ICD 08635

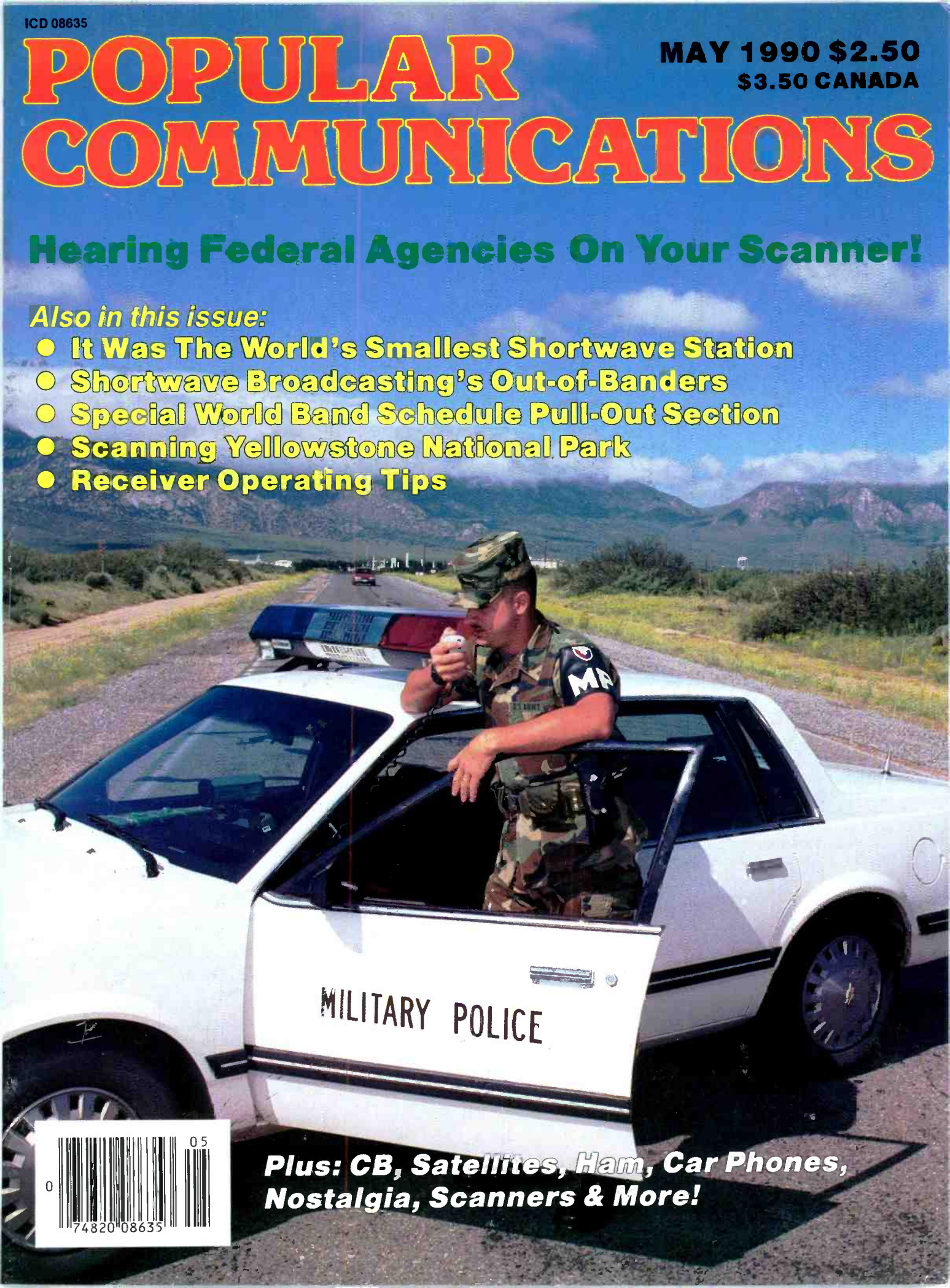
POPULAR COMMUNICATIONS

MAY 1990 $2.50
$3.50 CANADA

Hearing Federal Agencies On Your Scanner!

Also in this issue:

- It Was The World's Smallest Shortwave Station
- Shortwave Broadcasting's Out-of-Banders
- Special World Band Schedule Pull-Out Section
- Scanning Yellowstone National Park
- Receiver Operating Tips



Plus: CB, Satellites, Ham, Car Phones, Nostalgia, Scanners & More!

0 74820 08635 05

KENWOOD

...pacesetter in Amateur Radio

NEW RZ-1 Wide-Band Receiver.

Hear it All!

R-5000
R-2000
High performance receivers

Scan the entire frequency range from 100 kHz to 905 MHz with Kenwood's R-5000, R-2000 and RZ-1. Listen in on foreign music, news, and commentary. Monitor local police, fire, and other public safety services, as well as the Marine channels, and the many other services 50 MHz and above.

(The VHF converter options must be used in the R-5000 and R-2000.)

R-5000

The R-5000 is a high performance, top-of-the-line receiver, with 100 memory channels, and direct keyboard or main dial tuning—makes station selection super easy! Other useful features include programmable scanning, large, built-in speaker, 110 volt AC or 12 volt DC operation (with optional DCK-2 cable), VHF capability (108-174 MHz) with the VC-20 option, dual 24-hour clocks with timer, and even voice frequency readout with the VS-1 option.

R-2000

The R-2000 is an all band, all moce receiver with 10 memory channels and many deluxe features such as programmable scanning, dual 24-hour clocks with timer, all-mode squelch and noise blankers, a large, front-mounted speaker, 110 volt AC or 12 volt DC operation (with the DCK-1 cable kit), and 118-174 MHz VHF capability with VC-10 option.

RZ-1
Wide-band scanning receiver

The RZ-1 wide-band, scanning receiver covers 500 kHz-905 MHz, in AM, and narrow or wideband FM. The automatic mode selection function makes listening easier. One hundred memory channels with message and band marker, direct keyboard or VFO frequency entry, and versatile scanning functions, such as memory channel and band scan, with four types of scan stop. The RZ-1 is a 12 volt DC operated, compact unit, with built-in speaker, front-mounted phones jack, switchable AGC, squelch for narrow FM, illuminated keys, and a "beeper" to confirm keyboard operation.

Optional Accessory
- **PG-2N** Extra DC cable

Optional Accessories

R-2000:
- **VC-10** VHF converter
- **DCK-1** DC cable kit for 12 volt DC use.

R-5000:
- **VC-20** VHF converter
- **VS-1** Voice module
- **DCK-2** for 12 volt DC operation
- **YK-88A-1** AM filter
- **YK-88SN** SSB filter
- **YK-88C** CW filter
- **MB-430** Mounting bracket.

Other Accessories:
- **SP-430** External speaker
- **SP-41** Compact mobile speaker
- **SP-50B** Mobile speaker
- **HS-5** Deluxe headphones
- **HS-6** Lightweight headphones
- **HS-7** Mini-headphones.

KENWOOD

KENWOOD U.S.A. CORPORATION
2201 E. Dominguez St., Long Beach, CA 90810
P.O. Box 22745, Long Beach, CA 90801-5745

Specifications, features, and prices are subject to change without notice or obligation.

CIRCLE 41 ON READER SERVICE CARD

The ICOM EXPERTS

Minutes From Washington, D.C.

NEW

R72A .1-30 MHz

- New State Of The Art Circuitry
- Direct Digital Synthesizer (DDS)
- 100dB Dynamic Range
- All Mode AM, CW, SSB, FM (Opt)
- Keyboard And Memory Entry
- 101 Programmable Memory Channels
- Tuning Steps—.1, 1, 10 kHz
- Multiple-Action Scan Functions
- Frequency Voice Synthesizer (Opt)
- Computer & Cris Compatible
- 24 Hour Clock—Recorder Start/Stop
- Options CW Filter, 12VDC, CT17, CT16, CR64 More
- Power 117, 220/240 50/60 Hz (12VDC Opt)
- Size Only 9.5"W × 3.7"H × 9"D WT 10.6 LBS
- EEB Options To Be Announced

Sale Price And Delivery . . . Call

NEW

R100 .5-1000 MHz

- Advanced Wide Range Circuitry
- Frequency Coverage Unbelievable
- 120 Programmable Memory Channels
- AM, FM and FM Wide (TV-FM Sound)
- Multiple-Action Scan Functions
- Keyboard Entry • Priority Channel
- 24 Hour Clock/Timer-Power On-Off
- Low Noise 15dB Preamplifier
- Tuning Steps (<.1-905 MHz) 1, 5, 8, 9, 10 12.5, 20, 25 kHz. >905-12.5, 20, 25 kHz
- 3 Antenna Input Jacks
- Power 13.8 VDC I AC Adapter (Opt)
- ANF—Noise Limiter
- 5.9(W) × 2(H) × 7.1(D) Inch 3.1 LBS
- Selectivity (−6dB) FM 15, FMW 180, AM 6 kHz

Sale Price And Delivery . . . Call

NEW

R1 .1-1300 MHz

- New Compact HiTech Circuitry
- Unbelieveable Size 1.9W × 4.0H × 1.4D (Inch)
- No Handheld Ever With This Coverage
- 100 Programmable Memory Channel
- AM, FM, And FM Wide (TV-FM Sound)
- Multi Scan-Programmed, Memory, Selected—More
- Keyboard & Rotary Tuning (Not Found In Most Handhelds)
- 11 Tuning Steps .5 To 50 kHz Dial Steps .1, 1, 10, 100 MHz
- Clock Timer 24 Hour Auto On/Off
- Power Saver Mode Cuts Current By 93%
- Super Sensitivity .32μV FM
- Options Interchangeable With Amateur IC2SAT, 6 Battery Types, Desk Charger, Carrying Case, More

Sale Price And Delivery . . . Call

FREE DETAIL LITERATURE ON ALL ICOM PRODUCTS
CALL 1-800-999-9877

CLASSIC

R71A .1-30 MHz

- World Class HF Receiver
- All Mode AM, CW, SSB, RTTY, FM (Opt)
- Keyboard And Memory Frequency Entry
- 32 Programmable Memory Channels
- Optional Filters, Voice, 12VDC, Computer Input
- Many EEB Options Listed In Our 1990 Catalog
- 117/220/234 VAC 13.8 VDC (Opt)
- 11.25W × 4.44 × 10.9D (Inch) 16.5 Lbs

List $999
EEB Discount Price $849.95 + UPS

Get The Details From Our FREE 1990 Catalog.

CLASSIC

R7000 25-2000 MHz

- VHF/UHF Classic Nothing Like It Under $4000
- Triple Conversion Eliminates Images
- Tuning Steps .1,1,5,10,12.5,25 MHz Increments
- 99 Programmable Memory Channels
- Sensitivity Better Than .5μV (12dB SINAD) FMN
- Multimode AM, FM, FMN, FMW, CW/SSB
- Many EEB Options Listed In Our 1990 Catalog
- 117/220/234VAC 13.8VDC (Opt)
- 11.25W × 4.4H × 10.9D (Inch) 17.5 Lbs

List $1199.00
EEB Discount Price 1019.00 + UPS

CLASSIC

R9000 .1-2000 MHz

- Never Has So Much Been Offered In One Receiver
- Covers Everything VLF (100 kHz) To Super UHF 2 GHz
- Multimode AM, FM, FMN, FMW, CW, SSB, RTTY
- 1000 Programmable Memory Channels
- DDS (Direct Digital Synthesizer) Tuning
- CRT, Spectrum Analyzer, Multi Screen Readout
- Power 100-120VAC 220-240 12VDC(Opt)
- EEB Optional Power Supply And Filters
- 16.7W × 5.9H × 14.4D (Inch) 44.1 Lbs

List $5495.00
EEB Discount Price $4795.00 + UPS

ELECTRONIC EQUIPMENT BANK
323 MILL STREET, N.E.
VIENNA, VA 22180

ORDERS: 800-368-3270
LOCAL TECH: 703-938-3350
FAX: 703-938-6911

- PRICES SUBJECT TO CHANGE
- PRICES DO NOT INCLUDE FREIGHT
- SORRY, NO CODs
- RETURNS SUBJECT TO 15% RESTOCK FEE

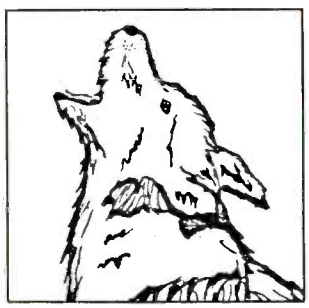
CIRCLE 178 ON READER SERVICE CARD

POPULAR COMMUNICATIONS

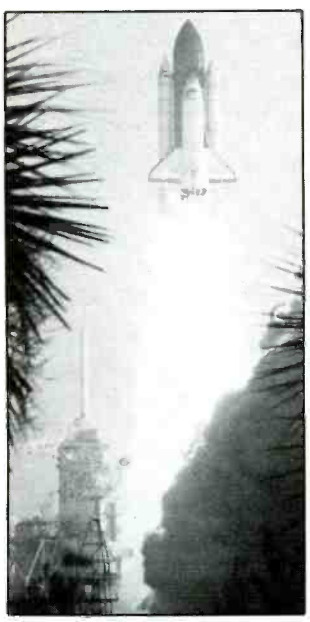
MAY 1990 **VOLUME 8, NUMBER 9**

12

72



70



60

FEATURES

DX'ing The Out-Of-Banders 8
Hey! These Shortwave Broadcasters Have Snuck Into Never-Never Land! *By Gerry Dexter*

Federal Agency & Military Activity On Your Scanner 12
Missile Tests, Drug Busts, Laser Weapons, Nuclear Tests, & War—Listen For It On 30 To 50 MHz!
By Chuck Robertson

Shortwave: Pulse Of The World 17
A Little DX Can Be Big News.
By Steven L. Herman, N7EPQ

Scanning In Yellowstone 18
A 3,500 Square Mile Federal Reserve With Its Own Police, Fire, & Communications System. A Unique Place To Monitor! *By Chad Gates, KWY7DW*

Radio: How It Was 20
A Leisurely Stroll Through The History Of Broadcasting & Communications. *By Alice Brannigan*

Books You'll Like 28
Equipment Of WWII German Army, Utility Address Guide, History Of American Broadcasting.
By R. L. Slattery

Radio Spies Of The KGB 30
Moscow's Surveillance: A Worldwide Effort That Runs On Its Own Inertia. A Former CIA Official's Analysis.
By Donald F.B. Jameson

The Tiniest Shortwave Station In The World! 36
With Its 5-Watt Transmitter, NRH Also Became One Of The Most Beloved By DX'ers.
By Dr. Adrian M. Peterson, N9GWY

COLUMNS

You Should Know . . . 39
Telephone Enroute . . . 43
Clandestine Communique . . . 45
Scanning VHF/UHF . . . 46
Broadcast DX'ing . . . 48
Ham Column . . . 51
Washington Pulse . . . 52
Communications Confidential . . . 54
Satellite View . . . 60
CB Scene . . . 65
RTTY . . . 68
Pirates Den . . . 70
Emergency . . . 72
Listening Post . . . 74

DEPARTMENTS

Beaming In . . . 4
Mailbag . . . 6
New Products . . . 35
Worldband Tuning Tips . . . 40
Communications Shop . . . 78

This month's cover: *White Sands Proving Grounds, New Mexico, MP Rex Scism mans road block during rocket launch. Photo by Larry Mulvehill.*

EDITORIAL STAFF

Tom Kneitel, K2AES/KNY2AB, Editor
George Doobinin, 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
Havana Moon, Clandestine Consultant
Roger Sterckx, AM/FM Broadcasts
Ed Noll, W3FQJ, Thoughts and Ideas
Donald Dickerson, N9CUE, Satellites
Kirk Kleinschmidt, NT0Z, Amateur Radio

BUSINESS STAFF

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

PRODUCTION STAFF

Elizabeth Ryan, Art Director
Barbara Terzo, Artist
Dorothy Kehrwieder, Production Manager
Emily Kreutz, Production
Pat Le Blanc, Phototypographer
Florence V. Martin, Phototypographer
Hal Keith, Technical Illustrator
Larry Mulvehill, WB2ZPI, Photographer

A publication of

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

Offices: 76 North Broadway, Hicksville, NY 11801. Telephone 516 681-2922. FAX (516) 681-2926. Popular Communications (ISSN 0733-3315) is published monthly by CQ Communications, Inc. Second class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year $18.00, two years $35.00, three years $52.00. Canada/Mexico—one year $20.00, two years $39.00, three years $58.00. Foreign—one year $22.00, two years $43.00, three years $64.00. Foreign Air Mail—one year $75.00, two years $149.00, three years $223.00. Entire contents copyright © 1990 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.

WHY IS FRANKIE SMILING?

He owns an *OPTOELECTRONICS* Frequency Counter.

Frankie took the guesswork out of finding emergency frequencies fast and so can you! He says, "It's as simple as 1-2-3!

1. Just read the frequency on your *OPTOELECTRONICS* counter
2. Program your scanner
3. and LISTEN in!"

Get in on the excitement! Start smiling like Frankie Freqfinder and thousands of his friends. Order your *OPTOELECTRONICS* frequency counter today!

MODEL 1300H/A 1MHz to 1300MHz range. Our lowest cost and most popular counter. Extremely sensitive from 27MHz up through 500MHz. $169.

MODEL 2210 10Hz to 2.2GHz. Wider frequency range than the 1300H/A, and more sensitive above 450MHz. Great general purpose counter for every application, audio though micorwave. $219.

MODEL CCA 10MHz through 550MHz Designed for counter surveillance, (bug detection), features RF detector LED with variable threshold adjustment. Maximum sensitivity in the range where RF bugs operate. $299.

All counters include NiCad Battery Pack and AC Charger/Adapter.

MODEL 2600H 1MHz through 2.6GHz. New, 10 digit LCD counter with 16 segment bargraph that responds to RF signal/level. More resolution, reads up to 150MHz direct count (1Hz displayed in 1 second). 4 gate times, two prescalers, hold feature, low battery indicator and more. Available April. $325.

Model 1300H/A *Model 2600H*

COUNTER ANTENNAS

MODEL TA100S - General purpose wide band antenna. $12.

MODEL RD11 -11 meter through 2 meter rubber duck. Best antenna for 27 - 100 MHz. $29.

MODEL RD100 -2 meter (150 MHz) narrow band rubber duck. $20.

MODEL RD800 -best 800 - 1300MHz antenna. Peak resonance in cellular phone band. $35.

SAVE $11!!
PACKAGE OF 3 ANTENNAS MODEL ANT/PACK-1 INCLUDES TA - 100S, RD11, AND RD800 for $65.

ORDER FACTORY DIRECT. VISA, MASTER CARD ACCEPTED.

OPTOELECTRONICS INC.

5821 N.E. 14th Avenue, Fort Lauderdale, Florida 33334
1-800-327-5912 • FL (305) 771-2050 • FAX (305) 771-2052

CIRCLE 66 ON READER SERVICE CARD

BEAMING IN

AN EDITORIAL

BY TOM KNEITEL, K2AES

Beaming In for the March issue mentioned my friend who had recently purchased a cordless telephone, and how he was filled with disbelief when I advised him that all of his conversations might easily be overheard by anybody having a scanner within the receiving range of his cordless unit. Just before the March issue came out, but after my editorial had been written, the U.S. Supreme Court handed down a decision about cordless phone privacy.

In fact, the decision related to the Iowa man mentioned in my March editorial. His neighbors went to use their cordless phone and, as chance would have it, realized that this fellow's phone was tuned to operate on the same channel pair as their own cordless phone. Before they could place their call, they heard his conversation coming from their unit. Moreover, he was discussing an activity they felt might be criminal in nature.

They notified the sheriff, who pursued the matter with some monitoring of the man's cordless phone frequency. This led to a trial in which the suspect was convicted of first degree theft, followed by the convicted man's large suit against the sheriff for illegally gathering evidence against him by monitoring his cordless phone. As various courts decided against the plaintiff, the chap kept taking it to higher courts in an effort to get someone to agree that this was a case of illegal search and seizure—a violation of his Constitutional right to privacy.

After five years of bouncing from court to court, it finally ended up in the Supreme Court. The court heard the man's plea and confirmed what many other courts in this and similar cases had ruled. With all of the many fancy words in the decision peeled away, the kernel of absolute wisdom at the very core of the decision was simple. When your talking on a radio transmitter, you have no reasonable expectation of privacy. So what else is new? We've said that for many years.

As soon as the Supreme Court acted, we began hearing from reporters putting together stories for the national print and broadcast media. They said that the public was going to be shocked to get the news that their cordless phone conversations weren't to be considered at least as private as a standard "non-cordless" telephone. They were asking for our opinions on the Supreme Court decision because the feeling was that the general public would surely perceive it as a significant dent of Fourth Amendment (against illegal search and seizure) rights.

It's always flattering to learn that POP'COMM is the first place many reporters attempt to call when they want to eliminate a lot of wasted time and get right to the basic nitty gritty.

Interestingly, the reporters themselves displayed a wide range of their own personal knowledge and familiarity with communications privacy matters. Paul Courson, of AP Network News was extremely knowledgeable on the topic, and was well aware of the positions that POP'COMM had taken on the subject. At the other end of the scale, a reporter from the newspaper in Allentown had been assigned the story, but had little more prior information than what she knew as a person who owned a cordless phone. The salesman had told her that her phone possessed many privacy code combinations that would not permit her conversations to be eavesdropped. I gave her a crash course that was the equivalent of a few cups of black coffee.

Mostly, the reporters wanted to include in their coverage some explanation that, in very basic lay terms, would let people understand why cordless phone privacy wasn't a simple Fourth Amendment matter, and how it should now be accepted as being open for general eavesdropping.

My thoughts are that the Fourth Amendment is intended to protect people (and "their houses, paper, and effects") from someone showing up, without a warrant duly issued for some specific reason, to invade their space and rummage through their clothing, records and belongings. It might be a matter of a separate argument as to whether conversations of any kind are meant to be covered here, since it appears to be worded towards protecting physical objects.

However, one might still assume that if the police snuck into your neighbor's yard and stood on an overturned bucket to peer through his window in order to see and hear what he was up to, there could be some reason for him to argue that his Fourth Amendment rights had been violated, unless they had a warrant to do so. He might feel the same way if he found you up on the bucket, because he had a reasonable expectation of privacy within his own home and on his own property. It was necessary to trespass in order to see and hear him.

Contrast this with a cordless telephone conversation. When stripped of any emotional arguments, it's only a person operating an unsecured two-way radio communications system.

A neighbor in his own home, a half-mile or more away, sits at his desk operating a receiver. A receiver is a passive device. The only thing it can detect are those signals that travel to its antenna.

The signals from the cordless telephone are deliberately being transmitted into the public airwaves. No effort is made to scramble or otherwise protect the conversation from being overheard. The signals radiate out from the person's home, past the boundary lines of the property, and invade the yards and homes of all of his neighbors within a one mile range. The signals arrive at the antenna used by the receiver of the neighbor sitting in his home. He did nothing to bring them there, nor did he have to take any effort to thwart the cordless user's steps to secure his conversation by means of scrambling.

It's hard to make a case here for the cordless user by saying that he either should have had a reasonable expectation of privacy, or that his Fourth Amendment rights had been trampled.

I also pointed out that ship-to-shore telephones aboard hundreds of thousands of boats, including yachts, tankers, trawlers, tugs, and other coastal and inland waterway vessels use VHF-FM maritime channels, As such, they are essentially similar to cordless phones in that they're always many boat skippers monitoring each and every call. It's been that way for decades. Nobody seems to care, and there has never been any hysteria expressed concerning anybody's privacy being invaded, even though the calls are repeated through powerful coastal base stations that send out both sides of the conversation for as far as fifty miles. Odd to find all of the talk about a privacy question relating to cordless telephones with ranges rated by their manufacturers at 700 to 1,500 feet! It's really ludicrous.

Fact is, when you come to think of it, this Supreme Court decision points up the absurdity and (as many have suspected) hollowness of the Electronic Communications Privacy Act which is intended to assure cellular car phone users of a fictitious "reasonable expectation of privacy." If a cordless telephone with a piddling little neighborhood signal has no reason to expect communications privacy (according to the Supreme Court), then how can there be a federal law like the ECPA to grant such an assurance to cellular users? Makes no sense.

Inasmuch as the ECPA has always been unenforceable and meaningless, and since it now appears that the Supreme Court rejects the concept as assuring an expectation of privacy to unscrambled telephone calls being sent out on 46 MHz, now may be the time to get this idiotic and meaningless law up before the Supreme Court and finally squashed.

The only effective use of the ECPA seems to be to mislead and hoax the gullible public, which is obviously willing and anxious to believe the fantasy of being able to conduct a secure conversation over car phone and cordless telephones.

Bless children, puppy dogs, kitty cats, and the wonderful, but hopelessly naive, general public—the people who believe EPA mileage ratings, hair-growing lotion claims, stories in supermarket tabloids, and in the privacy of their cordless and cellular conversations. PC

UNIVERSAL SHORTWAVE

Monitor More With Advanced Equipment From Universal!

COMMUNICATIONS RECEIVERS

❒ **Japan Radio NRD-525**

For the communications connoisseur. Covers .1-34 MHz. Incredible performance and features. In stock. $1149.95 (+$12 UPS)

❒ **Kenwood R-5000**

A powerful receiver for the serious DXer. An exceptional value. $849.95 (+$11 UPS)

❒ **Kenwood R-2000**

Many features: mems., scan, sweep, FM mode, 24 hr. clock etc. $649.95 (+$10 UPS)

❒ **Icom R-71A**

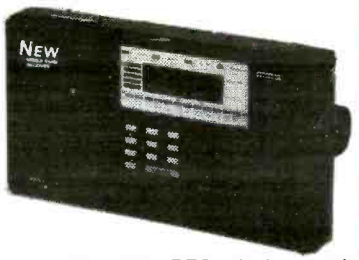
A well-respected time-tested performer. Notch, 2 VFOs, keypad. $849.95 (+$9 UPS)

❒ **Yaesu FRG-8800**

Beautiful LCD display, keypad, memories and more. $689.95 (+$9 UPS)

PORTABLE RECEIVERS

❒ **Sangean ATS-803A**



Keypad, memories, BFO, clock, RF gain, etc. A strong performer and unbeatable value. $189.95 (+$5 UPS)

❒ **Sony ICF-2010**

Super high performance and features. VHF air too. $359.95 (+$5 UPS)

❒ **Magnavox D2999**

A highly rated low cost fully loaded portable for every budget. $289.95 (+$5 UPS)

❒ **Grundig Satellit 500**

Hi-tech with beautiful fidelity and style. Synchronous tuning. $499.00 (+$5 UPS)

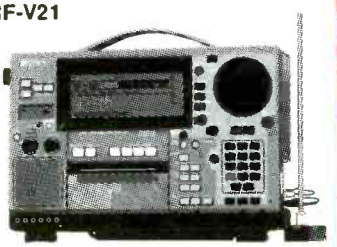
Note: Radios listed above are all LW-MW-SW-FM digital. Contact us for other models

SPECIAL RECEIVERS

❒ **Icom R-9000**

Solid all-mode coverage from .1 to 1999.8 MHz. Multi-function CRT with spectrum analyzer. The ultimate receiver! $4795.00 (+$28 UPS)

❒ **Sony CRF-V21**



This LW/MW/SW/FM *visual* receiver has an LCD screen for spectrum analysis, memory and data display. Built-in decoder-printer for FAX and RTTY reception. $4795.00 (+$15 UPS)

MULTI-MODE CONVERTERS

❒ **Universal M-7000**

The Universal M-7000 will permit you to intercept and decode Morse code, various forms of RTTY, FDM and FAX. Simple connections to your receiver and video monitor will enable you to monitor with the most sophisticated surveillance decoder available. No computer is required. See the world of shortwave excitement you have been missing. Requires 115/230 AC 50/60 Hz. Starting at $999.00. **Please write for full details.**

- Morse Code (CW)
- Regular Baudot RTTY
- Variable Speed Baudot
- Bit Inverted Baudot
- ASCII Low & High Speed
- Sitor Mode A (ARQ)
- Sitor Mode B (FEC)
- ARQ 2&4 chan. (TDM)
- ARQ-E and ARQ-E3
- VFT Modes (FDM)
- Russian 3rd Shift Cyrillic
- Facsimile (FAX) AM/FM
- Packet 300 & 1200 AX.25
- Remote Terminal
- Literal & Databit Modes
- Variable & Standard Shift
- Automatic Tuning
- Diversity Reception

MULTI-MODE CONVERTERS

❒ **Universal M-900**

Here is a compact, easy to use decoder that copies all the most important shortwave transmission modes. The M-900 covers Morse code for monitoring hams, ships and coastal stations. Baudot RTTY is included for decoding weather and international press broadcasts. Both Sitor A and Sitor B are supported for monitoring the extensive maritime and diplomatic traffic. Facsimile (to the printer only) lets you receive maps and pictures from around the world. Requires 12 VDC @.8A Text output to video monitor. **$499.95 (+$8)**

- Morse Code (CW)
- Regular Baudot RTTY
- Sitor Mode A (ARQ)
- Sitor Mode B (FEC)
- Facsimile (FAX) FM
- Variable & Standard Shift

M-900 System Components

A complete M-900 system would require:

- ➤ Universal M-900
- ➤ 12 VDC Power Supply
- ➤ Your SW Receiver
- ➤ Video Monitor
- ➤ Parallel Printer
- ➤ Cables for above

Please write to Universal for full information on the M-900 and the above optional items. Full system prices are available.

COMMUNICATIONS BOOKS

❒ **Passport To Worldband Radio 1990 Ed.**
By L.Magne. Graphic presentation of all SWBC stations. Reviews too. *New!* $14.95

❒ **Shortwave Receivers Past & Present**
By F.Osterman. Your guide to 200 receivers with new-used value, specs, features. $6.95

❒ **Aeronautical Communications Handbook**
By R.Evans. A mammoth book on all aspects of shortwave aero listening. 266 pages. .. $19.95

❒ **Complete SWL's Handbook Third Edition**
By Bennett, Helms, Hardy. Nearly 300 pages on all aspects of SWL'ing. $16.95

❒ **Guide To Facsimile Stations**
By J.Klingenfuss. The complete guide to FAX with freqs., schedules and addresses... $17.95

❒ **Shortwave Listening With The Experts**
By G.Dexter. Over 500 pages and 25 chapters of in-depth info. on all aspects of DXing. $19.95

❒ **World Radio TV Handbook 1990 Ed.**
All SWBC stations by country with schedules, addresses, power, etc. Reviews too. .. $19.95

✓ Please add $1 per title for shipping.

SHORTWAVE LISTENER CATALOG

Universal offers a huge 52 page shortwave catalog covering all types of monitoring equipment including receivers, antennas plus RTTY and FAX equipment. All major brands are represented including Kenwood, Icom, Yaesu, JRC, AEA, MFJ, Sony, Grundig, Sangean and Magnavox. Plus an unbeatable selection of books, parts and accessories. Big 8½" by 11" format.

★ Available for $1 postpaid ★

STORE HOURS

Monday - Friday 10:00-5:30
Except Thursday 10:00-8:00
Saturday 10:00-3:00

· We ship worldwide · Visa, MC, Discover · Prices & specs. are subject to change.

· In business since 1942! · Used equip. list available

Universal Shortwave Radio
1280 Aida Drive Dept. PC
Reynoldsburg, Ohio 43068 U.S.A.
Ohio: 614 866-4267 **Toll Free: 800 431-3939**

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 for consideration 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 North Broadway, Hicksville, NY 11801.

The Gravity Of The Situation

Your February comments about cosmic communications made me realize that, as you noted, there may be spectrums other than the electromagnetic that might be employed. I was especially intrigued by your suggesting the possibilities of communications by using magnetic or gravity waves, except that sometimes I can't tell when you're being serious or being facetious. Are there really such gravity waves, like radio waves?

R.J. Pritchard,
Bangor, ME

I'll admit to sometimes taking a jocular approach to a serious subject, but Einstein didn't have that problem. Almost 75 years ago, Al's general theory of relativity predicted that gravity waves exist. The gravity force, which is one of the fundamental forces of nature, is not especially powerful—despite what you think when you stumble and fall down. It's the least powerful of the four fundamental forces and 10,000 trillion-trillion-trillion times less potent than the electromagnetic force. Nevertheless, the waves do exist and have been relentlessly sought by scientists for many years. A gravity-wave detection project known as LIGO (Laser Interferomatic Gravitational Wave Observatory) is presently in the planning stages, with sites on both coasts of North America. This project is being run by MIT and CalTech—Editor.

No Threat To Mom & Apple Pie

I had never read Popular Communications until my brother handed me his copy of the January issue and suggested that I read the story about wireless room monitors. We have used one in our home for more than a year, and let it run continuously. The story in your magazine certainly provided me with much valuable information on how to properly use the device so as not to continue to compromise the privacy of conversations in my home. I think you must have shaken awake many naive people who were unaware that these units could have negative aspects unless care is taken in their use.

S. Tarrantino, Sr.,
Pittsfield, MA

The story on wireless room monitors was one of the best "insider" features I've ever come across. As soon as I could, I punched up all of those 49 MHz channels in my Realistic 2021 and was both amazed and amused to confirm that everything you said was absolutely true, and maybe even better than you let on. There are several wireless room monitors within range of my station, including one that is left on all of the time. In all, it's an unbelievable fantasmagoria of drama, humor, and nasty gossip. Better than "Dynasty," "General Hospital," and any other day or night soaper of the past five years. If they could figure out how to put it on cable TV, they'd charge extra for this.

Bob Hearn,
N. Miami Beach, FL

Pretty neat story on room monitors. I stumbled on these frequencies by myself a while back and was waiting for the rest of the world to join the fun.

Jill Watkins,
Roseburg, OR

Your article "How The Walls Have Ears" focused on an issue I find disturbing. With a literary wink, you advocate eavesdropping, a disgusting behavior. One can rationalize that such behavior is acceptable because it is not illegal, or that it (presumably) doesn't hurt anyone. Or, one could say that if people are so stupid as to leave them on while they converse, then they deserve to have their privacy invaded. But, I believe it hurts because it lowers our standard of life when people have to go around and turn off these devices because someone read your article. I would hope that you don't advocate sneaking around the neighborhood, binoculars in hand, looking in people's windows because they didn't close their curtains. What your story advocates is audio-voyeurism, which is equally disgusting. Writing about it is clearly irresponsible.

Gary H. McBain,
Sterling Hts., MI

Mr. McBain's three rationalization points for tuning in wireless room monitors are as good as any we've heard to justify doing, reading about, and writing about something he finds so offensive. Still, claiming that listening from your home on a scanner is akin to roaming the neighborhood with a pair of binoculars is a logic that doesn't work. Based on our mail, features about electronic surveillance are often requested and loudly appreciated by our readers. Basically, it seems that most people have a bit of a snoop in them. In America, it's a pursuit that is as old as the first multi-subscriber telephone lines, as current as a couple of dozen federal high-tech intelligence gathering agencies such as the NSA. Despite letters from people like Mr. Tarrantino expressing gratitude for our wising them up on being careful in their use of these devices (good advice for persons using any electronic communications equipment), Mr. McBain can rest assured that my story did not lower the standard of life of many people, nor convince them to shut off the monitors if they don't want the neighborhood to hear their family melodramas. This month's "Beaming In" editorial discusses the indignant "expectation of privacy" steam that some folks release under pressure into the atmosphere on occasion. It's never impressed us when it comes to radio signals, and now even the U.S. Supreme Court also thinks it's just so much piffle—Editor.

UFO Frequencies

Regarding your February editorial concerning UFO's, please note that 7414.9 kHz is the natural resonant frequency of the universe. Current research is focusing on this frequency as the most likely channel for intergalactic emissions. The new monthly pull-out center-section is a great idea.

Prof. S. Nodd,
Kings Park, NY

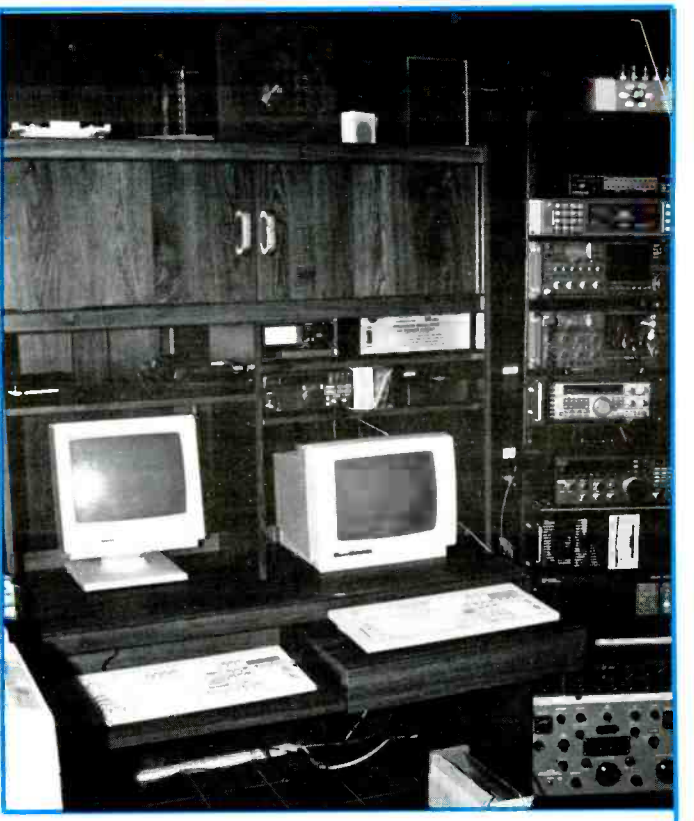
Your irreverent words about UFO communications in the February *Beaming In* were out of line. You are part of the conspiracy to belittle those know the truth. The truth is that our planet is being deliberately bombarded with microwaves from spacecraft. This has changed our weather patterns, eaten through the ozone layer, changed the composition of our atmosphere, and caused mutations in viruses that now threaten our civilization. This is why major world powers have realized its time to set aside petty political differences. Scientists know what's happening, so do world leaders, but they aren't ready to tell the public because people like you turn everything into a big joke.

Edward N. Charbonneau,
Fort-de-France, Martinique

Enjoyed your editorial on UFO's. Hope your didn't receive any letters stuffed with ectoplasm in response to your comments.

Chuck Robertson,
Creal Springs, IL

COMPUTERIZE YOUR SHACK



Control up to eight digital radios simultaneously from your MS-DOS microcomputer! We offer a series of software/hardware packages that interface with most current synthesized rigs.

ICOM: IC-781, 765, 761, 751A, 735, 725, 726, 745 R71A, R7000, R9000, 271, 471, 1271, 275, 375 475, 575, CI-V
KENWOOD: TS-940, 440, 140, R-5000, 680, 711, 811
YAESU: FT-767, 757 GXII, 757 GX, 747, 9600, 736 212, 712
JRC: NRD 525
COLLINS: 651 S1

Knowledge of MS-DOS is not necessary - the installation program does it all! Datacom allows complete control of your rig from the keyboard. Move your cursor to the desired frequency and the radio will be set automatically.

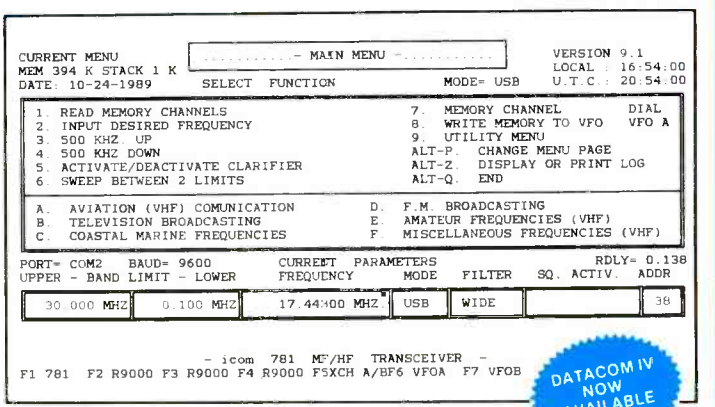
A few of its many features:

- **Adds sweep and scan to radios that don't allow this from front panel.**
- **Adds unlimited memories. Stores frequency, description call sign, sked time, and comments for each frequency, limited only by disk storage.**
- **Allows radio to be tuned from keyboard by use of arrow keys.**
- **Tabular screen display of all of the channels stored in memory, along with a full description of each including: MODE (LSB, USB, FM, etc.), eight character alphanumeric description, call sign, sked time, comments. Data files may be sorted by frequency, description, call sign, time, etc.**
- **Full featured logging utility allows searching for previous entries by call sign. Separate log for each service.**
- **Able to automatically log hits while sweeping or scanning.**
- **Color coded program for easy use (will run on a monochrome system).**
- **Menus for amateur, AM-FM broadcast, television broadcast, S/W, aviation, marine, FAX, satellite with most popular frequencies stored. Menu maker utility allows custom menus defined by user.**
- **50 page comprehensive user manual.**
- **Optional radio direction finder allows bearing information to be logged automatically.**

Call or Write today for more information.

AVAILABLE FOR IBM PC,XT,AT, 80386 256K RAM 1 SERIAL PORT AND 1 FLOPPY MINIMUM

PROGRAM WITH INITIAL LIBRARIES **129.95**
RS-232 TO TTL INTERFACE (NEEDED IF DON'T HAVE MFRS INTERFACE)
EXT. INTERFACE ALLOWS 4 RADIOS (WITH SQUELCH DETECT) **129.95**
INTERNAL PC INTERFACE W/1 SERIAL & 1 RADIO PORT **129.95**
may be addressed as com1, com2, com3, com4 includes cables to radio
SPECTRUM ANALYZER MODULE . . . . . **(CALL FOR PRICE)**
DIAGNOSTIC PROGRAM **25.00**
COMSET ALLOWS OPERATION ON COM3 AND COM4 . . . . . **25.00**
PROG. FOR UNIVERSAL M-7000, AEA PK232, KANTRONICS KAM
DIGITAL VOICE RECORDER OPTION!
ICOM UX-14 INTERFACES IN STOCK
COMPLETE SYSTEMS (RADIOS, INTERFACE, & COMPUTERS) . . **(CALL)**
30 MINUTE VIDEO TAPE GUIDE TO SETUP AND OPERATION 19.95



DATACOM IV NOW AVAILABLE

Order direct or from Universal Radio 800-431-3939, Gilfer Shortwave 800-GILFER-1

CALL FOR COMPETITIVE ICOM PRICING

IC-R9000 **IC-R7000** **IC-R71** NEW! **IC-R100** NEW! **IC-R1** NEW! **IC-R72**

SEE US AT DAYTON **And All Your Other ICOM Favorites**

DATACOM, INT.
7678 Venetian St., Miramar, FL 33023
Orders: (800) 780-9505 • Info: (305) 987-9505

CIRCLE 22 ON READER SERVICE CARD

DX'ing The Out-Of-Banders

Hey! These Shortwave Broadcasters Have Snuck Into Never-Never Land!

BY GERRY L. DEXTER

There are fences around the various shortwave broadcasting bands. We can't hear them as we tune through the shortwave frequencies, but they are there just the same. They're the upper and lower limits for broadcast use within each of the several bands of frequencies set aside for that purpose. These are limits set by international agreement, although the word "agreement" in this application is used in a very loose manner.

The basic shortwave broadcasting bands have been modified by international radio conferences several times over the years. The most recent changes came out of the World Administrative Radio Conference of 1979. This body's work created 780 kiloHertz of new space for use by broadcasters. There was, however, a ten year wait before most of these frequencies were officially OK'd for use (July 1, 1989), though many countries jumped the gun well ahead of time. 655 kHz (of the new space is now officially in use with another 125 kHz (9975-9900 kHz) to be implemented in 1994. As of now, 2,935 kHz of the shortwave spectrum is allocated for international broadcasting. That still isn't enough to accommodate the needs and wishes of all the counties which use shortwave for broadcast purposes. It's doubtful, in fact, whether turning over the entire shortwave spectrum to this purpose would even meet all the needs. Many countries have and are dealing with the problem of too much interference and too few open channels by operating out of band (oob), a practice which dates back to the very beginning of broadcasting on shortwave. The BBC, for instance, has used such out of band frequencies as 9410 and 15070 for decades. Hungary on 9835, Iran on 9022 and 15084, Israel on many oob frequencies, China, the USSR and others all have a long history of out of band operations. Countries may agree to band limits during international radio conferences but with "riders" or "exceptions" which gives them free reign to do as they wish. In some countries the national telecommunications authority may simply not care whether a private broadcaster adheres to these agreements or not. There is no international FCC that will lift your license if you don't comply with the agreements, anyway.

The inclusion of these new glumphs of frequencies into an expanded shortwave broadcasting range made many frequency usages legitimate but the netherworlds beyond these new limits still contain hundreds of stations and services. An estimated 60 countries are operating on out of band frequencies—more if you count "radio countries" such as Azerbaijan, the Ukraine, Inner Mongolia and such. These is no shortage of DX targets and other interesting things to tune for in these areas and we hope to whet your appetite with some samples. Since the tropical bands jungle is another world in itself, we're going to ignore the lower frequencies and concentrate on things from 5950 up.

To start with, here are some specific broadcast targets to tune for—some are pretty easy and some are real toughies:

5910: BRT in Belgium is a pretty easy catch in the afternoons from 2100-2230 UTC (especially in the winter months) with broadcasts to Europe in various languages. If you don't find them there move up five and try 5915.

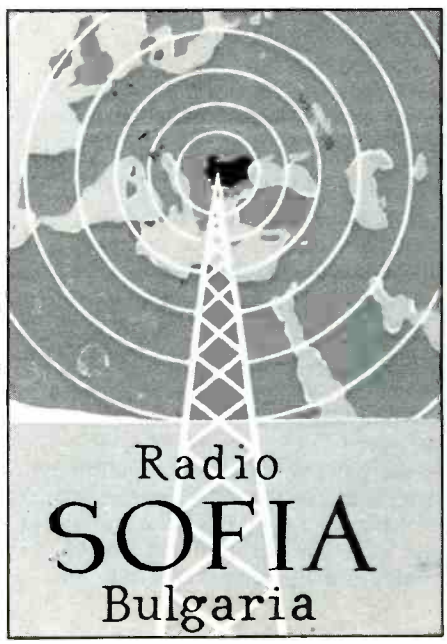
6250: Radio Nacional Malabo in Equatorial Guinea shows up sometimes at its 0500 sign on. Programming is all Spanish.

6280: The Voice of Hope, in Lebanon continues to operate "under the gun" in this ravaged nation, although a blown generator recently caused a suspension. Programs are in English and Arabic with an 0300 sign on and a listed power of just 12 kW. 6215 is an alternate frequency.

6340: Despite only 1 kilowatt, Turkish Police Radio in Ankara is logged by DX'ers here several times a year. Programs are Turkish music and talk. Try the sign on, which occurs just before 0600.

6500: Qinghai People's Broadcasting Station at Xining is only one of the many Chinese outlets you can hear in the outbands. It has a broadcast in Tibetan which runs from around 1045 to 1515, loggable in North America.

6581: La Vo de Juventud in Catacocha, Ecuador is said to operate from 0000 to 0500 but only on Sundays. This has been heard by DX'ers in North America, although not in a couple of years. The frequency is slightly variable.



Radio Sofia's home service transmitter at Stolnik on 7670 is almost never QSL'd.

7355: Trans World Radio in Monaco uses this frequency for broadcasts to Europe around 1930 but, even at its listed 500 kW that's tough to hear in most of north America at that hour. You'll have better luck on 9495 at 0830 sign on.

7375: Radio For Peace International in Costa Rica is scheduled to use this frequency at 1500-1900 but it's often reported here during evening hours as well and, of course, much better heard at that time.

7383: Lao Nation Radio's regional station at Savannakeht, even though it is rarely heard, is still generally easier to hear that the main outlet at Vientiane. Try between 1100-1400. The programs are in Liao and the transmitter runs only a "laosy" 3 kilowatts.

7670: The Bulgarians relay a domestic service on this frequency, transmitted from Stolnik. The schedule runs from 0400 to 2200, all in Bulgarian. Perhaps the fresh air sweeping through Eastern Europe will make the Bulgaians more willing the QSL reports on this transmitter.

9022: Has long been used by the Voice of the Islamic Republic of Iran as one of its mainstay frequencies. English is scheduled here at 1930. One

The "Brussels Calling" team on BRT, Belgium which uses a number of out of band frequencies, including 5910 and 5915.

of the anti-Iranian clandestines, Iran's Flag of Freedom, operates nearby (9045) at 1630 and 0330.

9490: Is home to the Xizang People's Broadcasting Station at Lhasa, Tibet, which broadcasts in Chinese between 1000-1500. Trouble is, there's a Radio Moscow transmitter on this frequency which operates virtually 24 hours a day and that's invariably what's heard.

