1980s decision to allow massive overcrowding of the AM band, further reducing station service radius and audio quality.

My gut-level feeling is that the arrival of a digital broadcasting service will be the death blow to hundreds, if not thousands, of AM broadcasters. The effect will be a lot like what happened when the compact disc became available; vinyl records became obsolete overnight and rapidly began to vanish from stores. Unlike vinyl records, AM radio will never disappear altogether. However, AM will be a much smaller portion of the total broadcasting mix than it is now. I predict AM radio will be re-positioned to take advantage of the strengths of the 540 to 1700 kHz frequency range, namely extended daytime ground wave coverage and

ICOM's IC-R9000 The Best Of Both Worlds

The pacesetter IC-R9000 truly reflects ICOM's long-term commitment to excellence. This single-cabinet receiver covers both local area VHF/UHF and worldwide MF/HF bands. It's a natural first choice for elaborate communications centers, professional service facilities and serious home setups alike. Test-tune ICOM's IC-R9000 and experience a totally new dimension in top-of-the-line receiver performance!

Complete Communications Receiver. Covers 100 KHz to 1999.8MHz, all modes, all frequencies! The general coverage IC-R9000 receiver uses 11 separate bandpass filters in the 100KHz to 30MHz range and precisely-tuned bandpass filters with low noise GaAsFETs in VHF and upper frequency bands. Exceptionally high sensitivity, intermod immunity and frequency stability in all ranges.

Multi-Function Five Inch CRT. Displays frequencies, modes, memory contents,

operator-entered notes and function menus. Features a subdisplay area for printed modes such as RTTY, SITOR and PACKET (external T.U. required).

Spectrum Scope. Indicates all signal activities within a +/-25, 50 or 100KHz range of your tuned frequency. It's ideal for spotting random signals that pass unnoticed with ordinary monitoring receivers.

1000 Multi-Function Memories. Store frequencies, modes, and tuning steps. Includes an editor for moving contents between memories, plus an on-screen notepad for all memory locations.

Eight Scanning Modes. Includes programmable limits, automatic frequency and time-mark storage of scanned signals, full, restricted or mode-selected memory scanning, priority channel watch, voice-sense scanning and scanning a selectable width around your tuned frequency. Absolutely the last word in full spectrum monitoring.

Professional Quality Throughout. The revolutionary IC-R9000 features IF Shift, IF Notch, a fully adjustable noise blanker, and more. The Direct Digital Synthesizer assures the widest dynamic range, lowest noise and rapid scanning. Designed for dependable long-term performance. Backed by a full one-year warranty at any one of ICOM's four North American Service Centers!

The ICOM logo consists of a stylized red 'O' above the word 'ICOM' in a bold, red, sans-serif font.

First in Communications

ICOM America, Inc., 2380-116th Ave. 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 Canada
All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 9006489

skywave propagation at night. There will still be plenty of locations where digital and FM radio service might be spotty, particularly in the western U.S., and that's where AM might find its niche if interference is reduced and transmitter powers are sufficiently high. However, the number of AM stations would have to be about where it was 30 years ago for this to work—and I expect market forces to bring about such a drastic reduction even if the FCC doesn't act to reduce the number of AM stations.

But if digital broadcasting is via satellite and reception is possible anywhere in the country, then I'm not sure there would be much of a need or a future for AM radio at all. Despite the explosion in the number of AM and FM stations, there are still significant areas of the country where it's difficult to get adequate radio service, or even any radio service! For example, I recently went camping at 8500 feet in California's Sierra Nevada mountains, and had the incredible experience of finding both the AM and FM broadcasting bands empty during the daytime at my campsite. It wasn't until nighttime that AM band stations began to fade in that I could hear something other than shortwave—yet I was only a little over 200 miles from the Los Angeles metropolitan area. Clearly, there are still areas of the United States and Canada without adequate local radio service, and satellite broadcasting would seem a very cost-effective way to provide it. However, expect existing terrestrial broadcasters and their lobbyists to fight it tooth and nail!

A Personal Communications Explosion

The cellular telephone industry has continued to grow rapidly despite a lengthy recession. Why? I think the cellular industry is being fueled by an enormous pent-up demand for personal communications services that don't require a FCC license or specialized knowledge. With more and more two-way radio services moving to frequencies above 800 MHz, several frequencies in the VHF low (30 to 50 MHz) and VHF high (150 to 175 MHz) ranges are prime candidates for reallocation for other uses.

Suppose you want a simple, cheap, and legal communications system that doesn't require a FCC license. Let's see... there's our old friend CB... some flea power Part 15 channels around 49 MHz... flea power Part 15 operations are permitted on the AM and FM broadcasting bands... you get a whole watt on 160 to 190 kHz... and that's it! That's about the same situation that has existed for over 30 years, yet we have more people who need simple but effective personal communications systems. Something has to give, and it will.

Some countries, such as Australia, have already instituted VHF and UHF CB bands.

The Australian UHF CB band is especially interesting, as several CB clubs in Australia sponsor and operate repeaters. The American general mobile radio service (GMRS) is similar to this in some respects, but has several drawbacks such as the requirement for a FCC license and assigned channels. I predict we'll see a new VHF or UHF CB band or bands, based on FM and repeaters, sometime within the next two decades. I also think we'll see several new frequencies for non-ham packet operations, sort of a digital CB band. You'll also see the FCC get out of the licensing business for most of these services, much like they walked away from the whole CB licensing mess.

Back in the July POP'COMM, I proposed the idea of an "amateur broadcasting service," somewhat along the lines of CB radio, for short-range radio broadcasting. I really hope something like this will come to pass!

Finally, you're going to see all sort of new services move into the frequencies above 900 MHz. I see new cellular telephone allocations as well as frequencies for wireless local area networks and other forms of data transmission. But if you want to monitor this stuff, you'll be frustrated because most of it will be via spread spectrum or encoded data.

So am I a visionary or a dope? Save this issue of POP'COMM until 2013 and see for yourself!

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!

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

Ask for Big Free Catalog

CABLE TV CONVERTERS

Save \$100'S

- All makes and models
- Quality Equipment
- Shipped within 24 hrs
- Years of customers complete satisfaction
- Free catalog

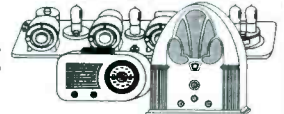
L & L ELECTRONICS, INC.

1430 Miner St. Suite 522
Des Plaines, IL 60016

VISA 1-800-542-9425 MASTER CARD

Purchaser Must agree to comply with all State and Federal laws.

FREE SAMPLE COPY!



ANTIQUE RADIO CLASSIFIED

Antique Radio's Largest-Circulation Monthly Magazine

Articles - Classifieds - Ads for Parts & Services

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

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

1-Year: \$29.95 (\$44.95 by 1st Class)

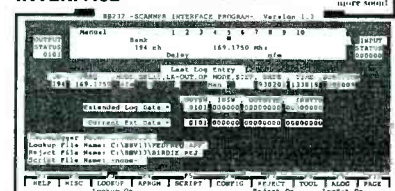
6-Month Trial - \$16.95. Foreign - Write.

A.R.C., P.O. Box 802-T8, Carlisle, MA 01741

Or Call: (508) 371-0512



The HB-232 SCANNER/COMPUTER INTERFACE



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 PCXT/AT/clone with-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. MCVISA. SAVE for more info.

* Reduced capability for 1987-88

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 11 ON READER SERVICE CARD

CIRCLE 56 ON READER SERVICE CARD

Using the MFJ-247 VSWR Analyzer

For many decades the "typical" short-wave receiver antenna was a single wire, 50 to 100 feet long, connected to the back of the receiver. This antenna was said to work on all frequencies from the AM BCB to TV channel 2. But more advanced SWLs understand that a resonant antenna tends to provide better performance than random length wire antennas. Not only is the reception sensitivity better on the resonant band, such antennas tend to have predictable nulls and main lobes so that selected stations can be optimized and interfering stations be suppressed. The resonant antenna also works as if it were a random wire on other bands, so little or nothing is lost on the nonresonant bands.

An antenna being "resonant" implies that it is tuned some way. The length of the antenna element(s) is the factor that tunes the antenna to a specific frequency. Antenna books, and computer programs like *Antlers*, tell you what length to use as a starting point for any given antenna, but from there purely local conditions take over and some lengthening or shortening is needed to find the actual correct length.

One indication of resonance is the standing wave ratio (SWR), or voltage standing wave ratio (VSWR) as it is sometimes called. Space does not permit a detailed explanation of VSWR here, but I can state that on verticals and dipoles, and most other resonant antennas, the minimum VSWR will be found at the resonant point (there are some situations where this isn't true, but for most common SWL antennas it is true). A VSWR of 1:1 is perfect, and for most transmitter applications under 1.5:1 or 2:1 is considered acceptable; above 3:1 and some serious thinking (or should I say "reflection"-get it?) needs doing. The goal is to get as close as possible to 1:1 in the center of the band of interest.

Figure 1 shows a 31-meter band example. Suppose you desire to cut a half wavelength dipole for 9750 KHz (9.75 MHz). According to the "standard wisdom" formula the overall length is $468/9.75=9.75$ feet=117 inches. But local conditions tend to alter the actual resonant point, if the minimum VSWR is found to the left of the indicated point in Fig. 1, then the antenna is too long. Similarly, if it is to the right then the antenna is too short.

Measuring VSWR is relatively easy for amateur radio operators: they excite the antenna with their transmitters, and then measure the forward and reflected power levels. They can either calculate the VSWR

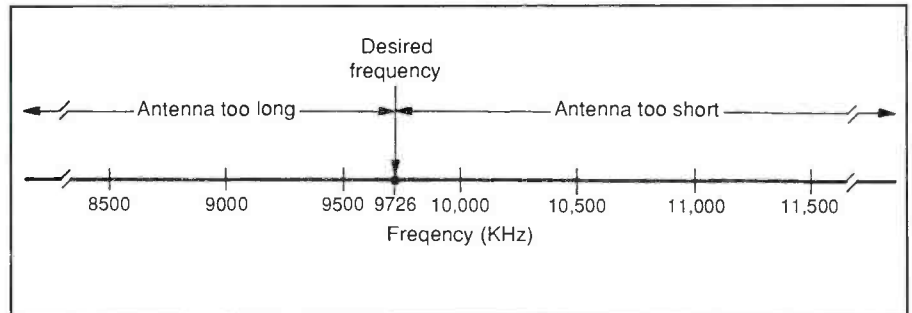


Fig. 1. Minimum VSWR example. If the actual resonant frequency, as indicated by minimum VSWR, is to left of the desired frequency, then antenna is too long; if it is to the right then antenna is too short.

from a standard formula (or look it up on a nomograph), or they can use an RF power meter that is inherently calibrated in VSWR terms rather than watts (many are calibrated in both watts and VSWR). But SWLs are not allowed to use transmitters, and most low powered signal generators will not drive the typical ham-type VSWR meter or RF power meter. But MFJ Enterprises (P.O. Box 494, Mississippi State, MS, 39762; Phones 601-323-5869 (voice), 1-800-647-1800 (toll-free for orders/nearest dealer), and 601-323-6551 (FAX only) has produced a delightfully easy to use VSWR analyzer called the Model MFJ-247 (Fig. 2).

Built on a tradition of earlier self-contained VSWR analyzers (MFJ-207 and MFJ-208), the Model MFJ-247 combines a 1.75 MHz to 33.5 MHz signal generator, VSWR analyzer circuit, and a digital frequency counter all in one hand-held package. The digital frequency counter can be used separately to measure the frequency of signals other than those of the internal signal generator.

There are four controls on the MFJ-247: Range (i.e. bandswitch), Tune (selects exact operating frequency), Gate and Input. The latter two are pushbutton controls that do not appear on the early model shown in Fig. 1. The Gate control selects the time base gate duration for the frequency counter module. When the unit is turned on, the gate time is set to 0.01 seconds, but successively pressing the Gate button selects 0.1 sec., 1 sec. and 10 sec. before recycling back to 0.01 sec. The input selector determines whether the frequency counter sees the internal signal source or the external signal source (through a BNC jack next to the SO-239 antenna jack on top of the

unit). Also on the unit is an analog meter that is calibrated in terms of SWR units. The MFJ-247 seems to work acceptably well with both 52-ohm and 75-ohm loads.

In normal operation, the MFJ-247 is connected to the receiver end of the coaxial cable feedline (Fig. 3) in place of the receiver. Set the range switch to the band of interest. For our 31-meter band example, select the 6.5 to 11 MHz position. Make sure the Input control is cycled to the internal position (as seen by a deflection of the SWR indicator meter), and then adjust the Tune knob for minimum deflection of



Fig. 2. Photo of the MFJ-247 VSWR/ SWR analyzer.

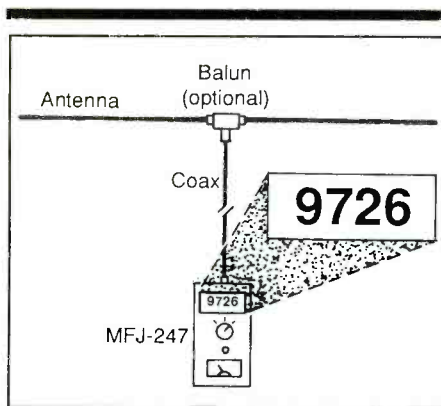


Fig. 3. Normal use of the MFJ-247.

the SWR meter (in ham terms: "dip it"). In most cases, the minimum point will be very near 1:1 unless there is something really wrong with the antenna. Next, read the frequency off the digital counter dial. If the frequency is lower than the desired design frequency, then shorten the antenna. Alternatively, if the measured resonant frequency is above the desired frequency then lengthen the antenna.

By the way, it should go without saying that you should not make any permanent connections on the antenna until after the antenna tuning is finished. I like to "rough in" the VSWR on the ground (with the antenna supported a few feet above ground), and then raise it into position. After two or three trips up and down, the correct point should be found, and the connections made permanent.

Bench Tests and Summary Conclusion

I make it a habit to test products that I recommend, so I took the MFJ-247 to Joe Carr's Basement Laboratory (actually a technorat's nest), and made some measurements. I have a low-powered dummy load calibrated for 12.5, 25, 50, 75, 100, 150, 200, 300 and 450 ohms with some pretty decent accuracy (<1%). Because VSWR/SWR is a function of the load impedance, I checked it at all these settings and calculated the "shouldabe" reading. In all cases the actual reading was precisely where the calculation said it ought to be (pretty good for a low cost instrument). Second, I measured the actual VSWR on a transmitting antenna using a very good, recently calibrated (in fact, new) Bird Electronics Model 43 RF watt-meter. I measured the forward and reverse power levels, and then calculated the VSWR at that frequency. Over a range of 1.2:1 to 2.7:1 (the cases I could generate with my multi-band vertical) the MFJ-247 tracked very closely to the SWR measured by the Bird Model 43. Therefore, I concluded that the MFJ-247 is a reasonable instrument for both hams and SWLs...and the SWLs don't need to get a ham license to use it. Let me say to the MFJ folks: "Ya done good, guys!"

WORLD'S SMALLEST FM TRANSMITTERS

NEW! POWERFUL! ULTRA-MINIATURE FM TRANSMITTER KITS

Surface Mount Technology (SMT) makes these the smallest high performance transmitters available anywhere! Use them with any broadcast FM receiver. Complete, easy to assemble kits with all SMT parts already assembled to the circuit board.

XST500 - Voice transmitter includes a super sensitive microphone to transmit voices at the level of a whisper up to a mile away.

XST500 \$44.95

XPS250 - Phone transmitter uses no batteries, attaches to your phone line, and transmits conversations up to 1/4 mile away.

XSP250 \$34.95



WE ACCEPT CHECK, VISA, MC, MO, OR COD (\$ & H EXTRA)



SATISFACTION GUARANTEED CALL: 1-800-336-7389

XANDI ELECTRONICS - SINCE 1981
201 E. Southern Ave., Suite 111, Tempe, AZ 85282



XST500



XSP250



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 80 ON READER SERVICE CARD

CIRCLE 71 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 177 ph. stainless steel. All of these reasons are why it is the best CB antenna on the market today, and we guarantee to you that it will outperform any CB antenna (K40, Formula 1, you name it) or your money back!

*Inductively base loaded antennas
**Call for details.

Lockheed - California Company

A Division of Lockheed Corporation
Burbank, California 91520

Aug. 21, 1987

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

Subject: Comparative Gain Testing of Citizen's Band Antennas
Ref: Eye 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	1.60	45
27.265	1.75	50
27.315	1.95	57
27.365	2.00	58
27.405	2.00	58

58% MORE POWER GAIN THAN THE K40

Individual test results may vary upon actual use.

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

Roof Top Mount \$595
Trunk Lip Mount \$695
Magnetic Mount \$795
Wilson 2000 Trucker \$595
DEALERS Exclusive dealer areas still open

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

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Economic problems continue to plague many of the world's nations and that continues to be reflected in the budgets allowed for international broadcasting. Last month we mentioned a couple of stations which have had cutbacks forced upon them and there are more to report this month.

First and foremost, the nearly sacred BBC, which is going to take a minimum \$5 million (UK) hit each year for the next three years. That may not do quite as much damage as we might imagine, since the overall budget runs to \$175 million per year.

A far more devastating blow may have already hit the Voice of Free China. The Taiwan government has cut a huge portion of the overall broadcasting budget, said to be equal to the entire cost of running VOFC. We'll have to make checks now and then to see if VOFC stays active. The Broadcasting Corporation of China is said to be fighting the cuts and may find a way to keep VOFC alive, even if only on a smaller basis.

Apparently progress continues to be made in getting a couple of long-awaited stations on the air. The University Network's new 100 kW shortwave from the Caribbean island of Anguilla continues a building, but we haven't heard a target date announced.

Radio Miami International continues to struggle with getting antennas up and a transmitter building completed. Keep an ear out on 9950 or 9955 for possible tests. Ditto for RMI's "sister" station, Radio Copan International, Honduras, due to operate on 15675.

LeSea Broadcasting's KWHR, at Nalehu, Hawaii, may well be on the air by now. No frequencies are known at this point but you might try tuning in LeSea's

WHRI, Indiana in case they announce them there.

Czech and Slovak radio facilities are being used by Radio Ropa Info but so far, apparently only on a test basis so it's possible the thing could be gone by now. Check 5980 from 0300 sign to 2300 closing. The broadcast is in German but features pop songs in English. The broadcaster can be reached at P.O. Box 5588, Daun, Germany. Radio Ropa normally broadcasts only on longwave and via satellite.

It's always interesting when international shortwave broadcasters relay their home services, even if those programs aren't in English. Three stations have begun such relays recently. Radio Bulgaria is relaying Radio Varna (which they also did briefly a year or so ago). Look for it on 11660 between 0400-1000, 1300-1500 and 2200-0100. The service includes an English language program for young people.

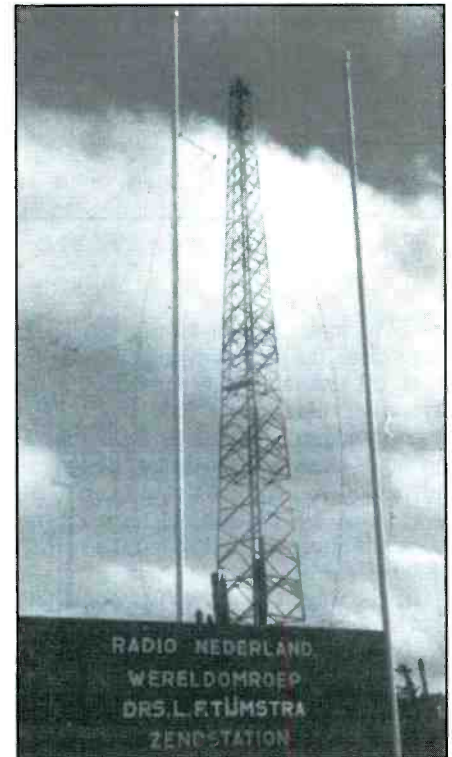
Romanian Radio now carries the domestic service Radio Actualiti from 0530 to 1130 on 11940 and 15250, and again from 2200 sign on using 7255 and 9625.

One of the Yugoslavian FM services is being carried on Radio Yugoslavia from around 1400 on 9505. The services carry several newscasts, including one in English.

The planned Jibouti relay of Radio France International is now a done deal—but that's about all. Don't look for this one to take the air for at least a couple of years.

Every now and then something in this complicated world gets a bit simpler. Deutsche Welle has a new address. Just the "Deutsche Welle, D-50588 Cologne, Germany will get your letter there.

Radio Norway has been issuing a summary covering what they require in order to verify a reception report. In order to be



Here's part of Radio Nederland's installation on Bonaire in the Netherlands Antilles. (Thanks to Mark R. Schmit, MA who passed along photos taken by Russ Price Photo in MA)

QSL'ed, reports to Radio Norway must contain specific information such as titles of songs aired, items which made up the news or features broadcast and so on. Simply quoting names of countries or people is insufficient. Radio Norway recommends listening to their Sunday English language programming as the best method of



You can do amazing things with a computer hooked to a communications receiver and/or RTTY terminal unit, at least Todd Dokey of California does. This is his set-up.



Here are Alison Oftalau (left) with the Chief Engineer of the Solomon Islands Broadcasting Corporation, in the SIBC transmitter room. Ms Oftalau is a writer, announcer, producer and news reader for the station, which employs about 50 people. (Thanks to Ed Rausch, NJ)



Here's Ms. Oftalau hosting a show on SIBC from the main control board. (Again, thanks to Ed Rausch, NJ for a rare look at SIBC!)



This view is of the RCI Sackville transmitter building. Thanks to Gary Hubert of Ontario.

obtaining confirmable details for your reception report.

SHORTWAVE COURSE: If you live in the Toronto area you can get in on a 10 week course in shortwave listening being given at Centennial College's Warden Woods Campus. Held on Tuesday evenings beginning January 25, 1994 and again from April 19. The course is taught by well-known Canadian SWL and ham operator Steven Canney, VE3FQ. For more information, call (416) 698-8200.

Here are this month's logs. All times are

UTC (which is five hours ahead of EST, i.e. 0000 UTC=7pm EST). The language of logged broadcasts is assumed to be English (EE) unless otherwise noted (SS=Spanish, FF=French, AA=Arabic, etc.)

ALASKA-KNLS, 9615 with listener mail at 0816. Later "Radio Today" feature, many IDs. (Pappas, ND)

ALBANIA-Radio Tirana, 9580//11840 at 0142 with classical music, EE talks, IS, ID (Lamb, NY)

ASCENSION ISLAND-BBC relay, 15000 at 1814 and 17880 at 1844. (Moats, OH) 15420 at 0254 ending EE lesson and into Ashanti at 0300. (Lamb, NY) 1500 on 21660. (Rausch, NJ)

AUSTRALIA-Radio Australia, 9560 at 1338 in

Cantonese and 11800 at 1516 in EE. (Lamb, NY) 9580 at 0800 to 1430. 15240 at 0500. (Turner, IL) 15240, 15365 and 21740 at 0245. (Gentry, IL); Unlisted 17840 at 0500. (Rausch, NJ); ABC, Perth on 15425 at 0455 with sports and racing results. Lamb, NY)

AUSTRIA-Radio Austria, 6015 via Canada at 0530 with news and features. (Pellicciari, CT)

AZERBAIJAN-Radio Azerbaijan, 15240 at 1700 with IS, ID as "Radio Azerbaijan European Service, the Voice of Azerbaijan" and news program. (Rausch, NJ)

BELGIUM-Radio Vlaanderen Int'l, 9930 at 2330. (Pellicciari, CT) Here and parallel 13655 at 2339 with "Brussels Calling." (Lamb, NY)

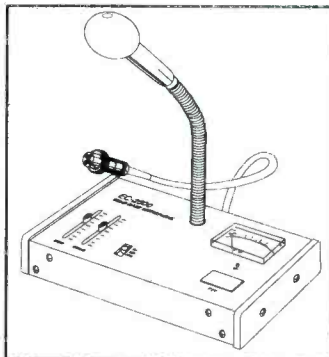
BRAZIL-Radio Aparecida, 5035 at 0209 in PP

EC-2500 EC-2500/UD

(Up - Down Scanning Function)

*Combination Repeating
Echo - Automatic Roger
Beep Base Station
Microphone*

*The ultimate base station
microphone with all the
features you have been
looking for!*



- Full Audio Spectrum Echo Repeater features "Matsushita" Bucket Brigade IC's
- Automatic Roger Beep 1 KHz tone automatically sounds at the end of transmission. Tone may be switched off if desired.
- Flexible goose neck bends 360°
- Status LED lights during transmission.
- 2 slide controls for setting modulation and echo levels
- Pre-wired for all popular radios.
- Uses either standard 9 VDC Battery or 12 VDC Wall adaptor.
- Large VU Meter for setting modulation and echo level.
- Dual OP-Amp Audio Amplifier for that natural sound.

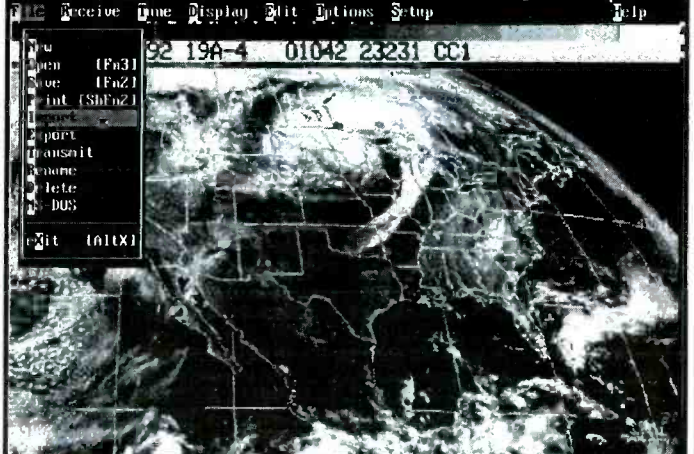


RF Limited

P.O. Box 1124
Issaquah, WA 98027
Telephone (206) 222-4295
Telex 329 473 BURGESS SEA
Facsimile (206) 222-4294

Write, call or fax today for a dealer near you!

PC HF FASCIMILE 7.0 \$99



Now under Windows or DOS

PC HF Facsimile is a simple, yet comprehensive shortwave fax system for the IBM PC and compatibles. It includes an FSK demodulator, advanced signal processing software, tutorial cassette, and complete reference manual. With your PC and SSB receiver getting FAX is a snap. Here are just some of the features:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Mouse or Menu Driven Unattended Operation • Easy Tuning Oscilloscope • Start/Stop Tone Recognition • Up to 256 Levels • Single Scan per Line with EMS Memory • Programmable Colorization • Brightness and Contrast Control • Transmit Option Available • Image Zoom, Scroll, Pan, Rotation | <ul style="list-style-type: none"> • Grayscale on all Popular Printers • Worldwide Broadcast Schedule • Worldwide Frequency Listing • CGA, HGA, EGA, VGA & Super VGA • Time Lapse Frame Looping • Slide Shows • Programmable IOC & Line Rates • Image Cropping • Automatic Radio Control • NAVTEXT & RTTY Option Available |
|--|--|

Call or write for our free 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

1-800-666-0908

New Equipment Orders & Prices Only, Please

Shortwave Radios

Sony® • All Popular Models Including The ICF2010, SW55, And The New SW77 • Philips DC777 AM/FM/CASS/Shortwave Car Radio • Sangean • ICOM • JRC • Panasonic • Yaesu, New FRG-100 • And The Superb

Drake R8



Grundig Satellit 500



Call For Special Pricing



Grundig Satellit 700

Scanning Radios

Featuring AOR Models AR1000XLT and AR3000A • ICOM R1, R100, and R7100 • Uniden Bearcat - All Models

Amateur Radio Equipment

Factory Authorized Dealer For:

ALINCO **STANDARD** **KENWOOD**

COMET **YAESU** **MFJ**

DIAMOND **ICOM** **cushcraft**

Accessories, etc.

• Call For Our Low Discount Prices •

For info and tech help call (203) 666-6227

Out-of-State Sales Call 1-800-666-0908

Conn. Sales Call (203) 667-9479



LENTINI

COMMUNICATIONS, INC.

21 Garfield St. Newington, CT 06111

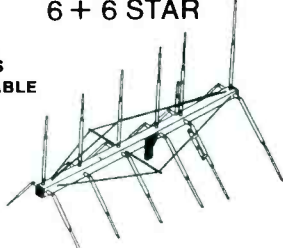
C.O.D.'s OK - SAME DAY SHIPPING

CIRCLE 67 ON READER SERVICE CARD

When It's Time To Get Out The "BIG GUNNS"!

6 + 6 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



with IDs, US pops with translations of lyrics. Off at 0253. (Lamb, NY) 6135 in PP with Brazilian pops. (Barnes, CO): Radio Nova Difusora, Aquidauana, 4796 at 0117 with religious talks in PP. ID. (Lamb, NY); Radio Cultura do Para. 5045 at 0806 in PP but with an EE ID. frequencies. pops. (Lamb, NY); Radio Educadora, Campo Grande. 4755 at 0041 in WW with IDs, address. music. (Lamb, NY); Radio Brazil Tropical, 5015 in PP with Brazilian pops, IDs, jingles. (Lamb, NY); Radio Universo. 9565 at 0500 with PP ID and announcements. (Barnes, CO) 0756 with religious program, contemporary Christian music, list of stations in the network which were carrying the program. ID. (Lamb, NY); Radio Anhanguera, 4915 at 0021 in PP with ID, jingles, Brazil and US pops. (Lamb, NY); Radio Guaiaba, 6000 at 0808 in PP with Brazilian pops, ID, time pips. (Lamb, NY)

BULGARIA-Radio Bulgaria, 11720 at 1803 with "Sports Brief," ID and music. (Lamb, NY) 13670 at 1758 with ID, concert music; 15330 at 2021 and ID 2024. (Gentry, IL) 2145 with news. (Pellicciari, CT)

CAMEROON-CRTV Bafoussam, 4000 at 2245 (presume FF, editor) Heard in the Dominican Republic but not audible in Indiana. (Peterson, IN); CRTV Garoua, 5010 at 2251 with music from Indian cinema. Off with anthem but no announcement. (Peterson, IN)

CANADA-Radio Canada International, 11955 with CBC programs at 1505. (Low, TX)

COLOMBIA-La Voz de Yopal, 5050 at 0959 in SS with Latin music. (Barnes, CO)

CONGO-RTV Congolaise, 4765//5985 at 2315

with news in FF. Afro pops, reggae, ID, national anthem at 2358 and close. (Rausch, NJ)

COSTA RICA-Adventist World Radio/ TIAWR at Cahuita at 1030 with SS ID, into religious program. Heard in the Dominican Republic. (Peterson, IN) 9725 at 1111 with religious programming, ID 1202. (Pappas, SD) 11870 at 0441 with EE and SS hymns, ID, into FF at 0503 with "La Vie Abundant." (Lamb, NY) 0630 in SS. (Barnes, CO); Radio For Peace Int'l, 21465USB at 1720 with talk on women's rights. (Gentry, IL)

CUBA-Radio Havana Cuba, 6010 at 0200 with "News of Latin America." (Pellicciari, CT) 9510 at 0630 with "DX'ers Unlimited" and many IDs. (Pappas, SD) 13660 at 0051 in SS with five IDs in a row. (Vaage, CA)

CZECH REPUBLIC-Radioropa, test via Radio Prague transmitter on 5980 at 0321 in GG with announcements, address (Radioropa Info, P.O. Box 5568, Daun, Germany) and pops. (Lamb, NY)

DOMINICAN REPUBLIC-Radio Amanacer, 6025, sign on with anthem, SS announcement and into religious programming. Heard in the Dominican Republic. (Peterson, IN) (1000 sign on? Editor)

ECUADOR-HCJB, 6050//9765 at 0732 with test in EE/PP featuring Brazilian and Ecuadorian music, bi-lingual test announcements. HCJB was running a test in conjunction with TWR Brazil, since HCJB will pick up PP program now that TWR Bonaire is off shortwave. (Lamb, NY) 9745 at 0040. (Vaage, CA) 9745//15155//21455USB at 0039 with "Saludos Amigos." (Gentry, IL) 15295 at 2233 in JJ with Andean music. (Barnes, CO); Radio Quito, presumed, 4920 at 0040 in SS with "futbol," cookoo clock and "La Voz de la capital" slogan. (Lamb, NY)

ENGLAND-BBC. 3975 at 0412 in GG with news, sports. Off at 0429. (Lamb, NY) 5975 via Antigua at 0330, 9590 via Antigua at 2315 and 12095 at 0415. (Turner, IL) 9590//15070 at 2200. (Pellicciari, CT) 11750 at 0031. (Vaage, CA) 15070//17880 at 1811 and 15260 at 1503. (Gentry, IL)

FINLAND-Radio Finland Int'l, 15400 at 1338 with "The Future of Finland; into Latin at 1354. (Lamb, NY)

FRANCE-Radio France Int'l, 9495 in FF at 2043 with jazz and big band music, ID, news. 11670//15365 at 1231 in EE with news, sports, "Club 9516" letters program. 17695 at 1426. (Lamb, NY) 11660 at 0001 in FF. (Barnes, CO)

FRENCH GUIANA-Radio France relay on 11670 in SS at 0505. (Low, TX) 15200 in FF at 0056. (Vaage, CA)

GABON-Africa Number One, 9580 in FF at 2125 with African pops. (Barnes, CO) 0550 with ID, station promos in FF. (Pellicciari, CT) 17630 in FF at 1418 with phone conversations, songs, IDs. (Pappas, SD) 0717 in FF with IDs. African music. (Lamb, NY)

GERMANY-Deutsche Welle, 3995 from Julich site at 0005, parallel to 6100 to USA in German. Heard in the Dominican Republic. (Peterson, IN) 6085 via Antigua at 0300 with news. (Pellicciari, CT)

GUATEMALA-AWR Guatemala on 5980 at 1100 in SS and into religious programming. Heard in the Dominican Republic. (Peterson, IN)

GUINEA-RTV Guinienne at 0640 in FF on 7125 with African pops. (Barnes, CO)

GUYANA-Guyana Broadcasting Corporation, 5950 at 2247 with EE and local announcements audible under WYFR/VOFC in Chinese. (Turner, IL)

HONG KONG-BBC relay, 11820 at 1444 with news. (Pappas, SD)

HUNGARY-Radio Budapest, 9835//11910 at 0235 with talk about Hungarian Parliament and legislation. (Pellicciari, CT) 0232-0300. (Barnes, CO)

ICELAND-Icelandic State Broadcast -ing, 13855 at 2302 in USB with presumed news in Icelandic. (Barnes, GA) 2300 on 11401 with IS, ID in English and Icelandic, news and commentary to close at 2333. (Rausch, NJ)

IRAN-VOIRI, 15084 in Persian (Farsi) at 2118. (Low, TX)

ISRAEL-Kol Israel, 15640//17575 at 1903 with news about Israel. (Gentry, IL) 15650 at 2130 with news, Mailbag, DX Corner. (Pellicciari, CT) 17575 at 1903 in EE. (Barnes, CO)

ITALY-RAI, 9575 at 0100 with news, music. (Pellicciari, CT)

JAPAN-Radio Japan, 11735 at 1445. (Gentry, IL) 1500-1600 via Canada with news, tuning information,

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

programs on travel, books, commentary. (Turner, IL) 17810 at 0315. (Rausch, NJ)

KUWAIT-Radio Kuwait, 13620 at 1815 with rock selections. (Gentry, IL)

LITHUANIA-Radio Vilnius, 11750 at 2300 with anthem, ID and program in Lithuanian. (Lamb, NY)

MALI-China Radio via Mali, 11715 at 0047. (Vaage, CA)

NETHERLANDS ANTILLES-Radio Netherlands Bonaire relay, 6165 at 0050. (Turner, IL) 11835 at 0037. (Vaage, CA) 21590 at 2019. (Gentry, IL)

NEW ZEALAND-Radio New Zealand, 15120 at 0530. (Low, TX)

NIGERIA-Voice of Nigeria, 7255 at 0530 with world news. (Pellicciari, CT) 0550. (Low, TX)

Radio Nigeria, Kaduna, 4770 at 0514-0530 in EE. (Barnes, CO)

NORTHERN MARIANAS-KFBS, 11650 at 0855 with IS, EE ID and into Russian. (Rausch, NJ)

NORWAY-Radio Norway Int'l, 9675//15165 at 0026 with end of Sunday EE program and into Radio Denmark broadcast at 0030. 11865//11870//15175 at 0409 with ID, news, book review during Sunday EE broadcast. (Lamb, NY) 11925 at 0200. (Pellicciari, CT); 15365 at 1905 with "Norway Now." (Gentry, IL)

PAKISTAN-Radio Pakistan 15550 at 1700 to 1730 in EE. (Barnes, CO)

PERU-Radio Union, 6115 in SS at 0703 with Latin pops. (Barnes, CO)

PHILIPPINES-VOA relay, 15425 at 1100 with news, ID, agriculture program. (Lamb, NY)

PORTUGAL-Radio Portugal, 9570 at 0130 with news and tourist program. (Pellicciari, CT)

ROMANIA-Radio Romania, 9510 at 0425 with political commentary. (Barnes, CO) 11830 at 0254 with "DX Mailbag," ID, listener club info. (Gentry, IL)

RUSSIA-Radio Moscow, 15150 at 2015 with talk about Yeltsin and reforms; 15290 at 1715 with news. (Gentry, IL) 15290 at 2100 with "Focus On Asia." (Pellicciari, CT) 15150//15290 at 1830 open. 17760 with jazz at 1855. (Moats, OH) 15425 at 1910. (Low, TX); Radio Galaxy, 11880 at 2148 in EE with RR pops, ID, schedule, promos. Off at 2200. (Lamb, NY); Golos Rossii, 15110//15130//15155//15295//15465 at 0313 with easy listening music, ID, theme music, news in RR, pops. (Lamb, NY); Radio Netherlands via Petropavlovsk Kamchatskiy, 12065 at 1110. (Rausch, NJ)

RWANDA-Deutsche Welle relay, 9565 at 0500 under Radio Universo. IS and sign on in unidentified language. (Barnes, CO); 17860 at 2304 in GG. (Low, TX)

SEYCHELLES-BBC relay, 15420 at 0500 with "Newshour." (Rausch, NJ)

SIERRA LEONE-SLBS, tentative, on 3316 at 0648 in EE. Heavy QRN. (Barnes, CO)

SINGAPORE-BBC relay, 9740 at 1400 with news and sports. (Pappas, SD) 11750 at 1456 and 15360 at 1257, going into Cantonese. (Lamb, NY) 15380 at 0300 with Far East Relay ID, news. (Rausch, NJ)

SLOVAK REPUBLIC-Radio Slovakia Int'l, 5930 at 0100 with "Folklore and History." (Pellicciari, CT) 9580//9810 at 0129 with IS, ID, Slovakian program with news, pops. (Lamb, NY)

SOLOMON ISLANDS Solomon Islands Broadcasting Corporation, 5020 at 0755 in EE and Pidgin with island music, ID, bamboo pipe and drum IS, news. (Lamb, NY)

SRI LANKA-Sri Lanka Broadcasting Corporation, 15425 at 0142 with "Living Waters" religious program, ID for All Asia Service. (Lamb, NY); VOA relay, 15250 at 0205 in EE with news. (Lamb, NY)

SPAIN-Radio Exterior de Espana, 9630 at 0500 with feature "Spain in the American West." (Pellicciari, CT) 0036 in EE but also ID in SS. (Vaage, CA)

SWEDEN-Radio Sweden, 9675 at 0200 with historical program. (Barnes, CO) 15240 at 1520 with program "Sounds Nordic." (Gentry, IL)

SWITZERLAND-Swiss Radio Int'l, 9535 at 0436 in FF with news. (Barnes, CO)

TAHITI-Radio Tahiti, 11827//15168 at 0317 in FF and TT with Tahitian music, ID, phone talks. The 15 MHz frequency is very variable of late. (Lamb, NY)

UKRAINE-Radio Ukraine, 10033 at 0145 with ID, news, folk songs in Ukrainian. Into Russian after 0230. New Frequency? (Rausch, NJ)

UNITED STATES-VOA Europe stereo test via Bethany transmitter site, 10869 USB/LSB in EE with IDs, pops, greetings to the EDXC conference in the Canary Islands. Each sideband carried a stereo channel so the broadcast could be heard properly only by using two radios! (Lamb, NY)

URUGUAY-Radio El Espectador, 11835.7 with news in SS at 1701. (Barnes, CO)

VATICAN-Vatican Radio, 5882 with Andean music at 0116. Heard in the Dominican Republic. (Peterson, IN) 7365 at 0404 in Ukrainian. (Barnes, CO)

VENEZUELA-Radio Rumbos, 4970//9660 at 0108 in SS with ID, promos, old Latin pops. (Lamb, NY)

VIETNAM-Voice of Vietnam, 15010 at 1904 in EE with news, ID, commentary, pops. (Lamb, NY)

YUGOSLAVIA-Radio Yugoslavia, 9580 at 0030 with news, history of Serbia. (Pellicciari, CT)

And that does it for this round! A tip o' the hat to the following good guys and gals who supported the cause this month: Scott J. Gentry, Matteson, IL; Steve Pellicciari, Norwalk CT; Maria Pappas, Huron, SD; Marie Lamb, Brewerton, NY; Donald C. Barnes, Wheat Ridge, CO; Dr. Adrian Peterson, Indianapolis, IN; Jim Moats, Revenna, OH; Ed Rausch, Cedar Grove, NJ; Brad Low, Jacksonville, TX; Claude Turner, Chicago, IL and Bjorn F. Vaage, Granada Hills, CA. Thanks to all and keep sending in those logs!

Until next month, good listening! ■



When seconds count, REACT® needs you...

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

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

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

Volunteer. Join Today!

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

REACT® International, Inc.

Tel (316) 263-2100

FAX (316) 263-2118

P.O. Box 998, Wichita, KS 67201



CIRCLE 72 ON READER SERVICE CARD

INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

Letters

Our first letter this month comes from down under. Bob Bell of Australia sent some timely information on Somalia. It seems that Australia has her share of troops helping out in Mogadishu. Bob, a columnist for *Australian Aviation* magazine, says that their troops were flown in on 747's by Qantas. They carried with them, satellite communication gear. With the increase in military activity in the area of Mogadishu, listeners should scan the Fleet-SatCom frequencies near 260 MHz for FM and AM activity. Listeners can also tune into these HF freqs that Bob passed along. They are Royal Australian Air Force freqs: 3.032, 5.688, 8.976, 98.76, 11.236, 13.207, 15.024, 15.035 and 17.989 MHz. Thanks for the information, Bob.

Greg Osbourne of Iowa is thinking of purchasing a new shortwave receiver and wants to hear broadcast of space shuttle communications he read about in January's issue. He wants to know if one of the economical portable shortwave receivers on the market would allow him to listen to WA3NAN shuttle broadcast. If they have a BFO or selectable USB/LSB they should work. Remember that portables are less selective and stable than other receivers. This is only a concern if you are interested in data (RTTY etc..) reception. This should not discourage you from buying one of the receivers you mentioned. I use a portable to listen in on shuttle broadcasts from WA3NAN myself. My Sony ICF 6500, one of the first portables to have digital read-out, is always handy, easy to use and does a good job. I might also mention, Greg, that any scanner that covers the 2-meter ham band, 144 to 148 MHz, will also allow you to hear FM voice transmissions from the shuttle and Mir space station which are heard on 145.550 MHz. A recent report from Europe states Mir has sometimes been heard on 145.850 MHz also. Good luck and good listening, Greg.

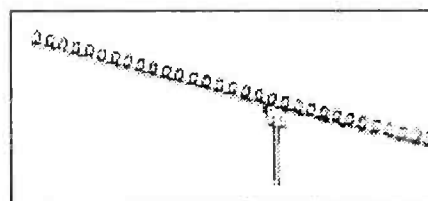
Robert Greter of Ohio has a question about the frequencies listed in the May issue on search and rescue operations. Robert is an active member of the Civil Air Patrol (CAP). In the May issue, I listed 40.5, 173.85 and 282.8 MHz as CAP frequencies, which they are not. I inadvertently included an Army (40.5), AF (173.85) and Coast Guard (282.8) search and rescue frequency. Robert reports that when the May issue hit the stands the CAP repeater, Packet and telephone lines went nuts! CAP members were trying to find out how they could obtain authorization for these new CAP frequencies. Sorry for the difficulty,

Low Band Satellites				
FREQUENCY	SATELLITE	LOCATION	INCLINATION	NOTES
136.110 MHz	MOS 1A	polar	99.09°	Ocean research
136.110	MOS 1B	"	99.09°	" "
136.370	ATS 3	105°W	12°	NASA EXPERIMENTAL
136.380	GOES 1	81.2°W	10.5°	NOAA WxSat
136.380	GOES 2	68.2°W	33°	" "
136.380	GOES 3	175.1°W	8°	" "
136.650	TRANSIT	polar	89.7°	NavSat
136.770	NOAA 11	polar	99.05°	NOAA WxSat
136.860	IUE	LEO	33°	
137.080	METEOSAT 3	72.8°W	.07°	ESA WxSat
137.170	MARECS A	22.8°W	5.7°	ESA Maritime
137.170	MARECS B2	14.9°W	3.6°	" "
137.300	METEOR 3-4	polar	82°	Russian WxSat
137.500	NOAA 10	polar	98.5°	NOAA WxSat
137.500	NOAA 12	"	"	" "
137.850	METEOR 2-10	Polar	82°	Russian WxSat
137.850	MAGION	polar	82°	Russian research

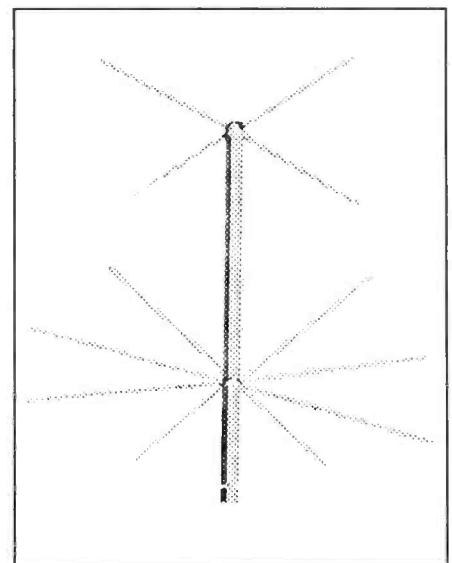
This low-band satellite chart gives satellite seekers a clear view of orbiting sats by providing satellite names, each one's frequency, location, and inclination, as well as additional notes.

Robert. Glad to see CAP members are such avid POP'COMM readers. Thanks for writing and inquiring.

Greg Vinci of Connecticut has a great many questions about weather satellites, so let's see how many of his questions we can answer. Greg says he has been tracking and listening to the low orbit weather satellites that transmit Automatic Picture Transmission (APT). Well Greg, all you need now is something to demodulate and display the weather signals from the low orbit satel-



A 44 element loop antenna, perfect for GOES satellite reception.



Vanguard APT-1 antenna for polar orbiting sats.

Link	Carrier Frequency	Information Signal	Baseline Bandwidth	Modulation
1. Beacon	137.77 MHz or 136.77 MHz	Low Bit Rate Instrument Data and Spacecraft Telemetry, All From TIP	8320 bps	Split-Phase PSK
2. VHF Real-Time -APT	137.50 MHz or 137.62 MHz	Medium Resolution Video Data From MIRP	2 KHz	AM/FM
3. S-Band Real-Time -HRPT	1698 or 1707* MHz	High Resolution Video Data and TIP Data From MIRP	665.4 kbps	Split-Phase PSK
4. S-Band Playback to CDA's	1698, 1702.5 or 1707 MHz	High Resolution and Medium Resolution Video Data From MIRP	2.6616 Mbps	Randomized NRZ-PSK
5. Data Collection (Uplink Only)	401.65 MHz	Data From Earth Based Platforms and Balloons	400 bps	Split-Phase PSK
6. S-Band TIP Data Playback	1698, 1702.5 or 1707 MHz	TIP Data Recovered From On-Board Recorders	332.7 kbps	Split-Phase PSK
7. Command Uplink	148.56 MHz	Digital Commands	1 kbps	Ternary FSK/AM

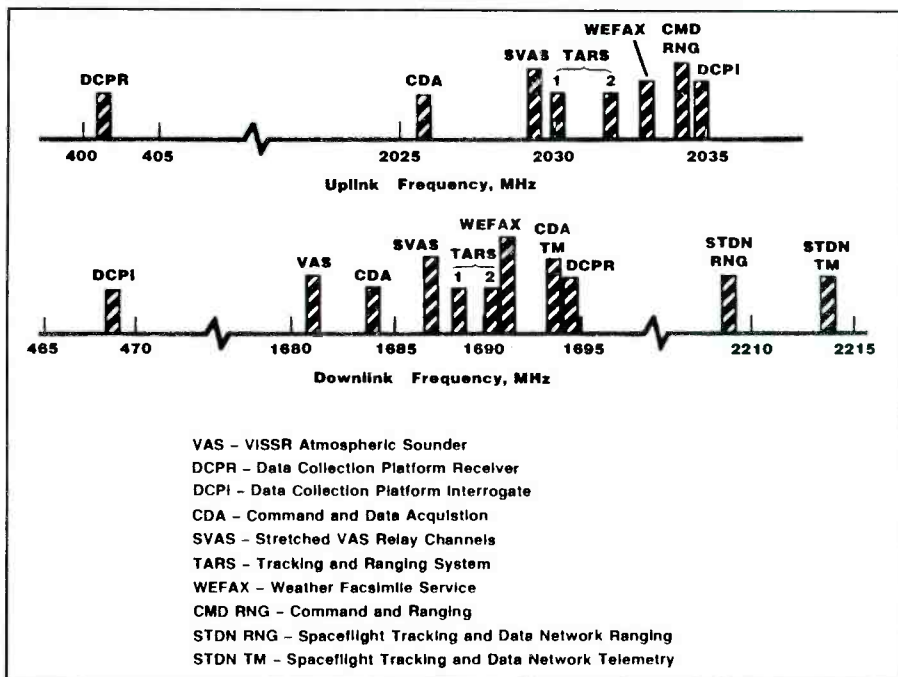
Polar Satellite Communications Link Summary

lites. A MFJ or similar modem and weather software, which comes with it, will do. Feed the audio signal from the receiver into the modem to TNC. This connects to your computer and puts you in business. You may want to add a pre-amp at the antenna to help combat white noise. The transmission format is similar to SSTV.

With the addition of a downconverter, you can receive transmissions from the GOES, geo-stationary weather satellites. You will, in addition, need a high gain antenna or you can add a downconverter to your TVRO dish. The GOES satellites

transmit WeFax on 1690 MHz (1.690 GHz). A home-made converter can still be found in The Weather Satellite Handbook by Dr. Taggart. This handbook is carried by POP*COMM advertisers. The downconverter takes the 1.6 GHz signal and downconverts it to 137 MHz.

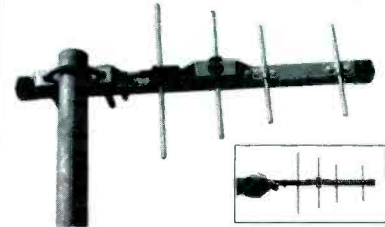
Any reader who has both a TVRO station and a multi-mode demodulator like a Universal M-7000, that can demodulate Frequency Division Multiplexing (FDM), might be interested in the March 1992 issue of Satellite View. It describes in some detail, how you can use your HF receiver



GOES uplink and downlink frequency spectra, emphasizing SVAS, WEFAX, CMD RNG, STDN RNG and STDN TM frequencies.