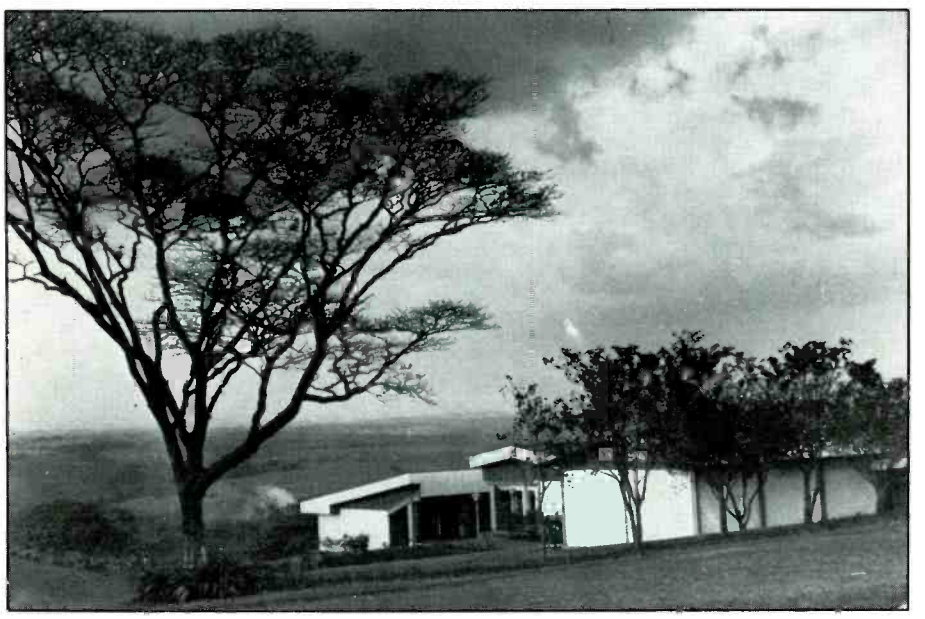
9865: The Italian Radio Relay Service (IRRS) is a private station currently active only on Sundays from around 0800. It carries programs produced by several different groups, including the UN. It's a low power operation and difficult to hear outside the eastern time zone of North America.

9950: Became home for Radio Clarin, in the Dominican Republic late last year, after Clarin abandoned its old in-band frequency of 11700. Best reception is in late afternoons and early evenings. Programs are in Spanish and include an anti-Cuban program at 0100-0200, produced by the Cuban American Nation Foundation.

9978: Is one of several out of band frequencies used by the Icelandic State Broadcasting Service in Reykjavik. There's a half hour broadcast in Icelandic at 1900 (in single sideband). Other frequencies used include 9986, 15662, 15767, and 15780. The later two have been well heard over the past winter, with transmissions at 1215, 1855, 1935 and 2300.

10330: Will often produce signals from All India Radio at Delhi if you check around 1400. There's a brief segment in English scheduled for 1530.

14917: (In sideband) Used by Radio Kiribati. Check for their 0600 sign on. The schedule includes some English.



7375 is used by Radio For Peace International in Costa Rica.

15045: The Scottish pirate station Weekend Music Radio makes occasional tests on or near this frequency, particularly over such holidays as Christmas, New Years and Easter. There;s no set schedule so about all you can do is to make frequent checks of the frequency around holidays or hope a shortwave friend hears them and tips you off with a phone call.

15055: One of many frequencies used by Your Family Radio (WYFR). This is one of several on which you can hear WYFR via the Voice of Free China's transmitters on Taiwan. It's used by WYFR at 2300 and 1300.

15685: One of many out band frequencies used by clandestines. In this case it's the Voice of Unity, broadcasting in opposition to the government of Afghanistan. It's often heard quite well in Pashto and Dari during its 0130-0230 broadcast.

Then there's a lot of stuff on the air that belongs in the category of the unusual—even weird. Most are quasi-broadcasters. Some have yet to be reported in North America.

6770: The Soviet News Agency, TASS, is reported to have a voice news broadcast airing on this frequency, as well as 7340, 7420, 9850 (and 5780) scheduled from 0700, in Russian. We've never noted this nor seen it reported by anyone in North America. Power is listed at 15 kW.

7565: Lazakh Telegraph is said to air dictation speed news on this frequency (and 9090 and 13810) on Mondays, Wednesdays and Fridays at 0730-0830 (language unknown) and in Russian at 0845-0930. Again, so far as we know this has never been heard in North America.

7445: United Nations Radio in Geneva airs a 15 minute newscast in Russian on Tuesday through Friday at 1830 (upper sideband) 14500 is an alternate frequency. Even though this 15 kW signal is beamed to the USSR it's still been heard in the US a few times, though there've been no recent loggings reported.

7850: Hunan Meterological in China is reported to have some sort of music and weather broadcast from around 0010-0040 and 0910-0940. 7950 is an alternate and one of these two is used with 10945. Again, there are no known North American loggings.

8001: Hosts what, apparently, is a similar operation: Zinjiang Meterologica, although its one listed transmission, at 1700, would make it an impossibility in North America.

9239: is one of several outband frequencies on which you can hear AFRTS broadcasts. This is a feeder transmission from Barford, England. Other frequencies include 9242, 9244, 9334, 16041 and 16454, all zone slightly variable. There seems to be no particular hour-frequency schedule but if you check these spots regularly you should hear it.

9270: Is home to one of those strange Chinese clandestine stations which operate for only 10 minutes at a time, or less. October Storm, opposes the Beijing government and is one the air on an irregular schedule between 0900-1500.

10922: Is used by the Deutsche Bundspost to air Deutsche Welle from a transmission is not a broadcast so the Germans will turn down your QSL request. Another frequency is 7490.

13584: A recent addition to the offbeat file is a medium wave station in the Azores, Radio Clube do Angra in Angra do Heroismo, being heard on this shortwave frequency. As yet no one knows if this is a point-to-point station using the broadcaster as a marker or what. It's heard around 2000 and as late as 0100.

A number of countries relay at least one of their domestic medium wave and/or FM

International Shortwave Broadcasting Bands (In MHz)

5.950— 6.200	15.100—15.600
7.100— 7.300	17.550—17.900
9.500— 9.775	21.450—21.850
11.650—12.050	25.670—26.100
13.600—13.800	

services on shortwave, often on out of band frequencies. Bulgaria on 7670 was mentioned earlier. Israel's various home services are hears on a number of channels including 7465, 9385, 9930, 11585 and so on. Egypt's "Voice of the Arab's" service is on 9850 during our evenings. Greek home services are carried by the Thessaloniki transmitter on 9935 and 11595. Belgium is another.

Clandestine stations are more likely to be found operating on out of band frequencies that they are in-band. Easily heard out of band clandestines include La Voz del CID on 9941 and 6305 (the latter late at night), Radio Caiman on 9960, Radio Iran on 9400 around 0200 and the Voice of Unity on 12230 at 0130.

Two of the most extensive users of out of band frequencies are the USSR and China. The Soviet Union—now that all those jamming transmitters have been freed from their original purpose—seems to be operating on every other frequency all over the dial. And every USSR radio service using shortwave can be tuned on an out of band frequency: Radio Moscow, Radio Mayak, Radio Peace and Progress, Radiostansiya Rodina, Radio Tikhiy Okean, Radiostansiya Atlantika, the Radio Afghanistan relay and various "Orbita" services. Also aired are the various foreign services of the republic radios: Radio Tashkent, Radio Minsk, Radio Yerevan, Radio kiev and Radio Vilnius—sometimes via transmitters within the particular republic but perhaps more often via transmitters anywhere within the USSR.

China's five major radio services include out of band frequency operations: Radio Beijing. the Central People's Broadcasting Station Network One and Two (CPBS-1, CPBS-2) and the two services directed to Taiwan (Taiwan-1, Taiwan-2). Many of the provincial outlets use out of band frequencies.

If you are even moderately active as a shortwave broadcast listener of DX'er you probably have a copy of the current *World Radio TV Handbook* and/or *Passport to World Band Radio* (from which many of these notes came). If you don't use one or both of these references (we recommend both) then most of the non-English language transmissions you tune will be very difficult to identify, much less to figure out such things as language, service, transmitter site and so on.

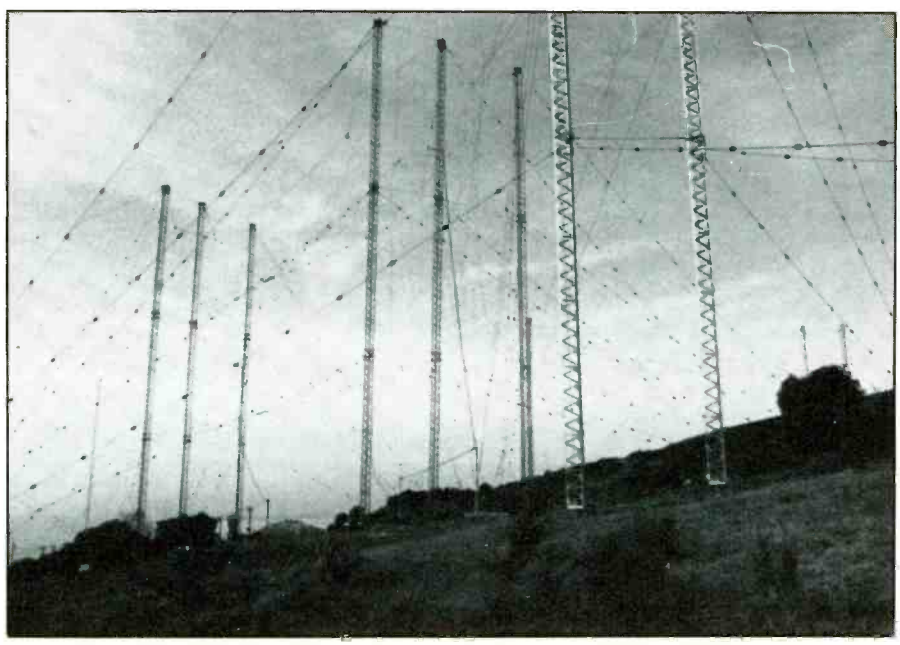
The out of band frequencies offer a long list of targets for the SWBC DX'er. Like those within the recognized international shortwave broadcast bands some are as easy to hear as your local FM rock pounder. Others are as challenging and elusive as anything on the airwaves.

If you want some extra special DX'ing fun, jump the fence and come explore the outworlds of shortwave broadcasting! **PC**

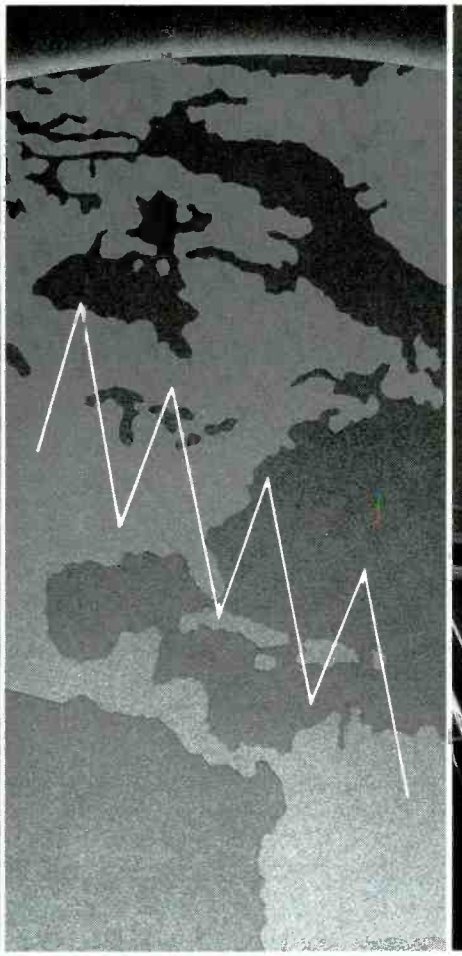
Both Israel's domestic services and its Voice of Israel foreign service use many out of band frequencies.

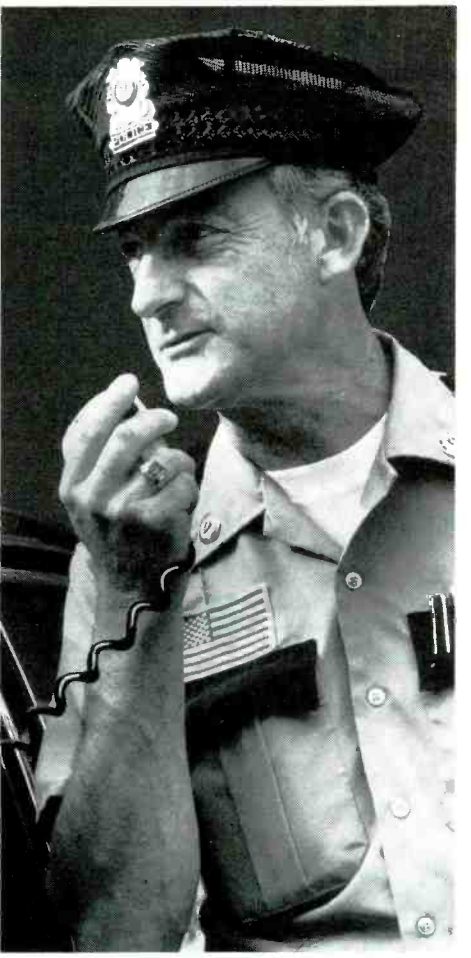
Countries Using Out Of Band Frequencies

Albania	Latvia
Austria	Lebanon
Bangladesh	Laos
Belgium	Monaco
Bolivia	Mongolia
Bulgaria	New Zealand
Burma	Netherlands
China	North Korea
Costa Rica	Northern Marianas
Czechoslovakia	Pakistan
Dominican Republic	Peru
Ecuador	Philippines
Egypt	Saudi Arabia
England	Scotland
Equatorial Guinea	South Korea
Estonia	Spain
French Guiana	Sudan
France	Switzerland
Gabon	Syria
Greece	Taiwan
Guam	Tibet
Hungary	Tunisia
Iceland	Turkey
India	United Arab Emirates
Ireland	United States
Israel	USSR
Jordan	Vatican City
Kiribati	Vietnam
Kuwait	Yemen Arab Republic



Trans World Radio at Monte Carlo can be heard on 9495 at 0830 sign on.





Realistic®–The First Name In Communications Excitement

Famous for Quality At Affordable Prices

Your nearby Radio Shack offers a wide selection of quality communications equipment and a complete line of accessories.

For Hams, there's our popular HTX-100 mobile 10-meter Amateur Radio transceiver. This compact SSB/CW rig gives you a 10-frequency memory, handy mike-mounted tuning controls and switchable 25 or 5-watt output. Only $259.95

Realistic HTX-100

MTX-120

Our MTX-120 VHF marine handheld is a "must" for boating safety. It features switchable 1 or 5-watt output, full channel coverage and NOAA weather reception. High-capacity battery pack and an AC recharger are included. Only $259.95

You'll hear local news as it happens with our PRO-38 handheld scanner featuring 10-channel memory. PRO-38 covers 29 to 54, 136 to 174, and 406 to 512 MHz UHF. Only $139.95

PRO-38

Visit Radio Shack soon and join the millions who own and trust Realistic brand.

FREE 184-Page Catalog! Write to: Radio Shack, Dept. 106-06, 300 One Tandy Center, Fort Worth, TX 76102

Prices apply at participating Radio Shack stores and dealers. You must have a valid FCC Amateur Radio License to legally transmit with the HTX-100. MTX-120 is not for land use; FCC license required. Mobile use of scanners may be unlawful in some areas or may require a permit.

Radio Shack®
AMERICA'S TECHNOLOGY STORE™
A DIVISION OF TANDY CORPORATION

Federal Agency & Military Activity On Your Scanner

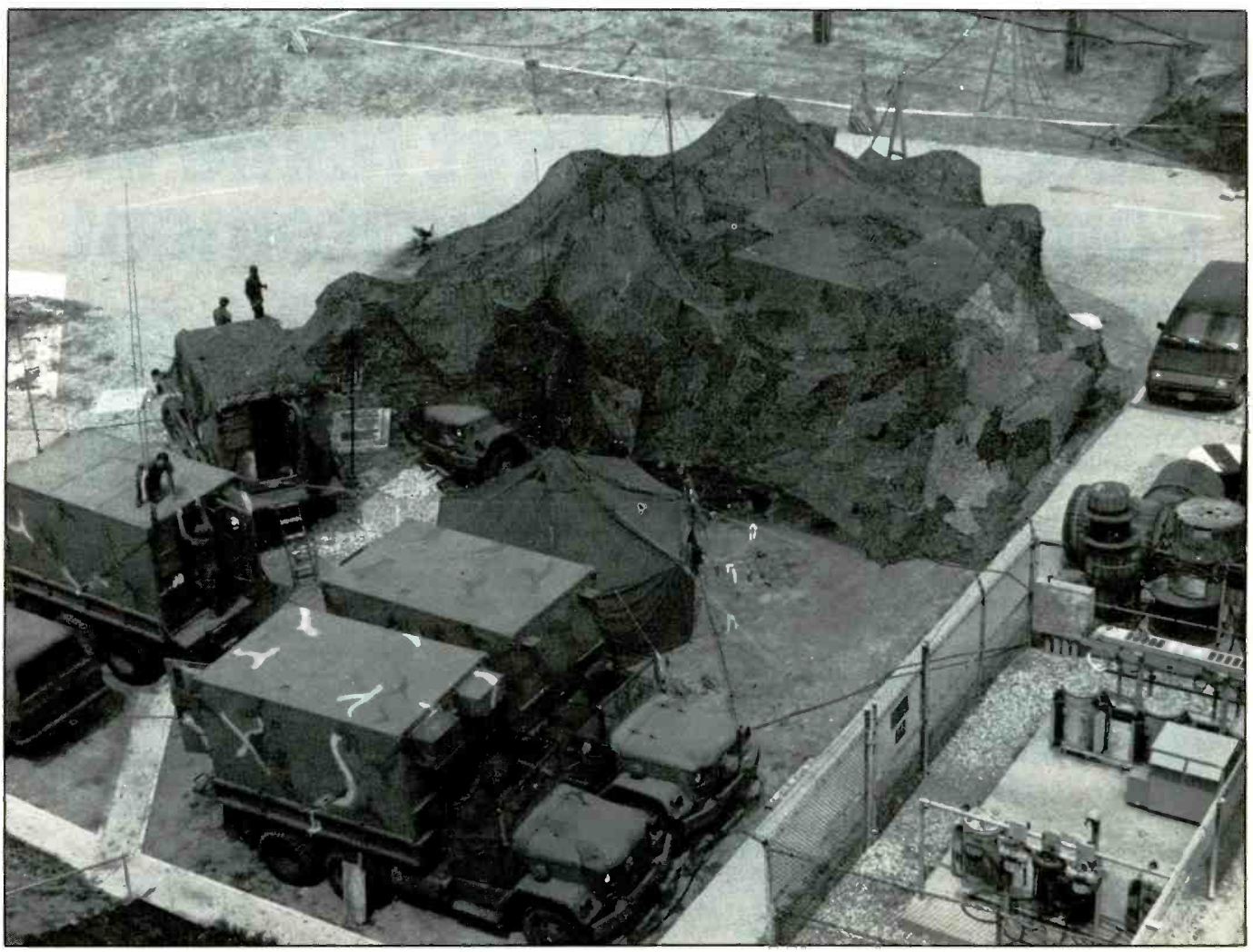
Secret Missile Tests, Drug Busts, Laser Weapons, Nuclear Tests, & War—Listen For It On 30 to 50 MHz!

BY CHUCK ROBERTSON

Scanning for U.S. government communications has always been one of the most exciting and challenging of endeavors. It's a fact that more than half of the communications frequency space between 30 and 512 MHz is reserved for the exclusive use of the federal government. Sadly, many scanner users assume that most of the action takes place between 162 and 174 MHz, or from 406 to 420 MHz, and assume that technology has caused the 30 to 50 MHz band to be of little interest when searching for federal communications. *Not so!* When the skip rolls in, this band quickly fills up with every kind of military and federal agency communications.

For example, from my monitoring post in Illinois, I regularly monitor Skaggs Island Naval Security on 36.50 MHz. Patrol boats in San Pablo Bay (north of San Francisco) are heard conducting board-and-search

Don't think that the 30 to 50 MHz "low band" has been abandoned by military and federal agencies in favor of higher frequencies. These frequencies are still in heavy use and their DX potentials allow you to bring in communications from considerable distances. (U.S. Army photo.)



Army and National Guard aviation makes heavy use of low band frequencies for control towers, bombing ranges, air-to-air, and other communications. (U.S. Army photo.)

Military Lingo Monitored

Alpha Alpha: Assembly area.
Camo: Camouflage/scrambling.
Ci-Tech: Cipher technician.
COMEL: Communications Electronics.
Comms: Communications.
CONUS: Continental U.S.
Cracker Box: Personnel carrier.
Dust Off: Medevac helicopter.
D.Z.: Drop Zone (parachute).
Go Covered: Activate scrambler.
Go Digital: Activate scrambler.
Go Green: Activate scrambler
Homeplate: Base of operations.
Hot: Active & operational.
In the Red: Using clear voice mode.
Lima Charlie: Hear you loud & clear.
Lima Papa: Listening post.
Metro: Meteorology station.
Mike Papa: Military Police.
Oscar Papa: Observation Post.
Red Leg: Artillery.
SITREP: Situation Report.
Splash: Troop disembarkment for beach.

ops: "Delta 1 to Delta 2. Cover our boat, we're going to get this guy. We're in China Slew . . . close it up, close it up . . . " Then, "Delta 2 to Alpha 1. Delta 1 aground in Devil's Cut Slew . . . The Outrage is alongside the suspect vessel now, board and search at this time." This was accompanied by background noises consisting of shouting and hollering.

These patrol vessels patrol in pairs and ID as Alpha 1 and 2, Bravo 1 and 2, Charlie 1 and 2, etc., and the Outrage. The base ID's as Chamber skill. Also, there's Bridge Guard, Camp Murray EOC, Zodiac (an inflatable raft), Napps River, Fuel Barge, as well as personal ID's 333 and 722.

On 37.00 MHz, you can hear board-and-search operations in the Gulf of Mexico by vessels under the control of a base with the ominous ID of Deathdealer. It's apparent they aren't looking for sponges or coffee beans in these searches, and I assume that these are U.S. Coast Guard operations. With the war on drugs heating up, this frequency has been getting very active as there are now U.S. Navy, National Guard, Customs Service and other federal services in contact with the mysterious Deathdealer base.

Adios, Noriega!

In the days immediately following the U.S. invasion of Panama late last December, I spent many hours at my scanners. Such activities invariably produce loads of wild communications, plus much data to be filed away for future reference and monitoring use.

Security patrols arresting members of Noriega's "Dignity Battalions" were operating on 33.90 MHz: "Gold 6-Bravo to Red 1. Some people here say these guys are the snipers, but others are running out of the woodwork saying they're innocent." Red 1 told the GI that he was going to "have to play judge and jury out there." You don't see that in the network news.

More security ops were noted on 37.00 MHz. Echo 06 told Charlie 06 to "pick out a man with a good head on his shoulders who you can trust and bring him here so we can brief him on the guard duty he has to perform at Noriega's house." Other ID's on 37.00 connected with Panamanian operations included Amador Security base (at Fort Amador, Panama City), Gate Guard, Barracks Guard, Main Gate, Charlie 02-Bravo, Lima 2, Tango 1, Whiskey 1, CP, and CA.

Aircraft were active on 47.05 MHz: "This is India 81. Have them write out Spanish phrases on paper, then I'll have them read over the loudspeaker."

Medic comms were on 32.45 MHz: "We've got a soldier with a hand wound. We're sending him over to Balboa." Balboa is near Panama City, where the fighting was heaviest. Medical paging at local Santo Tomas Hospital was on 30.66 MHz (in Spanish).

Secure nets using DES scrambling were regularly noted on 34.80, 34.90, 41.50, 41.80, and 41.90 MHz. My guess is that these were US mil comms from the Panama operation. Owing to F2 layer propagation, no CONUS skip can be received at my location during the early AM. That's when these scrambled signals were coming through, accompanied by a batch of Central American regulars like the security service in El Salvador on 30.475, and all of the Costa Rican telegram channels between 41 and 42 MHz.

Homing in on The Range

Our government has numerous high-tech facilities located on sprawling military ranges. One of the largest and best known is the White Sands Missile Range in New Mexico. Missile launches and laser tests can be monitored almost daily over the video recording operations frequencies. The repeater output is called Channel 1 on 36.51 MHz (36.91 input); Channel 2 on 34.85 MHz (34.85 input), all NFM. These frequencies provide countdowns, launch data, instructions to personnel, etc.

Between tests, maintenance is conducted on these frequencies. Technicians use 34.49 MHz. Actually, many low band frequencies are used at White Sands.

Big Bang

The Nevada Test Site (NTS) is our nation's only active nuclear testing range. It's located in the Nellis Air Force Range, about 65 miles northwest of Las Vegas. Underground nuclear detonations take place regularly.

The Department of Energy (DOE) maintains an extensive repeater system at NTS, with the most interesting comms taking place on 36.05 MHz (NFM): "The ATZ is on Ground Zero." Some of the ID's noted are Frenchman Flat, Yucca Flat, Valley Tower, MX Site, Shoshone Receiving Site, Mercury, and KMT317 (at North Creek, NV). Most bases use rounded off "hundred" numbers (100, 300, 700, etc.), with personnel using other numbers (247, 366, 547, etc.).

Repeaters on 36.33 and 36.39 MHz (NFM) seem to have much base chit-chat and informal traffic. An NTS control point installation is located on Pahute Mesa. A

No shortage of war games communications to be monitored in the 30 to 50 MHz band, and they sound like the real thing! Tanks, troops, trucks, GI's, helos, dogfights, and the whole shebang really gets the adrenalin pumping. (U.S. Army photo.)

Skip reception 30 to 50 MHz band sometimes causes conflict when a federal agency's communications jams another's, from hundreds of miles away. Here, the monitoring station at Ft. Huachuca, AZ checks out a frequency to see if it's suitable for use. (U.S. Army photo.)

second one is between Skull Mountain and Yucca Flat. Some ID's on these channels include: Montgomery Facility, Las Vegas Base, Indian Springs, Station 10, Cave Mountain, Red Butte Junction, Pahute Mesa Junction, EOD Operations, EOD-5, Net 12, Area 9, and U-20 Site. The initials EOD mean Emergency Ordinance Disposal.

Oddly all three of these repeaters seem to have 34.99 MHz as their input, and occasionally the repeaters will all key up simultaneously with the same comms. There is probably a code tone arrangement to select which repeater(s) will key up from transmissions on 34.99 MHz.

It's Just a Game (I Hope)

If practice makes perfect, then our military forces are ready for anything. The war games, maneuvers, and training exercises never stop. Much of the time it sounds so authentic, that you'd swear the forces were storming downtown Peoria, Scranton, or Abilene. The other day, on 32.40 MHz, several Marines were shouting and gasping for breath as they ran through gullies and underbrush while practicing to protect some unnamed city: "Shoot the -$-'s. I'm not gonna be a casualty. Get'em! Continue moving along the gully towards town."

At other times, there's a strange dark humor that war brings out in its participants. On 33.35 MHz, a soldier summed up his war games status by announcing, "I'm dead."

Immediately, his comrades on 33.40 MHz were heard lamenting his fate: "Horseman 04 to Horseman 11. 16-Alpha is a statistic at this time, over."

"Horseman 11 to 04. That's a shame!"

A short time later, Horseman 11 declared, "You're talking to a dead man."

Aerial dog fights are exciting to monitor. The Red Baron (himself) was seeing action while transmitting on 33.35 MHz. Meanwhile, on 34.55 MHz, another pilot was learning the hard way as his instructor barked orders: "Tighten up your turn . . . when you mess up like that, the best thing to do is go into another defensive attack . . . Break right! Break right!"

Along with the Nevada Test Site, Nellis Range also hosts a squadron of authentic Soviet fighter aircraft captured and turned over to the US during the recent war in Afghanistan. About every eight weeks the "Red Eagles" participate in training exercises with USAF fighters. I've logged these strange dog fights on 36.80 MHz. Listen on 34.60 MHz for Nellis Flight Space Control where they keep the dog fights separated from the activities taking place in the bombing ranges.

Tanks for the Memory

Some US mil ranges host foreign military forces during training exercises. Each year during the spring/summer Sporadic-E skip season, I log the Bundeswehr (West German military) conducting aircraft and tank exercises somewhere in the American Southwest. These names are in German with ID's like Panzer Alpha, Panzer Charlie, Magpie (aircraft), Hierleitung (Range Control), and Smiley. Active frequencies include: 30.60, 30.80, 31.10, 31.30, 31.50, 31.60, 31.70. 31.80, 32.00, and 33.10 MHz.

La Bomba

Underwater recon for sunken World War II wrecks around Pearl Harbor has been going on for a long time. For the past two years, it has been monitored on 32.45 MHz.

The vessels comb the ocean floor with electronic equipment and divers looking for ships, aircraft, and bombs left over from the Japanese attack of December 7th, 1941. There's a palpable sense of excitement when there's a report of a found item: "Nav Control to Dive Boat. Describe how its lying. What does it look like?"

The bomb found that time was described as being about two feet wide with three-foot fins. Later they raised the bomb and moved it to shore aboard the transport boat. ID's noted include Nav Control, EOD Boat, Snare Drum Echo, Fairground, Super Bowl, Dive Boat, Transport, Seaco Boat, Zodiac (raft), Hotel Tango-3, and Hurricane (helo).

In Hawaii, 32.45 MHz is allocated to the Kaneohe Bay USMC Air Station, Oahu. Base ops and phone patch are on 41.15 MHz ("Kaneohe Base"). Also try 36.50 and 40.80 for helos from this base.

No Shortage

Federal communications between 30 and 50 MHz are plentiful, exciting, and tune you

All federal drug interdiction operations aren't to be heard only on the HF and UHF bands. When skip conditions are right, try 37.00 MHz on your scanner and hear our government's mysterious "Deathdealer" base (possibly in Miami) communicating with Coast Guard, Navy, and Customs Service aircraft and ships. Here, the USCG Cutter "Reliance" checks things out. (U.S. Coast Guard photo.)

in on many communications absolutely available on other frequencies. The standard reference guide for scanning federal communications on all frequencies above 30 MHz is the *Top Secret Registry of U.S. Government Radio Frequencies*, an invaluable 192-page guide. It's published by CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. (free catalog available upon request), and is also available from many scanner dealers.

In addition, I have put together a log of some of the low band federal stations that you'll want to be certain to try for the next time the skip starts rolling in from 30 to 50 MHz. You'll soon add many of your own discoveries.

Federal Low Band Skip Log

Here are some new loggings plus a few old favorites. Look for these during Sporadic-E skip openings this summer/spring; distances of 450 to 1,500 miles will be common. A few F2 layer north/south openings will also show up this summer. Any way you look at it, the federal DX is there for you to scan!

29.98: War games: Yankee 20, X-Ray 60, etc. Check the entire 29.70 to 30.00 MHz band in 10 kHz increments.

30.00: MX missile net Channel 48. Warren AFB, WY is probable location, but don't know the other freqs yet!

30.007: Open carrier with data bursts. May be downlink from Soviet mil or scientific satellite.

30.09: White Sands photo net, NFM. Also check 41.43 MHz.

30.10; 31.65; 31.80; 32.25; 33.85; 33.95; 34.75; 34.95; 37.00: Constant tone with half-duplex comms by US mil. These are called "order wire" nets.

30.125, 30.15, 30.175: US mil MUX nets (voice multiplexing).

30.15: Repeater out, NFM: "We have a dress rehearsal for a missile launch." Is located north of White Sands, may be Los Alamos Proving Grounds. ID's are 3600 (base), 3645 (typical personnel ID), Optics Truck, & Noble Roman.

30.29: "Mobile 1 to Comm Van."

30.20, 32.20: Sreaming Eagle, helo from Ft. Campbell, KY.

30.30: Camp Pendleton (USMC), CA artillery range ID's as Long Rifle. Many 30.00 to 30.55 MHz (in 50 kHz steps) freqs are used at Pendleton. Medevac is 38.80 MHz. Splash ops are 41.10 MHz. Also try 38.45, 40.35, 49.30, & 65.10 MHz. ID's include Short Pistol, Cresline, Orange Net (pyrotechnics), Red Beach, Redeye, Range 407.

30.45: Range coordination channel, Ft. Hood, TX. ID's: Lone Star (multi-use range control); Black Gap (pistol qualification range); Cow House (machine gun range); Shrapnel (multi-use range); Claymore range; Chemical Range; Arctic Range; Sugar Loaf (multi-use range); Henson Mt.; Black Mt.; Jack Mt.; LRC Range. Medevac on 38.00; MP's 45.00; aero ops 46.65; ranges also on 38.30 MHz.

30.60: Although a Business Radio freq, is also used by USAF's SAC for phonetic lists to Skybird & Skyking bombers. Also see 34.05 listing.

31.05: Remote broadcast? A mil commander gave a briefing of the day's war games activities. Lots of open mic time.

31.10: Airspace Control somewhere. "Do we have a Phantom 3 message?" Also heard war games with Ghost & Mustang at Quackenbush Pass.

31.30: USN deep sea divers.

31.40, 31.75, 32.40, 34.60: War games & training at Yakima Firing Center, WA. Aircraft bombing at Rattlesnake Pass & White Pass were on 34.60. ID's: Columbia River, Viper Fire, Dragon Fire.

31.50: "Check Point Seattle"

31.70: Observers at chemical warfare games: "Everything is contaminated."

31.75: Pacific area ops, Alpha 99. Also heard ops at Davis-Monthan AFB, AZ with ID's M-57-Q, M-57-R.

31.85: USN helo Gulf 34 carring a vehicle in a sling to a ship.

31.90, 31.95, 32.10, 32.80, 36.60, 36.90, 38.45: Could be Ft. Ord, CA with ID's Bookcase, Salinas, Peace Castle, Peace Control, Tassel Charlie, Proud Banner, Bubblegum 22 (vessel).

31.90: War game ID's Alpha 11, Mack, St. Hooch, John Wayne.

32.00: F2 skip enabled a chat between personnel at Ft. Irwin, CA & Ft. Wood, MO.

32.10: Ft. Irwin, CA bombing range,

32.20: Mobiles at McGregor Firing Range, Ft. Bliss, TX/NM. Also check 37.05, 41.50 (base ops), & 41.70 (range control & air ops). Try 41.00 & 41.95 for Red Devil Range Control, Ft. Bliss.

32.23: White House communications van, NFM. Channel used for comms between White House (Crown), Anacostia NAS (Cloudburst), Camp David (Cactus), & van (Roadrunner). Other mobiles heard here are Cactus 413 & Cloudburst 77. Telemetry (called NESCO) & DES scrambling also hrd.

32.45: An a/c at Vandenberg AFB, CA mentioning use of 360.6 MHz UHF; an a/c at Eielson AFB, AK; a Dept. of Interior base at Walla Walla, WA.

32.50: Ft. Wood, MO (mobiles).

32.70: Ft. Irwin, CA bombing range.

32.75: "Pyramid Base to Sentry 112...yoo hoo!" Also X-Ray 12.

32.87: Pentagon (DC) taxi service (mobiles 32.53) for VIP's. Base callsign is WAR315 but ID's only as 315. Tone bursts in use along with voice. VIP's usually referred to by 4-digit code #'s instead of by name, but you can hear many DC locations (NSA, House, Senate, State Dept., etc.) given.

32.90: Fumble Base (USN, Pensacola, FL). Also Ft. Jackson, SC.

32.95: "Thunder Force"

33.00: Ft. Knox, KY: Range 14.

33.05: "We found a 200-lb. bomb... it has no fins." EOD ops: Maintenance 21, Eagle 08, Eagle Tango, Eagle's Nest. Air/air on 34.40 MHz.

33.10: Order wire: Ottawa Alpha.

33.25: "Track update: Still heading west at Licorice 99'er. Lost track at Licorice 99'er, but picked up again at Mexico 37." These ops also logged 37.85 MHz. Whatzit?

33.80: USMC: Long John & Panda.

33.85, 35.85, 36.00: Chemical warfare games at China Lake NWS, CA: Nerve 15 (Chem Officer); Blackbox 66, Gold Miner 7, Scorpion 10, Dragon 26, Dragon Land, China Site. These ops may be tied into nearby Ft. Irwin.

33.95: War games: "You got another Bradley tank coming your way."

34.00, 36.35: Aircraft inspecting a crash site: White Shadow & Pogo 9.

34.05, 34.85, 36.05: Long phonetic lists to & between aircraft in a military manner: "Bluebird Base, Bluebird 5. I copy message 003 as follows-- JAXKFLCQ, over." Also, "I copy a Foxtrot 2 message." The phonetics go on & on. Possible SAC or NORAD? If anybody knows, tell us!

34.09: White Sands transportation. Also try 30.29 MHz.

34.20: Camp Bullis, TX.

34.25: Dept. of Interior, Las Vegas Base, Trenching Bucket, Corn Creek. NFM.

34.30: Airlifts: "LZ Control to Wolfpack 56."

34.35: Order wire: "I need Mad Dog & Duce 1."

34.40: USS Bluebridge: battalions on board include Meatgrinder, Armchair, Easter Bunny, Jockstrap, Wildroot.

34.60: Dust Off Control, possibly Mountain Home AFB, ID. "Echo Valley."

34.85: US Fish & Wildlife Service ops. Also war games with aircraft Noble Dragon 37, Noble Dragon Bravo.

35.00: War games: "I got 4 Bradleys coming at me & the Stinger didn't fire!"

35.85: War games: "Is Granite clear so we can get these Zoomies out of here?"

36.00: Rock Base, Nova Base.

36.07: US Dept. of Justice mobiles.

36.22: NFM repeater out. Car pool & ops of Dept. of Health & Human Svcs., DC.

36.40: "Schoolhouse, this is Laumbo 1."

36.45: War games: "Two Blackhawks moving along highway." Kunkel Bridge, No-Name Bridge, Arrowhead Bridge, Owaddy Flying Center. Yakima, WA?

36.50: Ft. Wm. Harrison, MT.

36.57: USN fireboat in San Francisco Bay area.

36.60: Ft. Chaffee, AR. Also USN ops in in San Francisco Bay: Treasure Island Fleet Landing, Alameda Fleet Landing, CI Fleet Landing, & Oakland.

36.63, 36.69, 36.91: VIP limos in the Washington, DC area, NFM. For security

ASSOCIATED RADIO
8012 CONSER BOX 4327
OVERLAND PARK, KANSAS 66204
CALL 913-381-5900
FAX 913-648-3020

SHORT WAVE AMATEUR RADIO

New and reconditioned equipment.
BUY—SELL—TRADE—SERVICE

CALL FOR YOUR LISTENING NEEDS

Send $3.00 for our current catalog and wholesale sheet.

Please send all reader inquiries directly.

For 25 years, our people have endured long hours and tough working conditions for no pay.

REACT®

And 9 out of 10 would do it again.

TO FIND OUT WHY
call
(316) 263-2100
or write
REACT INTERNATIONAL, INC.
242 Cleveland
Wichita, KS 67214

CIRCLE 61 ON READER SERVICE CARD

reasons, 4-digit codes are used instead of names & addresses.

36.70: Rattlesnake Radio, Yakima Firing Range, WA.

36.71: Pentagon escort net. Base at Ft. Myer, VA with call WAR300.

36.79: Pentagon security, WAR430.

36.80: "Comm Company, this is First Marines, radio check, over."

36.95: War games: "I'm going to try to sneak through the Valley of Death."

36.99: Pentagon fire department.

37.05: F2 skip comms between MP's on St. Croix and personnel at Ft. Bliss, TX. The MP's asked Ft. Bliss to clear the channel so they could use it without interference.

37.25: Combat training: Alpha base.

37.45: Salt 1, Rockpile.

37.60: An aircraft at March AFB, CA.

38.00: USS Iwo Jima, radio check.

38.20: Ft. Jackson, SC.

38.50: Dept. of Agriculture personnel in CA: Charlie Tree, Oscar Tree, Slop Test, & Soil Test. Also Army at Dahlonega, GA: Estate Ruler; and Ft. Chaffee, AR: Arrowhead DZ & range.

38.51: Security, NFM. Might be Ft. Devens, MA.

38.53: Vint Hill Farms security, Warrenton, VA. Fire on 40.49 MHz.

38.90: Ft. Irwin range, CA; Camp Roberts range, CA.

38.91: Security, NY City. Also check 38.83 & 46.79 MHz, all NFM.

39.30: Camp Merrill Range Control, GA.

40.31, 40.33, 40.37: Bureau of Indian Affairs comms between schools & vehicles in AZ & NM. Inputs might be 40.01 & 40.03 MHz. ID's include Shiprock, Toadlena, Tuba City, Alamo, Ft. Defiance. In English & Native American languages.

40.45: VA hospital pagers.

40.55: Ft. Lewis Medevac, WA.

41.00: Many Army & National Guard units, nationwide. Walter Reed Hospital, DC.

41.10: Camp Pendleton, USMC with surf report: "Do I have permission to go Splash?"

41.15: War games: "We have one incoming." Red Hill.

41.25: Ft. Monmouth, NJ.

41.30: Ft. Rucker, AL.

41.31: Nevada Test Site transportation, NFM. Also check 41.03 MHz.

41.35: USN war games: Enemy Hotel, Blue Catskill, Green Catskill, Red Catskill, AV Control. Also try 32.10, 32.50, 35.00, 36.15, & 38.00 MHz.

41.50: Heavily used Army aviation freq., nationwide. Many ground stations & helos.

41.70: Plattsburg Control, Plattsburg AFB, NY.

41.80: Range Control, Camp Grayling, MI Air National Guard. Also 41.85 (Air Control); 41.90 (Guide Net); 42.00 (Fire Department); 42.10 (Pager); 42.40 (Maintenance).

41.95: Kirtland AFB, NM. A generally popular mil air ops freq. nationwide.

42.65: Repeater out: range control & handhelds, NFM: Range 14, 14 Alpha.

44.25: War games: India 49, Quebec 49.

46.60: Aircraft at Scott AFB, IL.

46.70: Camp Blanding, FL.

46.75: White House helos: Marine 1 (President's helo). Also 46.70 & 46.80.

46.90: Ft. Rucker, AL.

46.95: Camp Perry, OH.

47.00: "Operations," NY City area. Also Illinois National Guard helos.

48.00: Blackhawk Range Control, Ft. Irwin, CA. Blackhawk base ops with weather & air/air is 32.45. Also try 32.20 (Bike Lake Metro); 32.70 (Range Control); 38.90 (Dust Off Control); 33.05 (training); 36.90 (war games).

49.30: Ft. Stewart, GA.

49.65: Ft. Benning Medevac, GA.

49.70: Army EOD, nationwide.

49.80: Army EOD, nationwide.

49.90: Control tower, Ft. Drum, NY. Also check 30.10, 38.00 (MP's), 38.10 (mobiles on range), 38.85, 38.91 (fire dept.), 40.65 (National Guard), 41.10 (Medevac); 46.70 (range control); 46.87, 49.70, 49.80 MHz. PC

Shortwave: Pulse Of The World

A Little DX Can Be Big News

BY STEVEN L. HERMAN, N7EPQ

Every shortwave listener knows there's plenty of news across the dial every hour, but how many SWL'ers ever figure that they can help make news with the news they hear on their rigs and perhaps make a few bucks in the process?

Take just a one week period of June 1989, when details of three major international news events were revealed on the shortwave bands.

When China was thrown into turmoil by the democracy uprising and the subsequent mass killings of civilians by soldiers, Radio Beijing ignored the events, or made only very oblique references to them. I decided one night during the turmoil to begin monitoring Radio Beijing from our AP News Network headquarters in Washington, just in case the authorities there had something to say.

The newsroom's dog-eared copy of the World Radio-TV Handbook was a few years old and I wasn't sure if the Beijing frequencies were up to date. So I made a call to the hallowed BBC's famed listening post in England to cross check the frequencies they were monitoring. They suggested several frequencies in the 17 MHz band. I was skeptical of hearing much in the band at 11 p.m. Eastern Daylight Time, despite the peak in the sunspot cycle. Randomly tuning across the bands I came across Chinese sounding music at 9690 and decided to set up shop there.

At the top of the hour, I heard something which seemed very odd. An amateurish sounding announcer in rough English began talking about thousands of deaths at the hands of soldiers and denouncing the government! He concluded by saying because of the circumstances, there could be no further news of the massacre. Then, the regular female Radio Beijing announcer began reading an obviously government sanctioned newscast which did not mention the killings!

I called back the BBC listening post to see if they had heard this extraordinary announcement. They said they had not heard anything unusual, but they had not been listening to the 9690 frequency. In the excitement of the moment I forgot to ask them what *language* they had been listening in.

Minutes later, a New York City stringer and SWL enthusiast called in. He had heard the renegade broadcast, too, and had a very clear tape of it. He fed it to us using a direct patch through the phone and we cut it up and put it on the radio network. I transcribed a verbatim of the newscast and sent the text via satellite on our message circuit to the AP's foreign desk in New York for the inclusion in the main China story for that day. The next evening the unusual Radio Beijing broadcast was also aired on the NBC Nightly News.

Another major story during the same week was the natural gas explosion adjacent to a rail line in the Soviet Union. Hundreds of people aboard two passing trains died. In the era of glasnost, the Soviet media have begun to report such disasters—sometimes within hours of when they happen. AP Network News anchor Paul Courson, WA3VBJ, was at his home shack in Annapolis when he recorded Radio Moscow revealing graphic details of the tragedy. Within minutes, the audio recorded by Paul at home was being fed out on the network.

One of the AP's most sophisticated listening posts in the world is in Nicosia, Cyprus. The Mediterranean island is used by most major news organizations and intelligence agencies to keep tabs on the Middle East, especially the nations where reporters and suspicious foreigners are greeted with hostility. It was in Nicosia that AP correspondent Anwar Faruqi recorded Tehran Radio announcing the death of the Ayatollah Khomeini. Even though the broadcast was in Farsi, the AP Radio Network broadcast excerpts of the emotional announcement and the tearful man-in-the-street reaction. The grief in the voices needed no translation.

I'm certain that these newsmaking broadcasts were heard by hundreds, if not thousands, of readers of POP'COMM. But how many had a cassette or reel recorder patched in to their rigs and how many would have thought to make a few dollars by immediately selling the tape to their favorite (or several) radio and television networks? I'm sure many of the major networks were eager to quickly acquire good quality recordings of these dramatic broadcasts. Remember, most networks don't have the luxury of full time monitors like the BBC. And as I found out, even they can miss a biggie.

It is not only tape of newscasts of shortwave broadcasters that can be valuable. The dramatic description of an amateur radio operator detailing the ravages of an earthquake or a hurricane is also news. Or how about the mayday call of a ship at sea in distress? Those who listen to the VHF and UHF aircraft bands might find themselves tuning into a hijacking or hear a military pilot radio he's about to eject. The possibilities are endless.

Here are a few tips

-*Remember news gets stale fast.* A news organization may have little interest in your tape hours after you've recorded it. Try to inform them of it within minutes.

-*What about the QRM and QSB?* No one expects a shortwave broadcast to be in-studio quality, but it should be understandable without too much QRN. But even if it's barely decipherable, the content may be big news to the wire services and major newspapers, especially if it concerns a breaking event.

-*Buy or make a pair of "alligator clips."* This is a jack which patches out of a tape recorder on one end and latches onto the prongs under the mouthpiece of the telephone on the other end. This is one of the cheapest and best ways to send tape.

-*Don't expect to get rich.* Print media rarely pay for just a tip but they may give you credit in print for what you hear. Most networks pay stringers about enough to buy a nice dinner, but you might be able to politely negotiate for more money if you have something very dramatic. And you're free to sell it to as many outlets as you like, unless you negotiate an exclusive. PC

Scanning in Yellowstone

A 3,500 Square Mile Federal Reserve With Its Own Police, Fire, & Communications Systems. A Unique Place To Monitor!

BY CHAD GATES, KWY7DW

There's no place else in the "Lower 48" quite like Yellowstone National Park. That's a statement often made about Yellowstone because of its size, grandeur, natural features, history, and special place in the hearts of all who visit there (about 2.5-million per year). When, in the summer of 1988, a fire burned the vegetation in several large areas of Yellowstone the threat to one of our nation's largest and most easily accessible wilderness wonderlands made worldwide headlines for weeks.

In 1872, Yellowstone was set aside as the world's first National Park so that the wilderness, wildlife (elk, bison, bears), and natural features (geysers, hot springs, lakes, waterfalls, mountains), and many other things it has to offer would be available for people to see and enjoy for years to come without fear that the crush of civilization will diminish its beauty.

But there is another Yellowstone National Park beyond the one observed by most visitors. They use only their eyes to take in the park, but if you have the ability to take along a scanner, you'll enjoy it all the more as you tune in one the behind-the-scenes operations.

Yellowstone National Park is roughly a rectangle-shaped area more than 55 miles wide and 62 miles tall, situated primarily in northwestern Wyoming, but with strips extending across the borders of Montana and Idaho. It is larger than the states of Delaware and Rhode Island, *combined*. Being a federal area, it is not part of any Wyoming counties.