806-960MHz

Wideband Directional Yagi



This unique, 4 element Wideband Yagi Antenna covers the 806 to 960MHz band with 5 dBd of real directional gain to pick out and locate weak signals. Use outside on a fixed or rotatable mount. So small (14") and light (1 lb) you can even hold it in your hand! Great for giving handheld scanners 800MHz signal directivity.

only \$79.95

plus \$5.95 S&H

1-800-950-WARE

Write for your FREE 64 page catalog

RADIOWARE 
 PO Box 1478 Westford MA 01886
 (508) 688-4433

CIRCLE 70 ON READER SERVICE CARD

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

CELLULAR 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 0.5-1300MHz "All Bands" (for wide coverage revr.)
 ANTENNA PLUS-2 0.3-30MHz "Short-Wave" (peaked for SWL's)
 ANTENNA PLUS-3 25-2000MHz "Scanner" (peaked 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

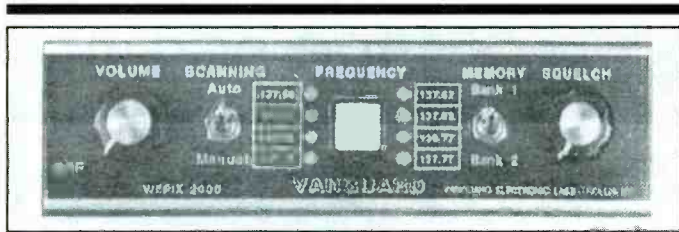
CAR ANTENNA RECEIVES SCANNER/SWL!

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

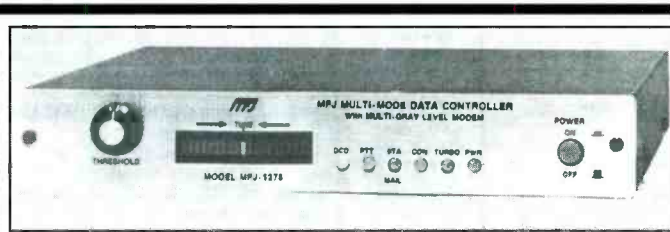
Continous US Shipping/Handling \$5. Canada, AK, HI, PR \$8. NY and MI add sales tax.

MANY NEW PRODUCTS
CALL FOR DETAILS!

ET ELECTRON PROCESSING, INC.
 PO BOX 68
 CEDAR, MI 49621 (616) 228-7020



A Vanguard satellite receiver.



MFJ's Multi-Mode TNC will receive APT.

in conjunction with a M-7000 (or similar unit), and a TVRO system to tune across all available weather satellites, Russian, US, LEO and Geo-stationary. This signal is found on Spacenet 3, Transponder 17. The HF receiver is tuned between 1.5 and 1.8 MHz.

Well Greg, I hope this information helps. There are several commercial interests that take this raw data, process it and sell it back to the government for use in various agencies that needs this type of weather information. It is too expensive for most individuals however. I hope to do another piece on weather satellites soon and can refer you to a weather satellite BBS (718) 740-3911 or phone (718) 468-2720. Greg, the April 1993 Satellite View column also covers some weather satellite information.

We next hear from Alberta, Canada. Don Henry also writes about the FMD

method of getting WeFax from your TVRO system. Don, like most SWL's, wants to be sure of the frequency. Yes Don, the frequency you mentioned, 1,926.30 in kHz or 1.926 MHz. The .30 in kHz should be dropped for clarity I suppose, but I wanted to give as exact a frequency as possible. You would hook your HF receiver to your FDM demodulator (like an M-7000 by Universal) and feed the signal to the receiver's antenna jack. This system requires you have a TVRO system and a 1691 GHz feed horn attached to your dish. (See March 1992 and April 1993 for details.)

Next we hear from John Tardy of New York City. John wants to know if I can recommend any schools that specifically train people for jobs in satellite communications. Well John, I don't know of any special schools outside of the military that specifically train people for technical specialties.

I think the best general approach is a solid background in engineering, work with satellites as a hobby, either amateur, weather or TV etc. You might also refer to a previous issue of POP'COMM for some general pointers. The October 1992 issue talked about the kind of education NASA requires. Perhaps some of our readers could give some other alternatives. Thanks for writing, John.

A final note for you this month on the TDRS satellite system. TDRS F6 was launched last January. This brought the number of operational satellites in the Tracking and Data Relay Satellite System (TDRSS) up to five. F6 is located at 62°W, F4 at 41°W, F5 at 174°W; F3 is at 171°W and F1 is at 85°W. Drop me a line with your latest satellite intercept, question, QSL card or shack photo. See you next month!

NOW! A QUALITY SATELLITE SCPC AUDIO RECEIVER

AT AN AFFORDABLE PRICE



UNIVERSAL SCPC-100 AUDIO RECEIVER

SPECIFICATIONS

STABLE, MICROPROCESSOR CONTROLLED TUNING. • 50 CHANNEL MEMORY RECALL. • COMPATIBLE WITH 950-1450 BLOCK SYSTEMS. • 3 MINUTE HOOK-UP. • LARGE L.E.D. TUNING SCALE. • RECEIVES C AND KU BAND SCPC. • DOES NOT DISABLE VIDEO WHEN IN USE.

SERVICES ON SCPC

HUNDREDS OF QUALITY SCPC CHANNELS ON SATELLITES - SPORTS - AP - UPI - RADIO NETS - HOME TOWN SPORTS & RADIO - RACING - TALK SHOWS - CLASSICAL, ROCK & JAZZ - RADIO STATIONS - FINANCIAL NEWS AND MORE.

INTRODUCTORY PRICE \$439.⁰⁰ PLUS S & H

UNIVERSAL ELECTRONICS, INC.

4555 GROVES RD., SUITE 13, COLUMBUS, OH 43232
(614) 866-4605 FAX (614) 866-1201

DELTACOMM™ DSS Digital Signal Strength Option For Your ICOM™ R7000

DELTACOMM™ I-7000 and your MS-DOS computer integrated with the Delta Research custom CI-V interface and optimized software will not just control but will maximize the potential of your ICOM™ IC-R7000's monitoring capability.

- CYBERSCAN function allows scan file tracking control of systems employing frequency hopping techniques.
- Spectrum log at speeds in excess of 1300 channels a minute, generate a real time histogram of activity and create scan database file automatically.
- Birdie log during frequency search automatically characterizes your R7000, then locks out those frequencies.
- Activity log function continuously monitors and logs all frequencies of a scan database while displaying active, was active and never active channels.



Optional DELTACOMM™ DSS (Digital Signal Strength) upgrade for your DELTACOMM™ I-7000 communication manager.

- Innovative interface design allows digitizing and storing the R7000 signal level information with 8-bit accuracy via your computer's game/joystick port.
- DSS allows user programmable upper and/or lower signal level detection limits during DELTACOMM™ I-7000's spectrum log, scan and search functions.
- Log signal strength information to printer or delimited log file while DELTACOMM™ I-7000 is scanning or activity logging the selected database file.

DELTACOMM™ I-7000 communication manager program includes all cabling, manual, UL listed power supply and Delta Research custom CI-V interface for \$299.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H. The DELTACOMM™ DSS interface upgrade comes complete with easy to follow NO SOLDER installation instructions, all cabling and 8-bit DSS A/D converter module (game port required) for \$99.00 + \$8.00 (U.S.) or \$25.00 (foreign) S&H and is available as an upgrade option to registered I-7000 users. Contact us for additional information on DELTACOMM™ communication managers for ICOM™ R7100, R71A, R72 and IC735.



Delta Research



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

PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

A couple of reporters have commented that pirate activity seems to have dropped off a bit in the past few months. I'll bet you, though, that it's only a temporary lull! Here's the fare being offered to you this month:

Mike LeClerc in Connecticut heard Pirate Radio Boston on 7413 at 0237, playing 60's music. Sign on was at 0215. Address: P.O. Box 146, Stoneham, MA 02180. Patrick Murphy in Virginia heard PRC in a joint broadcast with WREC (Radio Free East Coast) on 7415 from 1330 to 1358 close, playing rock and reading listener's letters.

Scott Gentry of Illinois had Hit Parade Radio on 7417 at 0418 and, on another occasion, on 7413 LSB at 0208. Playing oldies (both times "Moments to Remember") and announcing the P.O. Box 452, Wellsville, NY 14895. LeClerc hit on this on 7413LSB at 0204 with hits from 1955 and noted a slight frequency drift.

Radio USA was found by LeClerc on 7415LSB at 0024 with Mr. Blue Sky, punk music and comedy bits. Offered a special 10th anniversary color photo QSL for reports to the Wellsville address.

WORK was another LeClerc logging, at 0333 on 7419LSB. ID as WORK—"workers operating radio knobs." Also uses the Wellsville address.

New reporter Janet Whiting of Virginia found Radio DC on 7415 with a CW ID "DC Radio-don't vote Republican...Radio DC DX test." This ran for about 10 minutes, beginning at 1900 and was very strong in Virginia, Janet says.

Scott Gentry logged Pan Global Wireless on 7411USB at 0232 with a test transmission. Host Hugh Jardon was on a pirate expedition in the woods, mentioning "first amendment freedom of speech" and hellos to various DX'ers. Scott says thanks to Jardon who alerted him to the broadcast. Heard again in about the same time frame, again with test and lots of talk about pirate radio, freedom of speech and so on. Wellsville address.

Also heard by Daniel Voltz of Illinois on 7413SSB at 0235 claiming the transmitter site was Sonora. Heard again on 7414 SSB with repeated calls for other pirates to come out and do a show "before the fascist VOA comes on..."

Dan also had WLIS (We Love Interval Signals) on 7417 at 0015 playing "Dreadlock Holiday," Voice of Chile and commercial spoofs.

Pat Murphy had Down East Radio on 7415 at 2250 to close at 2306 with DJ Uncle Harry who talked about how nice it was in Maine and did a monologue about claiming and finding a body, complete with sound effects. Off with "good night and have a pleasant evening."

LeClerc got the URGE on 7416 at 0354 with a program mostly of comedy bits about human urges. The Hello Radio jammer slipped in a few times, says Mike. No maildrop announced.

The Hello Radio jammer was also noted by Mike on 7415 at 0217. No program content was noted, just an announcer saying "Helloooooo Radiooooooo."

The Voice of Stench, also noted by

LeClerc, at 2303 on 7414LSB with political commentary critical of both parties. Use the Wellsville address for reports to this program.

Gentry logged CSIC on 7413 at 0212 with Pirate Rambo doing a third anniversary special which included a parody of "Star Trek," talk of HeMan marrying Kristen Kaye and offering a commemorative wedding QSL card. Also mentioned a special test broadcast on 9901 at 1300. They played the "Psychochicken" song at time of sign off.

I'm not clear from reading Scott's report, but I believe closing was at 0244.

LeClerc had WJLR on 7415LSB at 0210 with Captain Crook, rock music and comedy. Mike says this one uses as its interval signal the wolf call from Deep Purple's song "Hush." They didn't give a maildrop address.

WQSL was another LeClerc logging, with a test broadcast on 7412 at 0201, giving the ID as "WQSL—the verification station" and announcing the Wellsville address.

Scott Gentry reports the arrival of a couple of QSLs: Radio Airplane with a full detail "Captain Eddy's FCC Fighter" card, bumper stickers and info sheet. Also KMRZ with a full data QSL sheet signed by Dr. Lobotomy. Also WMAD with a full data QSL sheet (QSL 68) signed by Al Jaffee.

That does it for this time. Keep those logs and other pirate radio information headed my way. Maybe, every now and then, we can talk a shy station operator into sharing a photo and info with us! ■



This Voice of Bono QSL card was received by Duane Vandenburg of Wisconsin.

Discover the Magic of Kit Building

In the "good old days," there were no ham radio superstores, no 800 numbers and no "all-in-one" transceivers you could buy off the shelf and throw on the air. Most hams got started by studying a few schematics and scrounging around for the parts until they had enough to build a radio and get on the air.

Although today's hams have all the "modern" conveniences, there's still something to be said for the thrill of kit building. (Who knows, maybe the thrill of building something yourself is more exciting today than it was when most hams built their own gear. Being different can be fun!)

After all, ham radio still consists of one ham with a bunch of parts and some wire talking to another ham with another bunch of parts and a different piece of wire. And when you put the parts together yourself, there's a special feeling you get with each contact you make.

The giant in the build-it-yourself industry was the Heath Company. Heath offered kits for just about anything you'd ever want in your shack, from rigs to keyers to meters to dummy loads to 24-hour clocks. Their "We won't let you fail" motto and easy-to-understand construction and operating manuals made them a natural for any budding kit builder. Unfortunately, Heath has gone out of the ham radio kit business. But that doesn't mean that there aren't enough kits out there to pique your interest.

As you can see in the suppliers table, there are plenty of kit companies to fill the gap left by Heath's departure. In fact, many of the kits offered by today's suppliers had no equivalent in Heath's line-up. Many of the new kits are really nifty.

Nobody offers nine-band multimode ham transceivers in kit form (like Heath used to)—but that's no problem. Today's kit-building focus has changed. Modern kits range from simple test equipment to single-band QRP transmitters and receivers—popular items—antenna tuners and more. Some even offer versions of projects you see in the ham magazines. An abbreviated list of kit suppliers is shown in the table. An SASE provides you with catalogs listing their respective offerings.

Building Kits Yourself

Will you need a lot of tools? It depends on the type of kit you get and its level of completeness, or "skill level." Most kits can be built with only a soldering iron (and sponge), a diagonal wire cutter, a pair of pliers, a screwdriver or two, wire strippers and a solder.

Many hams have spare tools you could use, should you be short a left-handed counter-clockwise uggerumpf and need one right away....

Building kits isn't as difficult as you might think. Each kit is different, and we all have different abilities, but if you're patient, care-

ful and follow the instructions closely—one step at a time—you'll have few problems.

Getting Started

I've got my kit, now how do I get started?

Step one is to lay all the parts out and check them against the kit's parts list. Egg cartons make excellent "parts bins" for this procedure. Examine each part carefully to make sure you have the right one, and that it's the right value.

Resistors can be tricky with their color codes; you might want to keep a chart handy that tells you what the values are. Another good trick is to wrap a piece of masking tape around one of the leads of each of the pieces, and write on the tape what the part number and value is (R3, 390k; C12, 150 pF, etc). This saves you fumbling around later on.

Once you've sorted the parts and have all the tools, dig in! Always carefully read the instructions. A good rule is to check off each procedure as you finish it. This will help you avoid skipping steps that could lead to problems later on.

When soldering, always dress (bend) component leads so that they point away from neighboring foil pads, and cut them as close to the foil as you can—this helps avoid solder bridges and shorts that can cause problems when you're done. When attaching wires, cover the ends with a light coat of solder (called tinning). This helps prevent the wires from fraying later on and makes good mechanical contact.

Another common mistake is not keeping your soldering iron tip clean and bright—wipe it off on a wet sponge regularly, and always apply some solder to the tip of the iron when you turn it on to keep it from oxidizing and turning black. This will go a long way toward ensuring good solder joints as you work. (According to kit manufacturers, poor solder joints are the leading cause of builder troubles, so take heed!)

If you make a mistake, don't panic! There are plenty of ways to "unsolder" a component if you put it in the wrong spot or bent it in the wrong direction. If you don't have a solder-removing gizmo (I use a spring-loaded, trigger-activated tube job affectionately called a "solder sucker," available for a few bucks at Radio Shack and other electronics stores or suppliers), you can get away with using a clean piece of coax braid. Just put the braid over the connection to be desoldered, and apply the iron. If done right, the solder will flow on to the braid. (It may take several applications to remove all the solder this way.)

(Radio shack also sells an inexpensive desoldering tool, which is a low-power soldering iron with a hollow tip connected to a squeeze bulb. You squeeze the bulb, heat the joint to be desoldered and release the bulb, keeping the desoldering tip in place. Eureka! the sol-

der is sucked into the hollow tip by the vacuum created by releasing the bulb. It's a handy tool for less than \$10.)

Before you screw the case together and try out your new kit creation, stop! Make sure there aren't any extra components left over that you might have missed. Check the underside of the board for solder bridges and short circuits. Make sure that all the components are installed correctly, and that your diodes, transistors and any ICs are facing in the right direction. Check the wiring, especially for any polarity. Crossed wires can often lead to fried components when power is applied.

When you're done with the final inspection, carefully apply power and test it out! (The jargon for this is called a "smoke test.") Some units may require minor adjustments or alignment, but it should be nothing that you can't handle from the comfort of your shack.

If your kit doesn't work, check everything once again. When I'm really stuck, I'll have a friend take a look at it—he usually spots the error I've made right off the bat.

The Reward

So you're finished, and it works—congratulations! Not only do you have a fine example of your own handiwork to show off, you've also grown closer to the original magic of ham radio. Every time you use your new piece of equipment you'll be reminded of how it went together, and of the time and effort you spent on it.

Send your photos, cards, comments and so on to me at ARRL, Department PCN, 225 Main St, Newington, CT 06111. Good luck—I can already smell the solder....

Kit Suppliers

Note: The following list of kit suppliers is rather abbreviated. For a more complete list, see page 70 of August 1993 QST.

A & A Engineering
2521 W LaPalma, Unit #K
Anaheim, CA 92801
Tel: 714-952-2114

FAR Circuits
18N640 Field Ct
Dundee, IL 60118

Oak Hills Research
20879 Madison St
Big Rapids, MI 49307
Tel: 616-796-0920

Ramsey Electronics
793 Canning Parkway
Victor, NY 14564
Tel: 716-924-45606

624 Kits
171 Springdale Dr
Spartanburg, SC 29302
Tel: 803-583-1304

**HERE NO MAN
HAS GONE
BEFORE**



NEW

Shown with optional
TA100S antenna—Actual
frequency measurement shown
(not simulated).

**OPTOELECTRONICS' New
HandiCounters® are Light Years Ahead!**

**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.)

	3000A	M1
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'
OPTIONS		
Back light	standard	standard
TCXO ± .2ppm	\$100.	\$100.
PRICE	\$329.	\$229.

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.



A simple external antenna will boost your hand-held range dramatically.

and range. But, those telescopic whips are sometimes dangerous in crowds, so save them as a last resort when you are miles away from either your repeater or dispatch station.

When operating the handheld inside the vehicle, an external antenna WITH GAIN makes a major difference in your transmit capabilities. An outside whip, connected to flexible low-loss coax, will let you get out

of the area that normally you cannot hit with the unit and its little rubber antenna inside the vehicle. You must make certain you never strain the antenna connector on your handheld with the external coax cable. These connection points are fragile. If the antenna connector ever wiggles loose, it will instantly tear the soldered circuit board connection, and you are off the air until it's repaired. Always make sure your BNC antenna connector is tight, and never flexed.

Many times your handheld transceiver will begin to exhibit the sounds of intermodulation when hooked up to an outside antenna. This is normal. Your powerful mobile antenna is pulling in so many signals, they sometimes mix within the handheld's "front end" circuitry, leading to sounds coming over your speaker that really shouldn't be there. If you can operate your handheld on full decode squelch, the problem will disappear. But if you must monitor without tone squelch, you may need to run your squelch setting slightly higher than usual.

External power amplifiers are an important consideration to extend handheld transmit range. Choose a power amplifier that is type accepted for the radio service you are operating on—Part 90 for land mobile radio service, Part 80 for marine, Part 97 for ham, and Part 95 for G.M.R.S. Don't try to use a ham radio amplifier on land mobile frequencies. It is not type accepted, nor is it legal, nor will it usually work. Most ham amplifiers cut off abruptly at band edges, and if you try to run a 146 MHz amp up at 155 MHz, it will just chatter at you before it goes up in smoke.

The properly matched commercial power amplifier may also be tight enough in its internal filtering to help minimize intermodulation on receive over your handheld. This is good news—you can boost your output power from 5 watts to 60 watts, and cut your interference in half. Sixty watts output from the amplifier is usually within the limits of your license. Any more than 60 watts output is going to suck your vehicle's battery dry in no time, and any more than 60 watts output is going to put RF into all of your other onboard electronics and probably create more problems than what is gained with more power output. If you can't get out to your base station or other mobile units with 60 watts into a 6 dB high-band or UHF antenna system, you aren't going to do it with 160 watts either. Stay with power levels below 60 watts in your type accepted amplifier, and everything will be fine.

One of your most important considerations to realize is ham radio power amplifiers for 2 meters or 440 MHz will not perform electronically or legally beyond their pre-set band limits. Stay with the professional power amplifier, type accepted for your particular radio service, and you'll be all set for extended range with your little handheld. ■

The Television Gray Market

The truth about cable theft!

\$23.75

Exactly what you guessed about piracy of cable and satellite programming. Yes, YOU pay for those who steal services! This 160-page bestseller includes details about TV's underground businesses, chips and test devices, bootleg converters, and industry countermeasures. If cable bills bother you, this book is a MUST!

"An electronic underground is stealing billions..." *ELECTRONICS NOW*

"Information never before available..." *PALADIN*

"...high interest."

"Revealing," *BOOKWATCH*

BOOKLIST

Scanners Secret Frequencies

320 pages: everything you need but the scanner!

\$19.95

"...broad in scope and authoritative" *Bob Grove, Monitoring Times*

"Absolutely the best..." *Norm Schrein, "Mr. Scanner"*

"...indispensable tool..."

Steve Crum, President, Ace Communications

"...comprehensive, no nonsense..."

Bill Cheek, Editor, *World Scanner Report*

"...must reading..."

Brian Fenton, *Electronics Now*

The first comprehensive scanning handbook... for experts and beginners alike!

The Underground Database

\$23.75

This large-format book lists and discusses hundreds of underground sources for services and products that are legal to make, import, advertise, sell, buy, even own, but if you actually use them... look out!

"Fascinating," *American Survival Guide*

ORDER WHILE YOU CAN!

Credit card orders:
1-800-546-6707



FIRST AMENDMENT PUBLISHING
AT ITS BEST!

Money order or check: **INDEX Publishing Group**
3368 Governor Dr., #273F
San Diego, CA 92122

\$3 U.S., \$4 Canada, \$8 elsewhere per book for shipping. CA add sales tax. U. S. funds only.

CIRCLE 6 ON READER SERVICE CARD

BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Tower of Power: AM'er WWWT/1320, of Randolph, Vermont, was fined \$20,000 by the FCC for running more than its authorized night power. The station is licensed for 1 kW during the day, but must drop to 66 watts at night. The FCC claims that from May to September last year, WWWT operated around the clock at its full 1 kW power. In responding to the FCC, the licensee claimed that the power changeover should have been handled automatically by a computer driven system, but the system apparently had developed software problems. The station pointed out that it has maintained a good past record of compliance with the rules. The FCC's original complaint had charged WWWT with overpowered night operation dating back as early as September of 1991.

Radio Network Info: Westwood One combined its Westwood One Entertainment Network into its Mutual Broadcasting System and NBC Radio Networks.

Wet Blanket?: Blanketing interference occurs when an FM station's signal strength is so strong that it causes receivers near the transmitting antenna to be partially or completely blocked from receiving other stations. FCC regulations state that licensees must satisfy all complaints of blanketing interference received by a station during a one year period.

When Boston, Mass., station WMJX relocated and modified its facilities, a complaint was filed with the FCC by WVBF in Framingham, Mass. WVBF claimed that WMJX had violated the blanking rules.

An FCC investigation noted that there was interference, but it was a form of interference known as Receiver Induced Third Order Intermodulation Effect (RITOE). This is different than blanketing. If blan-

keting had been the problem, there would have been complaints from many stations and individuals. There had been no other complaints of interference. WVBF was the only party to complain.

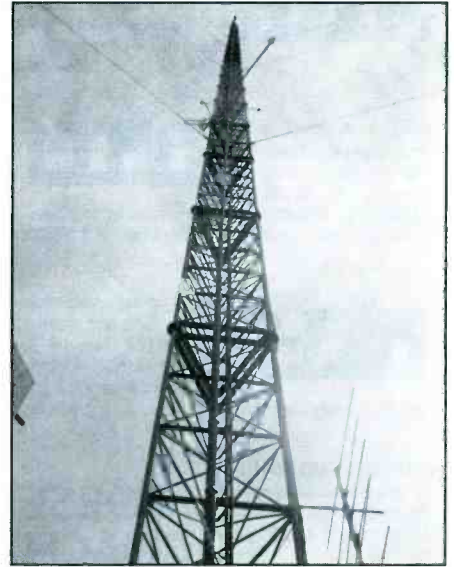
The FCC pointed out that, in any event, protection against blanketing interference is to protect FM listeners and TV views from these problems. The protection is not intended to ensure signal protection to other broadcasters. Hence, the WVBF complaint was not valid. In addition, there was no basis for overturning the WNJX license grant, even if RITOE-based service interruptions to WVBF had occurred.

Not On The Up & Up?: Station WOAB-FM, of Ozark, Ala., petitioned the FCC to allow FM stations to operate with vertical polarization only. FCC regulations require that all commercial FM stations use either horizontal polarization, or a combination of horizontal and vertical. Vertical alone is not allowed.

WOAB-FM contended that most FM receiving antennas are vertical, so horizontally polarized signals are a waste of power. The FCC said that WOAB-FM did not submit any studies to support their contention. The overwhelming number of FM equipped cars and FM portables should have made it abundantly apparent to the FCC what they were driving at.

WOAB-FM felt that switching over to all-vertical would allow FM stations to operate at lower transmitter power, consume less energy, and still provide the same coverage. The FCC dismissed the proposal. The only reason offered for rejecting the concept (FCC Report No. MM-755) was, "no useful purpose would be served by proceeding further in this matter."

AM Directional Antenna Arrays: The



The tower at WBLM-FM/103.7, Murray, Kentucky. This tower is more than 700 ft. tall and is also used for cellular phone service. (Sent in by Chris Adams, Murray, Kentucky.)

FCC is thinking that its AM broadcast regulations relating to directional antennas might do with some tweaking. They would like to eliminate any redundant, outmoded, or unnecessary rules, as well as any rules that pose a significant burden on licensees, although they don't want to sacrifice any of the benefits of control over interference (especially during night hours). The agency is aware that there are advances in antenna analysis methods and instrumentation technology that could be reflected in the regulations.



A sticker from AM station 8HA, Alice Springs, Australia. (Submitted by Gary R. Spurway, N.S.W., Australia.)



Great looking sticker from KBNN/100.1, northern San Diego County, Calif. (Thanks To Cary or Gary, and we couldn't make out the last name, of La Mesa, Calif.)

COMMODORE® USERS

SWL

SWL: A receive only cartridge for CW, RTTY (Baudot & ASCII) for use with Commodore 64/128. Operating program in ROM.....\$69.95

ART-1: A complete interface system for send and receive on CW, RTTY (Baudot & ASCII) and AMTOR, for use with the Commodore 64/128 computer. Operating program on disk included...\$199.00

ART-1

AIR-1

AIR-1: A complete interface system for send and receive on CW, RTTY (Baudot & ASCII) and AMTOR, for use with Commodore VIC-20. Operating program in ROM.....\$99.95

MORSE COACH: A complete teaching and testing program for learning the Morse code in a cartridge. For C64 or C128.....\$49.95 VEC SPECIAL.....\$39.95

MORSE COACH

G AND G ELECTRONICS
OF MARYLAND

8524 DAKOTA DRIVE
GAITHERSBURG, MD 20877
(301) 258-7373



CIRCLE 62 ON READER SERVICE CARD

CABLE TV DESCRAMBLERS

Best Prices in the U.S.A.!!
Guaranteed to Work!

WE WILL BEAT ANY PRICE!



JERROLD PANASONIC
SCIENTIFIC ATLANTA PIONEER

The Newest & the Latest

DMTB-A - all Jerrold Impulse & Starcom series
SA3-DFA - all Sci. Atlantas incl. 8536, 8536+, 8580, Drop-field
PN-3A - all Pioneer systems

ALSO

FTB3, SA3, TZPC145G

24 HOUR SHIPMENTS
30 DAY MONEY BACK GUARANTEE
FREE CATALOG & INFORMATION

1-800-772-6244

M-F: 9-6 EST

U.S. Cable TV, Inc. Dept.: KPC113
4100 N. Powerline Rd, Bldg. F-4 Pompano Beach Fl 33073
NO FLORIDA SALES!

CIRCLE 81 ON READER SERVICE CARD

Applications Filed to Construct New FM Stations

AL	Repton	101.1 MHz	4.1 kW
AR	Mountain Pine	101.0 MHz	6 kW
CA	Arvin	92.5 MHz	
CA	Gridley	101.5 MHz	
FL	Clermont	88.7 MHz	1 kW
FL	Lacrosse	99.5 MHz	4.2 kW
IA	Decorah	104.7 MHz	4.5 kW
IL	Carlyle	96.7 MHz	6 kW
IL	Dwight	98.9 MHz	3 kW
IL	Oregon	106.1 MHz	3 kW
IN	Ferdinand	98.5 MHz	8 kW
IN	Walton	93.7 MHz	8 kW
IN	Winamac	100.7 MHz	6 kW
KS	Silver Lake	92.5 MHz	6 kW
LA	Mamou	92.5 MHz	6 kW
LA	Ruston	99.5 MHz	6 kW
MI	L'Anse	106.1 MHz	3.1 kW
MO	Point Lookout	91.7 MHz	2 kW
MS	Bruce	94.5 MHz	4.5 kW
ND	Bismark	98.7 MHz	100 kW
NY	Brighton	94.1 MHz	
NY	Lakewood	106.9 MHz	25 kW
OH	Clarksfield	90.7 MHz	3 kW
OH	McArthur	98.7 MHz	6 kW
OR	Myrtle Point	94.1 MHz	2.2 kW
SD	Madison	91.1 MHz	230 watts
TX	Big Snady	90.7 MHz	10 kW
TX	Jourdantown	95.7 MHz	6 kW
UT	Richfield	97.05 MHz	31.7 kW
WA	Wenatchee	89.9 MHz	6 kW
MY	Newcastle	99.3 MHz	8 kW

Permits Issued to Construct New FM Stations

AK	Houston	94.3	6 kW
CA	Monitcello	92.3 MHz	363 watts
CA	Felton	93.7 MHz	656 watts
CA	Tulelake	96.5 MHz	1.8 kW
FL	Jupiter	99.5 MHz	3 kW
GA	Douglas	92.5 MHz	6 kW
IA	Epworth	97.3 MHz	20 kW
IA	New Sharon	99.9 MHz	25 kW
IL	Urbana	93.5 MHz	6 kW
MI	Sandusky	90.7 MHz	
NY	Plattsburgh	102.5 MHz	3 kW
NY	Westhampton	98.7 MHz	6 kW
OH	Delhi Hills	90.1 MHz	16 kW
OH	Reading	89.3 MHz	340 watts
PA	Newmarket	103.3 MHz	2 kW
TX	Big Spring	94.3 MHz	25 kW
TX	Crystal Beach	101.5 MHz	25 kW
TX	Odessa	107.7 MHz	49 kW
VA	Edinburg	88.3 MHz	1 kW

Applied to Change AM Frequencies

KNOW	Minneapolis, MN	1330 kHz seeks increase to 9.7/1.5 kW
WBRD	Pompano Beach, FL	1470 kHz seeks increase to 50 kW days
WCCF	Punta Gurda, FL	1580 seeks increase to 350 watts
WEXS	Patillas, PR	610 kHz seeks daytime drop to 250 watts

Interested parties are invited to review the AM broadcast service directional antenna regulations and evaluate which should be amended or deleted, in whole or part. The FCC wants to know. For further info, contact Joseph M. Johnson, FCC Mass Media Bureau, (202) 632-9660.

Airchecks Wanted: One of our readers is seeking airchecks of high school radio stations. He tells us that he is willing to supply the cassettes and return postage, or swap stickers to make up the cost. If you can do this, contact: Christopher Cuomo, 670 Third Avenue, Verona, PA 15147.

Changed AM Facilities

KAAB	Batesville, AR	1130 kHz added nights, 20 watts
KKVV	Las Vegas, NV	1060 kHz added unlt. hrs., 5 kW/43 watts
KOJY	Costa Mesa, CA	540 kHz operate days only, drop to 240 watts
KRVA	Fort Worth, TX	1600 kHz add synchronous transmitter
WBOW	Terre Haute, IN	1230 kHz move to 640 kHz
WKKQ	Nashwauk, MN	650 kHz increase nights to 1 kW
WMID	Atlantic City, NJ	1240 kHz drop to 870 watts
WNWZ	Germantown, TN	1430 kHz drop daytime to 2.5 kW
WSOL	San German, PR	1090 kHz move to Mayaguez
WVNE	Leicester, MA	760 kHz increase daytime to 25 kW

Applied to Change FM Frequencies

KBST	Big Spring, TX	95.7 MHz seeks 95.9 MHz, 8 kW
KOKE	Giddings, TX	104.3 MHz seeks 101.5 MHz
KSFH	Mountainview, CA	90.5 MHz seeks 88.1 MHz
KULE-FM	Ephrata, WA	95.9 MHz seeks 92.3 MHz, 20 kW
WJEZ	Pontiac, IL	103.1 MHz seeks 93.7 MHz

Changed FM Frequencies

KCFB	Sioux Falls, SD	100.1 MHz moved to 94.5 MHz
KZBK	Brookfield, MO	97.7 MHz moved to 96.9 MHz, 27.5 kW
WPTS-FM	Pittsburgh, PA	98.5 MHz moved to 92.1 MHz
WSOS	St. Augustine, FL	105.5 MHz moved to 94.1, 19 kW

Cancelled

KBIX-FM	Wagoner, OK	102.1 MHz
KMXO	Merkel, TX	1500 kHz
KOSY	La Monte, MO	97.1 MHz
KSKD	Sweet Home, OR	107.1 MHz
WCKX	London, OH	106.3 MHz

Requests for Changed AM Call Letters

Now	Seeks	
KQIK	KRIT	Lakeview, OR
KSEK	KPHN	Pittsburgh, KS
WFBL	WDCW	Syracuse, NY
WHIL	WMFA	Raeford, NC
WRNL	WRVH	Richmond, VA

Changed AM Call Letters

New	Was	
WBDN	WEND	Brandon, FL
WBFX	WBOW	Terre Haute, IN (1230 kHz)
WCLQ	WEDE	Eden, NC
WCNZ	WKTZ	Sheboygan, WI
WKLV	WBBC	Blackstone, VA
WLWA	WKRC	Cincinnati, OH
WOGY	WEZI	Memphis, TN
WPBS	WPBE	Conyers, GA
WPIQ	WMJX	Brunswick, GA
WWZN	WPRD	Winter Park, FL

Requested to Change FM Call Letters

Now	Seeks	
KQIK-FM	KCTL	Lakeview, OR
WBEY	WRFK	California, MD
WBPS	WYFW	Winder, GA
WDJK	WZLR	Xenia, OH
WLTO	WCMW-FM	Harbor Springs, MI
WOKD-FM	WKGF-FM	Arcadia, FL
WQMB	WBLU-FM	Grand Rapids, MI
WYAM	WTAK-FM	Hatselle, AL

New FM Letters Issued

KACX	Des Moines, IA
KADD	Laughlin, NV
KADF	Horton, KS
KSDM	Odessa, TX
WADD	Fenwick Island, DE
WADF	Starkville, MS
WADP	Oxford, AL
WADT	Brandon, VT
WADW	Pickford, MI
WECB	Seymour, WI
WCLW	Eden, NC
WCNZ	Sheboygan, WI
WJFL	Tenille, GA
WJIK	Binghamton, NY
WKPW	Knightstown, IN
WNTC	Chandler, IN
WREI	Kissimmee, FL
WSKY-FM	Biltmore Forest, NC

Radio With a Bite: According to a news clipping sent in by regular contributor Elmer Wallasin, of LaGrange Park, Illinois, *Radio Fugue FM*, of Compiègne, France, is broadcasting a 16 kHz audio signal along with its regular programming. The station said this signal will chase away female mosquitoes, which are the ones that bite. According to the station, mosquitoes hate this frequency. The signal can't be detected by the station's human listeners.

Elmer, you wouldn't kid us, would you? What happens if the mosquitoes are listening to other stations? We say, it would have been a lot easier for *Radio Fugue FM* to forget the ultrasound and just give the skeeters a few day's steady diet of *Achy, Breaky Heart*.

Achy, Breaky Budget: We always get letters from readers asking what kind of money they can expect to make if they try to break into broadcasting. I recently met a neophyte TV news reporter at a medium-sized station. This is a job with a schedule that requires working six days per week. The pay rate is \$11,000 per year. Yet there are people waiting to get these jobs! As I have said before, if how much money you're going to make is the first thing you want to know about, then consider that broadcasting may not be your industry.

Now For The Big Bucks: But enough talk of pocket money. How much do you



KJZZ/91.5, Phoenix, Ariz., has a bumper sticker that looks like a license plate. (Thanks to Steve Walkowski, N7TXS, Arizona.)

Changed FM Call Letters

New	Was	
KELE	KTJA	Mt. Vernon, OH
KGCA	KABG	Prescott, AZ/KGFYKKN
KSTZ	KRNQ	Des Moines, IA
KWYO-FM	WLWD	Sheridan, WY
WAVQ	WABU	Inglis, FL
WCDJ	WTUR	Truro, MA
WGMZ	WZJV	Glencoe, AL
WJMN	WZOU	Boston, MA
WKFM	WKGW	Utica, NY
WKHI	WWTR-FM	Bethany Beach, FL
WKTF	WKQB	Jackson, MS
WLXP	WVDP	Marion, SC
WOGY-FM	WOGY	Germantown, TN
WPLB-FM	WRIZ-FM	Lakeview, MI
WSNV	WPRG	Howland, ME
WYCT	WXLT	Kentwood, LA
WZAN	WXNL	Baraga, MI

think you would pay to buy a radio station? Los Angeles station KROQ-FM purchased rival station KRTH-FM. The price was a staggering \$110-million, believed to be the record sale price for a station.

Now both stations are owned by New York-based Infinity Broadcasting, owners of New York's WFAN/WZRC/WXRK, and many other stations around the nation. Two of the popular air personalities under contract to Infinity include Howard Stern and Don Imus.

KRTH-FM has been operating since 1941, making it one of the oldest FM

broadcasters still active, and highly profitable at that. It is one of the top grossing stations in the USA. While KRTH-FM has a lock on the over-25 audience, the KROQ-FM appeal is to younger listeners.

This information from W. R. McIntosh, Granada Hills, Calif.

Thank you, Mac, for all of the interesting data!

More Than One Way: Steve Walkowski, N7TXS, of Flagstaff, Ariz., tells us that he had been listening to two of his favorite NPR programs via the KJZZ shortwave relay, which is located in the Phoenix area.

A religious station came on and knocked it off the air. Steve says a new microwave went up on top of a 9,600 ft. mountain near him and should enable him to hear these programs with ease. He thanks Station Engineer Dennis Gilliam for making this microwave relay a reality.

In the mean time, Steve realized that his two favorite programs were also carried over AM station KUAT, Tucson. It's a 50 kW station, but it's still 300 miles distant from Flagstaff. Steve was able to pull KUAT in, however, and wrote to tell them so.

Responding to Steve's letter, KUAT's CE, Tom Boone, mentioned that the station used a Harris MW-50A transmitter fed into a 383 ft. base-fed vertical radiator. KUAT operates on a daytime-only to protect a station in Mexico. The cost of installing a directional array would be prohibitive for the KUAT, which is owned by The University of Arizona.

It All Adds Up: There are 4,949 AM stations licensed by the FCC; 4,879 Commercial FM stations; 1,620 Educational FM stations. Furthermore, there are 2,002 FM translators and boosters.

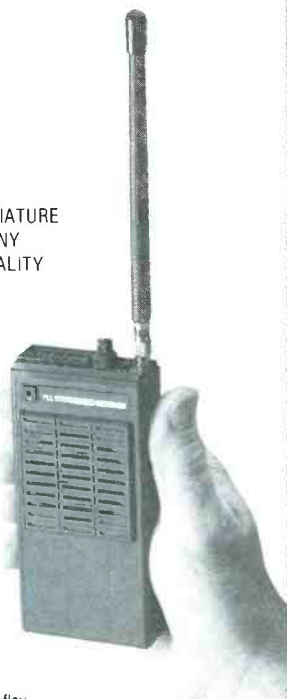
In addition, there are 681 VHF TV stations, plus 835 UHF stations. Add to this 1,352 LPTV stations, and another 4,799 TV translators.

Later: Please send along your news clippings, station decals and bumper stickers, AM/FM station photos, questions, comments, and whatever you have relating to broadcasting. ■

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 58 ON READER SERVICE CARD

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

CIRCLE 76 ON READER SERVICE CARD

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

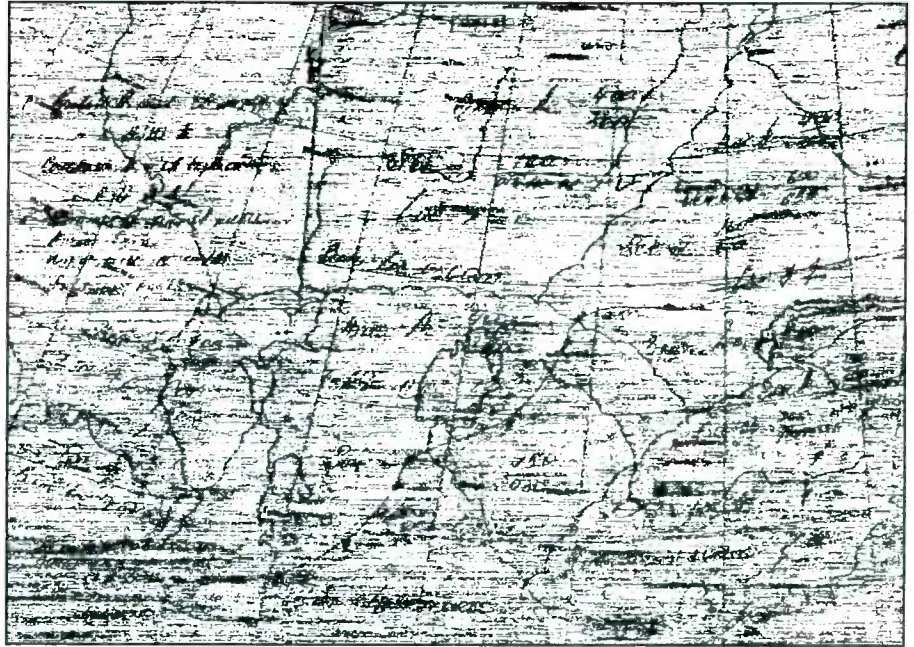
Robert Hall of South Africa, a regular contributor of RTTY loggings to this column, has become an armchair meteorologist, and this month he tells us the ups and downs he met in becoming one.

"Popular interest in weather has grown enormously in recent years as the technology has improved to provide pretty pictures in newspapers, on the television screen, and, for the hobbyist, via satellite transmissions to a dish on the roof and expensive equipment in the shack," Hall writes. "As an RTTY monitor with over a thousand fresh frequencies in the database, I am finding it harder to discover new stations and recently decided to expand into the weather scene."

He said he read articles and advertisements in several hobbyist publications, including *POP'COMM*, and it seemed "that the way to go was the satellite route... I bought 'The Satellite Experimenter's Handbook' (by Martin Davidoff, K2UBC, published by The American Radio Relay League—Ed.), became an AMSAT member, and acquired the PC WEFAX package (PC GOES/WEFAX 3.0, Software Systems Consulting of San Clemente, Calif.—Ed.), an SVGA video monitor, and an expensive active antenna. Also, the PC Instanttrack program was purchased and installed to tell me where the satellites were. All this was connected to a Kenwood RZ-1, and there on the screen came up all sorts of smudges, clouds, and rounded shapes, which might have been the edges of our world—or the backside of a cow! Amazing! All this for several thousand bucks!"

"More research indicated that I needed to spend many more thousands of bucks on a (satellite) dish and equipment to receive Meteosat and other weather satellites, to see, perhaps, something interesting on the screen. At this stage I began to experiment with the new SYNOP 2 package developed by ICS Electronics of England. This uses the RTTY meteo signals transmitted by the many meteo stations around the world on shortwave radio. The meteo codes are decoded by SYNOP 2 to provide a number of picture options on screen and in color, i.e., rainfall, clouds, wind, airpressure, temperature, aircraft reports, visibility, etc. There are also over 17 map options which allow one to focus in on selected geographical areas of Europe and the North Atlantic, but not elsewhere at the moment," Hall says.

"SYNOP 2 consists of two floppy disks, a demodulator which plugs into the serial port of a personal computer, and an excellent manual. It costs only \$232 or 150 British Pounds in the U.K. (computer and monitor sold separately—Ed.), which is un-



Weather chart, with Cyrillic notations, is from RIJ75, Tashkent Meteo, Uzbekistan. (From Robert Margolis.)

teen thousands of bucks cheaper than going the serious satellite route—and pretty pictures are almost guaranteed!" Hall continues.

"Just announced is a synoptic decoder made by ERA Electronics England. Like SYNOP 2, this uses the HF meteo signal stream which it decodes into plain English. No pretty pictures, but fast, simple and informative, and it has no geographical limitations. I have over 100 meteo frequencies in my database, but by using only Pretoria, Dakar, and Nairobi, one can cover the whole African continent. Add on Bracknell for Europe, Cairo and Jeddah for the Middle East, and India and Tokyo for the Far East. That's some coverage for a cost of only \$155, or 100 British Pounds in the U.K.," Hall says.

I gather from Hall's complaint about how expensive he found it could be to monitor weather satellites that he was talking about the GOES/METEOSAT satellites found on the S-Band between 1691.0 and 1694.5 MHz. A little more than a year ago, I became interested in installing a similar system, with a four-foot-diameter dish antenna on the roof. But when I learned the costs of the dish and all the other needed equipment: fax demodulator and software, scanning satellite receiver, downconverter, power supply, and coaxial cable—all sold separately—I got turned off to the idea. Also adding to the cost are a personal computer and video monitor, but I already had them. So I agree with Hall's assessment

and find that it would cost at least 3,000 greenbacks just to monitor one or two weather satellites.

I decided instead to be content in getting weatherfaxes from the NOAA and METEOR weather satellites, which are found transmitting between 137 and 138 MHz, frequencies that are found on many VHF/UHF scanning receivers. I have a dish-cone antenna on the roof. The scanner is hooked up to a fax decoder, which is connected to a dot matrix printer. Reception is quite good and the price is for this entire system is well under \$1,000. Some day, if I can find time, I plan to replace the dish-cone antenna with a turnstile antenna to improve weather satellite reception.

I'm aware of the ICS-SYNOP II and the ERA Synop Decoder that Hall wrote about. I've been hemming and hawing for some time now about getting those items for myself. I'll let you know if I do.

Meanwhile, I've received word while writing this column that the Wavecom W-4100 Data and Telegraph Analyzer I ordered in April from Switzerland has arrived at the airport near me, and it'll be delivered to me in a few days, once it clears U.S. Customs.

This thing's the size of a personal computer, folks. It comes with four MB RAM, expandable to eight MB, and has a graphics system processor, a 32-bit CMOS processor, and a clock speed of 50 MHz at 166 ns. It decodes Baudot, ASCII, Sitor-A, Sitor-B, Morse Code, Packet Radio, radio-

fax at all the frequently used drum speeds and IOC's, ARQ-E, ARQ-E3, ARQ-N, ARQ-M2-342, ARQ-M2-242, ARQ-M4-342, ARQ-M4-242, DUP-ARQ, POL-ARQ, Twinplex, ARQ-S, SWED-ARQ, ARQ6-90, ARQ6-98, HC-ARQ, FEC-A, FEC-S, Autospec, Spread-11, Spread-21, Spread-51, HNG-FEC, ROU-FEC, Info 300 Baud, POCSAG, Golay, ACARS, ATIS, Pactor, Piccolo, CIS modes, RAC-ARQ, RS-ARQ, SSTV, and Hell Systems. Alphabets include Bauer, Cyrillic, Arabic, and Greek. VGA monitor and printer are not included. Cost: Around that of a small new automobile.

On several days in June and July I came across NMF, Boston Coast Guard Station, Mass., with all kinds of routine traffic to NRCB, the Barque "Eagle" (WIX-327). Many different frequencies were used, two of which appear in this month's RTTY Intercepts section.

Some background about the "Eagle" was featured in the Utility Notes column of Shortwave Radio Today, a monthly publication of the shortwave radio listener's club, SPEEDX (The Society to Preserve the Engrossing Enjoyment of DXing).

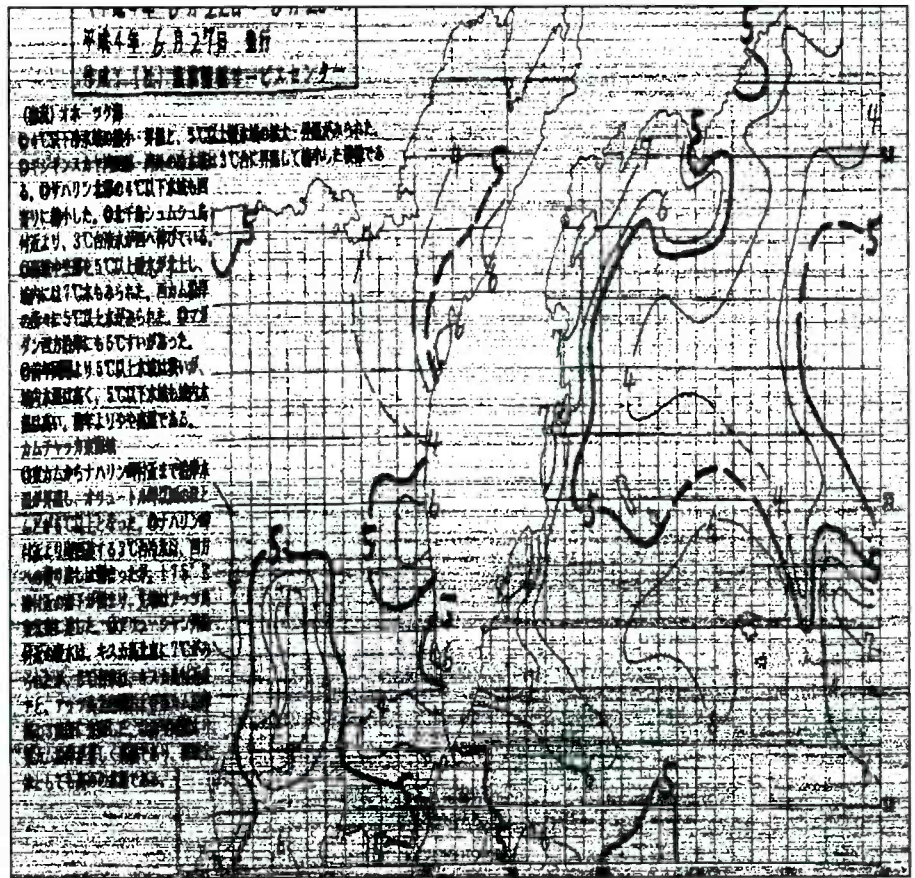
Ute columnist Rick Baker wrote, "Eagle is the largest tall ship flying the Stars and Stripes and the only square-rigger in U.S. Government service (the U.S. Coast Guard is run by the U.S. Dept. of Transportation—Ed.). It is the seventh Coast Guard cutter to bear the name in a proud line dating back to 1792.

"The (present) ship was built in 1936 by the Blohm and Voss Shipyard, Hamburg, Germany, and commissioned as "Horst Wessel," one of the three sail-training ships operated by Nazi Germany to train cadets for the growing German Navy. Following World War II, it was taken as a war prize by the United States, and a Coast Guard crew, aided by the German crew still on board, sailed the tall ship in 1946 from Bremerhaven to its new home port in New London, Conn.