The entire area is under the control of the U.S. Department of The Interior, National Park Service. In effect, this agency is responsible for providing practically all public services in this federal zone. It's as if the agency were performing all of the duties of a state police organization, a statewide fire agency, state fish and game agency, and other agencies spread out over an area larger than some actual states. The law enforcement efforts include the use of miniature

Yellowstone National Park

Location	Call	Frequencies
Artist Point	KOD713	1610 kHz (5 w.)
Artist Point Pots	KOD714	1610 kHz (5 w.)
Bear Tooth	KOF703	166.375 166.975
Beecher Ranger Station	KOF731	166.375 166.975
Biscu . Basin	KOP716	1610 kHz (5 w.)
Bridge Bay Campground	KOF708	166.375 166.975
	KOP722	1610 kHz (5 w.)
Buffalo Lake	KOF709	166.375 166.975
Buffalo Pit	KOF736	166.375 166.975
Bunsen Peak	KOF726	166.375 166.975
Cabin Creek	KOF714	166.375 166.975
Cache Creek	KOF737	166.375 166.975
Canyon Campground	KOP720	1610 kHz (5 w.)
Canyon Village	KOF722	166.375 166.975
Cold Creek	KOF715	166.375 166.975
Fast Entrance	KOF701	166.375 166.975
	KOP707	1610 kHz (10 w.)
Elkting Creek	KOF719	166.375 166.975
Fawn Pass Trail	KOF749	166.375 166.975
Firecigy.	KOP723	1610 kHz
Firehole Lake Drive	KOD712	1610 kHz (5 w.)
Fishing Bridge	KOP718	1610 kHz (5 w.)
Fox Creek	KOF742	166.375 166.975
Fountain Flats	KOP719	1610 kHz (5 w.)
Grants Village	KOF727	166.375 166.975
	KOP721	1610 kHz
Harbell Creek	KOF743	166.375 166.975
Hayden Valley	KOP729	1610 kHz (5 w.)
Heart Lake	KOF710	166.375 166.975
Howell Creek	KOF739	166.375 166.975
Indian Creek	KOD710	1610 kHz (5 w.)
Lake	KOF723	166.375 166.975
Lewis Lake	KOF745	166.375 166.975
Lamar River	KOF704	166.375 166.975
Lamar Valley	KOP725	1610 kHz (10 w.)
Lower Blacktail	KOF729	166.375 166.975
Lower Miller Creek	KOF738	166.375 166.975
Madison Junction	KOF730	166.375 166.975
	KOP714	1610 kHz (10 w.)
Mammoth (Park HQ)	KOF700	166.375 166.975 411.675 411.775
	KOP724	1610 kHz (5 w.)
Midway Geyser Basin	KOP715	1610 kHz (5 w.)
Moose Exhibit	KOP727	1610 kHz (5 w.)
Mt. Holmes (10,336 ft.)	KOF718	166.375 166.975
Mt. Sheridan (10,308 ft.)	KOF721	166.375 166.975
Mt. Washburn (10,243 ft.)	KOF728	166.375 166.975 417.375 417.475
	KOD711	1610 kHz (5 w.)
Mud Volcano	KOP709	1610 kHz (5 w.)
Norris Geyser Basin	KOF707	166.375 166.975
	KOP726	1610 kHz (5 w.)
Northeast Entrance		1610 kHz (10 w.)
North Entrance	KOF733	166.375 166.975
	KOF734	166.375 166.975
	KOP708	1610 kHz (5 w.)
Old Faithful	KOF724	166.375 166.975
	KOP713	1610 kHz (10 w.)
Pelican Cone (9,643 ft.)	KOF740	166.375 166.975
Roadside Bridge	KOP728	1610 kHz
Shoshone	KOF711/712	166.375 166.975
South Entrance	KOF725	166.375 166.975
	KOP711	1610 kHz (10 w.)
South River	KOF748	166.375 166.975
Sportsman	KOF705	166.375 166.975
Steamboat Point	KOP717	1610 kHz (5 w.)
Thorofare	KOF713	166.375 166.975
Tower Junction	KOF732	166.375 166.975
	KOP712	1610 kHz (10 w.)
Trail Creek	KOF706	166.375 166.975
Trv. Junction	KOF744	166.375 166.975
Upper Lamar Creek	KOF720	166.375 166.975
Upper Miller Creek	KOF717	166.375 166.975
West Entrance	KOF702	166.375 166.975
	KOF733	166.375 166.975
	KOP710	1610 kHz (10 w.)

National Park Service at Yellowstone NP

Ranger Operations	166.375 MHz
Point-to-Point	166.975 411.675 411.775 MHz
Repeaters	417.375 417.475 MHz
Experimental	164.80 417.575 MHz
Visitor Information	1610 kHz
Park Buses	40.07 40.21 MHz
Fire Operations	41.27 41.55 46.63 46.81 46.99 168.55 MHz
Handhelds	167.15 MHz

Miscellaneous handhelds also operate on frequencies between 417.30 and 417.975 MHz

Yellowstone Park Concessioners

TW Services	KNCU569-573	152.42 MHz
	KNFK912	463.45 MHz

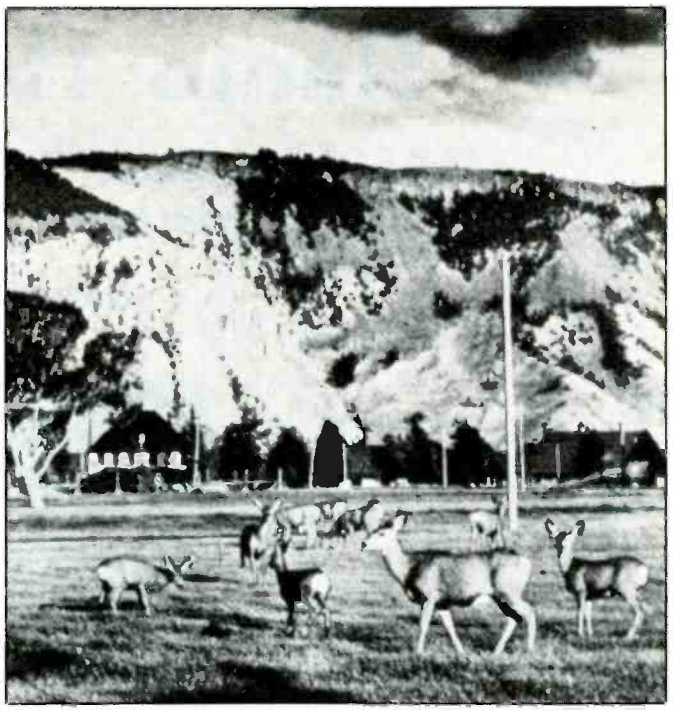
TW Services operates 3 hotels, 6 lodges, & cottages. Also transportation by boats, horses, tour buses, sleigh rides, snowmobiles & snow coaches, ski slopes, guided fishing, trail rides, sightseeing.

Yellowstone Service Stations KLT933 463.45 MHz
Operates service stations & automobile repair facilities in park.

Intermountain Construction WNJZ682 463.45 MHz

Other Services In & Adjacent to Park

West Park Hospital	WGQ204	462.45 MHz
Montana Power Co.	KNHE547	158.25 451.10 MHz
Mountain States Telephone Co.		151.985 MHz
Gardiner (MT) Airport		122.8 MHz
Yellowstone (MT) Airport		122.45 122.8 MHz



Mammoth Hot Springs has deer grazing in the foreground on the front lawn of park HQ. There's a low power 1610 kHz broadcast station here, too, plus at least five frequencies to check out on a scanner.

"Old Faithful" geyser, one of Yellowstone's natural wonders. It's also the site of a low power 1610 kHz broadcast station, plus a VHF communications station you can pick up on your scanner.

transmitters, vehicle tracking devices, hidden sensors, satellites, and scanners.

To coordinate the National Park Service operations in Yellowstone, a number of frequencies have been set aside for various activities. Park Rangers function as the police, tourist guides, fish and game wardens, and in many other vital roles. Lots of Ranger comms are monitored on 166.375 MHz via mobiles, handhelds, and base stations located throughout the park area. The base stations at Yellowstone are assigned calls from the bloc KOF700 though KOF749. All NPS base stations (throughout the United States) have "7" as the first of the three numerals in their callsigns.

Other NPS frequencies in Yellowstone are utilized for point-to-point, repeaters, park buses, fire fighting, and additional activities. There are also several private companies and concession operators operating within the boundaries of the park. Some have their own communications systems, with 463.45 MHz being used as a common channel by several of the operators.

At a number of specific visitor features, as well as at the five park entrances, there are low-power (5 and 10 watt) Travelers Aid System (TIS) transmitters operating continuously (except during service periods, and several that operate only on a seasonal basis). These have a normal operational range of between 1,300 ft. and a mile. These stations are operated independently from one another, sending out a constantly repeating tape to advise visitors of road and facility information, safety tips, and to describe specific features that may be viewed within range of each transmitter's signals.

Several of these transmitters are solar powered. The antennas used on 1610 kHz are all center-fed monopoles.

There are no aircraft landing areas within the park. Indeed, park officials do not even appreciate overflights since they consider them to be noisy intrusions into Yellowstone's natural tranquility. The nearest relatively large airport is 35 miles south of the park in Jackson, WY. However, there are two small fields in Montana, just beyond the boundaries of the park, that can be monitored from northwestern portions of the park.

We have put together a listing of the known frequencies, callsigns, and stations of the entire Yellowstone area. This data has been assembled from personal monitoring, from available official and unofficial sources, and information provided by other monitoring enthusiasts. Naturally, CB channels (especially Channel 19) are always jumping in Yellowstone.

If you're one of the many visitors to Yellowstone National Park this year, be sure to bring along your scanner and enjoy the sounds as well as the sights. Just don't play the scanner so loud as to disturb others nearby who may no appreciate the audio aspects as much as the visual. **PC**

Radio: How It Was

A Leisurely Stroll Through The History Of Broadcasting & Communications

BY ALICE BRANNIGAN

As the mediumwave broadcasting band sits on the verge of being expanded from existing between 540 and 1600 kHz to its new parameters of 540 to 1700 kHz, let's not forget that it was not ever thus. Right from the start, the band was edged out in fits and starts and could scarcely be regarded as being set aside for the exclusive use of broadcasters.

When the first licenses were issued to commercial broadcasters (late 1921), all stations were licensed to operate on a common frequency, 833 kHz (actually 832.8 kHz, since the license specification stated "360 meter wavelength"). Many of the early broadcasters had been on the air under experimental authorizations on various frequencies prior to the start of commercial broadcasting. They were the first to point out to the government that all stations sharing a single frequency wasn't going to be a workable arrangement.

By 1923, stations had become sprinkled over the range between 580 and 1340 kHz, with many still stuck on 833 kHz. One of the interesting and lesser known aspects of the early days of broadcasting was that the band wasn't set aside *exclusively* for broadcasters, the way it is today. Before the broadcasters set up shop, there had long been other assorted communications services operating on mediumwave frequencies.

Remember, too, that even today we sometimes battle over the ground rules about which services should or shouldn't be permitted the continued use of certain frequencies. But almost seventy years ago, with fewer rules on the books, and everybody who had discovered a new use for radio wanting suitable frequency space (below about 2 MHz), spectrum management faced new problems every day.

Hams were authorized to operate between 1360 and 2000 kHz, yet some operators in areas where commercial broadcasters hadn't been established simply slid down below 1360 kHz and established unofficial local broadcasting stations.

Among the authorized non-broadcast users of mediumwave frequencies at the start of commercial broadcasting were most of the world's ocean-going ships and hundreds of coastal stations that operated with noisy spark transmissions on 1000 kHz. Dozens of lightships dotting our coastlines sent out fog warnings on 630 and 794 kHz.

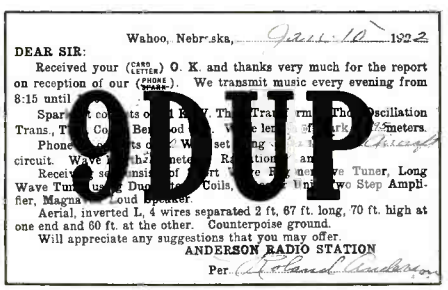
Radio audiences of the early 1920's complained about the intrusion of dots and dashes clashing with Rudy Vallee and Russ Columbo. They couldn't have cared less that the signals they found so annoying were on those frequencies long before the broadcasting stations.

The U.S. Navy's powerful station NAA, near Washington, DC broadcast time signals on 690 kHz that could be heard throughout the mid-Atlantic states all day and from coast-to-coast at night.

Those who strained to pick up broadcasters in those very early days got less than a cheerful little earful. As new broadcasters went on the air, as more receivers were put into people's homes, the government began getting complaints that neither the broadcasters nor the listeners were interested in putting up any longer all of the telegraphic clutter and other intrusions in the same band as the broadcasters.

Perhaps, at the outset, with broadcasting so new, the government had not foreseen any pressing need to establish mutually exclusive bands for broadcasters, telegraph and other stations. The public clamor clearly pointed out to the government that this conglomeration of broadcasters and non-broadcasters tossed together wasn't feasible. Nevertheless, it was one thing to assign broadcasters to those frequencies, quite another to uproot and banish existing maritime safety and navigation services to some other band. But it needed to be done.

Still, when 1924 rolled around, the problem remained. That's why broadcast station



Wahoo, Nebraska, June 10 1922

DEAR SIR:

Received your (CARD OR LETTER) O. K. and thanks very much for the report on reception of our (PHONE OR WIRE). We transmit music every evening from 8:15 until

Spar[illegible] Trans., [illegible] meters.

Phone[illegible] circuit. [illegible]

Receiving set consists of [illegible] Tuner, Long Wave Tuner, [illegible] Coils, [illegible] Two Step Amplifier, Magnavox Loud Speaker.

Aerial, inverted L, 4 wires separated 2 ft, 67 ft. long, 70 ft. high at one end and 60 ft. at the other. Counterpoise ground.

Will appreciate any suggestions that you may offer.

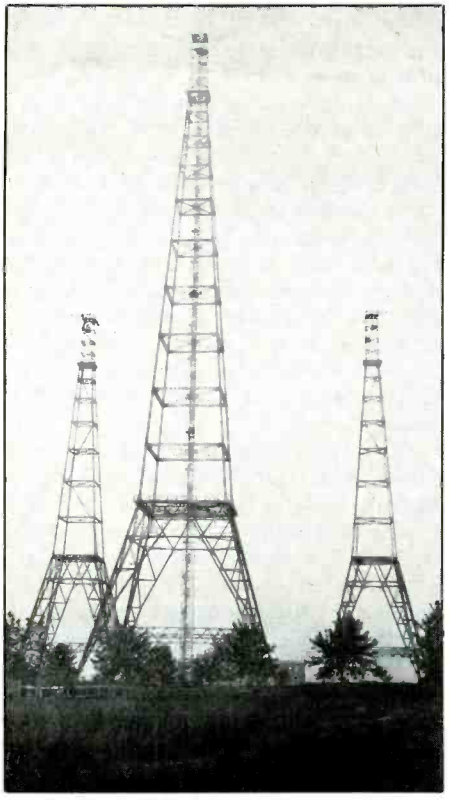
ANDERSON RADIO STATION

Per [signature]

9DUP

In some towns where there weren't any broadcasters, hams began playing music on broadcast frequencies. This 1922 QSL from ham 9DUP in Wahoo, NE mentions almost 2 hours of music every evening with 10 watts on 1333 kHz.

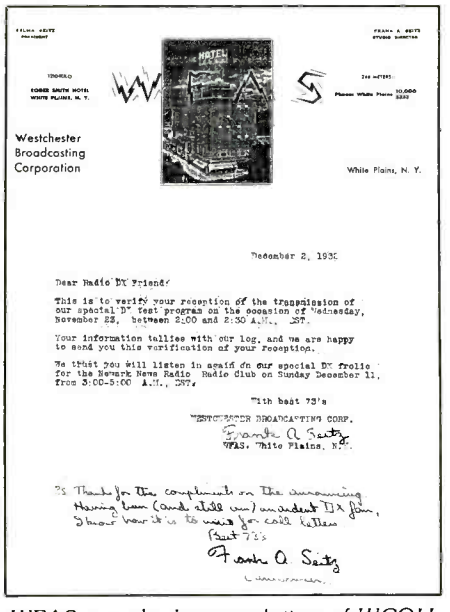
directories and lists of that era presented only a partial picture of what was to be heard. Yes, they listed all of the broadcasters (then operating from 550 to 1340 kHz), but they overlooked the hundreds of ships and coastal stations, and dozens of lightships. Neither did they list stations such as KUVW, of the New York City Police Department, on 666 kHz, nor KDAH, on the same frequency, operated by the C.E. Davis Packing Company, Fairport, VA. Then there



The U.S. Navy's mighty NAA had a signal on 690 kHz that could be heard in California at night. Broadcasters and audiences, however, chafed at such "intruders." They demanded that the government banish all such activities from the broadcasting band. It took some time, but it came to pass.

Station WDY, licensed to RCA at Roselle Park, NJ on September 19, 1921 was the second station in the U.S. to receive a commercial broadcasting license. As such, it was restricted to operating only on 832.8 kHz which was the common frequency on which the government planned to authorize all broadcasters. Prior to its commercial license being issued, WDY operated as experimental station 2XR. This 1921 photo shows WDY's "Man in the Moon" at the controls. Note the acoustic drapery on the walls. The station went off the air after only a few months. It ran 1 kW.

Ships had used 1000 kHz for a long time prior to the creation of the broadcast band. It took a few years to work out all of the details, but the broadcasters won out and the many coastal stations and vessels were banished. This 1925 photo shows the radio shack aboard the 40-ft. motor lifeboat "Elizabeth & Blanche."



Westchester
Broadcasting
Corporation

White Plains, N. Y.

December 2, 1932

Dear Radio DX Friend:

This is to verify your reception of the transmission of our special DX test program on the occasion of Wednesday, November 23, between 2:00 and 2:30 A.M., EST.

Your information tallies with our log, and we are happy to send you this verification of your reception.

We trust you will listen in again on our special DX frolic for the Newark News Radio Radio Club on Sunday December 11, from 3:00-5:00 A.M., EST.

With best 73's

WESTCHESTER BROADCASTING CORP.
Frank A. Seitz
WFAS, White Plains, N.Y.

PS Thanks for the compliments on the announcing. Having been (and still am) an ardent DX fan, I know how it is to wait for call letters
Best 73's
Frank A. Seitz

WFAS was the later evolution of WCOH, Westchester County, NY's only radio station in the early days. This may be the station A.W. Landry is looking for. A handwritten P.S. to this QSL 1932 QSL letter notes that Frank A. Seitz (announcer, manager, owner) is "an ardent DX'er." (Courtesy Joe Hueter.)

was also WUCN, the U.S. Army's station on 536 kHz at Fort Redman, MA. The directories usually didn't list the U.S. Navy's NAA, at Arlington, VA.

It took a while, but things eventually got worked out. By 1928, KUVW had been moved to 408 kHz (under the call WPY); KDAH had been shifted to 425 kHz (under the callsign WOZ), with the lightships moved to 300, 375, and 410 kHz.

By then, the broadcasting band ran from 550 kHz to 1500 kHz. There were still a few non-broadcast stations (in the U.S.) authorized within this band. Although broadcast station directories don't list them, you could hear stations WPJ and WMF on 733 kHz. WPJ was licensed to Warren K. Kathan, Cheboygan, MI. WMF was operated by the Kreetan Co., Johnswood, MI. There were also some experimental stations still in operation in the band. These included 12.5 kW station W9XA on 930 in Denver, CO., Chicago's W9XF on 1040 kHz; 100 kW station W2XAG on 789 kHz operated by General Electric in Schenectady, NY; W8XBD with 1 kW on 1020 kHz in Oil City, PA, and others.

Just prior to World War II, the upper frequency limit of the band was moved from 1500 to the present 1600 kHz. Police and remote broadcast pickup stations which had been operating there were kicked out of the band. There were also several experimental high fidelity broadcasters here that became commercial broadcasters. These included W2XR in New York City on 1550, which became WQXR on 1560 kHz. W6XAI in Bakersfield on 1550 kHz became KPMC on 1560 kHz.

The lower frequency edge of the mediumwave band for American stations remained at 550 kHz for many years, with the only occupant of 540 kHz being 50 kW CBK in Watrous, Saskatchewan. The first American station to use 540 was KFXM in San Bernardino, CA which had moved to 540 kHz from 1240 kHz when it increased power from 250 watts to 1 kW in the late 1940's. This station is presently KRSO On 590 kHz, and 540 kHz (still a Canadian Clear Channel slot) has many U.S. and Canadian occupants these days.

This is how the mediumwave band expanded outward in both directions from its official beginning on a single frequency (833 kHz) in September of 1921. After seventy years, it's still growing.

BUFFALO BROADCASTING CORPORATION
Rand Building
Buffalo, New York

Dear Radio Friend: RECEPTION VERIFIED

Thank you for your note of appreciation of our programs.

Your kind references to artists and programs will be forwarded to the individuals or concerns sponsoring the program you have mentioned, for they are glad, as we are, to have your comments.

Please feel that it always will be our earnest endeavor to give you such programs and reception as to continue to please you, and we shall be happy to have you write again.

Faithfully yours,
BUFFALO BROADCASTING CORPORATION
"The Voice of Buffalo"
Reaching you through

~~WKBW~~	WGR	~~WMAK~~	~~WKEN~~
~~1470 K.C.~~	550 K.C.	~~900 K.C.~~	1040 K.C.
~~204 Meters~~	545 Meters	~~333.3 Meters~~	288.3 Meters

A mystery solved, this 4-station QSL from the Buffalo (NY) Broadcasting Corp. shows that the company eventually owned several local broadcasters: WGR/550; WKBW/1470, WKEN/1040, and WMAK/900 kHz. Nobody else could get a word in edgewise, it was a regular monopoly! Today, FCC regulations frown upon such an operation. (Courtesy Joe Hueter.)

Reader Questions

We often get questions from readers trying to track down old timey broadcasters they remember from years back, or else are researching for a book or other project. We try to help as much as possible, although sometimes we draw a blank. At times this is due to insufficient information supplied to us because the details recalled have gotten slightly transposed with the passage of time. Other times, we just can't find anything despite an abundance of seemingly accurate information. However, we're game to try, but guarantee nothing.

A letter from A.W. Landry, W4MJG (ex-W2IRT), of Lake Lure, NC came in asking if we could dig up anything on a broadcaster that operated about 1930. He recalls that it was located on the top floor of a two story building, above a garage on the Albany Post Road (Route 9) in North Tarrytown, NY. He thinks it was run by a father and daughter with the last name of Koenig.

Based upon this information, and assuming this station was licensed, it narrows down to a possibility of one. That's because in those years, there was only one broadcaster licensed in Westchester County, NY. That was WCOH, which doesn't exactly fit Mr. Landry's specs.

In 1928, WCOH was licensed at Greenville, NY to the Westchester Broadcasting Co. It operated on 1420 kHz, but in November of '28 it switched to 1210 kHz. The station was run by Frank and Selma Seitz (father and daughter?). In 1930, the offices of the station were at 110 Highland Ave., Yonkers, NY. A year later the office address was 35 South Broadway (Route 9), Yonkers. By 1932, the station checked into the Roger Smith Hotel, White Plains, NY and became known as WFAS. Presently, WFAS runs 1 kW on 1230 kHz. It's quite possible that this is the station being sought by Mr. Landry.

Another question showed up from Michael J. Miranda, Charlotte, NC. He notes that Buffalo, NY stations WGR and WKBW (now WWKB) have shared the same transmitter building and towers for quite some time, although the front of the building doesn't indicate that WGR is located there. He says that somewhere he heard that years ago these stations were owned by the same company, and that Tom Kneitel's book *Radio Station Treasury* confirms this for the 1930's. He wonders if we can shed any light on this.

WGR went on the air in 1922 as a commercial station. WKBW started in 1925 as a religious station. Beginning in the early 1930's, both stations came under the ownership of the Buffalo Broadcasting Co., Rand Building, Buffalo, NY. The transmitting site for both stations was established at Hamburg, NY. The stations are no longer owned by the same licensee, however, that arrangement lasted for many years and at least past the end of World War II.

Also, Michael says it would be interesting to know what became of WSVS (Seneca Vocational High School) in Buffalo, NY and to WMAK in Lockport, NY. The 50 watt non-commercial WSVS operated 1330 kHz, then 1370 kHz, and finally ended up on 1400 kHz sharing time with WBNY. In all, WSVS had a long run. It was operating in the 1920's, and lasted until about 1943 when it went dark. WMAK was also operating in the 1920's (listed as near Martinsville, NY), then was purchased by Buffalo Broadcasting and moved into Buffalo's Rand Building in 1930 (transmitter at Grand Island). The station was deleted way back in January, 1932.

Great Outdoors

When I heard that *POP'COMM* was going to run a story on monitoring in Yellowstone National Park, it made me curious

A 1930's photo of KNJB, 2520 kHz, the National Park Service communications station at Yellowstone National Park. That's before VHF and even prior to Yogi Bear.

Though running only 50 watts, high school station WSVS operated for a long time. In 1931, Joe Hueter, in Philly, picked up its signals and received this typewritten QSL.

Buffalo, N. Y., Nov. 12, 1931

This is to verify your reception of Station WSVS on November 5th and 6th. Frequency 1370 K.C. - Power 50 Watts.

Yours truly,

David Warnhoff,
Radio Station WSVS,
Seneca Vocational High School.

uniden®

$12,000,000 Scanner Sale

Uniden Corporation of America has purchased the consumer products line of Regency Electronics Inc. for $12,000,000. To celebrate this purchase, we're having our largest scanner sale in history! Use the coupon in this ad for big savings. Hurry...offer ends September 30, 1990.

★★★ MONEY SAVING COUPON ★★★

COUPON COUPON

Get special savings on the scanners listed in this coupon. This coupon must be included with your prepaid order. Credit cards, personal checks and quantity discounts are excluded from this offer. Offer valid only on prepaid orders mailed directly to Communications Electronics Inc., P.O. Box 1045 – Dept. UNI2, Ann Arbor, Michigan 48106-1045 U.S.A. Coupon expires September 30, 1990. Coupon may not be used in conjunction with any other offer from CEI. Coupon may be photocopied. Add $12.00 for shipping in the continental U.S.A.

RELM RH606B-A $419.95
RELM RH256B-A $294.95
Bearcat 800XLT-A $229.95
Bearcat 210XLT-A $164.95
Bearcat 70XLT-A $139.95
Uniden HR2510-A $229.95
Uniden HR2600-A1 ..... $239.95
Uniden PRO810E-A $169.95
Uniden CARD-A $164.95
Uniden RD3XL-A $149.95
Uniden RD99GT-A $114.95

★★★★ VALUABLE COUPON ★★★★

Bearcat® 760XLT-A

List price $499.95/**CE price $254.95/SPECIAL**
12-Band, 100 Channel • Crystalless • AC/DC
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 760XLT has 100 programmable channels organized as five channel banks for easy use, and 12 bands of coverage including the 800 MHz. band. The *Bearcat* 760XLT mounts neatly under the dash and connects directly to fuse block or battery. The unit also has an AC adaptor, flip down stand and telescopic antenna for desk top use. 6-5/16" W x 1⅜" H x 7⅜" D. Model **BC 590XLT-A** is a similar version without the 800 MHz. band for only $199.95. Order your scanner from CEI today.

NEW! Uniden® Telephones

AM470D-A *Uniden* answering machine $69.95
AM464-A *Uniden* answering machine $49.95
AM468V-A *Uniden* answering machine $49.95
AM460-A *Uniden* answering machine $49.95
AM480-A *Uniden* answering machine $69.95
FP300-A *Uniden* feature phone $34.95
FP302-A *Uniden* feature phone $49.95
FP320S-A *Uniden* feature speakerphone $49.95
FP322S-A *Uniden* feature speakerphone $59.95
XE570-A *Uniden* cordless phone $74.95
XE422S-A *Uniden* cordless speakerphone $109.95
XE777S-A *Uniden* cordless speakerphone $109.95
BT100-A *Uniden* Trimstyle phone $17.95
KT280-A *Uniden* Family phone with 911 feature $29.95
FF150-A *Uniden* Executive phone $39.95

RELM® RH256B-A

List price $587.50/**CE price $299.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority
The *RELM* RH256B is a sixteen-channel VHF land mobile transceiver designed to cover any frequency between 150 to 162 MHz. Since this radio is synthesized, no expensive crystals are needed to store up to 16 frequencies without battery backup. All radios come with CTCSS tone and scanning capabilities. A monitor and night/day switch is also standard. This transceiver even has a priority function. The RH256 makes an ideal radio for any police or fire department volunteer because of its low cost and high performance. A *60 Watt* VHF 150-162 MHz. version called the **RH606B-A** is available for $429.95. A UHF 15 watt, 16 channel version of this radio called the **RU156B-A** is also available and covers 450-482 MHz. but the cost is $454.95.

★★★ Uniden CB Radios ★★★

The *Uniden* line of Citizens Band Radio transceivers is styled to compliment other mobile audio equipment. Uniden CB radios are so reliable that they have a two year limited warranty. From the feature packed PRO 810E to the 310E handheld, there is no better Citizens Band radio on the market today.

PRO310E-A *Uniden* 40 Ch. Portable/Mobile CB ... $83.95
PRO330E-A *Uniden* 40 Ch. Remote mount CB ... $104.95
PRO500D-A *Uniden* 40 Channel CB Mobile $38.95
GRANT-A *Uniden* 40 channel SSB CB mobile ... $166.95
PC122-A *Uniden* 40 channel SSB CB mobile $119.95
PRO510XL-A *Uniden* 40 channel CB Mobile $38.95
PRO520XL-A *Uniden* 40 channel CB Mobile $56.95
PRO530E-A *Uniden* 40 channel CB Mobile $79.95
PRO640E-A *Uniden* 40 channel SSB CB Mobile ... $137.95
PRO810E-A *Uniden* 40 channel SSB CB Base ... $174.95

★★★ Uniden Radar Detectors ★★★

Buy the finest *Uniden* radar detectors from CEI today.
TALKER-A2 *Uniden* talking radar detector $119.95
RD3XL-A *Uniden* 3 band radar detector $159.95
RD8-A *Uniden* visor mount radar detector $89.95
RD9GTL-A *Uniden* "Passport" size radar detector ... $114.95
RD9XL-A *Uniden* "micro" size radar detector $144.95
RD27-A *Uniden* visor mount radar detector $54.95
RD90GT1-A *Uniden* remote mount radar det. $109.95
RD99GT-A *Uniden* remote mount radar detector ... $119.95
CARD-A Uniden credit card size radar detector $179.95

Bearcat® 200XLT-A

List price $509.95/**CE price $239.95/SPECIAL**
12-Band, 200 Channel • 800 MHz. Handheld Search • Limit • Hold • Priority • Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The *Bearcat* 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 10 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the **BC 100XLT-A** for only $189.95. Includes antenna, carrying case with belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner now.

Bearcat® 800XLT-A

List price $549.95/**CE price $239.95/SPECIAL**
12-Band, 40 Channel • No-crystal scanner Priority control • Search/Scan • AC/DC
Bands: 29-54, 118-174, 406-512, 806-912 MHz. Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.
The Uniden 800XLT receives 40 channels in two banks. Scans 15 channels per second. Size 9¼" x 4½" x 12½." If you do not need the 800 MHz. band, a similar model called the **BC 210XLT-A** is available for $178.95.

Bearcat® 145XL-A

List price $189.95/**CE price $94.95/SPECIAL**
10-Band, 16 Channel • No-crystal scanner Priority control • Weather search • AC/DC
Bands: 29-54, 136-174, 406-512 MHz.
The *Bearcat* 145XL is a 16 channel, programmable scanner covering ten frequency bands. The unit features a built-in delay function that adds a three second delay on all channels to prevent missed transmissions. A mobile version called the **BC560XLT-A** featuring priority, weather search, channel lockout and more is available for $94.95. CEI's package price includes mobile mounting bracket and mobile power cord.

President® HR2510-A

List price $499.95/**CE price $239.95/SPECIAL**
10 Meter Mobile Transceiver • Digital VFO Full Band Coverage • All-Mode Operation Backlit liquid crystal display • Auto Squelch RIT • Preprogrammed 10 KHz. Channels
Frequency Coverage: 28.0000 MHz. to 29.6999 MHz.
The *President* HR2510 Mobile 10 Meter Transceiver made by Uniden, has everything you need for amateur radio communications. Up to 25 Watt PEP USB/LSB and 25 Watt CW mode. Noise Blanker. PA mode. Digital VFO. Built-in S/RF/MOD/SWR meter. Channel switch on the microphone, and much more! The HR2510 lets you operate AM, FM, USB, LSB or CW. The digitally synthesized frequency control gives you maximum stability and you may choose either pre-programmed 10 KHz. channel steps, or use the built-in VFO for steps down to 100 Hz. There's also RIT (Receiver Incremental Tuning) to give you perfectly tuned signals. With receive scanning, you can scan 50 channels in any one of four band segments to find out where the action is. Order your HR2510 from CEI today.

NEW! President® HR2600-A

List price $599.95/**CE price $299.95/SPECIAL**
10 Meter Mobile Transceiver • New Features
The new *President* HR2600 Mobile 10 Meter Transceiver is similar to the *Uniden* HR2510 but now has repeater offsets (100 KHz.) and CTCSS encode.

BC760XLT
800 MHz. mobile scanner
SPECIAL!

★★★ Extended Service Contract ★★★

If you purchase a scanner, CB, radar detector or cordless phone from any store in the U.S. or Canada within the last 30 days, you can get up to four years of extended service contract from Warrantech. This service extension plan begins *after* the manufacturer's warranty expires. Warrantech will perform all necessary labor and will not charge for return shipping. Extended service contracts are not refundable and apply only to the original purchaser. Warrantech does *not* have an extended warranty plan for *handheld* scanners. For mobile or base scanners, CB radios or radar detectors a 1 year extended warranty is $19.99, two years is $39.99 and four years is $59.99. Order your service contract today.

OTHER RADIOS AND ACCESSORIES

BC55XLT-A *Bearcat* 10 channel scanner $114.95
AD100-A Plug in wall charger for BC55XLT $14.95
PS001-A Cigarette lighter cable for BC55XLT $14.95
VC001-A Carrying case for BC55XLT $14.95
AT054-A Replacement antenna for BC55XLT $14.95
BC70XLT-A *Bearcat* 20 channel scanner $159.95
BC175XLT-A1 *Bearcat* 16 channel scanner $134.95
BC1-A *Bearcat* Information scanner with CB $129.95
INF7-A *Regency* Information Radio $109.95
INF10-A *Regency* Information Radio $109.95
INF50-A *Regency* Information Radio $109.95
UC102-A *Regency* VHF 2 ch. 1 Watt transceiver ... $114.95
VM200XL-A *Uniden* Video monitoring system $179.95
BP205-A Ni-Cad batt. pack for BC200/BC100XLT ... $39.95
FBE-A Frequency Directory for Eastern U.S.A. $14.95
FBW-A Frequency Directory for Western U.S.A. $14.95
RFD1-A MI, IL, IN, KY, OH, WI Frequency Directory ... $14.95
RFD2-A CT, ME, MA, NH, RI, VT Directory $14.95
RFD3-A DE, DC, MD, NJ, NY, PA, VA, WV Dir. $14.95
RFD4-A AL, AR, FL, GA, LA, MS, NC, PR, SC, TN, VI ... $14.95
RFD5-A AK, ID, IA, MN, MT, NE, ND, OR, SD, WA, WY ... $14.95
RFD6-A CA, NV, UT, AZ, HI, GU Freq. Directory ... $14.95
RFD7-A CO, KS, MO, NM, OK, TX Freq. Directory ... $14.95
ASD-A Airplane Scanner Directory $14.95
SRF-A Survival Radio Frequency Directory $14.95
TSG-A "Top Secret" Registry of U.S. Govt. Freq. ... $14.95
TTC-A Tune in on telephone calls $14.95
CBH-A Big CB Handbook/AM/FM/Freeband $14.95
TIC-A Techniques for Intercepting Communications ... $14.95
RRF-A Railroad frequency directory $14.95
EEC-A Embassy & Espionage Communications ... $14.95
CIE-A Covert Intelligence, Elect. Eavesdropping ... $14.95
MFF-A Midwest Federal Frequency directory $14.95
A60-A Magnet mount mobile scanner antenna ... $34.95
A70-A Base station scanner antenna $34.95
USAMM-A Mag mount VHF ant. w/ 12' cable $39.95
USAK-A ¾" hole mount VHF ant. w/ 17' cable $34.95
Add $4.00 shipping for all *accessories* ordered at the same time. Add $12.00 shipping per radio and $4.00 per antenna.

BUY WITH CONFIDENCE

To ***get the fastest delivery from CEI*** of any scanner, send or phone your order directly to our Scanner Distribution Center™ Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. On all credit card orders, the ship to address must *exactly* match the credit card billing address. If the billing address is a P.O. Box or a P.O. Box Zip® Code, UPS can not deliver to that address. When this occurs, the order must be shipped by mail at a higher cost to you. To avoid this extra charge, you may mail us a check with your order. Prices, terms and specifications are subject to change without notice. All prices are in U.S. dollars. Out of stock items will be placed on backorder automatically or equivalent product substituted unless CEI is instructed differently. A $5.00 additional handling fee will be charged for all orders with a merchandise total under $50.00. Shipments are F.O.B. CEI warehouse in Ann Arbor, Michigan. No COD's. Most items listed have a manufacturer's warranty. Free copies of warranties on these products are available by writing to CEI. Non-certified checks require clearance. Not responsible for typographical errors.

Mail orders to: Communications Electronics,™ Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $12.00 per scanner for U.P.S. *ground* shipping and handling in the continental U.S.A. For Canada, Puerto Rico, Hawaii, Alaska, or APO/FPO delivery, shipping charges are two times continental U.S. rates. If you have a Discover, Visa, American Express or MasterCard, you may call and place a credit card order. 5% surcharge for billing to American Express. Order toll-free in the U.S. Dial 800-USA-SCAN. In Canada, dial 800-221-3475. FAX anytime, dial 313-971-6000. If you are outside the U.S. or in Michigan dial 313-973-8888. Order from CEI today.

Scanner Distribution Center™ and CEI logos are trademarks of Communications Electronics Inc.
Sale dates 3/15/90 — 9/30/90 AD #020890-A

Copyright © 1990 Communications Electronics Inc.

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

COMMUNICATIONS ELECTRONICS INC.™

Consumer Products Division

P.O. Box 1045 □ Ann Arbor, Michigan 48106-1045 U.S.A.
For orders call 313-973-8888 or FAX 313-971-6000

CIRCLE 1 ON READER SERVICE CARD

FEDERAL CIVIL DEFENSE ADMINISTRATION
WASHINGTON 25, D. C.
NATIONAL OFFICE
Battle Creek, Michigan

DEC 30 1955

Mr. Nolan G. Tucker
4904 Dry Creek Road
Del Paso Heights, California

Dear Mr. Tucker:

This will confirm your reported reception of Broadcast Station KO2XDN, an experimentally licensed, 250-watt transmitter located 4700' from ground zero of the "Operation Cue" nuclear explosion at the Nevada Test Site. This was part of a project to determine the effects of a nuclear explosion on commercial communications equipment. It was sponsored jointly by the Federal Civil Defense Administration and the Radio, Electronics, and Television Manufacturers Association as Project 35.2 of the Civil Effects Test Group of the Atomic Energy Commission.

The transmitter was programmed with a repetitive tape recording on 1240 kilocycles; it operated into a 150-foot guyed antenna. The Station was on the air several nights between April 26 and May 5 in expectation of the detonation which occurred on the latter date. The transmitter did not come back on the air three minutes after the blast as was provided for through timing signals, due primarily to the snapping of the power service line from the generator unit serving the equipment. Despite some "tumbling" of the Station equipment, the only needed repair work was to re-establish power supply. Five minutes following this, the transmitter was back on the air with its program on the afternoon of May 6.

KO2XDN has been removed from the Test Site and will not be heard again. We appreciate your report and will mail you a copy of a booklet describing "Operation Cue" as soon as it is published.

Many thanks.

Sincerely yours,

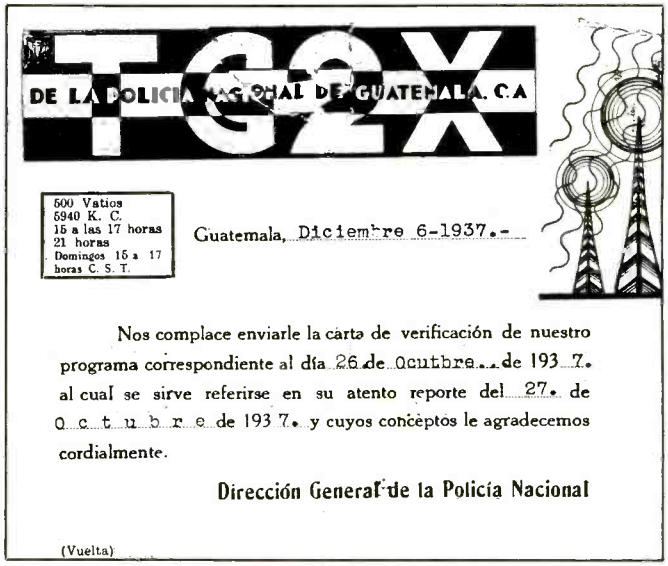
Albert H Stevenson

Albert H. Stevenson
Director, Program 35
Civil Effects Test Group

Radio Station KO2XDN
CETG Program 35
P.O. Box 7
Mercury, Nevada

KO2XDN ran 250 watts on 1240 kHz in 1955. It was probably the only American broadcaster deliberately blown up by a nuclear bomb. Don't bother looking it up in your White's Radio Log, though. (Courtesy "Major" Nolan.)

A wonderful old shortwave QSL from TG2X, apparently a broadcaster operated in the 1930's by the National Police of Guatemala. Ever see anything like it? Neither have we. (Courtesy W.L. Nielsen.)



SUBSCRIBER SERVICE
CHANGE OF ADDRESS
Planning to move? Please let us know six weeks in advance so you won't miss a single issue of POPULAR COMMUNICATIONS
Attach old label and print new address in space provided. Also include your mailing label whenever you write concerning your subscription to insure prompt service on your inquiry
POPULAR COMMUNICATIONS
76 N. Broadway,
Hicksville, NY 11801

ATTACH LABEL HERE

PLEASE PRINT
NEW ADDRESS HERE
NAME
ADDRESS
CITY STATE ZIP
DATE

This receiver (shown here last January) seems to have been built by Emerson about 1940 (± 1 year).

about the early use of two-way communications in this National Park. I thought it would make for an interesting tie-in. What I learned was that in the 1930's the National Park Service had established communications in Yellowstone, although the system consisted of a portable base used for emergencies such as fire situations. The base was used to send instructions to aircraft relating to supply drops, also directions for smoke eaters to go to problem spots.

In Yellowstone, the station used the call-sign KNJB and operated on 2520 kHz. National Park Service channels used at other parks in the 1930's included 2600 and 2640 kHz.

The photo shows the portable transceiver at the left. It's powered by an array of car batteries under the table. The table at the right accomodates a Hammarlund HQ-120X receiver. A quaint telephone is mounted on a stake driven into the ground. The Rangers are suitably attired in styles that look about the same as those used even today.

A Real Blast

KO2XDN was one of the most unusual broadcasting stations ever. "Major" Nolan, of Medford, OR sent along one of the two veris we have ever heard of from KO2XDN (Tom Kneitel received the other one), so it seemed an appropriate time to give you the background on this strange station.

This is another one of those stations you won't find in any published station directories, yet KO2XDN was fully licensed and ran 250 watts on 1240 kHz. The antenna was a 150-ft. guyed tower located at Mercury, NV. Programming consisted of a repeating ID tape. The station was on the air for only a few days in late April and early May of 1955, exactly thirty five years ago.

The reason for the brief broadcasting career was that the station was located less than a mile from ground zero of a nuclear test called *Operation Cue*. KO2XDN was designed (by the Federal Civil Defense Administration) to survive an A-bomb detonation at close range, and (along with many other structures) was going to be put to the

test. Prior to the blast, KO2XDN operated for several hours each night beginning on April 26th. When the blast came (on May 5th, and seen "live" on national TV), KO2XDN instantly went dark. It was expected to do that, but it was supposed to return to the air in 3 minutes. It didn't.

A check of the equipment showed that the problem was the power cable from the generator had snapped. Although some of the station equipment had been tossed around, KO2XDN was back on the air the afternoon of May 6th. This was within 5 minutes of the power line to the equipment being repaired.

Soon after the test and evaluations, KO2XDN was dismantled and removed from the site. It was never used again. In December of 1955, the FCDA's National Office in Battle Creek, MI issued verification letters for the several reception reports that the station received. A few months later, the FCDA also sent a booklet telling about *Operation Cue* and what was learned. In those days, one of the things they still hadn't learned was that it wasn't too bright sending technicians in to repair a wire at ground zero the day after one of those tests.

"Major" Nolan watched the test (and monitored KO2XDN) from a safe vantage point of Sacramento, CA. He remembers that the flash could be seen (and photographed) from his location. Tom Kneitel's recollection of KO2XDN is that he was with United Artists at the time, and was on location just outside of Las Vegas working on a film called *Johnny Concho*. He logged KO2XDN on his portable one night just before the blast, and also again during the test itself.

January Man

In the January issue we ran a photo of a mystery radio sent in by reader Jeff Holmes. The markings on the set were "R.H. Macy Model 454," and Mr. Holmes was hoping that we could come up with specific information and a manufacturing date. He had been given to understand that it may have been made in the 1920's.

Although this isn't an area in which we normally tread, we took a stab and guessed that it was privately labelled by some major manufacturer for R.H. Macy's Department Store around World War II (1941 to 1945). We asked if any reader could help with better information.

That brought a very newsy letter from R.A. Scott, Florence, NJ. His opinion, as a collector of antique radios, is that the set was manufactured by Emerson. This was based upon its looks, knobs, model number, and various subtle clues. He dates the set at 1941, plus/minus a year, based upon the model number, tube lineup, and other factors, and notes that radio sets were not made for sale to the public during 1943 and 1944 because the materials were needed for the war effort.

The information is appreciated, and we thank Mr. Scott for taking the time to provide us with his special expertise.

Another Odd Veri

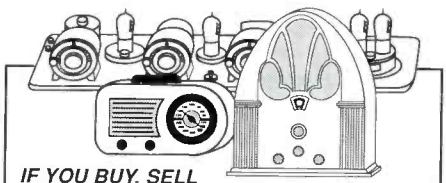
If you tune the shortwave bands, you'll appreciate the QSL sent to us by W.L. Nielsen, Lansing, MI. It's the first QSL we have ever seen from station TG2X, which was the station of the National Police in Guatemala City, Guatemala. The station ran 500 watts on 5940 kHz, and from the information on the QSL it seems that TG2X ran a program sked daily at 2315 and 0100 UTC, and Sundays at 2315 UTC. Maybe the inmate choir sang *If I Had The Wings of an Angel* and San Cooke's *Chain Gang* song. Well, whatever they did for programming, TG2X operated as a rather strange shortwave broadcaster.

Mr. Nielsen tuned them in and got a QSL in return in 1937. Most unusual!

Wrap-up

Before we leave, just time for a couple of short questions. Many have asked if I can tell them where to get the current "Vane Jones Log" (Directory of North American Broadcasting Stations). The last one was the 15th Edition. That was several years ago and it's no longer available anywhere. Vane Jones passed away a while back and therefore no further editions will be forthcoming.

That rounds it out for May. Hope we meet again on a rare and perfect day in June. Till then, thanks for the old station photos, QSL's, stories, questions, comments, station directories, etc. They're always welcome here at the *POP'COMM* archives. **PC**



IF YOU BUY, SELL OR COLLECT OLD RADIOS, YOU NEED...

ANTIQUE RADIO CLASSIFIED

FREE SAMPLE COPY!

Antique Radio's Largest Monthly Magazine
Articles - Classifieds - Ads for Parts & Services.
Also: Early TV, Ham Equip., Books, Telegraph, Art Deco, 40's & 50's Radios & more...
Free 20-word ad each month. Don't miss out!
6-Month: $11. 1-Year: $20 ($30 by 1st Class)
A.R.C., P.O. Box 802-T5, Carlisle, MA 01741

CIRCLE 60 ON READER SERVICE CARD

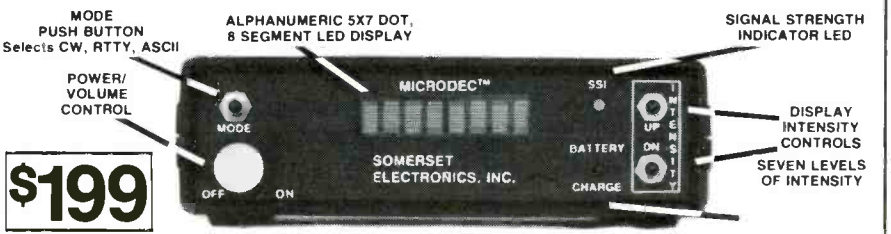
FREE CATALOG!
1-800-648-7938
JERROLD HAMLIN OAK ETC
CABLE TV EQUIPMENT

- *Special Dealer Prices!*
- *Compare our Low Retail Prices!*
- *Guaranteed Prices & Warranties!*
- *Orders Shipped Immediately!*

REPUBLIC CABLE PRODUCTS, INC.
4080 Paradise Rd. #15, Dept. 106
Las Vegas, NV 89109
For all other information (702) 362-9026

CIRCLE 63 ON READER SERVICE CARD

Add New Enjoyment To Your SW Receiver with the Portable MICRODEC™ Decoder



$199

MICRODEC™ converts MORSE, RTTY, and ASCII to ALPHANUMERIC CHARACTERS

- Automatically tracks MORSE code speeds from 5 to 70 WPM
- Decodes 60,67,75,100 wpm RTTY and 110, 330 BAUD ASCII.
- Standard ASCII port to interface with your computer.
- Internal practice code oscillator.
- Standard cockpit green display. (red & yellow optional)
- Power switch/Volume control/Internal speaker
- Completely portable with optional NiCAD rechargeable batteries mounted internally. — $29.95
- Ultra compact and lightweight 1.5 H x 5.08 W x 5.25 L (1 pound w/batteries).
- Operates on DC voltages between 9 VDC and 15 VDC (9 VDC adapter provided at no cost).