"Eagle now serves as a seagoing classroom for the future officers of the U.S. Coast Guard. A seasoned permanent crew of five officers and 30 enlisted personnel maintains the ship year round. To maneuver Eagle under sail, the crew must handle more than 22,000 square feet of sail and five miles of rigging. Over 200 lines control the sails and yards. When in home port in New London, Eagle rests alongside a pier on the Thames River at the U.S. Coast Guard Academy."

If you would like to be a SPEEDX club member and receive "Shortwave Radio Today," which has RTTY and fax listings, write for information to the club at P.O. Box 196, DuBois, PA 15801-0196.

Correction: In the December, 1992, column there was a list of callsigns given for a RTTY net on 20148.2 kHz between the United States and Central and South America, headed by ACC60, U.S. Army,

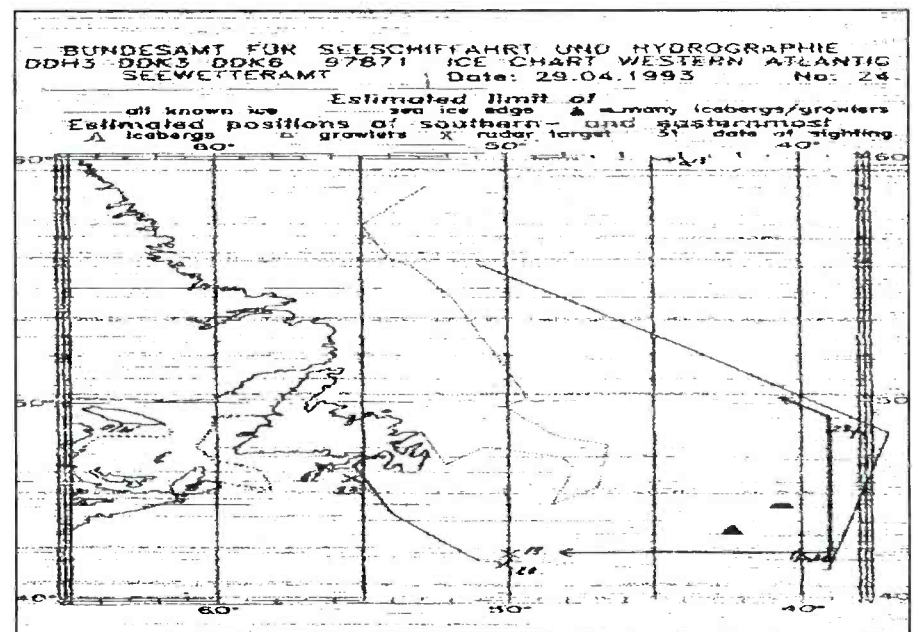


Weatherfax chart from JJC, Tokyo Radio, Japan. (From Robert Margolis.)

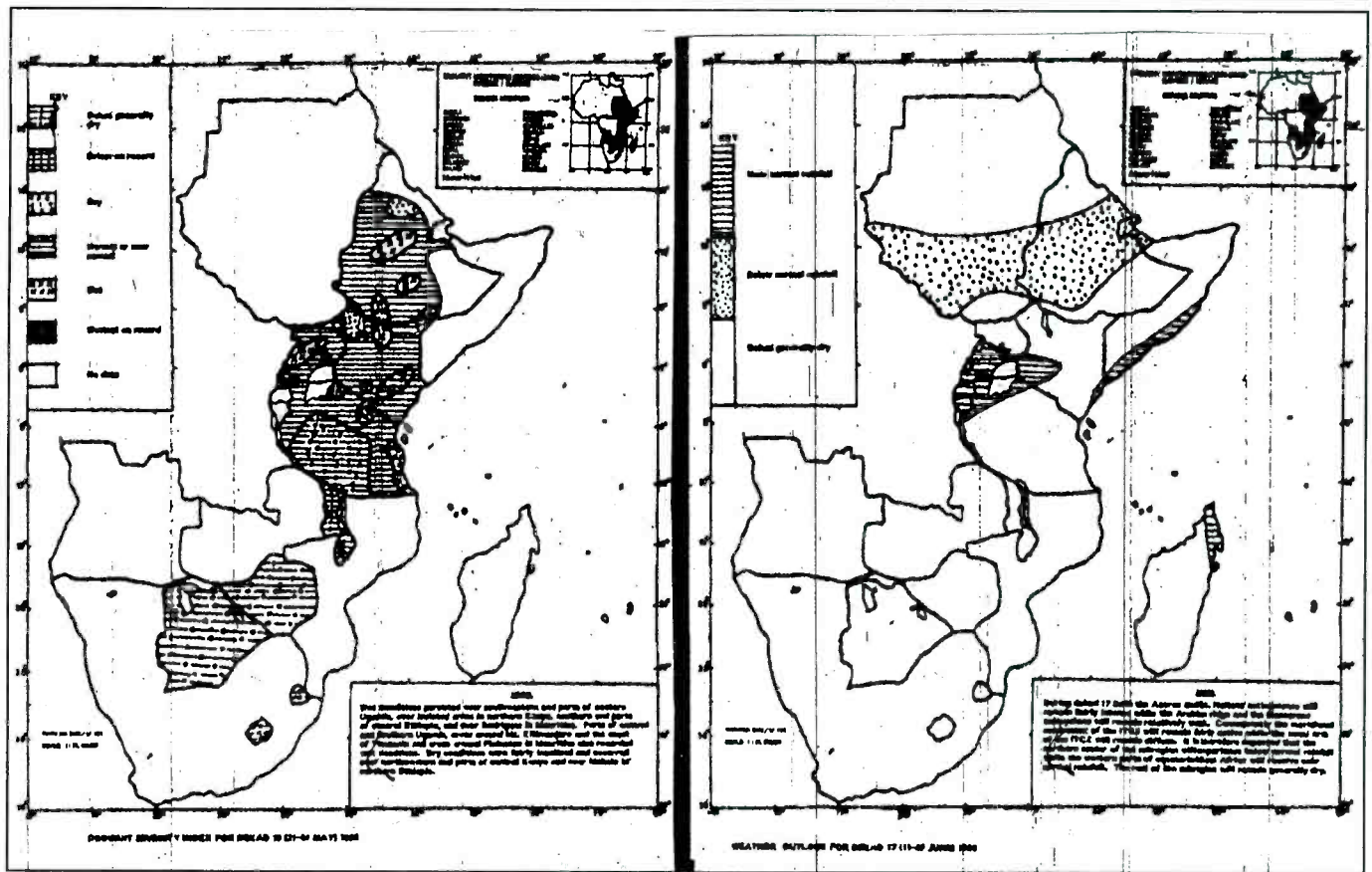
Fort Detrick, Md. Some of the callsigns were erroneous and were listed that way on FCC lists I consulted. I monitored the net for several days this past July and now have a more reliable list than the other one.

The callsigns are LTA46, Buenos Aires,

Argentina; CPEM, La Paz, Bolivia; PTO-2, Brasilia, Brazil; HIR-4, Santo Domingo, Dominican Republic; HCE-24, Quito, Ecuador; HK3-EJC, Bogota, Colombia; DECA2 and DECA3, Guatemala City, Guatemala; CVL-5D, Montevideo, Uru-



Ice chart, Western Atlantic, was issued by DDK6, Pinneberg Meteo, Germany. (From Robert Margolis.)



Two-panel chart from 5YE, Nairobi Meteo, Kenya. (From Robert Hall of South Africa.)

guay; YWH-3, Caracas, Venezuela; SAL-1, San Salvador, El Salvador; HREY-2, Tegucigalpa, Honduras; CAW-2J, Santiago, Chile; ZPX and ZPQ-5, Asuncion, Paraguay; and PRU-6S, Lima, Peru.

Other cities and callsigns mentioned in the December list are not on the new one. Either they're no longer part of the net or weren't being contacted on those days in July when I monitored the net.

The sunspot count remained low throughout July as the RTTY signal drought on shortwave radio was well into the fourth month. As mentioned last month, it was a rare occasion when a European utility station could be heard, while the signals of some African and Asian stations managed to slip through the ether.

Suddenly, on Fri., July 23, a downpour of European RTTY signals was loudly heard at The RTTY Ranch at around 1200 UTC. In less than 25 minutes time I came across eight European transmissions between 14480.0 and 14592.0 kHz. Switching over to higher frequencies, including some that had been virtual barren wastelands since March, I heard a bevy of other EuroRTTY stations. But, alas, my monitoring effort was cut short that day when I learned at around 1315 UTC of a plane crash in my area, and I spent a few hours listening to police, fire, and ambulance calls on my VHF/UHF scanner radio.

Stax of Fax Dept.: Naveastocencen, Norfolk, Va., has stopped sending the redesigned radiofax transmission schedule it broadcasts at 0000 UTC, and has reverted back to the one it had been using until April. I mentioned the redesign in the August column, saying that the type size was so small that one needed a magnifying glass to read it. Around the middle of July I saw that the older, larger type style was back in use.

CNA, Taipei, Taiwan, runs news in Chinese via radiofax at 0800 and 1500 UTC, on 9430.0, 13766.0, 14685.0, 15878.0, 19680.0, and 22850.0 kHz.

RTTY Intercepts

- 123.7:** DCF42, PIAB, Mainflingen, Germany, testing at 1435, FEC-A/96. (Ary Boender, NLD)
- 518.0:** GNI, Niton R., England, w/Navtex B/C at 1218. PBK, Netherlands CG, w/Navtex B/C at 1948. Both in FEC. (Boender, NLD)
- 3172.5:** IMB1, Rome Meteo, Italy, w/coded wx, 50 baud at 0050. (Boender, NLD)
- 3196.0:** Prague Meteo, Czech Republic, w/coded wx at 2112, 50 baud. (Boender, NLD)
- 3231.5:** DHJ57, Kiel Meteo, Germany, w/coded wx at 2015, 100 baud. (Boender, NLD)
- 3279.0:** AJE, USAF, Croughton AB, England, w/coded wx, 100 baud at 0025. (Boender, NLD) Are you sure it was 100 baud, Ary? The USAF usually sends its wx at 850/75—Ed.3302.0. DHN37, Grefel Meteo, Germany, w/plaintext wx in EE & GG, 100 baud at 2200. (Murray Lehman, AUS)
- 3452.0:** "13" (Irish Defense Forces) w/5L grps to "OA," ARQ at 2250. (Boender, NLD)
- 3582.0:** FDY, French AF, Orleans, France, w/

- RURY & "le bricks," 50 baud at 2315. (Boender, NLD)
- 4015.0:** AFA7JH, USAF MARS, unident QTH, w/kg AGA7BI, Bitburg, Germany, Packet at 2024. AEM1FGT, U.S. Army MARS, Hanau, Germany, to beacon, Packet at 2028. AEM1FKT, U.S. Army MARS, Frankfurt, Germany, to beacon and AEM5USA, Packet at 2028. AEM5USA, U.S. Army MARS, unident QTH, to beacon, Packet at 2029. (Boender, NLD)
- 4213.5:** DCL, Norddeich R., Germany, w/tfc list at 2000, FEC. (Boender, NLD)
- 4489.0:** GFL26, Bracknell Meteo, England, w/coded wx at 2010, 50 baud. (Boender, NLD)
- 4583.0:** DDK2, Pinneberg Meteo, Germany, w/coded wx, 50 baud at 2008. (Boender, NLD)
- 4601.5:** Un-ID w/YGB c/s sending unreadable msgs, FEC at 1845. (Boender, NLD)
- 4602.0:** "OA," Irish Defense Forces, Dublin, Ireland, w/TAR's, TAF's & 5L msgs to "CVVO," ARQ at 2018. "CVVO," Irish Defense Forces, unident QTH,

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

w/airfield listings to "0A," ARQ at 2135. "93" of the Irish Defense Forces w/coded msgs to "0A" at 2100. "XVQV," Irish Defense Forces, unident QTH, w/5L grps to "0A" at 2145; QSY on 3452.0 kHz. "XSFC," Irish Defense Forces unident QTH, w/5L grps to "CVVO" at 2238. "3," Irish Defense Forces, unident QTH, w/5L grps & FXTN EGRR wave prognoses to "89" at 2220. (Boender, NLD) "CVVO," "XVQV," & "XSFC" appear to me to be selcals. Are they, Ary?—Ed.5233.2. AJE. USAF, Croughton AB, England, w/coded wx. 850/75 at 0117. (Ed.)

6265.0: UVMX, the Russian merchant ship "Kashira," wkg Arkhangelsk Radio at 1748. ARQ. (Boender, NLD)

6475.0: HCYZ, UNHCR, Zagreb, Croatia, w/msgs & Reuter nx re Bosnia, to HCMP, UNHCR, Pristina, at 1935. ARQ. (Boender, NLD)

6825.0: AJE, USAF, Croughton AB, England, w/coded wx for North Africa & Europe. 75 baud at 2030. (Boender, NLD)

6853.0: VLC, OTC, Mawson Base, Antarctica, w/coded wx to JGX, Syowa Base, at 1330, ARQ-M2/96, ch. B. QSX is on 8186.0 kHz. (Lehman, AUS)

7658.0: YZD, Tanjug, Belgrade, Yugoslavia, w/nx at 2150. 50 baud. (Boender, NLD)

7672.5: MTO, Royal Navy, Rosyth, Scotland, w/available channels list, 850/75 at 0255. (Ed.)

7713.2: TJK, ASECNA, Douala, Cameroon, w/coded wx at 0024. ARQ-M2/96, ch. A. (Ed.)

7855.0: ROK24, Moscow Meteo, Russia, w/coded wx, 50 baud at 0110. (Zacharias Liangas, GRC) Welcome to the column. Zach. Hope to hear from you often—Ed.7931.8. CCS, Santiago Navrad, Chile, w/RYRY & SGGG to CXR, Montevideo, Uruguay, foll by msg saying QSY 18990.0 kHz within 30 mins. to receive t/c. Was 850/75 at 0215. (Ed.)

8263.7: Un-ID w/5F msgs. no words between msgs, 500/50 at 0224. Stops sending at 0230 while msg in progress. To CW at 0231. Returns at 0232 & resends interrupted msg foll by another msg that was interrupted w/a CW msg at 0237. CW msg was in 5 alphanumeric grps using full nbrs 3456789 & cut nbrs ANDURIT. Went QRT 0244. I think this is MFA, Havana, Cuba, for 3 reasons: 1) it mostly uses a 500-Hz RTTY shift. 2) interrupted coded RTTY msgs have been seen regularly on other diplo channels used by Havana. & 3) I've seen the Cuban MFA using CW in the past for sending coded grps in alphanumeric or in 5F using the ltrs ANDUWRIGMT as cut nbrs. (Ed.)

8302.8: LOR, Puerto Belgrano Navrad, Argentina, w/radio advisories in SS & a 5L msg, 170/75 at 0112 (Ed.) & w/5L grps at 0523. (Robert Hall, RSA)

8427.0: OXZ, Lyngby R., Denmark, w/nx in Danish, FEC at 0045. (Hetherington, Fla.)

8454.0: UJY, Kaliningrad R., Russia, w/t/c at 2158, 50 baud. (Boender, NLD)

8549.0: UXN, Arkhangelsk R., Russia, w/t/c list, FEC at 2210. (Boender, NLD)

8677.5: URD, St. Petersburg R., Russia, w/msg in EE to M/V Komsomolets Latvii, ARQ at 2140. (Boender, NLD)

8703.0: UXN, Arkhangelsk R., Russia, w/ nav-area warnings, 100 baud at 0735. (Boender, NLD)

8706.0: MTO, Royal Navy, Rosyth, Scotland, w/available channels list, 75 baud at 2152. (Boender, NLD)

9136.0: TTL52, ASECNA, N'djamena, Chad, w/Metar + "ch" at 2240. ARQ-E3/48. (Lehman, AUS)

9190.0: RDZ75, Moscow Meteo, Russia, w/coded wx, 50 baud at 0055. (Liangas, GRC)

9343.0: MKK, RAF, London, England, testing, 50 baud at 0050. (Liangas, GRC)

9417.0: BZP59, Xinhua, Yuryumqi, China, w/nx in EE. 75 baud at 1920. (Boender, NLD)

9924.7: RFLIG, French Navy, Cayenne, French Guiana, relaying "control de voie" msg from Paris back to Paris at 0915. ARQ-E3/192. (Hetherington, Fla.)

10150.0: SUA246, MENA, Cairo, Egypt, w/nx at 1850, 75 baud. (Boender, NLD)

10215.0: HZN48, Jeddah Meteo, Saudi Arabia, w/coded wx. 100 baud at 1900 (Boender, NLD), & at 0050. (Liangas, GRC)

10493.7: RFTJF, French Forces, Port Bouet, Ivory Coast, relaying a citation from French Pres. Francois Mitterand to French Army posts worldwide on Bastille Day (July 14). Was ARQ-E3/48 at 2111. (Ed.)

11039.0: DDH9, Pinneberg Meteo, Germany, w/RYRY at 2015. 50 baud. (Liangas, GRC)

12228.4: BZR62, Xinhua, Yuryumqi, China, w/nx in EE at 1559, 425/75. (Ed.)

12741.0: HWN, Paris Navrad, France, w/RYRY, 450/50 at 0000. (Liangas, GRC)

12840.5: PBC312, Goeree Island Navrad, The Netherlands, w/available channels list, 850/75 at 0009. (Liangas, GRC)

12905.9: MTO, Royal Navy, Rosyth, Scotland, w/availability notice at 0045, 850/75. (Liangas, GRC)

13375.3: "DOR," MFA, Sofia, Bulgaria, w/5L grps, 506/75 at 1725. (Hall, RSA)

13427.1: Un-ID w/good tune to ARQ-S4/96 at 1720, but nothing shows on screen. (Hall, RSA) My database shows DFZG, MFA, Belgrade, here with FEC-A/144—Ed.13457.3: CNM49, MAP, Tanger, Morocco, w/RYRY to Colombia, Brazil & Puerto Rico, 425/50 at 1845, foll by nx in SS at 1857. (Ed.)

13526.0: DHJ51, Gregelg Meteo, Germany, w/coded wx, 100 baud at 1120. (Liangas, GRC) Same at 1717. 430/100. (Hall, RSA)

13919.8: CLP1, MFA, Havana, Cuba, w/pren-saminex, 425/75 at 2130. (Ed.)

13939.8: CLP65, Cuban Emb., Managua, Nicaragua, w/msgs & crypto after ZZZ. Was 500/100 at 1507. 1st time I've seen a Cuban diplo sta. send at 100 baud. (Ed.)

13976.0: KNY27, a.k.a. HBD21, Swiss Emb., Washington, D.C. w/5L grps to Bern, Bonn, London, Ottawa, Paris, Rome & Tokyo. Was ARQ. 1858-1945. HBD20, MFA, Bern, Switzerland, w/5L msg marked "urgent" to Washington, D.C., ARQ at 1806. Msg appeared after FFFZZ ZFFFJ JJOOO HHHPP PKKKS SSEEE. (Ed.)

13986.7: RFLI, French Navy, Fort de France, Martinique, w/t/c to Cayenne, French Guiana, at 0610. ARQ-E3/192. (Ed.)

14373.7: SAM, MFA, Stockholm, Sweden, w/t/c to Latin American embs. SWED ARQ at 1451. Tuned down to 14353.0 at 1454 & 14352.6 at 1557. (Ed.)

14396.0: AJE, USAF, Croughton AB, England, w/coded wx. 850/75 at 1545 (Ed.) & at 1748. (Hall, RSA)

14480.0: OMZ, MFA, Prague, Czech Republic, w/nx in Czech, 425/100 at 1200. (Ed.)

14481.0: OEC, MFA, Vienna, Austria, w/5L grps. ARQ-S6/96 at 1201. (Ed.)

14481.7: RFTJ, French Navy, Dakar, Senegal, w/nx in FF for Army posts & Naval bases at 1405, ARQ-E3/48. (Ed.)

14501.7: KNY29, Egyptian Emb., Washington, D.C., w/msgs to Cairo, ARQ at 2213. (Hetherington, Fla.)

14524.8: RFFX, French Mil., Versailles, France, w/svc t/c to RFLIGCS, Cayenne, French Guiana, at 0740. ARQ-E/72. (Lehman, AUS)

14605.0: "VKX" w/RYRY at 1500, foll by QRU QRU SK SK at 1501. 425/75. (Ed.)

14667.8: RFLI, French Navy, Fort de France, Martinique, w/t/c at 1203. ARQ-E/72. (Hetherington, Fla.)

14688.0: "V5G," MFA, Bucharest, Romania, w/encryption, ROU-FEC/164.5 at 1645. (Ed.)

14760.0: CNM61, MAP, Tanger, Morocco, w/nx in EE, 425/50 at 1233. (Ed.)

14818.0: Interpol, Tokyo, Japan, relaying msg from Interpol, Ottawa, Ontario, Canada, to Interpol, Taipei, Taiwan, ARQ at 0810. (Richard Sprau, Fla.)

14824.2: CLP1, MFA, Havana, Cuba, w/5F msgs & "circulares" to African & Asian embs., 500/75 at 2013. (Ed.)

14873.3: RFLIRT, French Navy, Cayenne, French Guiana, w/5L msgs to Martinique. ARQ-E3/96 at 1438. (Ed.)

14921.0: NMF, Boston Coast Guard Sta., Mass., w/unclas msgs & nx items to USCGC Eagle, ARQ at 2005. (Ed.)

14929.0: Un-ID w/ARQ phasing sig at 1715, foll by "OM YTLARU" then misprinting. (Hall, RSA)

14964.0: RFFX, French Forces, Versailles, France, w/"control de voie." ARQ-E/72 at 1440. (Boender, NLD)

16017.4: DGQ21, PIAB, Elmshorn, Germany, w/nx in GG to Central America, 1900-2025, FEC-A/96. (Hetherington, Fla.)

16117.0: 6VK317, PANA, Dakar, Senegal, w/nx in EE & FF, at 0920, 50 baud. (Lehman, AUS)

16173.5: NNNONHA, USN MARS, Norfolk, Va., w/MARSgrams at 1643, ARQ. (Ed.)

16348.1: Un-ID w/ARQ t/c in FF at 1640. (Hall, RSA)

16683.5: UKVG, the Russian merchant ship "Kompositor Chaikovsky," wkg Riga Radio in ARQ at 1656. (Hall, RSA) Named in honor of the famed Russian composer Peter I. Tchaikowsky—Ed.16806.5: USCG, Boston, Mass., w/iceberg pos. warnings, FEC at 1220. (Hall, RSA)

16807.1: 9VG82, Singapore, w/wx at 1230, FEC. (Hall, RSA)

17461.0: Un-ID w/encryption, ARQ, 1320-1430. (Ed.)

17550.9: RFTJF, French Navy, Port Bouet, Ivory Coast, w/"control de voie." ARQ-E3/192 at 1410. (Boender, NLD)

18035.2: ZRH, Simonstown Navrad, RSA, w/RYRY & 10 count at 1202, 476/75, shifting to 814/75 at 1211. (Hall, RSA)

18039.9: TCY4, AA, Ankara, Turkey, w/nx in Turk, 817/48 at 1127. (Hall, RSA)

18152.1: Un-ID at 1215. Sounded like idling ARQ-E. (Hall, RSA) My database comes up w/an un-ID sending encryption at this time, ARQ-E/192—Ed.18265.2: CNM78, MAP, Tanger, Morocco, w/nx in FF, 386/50 at 1653. Was // CNM76 on 18221.1. (Hall, RSA)

18274.8: Un-ID w/ARQ pulses only at 1612. (Hall, RSA) My database shows this freq. to be a Swiss diplo channel—Ed.18340.9: Un-ID at 830/50 at 1150. M-7000 will not decode. (Hall, RSA) My database shows encryption at 850/50 on this freq.—Ed.18341.8: Un-ID going QRT at 1652 after sending "VXCT" in ARQ. (Hall, RSA) My database shows MFA, Cairo, Egypt, here—Ed.18379.9: Un-ID at ARQ-S4/96 at 1639. Good tune but nothing seen on the screen. (Hall, RSA) Several Interpol stations use this freq. for ARQ xmsgs, according to my database. (Ed.)

18518.0: OMZ, MFA, Prague, Czech Republic, w/nx in Czech, 425/100 at 1437. (Ed.)

18620.5: Cuban Emb., possibly in Guyana or Ghana, w/RYRY & 5F grps, 500/50 at 1445. (Ed.)

18621.0: Un-ID Cuban diplo w/2 lines of RYRY, 500/75 at 1459, foll by a long pause until 1505, when a few V's in CW were sent. Then the sta. went QRT. (Ed.)

18648.6: SPW, Warsaw R., Poland, w/FEC t/c to an un-ID ship at 1510. (Hall, RSA)

18717.7: NMF, Boston CG Sta., Mass., w/2-page sports summary to USCGC "Eagle," ARQ at 1553. NMF also w/msg to the cutter at 1749. (Ed.)

18893.5: URD, Saint Petersburg R., Russia, w/telegrams, 170/50 at 1513. This freq. is supposed to be for ship RTTY, not coastal stations. (Ed.)

19097.0: Un-ID w/t/c in Cyrillic, 180/50, 1050-1100. (Liangas, GRC) One possibility is RCV, Moscow Navrad, Russia. My database shows RCV in CW on 19098.0 kHz. (Ed.)

19145.8: RFTJ, French Forces, Dakar, Senegal, w/"control de voie" to RFPQ, Djibouti, at 0905, ARQ-E3/200. (Lehman, AUS)

19171.0: CNM85, MAP, Tanger, Morocco, w/nx in FF, 850/50 at 1105. (Liangas, GRC)

19425.5: SAM60, Swedish Emb., Islamabad, Pakistan, w/t/c in Swedish to SAM, Stockholm, SWED-ARQ at 0750. (Lehman, AUS)

19528.8: JMG5, Tokyo Meteo, Japan, w/coded wx at 1611, 850/50. (Ed.)

19707.0: UXN, Arkhangelsk R., Russia, w/telegram t/c at 1616, ARQ. (Ed.)

19773.0: Un-ID idling in ARQ, 1759 to past 1900. (Ed.)

19775.5: CLP1, MFA, Havana, Cuba, w/5F msgs, routine msgs. & circulars, 500/50 at 1544. (Ed.)

20140.0: German Emb., Delhi, India, w/encryption & telexes to DMK, Bonn, at 0400, ARQ-E/96. (Lehman, AUS)

20422.5: German Emb., Santiago, Chile, w/encryption, ARQ-E/96 at 1203. (Ed.)

20494.0: Austrian Emb., Delhi, India, w/t/c to OEC, Vienna, ARQ-S6/96 at 0740. (Lehman, AUS)

20856.8: RFPQ, French Forces, Djibouti, w/"control de voie" to RFTJ, Dakar, at 0630. ARQ-E3/200. (Lehman, AUS)

21807.5: YOV28, Rompress, Bucharest, Romania, w/nx in EE at 0720, 50 baud. (Lehman, AUS)

22398.2: HGX65, Hungarian Emb., unident QTH, w/CQ to HGX21, Budapest, 50 baud at 0750. (Lehman, AUS)

TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

Jersey Bounce

The New Jersey State Attorney General has decided that his state's residents are monitoring too many cellular phone calls, and that this is a violation of the state's wiretap law.

It must be quite a wiretap law if it includes transmissions sent in the clear over public airwaves! Especially when those signals invade and permeate everyone's property, and enter their yards and homes. Nobody is going around tapping into any wires. People are sitting at home with passive equipment that picks up electronic emanations that someone else has chosen to send into their homes without their permission.

The New Jersey Attorney General requested Radio Shack to remove about six specific scanner models (of the approximately 15 it sells) from the shelves of its stores in the state. Radio Shack pointed out that all of their scanners fully met FCC standards, but they would voluntarily comply with the request. The scanners were removed from sale. Nothing prevents New Jersey residents from purchasing them through the mail, or bringing them to New Jersey from another state.

I would think that New Jersey residents must now demand that the New Jersey Attorney General restrict the private cellu-

lar signals, protected by wiretap laws, from their unauthorized and illegal trespass into their yards and homes.

Let this be a double edged blade. If they have nothing better to spend their time on at the New Jersey Attorney General's Office than this cellular wiretap boondoggle, they should drool with delight over my suggestion. Apparently these things are easier and more fun than trying to prosecute the folks who did in Jimmy Hoffa. I say, first, let this yahoo agency take meaningful action against those companies that have so wantonly polluted the air, ground, and water in industrial areas of their beautiful state, then, afterwards, they can play FCC wannabees.

Cellphones in Hospitals

A technician at University Hospital, Edmonton, Alberta, brought a cellphone a few inches from the control panel of an incubator and demonstrated that it caused the incubator to dangerously malfunction. In another demonstration, a breathing assist apparatus called a ventilator was shut down when a handheld transceiver sent out a signal from three feet away.

There have been no reported instances of actual problems similar to those shown in the demonstrations, however a story by

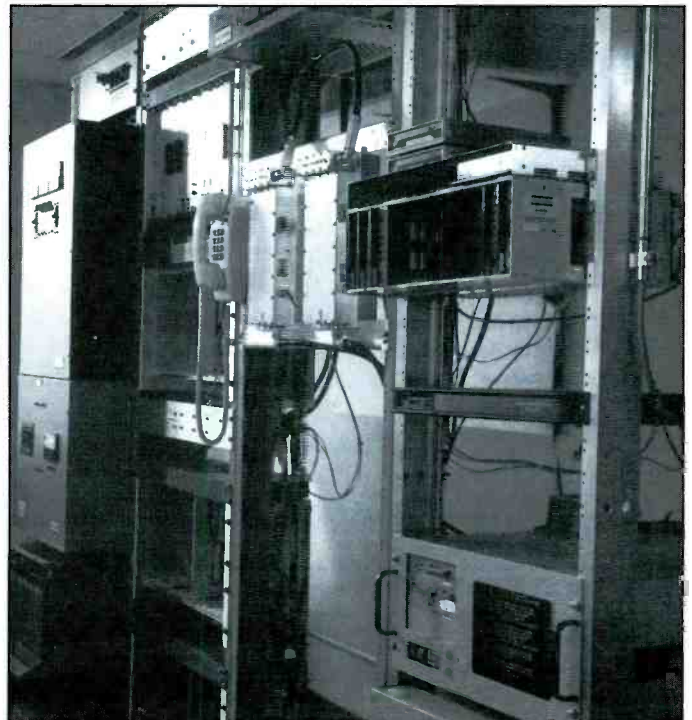


Jack Goeken, honcho at In-Flight Phone, displays one of his company's units.

Jim Farrell in *The Edmonton Journal* pointed out that such potentials do exist and that people should be aware of them. Trades people, maintenance personnel, visitors, medical technicians, physicians, and others use two way radios around med-



Every seat is equipped with a FlightLink phone.



The digital comms hardware at an In-Flight ground station.

ical apparatus. This may be in hospitals or in ambulances. Even though no life-support systems may be in direct view, signals can easily penetrate walls. Only one press of a transmit button could inadvertently turn something on or off, or else change the settings on vital equipment used for life support, or for monitoring a patient's vital signs.

This is worth keeping in mind for persons using cellphones and other two-way radios around life-support systems. The item was passed along to us by Trevor Fletcher, Edmonton, Alberta, Canada.

Mumbo Jumbo For All

The promised arrival of digital cellphones in the future has caused dismay in several quarters. We received a letter from Mark Marchiafava, of Baton Rouge, Louisiana. He wrote that the FBI is concerned that cellphones and other digital two-way systems will be either difficult, or completely impossible, to be monitored during investigations.

Mark felt that maybe there was a certain irony to this, inasmuch as the FBI's own pioneering and well publicized use of digital scramblers could have been a prime factor in gaining wide acceptance for digital technology.

We Will Follow You

Quite a few cellular services have recently started working towards what they call

a *seamless national network*. For the time being, they may be offering the opportunity to automatically make or receive cellular calls over a wide regional area without any more fuss than calling over a person's local system. With this arrangement, a cellphone user could travel hundreds of miles from home and make/ receive calls as if they were using their own local system. The cellular companies note that they have no extra charge or fee for this service.

But, based upon some of the mail that has arrived here, I believe many cellphone owners don't get the big picture. They think this is a free ride. Possibly this is because the cellular companies say that they have no additional charge or fee. Your own company may not charge you more, but that doesn't mean you aren't going to pay for dearly for this service.

Some people have the notion that there aren't any roamer fees within the extended regional area. Believe me, there are the usual roamer fees. Plus there are airtime charges. Furthermore, if you are hundreds of miles from home and either make a call to, or receive a call from, your home city, you will owe the long distance toll charges.

People in your city who don't realize you took a trip and are many miles away, could dial up your cellphone number and cost you airtime, roamer, and long distance toll charges. This may be more than you wish to spend for the joy of hearing them say

they didn't realize you were in Minneapolis, and they'll call you when you return home.

Luckily, people who don't want their calls to follow them as they travel, may deactivate this service with just a few key-strokes. The service can be reactivated again at any time just as easily. If your local company offers this service, and you aren't interested, ask them how to temporarily deactivate this function on your cellphone.

In-Flight Technology

Andrew W. Clegg, of the Naval Research Laboratory, Washington, DC, writes that he was on a USAir 757 and was amazed to see the current technology available to passengers. This plane had the In-Flight Phone Corp. *FlightLink* system on installed, which competes with the older GTE *Airfone*.

He tells us that, using an LCD on the seatback and a small handset from the armrest, *FlightLink* offers a variety of services including phone calls, outgoing FAX, shopping, airline skeds and reservations, rental car and hotel check-ins, stock quotes, news, sports, games, airport information, plus tourist and weather information for any city. The system also advises the aircraft's current position.

The armrest contains provisions for passenger use of laptop computers and portable FAX machines to tie into the phone. Passengers who advise *FlightLink*

GET SERIOUS!

MAX 800 MHz GROUND PLANE



**Hot Performer
Thousands in Use
Hear 10 Times More
The Best 800 Antenna**

\$31.95 for handheld
\$35.95 for base

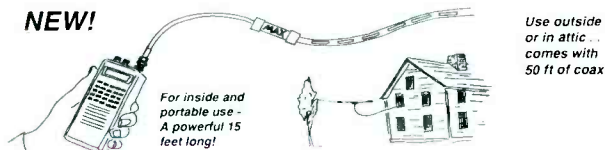
Attaches Directly to Scanner

MAX 46-49 MHz EAVESDROPPING ANTENNAS For Cordless Telephones and Baby Monitors

MAX Half-Wave \$29.95

MAX 46-49 Dipole \$49.95

NEW!



For inside and portable use - A powerful 15 foot long!

Use outside or in attic ... comes with 50 ft of coax

Free Cellular and Cordless Frequency Charts

1-800-487-7539 ORDERS

508-281-8892 info
508-766-7486 fax
SASE for Free Catalog
Shipping and Handling \$4.00
CK-MO-MC-VISA (MA 5%)

Cellular Security Group
MAX System Antennas
4 Gerring Rd, Suite 300
Gloucester, MA 01930

CB RADIO OWNERS!

We specialize in a wide variety of technical information, parts and services for CB radios. 10-Meter and FM conversion kits, repair books, plans, high-performance accessories. Thousands of satisfied customers since 1976! Catalog \$2.

CBC INTERNATIONAL
P.O. BOX 31500PC, PHOENIX, AZ 85046

SATELLITE
TV
BUYING
GUIDE

SATELLITE TV

NAME BRANDS AT 50% DISCOUNT
This FREE 24 page Consumer Buying Guide tells all about Satellite TV and lists guaranteed lowest prices.

Satman, Inc.
6310 N. University No. 3798 • Peoria, IL 61612

CALL FOR

1-800-472-8626

PAY TV AND SATELLITE DESCRAMBLING

*****1993 EDITION*****

Includes programming cable box chips, hacking B-MAC, wireless cable (MMDS) descrambling, bullets, PLUS fixes and much more. ONLY \$18.95. Other PAY TV and SATELLITE DESCRAMBLING volumes. Volume 1 (BASICS), 1989, 1991, and 1992 \$15.95 each. Different turn-ons, bypasses, ECM's, schematics and counter ECM's in each. *THE COMPLETE WIZARD* Using the VCI data stream \$15.95. Any 3/\$32.95 or 5/\$54.95. *SCRAMBLING NEWS* monthly. Keep up with the latest in satellite and cable descrambling. Everything that's new. \$32.95/yr. *OUR BEST DEAL* everything here, the video and much more for only \$129.95. New catalog \$1.

SCRAMBLING NEWS, 1552P HERTEL AVE., #123
BUFFALO, NY 14216 Voice/FAX (716) 874-2088
COD's are OK. ADD \$6

CIRCLE 75 ON READER SERVICE CARD

THE MONITORING MAGAZINE



The FlightLink handset has plainly marked buttons, and a list of services is conveniently posted.



Here's the customer service In-Flight Phone HQ's in Chicago.

that they're on a flight are able to be paged by family or business associates on the ground.

This is a digital system that operates with 90 ground stations 800 MHz band. It is installed in nine of the airline's 857's, and two American Airlines MD80's. By the end of next year, there will be 402 USAir aircraft equipped with FlightLink. In addition, USAir International will have 767 widebodies equipped with satellite-based systems that will offer over-ocean service.

In addition, In-Flight Phone Corp. will be adding a 12-channel digital stereo audio service for airline passengers. Programming will be furnished by ABC Radio Networks, Inc. Hardware is provided by Harris Corporation. Some programming will be offered free, but certain premium events will be offered at a fee and can be paid for by credit card.

We appreciate the photos sent to us by Andrew Clegg, showing some of the In-Flight Phone Corp. equipment. These were taken by In-Flight Phone Corp., Inc.

No Mas, No Mas...

The FCC told Congress that "cellular telephone calls today are relatively easy to intercept because they are broadcast over-the-air as analog, unencrypted FM radio signals." The agency advised, however that when their manufacturing and importing ban on scanners that can tune the cellular band becomes effective, it will change the situation.

Other factors the agency points out that should reduce the public's ability to hear these signals include the availability of voice-security equipment that can be added to analog cellphones. Also, digital service has already started, and at some point in the future, the cellular service will become all digital. When that happens, it "may well resolve the problem."

The agency admitted that they realize "no encryption technique is fool-proof. At

best, all one can do is try to make decryption extremely difficult and expensive." The FCC concluded "that further legislative or regulatory action would not be likely to increase significantly the security of cellular conversations. However, this assessment could change if abuses continue in the future."

Whoa! They might eventually have to suggest that the cellular industry itself encrypt its own signals if it wants its privacy so

damned much, just like all other radio services. Seems to be a measure of last resort, to be held in reserve for use only after all else fails. Well, maybe nobody thought of that yet.

We will see you here next month. Hope that we have given you a few plump turkeys for your holidays. Enjoy! Let's hear from you with cellular and pager related news clippings, product releases, experiences, questions, opinions, service information. ■

SCANNER MASTER Books

The most comprehensive scanner guides ever published! Huge new editions for regions across the USA. Ask about our new online service. Call 800-722-6701 for free Catalog

DECODE CELLULAR DATA

The Digital Data Interpreter (DDI) will decode and display cellular cell-site data from a radio on a computer. See phone numbers, frequency changes and much more from both control and voice channels. Included PC software allows all or only selected data to be displayed, it will automatically tune some radios and it can be set to track only certain events for certain phone numbers. The DDI is a very inexpensive diagnostic tool that can provide powerful diagnostic capability to your cellular test bench.

The deluxe DDI is now available. Call 414-781-2794 x20 or write for details. Most radios require an internal connection.

CCS P.O. Box 11191 Milwaukee, WI 53211

Personal Code Explorer™

★ Novices
★ SWLs
★ Veterans

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

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

PROFESSIONALS' CHOICE!

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

Crystal Controlled!
Use standard 9V battery

DECO INDUSTRIES • BOX 607 BEDFORD HILLS, NY 10507
914-232-3878

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Appeal Of Discrimination Complaint In Amateur Service Denied

The Commission denied Leonidas R. Moten, Jumping Branch, WV, appeal of denial handicap discrimination complaint in amateur service volunteer examination system.

The Private Radio Bureau denied Moten's complaint alleging discrimination on the basis of handicap in programs or activities conducted by the FCC in violation of the Rehabilitation Act under the Commission's Rules. Moten alleged that he was improperly excluded from administering amateur operator license examinations by the Black Diamond Amateur Radio Club due to his blindness. The Commission concluded that Mr. Moten's blindness prevented him from complying with the requirement in the Commission's Rules which clearly states that a volunteer examiner (VE) must be present and observe an examinee throughout an examination. Accordingly, Moten was not "otherwise qualified" to be a VE, and because he did not meet the eligibility requirements, no improper discrimination occurred.

Moten did not submit any new facts in his appeal that had not been considered before. He again alleged that the Americans with Disabilities Act of 1990 (ADA) is applicable to his case. The Commission said the ADA is not applicable because the telecommunications provisions thereof apply only to common carrier and broadcast licensees. In addition, he argued that he has not been permitted to serve in the examination process in ways that do not involve actual testing of examinees. John Hymes, a Contact VE for the Black Diamond Amateur Radio Club, in a letter, said that he and other VEs would work with Moten in order to help him find ways that he could assist them in the examination process.

Accordingly, the Commission denied the appeal of Moten.

Restrictions Relaxed In Amateur Service

The Commission amended the amateur service rules in order to allow amateur operators more flexibility to provide communications for public service projects as well as to enhance the value of the amateur service in satisfying personal communications needs.

The International Radio Regulations define the amateur service as a radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorized persons interest-

ed in radio technique solely with a personal aim and without pecuniary interest. Part 97 of the Commission's Rules prohibits amateur stations from transmitting any communications the purpose of which is to facilitate the business or commercial affairs of any party, or as an alternative to other authorized radio services.

The amendment would allow the amateur service to expand its public service capabilities and to provide greater flexibility for personal communications. The amendment would allow licensees to use amateur service frequencies to facilitate events such as races and parades, to support educational activities, to provide personal communications such as making appointments and order in food, to collect data for the National Weather Service, and to provide assistance voluntarily even where there are other authorized radio services available.

The Commission was unable to accommodate the American Radio Relay League's request that the Commission provide a list of anecdotal examples of permitted and prohibited communications. The Commission stated that such a list would necessitate that the FCC intrude upon the day-to-day functioning of the service to a far greater degree than desired. The FCC also said that there would have to be thousands of examples, and declined to devote staff resources to the development and maintenance of such a list.

Issued A Fine Of \$10,000 For Unlicensed Operation

The Federal Communications Commission's San Diego Office fined International Warehouse & Trucking (IWT), Calexico, California, \$10,000 for operating an unlicensed two-way radio communications system near the U.S./Mexico border in the United States and causing radio interference to the Sheriff's Department of Imperial County.

Utilizing direction finding techniques, Commission engineers pinpointed the offending radio transmissions to IWT's office in Calexico. IWT personnel admitted at the scene that their two-way radio system was being used to communicate with their employees in Mexicali, Mexico. In addition, IWT employees were operating on a radio frequency in a band allocated to the Police Radio Service and IWT is not eligible to be licensed in that radio service. In addition to the licensing requirement, FCC Regulations 47 C.F.R. §90.417 (b), require that communications with foreign stations in the Private Land Mobile Radio Services must first be approved by FCC after an agreement is reached between FCC and

the foreign administration for transborder communications.

Operating Without Proper Authorization

The Chicago, IL, Honolulu, HI, and Seattle, WA, Field Offices issued Notices of Apparent Liability to the following for willful violation of Section 301 of the Communications Act. The violations include operating an unauthorized portable hand-held marine type VHF radio transmitter station on Channel 77 and operating unauthorized radio stations on frequencies 469.6625 MHz and 156.800 MHz.

RECIPIENT	ISSUING OFFICE	AMOUNT
Halmeier Angerer Chicago, Illinois	Chicago	\$8,000
Eagle Hardware & Garden Waipahu, Hawaii	Honolulu	\$8,000
Robert D. Thompson Cosmopolis, Washington	Seattle	\$2,000

FCC Acts Against Unlicensed Coast Stations

Last May the FCC's field offices inspected 357 private coast stations throughout the country. Private Coast Stations are marine stations operating on land for communicating with ships. The inspections were performed to improve the level of compliance with licensing requirements and to initiate action against those found operating in violation. Prior inspections had shown a low compliance level in this area. As part of its compliance improvement project earlier in the year, the Field Operations Bureau sent approximately 8,000 informational letters to known coast station operators in the areas where inspections were to be conducted. The letter was intended to remind coast station users of the Commission's station licensing and equipment type acceptance requirements.

Of 357 stations inspected, 55 percent (198 stations) were found to be unlicensed. The users of the unlicensed stations will receive notices of apparent liability (fines) or letters warning about the unlicensed status of their radios. The Commission regards unlicensed station operation as a serious matter for which offense fines may reach \$8,000.

Because of the higher number of stations found to be unlicensed, more inspections will be conducted in the coming months to verify additional unlicensed stations. Stations found to be operating without a license will receive fines.

In addition to being unlicensed, some licensed stations have been operating with marine radios designed only for shipboard

use. Marine radios for use at coast stations must meet a more strict frequency tolerance than those used on boats.

Coast station users who need information about the status of their licenses or need to know if the radio equipment they have is approved for coast station use, should contact the Public Affairs Specialist at their local FCC office. Information about license status and equipment acceptability is available at the Commission's Consumer Assistance Branch in Gettysburg, PA, at 717-337-1212.

For further information, contact Leonard Langley at 202-632-6345.

Unlicensed Radio Station Causing Malicious Interference

The Detroit FCC issued a Notice of Apparent Liability for monetary forfeiture for \$18,000 to Ronald E. Roop of Wapakoneta, Ohio, for knowingly and willfully transmitting without a valid station license. He was also cited for causing malicious interference and refusing to allow inspection of his station.

While investigating a complaint of radio interference to the Allen County, Ohio, Sheriff's Department on June 10, 1993, an FCC investigator, by means of close-in direction-finding techniques, located Mr. Roop transmitting noises on the frequency of 154.83 MHz from a 1990 Dodge pick-up truck. He did not possess a license for operation on this frequency, which is a violation of Section 333 of the Act, and he refused to allow an FCC official to inspect his radio station, a violation of Section 15.29 of the Rules. Mr. Roop is the Police Chief of Uniopolis, Ohio.

Operating Without Proper Authorization And Causing Interference

The San Francisco, CA, Field Office issued a Notice of Apparent Liability to the party listed below for willful violation of Sections 301 and 333 of the Communications Act. Violations include operating a transmitter without authority and maliciously interfering with radio communications in the Public Safety Radio Service.

RECIPIENT	ISSUING OFFICE	AMOUNT
K. Ehambrave East Palo Alto, CA	San Francisco	\$15,000

Violations Relating To Operating Without Proper Authorization

Recently, several field offices issued Notices of Apparent Liability (NAL) to individualize or businesses for operating unlicensed radio stations. The Philadelphia, PA, Field Office issued a NAL to Leonard F. Shaner, Jr., in Pottstown, PA, for oper-

ating a radio station without authorization on 147.810 MHz which caused harmful interference to communications in progress on the corresponding local amateur radio service repeater output frequency 147.210 MHz. Based on the activity, the field office issued a NAL for \$2000.

The Ferndale, WA, Field Office issued a NAL for \$8,000 to West Sound Marina, Inc., in Orcas, Washington. West Sound Marina, Inc., was operating a private coast station without a license or authorization.

The Beverly Hills Unified School District in Beverly Hills, CA, received a NAL for \$8,000 as issued by the Los Angeles, CA, Field Office. The school was found to be operating a radio station from 1:14 to 2 PM on May 27, 1993 without a license or authorization in the broadcast services.

Lastly, the San Francisco, CA, Field Office issued an NAL to Stephen Paul Dunifer in Berkeley, CA, for \$20,000 for operating a radio transmitter in the FM Broadcast Service on at least two different days. Mr. Dunifer has no license or authorization to operate an FM station in the FM Broadcast Service.

Exempts Identification For Wireless Microphones

The Commission recently exempted its requirement for station identification by Part 90 low-powered wireless microphone operations.

Section 90.425 of the Commission's Rules requires a station to identify itself by transmitting its callsign by either voice or Morse Code every 15 minutes. The primary purpose of this station identification is to assist in locating station during interference investigations. However, because of the relatively short operating frequencies, interference to other licensed users from very low powered wireless microphones is highly unlikely.

Furthermore, because wireless microphones are typically used in settings such as lecture halls, auditoriums and theaters, frequent interruptions for stations' identification is disruptive. The Commission also noted that the use of wireless microphones in the 174-216 MHz frequency band is also limited to 50 milliwatts transmitter power and is exempt from station identification.

The Commission concluded, therefore, that because of the low-power, short operating distance, and typical use of wireless microphone operations is unnecessary and burdensome.

Notice Of Apparent Liability Issued For Transmitting False Distress Signals

The Ferndale, WA, Field Office issued a Notice of Apparent Liability to the party listed below for repeated violation of Section 325 of the Communications Act. An Emergency Locator Transmitter aboard a vessel being transported by truck, was transmitting false distress signals. The EPIRB had apparently bounced off the holder en route, causing the transmission. On April 15, 1993, the owner of the vessel was informed that the vessel's transmitter was transmitting a false distress signal.

RECIPIENT	ISSUING OFFICE	AMOUNT
James P. Cox Lynden, Washington	Ferndale	\$800

Fine Of \$8,000 For Unlicensed Operation

The Federal Communications Commission's San Diego office issued a proposed fine of \$8,000 to Agencia Aduanal Rodriguez (AAP) of San Ysidro, California, for operating an unlicensed two-way radio communications system near the U.S./Mexico border in the United States.

Personnel of AAR admits that their two-way unlicensed radio system was being utilized to communicate with their employees in Tijuana, Mexico. In addition, AAR (a customs brokerage house) was operating on a radio frequency in a band allocated to the Railroad Radio Service and did not appear to be eligible for licensing in that radio service. In addition to the licensing requirement, FCC Regulations require that communications with foreign stations in the Private Land Mobile Radio Services must first be approved by the FCC after an agreement is reached between the FCC and the foreign administration for transborder communications. ■

Need a GREAT-sounding, ULTRA-RELIABLE, SOLIDLY-made long play recorder? TIRED of POOR-sounding, FLIMSY recorders?

Why spend well over \$100 for a long play recorder "improvised" from a plastic "consumer-type"? Spend a few more \$\$ and get the BEST!

PROFESSIONAL 10 HOUR RECORDER. Built like a **BATTLESHIP**



- * Special *Pop Comm* price \$149
- * BUILT-IN voice activation (NO box dangling outboard) add \$25
- * Also available: 12, 14 and 16 hour models
- * Dialed number decoder, reads numbers from tape \$59

No shipping charges on prepaid orders. COD's OK. Cal. residents add tax. Sorry, no credit cards (all they "do" is increase prices...)

FREE info for reader service card requests. FREE 36 page catalog if requested by phone/fax/letter



VIKING INTERNATIONAL
SINCE 1971
150 EXECUTIVE PARK BLVD. #4600
SAN FRANCISCO, CA 94134
PHONE: (415) 468-2066
FAX: (415) 468-2067

SUPER SENSITIVE scanner antenna

MFJ-1864

\$79⁹⁵



Your scanner will come alive with signals you never knew existed when you use this new *super sensitive* antenna.

You'll hear distant mobiles -- even handhelds -- as they talk with base stations.

You'll pull in weak ground signals from distant control towers and air-traffic centers -- even hear *both* sides of conversations!