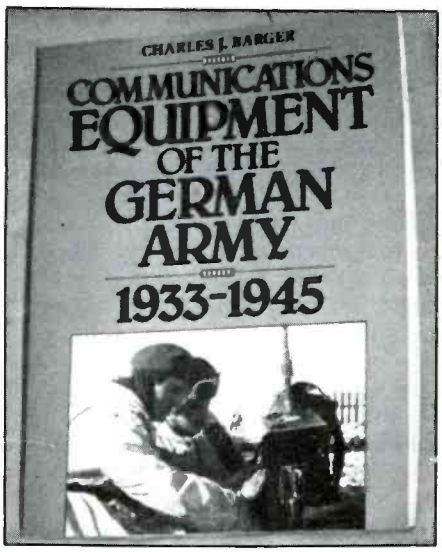
SHIPPING AND HANDLING: Continental United States add $8.50 for UPS ground. Florida residents add 6% sales tax. Other types of Express shipments and foreign destinations will be quoted on request.
METHODS OF PAYMENT: MasterCard, VISA, Money Orders, Certified Checks, and Personal Checks. Please note for personal checks we allow two weeks for checks to clear.

SOMERSET ELECTRONICS, INC.
1290 HIGHWAY A1A, SATELLITE BEACH, FL 32937 • ORDER & FAX: (407) 773-8097

CIRCLE 59 ON READER SERVICE CARD

BOOKS YOU'LL LIKE

BY R. L. SLATTERY



World War II Communications

The radio communications equipment used by the armies of the Third Reich during World War II has always been an elusive subject. Until now, there has been very little published on the topic, although information on the equipment has always been eagerly sought by communications enthusiasts, collectors, and military historians. Part of the problem has been that Germany's WWII radio equipment has been relatively rare from the beginning of the capitulation of the Nazi forces in 1945. Few examples were brought back to the Allied nations as war trophies. Also, occupation forces were told to destroy the sets. Countless thousands of German military transmitters and receivers ended up on the business end of sledge hammers, and the design, service, and operating documents for the equipment were thrown out or otherwise lost forever.

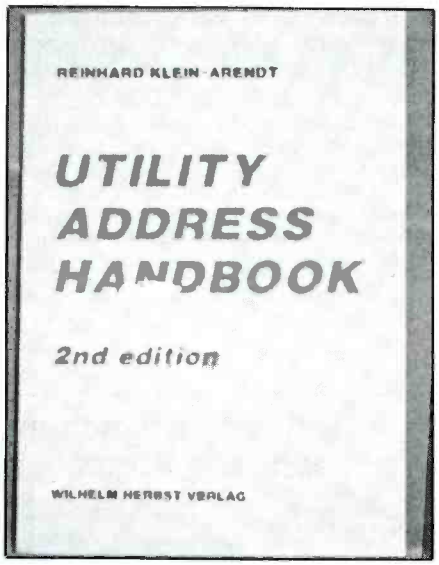
After much exhaustive research, a new 192-page authoritative reference book on this equipment has just been published. Entitled *Communications Equipment of The German Army 1933-1945*, author Charles J. Barger has compiled the most comprehensive reference ever published on German tactical field communications equipment between 1933 and 1945.

Loaded with what seems to be hundreds of photos, diagrams, charts, drawings, tables, and specs, the book also provides general descriptions as well as installation, antenna configuration, and operating instructions for a number of these transmitters and receivers. The detailed information in Barger's large and definitive book came from the author's personal "hands on" examination and testing of the largest collection of this equipment in the United States. This enabled Barger to provide detailed performance data, discuss frequencies, and design highlights as well as flaws.

Photos include the equipment in use, also shown taken out of their cases, with a close-up view of various circuits and components of special interest. In the back of the book, there are reproductions of actual German Army blank message forms used for taking down voice, CW, and RTTY traffic.

When looking at the equipment shown in this fascinating book, one is struck by many strange things. On the one hand, there is a modern and compact 34 to 38 MHz manpack that was 10 to 15 years ahead of its time in design and and compactness. It puzzles you when you compare this and several other innovative designs with a few lumbering behemoths that look like they'd have done better as road blocks than radios.

Communications Equipment of The German Army 1933-1945 is available for $24.95, plus $2 postage to North American addresses, from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State add $1.87 sales tax.



The Write Stuff

Utility stations (or *utes*, as they are popularly known) are usually described as communications facilities that don't fit into the broadcast, ham, or CB categories. Utes include diplomatic, military, maritime, aero, weather, time signal, international telephone, press, governmental, industrial, scientific, MARS, beacon, and similar activities. Utes may be operating in voice, CW, RTTY or other modes. Monitoring utes has become an exciting specialty for communications hobbyists.

One of the complaints some have had about utes is that it's usually difficult to dig up a good address to use to send a reception report. Many utes will verify (QSL) monitoring reports if you furnish them with a prepared reply card. Some utes even have printed QSL cards. But, you still have to figure out where to send the report. For a long time, that meant a trial-and-error process which produced many bounced letters stamped "Addresses Unknown." That was until 1986, when ute DX'er Reinhard Klein-Arendt compiled his *Utility Address Handbook*.

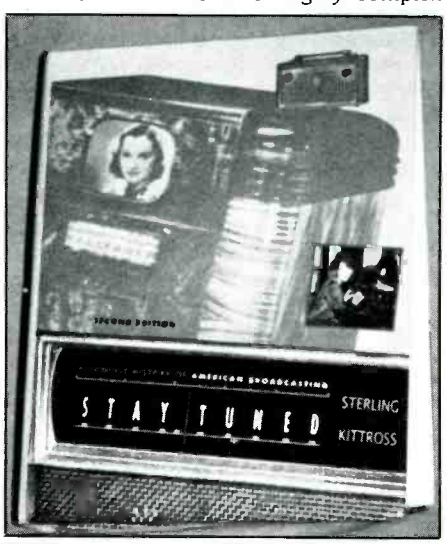
Klein-Arendt has just updated and expanded his useful guide into a 2nd Edition. This is 236-pages of wall-to-wall addresses. Listings are arranged by nations, Afghanistan through Zimbabwe, and covers the categories mentioned above. A special section covers only NDB's (non-directional beacons). In the back of the book, there's a huge listing of the mailing addresses of the world's ships, civilian and military. Throughout the book, whenever known, the call-signs are also provided. I don't know how many listings there are in this 2nd Edition, but I'd guess it to be more than 15,000. There are also illustrations of interesting ute QSL's from many nations and types of stations.

Even if you're not presently an active seeker of QSL's from ute's, the *Utility Address Handbook* is a bountiful source of valuable station informations for the ute DX'er or researcher.

The *Utility Address Handbook* is available for $16.95, plus $2 postage and handling, from our friends at Gilfer Associates, Inc., P.O. Box 239, Park Ridge, NJ 07656. Highly recommended for all ute fans.

Staying Tuned

Ever since we saw the original (1978) edition of *Stay Tuned: A Concise History of American Broadcasting*, by Christopher Sterling and John Kittross, it has been highly regarded here as one of the finest books on broadcasting history. Some say, however, that in the late 1970's, broadcasting entered one of its most highly complex



phases, with more major changes taking place place more quickly than at any other time. We have now seen things such as cable TV, VCR's, more high-powered stations, LPTV, changed FCC regulations and attitudes, stereo AM, changes in the major networks, pay-TV, PBS, radical new programming formats, shifting audience demographics, and many other factors have turned today's AM, FM, TV, and cable scenes into completely new experiences for broadcasters, advertisers, audiences, and students of broadcasting.

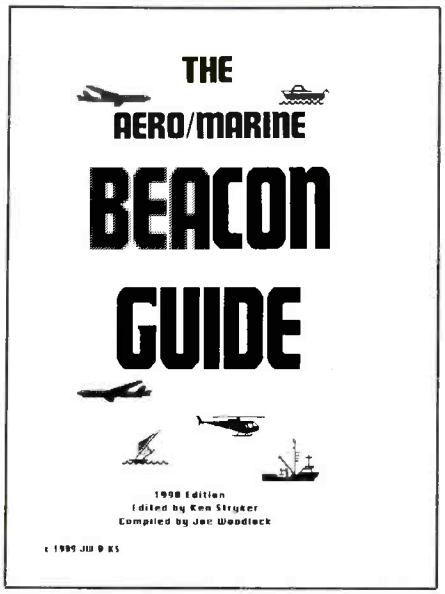
So, Sterling and Kitross sat down and totally revamped *Stay Tuned*, and when they got finished, they ended up with a 705-page hardcover book that takes into full account the many recent influences that have jelled into present day broadcasting, the schemes that fell by the wayside, and where it all seems to be heading.

The authors bring out the point that, in past eras, broadcasting was primarily in the hands of many innovative and colorful individuals who viewed their connection with broadcasting as a special calling for which only a few had been chosen. This is contrasted with more recent years which saw a great many of these people replaced by a new breed of MBA's who regarded broadcasting as "just another business." Sterling and Kitross, nevertheless, see broadcasting as such a challenging and romantic endeavor, that even the most colorless babbitt in charge of a broadcasting operation can't effectively stifle that something special about the industry that has always given it a unique panache that attracts talented and enthusiastic people within its creative ranks.

This is a book for all who enjoy reading about the past, present, and future of the broadcasting industry in America. It is a high quality book with a number of photos and other illustrations. Its authors are both college professors who teach telecommunications. They depart their knowledge in a most enjoyable and informative manner, bringing out many fascinating points that explain the subtle reasons behind the changes taking place. An excellent book in every respect. This book is $38.00 from Wadsworth, Inc., 10 Davis Drive, Belmont, CA 94002.

In Addition . . .

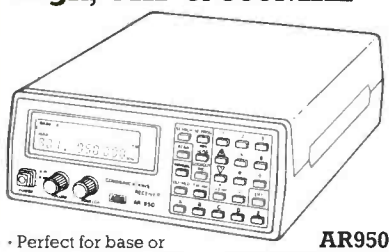
The 1990 Edition of Ken Stryker's popular *Aero/Marine Beacon Guide* is now available. For those who tune the 190 to 535 kHz and 1600 to 1745 kHz bands for radiobeacon signals, this is the must-have directory of the more than 7,000 stations from the Western Hemisphere, Pacific Ocean, and Asia that you can try for from monitoring locations in North America and Hawaii. Listings are by ID, then cross indexed according to frequency in North American and overseas sections. Information provided for individual beacons includes ID, frequency, location, operating data, geographic coordinates and transmitter power. Location data includes (where applicable) names of airports, oil drilling rigs, company names, etc. Detailed GWEN and LOWFER listings are also provided, as is a section with information on the best ways to monitor and QSL radiobeacons.



This guide is prepared in a looseleaf format to make future updating easy. It's available for $15 (postpaid to addresses in USA/Canada) from Ken Stryker, 2856-G West Toughy Avenue, Chicago, IL 60645. Tell Ken you read it here! PC

A New AOR Scanner

100 Channels Low, Air, High, UHF & 800MHz



- Perfect for base or mobile. Includes AC and DC power cords, mobile mount hardware and 2 antennas.
- Covers 27-54MHz, 108-174MHz, 406-512MHz and 830-950MHz.
- 5 Scan Banks and 5 Search Banks
- 25 Day Satisfaction Guarantee
- No Frequencies Cut Out.
- Size: 3½"H x 5⅝"W x 7⅞"D. Wt.: 2 lb. 10 oz.

AR950
Total Price, Freight Prepaid (Express Shipping Optional)
$239.00

ACE COMMUNICATIONS
10707 E. 106th St. Indpls., IN 46256
Toll Free **800-445-7717**
Visa and MasterCard (COD slightly higher)
In Indiana 317-849-2570 Collect FAX (317) 849-8794

CIRCLE 47 ON READER SERVICE CARD

MFJ SHORTWAVE ACCESSORIES

REMOTE ACTIVE ANTENNA

MFJ-1024 **$129.95**

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

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

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

Covers 50 KHz to 30 MHz. High dynamic range eliminates intermodulation. Control unit has 20 dB attenuator, gain control. Lets you switch 2 receivers and auxiliary or active antenna. 'On' LED. 6x2x5 inches. Remote has 50 ft. coax and connector. 3x2x4 in. 12 VDC or 110 VAC with MFJ-1312, $9.95.

INDOOR ACTIVE ANTENNA

MFJ-1020A **$79.95**

Now you'll rival or exceed the reception of outside long wires with this **tuned** indoor active antenna. **'World Radio TV Handbook'** says MFJ-1020 is a "fine value ... fair price ... best offering to date ... **performs very well indeed."**

Its unique tuned circuitry minimizes intermod, improves selectivity, reduces noise outside tuned band. Functions as a preselector with external antenna. 0.3-30 MHz. Telescoping antenna. Controls are Tune, Band, Gain, On-Off/Bypass. 6x2x6 in. Use 9 Volt battery 9-18 VDC or 110 VAC with MFJ-1312, $9.95.

ANTENNA TUNER/PREAMP

MFJ-959B **$89.95**

Don't miss rare DX because of signal power loss between your antenna and receiver.

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

20 dB preamp with gain control boosts weak stations. 20 dB attenuator prevents overload. Select from 2 antennas, 2 receivers. 9x2x6 inches. Use 9-18 VDC or 110 VAC with optional AC adapter, MFJ-1312, $9.95.

For your nearest dealer or to order:

800-647-1800

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

MFJ ENTERPRISES, INC.
Box 494, Miss. State, MS 39762
601-323-5869 **Telex:** 53-4590 MFJSTKV
MFJ . . . making quality affordable

CIRCLE 48 ON READER SERVICE CARD

Radio Spies Of The KGB

Moscow's Surveillance: A Worldwide Effort That Runs On Its Own Inertia. A Former CIA Official's Analysis.

BY DONALD F.B. JAMESON

It happened again, the ambassador noticed, as soon as he called in his secretary to dictate a dispatch to the Department of State in Washington, D.C. The curtains on the window directly across the street parted. Otherwise, they were always closed.

It was the last year of Joseph Stalin's life; fall already was coming to Moscow tat September of 1952; and Ambassador George Kennan was puzzled. Two technicians from Washington were in the embassy at the time, checking it for Soviet listening devices. They were about to depart, having found nothing in their search. After a brief dictating session, Kennan approached the technicians outside of his office and arranged a scene. The next time he dictated, his secretary sat where she normally would; Kennan dictated as he normally would and, just as normally, the curtains across the street parted. Only one thing was different. Crawling around on the floor below the level of the window sill so that he would not be seen was one of the technicians, discreetly probing the air above him with an antenna. He got a hit—his antenna had picked up a microwave beam being projected into the office. The target for the beam turned out to be small, thimble sized cylinder hidden in the Great Seal of the United States on the wall opposite the window.

Upon analysis, the cylinder was discovered to be a cavity resonator, probably the first one used for eavesdropping in the sophisticated manner that U.S. technicians had ever seen. The resonator reflected the beam back toward its point of origin with audio modulation from the voices in the room imposed on the carrier frequency. No problems. If only the Ministry on State Security (MGB), the Committee on State Security's (KGB's) predecessor, had been smarter about drawing the curtains, the cavity resonator might have been there much longer. As it was, the Soviets probably had years of ambassadorial memoranda and conversations to digest.

When a writer for *Time* Magazine wrote in 1987 the "The USSR may be deficient in many areas of high technology, but its spying techniques are as sophisticated as its missiles," he may have been too complimentary to the missiles. In any event, he paid homage to a tradition of technical excellence in remote surveillance that began more than 50 years before.

A bug was found in the ambassador's office shortly after the United States moved into its first Moscow embassy in 1934. In those days, the Soviets did not use cavity resonators. The listening post for their audio operations was the apartment within the embassy building where the Soviet caretaker lived. The caretaker always was helpful around the building; he even helped with the burning of the classified trash in a stove in the embassy basement. But the caretaker finally left in the 1950's when the then-ambassador, Charles Bohlen, demanded to have a key to his room.

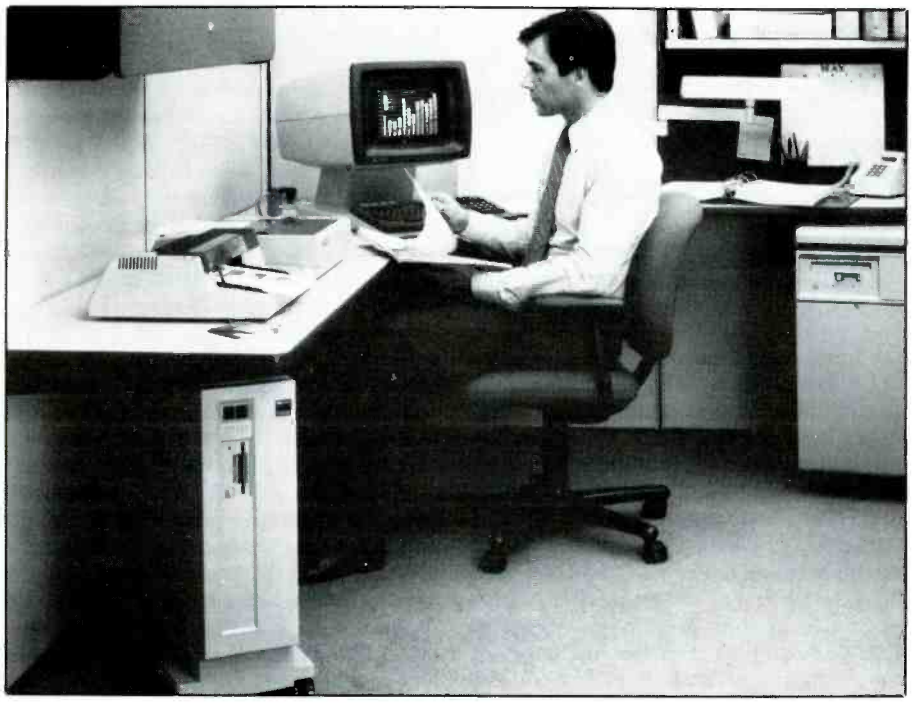
More than 200 Soviet "survey and research" and so-called "fishing trawlers" are festooned with antennas and surround the American coastline. These are monitoring platforms that tune the entire spectrum searching out every type of signal and communication.

Intelligence Agencies

When discussing Soviet technical intelligence capabilities and the opposite side to that coin, Western unconcern, one organization has, since its inception in 1919, always striven to be the best and the biggest in all aspects of clandestine operations—the KGB of the Soviet Union. If economies of scale are to be realized in the spy trade. The KGB is the best equipped to use them.

All elements of the KGB focus on keeping track of people, and they all use devices that extend the range of the normal human senses.

The KGB's First Chief Directorate is the principal element for clandestine operations abroad. Its personnel strength is probably somewhat above 15,000, which makes it



Computer hackers have been successfully used by the KGB to probe the electronic files of government and industry.

the largest spy organization in the world. (The next three in terms of size are the Soviet Military Intelligence *GRU*, the U.S. Central Intelligence Agency *CIA* Operations Directorate and the Cuban Directorate for Intelligence.) The First Chief Directorate is less than five percent of the whole KGB.

The Second Chief Directorate, the counterintelligence service, is equally as large as the Third Chief Directorate, which has five times as many officers to check on the security and reliability of military personnel than the KGB does for spying abroad.

In addition, there are the border guards, some 300,000 strong, whose principal task still is preventing Soviet citizens from leaving their country. The border is covered with sensitive alarm devices and surveillance gear.

Other units exist, such as the Guards Directorate, the personal protection service for the Soviet leaders, that also consume technical equipment. In addition, the Soviet Union has the GRU, itself bigger that the CIA clandestine services, and the regular police force. And this list does not include the other KGB elements involved with communications interception and analysis.

The technical snooping industry has a big market in the Soviet Union, the biggest by far anywhere, and the Soviets take this activity seriously. Still, even with *glasnost* and the efforts of Soviet President Mikhail Gorbachev, the first response of Soviet leaders to any problem, external or internal is to see what secret operations can do to make it better.

A few months ago, one of the top intelligence officers in Europe said that KGB operations against his country had tripled since President Gorbachev took over. William Webster, the Director of the CIA, recently said that Soviet operations against U.S. targets had doubled in the past five years. Internally, the Soviet Union has increased investigations of corruption and intrigue. Dissenters and minority nationality groups have begun to use protest demonstrations, underground publications and even clandestine radio broadcasts to enhance their cause. Penetrating and monitoring these activities are the first tasks of the KGB, Naturally, this organization uses all the technical help it can obtain.

Other Missions

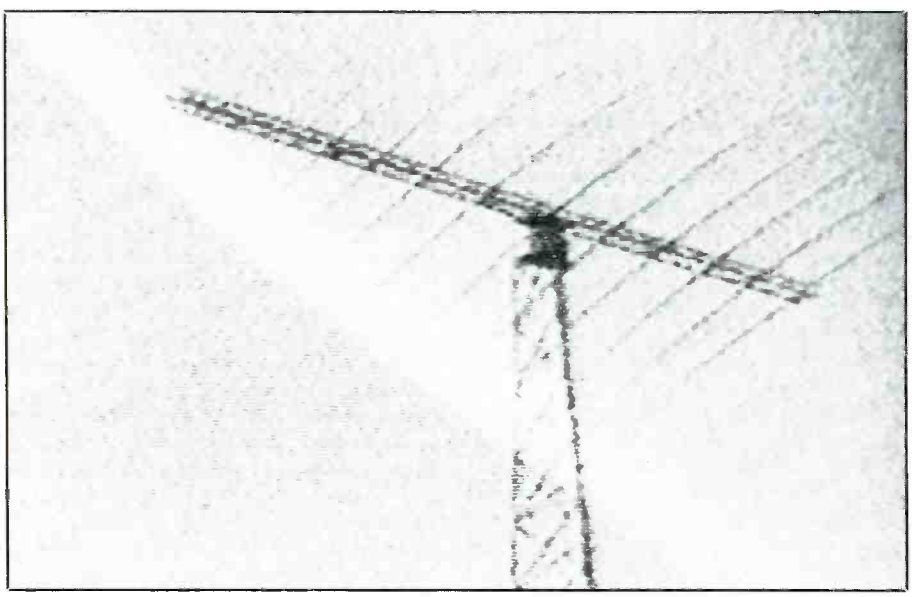
Every foreigner in the Soviet Union is nominally a target for surveillance. Every hotel that foreigners frequent, every apartment that they live in, every office that they work in (including as first priority the embassies of the leading NATO countries), even the restaurants that they eat in are under technical audio and often visual surveillance.

Soviet dissenters maintain that, if you kick the leg of a restaurant table hard enough, it somehow turns off the bug for a while. Foreign diplomats discovered long ago that the best way to bring a complaint about apartment or hotel room conditions, stolen property or the incivility of servants to the attention of the authorities was the speak about it in their bedroom.

Of course, most of the millions of foreigners who enter the Soviet Union each year are not specially watched, listened to or followed every minute, but thousands are. Most visitors stay within the seamless tube created by the Soviet tourist agency, *Inturist*, and the KGB, which insulates them from the Soviet environment. Sensors and monitors are efficient methods of watching for those who break out.

Most surveillance attention is paid to long-term visitors are residents such as business people, journalists, diplomats, scholars and students. The purposes for surveillance are not all related to counterespionage and clandestine intrigue, either. Soviet trade negotiators sometimes have profited by learning from recordings of conversations in hotel dining rooms how high or low foreign traders are prepared to go in making an offer.

Beyond the foreigners, the 280 million Soviet citizens also are potential targets. In practice, surveillance is focused on people



A surveillance photo of one of the log periodic antennas atop a Soviet diplomatic building in New York City.

such as political dissenters, selected practitioners of religion, black marketeers, professional criminals and suspected spies for foreign powers.

Monitoring

Soviet listening devices come in all shapes, sizes and materials. They transmit using all the known physical principles for transmission.

U.S. investigators found 40 microphones hidden in bamboo tubes built into the wall of the U.S. embassy. As described by Ronald Kessler in his book *Moscow Station*, the tubes ran horizontally from the inner walls of the building to the mortar behind the outer facing. There were tiny pin holes behind radiators where the bugs were nearest to the inner walls. Wires like spider thread ran from the microphones through the tubes and onto nearby apartments. Microwaves were used to turn the microphones on or off so that these devices could be turned off in the vent of an electronic sweep. These bugs covered the ambassador's office and that of the CIA, among others. After finding the 40 microphones, the sweepers found another 50 in apartments in the embassy building.

In the same year, 1964, children of U.S. embassy personnel in Moscow discovered a wonderful place to hide, a tunnel leading from the embassy basement down into Moscow's lower depths. The embassy sealed this tunnel, but new ones kept appearing, not only at the current embassy, but later on, at the new one being built. Construction on the new U.S. embassy has been stopped because debugging it has been judged impossible.

Fourteen years later, in 1978, a Navy Seabee, a construction specialist, found an antenna wire suspended through a chimney in the embassy. He traced it down the chimney, into the basement and through a tunnel going into a Soviet occupied apartment house. He caught some of the wire, but most was followed up by someone on the other end.

Those who prove to zealous at finding Soviet bugs should beware. A West German counter-audio technician names Horst Schwirkmann was almost killed in 1965, presumably because he found too many bugs in his country's embassy. The KGB squirted him with mustard gas during the Easter service at Zagorsk, Russia's most famous monastery.

In the 1960s, a microwave beam that systematically swept over the whole face of the U.S. embassy was detected. One guess as to its purpose was that it actuated cavity resonators hidden in the building, perhaps in the basic structural elements, as is the case with the now-abandoned new embassy. Another theory was that it was simply a psychological harassment. When former Ambassador Walter Stoessel developed skin cancer, some thought the microwave radiation caused the disease. The most benign acceptable explanation is that is was a cover for some other microwave serviced operation. That is possible, but, most likely, the microwave beam worked just fine on its own. It seems unlikely that the Soviets would have gone to such trouble for so long unless they were receiving a good read out from a system that the United States has never located.

The most horrifying accomplishments of the KGB from a security point of view and, technically, the most impressive, was the bugging of IBM Selectric typewriters used in the embassy in Moscow and in the consulate in Leningrad. As was the case with the microphones in 1964, the United States would never have known about the typewriters had not an outside source provided the information. In this case, an agent that the French service recruited from the KGB revealed in 1984 that the typewriters in Western embassies were bugged. The U.S. embassy's typewriters had been left overnight in a Soviet customs warehouse. Apparently, the Soviets performed the delicate task of removing the bars overnight. The one that was found in the Lenigrad consulate had once been shipped to Helsinki for repairs.

The batteries in the bugging devices in the first shipment of typewriters, which arrived at the embassy in 1976, had died by the time they were found. The bugs in later shipments used power from the typewriters. These devices stored their information and only transmitted it upon receipt of a signal from a remote listening post. When transmitting, they used the frequency of a local broadcasting station, intruding on it with only a brief noise that sounded like a burst of static.

The antenna that the Navy Seabee found in 1978 must have been one of those dedicated to picking up the signal from the typewriter bugs. These devices stored the electrical instructions sent from the keys to position the ball from which the characters are printed. This feature made the Selectric vulnerable to bugging, which raises the question of why the United States used these typewriters in sensitive offices in the embassy in the first place. Conventional typewriters are not so vulnerable, but word processors, which proliferate in embassies today, are even more accessible to penetration devices that Selectrics.

Another example of Soviet technology in this field has, what we might call, its dialectical aspects. The Soviets prepared a new embassy building in Moscow for the United States that is the realization of the audio technician's wildest fantasy.

Mixed into the concrete are thousands of little diodes to mask the actual bugs implanted. Designers created tiny microphone/transmitters that had the same specific gravity as the steel beams in which that were embedded so that they would not show up if the beam were X-rayed. The Soviets welded the entire steel skeleton together so that a signal could be transmitted throughout it. Steel beams, girders and rebars did not conform to the plan. Many parts also appeared to be shaped to act as cavity resonators and antennas on a grand scale. This set up was the ultimate in audio-transparency.

Information on video devices that might also have been installed has not been released, but the guess is that the Soviets probably had video too. They were not just after conversations. Communications equipment, in particular, was the target.

Strong evidence exists, reported in some detail by Kessler, that the Soviets were able to penetrate the code room and the coding machines in the old embassy, which the United States still uses in Moscow. With the information on U.S. code machines acquired from the John Walker case, the Soviets easily could have prepared the anomalous circuit boards found by National Security Agency (NSA) investigators in printers in the code room, called the Communications Program Unit (CPU) in bureaucratic parlance. Kessler says that these circuit boards diverted the plain test messages being input into the machines to the power cable for the CPU and that the screening mechanism that should have prevented any signal from going out of the CPU on a carrier frequency were removed. If all that is true, the Soviets were able to read the plain text of outgoing messages and then were able to compare the plain text with the enciphered text, which they could pick up in any event. Being able to compare the ext would have enabled the Soviets to reconstruct the code system used. Knowing the system, they then could read other messages not sent through the printers in Moscow. how much the Soviets actually were able to do along these lines will remain a mystery until some new KGB defector enlightens the United States or until *glasnost* envelopes Derzhinsky Square.

Based on evidence from investigations of the U.S. Marine Corps guards at the embassy, KGB technicians could have had access to the CPU, and given all that they already knew about U.S. systems, they could have made the necessary installations in a short time.

Hardware

Specific information on current Soviet hardware is difficult to come by. Neither those who implant it nor those who find it are interested in publicity as a rule. Based on what is publicly known, Soviet clandestine surveillance technology is, as it always has been, state of the art. As former Secretary of Defense and former Director of the CIA James Schlesinger said after reviewing the question of whether the new embassy could be made secure, "The notion that the Soviets are a decade behind the U.S. (in technology) certainly does not apply to electronic snooping."

Reports mention low light-level-video cameras for hotel rooms that operate with

lens diameters of one-six-teenth of an inch. Hotels for foreigners have many rooms so equipped and have had these rooms for more than 20 years. In a private conversation some years after his defection, a former KGB officer commented about the demoralizing influence on KGB monitoring personnel of having to watch the activities in hotel rooms, day after day, month after month.

Microphones and microphone/transmitters have been scaled down to minuscule size. One article compares the size of the smallest device to that of a pin head.

Wireless transmission has come a long way from the beam projected into Kennan's office in 1952. Now a tiny bug can store part of a conversation and then transmit it in a microsecond burst to a nearby concealed antenna. Hard wired sets, which eliminate the possibility of detection with antennas, use a variety of conducting materials, such as metallic paints, as substitutes for regular wire. These sets are almost impossible to identify.

U.S. officials have been given gifts of small figurines, lamps or radios that were bugged. Something that requires an electric current to operate normally has the advantage over the item in which, sooner or later, the batteries will become exhausted.

The KGB also has experimented with infrared and laser beams to pick up the vibrations of windows and walls. However, the process of filtering out the noise caused by such things as wind, passing vehicles or people walking would take a lot of sophisticated computer analysis.

The KGB has used listening disks, apparently, just the way television uses them in sports events. Dissenters in Moscow have alluded to KGB monitoring or outdoor conversations by this method and by lip reading from telephoto movies taken from an observation point.

In operations abroad, the KGB and its allied services—those of the other Communist countries—use the same gadgetry, but it is tailored often in ingenious ways. One U.S. diplomat found that the heel of a shoe he had sent for repair came back with a radio in it.

An agent of an East European service, who fortunately was doubled by the United States, was given a slab of wood exactly matching the wood in the book case of an officer in the Department of State. He was to spread an adhesive substance on one side of the slab and press it to the bottom of a lower shelf in the bookcase. It would have been almost invisible.

In Australia, Western Europe and, doubtlessly, elsewhere, the KGB uses vans and trucks crammed with eavesdropping equipment to intercept the impulses from typewriters and computers and other electronic devices. In Europe, when NATO holds maneuvers, the vans collect to record all they can.

Computer Infiltration

Other applications of technology to clandestine operations by the KGB include the use of computer hackers to invade classified or restricted data banks and read out information from them. This possibility long has been discussed in security circles, and some evidence of operations in the field goes back several years. The smoking gun was found in the hands of three West German hackers who were arrested in March of last year. They had managed to break into data banks in the Pentagon, Los Alamos National Laboratory and the National Aeronautics and Space Administration. Using thousands of passwords, access codes and programs obtained by the hackers, the KGB appears to have accessed main frame computers of the European Nuclear Research Center in Geneva, the European Space Agency, Thomson-CSF in France and other European and Japanese electronics firms. A program for the development of advanced microchips, called Hallo 2, and other state-of-the-art design programs apparently were acquired. Computer infiltration is a type of espionage that probably is more widely practiced than the available evidence indicates.

Additional Methods

In other realms of technology, by 1961 the Soviets perfected a device for reading safe combinations through radiation pro-

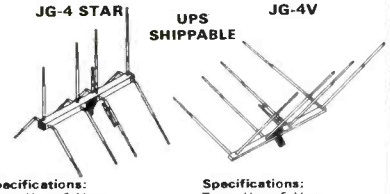
Jo Gunn Enterprises

– CB Antennas – Mobile Antennas
– 10 Meter Antennas – Coax

Long Distance Local-Ground Wave-DX
"Combination Talking"
JG-4 STAR

UPS SHIPPABLE

DX Antenna
"Strickly for DX Talking"
JG-4V



Specifications:
Type: Horz. & Vert. Polarization Twin Feed
Gain: 15.5 DB
Front to Back Ratio: 45 DB True
Side Rejection: 45-50 DB True
Back Rejection: 45 DB True
Weight: 34 Pounds
Length: 12 Feet
SWR: 1.1
Horz. to Vert. Separation: 20-25 DB
Wind Survival: 100 MPH
Power Multiplication: 50X
Audio Gain: 20 DB
Wind Load: 3.7

Specifications:
Type: Horz. & Vert. Polarization Single Feed
Gain: 15.5 DB on DX
Front to Back Ratio: 50 DB True
Side Rejection: 45-50 DB True
Back Rejection: 35 DB True
Weight: 24 Pounds
Length: 12 Feet
SWR: 1.1
Wind Survival: 100 MPH
Power Multiplication: 50X
Audio Gain: 18 DB
Wind Load: 2.8

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

ALL CANADIAN INQUIRIES CONTACT:

HEXIRO SALES CANADA INC.
5035 NORTH SERVICE RD. UNIT D-16
BURLINGTON, ONTARIO
L7L 5V2
Tel: 1-416-332-5944 Fax: 1-416-332-5946

JO GUNN Antennas

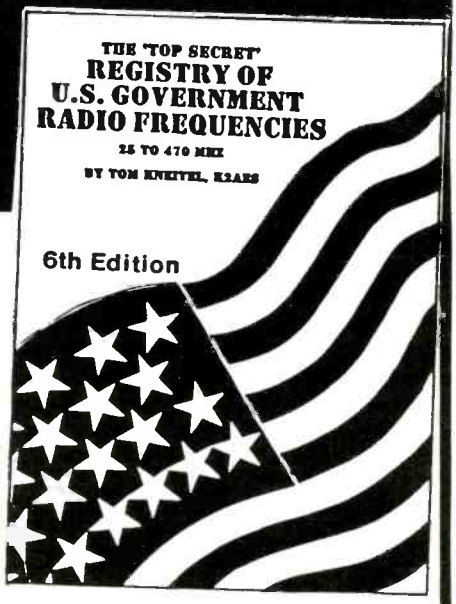
Route 1 – Box 32C, Hwy. 82
Ethelsville, AL 35461
(205) 658-2229
Hours: 10 am - 6 pm (CST)
Monday - Friday

DEALER INQUIRIES, PLEASE CALL

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
- Electronics & Projects
- Regency Scanner Directories
- Computer Technology
- & Other Related Topics!



New titles are constantly being added to our exciting catalog. If it's interesting and unusual, we've got it. You'll see! Ask for our latest FREE catalog.

CRB RESEARCH
P.O. Box 56 Commack, NY 11725

jected at the locks. They gave a U.S. Army sergeant this device when he was guarding the classified depository at Orly Airport in Paris. The sergeant clamped the device on the safe surrounding the dial of the combination lock; turned a lever, and sat down in the diagonally opposite corner of the room for 15 minutes. He then removed the device and returned it to his KGB case officer. A week later, he was told the combination. Fortunately for his sense of well-being, he had no means of measuring the amount of radiation he was exposed to. He did not even know that he was being zapped. The sergeant managed to open the safe door with ease and served his KGB masters well. He was killed in a federal prison before any latent effects of the radiation set in.

The KGB has used chemical powders to track people and documents by dusting some of the chemicals on a person's shoes and by putting some in their pockets, where they might put letters to be mailed. A letter mailed by the dusted person is easy to distinguish from others when the mail is sorted in the post office. This dust, transferred from the hand of one person to that of another, also helps in identifying who meets whom when contacts are being traced.

The KGB has put much effort into the development of unobtrusive ways of killing people. In 1957, one of the KGB's assassins killed a Ukrainian emigre journalist with a special gas gun. Not until the assassin defected to the West and confessed to the crime four years later did anyone think that the death was not natural.

The death of a Bulgarian broadcaster for the BBC in London in 1985 was caused by a tiny ampule of a subtle poison administered by a jab from the point of an umbrella. If it had not been for a fluke involving a botched attempt ot do the same thing to an other Bulgarian in Paris, the cause of the Londoner's death might not have been identified. It is doubtful that the Bulgarian service developed the potion on its own.

The dearth of examples of recent assassinations may be because of a change of policy by which such killings are now forbidden, or because the Soviets are doing a better job of them nowadays.

Soviet preoccupation with research in drugs that alter a person's mental state is known, but no information is available on whether they have applied it operationally. Parapsychology also has been investigated so carefully that Soviet mediums or others with apparent gifts in this field have been isolated from their Western contacts. However, no solid reports of the use of telepathy as the ultimate means of secure communication have been received.

Signals Intelligence

The Soviets' signals intelligence activities have benefited from a string of defectors and agents from NSA, other communictions intelligence organizations and communications units. From William H. Martin and Bernon F. Mitchell, two NSA employees who defected in the 1950's, to the Walker group and beyond, and apparently including the CPU bugging in the embassy in Moscow, the Soviets have been able to bring themselves up to date periodically on how the United States enciphers its messages and how it tries to decipher Soviet messages.

Presumably, the Soviets do not have the computer capacity that NSA possesses, and their antennas and recording systems probably are of lower quality. However, the Soviet Union may have many more collection stations than the United States does, in part because of geography, and they may have much more personnel, some 300,000, according to an informed source.[6] The 160 or so Soviet "survey and research" vessels and about 60 so-called fishing trawlers festooned with antennas probably outnumber the drug runners off of much of the U.S. coast.

The Soviet Union has very little accessible coast for the United States to listen off of, even if the United States tried to equal the Soviets in such efforts.

The Soviets also have the resources of Cuba. At Lourdes, 1,500 Soviet personnel operate one of the largest intercept stations in the world. It is equipped with Krug type circular antenna arrays, similar to the FLR 9 antennas found at some NSA field stations. Reputedly, it is good at direction finding, but inferior in sensitivity and range to its U.S. counterpart.

From this location, the Soviets can listen in on everything from military tactical radio traffic to the chatter between Miami taxi cabs and their dispatchers.

The Soviet Embassy

In Washington, D.C., the new Soviet embassy, located atop the highest hill in the area, remains unoccupied until the United States can build an equivalent one in Moscow. However, the roofs of both the new Soviet embassy and the old one, which still is used by the diplomatic staff, have a forest of antennas.

News reports have stated that, with the computer system the Soviets employ, they can intercept any microwave telephone call in the Washington, D.C. area and can select the interesting ones through the computer system. About one-third of all calls are routed randomly through the microwave circuits.

Arkady Shevchenko, the former Deputy Secretary General of the United Nations, who chose freedom 12 years ago, has said the attic of the Long Island retreat used by Soviet personnel in New York is jammed with intercept gear. The Soviet consulate in San Francisco, California, is located in the path of the telephone microwave relay stations that deliver most of the long distance calls coming in from the East.

Summary

Looking back over the whole field of technology in the service of Soviet intelligence operation, the most striking aspect is its size. The effort is massive by any standard, and when the intelligence operations are compared to the miserable state of the Soviet economy and its generally poor showing in applying modern technology, the contrast becomes even more striking.

Nothing indicates that the concern to realign resource allocation to improve the living standards of the Soviet people has led to any diminution of this effort. In fact, what evidence there is points to the contrary.

Some things are changing in the Soviet Union. No serious student of that country can deny it. In time, a society may evolve that will genuinely put the needs of the people first. This society may then see the rest of the world as a community of nations, concerned as always with the preservation of national security and dedicated to trade and, yes, competition in economic terms, but basically working toward a global society of independent states trying to enhance the well being of all.

In such a world, there would be no place for a giant country bent on expanding its influence wherever it can and using any means available to do so. And that has been, until recently, the explicit goal of the Soviet leadership for more than 70 years. The enormous mechanism of Soviet power has developed an inertia that persists even in spite of the desires for reformof its current leader and, as demonstrated in China, the temptation to turn back to the old course is strong within the system.

The Soviet effort in intelligence is basically part of that inertia, that desire to dominate others rather than cooperate with them. If the United States wants to encourage reform and work toward seeing the Soviet Union becoem a genuinely open society, it must study the mechanisms of power that block the path of progress. Whatever this country can do to thwart Soviet effectiveness will be a real contribution toward world peace.

Copyright Armed Forces Communications & Electronics Association. Used with permission. Donald F. B. Jameson is a former Central Intelligence Agency official.

Endnotes

[1]The initials KGB are used throughout this article (with one exception) to designate an organization that changed its name often in the Stalin era, but which, in the second half of Soviet history, has kept the same name, *Komitet Gosudarstvennoy Bezopastnosti (KGB)*, Committee on State Security, since 1954.

[2]Ambassador Kennan's account of this episode is somewhat, but not significantly, different in other writings. I have used the version I heard personally from him some years ago in a private conversation.

[3]"The Art of High-tech Snooping," *Time* magazine, April 20, 1987 p. 22.

[4]Ronald Kessler, *Moscow Station* (New York: Charles Scribners' Sons, 1989) contains more information than any other source I know of on the penetration of the U.S. Embassy in the 1980's. Much of the information mentioned in this article on the bugged typewriters, the audio system for the new U.S. embassy and other topics has been taken from Kessler.

[5]See endnote 3 above.

NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

IC-R1 Mini-Handheld Communications Receiver

The smallest wideband handheld receiver available today, the ICOM IC-R1 continuously covers 100 kHz-1300 MHz with AM, FM and wide-FM modes. Measuring just 1.9″ W × 4.0″ H × 1.4″ D this tiny receiver can go anywhere. Features include:

1. Built-in NiCD Batteries. Like the famous "S" series handhelds, the IC-R1 has built-in NiCD batteries and optional battery packs.

2. Multi-function Scanning. The IC-R1 incorporates a variety of scan functions to meet all your needs. They include: programmed scan, memory scan, selected mode memory scan, and auto memory write scan.

3. Keyboard and Tuning. This compact, easy to operate receiver features both direct keyboard entry and rotary tuning control.

4. One Hundred Memory Channels. The tiny IC-R1 has 100 memory channels that store frequency, mode and skip functions. You can even mask memories!

5. Built-in Clock. More advanced functions of the IC-R1 include a 24 hour clock and automatic timer. Your receiver can turn itself on or off. Super convenient for scheduled listening!

The world's smallest full-featured receiver, the IC-R1 is also equipped with a power saver function, adjustable LCD contrast, a signal indicator, and external DC power jack with battery charge capability plus a large variety of other options from the "S" series handhelds.

For more information contact ICOM America, Inc., P.O. Box C-90029, Bellevue, WA 98009-9029, or circle 102 on our Readers' Service.

High Speed Radio Modem

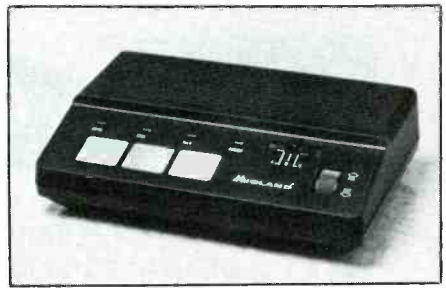
AOR, Ltd., Tokyo, Japan has introduced the AR-2400 high speed radio modem with built-in printer. The built-in 40 column thermal printer prints incoming messages in either real time, or can store into memory for later printing. The AR-2400 is ideal for SMR, Community repeater or Radio common carrier application, where simple installation and low product cost are of prime importance.

The AR-2400 can be added to the existing voice grade radio system without modification to the radio equipment.

AR-2400 features include eight customized answering buttons, data sound mute switch, voice-data switch, trunking radio compatible command structure, optional keyboard I/O, microphone connector, etc. A 2400 BPS. MSK (Minimum Shift Keying) modem with modified x.25 based protocol offers almost error free data communications. The AR-2400 measures only 7.09″ × 6.3″ × 2.24″. Contact AOR , Ltd. for further details at: AOR, Ltd., 2-6-4 Misuji, Taito-Ku, Tokyo 111, Japan.

Advanced Wireless FM Intercoms

A full line of wireless FM intercoms, ranging from one to three channels each, is available from Midland International. Model 72-008, the three channel, wireless intercom, offers "hands-free" communication, eliminating the need for operators to push and hold buttons. This is accomplished by

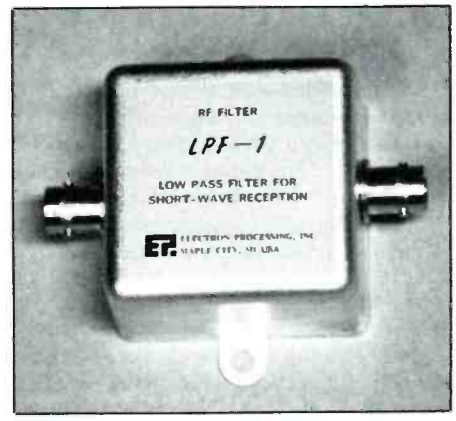


switching the unit to its voice-activated, automatic mode. The 72-008 also features new "touch sensor" switches, which control functions without mechanical movement, greatly increasing intercom longevity. In addition, the 72-008 permits three separate conversations to be carried to three different areas, or conference calls made on one channel. This unit also has "call alert," which sends an audio beep tone to the receiving unit, notifying that party of the caller's desire to talk. Midland's two-channel intercom, Model 72-006, has two separate, exclusive conversations on two different areas, plus noise filters to reduce background noise. The 72-006 also has conference calling capability and "call alert." For person-to-person communication, Midland offers single-channel intercom Model 72-002. This unit features built-in noise filtering circuitry and a fully automatic squelch circuit to reduce noise interference.

For complete information, contact Midland International Corporation, Consumer Communications Division, 1690 N. Topping, Kansas City, MO 64120, or circle 101 on our Readers' Service.

Filter Eliminates Interference To Short-Wave

Electron Processing, Inc. announced a new filter that eliminates interference to Short-wave reception caused by strong VHF/UHF signals. The LPF-1 effectively reduces signals from TV, FM and two-way radio stations from the antenna line of any short-wave receiver.



The LPF-1 is designed to connect in the antenna lead between your antenna and receiver and filter out signals on all frequencies above 50 MHz. Signals in the FM broadcast band are reduced at least 100 times in strength yet signals below 30 MHz are virtually unaffected. The LPF-1 uses a two-stage low pass filter network which requires no power to operate. The unit is housed in a compact 2″ × 2″ × 1″ rugged metal enclosure with BNC female connectors provided for easy connection in your antenna system.

Priced at $19.95 the LPF-1 is an inexpensive cure for overload caused by VHF or UHF signals reaching your short-wave receiver. For more information, contact Electron Processing, Inc. at P.O. Box 68, Cedar, MI 49621, or circle 104 on our Readers' Service.

The Tiniest Shortwave Station In The World!

With Its 5-Watt Transmitter, NRH Also Became One Of The Most Beloved By DX'ers.

DR. ADRIAN M. PETERSON, N9GWY

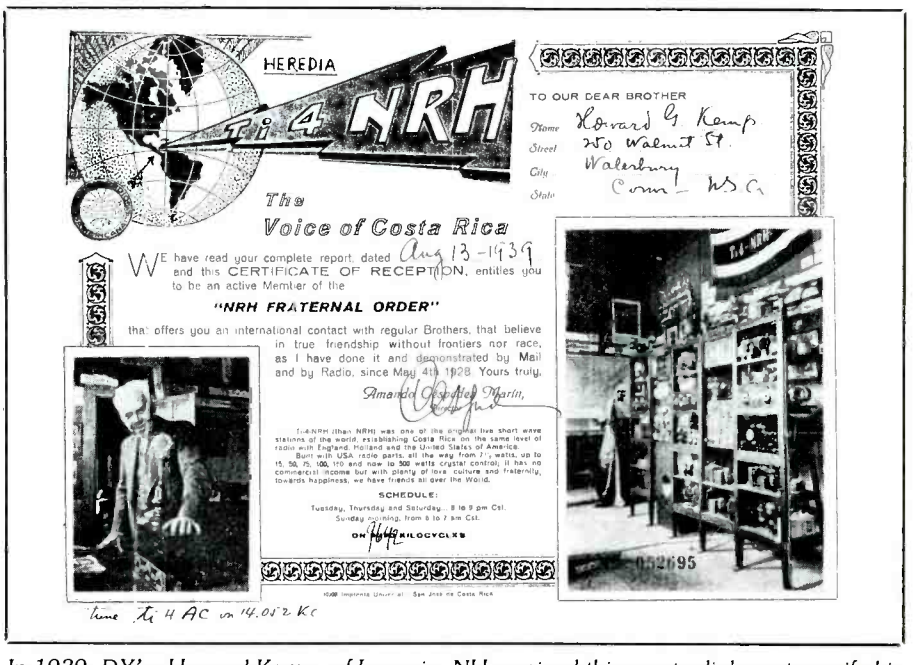
"The tiniest radio station in the world." That was how Senor Amando Cespedes Marin described his little Costa Rican radio station, NRH, back in the late 1920's. He ought to have known. After all, when he began his shortwave radio venture in 1928, he states that there were only 4 other regular broadcast stations on the shortwave bands anywhere in the world. His transmitter at the time, emitted a flea-power output of just 7½ watts. In spite of this low power though, his station made a tremendous impact worldwide and attracted a huge and adoring following.