The MFJ-1864 combines new weak-signal technology -- an *extremely low noise amplifier* -- with a resonant high gain omnidirectional antenna.

You get 20 dB of extremely low noise amplification that'll let you hear signals down to the noise level.

The sensitive high gain antenna operates as two collinear 5/8 wave elements fed in phase on the 108-174 MHz aircraft/VHF high bands and as resonant halfwave elements on 30-50 MHz VHF low band.

For really long range reception, you can mount your antenna up extra high outdoors in the clear and feed it with long runs of inexpensive coax.

Coax loss won't degrade your signal. That's because weak signals are amplified at the antenna *before* going into your coax.

Sidemounts to your existing tower. TV mast or any 1 to 1 1/2 inch pole with one U-bolt (supplied). 8' high, 2' boom. \$7 S/H.

MFJ high-gain narrow-band specialized antennas outperforms broadband antennas



For Handheld Scanners

A. Long Ranger™. MFJ-1714. \$16.95. Super long range reception on 118-174 MHz VHF high band. 40" extended. 10 1/2" collapsed.

B. Dual Bander™. MFJ-1712. \$14.95. 5/8 wave gives maximum gain 406-512 MHz. 1/4 wave 118-174 MHz. 19" tall. 7 1/4" collapsed.

C. MFJ Pocket Roll-Up™. MFJ-1730. \$14.95. Roll up this high gain J-antenna and stick it in your pocket! Hang it up for base station performance. Highest gain on 118-174, 406-512 MHz. 58" plus coax.

D. "Shorty" Duck MFJ-1718. \$12.95. 4 1/2" Hi-Q super efficient replacement rubber duck.

For Mobile Scanners

E. Maximum Gain 5/8 Wave™. \$29.95. Gives maximum gain of any single element mobile antenna on 108-174 MHz. Resonant 1/4 wave on 30-50 MHz. 48". Magnet mount. MFJ-1828B. BNC: MFJ-1828M. Motorola.

F. All Band Mobile. \$19.95. Cellular look-a-like. 25-1300 MHz highest gain 406-512, 108-174 MHz. 19". Magnet mount. MFJ-1824BB. BNC: MFJ-1824BM. Motorola.

Nearest Dealer/Orders: 800-647-1800
Order from MFJ and try it. If not satisfied return within 30 days for refund (less s/h).



MFJ ENTERPRISES, INC.

Box 494, Miss. State, MS 39762

(601) 323-5869; FAX: (601) 323-6551

Add \$7 each s/h. More outside USA for s/h. © 1992 MFJ

CIRCLE 87 ON READER SERVICE CARD

Beaming In

(from page 5)

In all fairness, they should simply be called "Unlicensed Stations," and just left at that. We fail to see what useful purpose is served by the FCC going out of its way to maintain the position that these unauthorized operations are linked to any particular radio service. Continuing to officially label these unauthorized and clearly illegal activities a part of the CB service isn't correct, and it's an injustice to the many CB operators who play things by the FCC's regulations.

I'd like point out that over the years I have come to know quite a few of the quasi-undercover operators who consider themselves *outbanders* or *freebanders*, and "operate on the uppers" (as some refer to these frequencies). Those I know hardly strike me as the irresponsible FCC-baiting threats to western civilization that the agency would have us all believe they are.

My feeling is that the *freeband* originally began with people who wanted to be ham operators, but said they couldn't pass the exam. From there, it blossomed out under its own inertia to also include those who never wanted to be hams. However, I know that there are some *freebanders* who hap-

pen to be licensed hams, but show up there to chat with friends they have on that band.

Of course, now that a ham ticket is so easy to get, it's laughable when you hear someone offer up the lame excuse that they are on these frequencies because they can't get a license.

You may have gotten the impression by now that this band is a complete enigma. Illegal communications activities have been going on there for more than thirty years. The FCC has tried practically every trick it knows from mobile strike forces to confiscated equipment and stiff fines in numerous failed attempts to take control of the band from the unauthorized operators.

Still, operators keep coming to these frequencies as if drawn by some strange and unknown force.

This makes no sense at all to me. With the arrival of the easy-to-get ham ticket, there really seems no rational explanation as to why operators still bother with these unauthorized frequencies. With very little effort, they could get a Tech-Plus ham ticket and yak all they want in a segment of the 28 MHz ham band.

So, from its odd non-connection to the CB service, to its mysterious way of attracting operators, this very strange band continues to baffle. If you know what the big attraction is, and why the FCC thinks it's part of CB radio, please write and let me know. ■

Product Parade

(from page 17)



The New Realistic® PRO-43 Scanner Radio Shack®

Phones

Our 17th Year of DISCOUNTS

Freight prepaid, save tax

Toll Free 800-231-3680

PRO-43 List \$349.95

Our Delivered Price \$290.00

"We discount everything in the RS catalog"

22511 Katy Fwy.

Katy (Houston), TX 77450

1-713-392-0747 FAX 713-574-4567

CIRCLE 90 ON READER SERVICE CARD

SHOCKING MANUALS!!

Survival Electronics, Computers, Security, Weaponry, Rocketry, Phones, Energy, Financial, Medical. 100+ offers include **Special Projects and Technical Research Services**, and hardware **Confidentiality Guarantees!** Send \$4 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 NAEs) and scanned. 30+ cellular phone models described. Specific scanner mode. \$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 freq. 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 compilers 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); **RADIOICS MANUAL** (\$29); **EM BRAINBLASTER** (\$29); **UNDER ATTACK** (\$29); **HIGH VOLTAGE DEVICES** (\$29); **DISK SERVICE MANUAL** (\$29); **ATM** (\$39). Include \$4 S/H. Educational purposes only.

CONSUMER TRONICS

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

MHz. This scanner is also programmed to scan all NOAA weather channels when you activate this feature by a front panel push-button. There is a priority channel, and a scanning rate of 14 c.p.s.

Sensitivity is 0.5 uV on the VHF low band, 0.7 uV on the VHF high band, 1.0 uV on UHF, and 2.0 uV on the VHF aero band.

Realistic's HTX-404 is the company's latest addition to their ever increasing line of ham radio products. This is a 440 MHz FM handheld transceiver suited to the newly licensed Tech class ham and also the more experienced operator.

When operated from 13.8 volts, the HTX-404 can kick out 5-watts, but there's a hi/lo (0.5 watt) RF power switch to conserve battery power. The unit is furnished with AC charger having a high-capacity rechargeable battery pack.

The IF frequencies are 45 MHz and 455 kHz.

The HTX-404 offers true FM modulation. Built-in CTCSS encoder and decoder, also built-in DTMF encoder and push-button page. Memory for five 15-digit sequences. A 16-frequency memory, with multifunction scanning, and programmable frequency step.

These new products are in Radio Shack stores now. ■

CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

Earlier this year an agreement was signed between the military government of Haiti and the man they ousted—President Jean Bertrand Aristide which, if the deal is adhered to, will have Aristide back at Haiti's helm about now. That, in turn, means two pro-Aristide broadcasts are likely to go off the air soon, if they haven't already done so. It often seems that agreements between political antagonists in third world countries are delayed in their implementation or otherwise not adhered to. Sometimes they are simply ignored. So, just in case the anti-government broadcasts to Haiti haven't yet closed down here's a quick look at the two which were active when the agreement was signed.

Radio 16 Desanm (December) spoke for the ousted Aristide government over WRNO in New Orleans. The broadcasts went out via phone line from the Haitian embassy in Washington, Mondays to Fridays from 1200 to 1300 on 7315 and from 2200 to 2300 on 17835. Other airings are (or were) Saturdays from 2300 to 0000 on 7355 and Sundays 1100 to 1300 on 9850. The Creole language program first went on the air as a half hour presentation in the spring of 1992. If you'd like to get a QSL for this broadcast write to the Chancery of Haiti, 2311 Massachusetts Avenue NW, Washington, DC 20008.

A second such program has been airing via Radio For Peace International out of Costa Rica. Radio Neg Mawon is described as a small radio collective, the members of which describe themselves as "deeply committed to the restoration of democracy in Haiti." The Neg Mawon broadcast tried to bring news to Haiti after the military government closed the country's independent radio stations. Radio Neg Mawon was on the air Saturdays at 2000 and Sundays at 1200 and 0400 on RFPI frequencies 7375, 7385USB, 11630USB and 15030. Verifications were issued by Molly Graver from P.O. Box 557, Warwick, NY 10990.

The white supremacist program American Dissident Voices, aired on WRNO, apparently has company now. We're advised that another program along this track is being aired Sundays at 1630 on WWCR—15685, then a few hours later at 2100 on WRNO-15420. It's hosted by an Ernest Zundel.

Colombian clandestine Radio Patria Libre is now announcing itself as "the voice of the Camilist Union—Army of National Liberation," which is at least a slight change from what followers of this one have always believed—that it was the mouthpiece of the National Liberation Army (ELF). It may be that the change reflects a reshuffled or realigned ELF. We'd be glad to hear from any readers who follow the Colombian political situation who may be able to clear up the confusion. Incidentally, Patria Libre has been noted on occasion running as late as 0200.



On Radio For Peace
International
YOUR REPORT ON RECEPTION OF
RADIO NEG MAWON 15,030 kHz
Transmission on 12 Dec. 1992 . . . 1953
has been checked with RFPI
log for the date mentioned and
is duly verified herewith

JEAN JEAN-PIERRE
Jean. Jean. Pierre
Producer

Radio Neg Mawon was—or perhaps still is—a broadcast to Haiti supporting the Aristide government.

The evening schedule normally runs only from about 0030 to 0110, of late on such frequencies as 5730, 6300 and 15050, all widely variable.

The Palestinian clandestine, Al Qods—Palestinian Arab Broadcasting, is using a shortwave frequency of 5910, although we don't yet have the complete schedule. It's been noted overseas running to 1715 sign off, a schedule which doesn't give us much of a shot at hearing it. The address is announced as P.O. Box 5092, Damascus, Syria.

The pro-democracy Vietnamese broadcaster Radio Irina, aka the Voice of Freedom, continues to air its program via Russian radio facilities. The Vietnamese language program is on the air from 1400 to 1500 on 15500 and can be reached via this address: International Post Office, P.O. Box 174, Moscow. Considering the very chancy mail situation in Russia these days you may want to fax them your report. The number is (7095) 149-1458.

The Rwandan Patriotic Front's station, Radio Muhabura, continues to operate on or

about 6340, and continues to be a difficult (but possible) catch in North America. Sign on is at 0415, sometimes 0400 or a little before that. This station may be located in Uganda, where the RPF launched its guerrilla war against the Rwandan government.

Afghanistan clandestine Radio Message of Freedom is supposedly on the air at 0145, 0830 and 1400 on a variable frequency of 7090. Unfortunately we don't think anyone in North America has been lucky enough to hear this one.

What's thought to be the deliberate jamming of several of the anti-Castro stations and broadcasts continues to hassle the likes of Radio Caiman and La Voz del CID. Check Caiman's signal on 9965 in the evenings, and La Voz del CID on 9941.6.

Your information about clandestine and similar broadcasts are always welcome, whether in the form of logs or QSL information or background data on stations or the groups which operate them. Copies of QSLs or other clandestine related literature is also needed for use as illustrations. Thanks for your continued interest. ■

COMMUNICATIONS SHOP

Advertising Rates: POP/COMM subscribers are entitled to one FREE 30-word non-commercial classified ad per year. Enclose subscription name label with ad copy. For those people not in the previously mentioned group, non-commercial ads are 30 cents per word, including abbreviations and addresses; minimum charge \$6.00 per issue. Ads from firms offering commercial products or services are \$1.00 per word; minimum charge \$20.00 per issue. Boldface words are \$1.20 each (specify which words). Leading key words set in all caps at no additional charge. All ads must be prepaid in full at time of insertion; a 5% discount is offered for prepaid 6 time insertions. All ads must be typewritten double spaced.

Approval: All ad copy is subject to Publisher's approval and may be modified to eliminate references to equipment and practices which are either illegal or otherwise not within the spirit or coverage scope of the magazine.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Communications Shop have not been investigated, the Publisher of Popular Communications cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: PC Communications Shop, 76 N. Broadway, Hicksville, NY 11801.

TOMCAT'S BIG CB HANDBOOK, by Tom Kneitel. 221 large pages, fully illustrated. Complete guide to worldwide AM, SSB, Freeband, 27 MHz operations. Everything they never told you (legal & otherwise) from world's leading CB authority. Only \$13.95 plus \$4.00 postage (\$5.00 to Canada) from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. (NYS residents add \$1.53 sales tax).

TUNE In On Telephone Calls. Revised and Updated Edition! Tom Kneitel's new 160-page book. Everything you need to effectively use a scanner and communications receiver to eavesdrop on private telephone calls from homes, offices, cars, ships, aircraft, trains. Explanatory text, photos, extensive listings section covers USA/Canada on HF, VHF, UHF, and above; thousands of locations, frequency assignments. Explains equipment, best techniques, laws regarding monitoring cellular, cordless, ship/shore, high seas. Air Force 1, airliners, 1-way paging, more. Only \$12.95 plus \$4.00 postage (\$5.00 to Canada) from CRB Research, PO Box 56, Commack, NY 11725. NY residents add \$1.44 sales tax. Dealer inquiries invited. Visa/MC OK. Tel: (516) 543-9169.

WOW! UNDERSTANDING & REPAIRING CB RADIOS by Lou Franklin. Giant 380-page technical book picks up where THE "SCREWDRIVER EXPERTS" GUIDE leaves off. Includes circuit descriptions and troubleshooting guide for virtually all CB radios: 23 and 40-channel, crystal and PLL, solid-state and tube, AM, FM, SSB, CW, American, British and export models. Covers test equipment, transistor basics synthesizers, receivers, transmitters, power supplies, T/R switching, antennas, interference, parts and accessory sources. Over 350 illustrations plus huge subject index. Moneyback Guarantee! Only \$29.95 plus \$3.50 U.S. & Canadian Air Mail, VISA/MC accepted. Free catalog of unique CB books, plans, and modification kits with order. Catalog only \$2. CBC INTERNATIONAL INC., BOX 31500PC, Phoenix, AZ 85046. Thousands of satisfied customers since 1976.

NEW 1993 CB IMPORT/EXPORT RADIO CATALOG—Hard to find CB Dealers, Equipment, Modification Kits and Plans—\$3.00. **LORD WYATT COMMUNICATIONS**, PO Box 030128PCJ, Brooklyn, NY 11203-0001.

SURVEILLANCE TRANSMITTER KITS tune from 65 to 305 MHz. Main powered duplex, telephone, room, combination telephone/room. Catalog with **Popular Communications, Popular Electronics and Radio-Electronics** book reviews of "Electronic Eavesdropping Equipment Design," \$2.00. **SHEFFIELD ELECTRONICS**, PO Box 377785, Chicago, IL 60637-7785.

THE SCANNER HACKERS BIBLE. 112 modifications. Includes: PRO-2004/5/6, Yaesu, Kenwood, Bearcat, Icom and others. Frequency fixes, modifications (scan rates, interfaces, programmable channels, improving operation, etc.), antenna plans, operation, laws, cellular telephone operation and frequencies, accessories, 10-codes and more. \$33.45. CODs, 1-602-782-2316, or fax 1-602-343-2141. **TELECODE**, PO Box 6426-CQ, Yuma, AZ 85366-6426.

PAN-COM INT'L CATALOG. Over 350 Kits, Plans, Licensed/unlicensed. AM/FM broadcasting. Ham/CB/SW/DX, 1750M transmitters, Surveillance devices, Computers/Software, Science Projects, MORE! \$1 refundable. Box 130-P08, Paradise, CA 95967.

CW Lite is the **easiest** Morse Code training method in the world, bar none! And it is the **fastest**, too. Just closed your eyes and relax. This powerful **hypnosis cassette tape** does the rest. **Subliminals** speed you along! Only \$15.95 ppd in US GA residents add 6% tax. Order today! **PASS Publishing**, Box 768821, Roswell GA 30076. 404-640-6295; FAX: 404-640-8780. Office hours after 4:30 PM Eastern. MC/VISA, COD. Mail/fax orders include signature.

COMMODORE 64 HAM PROGRAMS—8 disk sides over 200 Ham programs—\$16.95. 29¢ stamp gets unusual software catalog of Utilities, Games, Adult and British Disks. Home-Spun Software, Box 1064-PC, Estero, FL 33928.

New 8th Edition, Kneitel's "Top Secret" Registry of U.S. Gov't. Radio Frequencies! Giant 268 page book; largest amount of fed agency comms data ever published in 1 book. Includes worldwide American mil bases, FBI, DEA, Secret Service, Customs, ATF, Immigration, US Marshals, FCC, FAA, EPA, USCG, CIA, Border Patrol, IRS, State Dept, Dept. Agri., Nat'l. Parks, Postal Service, GSA, lots more, plus UHF aero. Also, Canadian listings, foreign gov't mil listings for Caribbean, Latin American, & Mideast hotspots. New key-freq. VHF/UHF index section. The ultimate insiders' scanner directory! Plenty of HF freq. info, too. Lots of new & updated data. All for \$21.95, plus \$4.00 shipping/handling (Canada \$5.00). Residents of NY State please add \$2.21 tax. From CRB Research Books, Inc., PO Box 56, Commack, NY 11725. VISA/MC accepted. Tel: 1-(516) 543-9169.

RADIO MONITORS NEWSLETTER OF MARYLAND FOR THE SERIOUS SHORTWAVE AND SCANNER LISTENERS. PO BOX 394, Hampstead, MD 21704. For a one year subscription: \$15.00. Sample copy: one dollar.

WANTED: WWII-1970 x-band radars/microwave, civilian/military-working or not. Test equipment, parts. SHF. BOX 10215, PGH, PA 15232-0215.

COMPLETE LAW ENFORCEMENT CELLULAR phone monitoring guide. All methods of attack, frequencies, channels, base, spacing, increment search, cell search, **phone number target interception**. **FREE** equipment catalog with order. \$21, Operative Supply, PO BOX 2343C, Atlantic Beach, NC 28512. **CB RADIO HACKER'S GUIDE!** Big 151 page book; pictorials, diagrams, text. Complete guide to peaking, tweaking, & modifying 200+ CB radios for enhanced performance & more features. Which screws to turn, which wires to cut, AM & SSB radios: Cobra, Courier, GE, Midland, Radio Shack Realistic, SBE, Sears, Uniden/President. Get the most from your CB radio & operations. Only \$18.95, plus \$4.00 shipping (\$5.00 to Canada). NY State residents add \$1.95 tax. Order from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. Visa/MC OK. Tel: (516) 543-9169.

SCANNER MODIFICATION HANDBOOK VOL. 1 by Bill Cheek ("Doctor Rigomortis"). The original 160-page book. Performance improvement modifications. Simple step-by-step instructions, many photos. Primarily PRO-2004 & PRO-2005, some for PRO-34, BC-200/205XLT, BC-705XLT, BC-705XLT. Restore blocked-out bands, speed up scanning rate, disable "beep," increase number of channels, improve squelch action, add an S-meter, interface with shortwave receivers, etc. Make the PRO-2004 & 2005 into a 6,400 channel scanner; put 3,200 channels into the PRO-34! Plus, cellular frequency charts, antenna info & mods, inside info on frequency management, operating hints, emergency power supplies, scanners & the law, lots more! Only \$17.95, plus \$4.00 shipping (\$5 to Canada). Residents of NY State add \$1.87 tax. **Big 220 page VOL. 2** with more mods for PRO-2004/5/6, PRO-34, PRO-2022, BC-760/950XL, BC200/205XL, now available, \$17.95 plus \$4.00 shipping (\$5.00 to Canada). NY State residents include \$1.87 tax. If both books are ordered at the same time, send only \$4.50 shipping. (\$5.50 to Canada). Order from CRB Research Books, Inc., PO Box 56, Commack, NY 11725. Visa/MC welcome. Tel: (516) 543-9169.

CW? NO PROBLEM. You can increase your speed, no matter how many times you've failed before. **Results guaranteed** when you follow the instructions. PASS Publishing's CW Mental-Block Buster program helps you **explode mental blocks** that hold you back. Based on 40 years of research, the **CW Mental-Block Buster** uses guided meditation, dynamic visualizations, and powerful affirmations to blast through mental blocks. **You can do code!** That means new bands, more contacts, more fun! (This is not a CW practice tape.) The **CW Mental-Block Buster** audio cassette and practice booklet are only \$29.95 ppd. in the US GA residents add 6% sales tax. (Quantity discounts available for classes.) **PASS Publishing**, PO Box 768821, Roswell, GA 30076. 404-640-6295, FAX: 404-640-8780. MC/VISA COD. Mail/fax orders include signature. Office hours after 4:30 PM Eastern.

CANADIANS ONLY. Lowest prices, Bearcat-AOR, Uniden, Midland, Ranger, Galaxy, K40, Wilson, Antron, Valor, Sangean, MFJ, Diamond. Free Price List. Catalog \$2.00. Cellular Communications, 83 Galaxy Blvd., Unit #39, Rexdale, ONT., M9E 5X6. (416) 675-0029.

SCANNER FREQUENCY SEARCH SERVICE. Hear all there is to hear! SAE to: Heald, 6886P, Jefferson, North Branch, MI 48461.

"PERMANENT MAGNET MATERIALS SHORT COURSE." Complete history, materials listing, glossary, specifications, applications, design criteria, sources. Details—\$2.50, order refundable. SJL Publishing, Dept., A004PC, Hanna, IN 46340-0152.

ICOM R-1 Mini, handheld scanner. Mint condition. \$330. Call Steve, (203) 535-3070.

Your **HAM RADIO LICENSE** is only hours away with **THE ARRL TECHNICIAN CLASS VIDEO COURSE**

The Fast, Easy, Fun Way to Pass Your Novice- and Technician-Class FCC Written Exams!



**ENJOYING
HAM RADIO
HAS NEVER
BEEN EASIER!**



Your Complete ARRL Technician Class Home Study Video Course Includes:

- Three exciting video tapes—five hours of invaluable instruction—covering everything you need to pass your Novice and Technician Class written exams
- 164-page Course Book with detailed notes.
- Every FCC question—with correct answers and detailed explanations.
- Six practice exams to “tune you up” for the real exam. On the big day, you’ll be relaxed—and more than ready!

Your ARRL Technician Class Video Course is produced by King Schools, Inc., a recognized world leader in the production of exam preparation video courses. King videos work, and they get the job done for the student like no other medium can.

And your ARRL Technician Class Course is no exception. You’ll witness the magic of King’s 3-D animation and full screen “monster” graphics, see problems solved right before your eyes, and always be in complete control of the learning process—able to stop, rewind, and review any part of the course whenever you like.



Order Risk Free

We're so sure you'll do well on your exam with the Technician Class Video Course that we make this guarantee:

1. Examine your Technician Class Video Course free for 20 days. If it's not what you expected, simply return it for a full refund—no questions asked.
2. You will pass your FCC written exam with the ARRL Technician Class Video Course. If you fail your test within one year, return your course and we'll refund your money. Every penny. **You pass, or you don't pay!** (Include a dated proof of purchase and the date and location of your VEC-administered exam session when you return your course.) **And...**
3. In addition, the veteran hams at ARRL Headquarters in Newington, Connecticut, stand ready to answer your questions and provide expert advice and information. **We won't let you fail.**

Get the Best, When You Need the Best!

- Only the American Radio Relay League (ARRL), the national organization of Amateur Radio Operators, has more than 75 years experience in helping people—just like you—become hams. With our expert help, you'll be on the air in no time!
- The ARRL Technician Class Video Course demonstrates every important concept on video. You succeed because you completely understand the material, not because of rote memorization.
- Only the ARRL has the resources to make sure you have the latest, most accurate information on video. With the ARRL, you know your course is fully updated for the current FCC exams.
- Your course is produced in association with King Schools, whose award-winning “Monster Graphics” let you see your instructor and “the action” at the same time.
- With the ARRL, expert help is only a phone call away. Call us any business day, toll-free, to have your questions about the ARRL Technician Class Video Course or your FCC exam answered personally.



NO MORSE CODE REQUIRED

Your ARRL Technician Class Video Course is all you need to pass your FCC Technician Class exam and start exploring every nook and cranny of the VHF/UHF ham bands—that's full access: all bands, all modes!

Start with a simple FM mobile rig and follow your interests wherever they lead.

Optional Exam Software Available

The ARRL Technician Class Computerized Exam Review is a fun, user friendly program that lets you choose questions by subject, or take them all.

At your command, you'll see on-screen correct answers with ARRL's detailed explanations.

Plus... the program selects unanswered or previously missed questions, tracks your progress, and gives you a personal Report Card so you can watch your score improve!

So What Are You Waiting For?

With your new license, the world of Amateur Radio awaits you. Pass your written exam now with the ARRL Technician Class Video Course...and get in on the fun!

1. Your ARRL Technician Class Video Course, only \$99

—OR GET EVEN MORE!—

2. Your ARRL Technician Class Video Course, Plus The Technician Class Computerized Exam Review Program (A \$49 Value), all only \$119

To Order, Call 1-800-32-NEW HAM or Tear Out And Mail Today

OK! I want to start enjoying the World of Amateur Radio. Rush me:

Complete ARRL Technician Class Video Course, Only \$99

Complete ARRL Technician Class Video Course **And** Technician Class Computerized Exam Review. All only \$119

Computerized Exam Review

Macintosh IBM Compatible (512k, hard drive)

Specify 3 1/2" 5 1/4" Disks

The American Radio Relay League
Helping Hams Get Started Since 1914

225 Main St, Newington, CT 06111
PC 203-666-1541 • Fax 203-665-7531

Ship To:

Name _____
Address _____

City _____
State, ZIP _____
Telephone (____) _____

Charge To: _____ **VHS Format**

MC VISA AMEX Discover
Card No. _____

EXP _____

Check or Money Order Enclosed

TOTAL PURCHASE \$ _____

Shipping and Handling _____

UPS Surface, \$5

FEDEX 1-2 Day Delivery, \$15

In CT add 6% Tax _____

TOTAL AMOUNT \$ _____

212-925-7000

SHORTWAVE RECEIVERS, HAM RADIOS, BOOKS
ANTENNAS, SCANNERS, Business Radios.
MOTOROLA, ICOM, YAESU, KENWOOD, SONY
PANASONIC.