Actually, the NRH broadcasts began earlier than the official and now historic 1928. It all began this way.

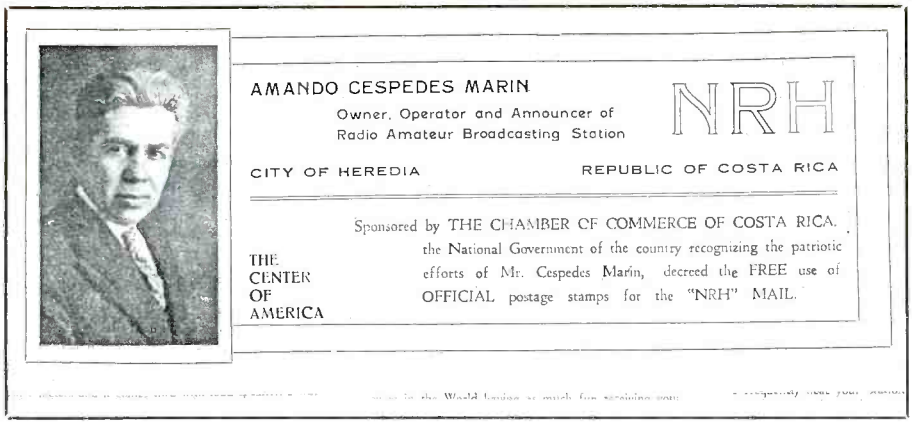
Senor Marin, while visiting Nicaragua in 1902, gained an interest in the newly developing invention known as "wireless," when he met a man who was attempting to launch a radio communication company. Then a little later, as a diplomat for his country, he met the famous inventor, Thomas A. Edison, in Buffalo, NY, and the now almost equally famous Dr. Lee de Forest, at the 1904 St. Louis World's Fair. A few years later, in 1922, back in his home town of Heredia, Senor Marin began the commercial construction of radio receivers. He modified one of these receivers, turning it into a transmitter, and with this simple apparatus, began the first broadcast programming service in Costa Rica. His homebrew transmitter operated with low output on the AM channel 310 (approx 965 kHz). This new and unique program service began in 1933.

A little later, and again using some of the electronic equipment in his small receiver "factory", Marin constructed Costa Rica's first shortwave transmitter. This was a small unit, emitting just 7½ watts on about 9,900 kHz under the callsign NRH. Perhaps these letters stood for National Radio Heredia. Experimental transmissions from this small unit were conducted in 1927 and the historic inaugural broadcast took place on May 4, 1928. The studio and all of the technical equipment were housed in his comfortable suburban-styled home.

A TI4NRH veri from 1936 received by Carroll H. Weyrich, Registered Monitor KMD3CHW, of Baltimore, MD.



In 1939, DX'er Howard Kemp, of Laconia, NH received this ornate diploma to verify his reception of TI4NRH. A handwritten notation at the bottom makes reference to ham station TI4AC on 14052 kHz, perhaps operated by Cespedes Marin.



An undated souvenir card from NRH offers a photo of Amando Cespedes Marin and some comments about his "Radio Amateur Broadcasting Station." (Courtesy Will Jensby, WOE0M/6.)

At this stage in the shortwave outreach of tiny NRH, dubious radio engineers from New York visited Heredia to verify the claims of its operator that it was the smallest radio station in the world, operating with an output of only 7½ watts. how could the station be heard so well so far? When the engineers finished their investigations, they issued a statement on their findings. They declared that the claim of Senor Marin that his transmitter was emitting an output of just 7½ watts was incorrect. They stated that the correct output was *only 5 watts!*

Four years later, in 1932, Senor Marin constructed another shortwave transmitter, this time a larger unit radiating at a higher power, 150 watts. The channel was modified to 9675 kHz, and, according to the new international prefix system, the callsign was expanded to TI4NRH.

During the following year, he wrote a book on his shortwave radio broadcasting experience, under the title, "Me and Little Radio—NRH". This unique volume sold in paperback at the time for $2.50, but these days, I would imagine that an original copy of this historic volume would be worth considerably more.

Up to this time, "La Voz de Costa Rica", as the station was known on air, had received a mail response from all around the world, totalling nearly 17,000. Articles about his famous little radio station were published far and wide.

In 1935, there was a temporary lapse in broadcasting activity over TI4NRH. The owner, builder, and operator, Sr. Amando Cespedes Marin erected another shortwave station, this time for the Catholic church in San Jose. This new outlet was station TIRCC, emitting 500 watts on 6559 kHz. The letters TI identified Costa Rica, and RCC identified the Roman Catholic Church.

He also built several other stations in Costa Rica around this era including an AM outlet for TIRCC.

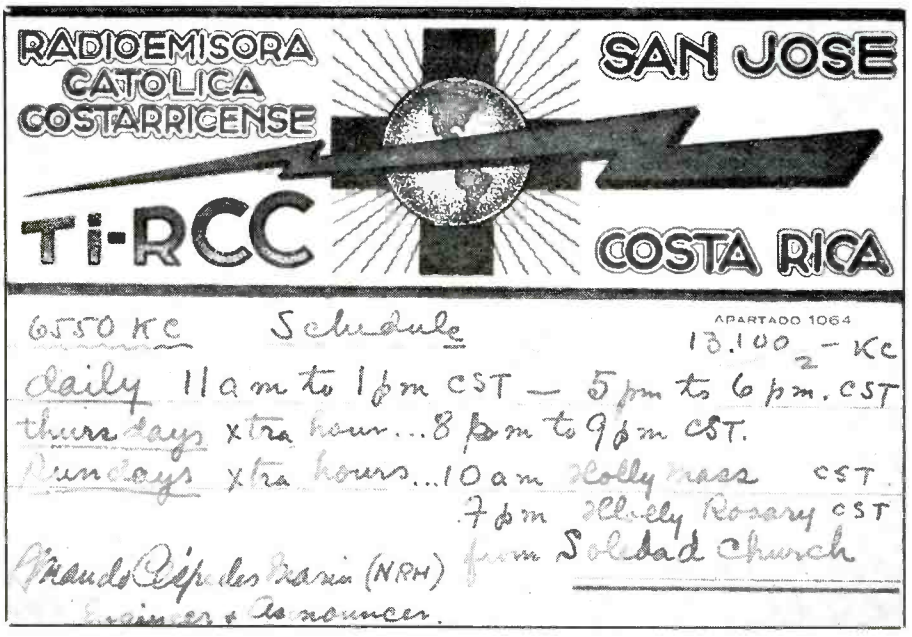
During these times, Marin was still operating his own station, though perhaps somewhat spasmodically, and in 1936, he issued a QSL letter and certificate in response to a reception report from Australia. The listener was Roy Simpson. At the time, he was contributing to the "Shortwave News" column in the Melbourne based Listener In, and 3 years later, when Radio and Hobbies was launched in Sydney, he became their shortwave editor. The QSL letter, in part, read as follows:

"The Voice of Costa Rica" congratulates you for being the first one in Australia reporting now on the third epoch of my ama-

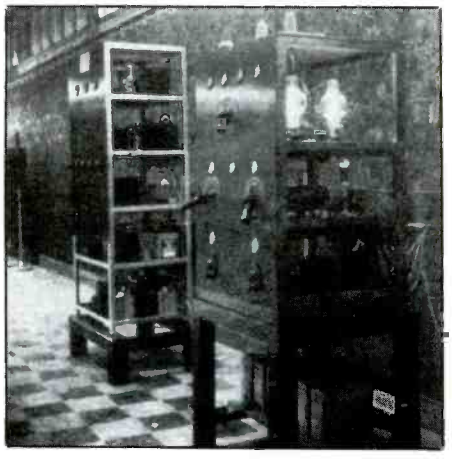
In May of 1938, for the station's tenth anniversary, this ornate certificate was mailed out to DX'ers who sent reception reports.

A special NRH QSL issued for use only for reception of the station on its first anniversary, May 4th, 1929. The card states that the station was operated because Marin was "doing it for fun just to please you and in behalf of culture and universal fraternity." (Courtesy Will Jensby, WOE0M/6.)

An autographed photo of "Mr. TI4NRH," who endeared himself to the world's DX'ers with his friendly little station.



TIRCC was another Cespedes Marin station. This 1937 sked card was signed by Marin in the lower left corner.



The TIRCC transmitter operated by Cespedes Marin in 1935.

teur broadcast period heard all over the world since 1927, and reported extensively from Australia since then, 8-9 pm CST, and 10.30-11 pm CST, our time."

It must be the good Lord that allows us to reach you with our work famous since under the pioneer days. Now you will have to go and advise your great Island Continent to pay attention to our station and to report it fancily."

The third epoch he refers to in this QSL letter is the revival of his own shortwave station in Heredia, Costa Rica, after his temporary absence with the Catholic station TIRCC. The quaint style of English is a gallant attempt on his part to express appreciation for the distant reception report; and the certificate contained a photo of Marin, and measured 7¼" × 12".

At the time of the 10th Anniversary of "The Voice of Costa Rica", the government demonstrated its appreciation for the world-wide publicity that he was gaining for his country that he was permitted to use the postal service without cost. Each QSL letter, certificate and card that he sent out was franked with the word, "Official". This was unique in that this broadcasting service on shortwave was still considered to be an experimental operation, though it enjoyed a professional status. At the time when he began his pioneer efforts ten years before, the only other stations in the world on shortwave were the experimental services from London, Phillips radio in Holland, and two outlets of General Electric in the United States.

During the month of May, 1938, station TI4NRH broadcast many special programs in honor of its 10th anniversary. Among the performers was the official government National Brass Band. These anniversary broadcasts were also heard far and wide, and a special new QSL card and certificate were issued to honor the occasion.

In 1941, TI4NRH verified a reception report from the well-known Art Cushen in New Zealand. At the time, the power output from the crystal-controlled transmitter was listed as 500 watts.

For a while during World War 2, TI4NRH was off the air, but it resumed broadcasting again about the end of the war, with 750 watts on 9692 kHz. Then a little later again, the station went dark once more. This was about the beginning of the 1950's, but it was revived again in 1952, this time as TINH. On this occasion, the station utilized a 3 kW transmitter on 9692 kHz and an additional AM unit, 750 watts on 710 kHz. The station still identified on air as "La Voz de Costa Rica," and it was still owned and operated by the same Senor Marin who was by this time 71 years of age. He died, probably about 1958, when the shortwave outlet was dropped and the AM outlet was then taken over by another commercial entity, as Radio Columbia. This new Radio Columbia became TILX San Jose with 20 kW on 760 kHz. According to the World Radio TV Handbook, this organization currently has plans to erect a shortwave outlet with 1kW on 4850 kHz.

Senor Amando Cespedes Marin achieved a well-deserved world-wide reputation as a respected shortwave broadcaster back in the days of pioneer radio broadcasting. As an unsung and almost forgotten hero, he is remembered now only by the oldest of international radio monitors, and by radio historians.

He issued many thousands of QSL cards, letters and certificates, verifying reception in countries all around the globe of what was at the time, "the tiniest radio station in the world". Most of these reminders of a bygone era are now all but one, and the only remaining copies of the historic QSL from TI4NRH are in the collections of oldtime radio monitors or on display in radio museums. Or perhaps you may even be fortunate enough to come across a reproduction of one of his QSL cards when you are perusing this magazine.

The shortwave radio broadcasting achievements of Senor Marin are now almost forgotten. Perhaps, when Radio Columbia goes shortwave sometime soon, this will be a reminder to at least some in the world of international radio monitoring, that Senor Marin began his historic pioneer shortwave station in Heredia, Costa Rica, more than 60 years ago, way back in 1928. PC

YOU SHOULD KNOW

BY ED NOLL, W3FQJ

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

Some Receiver Operating Tips

The modern world-band and all-band receivers have several features that can improve reception and operating convenience for both the program listener and ardent DX'er. One of these is the memory. Typically a late model receiver will have ten or more memory positions that can be set to favorite stations. This is one obvious application, but there are others, too.

How do you make wise use of bandwidth setting? The proper setting of the attenuator switch or bandwidth control is important as is the noise limiter and AGC switch if you are interested in program quality. Don't forget the tone control and its influence on the audio frequency response.

Much shortwave broadcast listening occurs during the evening hours. These have come to be known as the prime time listening hours just as they are for evening television. With your shortwave broadcast schedule in front of you, set the memory positions for the frequencies you plan to listen to this evening. Write the programs and times on a piece of note paper and place it in front of the receiver. You are then ready for an evening of enjoyment and education.

A second application for the memory bank is to set up the alternate frequencies of one or more stations. Propagation conditions can change during the program and if your initial frequency becomes troublesome, you can try one of the station's other frequencies. You may receiver a better signal or one with less interference or fading. Fading is usually more prevalent on the higher-frequency SWB bands.

One of my favorite Sunday night shows is the Happy Station on Radio Netherlands. As per this writing, it is broadcast 0030 UTC on 6020 from Fleva, Holland and 15315 from their Bonaire relay transmitter. I set my switch back and forth a number of times during the program to maintain good listening for their recordings. Propagation and interference conditions can change quickly or slowly during the evening and you can always find the more favorable signal very quickly. Even when setting up your prime time listening program described previously you may have memory space left for several alternate frequencies.

Frequencies for English-language programming are published quarterly in Gerry Dexter's column in *Popular Communications* magazine. They can also be found in the *World Radio Television Handbook* (WRTH). However, this is an annual and may not reflect some of the frequency and time changes that take place over a year of broadcasting.

Memory pushbuttons on control panel of modern receiver.

General Tuning

If you are DX'ing the sunspot bands, 11, 13, 16, 19 and 21 meters, you can lock in memory two frequencies of each band. You may wish to select one frequency ⅓ and another ⅔ the way up the band. By so doing, you can avoid band changing and spinning the tuning dial from one end of the band to the other. The same plan can be set up for prime time evening or late night DX'ing on the 21, 25, 41, 49 and 60 meter bands.

Of course, you can always put in memory some of the key frequencies on the MW AM broadcast band. These may be key frequencies of stations you may wish to listen to when band conditions are favorable. One obvious memory application for the graveyard DX'er is to put their frequencies (1230, 1240, 1340, 1400, 1450, and 1490) in memory and avoid having to tune among them. Each graveyard frequency has hundreds of broadcast low-powered stations assigned to it. As propagation conditions change at dawn or dusk and into the night hours a number of stations will fade in and out. They give you the opportunity to ID many new stations.

If there is a local station on any one of the frequencies you can't do this. Often you can ask one of the station technicians when they go off the air for maintenance. Try to log some stations during this time. Usually it is late at night when DX'ing could be good.

You may put several foreign station frequencies in memory that have been received well previously. If any of these stations start to come through, it could be an indication that DX conditions may be such that some long range DX signals may be receivable now or later in that evening.

Tuning the Bandwidth

Acceptable program quality and readability are often not similar objectives in radio listening. The program listener, especially a music fan, enjoys reasonable audio quality. The DX'er seeks the best voice readability so he can make an identification (ID) in the presence of noise and the possibility of adjacent channel interference. Remember that the shortwave broadcast channels are separated only 5 kHz while our regular MW AM broadcast channels are spaced 10 kHz. This fact makes SWB tuning and reception more troublesome. However, the design of modern world-band receivers helps considerably in overcoming bandwidth limitations.

The program listener likes to operate with a wide bandwidth. To do so he can set his receiver on the wide bandwidth position and enjoy the better frequency response. Although it does not match the performance of a good quality AM/FM home

POP'COMM's World Band Tuning Tips

May, 1990

This Pop'Comm feature is designed to help you log more shortwave stations. Each month this handy, pull-out guide will show you when and where to tune to hear a wide variety of local and international broadcasters on shortwave.

Note that languages used will not always be English and that many broadcasts are not beamed to North America. Further, stations often make changes in the times and frequencies of their broadcasts. Changes in propagation conditions and your own receiving location will also have a bearing on what you are able to hear.

All times are in Coordinated Universal Time UTC.

Freq.	Station/Country	UTC	Notes
2390	R. Huayacocotla, Mexico	0100	SS; sign off
3235	R. Clube, Marilla, Brazil	2300	PP
3275	R. Mara, Venezuela	0330	SS
3315	R. Pastaza, Ecuador	1045	SS
3385	R. East New Britain, Papua/New Guinea	1200	Pidgin
4680	R. Nacional Espejo, Ecuador	0200	SS
4775	RRI Jakarta, Indonesia	1300	II
4820	HRVC, Honduras	0230	SS religion
4870	ORTB Benin	2300	FF, sign off
4885	R. Clube do Para, Brazil	0930	PP
4890	Rdf National, Guinea	0000	FF, sign off
4915	R. Armonias del Caqueta, Colombia	1030	SS
4915	GBC, Ghana	0600	EE
4920	ABC Brisbane, Australia	0900	
4930	4VEH, Haiti	1100	Creole
4940	R. Continental, Venezuela	0200	SS
4965	R. Landia, Honduras	0400	SS; reactivated
5011	Esc. Radiofonicas, Ecuador	1015	SS
5023	BBS, Bhutan	1330	
5030	R. Catolica, Ecuador	0130	SS
5040	LV de Nahuala, Guatemala	0100	//3360
5066	R. Candip, Zaire	0400	FF
5910	BRT Belgium	2210	
5960	V of Germany	0500	via Antigua
5965	R. Havana Cuba	0400	EE start
5980	Union Radio, Guatemala	0200	SS; closing
5990	R. Bucharest, Romania	0245	
5999	LV de Nicaragua	1100	SS
6005	R. Yugoslavia	0100	
6005	RIAS, W. Berlin	0700	GG
6025	R. Amanacer, Dom. Rep.	0405	SS; close
6060	R. Australia	1130	
6080	R. Berlin Int'l, E. Germany	0200	
6105	R. Panamericana, Bolivia	2330	SS
6115	R. Union, Peru	0945	SS
6115	R. Univ. de Sonora, Mexico	0600	SS
6115	LV del Llano, Colombia	1100	SS
6130	CHNX, Halifax, Canada	1000	
6135	Swiss R. International	0400	
6160	CKZN St. John's, Canada	1030	
6185	WRNO, USA	0400	
6320	R. Stella Int'l	0230	Scottish pirate
6550	V of Lebanon	0300	AA
6712v	R. Farbundo Marti	2315	SS; clandestine
7135	Radio France Int'l	0335	via Gabon
7189	R. Africa, Eq. Guinea	2215	sign off
7200	R. Mogadishu, Somali	0300	Somali
7215	RTV Ivoirienne	0100	FF
7255	R. Botswana	0350	IS
7255	V of Nigeria	0500	sign on
7290	R. Moscow	0400	
7325	BBC, England	0200	
7345	R. Prague, Czechoslovakia	0130	
7355	KNLS, Alaska	1530	
7375	RFPI, Costa Rica	0700	
7400	R. Vilnius, Lithuania	2300	
7340	V of Greece	0215	Greek
7445	V of Asia, Taiwan	1145	
7475	RTT Tunisia	0500	AA
9022	VOIRI, Iran	0230	SS
9325	R. Pyongyang, N. Korea	1500	Korean
9360	Spanish National Radio	0330	SS
9375	R. Tirana, Albania	0530	unidentified language
9395	V of Greece	0416	Greek
9400	R. Iran	1200	Farsi; clandestine
9435	V of Israel	0100	
9445	V of Turkey	0045	Turkish
9465	WMLK, USA	0400	sign on
9475	R. Cairo, Egypt	0230	
9480	R. Tirana, Albania	2230	
9485	Trans World Radio, Monaco	0730	
9495	KFBS, Saipan	1330	CC
9510	R. Bucharest, Romania	0210	
9515	R. Novas de Pas, Brazil	0000	PP
9525	R. Veritas Asia, Philippines	1330	sign on
9525	R. Marti	0330	S via VOA
9530	KHBI, Saipan	1500	ex KYOI
9540	R. Nacional Venezuela	1415	SS
9540	R. Omdurman, Sudan	1430	AA/FF
9545	V of Germany	0348	via Antigua
9545	SIBC Solomon Is.	0715	
9555	La Hora Exacta, Mexico	1415	SS
9560	V of Ethiopia	1400	sign on
9560	All India Radio	1330	
9560	R. Jordan	1700	
9565	Voice of America	0545	to Africa
9565	V of Germany	0130	via Malta relay
9575	RAI, Italy	0105	
9580	R. Australia	1215	
9595	R. Tanpa, Japan	0930	
9600	R. UNAM, Mexico	1415	SS
9600	BBC, England	0430	via Ascencion Is
9600	R. Tashkent, Uzbek SSR	1230	
9600	R. Renascenca, Portugal	0015	PP

Freq.	Station/Country	UTC	Notes
9605	Vatican Radio	1010	
9610	R. Vilnius, Lithuania	2330	
9610	ABC, Perth, Australia	1200	
9610	Broadc. Corp. of China, Taiwan	1200	CC
9610	R. RSA, South Africa	0200	
9625	CBC No. Quebec Service, Canada	0100	
9630	Spanish National Radio	0515	
9645	R. Japan	0300	via Canada
9660	R. Rumbos, Venezuela	0130	SS
9675	R. Cancao Nova, Brazil	2300	PP
9690	R. Beijing, China	0330	via Spain
9705	R. Portugal	0300	close
9705	BSKSA, Saudi Arabia	1600	
9730	R. Berlin Int'l, E. Germany	2200	
9735	R. Nacional, Paraguay	0115	SS
9745	HCJB, Ecuador	0200	
9760	R. Tirana, Albania	0355	close
9765	V of the Mediterranean, Malta	0600	
9765	V of Germany	0440	
9765	R. Moscow	2300	
9785	KNLS, Alaska	0500	RR
9815	KUSW, USA	0330	
9835	R. Budapest, Hungary	0030	sign on
9845	FEBC, Philippines	1550	CC
9850	R. New Zealand	1120	
9910	All India Radio	2030	
9920	R. Beijing, China	2045	to Europe
9925	BRT, Belgium	2200	
9950	R. Clarin, Dominican Rep.	2345	SS
9950	R. Damascus, Syria	2030	
10010	V of Vietnam	1545	EE
11100	CPBS China	1100	CC to Taiwan
11330	CPBS-1, China	0115	CC
15595	R. Makedonias, Greece	2200	Greek; home service
11605	V of Israel	0000	
11620	All India Radio	1905	
11625	R. Omdurman, Sudan	0400	AA; occasional use
11645	V of Greece	0130	
11650	KTWR, Guam	1500	
11660	R. Sofia, Bulgaria	2230	
11680	R. Sofia, Bulgaria	0000	
11685	R. Beijing, China	0450	via Fr. Guiana
11690	R. Berlin Int'l, E. Germany	2245	
11705	R. Sweden	0245	
11710	RAE, Argentina	0200	SS
11720	Vatican Radio	0320	
11740	R. Portugal	2130	
11765	R. Japan	0000	sign off; via Gabon
11781	R. Belgrano, Argentina	1930	SS; reactivated
11785	BBC, England	2130	via Cyprus
11800	RAI, Italy	0105	
11805	R. Globo, Brazil	2100	PP
11810	R. Jordan	1645	
11820	R. Havana Cuba	0320	EE
11830	Vatican Radio	2215	
11835	R. Japan	2130	
11835	R. El Espectador, Uruguay	0100	SS
11840	R. Moscow	1805	via Cuba
11845	R. Norway	0500	sign on; Norwegian
11850	R. Finland Int'l	1500	
11860	V of Free China, Taiwan	1700	CC
11865	FEBA, Seychelles	1500	
11910	KTWR, Guam	1600	
11938	V of Cambodia	1200	
11980	KSDA, Guam	1630	
11985	All India Radio	1200	sign on
11985	V of UAE, UAE	2225	
13605	V of the UAE, UAE	2225	
13610	R. Kuwait	1820	
13650	RCI, Canada	1705	FF
13650	R. Jordan	2015	AA
13650	R. Baghdad, Iraq	2000	AA
13660	RFPI, Costa Rica	0230	
13675	BRT, Belgium	1800	Flemish
13715	R. Prague, Czechoslovakia	0100	
13720	KSDA, Guam	1320	
13730	R. Austria Int'l	0325	
14918	R. Kiribati	0555	sign on; sideband
15050	R. Pyongyang, N. Korea	0000	
15060	BSKSA, Saudi Arabia	0400	sign on
15084	VOIRI, Iran	0130	SS
15090	Vatican Radio	1455	
15095	V of Israel	0520	Hebrew
15115	R. Pakistan	0130	
15120	R. RSA, South Africa	0200	
15130	R. Beijing	0345	via Mali
15130	R. Free Europe	1645	
15135	R. Moscow	1530	
15135	R. France Int'l	0515	FF
15135	R. Record, Brazil	2230	PP
15140	R. Nacional, Chile	2200	SS
15155	HCJB, Ecuador	0200	EE
15160	LV de America Latina, Mexico	2000	SS
15160	R. Australia	0530	
15165	R. Norway	1200	
15170	R. Tahiti	0455	FF, TT
15180	R. Minsk, Belorussia	2335	Belorussian
15195	R. Bangladesh	1230	sign on
15200	R. France Int'l	0000	PP; via Fr. Guiana
15215	R. Algiers, Algeria	1945	
15225	R. Portugal	1000	PP
15230	R. Havana Cuba	0630	SS
15230	R. Moscow	0420	RR
15230	HCJB, Ecuador	0100	EE
15260	BBC	0200	via Ascenscion Is
15260	R. Moscow	0440	world service
15265	Radiobras, Brazil	1855	
15270	RCI, Canada	1330	sign off; via Japan
15280	KGEI, USA	0000	SS
15290	WINB, USA	1945	
15310	R. Norway	0535	Norwegian
15315	R. Netherlands	2345	SS; via Bonaire
15315	RCI, Canada	1550	via Sines, Portugal
15325	FEBA, Seychelles	0344	sign on
15325	R. Yugoslavia	1315	EE
15345	RAE, Argentina	2100	Mon-Wed-Fri
15345	V of Free China, Taiwan	2245	via WYFR
15355	TWR, Bonaire	2350	GG
15380	BBC, England	0030	via Singapore
15400	R. Baghdad, Iraq	0300	AA
15400	R. Finland	1455	Finnish
15415	LJB, Libya	0140	AA
15420	WRNO, USA	2345	
15425	V of Germany	2200	sign on
15430	Swiss Radio Int'l	0545	GG; sign on
15445	R. Veritas Asia, Philippines	1500	
15450	RTT, Tunisia	0430	AA
15460	R. France Int'l	1000	FF
15474	R. Nac. Archangel, Antarctica	2330	SS
15475	Africa No. One, Gabon	1830	
15495	R. Kuwait	1830	
15535	R. Peace & Progress, USSR	1300	
15575	R. Korea, S. Korea	0015	
15580	KUSW, USA	2200	
15615	V of Israel	0210	
15780	ISBS, Iceland	2310	Icelandic; USB
17387	All India Radio	1100	
17630	Africa No. One, Gabon	1445	FF
17665	R. Vilnius, Lithuania	2300	
17680	R. New Zealand	0330	
17680	R. Pakistan	0030	Urdu listed
17690	R. Kiev, Ukraine	0030	
17725	All India Radio	0100	
17730	Swiss R. Int'l	0110	via Radiobras, Brazil
17735	R. Oman	1800	AA
17745	R. RSA, South Africa	1955	close
17755	R. Surinam Int'l	1730	via Radiobras, Brazil
17775	KWOH, USA	1935	SS at 2000
17790	HCJB, Ecuador	2245	
17810	RCI, Canada	1300	via Japan
17815	R. Cultura, Brazil	0145	PP
17820	RCI, Canada	1715	
17830	WHRI, USA	1900	
17855	R. Beijing, China	0000	sign on
17860	R. France Int'l	1555	FF; via Fr. Guiana
17880	R. Sweden	1550	
17890	R. Nacional Colombia	2145	SS
21685	R. Netherlands	2030	Dutch; via Bonaire
21505	R. Prague, Czechoslovakia	1730	
21515	Vatican Radio	1215	sign on
21515	R. Moscow	0120	CC
21525	R. Australia	0100	
21525	QBS, Qatar	1500	AA
21610	R. Sweden	1530	
21740	R. Australia	0030	
25645	RTBF, Belgium	1545	FF
25850	R. Denmark	1159	Danish; EE ID

PC

Tom Meyer, of Happy Station Program, with friend Klaasje. Program is on Radio Netherland—Sunday night.

console, radio, or a quality auto radio, this is not to say that a good shortwave receiver does not give you acceptable musical reproduction. I'm a music fan and with my receiver set for wideband operation, I enjoy music from around the globe, despite its limitations.

When I receive a strong signal in the clear I go to wideband operation. I turn off both the AGC and noise blanker. On my receiver, both of these operating modes produce some distortion and limit the dynamic range of music reproduction. Dynamic range is the amplitude range between strong passages and quiet ones and seems to have disappeared with the de-emphasis of high fidelity music, and the changeover to channelized and embellished recordings, and music reproductions. If the signal is very strong, insert some attenuation without introducing a higher background noise and turn up the volume control instead. This also results in more natural music and voice reproduction.

Fading, too, can induce distortion, especially when its is fast and substantial. Distortion results because the portions of the incoming signal that represent individual audio frequency components fade at a different rate on one sideband than from the other. This is called selective fading. Although sideband transmission does not have this distortion characteristic, it is not as yet used for shortwave broadcasting, although a number of experimental broadcasts are being made.

In terms of SWB propagation, the higher frequency shortwave broadcast bands as compared to the lower ones are likely to fade more often and deeper. Thus, if fading becomes bad on one of the higher-frequencies of the station you wish to receive, try to find a frequency carrying the same program on one of the lower-frequency alternate bands of the station. Fading is likely to be less severe.

When you wish to listen to a program, or DX a signal with high noise level present and/or adjacent channel interference, it is better to switch over to narrow band operation. Voice readability is the matter of concern, especially for ID'ing a weak signal. AGC is helpful and the noise blanker, too, if the noise level is high. Also go for the least attenuation if the signal is weak. Turn your attenuator or RF gain control to maximum.

Detuning about 1 kHz can also improve readability. Give it a try on your set. It usually makes the voice reproduction more readable. Also, proper setting of the tone control helps. The same detuning is a help in improving readability when there is adjacent channel interference. For example, if the desired signal is on 9700, set your tuning control to 9701 if the interference is from a station on its low frequency side. In this case it would be 9695. Oppositely, set the receiver to 9699 if the interference is on the high frequency side of 9705.

Reception improves when you know your receiver well and use its capabilities fully. Get to know your receiver better to improve listening satisfaction and also more successfully ID'ing of weak signals. PC

THE FUTURE OF AMATEUR COMMUNICATIONS

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

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

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

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

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

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

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

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

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

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

See the IC-781 at your local ICOM dealer.

ICOM

First in Communications

ICOM America, Inc., 2380 116th Avenue N.E., Bellevue, WA 98004
Customer Service Hotline (206) 454-7619
3150 Premier Drive, Suite 126, Irving, TX 75063
1777 Phoenix Parkway, Suite 201, Atlanta, GA 30349
ICOM CANADA, A Division of ICOM America, Inc.,
3071 - #5 Road, Unit 9, Richmond, B.C. V6X 2T4

All stated specifications subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 781188.

TELEPHONES ENROUTE

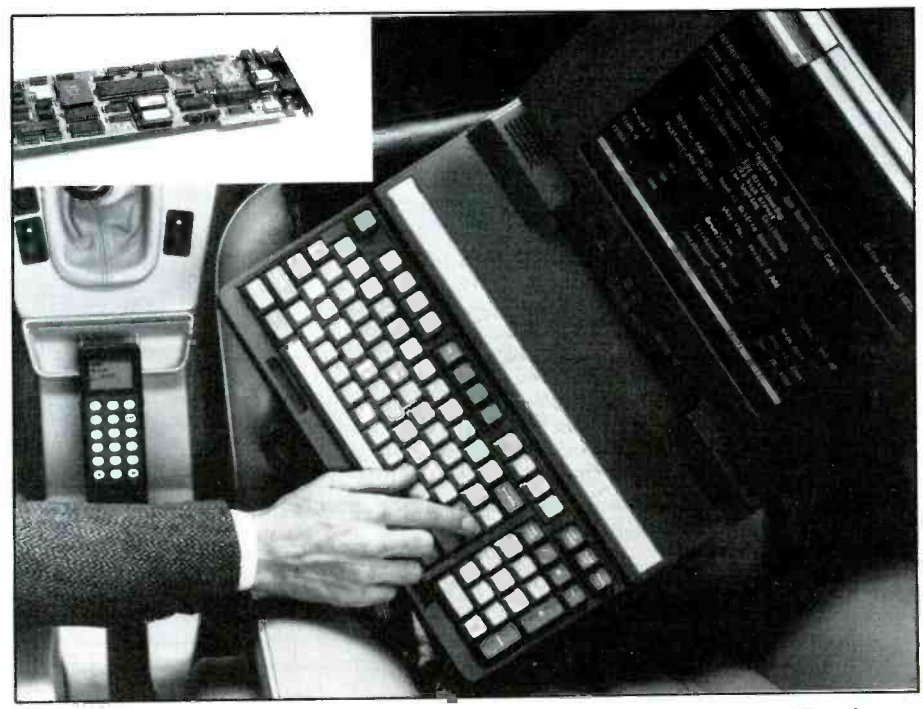
BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

When cellular got started in 1984, the FCC set aside the frequency band 870 to 890 MHz for the new service, with channels spaced at 30 kHz intervals for the cell sites. Although most systems are still set up for operation only in this range, in 1987 the band was expanded to cover 869 through 894 MHz in order to accommodate a few cellular systems in large metro areas that argued the need for additional channel space in order to accommodate the large number of simultaneous calls that go through during certain peak calling hours. The expanded 869 to 894 MHz system fits in 832 channels, and all currently made cellular mobile phones can function fully on all of these channels.

As things turned out, even the cellular industry didn't foresee how popular the car phones were going to become in areas like Southern California, Dallas/Fort Worth, New York, Chicago, Atlanta, and other population hubs with lots of cars and monied citizens. Even with 832 channels, there's no guarantee that a car phone owner will be able to find an open one every single time. Indeed, now cellular service providers in some metro areas are claiming that their systems are rolling down the road to saturation at double-nickel speed.

For now, at least, *Uncle Charlie* (a/k/a the FCC) doesn't appear to be ready to send any direct relief such as chipping off another 5 MHz chunk of spectrum for the cause (actually, 10 MHz if you count the paired mobile channels). The cellular industry has therefore taken a different approach to the dilemma.



The Telebit CellBlazer PC modem, an internal modem card for IBM PC/XT/AT and compatible computers, allows users to send and receive large text and graphic files over the cellular telephone network at typical speeds of 16,800 bps. A dual-mode modem, the CellBlazer PC modem also offers users the option of transmitting over landlines at speeds of 19,200 bps. The unit is ideal for mobile office applications such as remote insurance claim processing, field sales order entry and tracking, and remote database access.

How Do You Spell Relief?

In this case, relief may come by means of a digital technology commonly known as TDM, or Time Division Multiplexing. TDM permits anywhere from two to perhaps four separate car phone calls to simultaneously use the same channel at the same cell site. In such a system, the signals sent out by the various simultaneous users are sent out in pulses or bursts lasting 20 milliseconds or less, each station's bursts occurring during the short silent period between the transmissions of the other stations sharing the channel at the same time. It's all orchestrated by a multiplexer at the cellular service supplier, and it takes place so rapidly that users won't notice any difference between the ways a digital call sounds from the sound of a call handled by existing analog methods.

Let me point out that this is more than just hypothetical planning by several engineers dropping pipe-tobacco ashes into a computer keyboard. The system has been tried and tested on an experimental basis. Seems to work fine.

By this point, several pressing questions may have started crossing the mind of astute readers. For instance, existing analog and the new digital systems are obviously incompatible with one another. If, for instance, Los Angeles should decided to use TDM, does that mean that all existing analog operations would be immediately shut down? And will existing cellular phones work in this system, should it actually be FCC approved and put into use in various systems?

First of all, it hasn't been given the green light by the FCC, and there's no iron-clad guarantee it will be in the immediate future— *if ever!* If it is approved, it would have to be phased in gradually as the present analog system is very slowly phased out. The entire process could take years.

At the beginning, perhaps 80 channels might be set aside for digital users. As the demand for digital service continued to increase, so would the number of digital channels as the analog channels were chipped away. At some point in the distant future, a system might have only 10 or (or fewer) remaining channels permanently designated and set up for serving analog users still hanging on to such equipment.

Present cellular car phones won't be able to interface with digital systems. Should the digital concept be put into use, however, new phones will show up on the market that will be able to operate both in digital and analog modes so that they would be usable regardless of the system encountered during the transition period from analog to digital. Eventually, when digital systems begin to dominate cellular operations, new mobile units will contain only digital operating functions. Note that hybrid digital/analog phones will undoubtedly cost the consumer about the same as present analog-only phones, with an added incentive for those who elect to trade in their analog equipment during the transaction. once the digital ball starts rolling, the hope is to call in all of the analog equipment so that it doesn't get sold into the second-hand market and prolong the life of analog any longer than absolutely necessary.

Scanner owners who enjoy the (illegal) pleasures of monitoring cellular conversations will be dismayed to find that digital

Telebit's CellBlazer dual-mode modem transmits data at typical speeds of 16,800 bps over cellular links and 19,200 bps over landlines. Adaptable to both mobile and fixed cellular environments, the CellBlazer standalone supports such applications as mobile diagnostic X-ray services, emergency trauma care, disaster backup of the public switched telephone network, or local telephone network bypass.

Mitsubishi's hands-free kit for the Model 900.

conversations are going to sound like so much gibberish. This is another reason the cellular industry likes digital technology, it offers practical communications security, which is second in delight only to the fact that each channel will be able to generate two to four times as much revenue because of all of the simultaneous calls it can handle. Scanner owners will still have those channels remaining in use with the older analog system.

Let me again emphasize that, even if digital operations were approved and started in use tomorrow, it would be many years before an analog-only cellular phone would be useless. Any cellular phone you presently own, or are planning on purchasing in the next twelve months, will have long been mercifully retired, traded in, or sold off because of its age long before cellular systems refused to have any dealings with the unit because of its technology. The nation is sectioned into 305 metro cellular areas and 428 rural service areas. It is only in perhaps ten metro areas that the channel crowding problem is of serious concern, and maybe another few metro areas where there is some worry for the future. The remaining metro areas are not yet worried about how to accommodate more subscribers. Most haven't even taken expanded out of 832 channels.

So, be aware of what's going on and keep it all on file for future reference. Undoubtedly, it will have a bearing on your cellular activities at some point. But I wouldn't start selling off the analog phone. Not just yet, anyway.

Hardware Department

The *CellBlazer* is Telebit Corporation's new high-performance modem designed for cellular use. Capable of typical speeds of 16,800 bps, the unit utilizes the cellular network to cost effectively transmit data from mobile units to micro-, mini-, or mainframe computers.

Available as an internal PC card, a rackmount card or as an external unit, the *CellBlazer* frees personnel from having to rely on landline telephone outlets to connect modems to the regular telephone network. The *CellBlazer* PC, and expansion slot, permits mobile computer users to send and receive data through cellular facilities. Fully compatible with portable computers from Toshiba, Zenith, NEC, Grid, and Compaq, it has many applications ranging from field sales, remote inventory access, claim processing, etc.

This unit connects to the transceiver an RJ-11 cellular data adapter. The adapter provides a modular RJ-11 hookup and simulates a standard landline connection. MSRP of the stand alone and rackmount versions is $1495. The internal modem version is $1295.

For more information, contact Angela Mongillo, Telebit Corporation, 1345 Shorebird Way, Mountain View, CA 94043-1329, or circle 106 on our Readers' Service.

Mitsubishi International Corporation announced a new mobile hands free kit for its Model 900 portable cellular telephone. The 900HFK allows practical in-car use of the Model 900 while providing convenient hands free operation, external antenna interface, and telephone battery recharging.

The 900HFK provides a high level of audio quality via an integrated speaker and miniature hands free microphone. Delivering operating power to the telephone, the kit also trickle charges the telephone's battery. An optional Mitsubishi quick charger can be connected through the kit for rapid (1.5 hour) recharging of the telephone's battery. The 900HFK also provides quick interface to an external vehicle antenna (not included) for applications where increased signal gain is desired.

The 900HFK includes a compact telephone holder with integrated speaker, an adapter module with mounting bracket and hardware, a hands free microphone and all the necessary cabling for a neat, professional vehicle installation.

For more information, contact Gary Miller or Jeff Nelson, Mitsubishi International Corporation, 879 Supreme Dr., Bensenville, IL 60106, or circle 107 on our Readers' Service.

This column would like to hear from cellular manufacturers and service suppliers, also from users who have questions and anecdotes about cellular. **PC**

BY GERRY L. DEXTER

CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

This column has now received information direct from the manager of the *Voice of June 4th*—a radio production of the Independent Federation of Chinese Students in the USA. The Voice of June 4th aims at breaking the Beijing government's "blocking off" of news and, by so doing, hopes to help accelerate the democratic cause in China. The program began production last September 30th and features news—especially news related to the democratic cause in China and elsewhere—along with other features such as "Free Forum," "World Trends," "American Society" and "Chinese Students Speak."

According to Sanyuan Li, manager of the project, the program has already aired on "Some powerful radio stations off the South China Coast on both medium and shortwave." He says the group has received phone calls from Beijing and Nanjing indicating that the program was heard in both those cities. He also says there's evidence the Chinese government is trying to jam the broadcasts, at least those on shortwave. The manager had an agreement with the party in charge not to reveal the identity of the stations carrying the program. This is certainly regrettable and hard to figure since the people listening must know to which stations they are listening, unless there are clandestine transmitters involved here.

According to the information received here, the Voice of June 4th was on the air for seven hours a day over a 3 day period around October 1, China's national day, and ran on 27 medium and shortwave frequencies. Normally, however, the broadcast is only half an hour per day, 6 days a week, though the schedule is given as 9 to 10 pm Beijing time(1300 UTC) 7 days a week. The program is also said to be airing in Boston on "FM 100" at 1-3 pm Sundays. The US airing is so those interested in the project can hear what's going out to China and offer comments and support.

The Voice of June 4th is affiliated with the Independent Alliance of Chinese Students in the USA. The Committee of Broadcast, working under the Alliance, is the "supporting force" for the Voice of June 4th. If anyone hears the broadcast, especially on shortwave, we'd certainly appreciate details!

The Voice of DAB (Democratic Alliance of Burma) mentioned in our last column, has, in fact, gone on the air, according to an item in the *Bangkok Post*, forwarded by Randall Reese. According to the report the station made its first broadcast on December 4th. The station is operated jointly by the Karen National Union (KNU), Kachin Independent Organization (KIO), All Burma Muslim Union (ABMU) and People's Liberation Front (PLF). U Aye Saung, a PLF member, is chairman of the radio broadcast board and said the station is located in an area along the Thai border which is under control of the Karen group. As we noted last time, the station is scheduled on 7135 between 0130-0330.

A broadcast is taped for airing on the anti-Burmese government station, Voice of the DAB. (Bangkok Post via Randall Reese)

An asterisk to all of this is a late December news item which reports that Burmese forces overran and captured a rebel camp at Pa Loo, about ten miles southwest of the Thai border town of Mae Sot, which was the dateline of the *Bangkok Post* item. So, it may be that the Voice of the DAB was a short-lived operation, though there is another rebel base at nearby Kaw Moo Ra

Aris Giannarelis reports reception in Greece of *La Voz del CID* on 9940 from 2145-2240 with interference from the Voice of Israel on 9930. This was his first clandestine logging and has spurred his interest in hearing more.

Robert Ross in London, Ontario had reception on the anti-Yugoslavian program *Radio Libertas* on 11790 at 1635-1658 close (the program begins at 1600). The broadcast is via religious broadcaster WHRI in Nobelsville, Indiana. Bob has since received a QSL via the Croatian Committee for Human Rights, 1174 Clarkson Road, Mississauga, Ontario L15J 2W2, Canada.

Ross notes *Radio Farabundo Marti* on 6700.9 at 0100 sign on with marching music, gunshots, patriotic music and slogans in Spanish. There was a shift to 6713.3 at 0109. This one bounces around the 6700 area. It's cohort, *Radio Venceremos*, now seems to be operating two of its transmitters in the 6 MHz range. Loggings in various bulletins in recent weeks indicate it's operating as high as 6834 and doing a lot of jumping. Ohio-based clandestine expert, George Zeller, says he notes them on both 6350 and 6750, both variable. Various jammers continue to operate against Radio Venceremos, some using programming, some using noise.

Ross also heard *La Voz de la Fundacion*, the Cuban American National Foundation's anti-Castro broadcast, at 0147-0201 on 9950 via Radio Clarin in the Dominican Republic. The program is all Spanish and closes at 0200.

Most literature produced by resistance groups isn't quite the slick and flashy stuff you find on the newsstands. But the *NCR Bulletin*, published by two Cambodian resistance groups (the KPNLF and FUNCINPEC) is certainly an exception. Robert Ross forwards the November, '89 issue—marked as a United Nations Special Edition. It's a full color magazine with many photos and articles on the war and the situation in Cambodia and Vietnam. The KPNLF and FUNCINPEC operate the *Voice of the Khmer* on 6325. If you are interested in getting a copy you can try writing to P.O. Box 12-1014, Suan Phlu, Bangkok, Thailand. This is Volume 1, Number 2.

Remember, your input on the subject of clandestine broadcasting is always needed and very much appreciated. We can use loggings, news clips, information from stations or groups, leads to addresses and locations, QSL copies and information. We can keep your identity confidential if you wish.

Until next month, good hunting.! PC

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Are you ready for a major emergency? Is your scanning station ready so that you don't miss non-stop action in the event of a disaster?

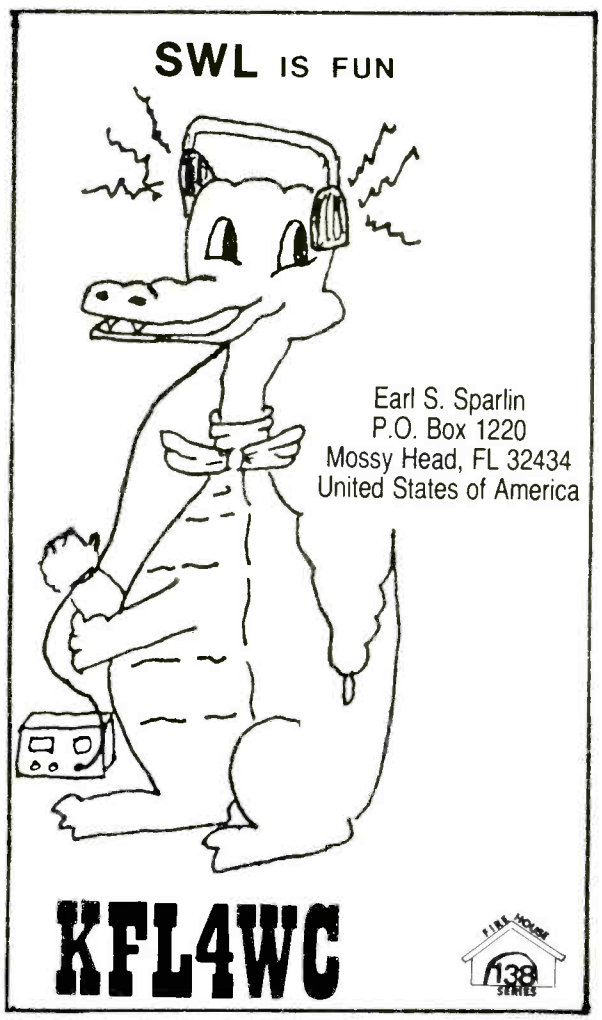
Taking a cue from an old Scout pledge to "be prepared," it's quite fitting that scanner listeners be ready to activate their monitoring posts whenever something important happens. For instance, if there's a large oil spill on a lake or river near your home, do you have a list of all the possible frequencies that might become active? If you have such a list, how quickly could you program your radios to tune in all the action?

Preplanning emergencies is not something that only emergency management and civil defense personnel do. The experienced scanner listener will anticipate the types of emergencies that might happen in his or her community. For instance, there may be a large chemical plant in your town or nearby. If there was a major fire or explosion at that plant, what frequencies would you want to listen to? For starters, you'd want to monitor the local police and fire channels, as well as emergency medical and rescue services. But if the incident were that major, what other frequencies would you need to tune in? If state or federal agencies were called in to respond, you'd want to listen to their communications. How about neighboring towns that might send police or fire assistance to the scene? If they each have their own frequency, you'd need to monitor each channel. Does the plant itself use radios? If so, that probably would be one of the hottest channels during the emergency, especially if security guards might be carrying walkie-talkies. If there are neighboring businesses, you'd want to listen to their channels, too.