... our 40th Year ... Worldwide shipping.

Sales ... Service. Large Showroom. Open 7 days.

Barry Electronics Corp.
WORLD WIDE AMATEUR RADIO SINCE 1950
Your one source for all Radio Equipment!

Fax 212-925-7001

512 Broadway, NYC, NY 10012

CIRCLE 54 ON READER SERVICE CARD

MONITOR WITH THE PRO'S

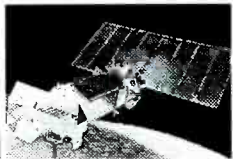
- The World Scanner Report -

published 10x/yr for casual hobbyists • follows the latest technology of scanning the radio frequency spectrum from DC-to-daylight • consumer & hobby electronics • do-it-yourself scanner/receiver projects. • SASE or 2 IRC for info, or US Funds: \$4/ea. \$25/yr. Canada+15%. Foreign+25% surr/50% air. MC/VISA ok

COMMtronics Engineering, PO Box 262478, San Diego, CA 92196

CIRCLE 57 ON READER SERVICE CARD

SPY ON THE EARTH



See live on your PC what satellites in orbit see

Capture live breathtaking images of the Earth for fun or profit. Zoom in up to 20X. Send \$39 check or M.O. (\$45 air, \$50 overseas) for our fantastic 12 diskette set of professional quality copyrighted programs (IBM type) that does satellite tracking, image acquisition, image processing, 3-D projections and more. Direct reception from the satellites guaranteed worldwide without a satellite dish. Schematics included for interface. For FREE information log-on to our bulletin board anytime at: (718) 740-3911.

VANGUARD Electronic Labs
Dept. PC, 196-23 Jamaica Ave.
Hollis, NY 11423 Tel.718-468-2720

SURVEILLANCE & COUNTERSURVEILLANCE Electronic Devices

Bugging/Phone Tapping Detectors • Caller IDs
Phone Scramblers • Voice Changers • Shotgun Mics
Vehicle Tracking • Transmitters • Locksmithing • AND MORE!

NEW! 7-hour telephone recording system.
Tapes phone calls automatically. \$125.00

FOR CATALOG SEND \$5.00 TO...
E D E P.O. Box 337, Buffalo, NY 14226 (716) 691-3476

FREQUENCY PRINTOUT SERVICE

- Printouts of FCC frequency data • Your country or selected radius Custom searches made to order

G. Bellows
P.O. Box 1239
Charleston, S.C. 29402

CIRCLE 61 ON READER SERVICE CARD

CELLULAR HACKERS BIBLE. Theory—Hacks—Modifications—\$53.95. Cellular Cloning Video—\$39.95. Cellular Programmers Bible \$84.45. COD's: (602) 782-2316. FAX: (602) 343-2141. **TELECODE**, PO Box 6426-PC, Yuma, AZ 85366 6426.

CABLE TEST CHIPS. Scientific-Atlantic 8550, SA8500-310, 311, 320, 321 (specify) \$33.95. 8580-338—\$69.95. 8570xxx, 8590xxx, 8590 (11 BUT-TON)—\$69.95. TOCOM 5503/07 VIP—\$33.95. ZENITH ZF-1—\$33.95. STARCOM 6 (except BB)—\$33.95. STARCOM7 (except M1)—\$49.95. STARCOM 7 (M1)—\$109.95. **CABLE HACKERS BIBLE**—\$53.95. **CELLULAR CLONING VIDEO**—\$39.95. **CELLULAR PROGRAMMERS BIBLE**—\$84.45. COD's: (602) 782-2316. FAX: (602) 343-2141. Catalog—\$3. **TELECODE**, PO Box 6426-PC, Yuma, AZ 85366-6426.

PORTABLE, SATELLITE COMMUNICATIONS SYSTEMS, COMSAT TCS-9000, up/downlink. INMARDAT telephone, data, telex, 106 pounds total. Excellent condition, complete documentation. (205) 826-0390.

VIDEOCIPHER II - Satellite - Scanner - Cable - Amateur - Cellular - Repair Manuals, Modification Books & Software. Catalog—\$3.00. **TELECODE**, PO Box 6426-PC, Yuma, AZ 85366-6426.

CB, HAM, SWL DISCOUNT OUTLET. Cobra, Uniden, Phillips, K40, A/S, Larsen, Firestick, Valor. Many hard to find items. Catalogs \$1.00. Mobile installations available at our retail store. Custom Auto Radio. Dept. P3, 660 Arsenal St., Watertown, MA 02173. Tel. 617-923-2122.

MEN OF ACTION AND ADVENTURE — Paladin Press has been described as "the most dangerous press in America." Millions of satisfied readers disagree. Outrageous and controversial books and videos on firearms, exotic weaponry, unconventional warfare, new identity, espionage and investigation, privacy, action careers and more! To order our 50-page catalog send \$1.00 to: Paladin Press, Box 1307-3BP, Boulder, CO 80306. (303) 443-7250.

VIDEO SYNC GENERATOR. Restores Horizontal & Vertical sync lines from distorted analogue video formats. For Information on completed units & pricing write: R.C. Distributing, Box 552, South Bend, IN 46624. Phone: (219) 236-5776.

FOR SALE: Two Realistic CB walkie-talkies, model TRC-216. 40 ch., 5W. Uses Nicds or AAs. Includes carry case and wall charger, manual. Mint cond — \$100 each. Realistic 40 ch. AM/SSB mobile CB. Mint cond with bracket, mic and manual \$135. Postal mo only! H. Ort, 270 Mechanic St., Red Bank, NJ 07701.

HAM RADIO PROGRAMS (plus 100s of other applications). Low as \$1.00 per disk. Send \$2.00 for catalog and sample disk to: TRI-MI SOFTWARE, 517 Pine Brook Road, Eatontown, NJ 07724. (908) 3891049.

CELLULAR, 2-WAY, CB, SCANNER ANTENNAS for base, portable, mobile. High quality at discount prices. Price list \$1 (refundable) **Radio Communications Services**, 1007 Eastfield, Lansing, MI 48917.

WANTED: R-390 receiver, especially model in use by Air Force in early '70's. Any condition. Stan Sullivan, PO Box 270, Montevallo, AL 35115. (205) 665-2065.

NATIONAL SCANNING REPORT, America's #1 all-scanning magazine. Articles, frequencies, new products, more. One year subscription (\$17.50) includes custom frequency print-out for your country. Order toll-free 1-800-423-1331. Sample copies \$3.00 cash from Box 360, Wagoniown, PA 19376.

LOCATING, TRANSLATING SERVICE: Books, shop service manuals, journals. Will barter third world translation services, book forwarding. Waterproof pages optional. Specialties: Bio-medical, folk medicine, Celestial Navigation. \$200 package. Bater with bible translators, Peace Corps, others. R.V. Engineering, PO BOX 734, Ottertail, MN 56571. (218) 367-2636.

WANTED: Pre-1925 Antique **RADIOS** and parts. Also later models with 15 or more tubes, or bright colored cases. Matthew Kurzdorfer, 107 Falconer Street, North Tonawanda, New York 14120-6108. (718) 695-0036.

FOR SALE: ICR1 New \$385.00; AEA CP1 Computer Interface w/Commodore 64 Software (New) \$150.00; McKay Dymek DA100 Active Antenna \$75.00; SBE Opti-Scan w/Instruction Book and Cards \$100.00; Kenwood SP100 Speaker (new) \$50.00; Handic 6 Channel W/T \$35.00; Antenna Specialist VHF/UHF Pre-Amp \$35.00; Gladding Islander AM/FM/ MB/LW/VHF with RDF \$35.00; Regency 8 Channel Crystal Scanner \$25.00; Grove Spectrum Probe \$25.00. John Lewitsky, 615 Main Street, Stroudsburg, PA 18360. (717) 629-3403.

RCI-2950 Modification Manual, Including power and modulation increase. Clarifier, receiver modifications. Operating hints and more. Parts included. \$20.00 ppd U.S. Money Order. \$25.50 COD (MO residents add \$1.15 tax). Scott, PO Box 510408, St. Louis, MO 63151-0408. (314) 846-0252.

MORSE CODE Got You Down? Why let a mental block stand between you and upgrading? Use PASS Publishing's **CW Mental-Block Buster** to **blast through those barriers**. Just follow the instructions for 30 days—Results Guaranteed! Based on 40 years of research, the **CW Mental-Block Buster** uses guided meditation, dynamic visualizations, and powerful affirmations to blast through mental blocks. **You can do code!** That means new bands, more contacts, more fun! (This is not a CW practice tape.) The **CW Mental-Block Buster** audio cassette and practice booklet are only \$25.95 ppd. in the US (GA residents add 6% sales tax). (Quantity discounts available for classes.) **PASS Publishing**, PO Box 768821, Roswell, GA 30076. 404-640-6295. FAX: 404-640-8780. Office hours after 4:30 PM Eastern. MC/VISA. COD. Mail/fax orders include signature.

PRO 43, 39, 2026, 37, 34, 2006 800 MHz modifications. Well explained and illustrated steps. \$12 each. A.P. 500 - Dineen, Apt. #300, Labrador City, NFLD, Canada A2V 1E6.

SELECTED SHAREWARE (MSDOS): Choice programs. All good. Many unusual. No disappointments. \$1 each. Free catalog on disk. Restricted book listing included. **MENTOR PUBLICATIONS, Box 1549-P, Asbury Park, NJ 07712.**

NEW BC-2500XLT call!!! New BC-8500XLT call!!! AR-1500 with SSB \$469. AR-2800 \$439. AR-3000A \$989. BC-200XLT \$245. BC-760XLT \$275. BC-855XLT with 100 memories \$225. CBs, shortwaves, antennas, books, more!! If you don't see it call for price quote! Free UPS shipping and insurance to 48 states! We ship COD daily and we take trades! Price sheets \$1.00. GALAXY, Box-1202, Akron, OH 44309. (216) 376-2402. Our 10th year!!

MacRadio. Macintosh tutorial program for New Pool Novice & Technician HAM License. \$29.00 + \$3.00 shipping (CA add \$2.40 tax). Lightning Industries, 1806 Millmont Dr., #125, Santa Clara, CA 95035 (408) 942-7998.

HEATHKIT FANS—The kits are gone, but a new illustrated 124 page book provides company history and the personal insights of many company oldtimers. A perfect gift. Only \$9.95 postpaid from Heath Nostalgia, 4320-196th S.W., Suite B-111, Lynnwood, WA 98036-6754.

WANTED HIGH PERFORMANCE? The "Great" CBs, necessary accessories, antennas of the "Golden Era." Special Schematics, Classic Tubes. Dynamite Xstrs. L.S.A.S.E. to: AC. PO Box 383, Buckner, NY 40010-0383.

DRAKE SPR-4 perfect condition. 25 Crystals for all international and marine bands. Manuals, noise-blanker, calibration crystal, 12-volt cable, Drake medium-wave antenna. \$260, including shipping. John McCarthy, 345 Gray Avenue, St. Louis, MO 63119. (314) 962-3458.

HOW TO BUY A USED SHORTWAVE RECEIVER—\$6 ppd. Complete catalog of Patriot/Right Wing books - \$1. Bohica Concepts, POB 546-PC, Randle, Washington 98377.

SHORTWAVE + SCANNER computer service. ShortWave Paradise-2008 SW 15th Ave., Fort Lauderdale, FL 33315-1871. 6 mo \$15.00, 1 yr. \$25.00. Call our Computer system today! (305) 524-1035.

FOR SALE: NRD 535D, Universal M-8000, AOC CM-335 Color monitor, sell as package only. All mint, original boxes, manuals and receipts of purchase, \$2800. Call Mark, (203) 259-5417.

FOR SALE: CABLE TV DESCRAMBLERS/CONVERTERS wholesale outlet. All major brands. Money back guarantee. One year warranty. THE CABLE CONNECTION 800-764-5400. DEALERS WANTED.

SCANNER! HAM, CB RADIO! REPAIRS. Maximum labor, \$80. Most models, modifications, Dan Rupe (Telo-Technology), 1302 South Uplands, Camano, WA 98292. (206) 387-3558.

AR-1500 w/SSB \$469, AR-2800 w/SSB \$425, AR-3000A \$989, BC-2500XLT call! BC-890XLT call! BC-200XLT \$245, BC-760XLT \$275, BC-855XLT with 100 memories \$225. CBs, books, shortwaves, antennas, more! Free UPS shipping to 48 states! Price sheets \$1. Buy/sell/trade. Prices subject to change without notice. Galaxy, Box-1202, Akron, OH 44309. (216) 3760-2402

Motorola MT 500 four channel walkie, drop-in charger, new battery, marine freqs., 156.80, 156.70, 156.65, 157.125. \$150 or swap for scanner with aircraft freqs or six meter rig. Mike Starr, N80VJ, (313) 797-4150.

PORTABLE SATELLITE COMMUNICATIONS SYSTEMS, COMSAT TCS-9000, up/downlink. INMARSAT telephone, data, telex. 106 pounds total. Excellent condition, complete documentation. (205) 826-0390.

CONFIDENTIAL, Catalog of Police and Investigation Equipment \$2. INTERNATIONAL POLICE EQUIPMENT, Department PCM693, PO BOX 7638, Moreno, California 92552.

Kenwood R-2000 receiver \$385 Realistic Pro 2022 Scanner \$150. Send money order to David Van Densen, 888 East Shady Lane Lot, 241 Neenah, WI 54956, or call (414) 734-2437.

SHORTWAVE & SCANNER computer service. ShortWave Paradise, 2008 SW 15th Avenue, Ft. Lauderdale, FL 33315-1871. Six months, \$15, one year, \$25. Call our computer system today! (305) 524-1035.

WANTED: A schematic or copies for a **SBE Console V**, and also for a Radio Shack Realistic Mobile, model TRC-428 nine-scan. If you can help, please send info to Michael Gostas, PO BOX 241, Appleton, WI 54912.

FREE SPACE-AGE TELEPHONE TRANSMITTER super thin design with counter-measures equipment catalog purchase, \$10. SPY MART, P. O. Box 2343-C, Atlantic Beach, NC 28512.

PROSCAN FREQUENCY MANAGER. Innovative DOS software. Track 9,999 frequencies. Indispensable for the scanner enthusiast. Other software available. S.A.S.E. for details. **DataFile, Box 20111, St. Louis, MO 63123.**

SONY 2010 shortwave, \$225; Realistic Pro-2006 scanner, \$250—or both for \$450 complete. Panasonic RF4900 shortwave radio, \$250. All have original boxes and manuals. All in excellent working condition. L.Larsen, (708) 896-1412.

WANTED: The following early model radios: Regency TMR-12 (high), TMR-1 (high), HX-1000, Sonar 2513 (high), and EF Johnson 8 channel scanner (high). Top dollar for any of the radios listed in good usable condition with AC cord. Contact: Tom Lake, PO Box 4137, Stn. B, Long Branch, NJ 07740. (908) 229-9302.

GUIDE TO THE AR1000. We publish a complete, 90-page guide for the operation and use of all AOR-AR1000 and Fairmate HP-100/200 scanners. Comes with 10 scan bank templates and a handy, six-panel, folded Quick Reference Card. \$18.45 including S&H in the USA. Design EQ, PO Box 1245-PC, Menlo Park, CA 94025. 415-328-9181.

PRO-2004/5/6 OWNERS: Search-and-Store finds unknown frequencies automatically. Internal no-holes installation-keyboard control. Wired-tested-postpaid: Ten channel-\$24.95; Selectable to 225 channels-\$44.95. US checks or MO. SASE for information. Key Research, POB 846P, Cary, NC 27512-0846.

KENWOOD & ICOM Service Bulletins. 175+ pages covering all models—\$39.95. Catalog—\$3.00. CODs 602-782-2316/FAX 602-343-2141. **TELECODE,** Box 6426-PC, Yuma, AZ 85366-6426.

SUPER CABLE TV "TURN-ON CHIPS." Provides full service Activation. **Easily Installs** inside your factory Cable Box. Includes instructions & illustrations. **Jerrold Starcom-6 & Starcom-7. Scientific Atlanta:** 8500...8550...8570...8580...8590 & 8600. **Tocom:** 5503-VIP & 5507. **Zenith:** ST-1000 thru ST-5000. **CALL NOW!! MASTER COMPONENTS. (310) 920-0570.** Sold for test purposes only.

NORTHEAST SCANNING NEWS, the UHF/VHF scanner publication for scanners from Maine through Virginia. Nearly 800 subscribers read this 68-paged news-magazine monthly. One-year subscription is \$26, sample copy is \$2.50 (United States residents only!). Make checks or money orders payable to LES MATTSON, P.O. Box 62-P, Gibbstown, NJ 08027.

ANTENNAS FOR CB, SCANNER, CELLULAR, 2-WAY base, portable, mobile. High quality at discount prices. Price list \$1. **Radio Communication Services,** 1007 Eastfield Lansing, MI 48917.

SATELLITE EQUIPMENT 5-10% ABOVE COST! All major brands: Chaparral, DX, Echostar, HTS, GI, Toshiba, Norsat LNBs, Orbit \$40, SatTVwk, \$44. Canyon Satellite 1-800-SAT-PRTS, 602-921-3159.

TREASURE QUEST MAGAZINE. The Journal of Lost Treasure, Shipwrecks and Recovery. Salvage, metal detecting, archaeology. Covers both land and sea treasure hunting. Hi-tech search and recovery. Subscription, 5 issues, \$16, 160 pages. Sample copy, \$4. Treasure Quest Magazine, P.O. Box 10030, McLean, VA 22102-8030.

FOR SALE OR TRADE: Motorola Motrac two-way radio system. 100 watt base. (1) 100 watt, (2) 50 watt mobiles, all accessories. \$650 or R7000, RZ-1, Pro-2006, etc., offer. J. Yurrick, P.O. Box 175, Bovey, Minnesota 55709.

CB OWNERS: Echo Power Mike w/battery wired for any make/model. Lifetime warranty. Three controls. \$49.95 plus model number to **ADVANCED SPECIALTIES,** Box 1099, Lodi, NJ 07644-1099.

DRAKE R-8 WANTED: Will swap 386-33 PC, 170HD, 4 meg RAM, 2FDs, SVGA monitor, kbd, mouse, software. (516) 482-2288 days, (212) 777-1332 evenings.

NEW ICOM R7000, \$1129, R72 \$799, Yaesu FRG-100 \$519, Bearcar 760XLT \$219, 200XLT \$229, 2500XLT \$359. Yupiteru scanners. Call for our new and used price sheets. Send \$1 to The Ham Station, 220 North Fulton Avenue, Evansville, IN 47710. For orders and quotes, call toll free, 1-800-729-4373.

FOR SALE: Classic Antique Studio Microphones. RCA 77-DX just like Larry King's! Good ribbon, sounds and looks great. Also vintage RCA 44-BX, also looks and sounds magnificent. Comes with original documentation. \$1700 for each; obo. Send \$1 for photo of either microphone. Victoria Kensington, 1306 North Park Avenue, Indianapolis, IN 46202, 317-638-7314.

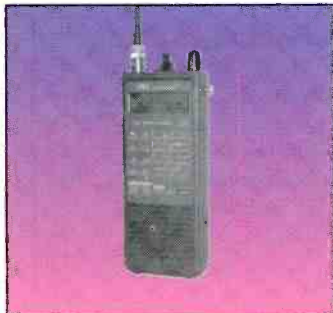
Bearcat 200XLT case, antenna, wall charger, manual. \$150. Realistic PRO-30 antenna, wall charger, \$75. Bob KESZY (210) 614-3920.

Advertisers' Index

AMC Sales, Inc.	15
A.R.R.L.	16,77
Ace Communications.	11,80, Cov III
Antenna Specialists	6
Antenna Supermarket	29
Antique Radio Classified	43
Barry Electronics Corporation	78
CCS.....	71
CB City International, Inc.....	70
CRB Research	43
Cellular Security Group.....	29,70
COMMtronics Engineering.....	43,78
Communications Electronics	19
Communications Specialists	64
Computer Aided Technologies	22
Consumertronics.....	74
DECO	71
Delta Research.....	52
Drake, R.L. Company	4
EDCO	21,22
EDE	78
Electron Processing	51
Electronic Equipment Bank	1,38
Frequency Printout Service.....	78
G & G Electronics	62
GRE America, Inc.	35
Gilfer Shortwave	5
HR Bookstore	20
ICOM America	42, Cov IV
Index Publishing Group.....	60
J & J Enterprises	22
Japan Radio Company, Ltd.	Cov II
Jo Gunn Enterprises.....	48
L & L Electronics	43
Lentini Communications, Inc.....	48
MFJ Enterprises, Inc.	74
MARYMAC Industries, Inc.....	74
Microcraft Corporation	71
MoTron Electronics	29
National Amateur Radio Assoc.	5
OPTOelectronics.....	7,57
Percon Corporation	37
RC Distributing	45
RF Limited	47
REACT International	49
Radio Shack	13
Radioware Corporation	51
Satman, Inc.	70
Scanner Master Books	71
Scanner World USA	59
Scrambling News	70
Software Systems Consulting	47,64
U.S. Cable	62
U.S. Radio	15
Universal Electronics, Inc.	52
Universal Radio, Inc.	3
Vanguard Labs.....	78
Viking International	73
Wilson Antenna, Inc.	45
Xandi Electronics	45
Yaesu U.S.A.....	23

Reach this dynamic audience with your advertising message, contact Don Allen, N9ALK at 217-344-8653, FAX 217-344-8656

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.



MVT7000



MVT8000

\$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 gaps, no cut-outs. Mobile is super slim line. AC/DC. Order MVT8000, includes antenna, mbl mnt. Order MVT7000 for the hand held. Complete with Ni-Cads Charger, antenna & earphone.

Fax fact document #275



New Bearcat mobile/desktop offer continuous coverage of VHF/JHF/800 bands The Bearcat 890XLTB covers 29-956 MHz with 200 channels, Turbo scan, WX search, VFO tuning, 10 priority channels and more! The Bearcat 8500XLTC covers 25-1300MHz 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 8500XLTC\$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 #550

Other Mobile Scanners

BC590\$159.95

BC560XLTZ\$99.95

Fax fact on above: #560

Scan/CB/Highway Patrol/WX. X,K,Ka,Wide & Laser

\$399.00

Scans police pre-programmed by state channel 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 TR-33WL

Other Pre-Programmed Scanning Receivers

BC350AS\$129.00

BCT2\$149.00

BC700AS\$169.00

Fax fact on all above: #580

Hand Held Scanners



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 & Chrg.

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

Shortwave Receivers



ATTS-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 & Bt. strength indicator. Sleep timer & tone control.

Fax Fact #505

ATTS-818\$194.95

Same as 818CS but without cassette.

Fax Fact #506

ATTS-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

ATTS-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

ATTS-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.



ATTS-606P\$174.95

SG-621\$79.95

Compact 10 band receiver with AM/FM/Stereo. Analog tuning with a digital display.

Fax Fact #513.

ATTS-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

Table Top Scanners



Bearcat 800XLX

12 bands and 40 channels with 800MHz and nothing cut out. AC or DC.

Fax facts #690



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.D. 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.

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

ACE
COMMUNICATIONS
10707 East 106th Street, Fishers, IN 46038

Call Toll Free,
24 Hours A Day!

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



Wide Band Receivers...



ICOM has broken the barriers with its new line of wideband receivers built to go the distance. Introducing the IC-R1 handheld receiver, the IC-R72 HF receiver and the IC-R100 multi-purpose receiver.

IC-R1. The smallest wideband handheld available today, the IC-R1 continuously covers 100kHz-1300MHz with AM, FM and Wide-FM modes. This tiny receiver measures just 1.3"H x 4.0"H x 1.4"D.

Easy operation is a snap with the IC-R1's Dual Frequency Selection (direct keyboard and rotary tuning), 100 memories and a 24-hour clock completes the world's smallest full-featured handheld receiver.

IC-R100. Install the IC-R100 at home or in your car. Listening pleasure is guaranteed

with continuous coverage from 100kHz-1856MHz in AM, FM and wide FM modes. Monitor VHF air and marine bands, emergency services, government as well as amateur stations. 121 fully programmable memory channels, multiple scanning system, an automatic noise limiter, built-in preamplifier and attenuator, clock with timer and built-in backup lithium battery make the IC-R100 the perfect package for mobile or base operation.

IC-R72. The IC-R72 continuously receives 100kHz-30MHz in SSB, AM and CW modes with very high sensitivity. An optional U-E provides FM reception. Additional features include: Noise blanker, five scanning systems, AC/DC operation, internal backup battery, built-in clock and ICOM's DOS System. The IC-R72 boasts a 160 dB wide dynamic range while

an easy-to-access keyboard provides convenient programming versatility. The easy to operate IC-R72 is superb for short wave listeners.

The IC-R1, IC-R72 and IC-R100 join ICOM's current line of professional quality receivers... the IC-E71A, IC-R7000 and IC-R9000. ICOM... expanding the horizons to bring you better technology, today. See the complete line of quality ICOM receivers at your local authorized ICOM dealer today.

For a brochure on this or any other ICOM product, call our Literature Request Hotline 206-450-6088.

ICOM
First in Communications

...That Go The Distance.

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004 Customer Service Hotline (206) 454-7619
18102 Skyway South, Ste. 52-B, Irvine, CA 92714 ICOM Canada, A Division of ICOM America, Inc., 3071-85 Road, Unit 9, Richmond, B.C. V6X 2T4 Canada
For inquiries in UK contact: ICOM (UK) Ltd Unit 9, Sea St, Herne Bay, Kent CT6 8LD, UK Phone 0227 741741 Fax 0227 741742
All stated specifications are subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. R1593

CIRCLE 68 ON READER SERVICE CARD