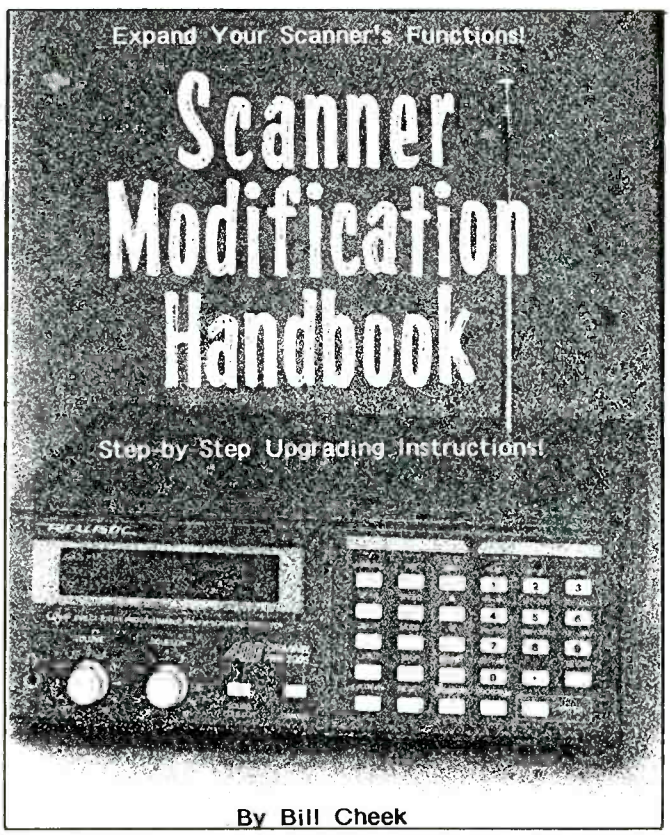
But, there are auxiliary channels that might be of interest. For instance, if a commuter bus line runs in front of that plant, you may want to monitor the bus frequency to see where the vehicles are being rerouted. This is the type of information that news reporters would be attempting to gather at the scene, but it's information that would be right at your fingertips if you monitored the right frequencies. The list of possible frequencies actually could go on and on.

If you are prepared for such emergencies, you won't find yourself scrambling around looking for frequency information when something blows up. One person I know has a notebook with various types of incidents listed that might occur in his community. Under each type of emergency, he lists frequencies that he thinks might become active. For instance, if a plane crashes at the airport, he has frequencies listed running from the ground control aircraft channels to the news media that would be responding to cover the story. When something big occurs in his listening area, he goes to the book and quickly punches in the necessary channels to keep up to date on the incident. However, if he hadn't done his homework, he'd

How about sending us one of your cards? This one's from Registered Monitor KFL4WC. That's Earl, in Florida.



All the most wanted mods are in this new book by Bill Cheek.



lose valuable time looking through his notes for frequencies that he'd need to listen to.

On the same note, he doesn't need to listen to some channels day in and day out. For instance, in the event of an oil spill on the river near his home, he would need to listen to the oil-spill cleanup frequencies as well as several VHF marine channels. However, there is no need to listen to those channels every day of the year. But when the call goes out, he's quickly punching in the needed frequencies. For some listeners who have high-capacity scanners that allow storage of hundreds of frequencies in banks, you might want to set aside a band for plane crash frequencies, while another may be set up for earthquake communications. It's not really that hard to be prepared for major emergencies. If you take a few minutes now, you won't miss anything in the future. But if you scramble when units are responding, you'll miss most of the good information as they arrive on the scene. So start digging through your notes for those hot frequencies now!

Letters

Glen Campbell, Registered Monitor KSC4BL, of Myrtle Beach, South Carolina, writes in to inquire about modifications. He said he modified his Realistic PRO-2004 scanner to allow continuous reception of the 800 MHz band (i.e., cellular). However, he also has a Realistic PRO-34 handheld and wants to modify that radio also to allow continuous 800-MHz reception. All such mods, and many others (search/scan speed increase, interface with a communications receiver, adding more memory channels disabling the *beep*, and many more) mostly for the PRO-2004 and PRO-2005 are in Bill Cheek's new book, *Scanner Modification Handbook*. The 160-page book also gives 800 MHz restoration instructions for the PRO-34, and Bearcats BC-200/205XLT, BC-760XLT, and CB-950-XLT. Find out how to put 3,200 channels, into a PRO-34, or 6,400 channels into you PRO-2004 or PRO-2005. Plenty of photos, diagrams, and complete step-by-step instructions are provided. These mods can be accomplished by most hobbyists using commonplace tools such as wirecutter, screwdriver, and soldering gun. This book is available from many communications dealers, or you can order a copy my mail from the CRB Research, the publisher. The book is $17.95, plus $2 postage/handling to addresses in USA/Canada. Residents of NY State add $1.35 sales tax. Order from CRB Research Books, P.O. Box 56, Commack, NY 11725.

Larry P. White of Houston, Texas, writes in with some thoughts on scanning. We thought we'd let Larry tell it in his own words:

"I've been an active scanner enthusiast for the past four years. I learn something new almost every day. A lot of people think that I am a kid with a toy, but it's an adult's way for pastimes. Also, it's a good vise to have if you don't smoke. Try it! I can always find out what's going on with my local weather, who has been injured on the road and what's going on in my neighborhood."

"Basically, if you monitor, you know where the action is as it's happening. To me, listening to my scanner is like eating homemade bread. You can taste the action as it's taking place. Finding out the news in your local paper is like eating day-old bread. I believe people who seriously pursue scanner monitoring as I do want to promote and protect an understanding of the legal and ethical use of scanner radios and their operation and to promote a further understanding of radio and the laws that govern the use of the equipment."

Larry goes onto say that he listens with a Regency HX-1000 handheld scanner attached to a pair of Sony SRS-55 amplified speakers. Thanks for your thought, Larry.

We'd like to hear from you. We'll publish frequency updates or lists, comments, inquiries or suggestions. If you know of laws that may be enacted or changed that might affect scanner enthusiasts, please send us the information so other scanner listeners may be made aware. Write to: Chuck Gysi, N2DUP, Scanning UHF/VHF, Popular Communications, 76 North Broadway, Hicksville, NY 11801. PC

The Best* Just Got Better!

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

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

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

Model T includes 100' twinlead feedline

Model C includes weatherproofed center connector for your coax & coax sealant

- Either model $79.95
- UPS for lower 48 states $4.00
- COD add $3.00, IL add 7% sales tax
- Foreign shipping quoted

*"The best...built like an antenna should be." –Larry Magne in *World Radio TV Handbook*
*"Our best seller." –EEB in their recent ads and catalogs
"Now in use in 45 countries." –Gilfer Shortwave in 1983

Antenna Supermarket

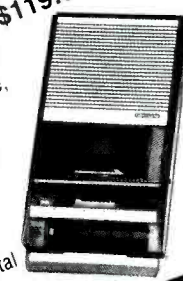
P.O. Box 563 Palatine, IL 60078 Tel (708) 359-7092 Fax (708) 359-8161

At your dealer or direct • Visa & Mastercard accepted

NEW SUPER LONG PLAY TAPE RECORDERS

12 Hour Model — $119.00*

USES D-120 TAPE



Modified Panasonic Slimline, high quality, AC-DC Recorders provide 6 continuous hours of quality recording & playback on each side of cassette for a total of 12 hours. Built-in features include • Digital counter, etc. TDK DC 120 Cassette Furnished.

PHONE RECORDING ADAPTER

Records calls automatically. All Solid state connects to your telephone jack and tape recorder. Starts recording when phone is lifted. Stops when you hang up. $28.50* FCC APPROVED

VOX VOICE ACTIVATED CONTROL SWITCH

Solid state. Self contained. Adjustable sensitivity. Voices or other sounds automatically activate and control recorder. Uses either recorder or remote mike. $28.50*

*Add for ship & hdlg. Phone Adapter & Vox $1.50 ea. Recorders $4.00 ea. Cal. Res. add tax. Mail order, VISA, M/C, COD's OK. Money Back Guarantee. Qty. disc. avail., Dealer Inquiries invited, Free data. ©

AMC SALES INC. Dept P 9335 Lubec St., Box 928, Downey, CA 90241 Phone (213) 869-8519

CIRCLE 51 ON READER SERVICE CARD

BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

A letter arrived from reader Mark R. Schmit, who is on the staff of station WORC (1380 kHz) in Worcester, MA. Mark advises that WORC has changed its format from country music to oldies. Hank Williams, Jr. has been replaced by Tony Bennett.

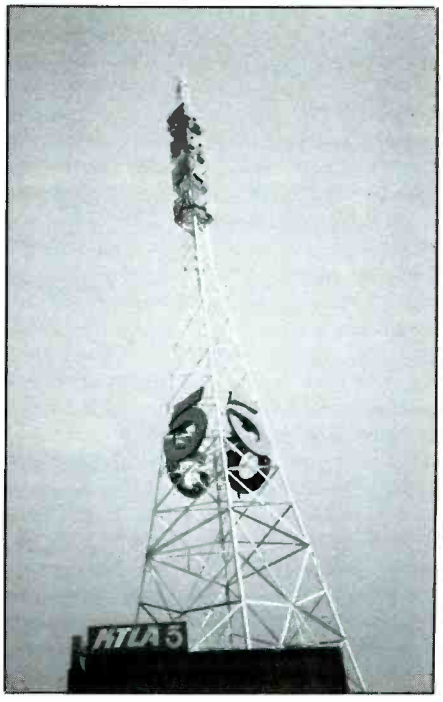
WORC operates in stereo on a 24 hour sked, running 5 kW days and 1 kW nights. The station's transmitter and tower are on Pakachoag Hill in Auburn, MA, with studios at 167 Pleasant Street, Worcester, MA 01609. The station is owned by a company with the wonderful name of the Great Worcester Wireless Talking Machine Company. They've owned WORC since 1984, although the station has been in operation since the earliest days of broadcasting (it was written up last year in Alice Brannigan's section on radio history).

Some information on station switches in Florida. Station WAXE (1370 kHz, 1 kW) in Vero Beach purchased local FM'er WAVW (105.5 MHz). WAVW is shifting over to 101.7 MHz, a spot that had been occupied by local WCXL. WCXL moved from 101.7 MHz to 105.5 MHz, but only until they get their new transmitter built. Then WCXL will move again, this time to 103.7 MHz. WPSL (formerly of 1590 kHz, but now 1450 kHz, 5 kW) seeks to open an FM outlet on 101.3 MHz. There are more than 40 applicants hoping to secure eventual use of 105.5 MHz after WCXL's temporary stay there. Thanks to R.T. of Stuart, FL for passing this along.

Several readers have asked us to tell more about why broadcast stations seek FCC approval to change their operating frequencies in the AM or FM bands. There could be a number of different motivations, including escape from co-channel or adjacent channel interference, or to move to a part of the dial near another station having a larger share of the audience. Another reason could be to enable the station to increase its power, or make changes in its schedule or antenna system not allowed on its existing frequency. These are typical reasons, although there are others.

Not all requests for frequency changes are approved. Some are turned down for reasons the FCC comes up with, other requests are denied because of objections made to the FCC by broadcasters who fear that the proposed change, if approved, would interfere with their coverage, or cause them audience or business reverses.

In the United States, FM channels between 88.1 and 91.9 MHz are set aside for the exclusive use of non-commercial stations. This category includes college, school, and religious stations, as well as those operated by non-profit foundations.



Michelle Schute, of Pensacola, FL snapped this photo at Los Angeles TV station KTLA, Channel 5.

FM Permits Granted by FCC

FL	Tallahassee	88.9 MHz
GA	Clarksville	102.9 MHz
GA	Fort Valley	97.9 MHz
GA	Lyons	92.5 MHz
HI	Hilo	88.1 MHz
HI	Lihue	90.1 MHz
IA	Eddyville	101.5 MHz
IL	Chicago	88.3 MHz
KY	Shelbyville	101.3 MHz
KS	Emporia	99.5 MHz
LA	Belle Chasse	102.9 MHz
MD	Salisbury	98.9 MHz
MN	Caledonia	94.7 MHz
MO	Campbell	107.5 MHz
MO	LeMonte	97.1 MHz
MS	Wiggins	97.9 MHz
NC	Rocky Mount	98.5 MHz
NE	Omaha	88.1 MHz
NH	Moultonborough	106.9 MHz
NY	Ogdensburg	98.7 MHz
NY	Wurtsboro	97.3 MHz
OH	Gibsonburg	95.7 MHz
OH	Marysville	105.7 MHz
OK	Tishomingo	88.3 MHz
OR	Nyssa	98.7 MHz
SC	Charleston	100.7 MHz
TN	Crossville	102.5 MHz
TX	Burnet	92.5 MHz
VA	Dublin	91.5 MHz
VA	Exmore	106.1 MHz
VA	Saltville	106.1 MHz
WI	Sturgeon Bay	90.5 MHz

Applications For New AM Stations

CA	Bakersfield	1100 kHz
CA	Oceano	1120 kHz
MS	Flowood	1240 kHz

Applications For New FM Stations

AL	Dothan	101.3 MHz
AL	Glencoe	93.1 MHz
AR	Hot Springs Vlg.	92.9 MHz
CA	Shafter	90.9 MHz
CO	Fountain	96.1 MHz
CT	Plantsville	91.9 MHz
FL	Conway	88.3 MHz
FL	Fernandina Beach	105.3 MHz
FL	Jupiter	105.3 MHz
FL	Lake Mary	99.3 MHz
FL	Mims	88.5 MHz
FL	Ormond by the Sea	95.7 MHz
FL	Port St. Lucie	101.3 MHz
FL	West Palm Beach	88.1 MHz
GA	Ringgold	93.7 MHz
GU	Agana	101.9 MHz
ID	McCall	101.1 MHz
IL	Danville	94.9 MHz
IL	Pinckneyville	104.3 MHz
IN	Ligonier	102.7 MHz
IN	Nashville	95.1 MHz
KS	Seneca	92.1 MHz
KY	Campbellsville	99.9 MHz
MA	Marion	88.5 MHz
MI	Whitehall	102.5 MHz
MN	Waite Park	103.7 MHz
MO	Troy	100.7 MHz
MS	Ocean Springs	92.5 MHz
NC	St. Pauls	106.9 MHz
NH	Manchester	91.7 MHz
NJ	Berlin	88.1 MHz
NV	Laughlin	93.5 MHz
NY	Essex	101.3 MHz
NY	Monroe	89.3 MHz
NY	Oneonta	91.7 MHz
NY	Oswego	88.5 MHz
NY	Rochester	88.9 MHz
OH	London	106.3 MHz
OK	Alva	89.7 MHz
OK	Wilburton	103.7 MHz
OR	Brownsville	102.3 MHz
PA	Allentown	89.3 MHz
PA	Covington	101.5 MHz
TN	Celina	101.5 MHz
TN	Knoxville	104.5 MHz
TN	Mt. Juliet	106.7 MHz
TN	Signal Mountain	98.1 MHz
TX	Amarillo	105.7 MHz
TX	Comfort	95.1 MHz
TX	Pearsall	94.1 MHz
TX	San Augustine	99.9 MHz
VA	Bowling Green	96.9 MHz
VA	New Market	103.3 MHz
VA	Richmond	89.3 MHz
VA	White Stone	100.1 MHz
WI	Neillsville	92.7 MHz
WI	Plymouth	104.5 MHz
WI	Whitewater	104.5 MHz

Applications To Change AM Facilities

KABN	Long Island, AK	830 kHz	Shift to 840 kHz
KFRS	Sumner, WA	1560 kHz	Increase to 5 kW
KKMC	Gonzales, CA	880 kHz	Increase to 50/2.5 kW
KLGR	Redwood Falls, MN	1490 kHz	Decrease to 470 watts
KPUA	Hilo, HI	670 kHz	Increase to 50 kW
WCTF	Vernon, CT	1170 kHz	Increase to 2.5 kW days
WIAC	San Juan, PR	740 kHz	Decrease to 4 kW nights
WPGS	Mims, FL	840 kHz	Increase to 10 kW days
WSJM	St. Joseph, MI	1400 kHz	Shift to 1310 kHz, 5 kW/500 watts
WTTN	Watertown, WI	1580 kHz	Increase to 500 watts nights

Applications To Change FM Facilities

KEJS	Lubbock, TX	106.3 MHz	Move to 106.5 MHz
KLLR-FM	Walker, MN	99.3 MHz	Move to 99.1 MHz
KWCB	Floresville, TX	94.3 MHz	Move to 94.1 MHz
KWNG	Red Wing, MN	105.5 MHz	Move to 105.9 MHz
KYOC	Yoakum, TX	102.3 MHz	Move to 92.5 MHz
KZLN-FM	Othello, WA	97.7 MHz	Move to 97.5 MHz
WHOV-FM	Hampton, VA	88.3 MHz	Move to 88.1 MHz
WKIO	Urbana, IL	103.9 MHz	Move to 92.5 MHz
WMLA	Leroy, IL	92.7 MHz	Move to 104.1 MHz
WQIM	Prattville, AL	95.3 MHz	Move to 95.1 MHa
WQTY	Linton, IL	93.5 MHz	Move to 93.3 MHz

AM Facilities Changes Approved

KTGG	Spring Arbor, MI	1540 kHz	Increase to 490/200 watts
WGUL	Dunedin, FL	860 kHz	Decrease to 1.5 kW nights
WQBB	Powell, TN	1040 kHz	Increase to 10/3 kW
WWNZ	Orlando, FL	740 kHz	Increase to 50 kW

FM Facilities Changes Approved

KDNC	Denver City, TX	107.1 MHz	Move to 97.5 MHz
KFAY-FM	Huntsville, AR	95.9 MHz	Move to 92.9 MHz
KICR	Oakdale, LA	104.9 MHz	Move to 98.7 MHz
KZMI	Garapan, Saipan	93.9 MHz	Move to 92.9 MHz
WILN	Panama City, FL	106.3 MHz	Move to 105.9 MHz

Requesting To Change AM Callsigns

Present	Seeking	
KCCV	KIDZ	Independence, MO
KLAY	KDFL	Lakewood, WA
KLAY	KTGN	Lakewood, WA
KZKZ	KVOG	Greenwood, AR

Requesting To Change FM Callsigns

Present	Seeking	
KCIL	KIXA	Houma, LA
KSSC-FM	KOCD	Columbus, MS
KVMT	KSKE	Vail, CO

Changed AM Callsigns

Now	Was	
KCDV	KRQZ	Dungeness, WA
KFON	KOKE	Rollingwood, TX
KGHF	KRYT	Pueblo, CO
KIIM	KCUB	Tucson, AZ
KIPO	KLNI	Pearl City, HI
KKIS	KIXA	Pittsburg, CA
KZZA	KKVU	Tremonton, UT
WGNC	WBIG	Castonia, NC
WIRE	WMLA	Normal, IL
WMSH	WSTR	Sturgis, MI
WQMX	WFIG	Sumter, SC
WTKX	WBOP	Pensacola, FL

Changed FM Callsigns

Now	Was	
KAWC-FM	KWCC	Yuma, AZ
KBXQ-FM	KKVU-FM	Tremonton, UT
KFMY	KNNS	Grand Rapids, MN
KGRQ-FM	KCSJ-FM	Pueblo, CO
KIIM-FM	KIIM	Tucson, AZ
KIPO-FM	KIPO	Honolulu, HI
KTHQ	KVAO	Eager, AZ
WAPQ	WHOH	Crestline, OH
WAVW	WCXL	Vero Beach, FL
WBKL	WXDZ	Callaway, FL
WBRX	WHUM-FM	Patton, PA
WBVD	WFOT	Huntingdon, TN
WCXL	WAVW	Vero Beach, FL
WHKS	WNSY	Pt. Allegheny, PA
WKAA	WSPX	Ocilla, GA
WMSH-FM	WMSH	Sturgis, MI
WOUL-FM	WOUL	Ironton, OH
WPHD	WKGV	Tioga, PA
WQSF	WQSF-FM	Williamsburg, VA
WQTX	WHOR	Roanoke, VA
WTHT	WBLM	Portland, ME
WTKX-FM	WTKX	Pensacola, FL
WWBB	WLKW-FM	Providence, RI
WYGO	WQXM-FM	Gordon, GA

New AM Callsigns Issued

WBPW	Sault Ste. Marie, MI
WGHK	Fairlawn, VA

New FM CallSigns Issued

KAFR	Angel Fire, NM
KAIR	Crane, TX
KDYC	Grants, NM
KEAL	Winton, CA
KFRJ	San Saba, TX
KGHR	Tuba City, AZ
KGKB	Tyler, TX
KGYU	Visalia, CA
KHSA	Taft, OK
KLDN	Lufkin, TX
KMBH-FM	Harlingen, TX
KQKZ	Greenfield, CA
KTQQ-FM	Rapid City, SD
KWMB-FM	Wabasha, MN
KZRX	Chaffee, MO
WAYP	Holmes Beach, FL
WGNJ	Alberta, VA
WHLC	Solana, FL
WJHT	Cedar Bluff, VA
WMHI	Cape Vincent, NY
WNHX	Moultonborough, NH
WPIR	Nags Head, NC
WQKZ	Catskill, NY
WTUZ	Uhrichsville, OH

Callsigns Deleted, Rescinded Or Withdrawn

KCNW	Tempe, AZ
KRAX	Rapid City, SD
KRGF	Greenfield, CA
WDRZ	Etowah, TN

WORC 1310 am Stereo
Worcester's Oldies Radio Channel

These stations may also operate on frequencies within the "commercial" portion of the FM band (92.1 to 107.9 MHz), although relatively few actually do because such frequencies are so valuable. Examples of non-commercial stations in the commercial portion of the band include the Pacifica Foundation's stations, WBAI in New York City on 99.5 MHz, and KPFA in Berkeley on 94.1 MHz (the Pacifica station in Los Angeles, KPFK, is in the non-commercial band on 90.7 MHz).

There are non-commercial stations in the AM band, however they are mixed in with the commercial licensees across the entire band.

Changes requested by broadcasters that may also trigger objections to the FCC are concerned with callsigns. If a station files a request with the FCC to change its callsign, the callsign it seeks to get may be claimed to be too similar in appearance or phonetic sound to those assigned to another broadcaster in the same area. If the FCC agrees, the request will be turned down.

For (a hypothetical) example, if someone wanted to obtain the callsign WOOO in the same town where there already existed WQQQ, then there could well be an objection filed because the callsigns looked to similar. Or, if someone wanted to use the callsign WLMM in a town where there was a WLMN, you'd probably find an objection raised because the two calls could sound similar over the air.

This column is interested in photos of broadcasting stations, bumperstickers, recent mediumwave and FM QSL's, and information about broadcasting stations. PC

Introducing the Super Penetrator
Mobile Ultra-Wideband 10 & 11 Meter Antenna

Featuring the widest band pass of any antenna on the market today. Our exclusive "Quad-Angular" helical coil has more surface area for highest possible gain and lowest static build-up resulting in quieter operations.

- Frequency range: 25-30 MHz
- VSWR: 1.3 MHz with a standing wave of 1.5 to or less
- Power Rating: 2.5 KW
- 2 shaft lengths available: 16 or 25 inches
- Mounting: 3/8 x 24 standard "stud" type
- Materials: machined from highest quality solid brass and stainless steel

Send for free catalogue and Smith chart.

Manufactured in Japan by Diamond
"The technology leader in antenna design"

Exclusively for
RF Limited
P.O. Box 1124
Issaquah, Washington 98027
Telephone (206) 392-0399
Telex 329 473 BURGESS SEA
Fax (206) 302-8413

CIRCLE 45 ON READER SERVICE CARD

POPULAR COMMUNICATIONS
76 NORTH BROADWAY
HICKSVILLE, NEW YORK 11801

FREE READER SERVICE CARD

ENTER MONTH AND YEAR OF THIS ISSUE:

Month _____ Year _____

(REQUESTS CANNOT BE PROCESSED WITHOUT DATES)

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	34	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175	176	177	178	179	180

Did you purchase this issue of Popular Communications from either a newsstand or magazine store? **Yes** ☐ **No** ☐

Name _____

Company Name _____

Address _____

City _____ **State** _____ **Zip** _____

THE HAM COLUMN

KIRK KLEINSCHMIDT, NT0Z
AMERICAN RADIO RELAY LEAGUE HQ

GETTING STARTED AS A RADIO AMATEUR

Hamfests: A Spring Tradition

Now that Spring has fully sprung, the hamfest season is in full bloom. If you're a newcomer to ham radio, it's possible that you've never participated in one of these age-old Amateur Radio get-togethers. If so, you're in for a pleasant surprise. Why not pay a visit to your local hamfest? You're sure to have a good time, and you'll probably walk away with a few more friends, a few new treasures and a slightly thinner pocketbook. In this month's column I'll tell you little bit about hamfests, how to find out about hamfests in your area, and how to be the proverbial "smart shopper" when buying Amateur Radio or computer gear at hamfests.

What Happens at Hamfests, Anyway?

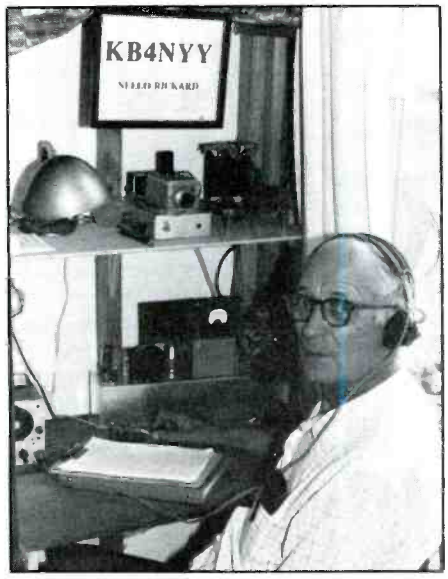
Where can you find a thousand fellow hams, scads of bargain-priced radio and computer gear (especially obscure and hard-to-find goodies and electronic assemblies and components), interesting forums and lectures, and the best bratwurst sandwiches in a hundred-mile radius? Hamfests, of course. Just how much of the previously mentioned "stuff" you're likely to find depends a lot on the kind of hamfest you're going to, its size, and to some extent, the region of the country you're in.

Large multiday hamfests, such as the annual Dayton HamVention® or ARRL Division Conventions, attract many thousands of hobbyists. Small regional or local hamfests may draw only a hundred. At Dayton, you'll find more than a dozen specialized forums; at the annual "Corn Feed" hamfest in Abercrombie, North Dakota, you probably won't find any. You will have fun, however, at both extremes.

Nearly every hamfest will have a swapfest or flea market where individuals and commercial dealers hawk their wares—with a few regional differences. Generally, flea markets on both coasts will have more exotic hardware such as microwave assemblies and transistors, but prices will tend to be higher. A small hamfest in the Midwest may not offer as much high-tech stuff, but there will usually be a surplus of good, used HF gear. A transceiver that will fetch $500 in New England will probably go for $300 in Iowa.

When and Where?

Information on upcoming hamfests is available from a number of sources. Members of your local ham club will probably be "in the know." Hamfests tend to be annual events, publicized well in advance. Check your club's newsletter or packet BBS for announcements.



You're never too old to learn: Nello Rickard, KB4NYY, of Sheffield, Alabama, used parts from his junk box to get on the air at the tender age of 71. Nerve disease prevents him from writing code at 13 wpm, but he had no trouble calling it out to the VE to obtain his General class ticket. His transmitter design is taken from the 1942 ARRL Handbook, and the receiver is a modified WWII unit. Total investment: $20. (KJ4CA photo)

Nationally, hundreds of hamfests and Amateur Radio events are listed in the Hamfest Calendar and Coming Conventions sections in *QST*. Listing usually appear a month or two in advance.

As far as locations go, you're likely to find hamfests held in hotels, schools, parks, National Guard Armories, fairgrounds, or civic centers. Organizers usually try to hold the events at readily identifiable and accessible locations, although sometimes you'd wonder . . . .

Hamfest Shopping Tips

Because of the camaraderie and all-around "good-naturedness" associated with Amateur Radio, we'd like to think that we could never run into a bum deal at a hamfest. After all, these people are *hams*! Although it's generally true that most individuals and commercial concerns selling radio gear at hamfests and flea markets are on the level, smart shopping and healthy dose of preventive caution will help you avoid unwelcome surprises.

Here are a few tips for buying used radio or computer gear at hamfests:

- Budget your money: If you're like most folks, you don't have an unlimited budget for ham radio acquisitions. For some, going to a hamfest is like going to the candy store. if you're not careful, you'll go home with plenty of "candy' and no mortgage money. That's why it's a good idea to plan your spending in advance. I always try to bring along a few pieces of gear to sell or swap—just in case I find a big-ticket item I just "have to have."
- Negotiating skills are helpful: If your expectation of ham radio flea markets is reminiscent of open-air Byzantine street markets, then you'll probably do just fine. Haggling over the price of used gear or components (in a friendly and generally reasonable manner) is appropriate and expected. Don't take the negotiating stage too far, however. If someone was selling a $5,000 transceiver for $50, someone would, no doubt, offer $45. (I have been accused of similar behavior, but I've consistently denied all allegations.)
- Get there early, or stay late: The best hamfest deals are usually made in the first and last hours of each event. Getting to the hamfest early will allow you to snap up some of the best merchandise. If you wait too long, your favorite stuff may be all gone. Alternately, if you play the waiting game, sellers will be quick to discount stuff that did not sell previously.
- Always test expensive gear: If you're buying a major item such as a transceiver or receiver, make sure you're able to plug the thing in somewhere and see if it works. As I said before, most sellers will represent their stuff accurately, but it never hurts to power-up a potential acquisition.
- Returns?: In a similar vein, make sure you get the seller's name, address and phone number—just in case. Although you don't expect to have major problems with a piece of gear you've thoroughly inspected and casually tested, it never hurts to be prepared. If the seller is truly compassionate, you may be able to negotiate a return policy. It never hurts to try!

So there you have it: The beginners' guide to hamfests in a nutshell. If you've never been to a hamfest or flea market, this spring's the perfect time. Have fun!

Comments, questions or suggestions? Write to me at ARRL, Department PCN, 225 Main Street, Newington, CT 06111.

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Pirate Radio Station Shut Down

A licensed ham radio operator in West Taghkanic, NY was fined $1,000 for pirate radio operation, the Federal Communications Commission said.

On the afternoon of Sunday, December 17, an FCC engineer inspected the radio station of Frederick K. Stark (KA2YLZ) after monitoring his operation on 1000 kHz on the AM dial.

The FCC had received a complaint from the N.Y State Broadcasters Association (Albany) that alleged an unauthorized station was rebroadcasting U.S. Armed Forces Radio Network programs and "news" from the John Birch Society. The unauthorized station apparently interfered with the reception of a licensed station on 1010 kHz.

Using mobile radio-direction finding equipment, an engineer from the New York FCC office located the illegal station at the Stark residence.

The unauthorized station was playing "light classical" and "easy listening" music and gave WNYS as its call.

Illegal Radio Operation by NYC Area Taxis

Since April 1989, the New York office of the Federal Communications Commission has been investigating complaints alleging illegal radio operation by New York City taxis and for-hire vehicles. Frequencies authorized for the amateur ten meter band are reportedly being used by taxi and for-hire vehicle drivers. NYC-area amateurs who have specific information on illegal ten meter operation, are requested to send the information to the FCC New York office.

The FCC has monitored the frequency band (28.0-29.7 MHz) and has noted several foreign language groups which appear to be taxi or for-hire vehicle drivers who have installed radios for mobile to mobile communications during their shifts.

Inspections of yellow taxicabs by FCC personnel were conducted in May and June 1989 to locate illegal radio operators. Information bulletins on legal two-way radio operation were distributed to taxi drivers. Several illegal stations have been closed down as a result of the investigation.

Illegal radio operators found to be in violation os Section 301 of the Communications Act of 1934, as amended, may be subject to fines of up to $100,000 and one year in prison.

NYC-area amateurs who have information on illegal 10 meter radio operation should send it to: FCC, 201 Varick Street, New York, NY 10014.

The FCC seeks information such as names and/or addresses of operators, hours of operation, and vehicle license numbers.

For further information, contact Kevin McKeon or Stephen Barone at (212) 620-3437/8.

Security Coding For Cordless Telephones

The Commission proposed amending Parts 15 and 68 of its rules to require cordless telephones to be equipped with security provisions to protect the public switched telephone network from unintentional line seizure and telephone dialing. The primary objective of the proposed requirement is to reduce harm to the "911" Emergency Services Telephone System.

Security provisions referred to in this proceeding are cordless telephone features that prevent unauthorized access of the telephone line, the dialing of calls in response to signals other than those from the owner's handset, and the unintentional ringing of a cordless telephone's handset. These terms do not refer to the ability of someone else to listen in on the conversation.

Cordless telephone security is the ability of a cordless telephone to reject either dialing sequences from another user's cordless telephone or spurious electrical signals generated in the vicinity of the cordless telephone. These signals may cause unintentional responses in unprotected cordless phones, creating billing and other operational problems for telephone companies.

When it adopted the existing cordless telephone rules, the Commission felt that mandating a security requirement was not warranted because marketplace forces had already served to bring about security features on some cordless phones and the Commission expected further improvements in the future.

It now appears, the Commission said, that instances of interference to the public switched telephone network from cordless phones are increasing. Cordless phones not equipped with security coding circuitry are generating random hook switch closures that are interpreted by the central office as dialing sequences. These dialing sequences are causing significant interference to many telephone company services, to customers with low telephone numbers and to the "911" Emergency Services Telephone System. It also appears that the security coding of cordless telephones, which could provide an effective solution to this problem, is not being implemented at a satisfactory rate by manufacturers. The Commission said there is no indication that the percentage of cordless telephones being marketed with security coding is increasing or that market forces will eventually cause such features to become standard on cordless phones.

Consequently, the Personal Communications Section of the Telecommunications Industry Association (TIA) asked the FCC to require cordless telephones to incorporate digital security coding to provide protection to the public switched telephone network from unintentional line seizure and dialing, and protection to the user from unintentional ringing.

The Commission noted that, while most manufacturers offer digital coding on their more sophisticated cordless telephones, 60 percent of the latest applications for the registration of such devices do not specify the use of digital coding. Indications are that consumers have been complacent about the warning statements that must be placed on the equipment package to inform consumers regarding the problems that could be experienced with cordless telephones without security coding. Therefore, the Commission concluded, now is the appropriate time to propose requiring security coding in all cordless telephones.

Cordless Phones on Frequencies Off-Set From Frequency Pairs

The FCC stayed the provisions of its rules that allows cordless phones to operate on frequencies off-set from the frequency pairs specified in Part 15 of the rules, pending resolution of a rulemaking proceeding addressing this issue.

This action is a result of a request by the Electronics Industry Association (EIA). EIA asked for partial reconsideration of an order which allowed an indefinite extension of Part 15 interim provisions for cordless telephones and modified parts of Section 15.231-15.233 of the rules.

Cordless telephones currently operate under Part 15 rules on one of ten duplex channels at frequencies near 46 and 49 MHz. Prior to 1987, radio signals transmitted by cordless telephones were required to be centered on the frequencies specified in the rules and to be contained within a 20 kHz bandwidth. The provisions for operation at the 46/49 MHz frequencies were to be phased out beginning in 1989. However, in 1987, the Commission extended these provisions indefinitely. At the same time, it made minor modifications to the Part 15 rules to allow manufacturers, at their option, to subdivide the existing ten channels. For example, a manufacturer could design a

cordless telephone with 20 channels, where each channel has a bandwidth of 10 kHz. The Commission noted that this rule amendment merely made available an additional option to cordless telephone manufacturers and it did not appear that there would be any increased risk of interference to other users of the spectrum. Accordingly, the rule was implemented without notice and comment.

EIA asked for partial reconsideration of this order, objecting to the portion that permitted use of offset frequencies because it was concerned that increased interference between cordless phones might occur. It said the matter should be considered through rulemaking.

The Commission, by Memorandum Opinion and Order, said that it would stay the portion of the rules that permit the use of offset frequencies. However, the Commission adopted a separate Notice of Proposed Rulemaking to give interested parties time to consider the issues involved in the use of off-set frequencies. The Commission said it is proposing to relax the rules to allow cordless phone manufacturers the option of subdividing channels. It noted that in recent comprehensive revision of Part 15, certain rules were relaxed to permit operation anywhere within a broadly defined band of frequencies. Thus, there is no reason that cordless phones, which operate under Part 15, should not be permitted similar flexibility. PC

World Probe

$29.95 + $3 P&H

World Band Scanner Antenna

• Cuts Noise • Improves Reception • Indoors or Out •
• Works with all World Band Portables and Scanners •
• Sleek 6-ft Probe with Integral 25-ft Low-Loss Shielded Feedline •
• Fully Insulated and Weather Sealed • Decorator White Design •

AntennasWest Box 50062-P
801 373 8425 Provo, UT 84605

FREE Storage Pouch & Universal Connector Kit

CIRCLE 5 ON READER SERVICE CARD

PICKS UP A WHISPER 50 FEET AWAY!

The model WAT-50 miniature FM tranmitter uses a 4-stage circuit NOT to be confused with a simple wireless microphone. Simply snap the unit on top of a 9V battery and you can hear every sound in an entire house up to 1 mile away! Use with any FM radio. Tunes to any frequency from 70mhz - 130mhz. Easy to assemble kit includes all parts and instructions. Only 29.98 tax incl.

The **WIRELESS TELEPHONE TRANSMITTER** model WTT-20 is only about the size of a dime, yet transmits both sides of a telephone conversation to any FM radio with crystal clarity. Completely automatic. Uses power from the telephone line itself - never needs a battery! Up to ¼ mile range. Tunes from 70mhz - 130mhz. Easy to assemble kit includes all parts and instructions. Only $29.98 tax incl.

Call or send MO, VISA, MC for immediate delivery. Single kit orders include $1.50 S&H. FREE SHIPPING on orders of 2 or more. All orders shipped by U.S. Mail. COD add $4.00. Personal checks allow 21 days.

DECO INDUSTRIES
BOX 607, BEDFORD HILLS, NY 10507
914-232-3878

CIRCLE 46 ON READER SERVICE CARD

POPULAR COMMUNICATIONS BOOK SHOP

World Radio TV Handbook 1990 ed.
The world's only complete directory of international broadcasting and TV stations—the established, authoritative guide endorsed by the world's leading broadcasting organizations. A comprehensive country-by-country listing of short-, medium-, and long-wave stations revised and updated to reflect actual conditions. Also includes special features on The Future Regulation of High-Frequency Broadcasting, Solar Activity in 1985, Technical Innovations at Radio Nederland's New Transmitting Station, and more. 604 pages, paperback, $19.95. Order #H097.

Radio Handbook, 22nd ed.
by Bill Orr, W6SAI
A state-of-the-art, single-source reference on radio communications and theory for hams, professional ops, techs, and engineers. New coverage includes solid-state devices, Yagis and quads, and h.f. amplifier designs. A hands-on instruction manual, as well. 1168 pages, hardcover, $39.95. Order #S197.

World Press Services Frequencies
by Thomas Harrington
A comprehensive manual covering the field of radioteletype news monitoring—antennas, receivers, terminal units, monitors, and more. Contains 3 master lists of times of transmission, frequencies, plus ITU list of over 50 news services worldwide. 72 pages, paperback, $8.95. Order #H173.

Antenna Handbook, 192 pp. paperback. $11.95. Order H145.

Packet User's Notebook
This brand new book by Buck Rogers, K4ABT is your one source of essential information for the newcomer or oldtimer. Tips, tricks and techniques from a real insider. Over 90 diagrams showing the tried and true connections for popular TNCs, transceivers and computers. Why chance destroying hundreds or thousands of dollars of equipment with risky connections? This is a genuine nuts-and-bolts how-to-do-it manual that every packet operator should have on the bookshelf. Packet is not only the fastest growing segment of amateur radio. It is the fastest changing, too! Why rely on information that may be a year or more out of date what **Packet User's Notebook** is hot off the press with the latest essential information? Don't "connect" without it. It is only **$9.95**, and that's a small price to pay for peace of mind. Order today.

Amaco Novice Code and Theory Package
A complete training package containing the 128-page Novice theory course and a 60-minute code cassette, which teaches how to send and receive code up to 8 words per minute, and a 32-page book. Also included are FCC-type code and theory examinations to help even a rank beginner get a ticket fast! $9.95. Order #H024.

Cubical Quad Antennas, 112 pages, paperback, $9.95. Order #R146.

Vertical Antennas, 192 pages, paperback, $10.95. Order #H303.

Interference Handbook, 247 pages, paperback, $11.95. Order #H172.

RTTY Today
by Dave Ingram, K4TWJ
A brand new, completely up-to-date handbook on RTTY, covering the latest developments and techniques, plus use of the home computer for RTTY. Illustrated with photos, diagrams, station setups, and RTTY gear. 112 pages, paperback, $8.95. Order #H211.

Vertical Antenna Handbook, 2nd ed.
by Paul H. Lee, N6PL
Out of print for several years, this classic has been reprinted with updates, including an addendum on antenna design for 160 meters. Other sections include feeding and matching, short verticals, ground effects, and much more. 139 pages, paperback, $9.95. Order #H208.

The Radio Publications Group—The "Bill Orr Series"
These easy reading classics belong in the library of any active ham. Loaded with practical how-to information, with tables, charts, and formulas arranged for handy reference.

Beam Antenna Handbook, 200 pages, paperback, $11.95. Order #H143.

Wire Antennas, 192 pp., paperback, $11.95. Order #H144.

The Shortwave Propagation Handbook, 2nd ed.
by George Jacobs, W3ASK, and Theodore J. Cohen, N4XX
A new, revised edition of the popular guide to all your propagation needs. Contains up-to-the-minute information and charts, and guides you through producing your own propagation data. 154 pages, paperback, $9.95. Order #H137.

Passport To World Band Radio, 1990 ed. NEW
By Radio Database International
A graphically-oriented guide to shortwave stations, listening, radios, and accessories. Now you can tune-in the over 1100 radio stations around the world broadcasting everything from news to authentic Peking opera. Paperback, $14.95. Order #R400.

Easy-Up Antennas for Radio Listeners and Hams NEW
By Edward M. Noll
This comprehensive handbook can help you construct low-cost, easy-to-erect antennas. Contains all the latest antenna design and construction tips, techniques, and tools needed, plus info on testing procedures, band frequencies, time considerations, and more. 163 pages, paperback, $16.95. Order #S401.

POPULAR COMMUNICATIONS

BOOK SHOP 76 North Broadway, Hicksville, NY 11801

QTY.	ORDER#	TITLE	PRICE	TOTAL

Book Total

Shipping Charge

Grand Total

Shipping charges $2.00 per order. Shipping charges waived on orders of $50.00 or more. Books shipped best way. All orders processed the day they are received, but please allow 30 days for delivery within North America.

Name _____

Address _____

City _____

State _____ **Zip** _____

☐ **Check** ☐ **MasterCard** ☐ **VISA**

Card No. _____ **Expires** _____

X _____

Signature required on all charge orders

BY DON SCHIMMEL

COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

An interesting article from the *New York Times* was sent in by Bill Walbesser, NY, described a Cloak & Dagger display put on by the Sandinista Government at a fairgrounds in the Managua area. The display of spy tradecraft items was on view in connection with the celebration of the Sandinista 10th anniversary. Along with this display were letters of commendation to Nicaragua Government agents for unidentified activities on behalf of the Sandinistas. The article concluded with the comment "next door, in a separate booth, the Nicaraguan Interior Ministry offered special visa procedures for Nicaraguan citizens who wish to leave their country. Since the week began, the lines for that booth were the longest at the fair."

Mark Warrington, OH wrote "I am now the proud owner of a Realistic DX-440 with a home-brew 50-foot longwire antenna. I also own a PRO-34 scanner with an all-band discone antenna. While putting up my longwire antenna in the attic, I came up with an insulator trick I would like to pass on to readers. I used empty Kodak film cans by drilling 2 holes in the bottom of each container and passing a zip-tie thru them. Staple or nail the lid wherever you want the insulator, tighten the tie-wrap on the wire and snap the holder into the lid. I used 4 of these to hold up my antenna and they work great!" Thanks for the tip, Mark.

"I am interested in all aspects of radio." This from Gregory McNeill, PA. He continued "I own quite a few scanners and have just bought a Kenwood R-5000 as I am also interested in SWL." Greg also indicated he hoped to buy FAX & RTTY equipment in the future.

Cliff Reynolds, MO contributed a logging and had this to tell us. "Although I am an avid SWL and have contributed to Listening Post, I am new to UTE loggings. I have only one this month, but hope to have more soon. After logging this item, I heard mention of it on the news a few days later. Wow!"

Andy Gordon, CT passes along this hint for those SWL'ers who like to follow USN activity. "For best results, monitor San Diego CSS1 return side (4360.5 kHz) and you can then hear both CSS1 and the ship. If you listen to 4066.1 kHz you will just hear the ship." Our thanks to Andy for passing on this info for readers.

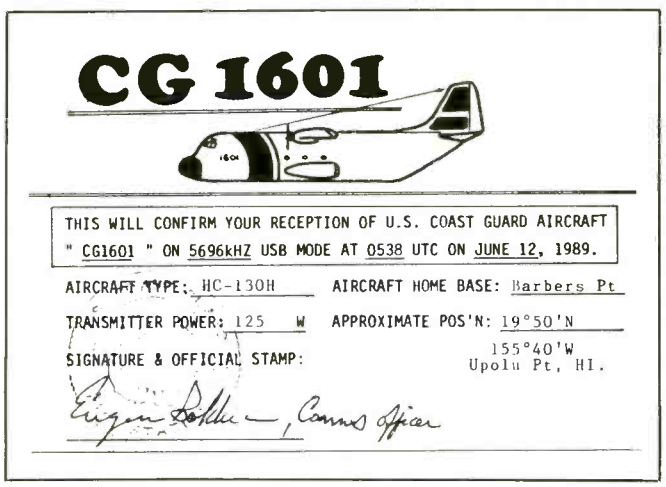
The chuckle-of-the-month goes to this item from the *Detroit News* sent in by Michael Willmer, MI. A Copenhagen mechanic purchased a US submarine communications transmitter at an auction for $50. The transmitter had washed up on a beach and after inspection the Danish authorities decided it had no military value and thus it was auctioned. The device is normally towed by US nuclear submarines for underwater low-frequency transmissions. According to the news article, such transmitters are valued at $500,000. The mechanic has hidden the unit while waiting for a better bid for it. The American Embassy reportedly offered him only $500 for the transmitter. The US ship which lost the transmitter in the Danish Sea was not identified.

In connection with the photo of the Warning System which appeared in the December column, Richard Burton, GA furnished the following clarifying information. "The Savannah River Plant and Plant Alvin Vogtle are not affiliated with each other. They are located across from one another, separated by the Savannah River. Plant Vogtle (Georgia side) is operated by Georgia Power and the Savannah River Plant (South Carolina side) is a plutonium processing plant operated by the Department of Energy. This plant provides materials for our National Defense."

Steve Bastarache, MA asks for information on a source for a Master MARS list of callsigns and idents. "Being a former navy man I like to follow MARS stations the most

Here is a variation of the Whelen Warning System. This one is installed near the Seabrook Nuclear Power Plant in New Hampshire. This particular system utilizes solar panels to charge the batteries instead of a commercial power drop. Note the UHF Collinear receive antenna. Photo and info from Tim Lucca, NH.

Steve McDonald, BC, Canada received his PFC back from the USCG and sent this QSL address: Barber's Point Coast Guard Air Station, US Naval Station, Barbers Point, HI. 96862 USA.



CG 1601

THIS WILL CONFIRM YOUR RECEPTION OF U.S. COAST GUARD AIRCRAFT " CG1601 " ON 5696kHZ USB MODE AT 0538 UTC ON JUNE 12, 1989.

AIRCRAFT TYPE: HC-130H AIRCRAFT HOME BASE: Barbers Pt

TRANSMITTER POWER: 125 W APPROXIMATE POS'N: 19°50'N 155°40'W Upolu Pt, HI.

SIGNATURE & OFFICIAL STAMP:

Eugene Dobbin, Comms Officer

N M W

United States Coast Guard Group Astoria, Oregon

This will confirm your reception of station NMW on 267Ø KHZ USB at Ø536 UTC on 1Ø July 1989.

Transmitter/Power: 1 KW

Antenna: Inverted cone

Signature and Stamp: Karen J. Milligan, RM2, USCG

COMMANDER
U.S. COAST GUARD GROUP ASTORIA
2185 S.E. AIRPORT RD.
WARRENTON, OR 97146-9693

This PFC was returned to Dave Sabo, CA

and would like a Master MARS list so I may QSL them. For the record I presently use a Sony ICF-2010 and a home-brew sloper antenna." Perhaps one of our *POP'COMM* readers can supply details of a source for the MARS list?

We received a letter from Aris Giannarelis, Athens, Greece. His letter said in part: "I am 22 years old and have been monitoring the SW Bands for 6 years but just recently started logging Utility Stations. My receiver is a Kenwood R-5000 and my antenna is 35m long. While scanning the 19 meter band, I received a rather strange signal. The frequency was 15682 kHz USB at 1423 UTC. The transmission was a YL/EE with 4F groups. When the YL stopped. I could hear an OM announcer in the background and he was announcing a soccer match. The language used by the OM was Greek. I was amazed because on this day there was no soccer match in Greece because national elections were being held. The Greek language is also used in Cyprus thus that may be where the transmitter was located. The transmission in English might have come from a RAF base in Cyprus?" Aris, since I did not hear the transmissions you referred to, it is not possible to state with any degree of certainty that both transmissions were on the same carrier and/or from the same location. Your comments, however do raise some interesting possibilities.

Tom Bennett, BC, Canada outlined some information concerning USAF communications. Here is what he had to say: "I have been an avid SW monitor since the 1950's while I was in the Canadian Air Force stationed in the North. Since then I have always had one of many receivers on at all times. My specialty is military comms and I would like to comment on a logging in the November column. On 11214 kHz a station was reported with a callsign of Century-54 in contact with Raymond-24. This should have been Sentry-54. Sentry is a general callsign for AWACS (Airborne Warning & Control Aircraft) who are based at Tinker AF Base with the 552nd Airborne Control and Warning Wing. Tinker is the Tactical Air Command Operations Center (Raymond-24) while the 552nd Operations Center uses the callsign of Falcon.

Normally AWACS operate on UHF or on NORAD HF frequencies of 9023, 11444, and 14894 kHz. Activity has been noted on 9023 which appears to be AWACS training in the area of North Dakota along the US/Canadian border.

If communications are lost or broken the AWACS will very often switch to an 'Airways' frequency and call via phone patch to command centers or ops centers.

Another item to note regarding AWACS aircraft is that they very often use two callsigns on a mission. The operation callsign will be Sentry + figures and a tactical callsign consists of two names and a letter. For example: The November logging for 9023 kHz indicated the callsign 'Dog Star Papa'. This was an AWACS tactical call." Thanks so much Tom for this rundown on AWACS.

And now let's see what the mailbag brought this month in the way of loggings.

361: Beacon KIN, Kingston, Jamaica at 0432. (Symington, OH)
362: Beacon AK, Akron-Fulton Intl AP, OH at 0435. (Symington, OH)
365: Beacon CKK, Miami Intl AP, FL at 0440. (Symington, OH)
366: Beacon NMG, NAS, Belle Chase, LA at 0445. (Symington, OH)
379: Beacon TL, Tallahassee, FL at 0505. (Symington, OH)
380: Beacon UCY, Cayojabo, Cuba at 0510. (Symington, OH)
391: Beacon DDP, Dorado AP, San Juan, PR at 0525. (Symington, OH)

BRITISH AIRWAYS

TBE, E122
PO Box 10
Heathrow Airport (London)
Hounslow
TW6 2JA

Telephone ~~01-759 5511~~ 562 4859
Cables Britishair
Telex 8813983 Bawysc G

2nd December 1988

Our Ref: RS10/DNM/sbh

Mr M Horsfield

Lancs
M34 3PB

Dear Michael

HF SSB SPEEDBIRD LONDON

I am pleased to confirm your reception report of Saturday 19th November 1988 at 2140 UTC on 5535 KHZ.

The aircraft being worked was a Boeing 747 of Saudi Arabian Airlines, Flight SV 7356 enroute to Cairo from Algeria.

Best wishes.

D N Nash
Telecommunications Controller
Radio Systems and Services

British Airways Plc
Registered office
Speedbird House
Heathrow Airport (London)
Hounslow TW6 2JA
Registered in England No 1777777

When Michael Horsfield received the QSL from British Airways, this information sheet was included.

SPEEDBIRD LONDON - INFORMATION SHEET

The Long Range Company Operational Control Radio Service Speedbird London is operated by British Airways PLC at London (Heathrow) Airport.

The Station and the service has been in operation since 1968 and is licensed by the British Civil Aviation Authority (CAA) to provide facilities for world-wide operational control to aeronautical users. Confidentiality of all messages handled by the Station is a feature of this CAA license and is vigourously maintained.

The Station operates 24 hours J3E and H2B (SELCAL) HFSSB USB on 3497, 5535, 8921, 10072, 13333, 17922 and 21946 KHZ for British Airways and over 40 other air operating agencies.

The main equipment comprises a 10KW MFT Marconi transmitter driven by a Marconi 1542 drive unit operating into a 3001 Spiracone low angle antenna. This is located at Rugby.

On the receive side we have 6 Eddystone single frequency receivers and one Eddystone ten channel receiver remotely switchable all fed by a Marconi Conipole antenna. These are located at Cobbett Hill near Farnborough, Surrey.

The fallback system located at London (Heathrow) Airport comprises the same equipment as used at Cobbett Hill. The transmitters however are 1 KW broadband amplifiers driven by Marconi 1541 drive units. Both the transmitter and receive functions operate via either a Spiracone (Low/High Angle) or RLP antenna as required.

Abbreviations Used For Intercepts	
AM	Amplitude Modulation mode
BC	Broadcast
CW	Morse Code mode
EE	English
GG	German
ID	Identifier/Ied/Ication
LSB	Lower Sideband mode
OM	Male operator
PP	Portuguese
SS	Spanish
tfc	Traffic
USB	Upper Sideband mode
w/	with
wx	Weather report/forecast
YL	Female operator
4F	4-figure coded groups (i.e. 5739)
5F	5-figure coded groups
5L	5-letter coded groups (i.e. IGRXJ)

447: NMN, USCG Portsmouth, VA w/Navigational hazards. CW 0115-0122. (D.P., NC)
515: Beacon PKV, Calhoun Co. AP, Port Lavaca, TX at 0600. (Symington, OH)
2670: USCG CommSta, Boston, MA in USB 0450. Various CG announcements for East Coast area. (Mierzwinski, PA) Portland, ME in USB w/Merchant Marine bcst w/info re overdue lobster boat. (Reynolds, MO)
2714: NDVW, USS Nashville, LPD-13 clg (off freq) Norfolk Tug Control at 1040. (Gordon, CT)
2716: HMCS Protector, AOR-509 clg QHM Halifax at 1115 w/ETA and request for Tugs/Pilot; NKAM, USS Kamchameha, SSBN-642 clg US Navy Tug YTO-771 at 1030 re personnel transfer, both units QSY to VHF Ch 12; NIDC, USS Valdez, FF-1096 clg Navy Bermuda Control at 1055; USS Pennsylvania, SSBN-735 using callsign Kilo Four Yankee clg India Eight Xray (Canaveral Control) at 1000 re permission to enter port. (Gordon, CT)
2717.5: USS Chancellorsville, CG-62 (off freq) clg Harbor Control Panama at 1100, vessel was recently commissioned and was headed towards San Diego, CA, their new homeport. (Gordon, CT)
3130: Tfc between 28Q, T2U, TUGH, and 7YU in USB at 0040 w/discussion re callsigns, tracks, etc. Also hrd A4X clg ILM at 0338. (Rome, NY)
3225: YL/Czech in AM at 0525 w/5F grps (each grp x2). Seemed to be several short texts in succession (2 min each) and simulcast on 4030 kHz. (Fernandez, MA)
3228: YL/GG in SSB at 2017 w/3 + 2F grps. (Charret, France)
3378: WGY912, Mt. Weather, FEMA, Berryville, VA, w/auto CW grps of three alphanumeric characters, 18 grps per msg rptd, also on 4779 kHz. Stn has changed procedures but still sends callsign when tfc is updated, usually on hour and half-hour. (McMahan, GA)
3465: AWA and YYE in CW at 0150. Stns having trouble hearing each other. Minly sending V's and confirming msg nbrs. At 0202 they do their rendition of dueling VVV's. (D.P., NC)
4066.1: NTYL, USS Truxtun, CGN-35 wkg San Diego CSS1 at 0040; HMCS Fraser, DDH-223 wkg QHM Halifax at 1120; NNQD, USNS Kawishiwi, T-AO-146 using classified callsign Victor Four Alpha wkg San Diego CSS1 at 0045 (CSS1 on 4360.5 kHz); NJFY, USS Platte, AO-186 clg Norfolk ICSB at 0225, no joy from ICSB but propagation was good and even thos Platte is SurfLANT, they were answered by San Diego CSS1; This is only the second time I have ever heard a ship in the Atlantic, clg Norfolk ICSB, who has been answered by San Diego CSS1 (apparently by an inexperienced opr at CSS1 who didn't realize Platte is an Atlantic Fleet ship—COMLOGRON-4). Platte also clg NAVCAMSLANT Tech Control at 0315, still no joy from ICSB; NHQB, USS Waddell, DDG-24 clg San Diego CSS1 at 0140, Waddell couldn't hear CSS1 on 4360.5 kHz due QRM caused by RTTY on 4360 kHz generated by NAVCAMSLANT; NPXQ, USS Reasoner, FF-1063 wkg San Diego CSS1 at 0140 w/Phone patch to Balboa Naval Hospital. (Gordon, CT)
4112: C6CP, Cruiseship Stardancer wkg KMI, San Francisco, CA in USB at 0424 w/PP; SOHE, Merchant ship Belchatow in USB at 0436 wkg WOM, Miami (on 4407 kHz) w/pp. (Symington, OH)
4407: WOM, Miami in USB at 0414 trying make pp for Cruiseship Holiday. (Symington, OH)
4455: YL/GG in SSB at 2012 w/4F grps. (Charret, France)
4457: KMI San Francisco in USB at 0530 wkg Cruiseship Royal Viking Sun for pp. (Symington, OH)
4545: 7BN cld by REX in CW at 0052. Sounds like hand cranked powered xmtr w/no tone. Others came up on 4547 kHz, hrd CIH cld by U/I. (D.P., NC)
4585: KIG446, CAP, North Carolina (identifier-Red Dog) in USB 1200-1207 w/TFC rollcall. (Mierzwinski, PA)
4725: Foul Plan (YL Opr) ending an EAM bcst in USB at 0617. USAF SAC freq. (Fernandez, MA)
4750: Two OM/EE wkg w/2nd OM clg Rebel 1 and Hardball 1 numerous times, no replies. USB at 1200. (Mierzwinski, PA)
4752: IMO cld by U/I stn, CW at 0118. Also hrd JPT DE NTA, DIZ DE PNI, both stns xmt but not to each other. Next day hrd OSO & NTA. SS chatter, possible placename of Santiago. (D.P., NC)
4754: Unid stns in CW at 0312 w/chatter in SS. Lousy fists. (Ed.)
5046: YL/EE in AM w/3 = 2F grps, off at 2343. (Warrington, OH)
5320: USCGC Buttonwood in USB w/pp from National Data Buoy Center via New Orleans CommStas. Was told to adjust UHF antennas and reqork the connectors on malfunctioning buoy. USB at 0153. (Wilmer, MI)
5348: INU, unid in CW at 0244. (J.M., KY) Poss related to 4545 & 4752/4754 kHz activity. (Ed.)
5390: Bell Tel. loc Alma, Quebec, Canada w/tel. calls from bush (mining, fish camps) in SSB w/FF & EE tfc. Active 24 hrs. (Clifton, Quebec, Canada)
5437: YL/EE in SSB at 2007. MOSSAD freq. (Charret, France)
5535: Saudi 028 hrd in SSB at 0722 wkg Speedbird London w/pp to London Dispatch. Engine problems. Cockpit decision to change destination to Paris. (Halstead, WV)
5615: OM/RR in AM at 1939 wk/5F grps. (Charret, France)
5690: DHM95, Lahr Military in USB at 0225 w/wx observations. (Symington, OH)
5696: Romeo Zero Uniform/Cape Cod Air in USB w/pp thru CommSta Portsmouth re ELT bearing report from helo's present position (on Delaware coast), which was SE out in the Atlantic. Hrd 2038; Rescue 1493 (helo)/CommSta Boston/Cape Cod Air wkg re fishing vessel sinking 50 miles SE of Cape Cod. The 1493 dropped pumps to keep vessel afloat and remained on scene next 2 hours. Further reception hampered by local thunderstorm at my QTH. USB at 0350. (Fernandez, MA) New Orleans USCG ComSta wkg unid stn telling them their sig weak and to go to 8984 kHz but no joy, USB at 0056; Clear Water AirCom in USB at 0045 wkg ComSta Miami discussing patient on board Rescue 1430 to be brought to Sarasota Int. AP. Miami having trouble reaching Rescue 1430. (Rome, NY)
5712: FUB7, French Navy, Paris-Houilles, France in CW at 0641 w/mkr every 5 secs. (Fernandez, MA)
5840: YL/EE in AM at 0906 w/5F grps. (Charret, France)
6506.4: NMN, USCG, Portsmouth, VA w/wx at 0532. NMO, USCG, Honolulu w/wx at 0546. USCGC Resolute clg ComSta San Francisco & QRM'ng both. (Watts, KY)
6507: Music box w/Swedish Phapsody from 1900-1904, then YL/GG w/headings of 78319, 97926 and 28083. Simulcast on 4778 and 5340 kHz. (Mason, England) YL/GG in USB w/5F grps. Started at 0500 w/Bavarian music box chimes until 0505, then into numbers. (Grubbs, NY)
6520: Boston Rescue to USCGC Seneca at 0159 research for missing lobster boat. Hrd in USB. (Walbesser, NY)
6577: New York Radio hrd in SSB at 0638 wkg Czechoslovak 577 w/pp fm ATC. "We believe you have severe navigation problem and we suggest you land Bermuda." 577 replied "We have no navigation problems" rptd twice. ATC then tells them that Bermuda cleared them to ELTIN and that they couldn't find ELTIN. "We suggest you land at Bermuda and get your navigational equipment checked." 577 disregarded the suggestion and advised they would continue on to their destintion (risking the safety of 132 souls on board.) If you hear of a Russian-made Czech Airliner wandering around looking for Prague, it is probably this poor bloke. ATC's last question to the airliner was "Give us your fuel exhaustion time." (Halstead, WV)
6675: Military drums & trumpets 2250-2305. then YL/CZ w/Norma 68 Gruppi 44 and into 5F grps. Ends w/Krai. AM mode. (Mason, England)
6716: Halifax Military in USB at 1312 telling B2B to QSY to freq D11 which was 6746 kHz. Passed RTTY tfc. (Willmer, MI)
6725: Sweeping unmodulated sig in repetitive pattern at 0215. Sweeps between 6722.7 & 6725.6 kHz, nbr of sweeps per set varies. (Wolfe, MA)
6761: Various unid voices acknowledging Cobra 55 at 0340 in USB. (Walbesser, NY)
6820: Romanian Skylark melody playing here at very unusual time of 0400. Trying to reach evening outstation in USA?? Ended with OM saying 'Terminat x3' in AM mode. (Mason, England)
6840: OM/RR rptng 419 from 2130-2135 in AM mode. Then 728, 36 and into 5F grps, ended w/ 00000. (Mason, England)
6962.5: YL/EE in USB at 0224 w/3 + 2F grps. Bad warbling QRM on freq. (Ed.)
7384: WYG908 to WYG 908 mobile re Fort Ritchie people wanting to look over antennas on unid building. USB at 2222. (Willmer, MI) Wonder if this should be 7348 kHz and calls of WGY908, WGY908 mobile. FEMA. ?? (Ed.)
7535: Foll ships testing equip w/Norfolk SESEF; USS Monterey, CT-61 at 2015; NPGA, USNS Sirius, T-AFS-8 at 1945; NKIA, USS Moinester, FF-1097 at 1830; USS Gunston Hall, LSD-44 at 1820, QSY 4040 for RTTY; Alpha Charlie Four, small amphibious assault craft (hull #4) at 1930; NMYE, USS Biddle, CG-34 at 1820, after rdo check QSY'd to UHF freq; NTQP, USS Lawrence, DDG-4 using classified callsign November Six November at 1930. (Gordon, CT)
7648: YL/SS in AM mode addressing 094 w/5F grps at 0230 ending w/finale. (Walbesser, NY)
7605: Unid YL in AM mode addressing 094 w/5F grps at 0230 ending w/finale. (Walbesser, NY)
7635: Communicators Net, CAP, USB at 0150, Mon & Wed. Callsigns hrd: Bluechip 13 (Net Control), Arrow 4, Southeast 15, Southwest 4, Pleasure Peak 16, Bluefly 312, Eagle 95, Headcap 35, Southeast 28 and Bluechip 1 (addressed as 'Colonel'). (Grubbs, NY)
7773.5: USB from 0400-0500, tfc related to Hurricane HUGO: USCGC Bear (WMEC-901) to San Juan re evacuation of FAA personnel. USCGC Point Whitehorn (WPB 82364) said fuel may be contaminated with water. FAA took fuel from CG Cutter and it contaminated with water and they now have no power. 0106. USS Clifton Sprague to USCGC Bear re using NOAA vessel Raw Umbrage to evacuate 50 Marine Biology students in St. Croix. Said USCGC Overcoat on scene but can't handle 50 people. C-130 has broken down on runway. USCGC Minivac in contact w/USCGC Bear re FEMA report of 50% of MP's deployed. Prisoners were loose and roaming Island. Airport is secured. Talk of evacuation of shopkeeper who shot looter and fears for his life. (Willmer, MI)
7847: YL/SS in AM w/5F grps. Off at 0515. (Warrington, OH)
7850: YL/SS in AM at 0401 w/callup Ocho Cinco Cero rptd until 0404, then Siete Cuatro Uno & start of 5F grps, (each x2). (Fernandez, MA)
7886: OM/SS in AM at 0805 w/5F grps. (Charret, France)
7918: YL/EE in AM at 2034. MOSSAD. (Charret, France)
8056: OM/SS in AM at 0805 w/5F grps. (Charret, France)
8084.5: Stns Buford, LZ Yello, 9C, 6D, 7A, Dead Pan, Dead Bravo, Dead Lima, and Picket in net. Buford & LZ Yellow handled most tfc. Buford in contact w/Camp LeJeune. Other freqs used: 5078 (Group 4), 5425.5 (Group 1), 7942 (3 Bravo), 8073.5 (Group 2), 10175 (Group 3), 10333.5 (Picket). (all kHz). Talk mostly of rdo checks & verifications of assigned freqs for various units. USB mode at 0142. (Willmer, MI)
8120: YL/GG w/1-0 count and 907 x3. After ten tones, Gruppen 93 and into 4F grps. Also on 10137 kHz. (Mason, England)
8240: YL/SS in AM/w5F grps. Ended w/00000 at 0538. (Warrington, OH)
8290.9: Whiskey Sea Buoy being cld by 21 in USB at 0622. Few mins later unid stn advised had left sea buoy

& was going to Barbados. Very active freq along w/ 8264.9 and 8272.4 kHz but mostly Spanish language. (Watts, KY)

8380: YL/SS in AM w/5F grps at 0205. (Grubbs, NY)

8610: Poss USN or USAF net in USB at 1645. Calls incl Hard Rock 10, 20, & 30, Hard Rock Control and Blue Air. (J.M., KY)

8625.2: GYU, Gibraltar at 2019 in CW w/DE GYU QSX 4 6 marker. (Giannarelis, Greece)

8737.6: 5BA, Cyprus at 1145 in USB w/announcement "This is Cyprus Radio, Radio-Telephone Maritime Service" in EE & Greek. (Giannarelis, Greece)

8894: Ghana 7077 hrd in SSB at 0550 wkg Niamey reporting over NAVON at 0533 and Oscar Golf (Ouagadougou) at 0540. Gave a/c registration as 9G-RCA. (Halstead, WV)

8894: ATC, Niamey, Niger in USB at 0325. OM opr w/several a/c flight data reports. (Fernandez, MA)

8971: I1B to R3P w/alphanumerics at 0653 in USB. (Walbesser, NY)

8993: MAC 540 w/call for "Any stn for a rdo check." AirGuard 410605 responded. USB at 1418. (Rome, NY)

9290: Noise burst signal at 0224. 9 dots, 1 dash. (Grubbs, NY)

9950: SESEF Charleston clg USS Comstock (MCWK?) in USB at 1627. SESEF Charleston sometimes ID'ing as Charleston Test Control. Also hrd on 7485 kHz conducting all mode tests w/USN vesels. (J.M., KY)

9960: YL/SS in USB at 0230 w/4F grps. (Grubbs, NY)

10053: Gander VOLMET w/wx at 0456 in LSB. (Walbesser, NY)

10193: Noise burst at 0320. Sending "V" in CW? Similar to 8090 and 8176 kHz signals. (Grubbs, NY)

10390: FSB, Interpol, Paris w/CW id and RTTY at 0320. (Grubbs, NY)

10488.9: Stn in CW (hand sent) at 2010 sending KNY25 over and over. KNY25 is call of Romanian Embassy, Washington, DC. (Ed.)

10780: Cape Radio wkg Orion 2 in USB at 0553 re Shuttle ops. Numerous freq changes made by Cape & Orion 2. Freqs used were 13878, 14896 LSB, 16226, 17470 & 17668 kHz. Cape reported 16226 provided best reception. (McAtee, WV) Orion 2 prob Navy P-3 Orion which is a maritime patrol a/c. (Ed.)

11214: Dark Star Oscar in USB at 1325 w/pp via Trenton to Bastille w/KL-43 modem tfc & advising they were switching status from CinCNORAD to CONUSNORAD. (Willmer, MI)

11246: Gull 13 (a/c) & McDill AFB in USB at 2132 w/pp to Keefler AFB and inquiry re wx there for landing. (Fernandez, MA)

12435.4: WFZ, Morgan City, LA in USB at 2020 wkg tug Jaguar w/posit report which put it off N. Coast of Haiti & headed for San Juan. (McMahan, GA)

13071.5: 9VG, Singapore at 2330 in CW w/9VG marker. (Giannarelis, Greece)

13201: A/c Dog Star Oscar (AWACS) in USB at 2130 w/pp via McClellan to Raymond-24 (Tinker AFB Ops) w/ETA info. Then additional pp thru Raymond-24 to Falcon (552nd ACWS Ops) using callsign Sentry-48 re cancellation of work w/aircraft from 142nd TAC Fighter Group due low fuel state. (Bennett, BC, Canada)

13244: MAC 40610 in USB at 1216 enroute St. Croix via MacDill to Format re diverting to San Juan International due to bad wx. (Willmer, MI)

13292: Unid stn in CW at 1406 sending 5L grps. After msg completed sends heading of NR 47522 CK19 BT and into text of 5L grps. Ends with AR TKD ZNN EE T T and down at 1412. (Ed.)

13630: KDM45, FAA St. Croix in contact w/KDM47, Ft. Worth, TX Roof had been blown off but no injuries. 1458. KDM49, Atlanta, GA in contact w/KMP53, unid. KDM45 in contact w/KDM45 mobile and KDM50, Hampton, GA re routing of food and water aboard a King Air fm San Juan to St. Croix. USB at 1200. (Willmer, MI)

14343.5: HAMS talking w/HAMS in Panama re situation there during U.S. stabilization operations. USB 2130-2200. (Ed.)

14380.7: Several stns in USB net at 1954. Unid language, poss Arabic. One stn sending msg and repeats each short phrase. Some phonetic letters hrd such as Kilo, Lima, Romeo Romeo and Lima Hotel. (Ed.)

14441.5: NUOU, USS Buchanan, DDG-14, NNN0CGH clg NNN0NRJ, San Diego at 0055; NLBH, USS Long Beach, CGN-9, NNN0CLB clg Any West Coast MARS Station at 1945; NWQU, USS Tripoli, LPH-10, NNN0CNA-wkg NNN0NSF. NAS ALameda at 2200. (Gordon, CT)

14477: NTWX, USS Hoist, ARS-40, NNN0NXU & NNN0QLP at 0110. (Gordon, CT)

14684: 8X7U and NFN1, unid CW stns. Probable Soviet mil from 0450 to 0523 reconciling prev tfc. Noted some CW Cyrilic characters. (McMahan, GA)

16917: WSC, Global Marine Communications, West Creek, NJ w/tfc list in CW at 1730. (J.M., KY)

16923.6: OFJ5, Helsinki, Finland wk/QSX mkr in CW at 1735. (J.M., KY)

16951.5: 6WW, Senegal at 1722 in CW w/6WW mkr. (Giannarelis, Greece)

18062.9: WNFT417, Bell Communications Research, Morristown, NJ in comms w/stn ID'ing as 1990. USB at 1620. (J.M., KY)

18485: Phoenix & Banjo Player in USB at 2100 QSY to freq Tango Tango, then returning and passing figs/data, which sounded like they were setting up RTTY comms on Tango Tango. (Fernandez, MA)

20245: Unid CW sta w/callsign R4N w/auto sent 5L grps. 120 grps each msg w/1st & last groups the same. Digital xmsn between CW msgs. Simulcast on 4843 kHz. Msg headers seldom older than 10 mins of UTC. (McMahan, GA)

21760: NRV, USCG CommSta, Guam in CW at 0100-0130 w/HydroPac nav hazards, (McMahan, GA)

22361: DGW36 w/nx in GG, CW at 1622. DGR28 hrd at same time w/nx on 17082 kHz, also in CW. DGR28 is Elmshorn, GFR, DGW36 unlocated. (J.M., KY)

24978: US military stn Brake Rod hrd in USB at 1512. (J.M., KY)

Order Back Issues of

POPULAR COMMUNICATIONS

NEW

CODE SCANNER

ADVANCED MULTI-MODE DECODER

Two Line, 32 Character LCD Display

Copies Morse, Baudot and ASCII Codes from your Radio! Automatic Morse Code tracking: 3-70 WPM. Built-in Code practice oscillator for hand key with readout to display. Built-in speaker. Advanced Analog and Digital filtering with AGC. Special practice mode to learn Morse characters. Compact size: 3½" x 5¾". Operates from 12 VDC or 120 VAC adapter provided. Easy hook-up to Radio speaker or headphone jack. Made in U.S.A.

Call or write for **FREE** brochure or order Factory Direct.

CODE SCANNER Model CSCAN ..... $ 189.00

Add $5.00 shipping for continental U.S. Send check, money order, VISA or MasterCard.

Microcraft Corporation Telephone:(414) 241-8144
P.O. Box 513Q, Thiensville, Wisconsin 53092

CIRCLE 57 ON READER SERVICE CARD

1989 Pirate Radio Directory

stations, formats, QSLs
how to hear 'em

$6 plus $1 ($2 foreign)
US Funds
$2 shipping/handling
Catalog $1

Tiare Publications
P.O. Box 493
Lake Geneva WI 53147

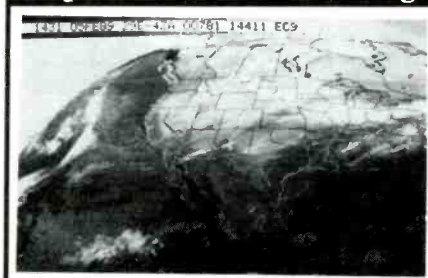
★★★★★ PRESENTING ★★★★★
CABLE TV DESCRAMBLERS
★★★★★ STARRING ★★★★★
JERROLD, HAMLIN, OAK
AND OTHER FAMOUS MANUFACTURERS

- FINEST WARRANTY PROGRAM AVAILABLE
- LOWEST RETAIL/WHOLESALE PRICES IN U.S.
- ORDERS SHIPPED FROM STOCK WITHIN 24 HOURS

FOR FREE CATALOG ONLY **1-800-345-8927**
FOR ALL INFORMATION **1-818-716-5914**

PACIFIC CABLE CO. INC.
7325½ RESEDA BLVD., DEPT. 1150
RESEDA, CA 91335

Improve Your World Image



PC HF FACSIMILE 4.0 $99

A complete facsimile reception system for the IBM PC or Compatible. Receives up to 16 intensity levels.
Includes:
Demodulator — 80 Page Manual
Software — Tutorial Cassette
Frequency List — Interpretation Guide
Features:
Print on Epson, or HP Laser Jet
Disk Save, Zooming, Image processing
Unattended Image Capture and much more

PC GOES/WEFAX $250

Designed to receive images directly from U.S. and Soviet meteorological satellites. Includes all of the above feature plus a complete orbital tracking sytem and resolution of up to 256 gray levels.

Software Systems Consulting
150 Avenida Cabrillo, "C", San Clemente, CA 92672
(714)—498—5784

CIRCLE 58 ON READER SERVICE CARD

SATELLITE VIEW

BY DONALD E. DICKERSON, N9CUE

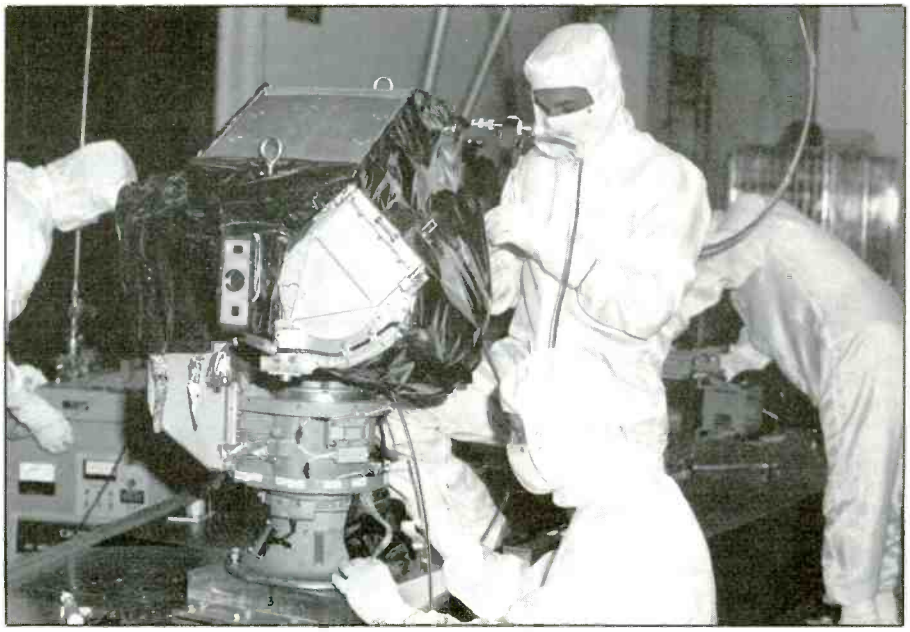
INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

Update

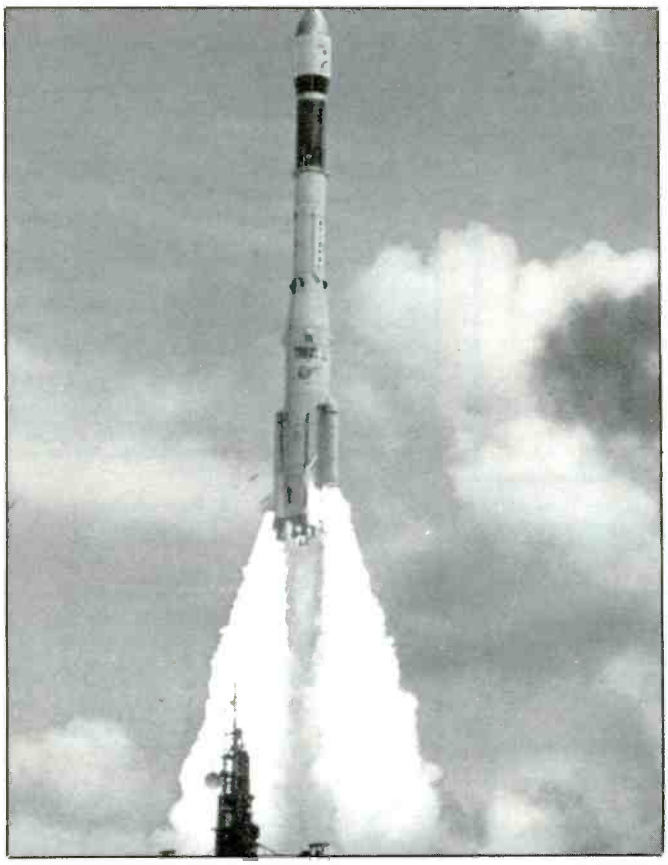
Between January 1st and October 1st of 1989, 150 satellites were launched by eight space fairing nations. They include 82 Soviet Cosmos, 34 US military, 11 Soviet telecommunication, two Intelsat, two InterCosmos, two Soviet weather, one Swedish TV, one Japanese TV, weather and an experimental, one Czechoslovak TV and two Amateur Radio satellites and two US Space probes (Galileo and Magellan). During this same time period 137 spacecraft have deorbited and been consumed by the upper atmosphere.

Syncom IV-F5—Also known as Leasat-5, was launched in Nov. '89 from STS-32. Leasat 5 is the 4th operational satellite in this series. Leasat's are commercial satellites (Hughes HS 381) leased by the Department of Defense. These spacecraft are supplementing DOD's aging fleet of Fltsatcom satellites. Leasat will carry the military's additional communications needs while the next generation of super satellites, known as Milstar, is being developed. The first Leasat was launched from the shuttle in 1984.

NAVY—DOD's last Fltsatcom spacecraft

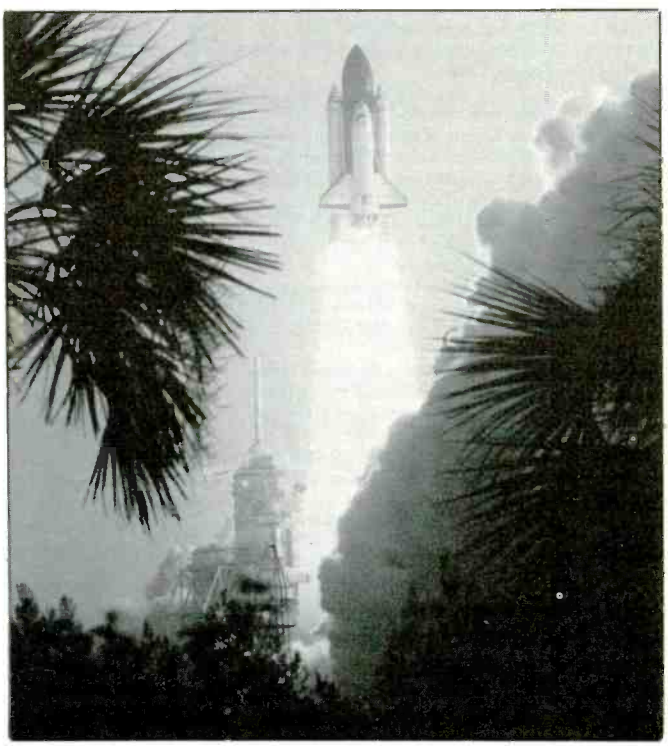


HALOE assembly personnel install multilayer insulation (MLI) blankets on the instrument in the clean room in Building 1202 prior to shipping. The MLI blankets maintain constant temperature in orbit, insulating the instrument from the sun's heat and the cold of deep space.



An Ariane launch from Kourou. (ESA).

Launch of space shuttle Columbia.



Low Band Satellite Report

Designation	National Name	Frequency, Power, and Orbit Information
1966-110A	ATS 1	June 16, 1983 137.35 MHz Inclination: 14.0 deg
1967-111A	ATS3	June 16, 1983 136.37 MHz 137.35 MHz Location: 105 deg W Inclination: 12.1 deg
1973-081A	OSCAR (NAV) 20	September 15, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 89.9 deg
1975-100A	GOES 1	September 29, 1989 136.38 MHz Location: 120.4 deg W Inclination: 9.1 deg
1977-014A	KIKU 2	February 3, 1989 136.11 MHz Location: 124.6 deg E Inclination: 8.0 deg
1977-048A	GOES 2	September 5, 1989 136.38 MHz Location: 114.0 deg W Inclination: 7.4 deg
1977-108A	METEOSAT 1	June 16, 1983 137.05 MHz Location: 5 deg E Inclination: 7.3 deg
1978-012A	IUE	September 10, 1989 136.86 MHz Inclination: 31.883 deg
1978-062A	GOES 3	September 13, 1989 136.38 MHz Location: 130.1 deg W Inclination: 6.2 deg
1981-044A	NOVA I	September 15, 1988 150 MHz at 3.00 W 400 MHz at 5.00 W Inclination: 90.0 deg
1984-110A	NOVA III	September 15, 1988 150 MHz at 3.00 W 400 MHz at 5.00 W Inclination: 90.0 deg
1984-114B	MARECS-B2	September 30, 1989 137.17 MHz Location: 26.1 deg W Inclination: 3.0 deg
1984-123A	NOAA 9	October 13, 1989 137.62 MHz Inclination: 99.155 deg
1985-066A	OSCAR (NAV) 24	September 15, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 89.9 deg
1985-066B	OSCAR (NAV) 30	September 15, 1988 150 MHz at 1.00 W 400 MHz at 2.00 W Inclination: 89.9 deg
1986-073A	NOAA 10	October 15, 1989 137.50 MHz Inclination: 98.631 deg
1986-088A	POLAR BEAR	September 15, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 89.9 deg
1987-080A	OSCAR (NAV) 27	December 5, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 90.3 deg
1987-080B	OSCAR (NAV) 29	December 5, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 90.3 deg
1988-033A	OSCAR (NAV) 23	January 31, 1989 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 90.4 deg
1988-033B	OSCAR (NAV) 32	September 15, 1988 150 MHz at 1.00 W 400 MHz at 2.00 W Inclination: 90.4 deg
1988-052A	NOVA II	September 15, 1988 150 MHz at 3.00 W 400 MHz at 5.00 W Inclination: 90.0 deg
1988-074A	OSCAR (NAV) 25	September 15, 1988 150 MHz at 0.75 W 400 MHz at 1.25 W Inclination: 90.0 deg
1988-074B	OSCAR (NAV) 31	September 15, 1988 150 MHz at 1.00 W 400 MHz at 2.00 W Inclination: 90.0 deg
1988-089A	NOAA 11	October 13, 1989 136.77 MHz 137.77 MHz Inclination: 98.949 deg

was launched from Kennedy in September of 1989. Several of these carry experimental 20 & 40 GHz transponders.

Hughes Communications Inc. operates the world-wide network of ground stations for the Leasat system. Leasat 5 is located at 177°W, Leasat 4 is at 105°W, 3 is 15°W and one is located at 73°E. They operate on a frequency of 240 to 317 MHz.

NASA—No longer will NASA launch the Atlas-Centaur from complex 36B. Both operation and control of the launch pad and rocket have been given over to General Dynamics. Apparently no lessons were learned from the Challenger incident.

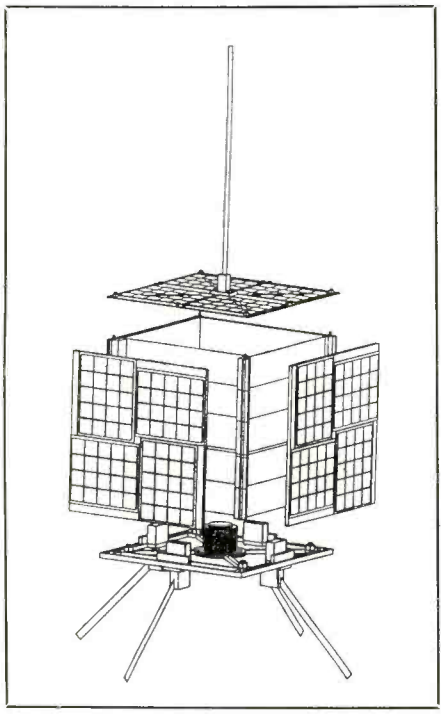
TDRS—NASA's Tracking and Data Relay Satellites, located at 41°W & 171°W, have been leased to Intelsat. The $51 million dollar agreement gives Intelsat use of 12 C-band transponders on each satellite for 6 years. NASA will maintain operational control of the spacecraft from their control center at White Sands, New Mexico.

IUE—The International Ultraviolet Explorer (IUE) celebrates it's 10th year in orbit. It was designed to last 3 years. IUE has discovered galactic halos (hot gas that surrounds our galaxy) and volcanoes on Jupiter's moon IO. IUE sent back the first pictures from space of Halley's comet and it has been measuring ultra-violet emissions from the Super-Nova of 1987. The Super-Nova is an exploding Star 163,000 light years from Earth. IUE is in geo-stationary orbit over the Atlantic. It is controlled 16 hours a day by Goddard Spaceflight Center and 8 hours a day by ESA (European Space Agency) from a control station in Madrid, Spain.

Back in time—Nov. 9, 1989, NASA launched the Cosmic Background Explorer (COBE) from Vandenberg AFB, California. It is looking for evidence of the Big Band by studying background radiation in the microwave and infrared frequency bands.

Explorer Program—Goddard Spaceflight Center has developed and launched dozens of small to moderate size spacecraft through the years. This includes the International Ultra Violet Explorer. These spacecraft are launched from Wallops Island, Va. on the Scout, our smallest rocket. NASA will continue to launch at least two spacecraft per year.

Moscow—In November of '89 the US/



PACSAT Design (AMSAT).

Leo Labutin (UA3CR) with PACSAT (Courtesy WA5ZIB).

USSR Joint Working Group on Solar System Exploration, meet for the third time in Moscow. The group is promoting the continued Joint Biological experiments between both countries. It is also concentrating on the details of a joint mission to Mars.

San Francisco Quake—Goddard Spaceflight Center began studying the effects of the quake the day after it happened. Using Very Long Baseline Interferometry, a technique derived from radio astronomy, precise measurements of distance could be measured by radio. Sophisticated electronics allow the simultaneous timing of radio signals from stations great distances apart. The time it takes a radio signal from a man made source or from a natural object in space can be measured to within a 30 picosecond variance. These studies showed that the quake and the ensuing destruction in San Francisco was caused by a 2 inch movement of the San Andreas fault. The New Global Positioning Satellites (GPS) were used to take these measurements.

Medsat—Two unique satellite bridges were established with the USSR in 1988 & 1989. During the '88 earthquake in Armenia and the '89 railroad disaster (explosion) in Central Russia, U.S. medical specialist were put in direct contact with Soviet Hospitals through two satellite links. Both Comsat Corp and Intelsat provided the transponders free of charge. NASA provided the ground terminals for the Soviet Hospitals.

AI—Artifical Intelligence will be used to monitor radio signals from space probes in the future, according to spokesmen of the Jet Propulsion Laboratory's Deep Space Network. The software for AI is called Spacecraft Health Automatic Reasoning (SHARP). It will be used by mission opera-

Launch List

1989-090A	STS 33 (Space Transportation System) was launched on November 23, 1989, by the United States.
1989-089A	COBE was launched using the Delta launch vehicle on November 18, 1989, from the Vandenberg Air Force Base, United States, to monitor cosmic background radiation.
1989-088A	COSMOS 2049 was launched on November 17, 1989, by the U.S.S.R.
1989-087A	INTELSAT 6A, a geosynchronous communications satellite, was launched using the Ariane 44L launch vehicle on October 27, 1989, from the kourou Space Center, French Guiana, for the International Intelsat Organization.
1989-086A	METEOR 3-3, a meteorological satellite, was launched using the Cyclon launch vehicle on October 24, 1989, by the U.S.S.R. Initial orbital parameters are period 109.5 min, apogee 1228 km, perigee 1191 km, inclination 82.6 deg. On board are optical-mechanical scanning television and radio-metrical equipment and a geophysical instrument.
1989-085A	USA 47, a navigational satellite, was launched on October 21, 1989, by the United States.
1989-084B	GALILEO was deployed from the orbiting STS 34 on October 18, 1989. The spacecraft will make remote sensing observations of Jupiter and its satellites as well as in situ observations of the Jovian space environment.
1989-084A	STS 34 (Space Transportation System) was launched on October 18, 1989, by the United States. Orbital parameters were period 90.5 min, apogee 323 km, perigee 295 km, inclination 34.3 deg.
1989-083A	COSMOS 2048 was launched using the SOYUZ launch vehicle on October 17, 1989, by the U.S.S.R. Initial orbital parameters are period 89.4 min, apogee 270 km, perigee 248 km, inclination 62.8 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.
1989-082A	COSMOS 2047 was launched on October 3, 1989, by the U.S.S.R. Initial orbital parameters are period 89.5 min, apogee 357 km, perigee 178 km, inclination 67.2 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.
1989-081A	GORIZONT 19 was launched using the PROTON launch vehicle on September 28, 1989, by the U.S.S.R. The satellite was placed in a near geostationary orbit with the following intiial orbital parameters: distance from the earth's surface 35,753 km, period 23 hr 54 min, inclination 1.3 deg. On board are communication and television relay instruments.
1989-080B	MAGION 2, a Czechoslovak satellite, separated from the INTERCOSMOS 24 on October 3, 1989. On board are scientific instruments for simultaneous research together with INTERCOSMOS 24. Orbital parameters are period 115.9 min, apogee 2494 km, perigee 504 km, inclination 82.5 deg.
1989-080A	INTERCOSMOS 24, known also as ACTIVNYI/ACTIVE, was launched using the CYCLONE launch vehicle on September 28, 1989, by the U.S.S.R. Orbital parameters are period 115.9 min, apogee 2492 km, perigee 505 km, inclination 82.6 deg. On board are scientific instruments for comprehensive study of low frequency electromagnetic emissions. It also carried a subsidiary satellite called MAGION 2.
1989-079A	COSMOS 2046 was launched on September 27, 1989, by the U.S.S.R. Initial orbital parameters are period 92.8 min, apogee 431 km, perigee 412 km, inclination 65 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.
1989-078A	MOLNIYA 1-76 was launched on September 27, 1989, by the U.S.S.R. The satellite was placed in a high elliptical orbit with apogee 38,960 km in the northern hemisphere, perigee 650 km in the southern hemisphere, period 11 hr 42 min, inclination 62.8 deg. On board is communication equipment for long-distance telephone, telegraphic radio, and television broadcasting.
1989-077A	USA 46, a communications satellite known also as FLTSATCOM 8, was launched using the Atlas-Centaur launch vehicle on September 25, 1989, by the United States. Orbital parameters are period 1413.4 min, apogee 35,791 km, perigee 35,774 km, inclination 5.0 deg.
1989-076A	COSMOS 2045 was launched on September 22, 1989, by the U.S.S.R. Initial orbital parameters are period 89.6 min, apogee 322 km, perigee 216 km, inclination 70 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.
1989-075A	COSMOS 2044 was launched using the SOYUZ rocket on September 15, 1989, by the U.S.S.R. Initial orbital parameters are period 89.3 min, apogee 294 km, perigee 216

km, inclination 82.3 deg. On board are two monkeys and other biological objects as well as scientific instruments for studying the influence of weightlessness and cosmic radiation on living organisms.

1989-074A through 1989-074F — COSMOS 2038 through COSMOS 2043 were launched using the TSIKLON rocket on September 14, 1989, by the U.S.S.R. Initial orbital parameters are period 114 min, apogee 1435 km, perigee 1394 km, inclination 82.6 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.

1989-073A — RESURS-F 5 was launched using the SOYUZ launch vehicle on September 6, 1989, by the U.S.S.R. Initial orbital parameters are period 88.7 min, apogee 261 km, perigee 189 km, inclination 82.3 deg. On board is equipment for taking multizonal and multispectral photographs of varied scale. Also carried is West German equipment for biotechnological experiments in low gravity conditions.

1989-072A — USA 45 was launched on September 6, 1989, by the United States Department of Defense.

1989-071A — SOYUZ TM-8 was launched on September 5, 1989, by the U.S.S.R. The flight program envisaged the docking of the craft with the orbital complex MIR. It docked with MIR on September 7, 1989.

1989-070A — GMS 4 (Geostationary Meteorological Satellite-4) was launched using the H-I launch vehicle (H20F) on September 5, 1989, from the Tanegashima Space Cneter of the National Space Development Agency of Japan. Tentative orbital parameters are period 663 min, apogee 37,397 km, perigee 197 km, inclination 28.7 deg. Nominal transmitting frequencies and output powers are 2280.72 MHz 5 W, 1694.0 MHz 2 W, 468.875 MHz 4 W, 468.883 MHz 4 W, 468.924 MHz 4 W, 1681.6 MHz 20 W, 1684.0 MHz 20/2 W, 1688.2 MHz 0.2/0.02 W, 1690.2 MHz 0.2/0.02 W, 1687 .1 MHz 20 W, 1691.0 MHz 20 W, 1694.0 MHz 2 W, and 1694.3 MHz—1694.7 MHz 0.3 W. The national name of GMS 4 is HIMAWARI 4.

1989-069B — USA 44 was launched using the TITAN 3 launch vehicle on September 4, 1989, by the United States Department of Defense.

1989-069A — USA 43 was launched using the TITAN 3 launch vehicle on September 4, 1989, by the United States Department of Defense.

1989-068A — COSMOS 2037 was launched using the TSIKLON rocket on August 28, 1989, by the U.S.S.R. Initial orbital parameters are period 116.1 min, apogee 1537 km perigee 1503 km, inclination 73.6 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.

1989-067A — BSB-R1 (British Satellite Broadcasting-R1), a UK television direct broadcasting satellite known as "MARCOPOLO 1," was launched using the DELTA launch vehicle on August 27, 1989, by the United States. Orbital parameters are period 1435.76 min, apogee 35,787 km, perigee 35,777 km, inclination 0.15 deg.

1989-066A — PROGRESS M, first of a new series of automatic cargo spacecraft, was launched on August 23, 1989, by the U.S.S.R. Initial orbital parameters are period 88.5 min, apogee 235 km, perigee 191 km, inclination 51.5 eeg. The flight program envisages the testing of onboard systems in various modes and the delivery of expendable materials to the orbital station MIR.

1989-065A — COSMOS 2036 was launched using a SOYUZ rocket on August 22, 1989, by the U.S.S.R. Initial orbital parameters are period 89.6 min, apogee 273 km, perigee 248 km, inclination 62.8 deg. On board are scientific instruments for continuing space research, systems for precise orbital measurement, and a radio telemetry system.

1989-064A — USA 42, a navigational satellite carried by a DELTA 2 rocket, was launched on August 18, 1989, by the United States.

1989-063A — RESURS-F 4 was launched on August 15, 1989, by the U.S.S.R. Initial orbital parameters are period 89.0 min, apogee 258 km, perigee 192 km, inclination 82.3 deg. On board is equipment for taking multizonal and multispectral photographs of varied scale.

1989-062B — HIPPARCOS, a European astronomy satellite, was launched on August 8, 1989, by an Ariane 44LP rocket, from the Kourou Space Center, French Guiana. Orbital parameters are period 628.9 min, apogee 35,632 km, perigee 223 km, inclination 7.0 deg.

1989-062A — TV-SAT 2, a West German direct television satellite, was launched on August 8, 1989, by an Ariane 44LP rocket, from the Kourou Space Center, French Guiana. Orbital parameters are period 1429.9 min, apogee 35,785 km, perigee 35,544 km, inclination 0.2 deg.

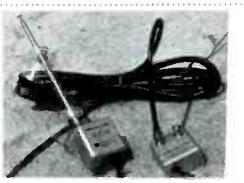
tors to analyze radio signals from spacecraft in deep space. The computer program combines conventional computer science methods with artificial intelligence techniques to automatically detect potential problems with the spacecraft or ground station data systems. SHARP was used during Voyager's Neptune encounter and will be used on the recently launched Galileo and Magellan missions to Venus and Jupiter.

Ozone—Continued concern over the disappearing protective layer of our atmosphere, the ozone, NASA is nearing completion of the HALOE (Halogen Occultation Experiment) project. This ozone monitoring device is part of the Upper Atmosphere Research Satellite (URS), scheduled for launch in 1991. UARS will measure trace gasses during sunset and sunrise portions of it's polar orbit.

SUPERCHARGE YOUR RECEIVER !

ANTENNA PLUS-1

This indoor active receive antenna covers both scanner and SWL frequencies (0.5-1300 MHz) and with it's built in SIGNAL INTENSIFIER brings in even the weakest signals! Avail w/BNC, UHF, F connectors and 115VAC pwr. (12VDC $4 more) SPECIAL INTRODUCTORY PRICE $79.95! (reg $89.95) Dual output version $109.95



SUPER VAK-TENNA Only $149.95

0.5-800MHz ACTIVE RECEIVE ANTENNA

SWL's and Scanners will love the superior reception and wide frequency range of this compact antenna. Includes a 14 db amplifier and mounts using convenient SUCTION CUPS! 15' feedline and 110 VAC power std. DC version avail. MAST MOUNTED version SUPER-VAK-TENNA-MM $149.95!

Only $34.95

SUCTION CUP MOUNT VAK-TENNA!

IDEAL FOR APARTMENTS, OFFICES OR RV's

Mount to your window for the BEST coverage! VHF/UHF Scanning, HAM 2 meter, FM/TV, Marine users now have a convenient, portable antenna that mounts easily. POWERFUL suction cups hold for weeks! Whips telescope to 79" yet fold to 12". Receives 30-500MHz (transmit: 70-230MHz.) Supplied with 15' of coax and choice of BNC, PL259, F or Motorola connector. (please specify when ordering)

TAPE SAVER TS-1 $59.95

Eliminates dead time on your scanner tapes!

Connects between scanner and recorder for "action only" recording. Internal speaker so you can listen while hooked up. 115VAC powered 12VDC & batt avail.

SIGNAL INTENSIFIERS

A HEARING AID FOR YOUR RECEIVER!

These WIDEBAND receive preamps use state-of-the-art MMIC chips to make your antenna come to life!

PREMIUM REP-40 $69.95

1-1300 MHz! 15 DB GAIN!

For all scanners, shortwave rcvrs., AM-FM-TV, cable and more. 115VAC pwr. (12VDC add $4). Choice of BNC, SO239 (PL259 mate) and "F" connectors. Battery powered, remote mounted and many more versions available. Some priced from $34.95! (RFA16B/RFA20)

CB INTENSIFIER

Only $49.95

Improve your CB's range! The RFTR boosts received signals by 13db! Internal T/R relay. 12VDC pwr. (AC pwr add $10)

SSB Version $64.95

MARINE-VHF version $99.95

INTERFERENCE FILTERS & ACCESSORIES

SCANNER FILTER HPF-1 (passes above 45 MHz) $8.95; SHORT-WAVE FILTER LPF-1 (passes below 50 MHz) $19.95; ANTENNA SWITCH AS-3 3 position $14.95; VARIABLE ATTENUATOR VA-20 $12.95

Conterminous US shipping/handling $4
AK, HI, PR, Canada shipping/handling $7
NY and MI residents add local sales tax.

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

SATISFACTION GUARANTEED!

Order any product (except software) from EPI and if not satisfied return it within 15 days for a full refund (less shipping/handling).

CIRCLE 52 ON READER SERVICE CARD

Dove logo (Project Dove).

Soviet's issue long awaited MIR QSL card.

Relativity—20 years ago, Apollo 11 left a Laser Ranging Retro-Reflector Experiment on the Moon. It is designed to reflect laser pulses fired from ground stations in Grasse, France, Maui, Hawaii and Ft. Davis, Texas. These stations can measure the distance between the Earth and Moon to an accuracy of one inch. These laser experiments have confirmed Einstein's Theory of Relativity.

Spysat—The French are about join the two super-powers in the space spy game. They are building a satellite called Helios. It will carry both radio receivers for Signal Intelligence and cameras for Photo Intelligence. Launch date—1993.

Amateur Satellites

Six new Amateur Radio satellites were scheduled for launch on January 11, 1990 from Kourou, French Guiana, South America on an Ariane 4 launch vehicle. The European Space Agency main payload for this launch was SPOT 2, a new Earth-Imaging spacecraft. Four of the Amateur spacecraft are called Microsats because of their small size (9" by 9"). Three of these satellites are called Pacsat because of the data format (protocal) used by the satellite. The third satellite Dove is an educational satellite designed for use in Grade Schools and High Schools. It will transmit one way messages in several languages from school children from around the world. The fourth Microsat is called Webersat. Built at Weber State College in Utah. It carries an experimental TV camera. In the very near future we will take a close look at each of these Microsats and give you details on what type of equipment you would need to work these satellites (if you are a licensed Amateur). For the rest of us the equipment is simple. Just tune your scanner to the downlink frequency for the Dove spacecraft. It will identify itself in English on 145.825 MHz. The other Pacsat's will require a computer, software and an interface to decode these transmissions. If you are already equipped for data operation you will be interested in the chart below showing the mode of operation for each of the Pacsat's. Japan will soon launch it's second Pacsat, more later.

USSR—The Soviet Union has announced it's plans for a new Amateur satellite. It will be RS-14. This spacecraft will be the first Soviet satellite to carry a J-mode (435 MHz uplink & 145 MHz downlink) transponder. With the postponed launch of RS-12/14 it is possible that it, like it's predecessor RS-9, could be cancelled all together.

Amateur Astronauts—Two Amateur Astronauts are scheduled to fly on Shuttle missions in 1990. The men are not really Amateur Astronauts, but rather both Amateurs and Astronauts. Dr. Ron Parise, WA4SIR, was payload specialist on STS-35 in April. Lt. Col. Ken Cameron, KB5AWP, is scheduled to operate voice, packet and ATV (Amateur TV) from STS-37 in June.

A Few Good Men—AMSAT, the Radio Amateur Satellite Corp., is looking for a few good men. If you are a licensed Amateur and are now equipped for satellite operations or would be willing to invest in the equipment, you may be interested in AMSAT's general call to all stations. They are trying to put together a dedicated group of ground control station operators, to monitor and even upload command data to the new Pacsats. If you are interested and meet the qualifications write: Bruce Rahn, WB9ANQ, 410 Coronado Trail, Enon, OH 45323. Only licensed Amateurs need apply.

Don't forget—Live Shuttle transmissions are re-broadcast by WA3NAN, Goddard Spaceflight Center, on the following frequencies:

3860 KHz (6pm-10am EST)
7185 KHz (8am-6pm EST)
14,295 KHz (24 hrs)
21,395 KHz (sometimes)
28,650 KHz (sometimes)

Dial-a-Shuttle service is also available 2 hrs. before launch and 24 hrs. a day during missions. Dial 1 900 909-6272. See you next month.

CB SCENE

27 MHz COMMUNICATIONS ACTIVITIES

BY BILL SANDERS, SSB-295

CB radio has been on the rebound for several years now, and many old timers are digging in their closets, attics, and garages to see if they can fire up that old rig. Soon enough, this column hears from a goodly share of these people who had been away from CB for a while and are now ready to jump back in. *POP'COMM* is, after all, the only national publication that regularly covers CB radio. Some who write to us after having been inactive for many years express shock and surprise at all of the changes that have taken place, especially at the inabilty to locate any all-CB publications on their local newsstands. They can't understand why, they write to ask where *this* or *that* favorite CB magazine can be obtained nowadays.

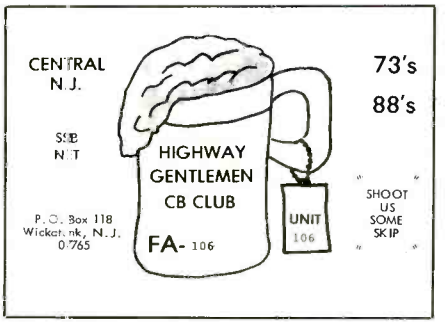
Well, of course, from 1974 to 1976 there were about 12-million CB sets per year being sold. Those were the three peak years. From 1977 to 1982 there were 25-million licenses issued by the FCC. Dozens of manufacturers and accessory manufacturers were in the marketplace selling rigs, antennas, power mikes, and other CB stuff like it was going out of style. Unfortunately, it *was* going out of style. At one point, there were enough readers and advertisers in CB to keep more than forty monthly magazines going, but things began to cool off by 1977. The beginning of the 1980's saw only two monthly CB magazines still ble to hang on. Those were *S9* and *CB* magazines, which (ironically) were the two CB magazines that had been publishing back in the 1960's.

By early 1982, the owner of *CB* magazine announced a merger of *S9* with his publication into one consolidated monthly put out from his offices in Oklahoma City. Apparently there weren't enough readers or advertisers left in the CB field to permit those plans to work out. The magazine simply withered and died.

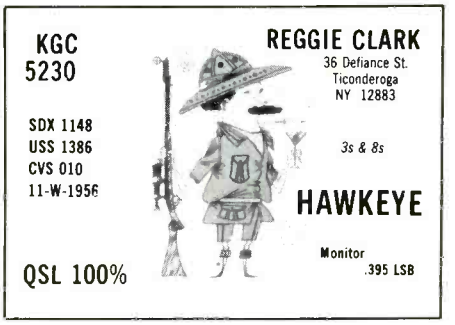
That's where those magazines went. Today there are between 1.8 and 2-million CB sets sold each year. While this is a lot more sets than were sold in 1982 and 1985, it is still hardly sufficient reason for old timers to expect that everything would still be the same—same magazines, same manufacturers, same old gang on the channels. We don't know if CB will ever be what it was in the 1970's, and we don't know (in retrospect) that it was the best of all possible worlds, anyway.

Still, there are long-standing traditions on the band which have been maintained over the years by those of us who have remained active on 27 MHz, although it hasn't always been easy to keep them alive without the necessary help from enough old-timers. For instance, the understanding and unofficial arrangement whereby AM-mode operators utilized most of the channels, but stayed off the higher channels (usually between 35 and 40) where the SSB-mode operators congregate. We have mentioned this arrangment here numerous times in the past, but we have only one voice and if there aren't enough 27 MHz communicators on the band (old or new) who give a hoot about good communications and having a band that isn't sheer chaos, then it's not for lack of our trying. At one time, sideband operators would key up and remind AM operators of this arrangment when they chanced to stray, but these days it's mostly a matter of waiting for "someone else" to say something.

Even so, you seldom hear sideband operators below Channel 35. They are willing to live with the arrangement, even if the major-

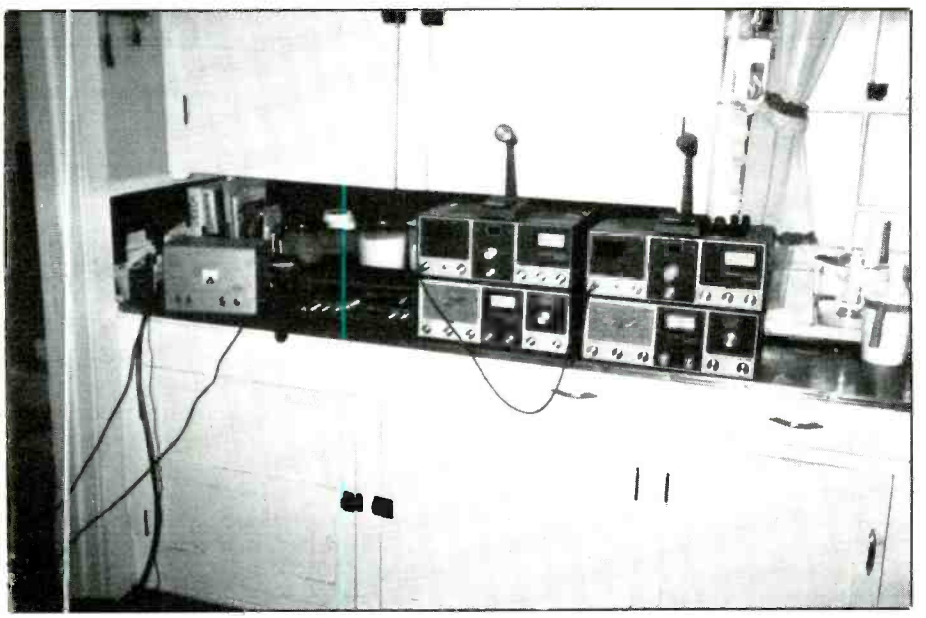


QSL sent out by Jerry, FA-106 and SSB-851 in New Jersey.

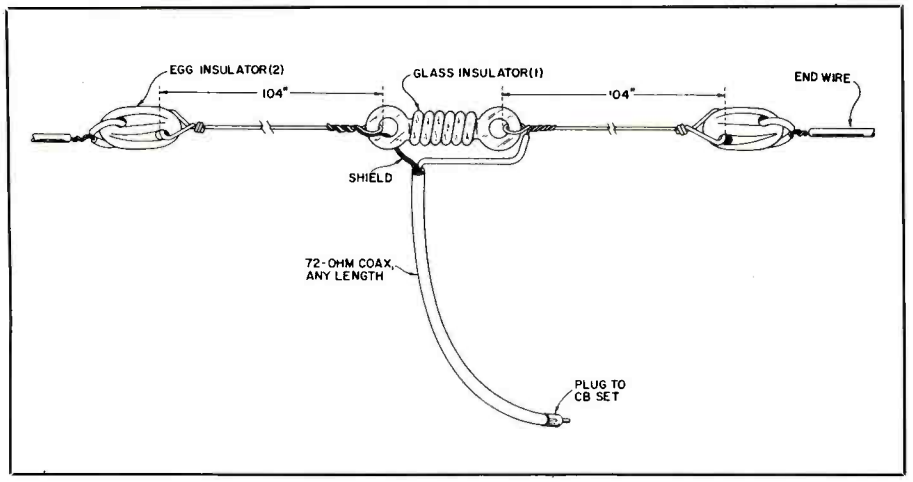


Reggie Clark's attractive QSL. Why not send us yours?

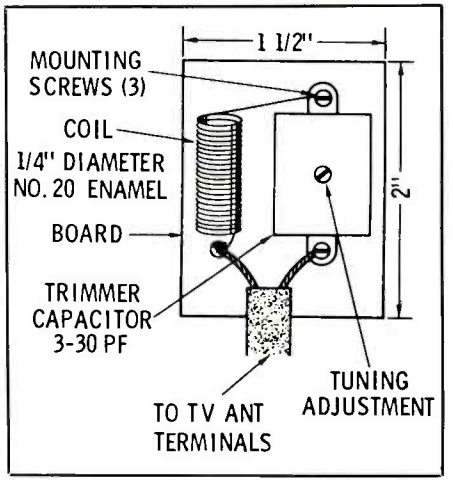
If you're in the area of Woonsocket, RI listen for this station operated by Allen, SSB-1949.



Dave, "129," of WI owns two pristine Browning SSB stations.



Here's an excellent temporary antenna.



A TVI filter you can build.

ity of AM operators aren't, and despite the fact that sidebanders these days appear little interested in preserving the quality of what's taking place between Channels 35 and 40. A pity.

Ken Lloyd, of Connecticut, reports on some monitoring he's done on the illegal "outbander" operations frequencies above CB Channel 40. He reports high powered AM operations on 27.505 and 27.525 MHz. A group calling themselves the CJ's seems to be active on the 27.525 frequency. Sideband operations are noted from 27.415 through 27.915 MHz. Ken writes that he would like to see the FCC designate CB Channels 35 to 40 exclusively for sideband operations, then add new SSB channels from 27.415 to 27.915 MHz.

One old timer we heard from recently is Jerry Ham, P.O. Box 118, Wickatunk, NJ 07765. Jerry is known as FA-106, and has held SSB Network membership number SSB-851 since way back in 1976. Jerry is Treasurer of The Highway Gentlemen CB Club and Freehold Area (FA) Net. Jerry would like to hear from sideband operators in Central New Jersey who would like to participate in the area net, which has existed for many years. Write to him and let him know your sideband ID, type of equipment in use, address, name, and address. Please enclose a self-addressed, stamped, return envelope.

Another operator who has been around for a long while is Reggie Clark, SSB Network Member SSB-9017G, of Ticonderoga, NY. He's got a Cobra 2000-GTL rig, plus Realistic PRO-34 and PRO-2004 scanners. Reggie's been on 27 MHz for about 20 years now and his main complaint is that CB Scene isn't long enough.

A note from Allen Zatonsky, P.O. Box 1954, Woonsocket, RI 02895 tells us that he looks forward to every issue of this column. Sent along a good looking photo of his station, too. Allen has been SSB Network member SSB-1949 since October of 1976!

Do we get impressed with classic Browning CB equipment? You bethcha! Dave *Gypsy Joker*, of Egg Harbor, WI owns two complete Browning Golden Eagle IV stations in excellent condition. He also has a Realistic Navajo TRC-457 and a Joe Gunn ground plane. Says he really gets out with this gear.

Edward Methot, Box 1314, Dalnousie, New Brunswick, Canada E0K 1B0 writes that he hears plenty of activity on 26.945, 26.955 and other frequencies below Channel 1. Wonders if such operation is legal, because if it isn't legal it should be made so. Edward notes that there is less interference, more DX, and more courteous operators there than on Channels 1 through 40. These frequencies, like those between 27.415 and 27.995 MHz, have never been authorized in Canada or the U.S. for two-way hobby type communications such as you describe. This isn't to say that the frequencies haven't been used that way for decades, but it's a clear violation of existing regulations.

"Help!" says Louis E. Padovani, 66 Potomac Ave., Paterson, NJ 07503. He just acquired an older CB base station and he'd like to get it operating on Channel 19. It works, and has crystals for Channels 9 and 17, but no crystal for transmitting on Channel 19. He would like to know if anybody can point him in the direction of a rock for this unit. Lou's set is described only as an International Crystal Executive, although he didn't specify which one of the many different models of Executive he has. I suspect that all models (except the very earliest ones made) take the same crystal cut. International Crystal (of Oklahoma City) was one of the first companies to produce high quality transceivers in the very early days of 27 MHz CB. As popular as these sets were in the early 1960's, by the end of the decade the company had backed away from their CB transceiver line.

There continues to be lots of interest in older CB equipment and you'd be surprised at the large amount of mail we get from people asking questions about current values and original prices, service data, information on relative quality ratings, background on manufacturers, etc. Perhaps we'll devote a forthcoming installment of CB Scene to the topic, for there certainly was as much poor quality junk on the market between 1960 and 1980 as there was beautifully engineered and built equipment.

The lower-grade cheapies included sets from Philmore, Knight, DeWald, Arkay, USL, WRL, Olsen, Lafayette, and Metrotek (to name only a few). Sonar Radio Company's equipment was expensive, but I never had any luck with the stuff. Good, reliable popular priced sets came from Midland, Royce, Hallicrafters, Globe, Regency, Teaberry, Heathkit, Gonset, Realistic, and dozens of others. Some of the companies producing the best quality expensive equipment included CPI, Johnson, SBE, Polytronics, Stoner, Dak, International Crystal, Tram, Browning, Cobra, and a handful of others.

Emergency Antenna

If, for some reason, you must put a signal on the air quickly and have no conventional antenna, it's possible to rig a temporary length of wire that will radiate a reasonable amount of powr. It's done by taking a length of ordinary hookup or other wire cut to 108 inches. Form a tiny loop at one end and insert it into the transceiver's antenna jack. The other end is run straight up, as vertically as possible, and taped to a high molding or ceiling. Performance of the temporary antenna is improved if the transceiver has a good electrical ground; a wire from the chassis to a cold-water pipe, for example.

Temporary Antenna

An easily constructed half-wave antenna might come in handy for temporary installation. The one described here takes up little space and may be rolled into a coil when not in use. Although the design is not as efficient as a regular base-station antenna, this may be outweighed by simplicity. One end of a length of 72-ohm coaxial cable is prepared so the shield and center wire may be connected to each wire arm of the dipole. Egg-type strain insulators at the outer ends permit rope or wire to fasten the antenna in place without short-circuiting the wire elements. Those wire elements, each 104 inches long, may be regular stranded antenna wire or No. 18 solid copper wire.

Since virtually all CB antennas are vertically polarized, it is advisable to mount this antenna vertically for best effect. This is done by tying one end of the antenna, using either end wire or rope, to a tree limb or other high support. Another improvement occurs if the coaxial cable is brought away from the middle of the antenna at right angles for a distance of at least eight feet. Bringing the cable down alongside the lower antenna wire is apt to introduce some energy losses.

Telescoping Elements

The construction of most base-station antennas utilizes telescoping aluminum tubes. The tubes are generally fastened at each joint by a sheetmetal screw. But if the antenna is dismantled, you may discover that element sections have become corroded and are difficult to slide apart. This problem is eliminated by coating the mating surfaces with either conductive grease or silicon-type lubricant during installation of the antenna. Not only does this eliminate locked joints, but it can also reduce noise problems which sometimes occur when corrosion develops where the tube sections join.

TVI Filter

Where a CB set is located near a television receiver, there is risk of a type of interference which disturbs television reception on most channels. The filter illustrated is designed to reduce this interference. It is connected to the television antenna terminals. This circuit, known as a *series-tuned trap*, does not reduce another common type of interference, the kind which produces close-spaced lines across the picture. This is harmonic interference which must be reduced by a filter already inside the CB set, according to the manufacturer's instructions. The unit described here handles only the kind of interference which causes the picture to be completely blocked or torn.

The filter is constructed on any small piece of insulating plastic board with the dimensions shown. (Use experimenter's perforated phenolic board or bakelite, if you desire.)

Wind the coil on a dowel or rod of 1/4 inch diameter, or even around a pencil. Then slip it off, remove the enamel insulation from the end wires, and mount the coil under the screws. The hardware may be three 6-32 machine screws and nuts. The capacitor is mounted by your first flattening out its end tabs and placing the screws through the tab holes. The unit is completed by your attaching a short piece of television twin lead under the two lower screws, then connecting the other end to the television set's antenna terminals. The set's regular twin lead from the antenna is left in place. When you are mounting the filter at the rear of the television, fasten it so its screws and metal parts do not touch anything. It can be held in place with tape.

Tuning the trap is done while you are observing CB interference on the television screen. Adjust the capacitor tuning screw with a nonmetallic screwdriver until interference is reduced. In some cases, it may not be possible to tune out the interference, since the trap needs adjustment to its coil. First try spreading the coil turns slightly, then repeat the tuning adjustment at the capacitor. If this does not work, rewind the coil, adding about four more turns. Once the filter is correctly tuned, it should not interfere with normal television reception. The filter operates only on 27 MHz, whereas the lowest television channel enters on slightly over 50 MHz.

Let's hear from you! We want to see your QSL, station photo, and hear your thoughts.

CB TRICKS OF THE TRADE I & II

Tricks I and Tricks II, plus a free set of plans for CB Super Modulation.

Special: $40.00

Order each book separately for $19.95

C.O.D. Orders Accepted

Medicine Man CB
P.O. Box 37
Clarksville, AR 72830
(501) 754-2076

CIRCLE 56 ON READER SERVICE CARD

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

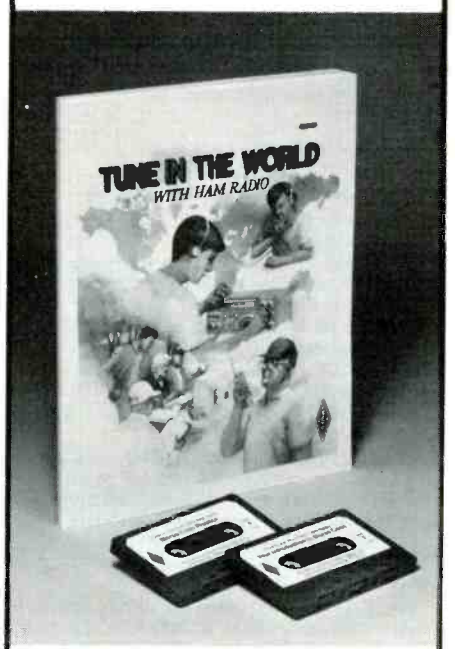
CABLE T.V. CONVERTERS
WHY PAY A HIGH MONTHLY FEE?

All Jerrold, Oak, Hamlin, Zenith, Scientific Atlanta, & Magnavox. 60 Day Guarantee. MC/Visa COD. Shipment within 24 hours. Send self addressed envelope (60¢ postage) for catalog. No Illinois Orders Accepted. Daily & evening hours, also open Saturday.

Electronic Engineering
P O. Box 337
Barrington, IL 60011
(708) 540-1106

HAM RADIO IS FUN!

It's even more fun for beginners now that they can operate voice and link computers just as soon as they obtain their Novice class license. You can talk to hams all over the world when conditions permit, then switch to a repeater for local coverage, perhaps using a transceiver in your car or handheld unit.



Your passport to ham radio adventure is TUNE-IN THE WORLD WITH HAM RADIO. The book tells what you need to know in order to pass your Novice exam. Two cassettes teach the code quickly and easily.

Enclosed is my check or money order for $19.00 plus $3.50 for shipping and handling or charge my

( ) VISA ( ) MasterCard ( ) Am. Express

Signature _____

Acct. No. _____

Good from _____ Expires _____

Name _____

Address _____

_____

_____

City State Zip

PC

THE AMERICAN RADIO RELAY LEAGUE
225 MAIN ST.
NEWINGTON, CT 06111

CIRCLE 55 ON READER SERVICE CARD

RTTY

BY ROBERT MARGOLIS

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

Fred Hetherington of Florida reports logging a station using the callsign of "W54V" along with foxes, counting and RY's to KKN50, U.S. State Department, Washington, DC. Fred says the tape, reading "KKN50 DE W54V" was found at 1300 on 17930, transmitting at 850/75. He says the signal was strong and the transmission lasted until 1315, when there was a frequency change.

It appears that Interpol stations have been encrypting their police bulletins the past several months. Rarely do I see traffic in the clear any more over its many frequencies. Is it possible Interpol suspects Colombian drug smuggling kingpins of tuning to its shortwave radio teletype broadcasts to get first-hand dope (pun intended) on their criminal dossiers?

RTTY Intercept
Al Times Are UTC
Settings = Hz/Baud/Polarity

2656.9: AFRTS, Los Angeles, CA, w AP/UPI nx, FDM 85/75R, at 0300 (Ed.).
6967: RFLIG, French Navy, Cayenne, French Guiana, w/tfc in FF to RFLIA, ARQ-E 850/72 at 0310 (Fred Hetherington, FL).
6988: U.S. Army MARS sta. AAA6RD w/ARQ msgs to AAA6OK at 0200 (Hetherington, FL).
7340.2: 7OC, Khormaksar Aero, South Yemen, w/RYRY at 0321, 375/50N (Ed.).
7402.5: JMG3, Tokyo Meteo, Japan, w/coded wx at 1615, 850/50R (Ed.).
7357.7: U.S. Army MARS sta AAR6IF relaying a "special bulletin" from AAA6RD, region 6 director, to all MCS operators in region 6, at 1540. Used ARQ instead of the usual 170/45R for Army MARS stas (Ed.).
7460.5: Un-ID w aero wx, 425/100R at 0346 (Ed.).
7521: FDY, FAF, Orleans, France, w/RYRY, le brick, & counting, 425/50R at 2019 (Ed.).
7604: KAA60, FCC, Grand Island, NE, w/tfc in the clear at 1445, 425/45N (J.M., KY).
7642.4: USN MARS stations NNN0TDD, NNN0AGB, and NNN0QKW, noted w tfc after 1400, packet 1030/300 (Ed.).
7760: RGH77, Arkhangelsk Meteo, USSR, w/coded wx, 1000/50N at 1554 (Ed.).
7800.9: Un-ID w/text in SS re elections. Was 250/100N, 0010-0013 (Ed.).
7890: ROQ3, Novosibirsk Meteo, USSR, w/coded wx, 425/50N at 0233 (Ed.). Same at 1020 w/a strong sig (Hetherington, FL).
8297.6: Greek ship, w c/s SVLM, wkg SVT, Athens, ARQ at 0200 (Ed.).
8298.1: GDR ship Y5CC, Arkona, w/telegrams in GG to Ruegen R., ARQ at 2156. Sev. hours later, at 0325, Arkona was on 8344 w/more telegrams to Ruegen (Ed.).
8328.5: The Polish ship Vlaslavovo w/ARQ telexes in Polish to Gdynia R. at 0217 (Ed.).
8348.5: C6CP, M/V Stardancer, w a telex in ARQ at 0356 (Ed.).
8349: Polish container ship SZSA, Zim Livorno, a former Israeli vessel, w a telex in EE, ARQ at 0328 (Ed.).
8354: H9LS, M/V West Virginia, w/ARQ telexes via WCC at 1819. C/S indicates ship has a Panamanian registry (Ed.).
9042: UN-ID w/coded wx at 2107, 850/100N (J.M., KY). Might be 5YE, Nairobi Meteo, Kenya, although 75 baud is the norm for it—Ed.
9285: TNL24, ASECNA, Brazzaville, Congo, w/RYRY QJH1 at 2213, 425/50N (Dallas Williams, CO).
10078: Un-ID w/lots of rptd 3L grps, e.g., ELP rptd, SAR rptd, DSN rptd, etc., btwn encrypted tfc. Was 170/50R at 1742 (Ed.).
10087: CLP1, MFA, Havana, Cubam w/lengthy nx items at 0304, 425/75N (J.M., KY).
10202.7: MKK, RAF, London, England, w/RYI's & foxes, FDM 325/50R at 0252 (Ed.).
10295: Un-ID Interpol sta. w/ARQ tfc at 0510 ("Bunky," IL).
10380.7: VOA, Greenville, NC, w/AEF file nx in EE & FF at 0810, FDM 85/75N. Was //10382 (Ed.).
10386.5: JXA, Norwegian Army, Oslo, Norway, w a brief msg in Norwegian, ARQ, 0551-0554 (Ed.).
10410: Possibly GDR Embassy, Havana, Cuba, w/5L msgs at 0718, 425/50R (Ed.).
10413: RFFXL, French military, Beirut, Lebanon, w/"controle de voie," RYRY, & le bricks, ARQ-E/72 at 0612 (Ed.).
10419: Ethiopian Telecommunications Authority, Addis Ababa, w/RYRY & "REQ QRX" to ETD3, Addis Ababa Aero, 0356-0410, 425/50R. Began sending msgs at 0413 (Ed.).
10423.5: YMA20, Ankara Meteo, Turkey, w/coded wx, 850/50R at 0606 (Ed.).
10497.7: MKD, RAF, Akrotiri, Cyprus, w/RYI's & foxes, FDM 325/50R at 0242 (Williams, CO).
10610: MENA, Cairo, Egypt, w/nx in FF at 2106, 425/50R (Williams, CO). Callsign is SUA251—Ed.
10633: Un-ID w/coded wx at 0252, 425/50N (J.M., KY). Might be SUC, Cairo Aero, Egypt—Ed.
10648: TAD, MFA, Ankara, Turkey, w/telexes at 1611, 850/75R (J.M., KY).
10664.5: KAWN, Offutt AFB, NE, w/aero wx at 0409, 850/75N (Ed.).
10814.6: U.S. Army MARS sta. AAA0USA w/tfc to AAA3USA, Fort Meade, MD, packet 1030/300 at 0614 (Ed.).
10857.7: GXQ, British Army, London, England, w/RYI's & foxes, FDM 325/50R at 2152 (Williams, CO).
11006.8: AFRTS, Los Angeles, CA, w AP/UPI nx at 0408, FDM 85/50R (Williams, CO).
11251.7: MFA, Cairo, Egypt, w/an ARQ msg in AA at 1943 (Hetherington, FL).
11450: RDD77, Moscow Meteo, USSR, w/coded wx at 1403, 1000/50R (Ed.).
11458.5: Y7A49, MFA, Berlin, GDR, w/tfc to Bucharest, Romainia, 350/50R at 1355 (Ed.).
11497: SOL349, PAP, Warsaw, Poland, w/RYRY, 425/50R at 1346, foll by nx in EE at 1400 (Ed.).
11502: LZH4, BTA, Sofia, Bulgaria, w/RYRY, 425/50N at 1424 (Ed.).
12171.5: "WZ33" wkg "WR44" in SS, 850/50N at 0100 ("Bunky," IL). It appears that it's PWZ33, Rio de Janiero Navrad, Brazil, to PWR44. See next item—Ed.
12216.8: PWR44, Un-ID Brazilian Navrad, w/RYRY & aero msgs to PWZ33, Rio de Janeiro, 120/50N at 0040 (Joe Palkovic, FL, via Hetherington, FL).
13083.5: WLO, Mobile R., AL, w/tfc list & plaintext wx in ARQ at 1849 (Ronnie Rome, LA).
13092.5: UAH, Tallinn R., Estonian SSR, w/FEC telegrams to Soviet cargo ship UDUQ, Ivan Pokrovsky, at 1559 (Ed.).

Abbreviations Used In The RTTY Column

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

13098: WLO, Mobile R., AL, w/a xmsn schedule & instructions for using its autotelex facilities. Was ARQ at 2026 (Rome, LA).
13399: DFZG, MFA, Belgrade, Yugoslavia, w/nx in SC at 0700, and crypto at 1505, 425/75N (Ed.).
13351.7: MFA, Cairo, Egypt, w ARQ & FEC tfc in AA to Riyadh, Saudi Arabia at 0633 (Ed.).
13366.4: 5YD, Nairobi Meteo, Kenya, w/RYRY at 1747, FDM 85/50N (Ed.).
13393: Possibly GDR Embassy, Havana, Cuba, w/5L msgs, 2353-0008, 425/75N (Ed.).
13440: YZJ5, Tanjug, Belgrade, Yugoslavia, w/nx in EE at 0705, and nx in FF & EE at 1515, 425/50R (Ed.).
13464: YPM22, Romanian Embassy, QTH unknown, w/test tape + ID, 350/75R at 1556. Went to CW at 1601 (Ed.).
13524: YI072, INA, Baghdad, Iraq, w/nx smsn schedule, 425/50R at 1015 (Hetherington, FL)
13791.5: Un-ID w s/off in II at 1130, 170/50R (Hetherington, FL).
13872.5: HGX32, Hungarian Embassy, QTH unknown, w/RYRY ? s/off to HGX21, MFA, Budapest, 425/100 at 1705 (Hetherington, FL).
14353: Un-ID w/foxes & counting at 1607, 850/75R (Williams, CO).
14373: YIL71, INA, Baghdad, Iraq, w/nx in EE, 425/50R at 1609 (Williams, CO). The callsign here is YIL73, Dallas, YIL71 is to be found on 10162.5 kHz—Ed.
14478: Un-ID in ARQ, 1913-1916, w a brief msg in FF re not receiving part of a xmtd msg (Ed.).
14597.2: SPW, Warsaw R., Poland, w nx in Polish, FEC at 1852 (Ed.).
14716.5: RFHJ, French Navy, Papeete, Tahiti, w/"controle de voie," TDM-B/96 at 1527 (Ed.).
14747: Un-ID w TASS nx in RR, 425/50N at 1647. Might be RUZU, SAAM, Molodezhnaya, Antarctica, because of wx reports labelled "RUZU POGODA" (RUZU weather) before xmsn ended at 1723 (Ed.).
14771.8-14773.9: VER, Canadian military, Ottawa,

```
QRA QRA LZH-4 - 11502 KHZ - BTA - SOFIA - LZH 4 - 11502 KHZ
RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY
QRA QRA LZH-4 - 11502 KHZ - BTA - SOFIA - LZH 4 - 11502 KHZ
RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY
QRA QRA LZH-4 - 11502 KHZ - BTA - SOFIA - LZH 4 - 11502 KHZ
RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY RYRYRY
```

Test tape of the Bulgarian Telegraphic Agency was logged on 11502 kHz at 1424 UTC, 425/50N.

ON, Canada, w/crypto on 10 FDM channels, 170/75 at 1640 (Ed.).
14799.5: 3VA71, TAP, Tunis, Tunisia, w/nx in FF, 550/50N at 1552 (Ed.).
14807.7: RPFNN, Monsanto Navrad, Portugal, w/ RYRY, SGSG, foxes, & service msgs to RPTIH, 850/ 50N at 2129. First time I've seen use of RPFNN; have always seen RPFN (Ed.).
14864.7: Japanese Embassy, Lima, Peru, w/telexes in JJ, ARQ at 1723 (Ed.).
14867: MFA, Cairo, Egypt, w/telexes in AA, ARQ, 1609-1639 (Ed.).
14944: CLP1, MFA, Havana, Cuba, w/RYRY & encryption at 1545, 850/100N (J.M., KY). Although CLP1 has been logged numerous times near this freq., I hesitate to say that was your catch. Neither the 850 shift or the 100-baud speed are characteristic of CLP1. Therefore, I have given CLPI a tentative ID—Ed.
15647.2: PCW1, MFA, The Hague, Holland, w ARQ phasing sig + ID in CW at 1434 (Ed.).
15670: MTI, Budapest, Hungary, w/RYRY at 1613, foll by nx in SS, 425/50N (Ed.).
15681.5: Un-ID sta w s/off that included the II word "ciao." Was in ARQ at 1509 (Ed.).
15693: RWU55, APN, Moscow, USSR, w/nx in FF at 0920, 380/100 (Hetherington, FL).
15818.8: MKD, RAF, Akrotiri, Cyprus, w/RYI's & foxes at 1526, FDM 170/50R (Williams, CO).
15914: CLP65, Cuban Embassy, Managua, Nicaragua, w/5L grps & tfc to CLP1, 425/50N, 2110-2116 (Ed.).
15938.7: Un-ID Egyptian diplo, IDing as "WT 01," w/ tfc in AA to "WD JG," ARQ at 1633 (Ed.).
15988: ADN, Berlin, GDR, w/nx in FF at 1517, 325/50N (Williams, CO)
16066.5: IRO30, ANSA, Rome, Italy, w/nx in EE, 425/50N at 1820 (Ed.).
16125: Un-ID w/5L grps, 1511-1514, 500/75N (Williams, CO).
16136.7: Egyptian Embassy, Washington, DC, w/tfc in AA, ARQ at 1900 (Ed.).
16140: RGW28, TASS, Moscow, USSR, w/RYRY at 0558, 425/50R (J.M., KY).
16146: "66X," possibly USN, w/75-baud encryption at 1445 to "Y1V" and "Z9G" (Ed.).
16151.7: Egyptian Embassy, Algiers, Algeria, w/ARQ tfc in AA at 1502 (Ed.).
16181.7: Egyptian Embassy, QTH unknown, w/ARQ tfc to MFA, Cairo, at 1414 (Hetherington, FL).
16218: Un-ID w/5L msgs, 1552-1557, 75/425N (Ed.).
16249.5: VOA, Tangier, Morocco, w/RYRY to Greenville, NC, FDM 85/75N at 1445 (Hetherington, FL).
16265: CCS, Santiago Navrad, Chile, w RYRY/ SGSG/foxes/"test canal alfa," to NBA. Was 850/75R at 0032 (Williams, CO).
16314: Yugoslav Consulate, Toronto, ON, Canada, w/nx items from Toronto newspapers translated into SC. Was 425/75N at 1836 (Ed.).
16323: RFTJ, French military, Libreville, Gabon, w/tfc in FF at 1800, TDM/96-B (Ed.).
16350: Un-ID w/5F grps + a handtyped intro, 500/ 75N at 1804. Off 1826 w "AS QTC" (Williams, CO).
17198: GKE6, Portishead R., England, w/yacht position reports, FEC at 1700 (J.M., KY).
17349: CCS, Santiago Navrad, Chile, w/RYRY & foxes to NBA, 850/75R at 0045 (Hetherington, FL).
17397: RUEHC, U.S. State Department, Washington, DC, w/tfc to diplo posts and missions at 1330, 850/75N (Hetherington, FL).
17472: RPFN, Monsanto Navrad, Portugal, w/foxes & RYRY, 850/75R, 1523-1526, then service msgs to RPTI & RPTN, foll by crypto at 1529 (Ed.).
17492: SOR249, PAP, Warsaw, Poland, w/nx in EE at 1704, 425/50R (Williams, CO).
17502: RFFA, Defense Ministry, Paris, France, w/tfc to Martinique, ARQ-E/72 at 1737 (Ed.).
17525: OLV3, CTK, Prague, Czechoslovakia, w/nx in EE, 425/50N at 1624 (Williams, CO).
17540: NBA, USN, Balboa, Panama, w/tfc to HDN, 850/75R at 0031 (Williams, CO).
18623.8: CLP1, MFA, Havana, Cuba, w/5F grps to Tanzania, 500/50N at 0030 (Williams, CO).
18633.5: CLPI w circulars in SS at 1340, then 5F grps, 525/50 (Hetherington, FL).
19353.4: Un-ID sta w s/off in II in ARQ at 1351. S/ off read, "QSL QSL FINO AL NR 76 QRX NEXT SL VA VA VA" "Fino" was the one II word in the s/off (Ed.).
19405: TCC2, Interpol, Ankara, Turkey, wk/police bulletin in EE, ARQ at 1437 (Ed.).
19460: Un-ID w/5L grps, some CW, then nx, probably East European, at 1540, 425k/100N ("Bunky," IL). Thanks for the printout. It shows that you logged the Czech Embassy, Ottawa, ON, Canada. The lang was Czech—Ed.
19865.5: YZJ4, Tanjug, Belgrade, Yugoslavia, w/ RYRY at 1405, 425/50OR (J.M., KY).
20596: HBD46, Swiss Embassy, Havana, Cuba, w/5F msgs in ARQ, 1617-1628. S/off w "This is HBD 46." At 1751, HBD20/2, MFA, Berne, comes on w/tfc to Cuba (Ed.).
20619: OMZ. MFA, Prague, Czechoslovakia, calling KNY23, Czech Embassy, Washington, DC, 425/75 at 1738 (Hetherington, FL).
20889: Un-ID w/encryption after ZPZP, 425/75N at 1630 (J.M., KY). Might be a Yugoslav diplo—Ed.
22888: DFZG, MFA, Belgrade, Yugoslavia, w/RYRY, 3F grps, & crypto after XYXY. Was 425/75N at 1515 ("Bunky," IL).
23370: HZN50, Jeddah Meteo, Saudi Arabia, w/coded wx, 250/100N at 1347 (Ed.).
23561.7: PCW1, MFA, The Hague, Holland, w/ARQ phase sig & CW ID at 1351 (Ed.).
23840: RFFA, Defense Ministry, Paris, France, w/tfc to martinique, TDM-B/96 at 1420 (Ed.).
23921.5: RFFI, Defense Ministry, Paris, w/"controle de voie," ARQ-E3/96 at 1509 (Ed.). **PC**

Feeling Left Out?

Have your favorite communications (Police,Fire, etc) moved to the 800MHz band? Are the scanners available which access this band too expensive? If you are like many scanning enthusiasts, this can be a real dilemma. For those of you who are still in a futile search for 800 MHz coverage on your hand held scanning radio, GRE America, Inc. has a product for you. Introducing the newly developed ***Super Converter ™ II*** *which has all of the features that you have come to enjoy in our* ***Super Converter ™ 8001*** *(810 - 912 MHz coverage, etc.), and more. The* ***Super Converter ™ II*** *has a convenient switch which allows for an instant return to normal scanning frequencies without disconnecting the unit. It is also equipped with BNC connectors for easy adaptability to your handheld scanner.*

Intorducing the ***Super Converter 8001™*** *from GRE America, Inc. The* ***Super Converter 8001™*** *once attached allows any UHF scanning or monitoring receiver to receive the 810 to 912 MHz band.*

It has been our experience that most scanning radios suffer from a lack of sensitivity due to antenna and power limitations. Introducing the GRE ***Super Amplifier ™.*** *The* ***Super Amplifier™*** *is a compact pre-amp designed to work with scanners and it amplifies the reception of the VHF/UHF bands (from 100MHz to 1GHz) as high as 20db. The* ***Super Amplifier ™*** *has an adjustable gain which is controlled from the back of the unit and allows amplification level of up to 20db through all frequencies, equipped with a bypass switch to return to normal scanning frequencies. As with all other GRE products, you will find the quality and design of the* ***Super Amplifier ™*** *to be of the highest standard.*

NEW

Wide range frequency (up to 1GHz) antenna is exclusivley available from GRE America, Inc.

For more information, *or a dealer near you (new dealers are welcome), contact GRE America, Inc. at the address below.*

GRE America, Inc.

GRE

GRE America, Inc.
425 Harbor Blvd.
Belmont, California 94002

Telephone (415) 591-1400
Outside CA: (800) 233-5973
Fax: (415) 591-2001

CIRCLE 69 ON READER SERVICE CARD

PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

Based upon the reports coming in here over the past month the most active pirate currently must be **Hope Radio 16**. Unfortunately, they are still giving listeners the idea that reception reports will be handled by this column. The station was heard at 2325 on 7412, announcing 100 watts. (Sam Alcorn, NJ) on 7416, featuring George Carlin comedy, around 2200-2300 and readings from *POP'COMM*. (Nils R. Bull Young, OH) 0330-0400 close on 7416 and 0100-0156 sign off with comedy bits. (Tim Tobin, IN). 2200 on 7375. (Gary Veraldi, Ontario) 7416 at 2230-2345. (Doug Ferguson, TX) 7376 at 2308 and 7414 around 0200. (Jerry Coatsworth, Ontario) 2308-2356 on 7415. (Tim Tromp, MI). A letter, apparently from the station operator, says 7415 is the main frequency, 7375 an alternate. Usually operates from 0300-0500 Friday, Saturday and Sunday.

There were couple of pirates which may have been active only for the Christmas holidays: **Radio Yuletide** ". . . from the North Pole" heard on 7415 at 0300. (Skip Harwood, CA) and **Voice of the North** on 15047 at 1904 to 1916 sign off. (Pat Murphy, VA).

Scottish pirate **Weekend Music Radio** was heard on 15043 at 1330. (Murphy) Pat is a radio announcer and says it's his voice on the Weekend music Radio IDs!

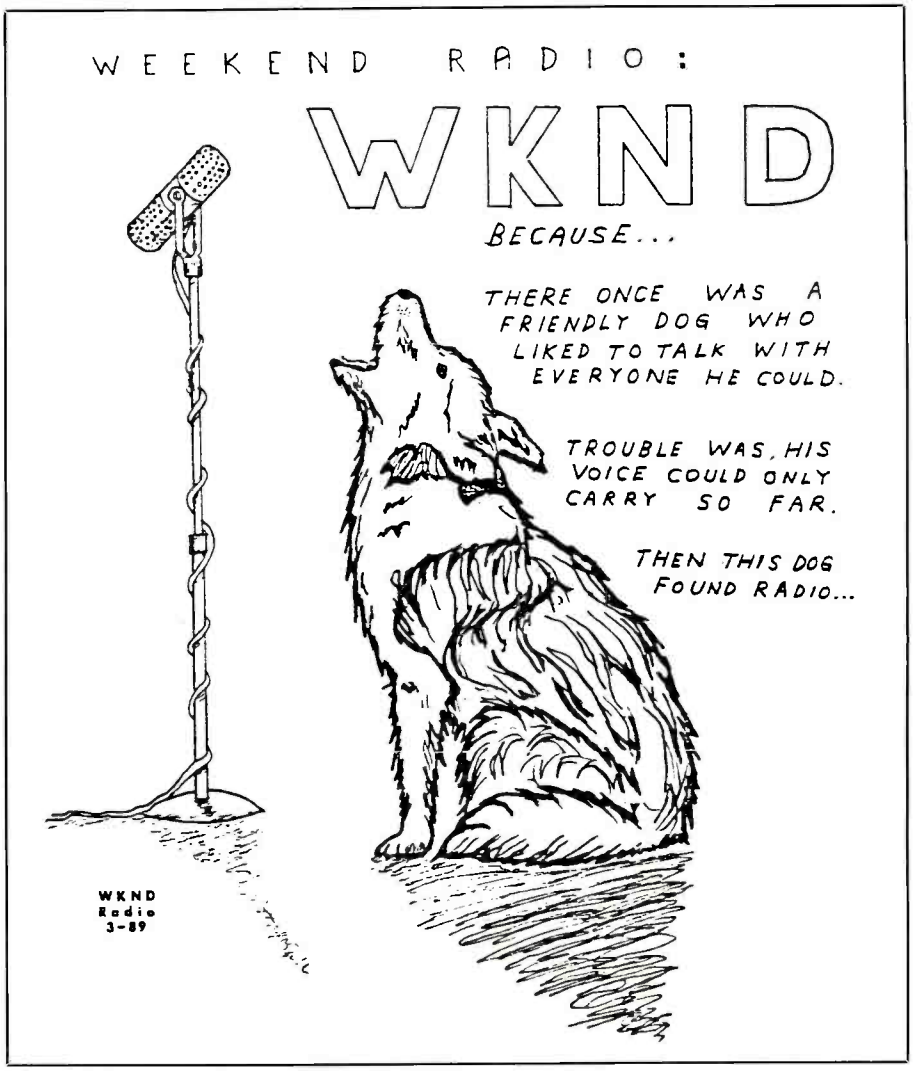
Secret Society Radio heard on 7412 at 2300 with bluegrass music and address given at PO Box 6527, Baltimore, MD 21219. (Murphy) 2242-2305. Announcer had a southern accent and played a newer rock music format. (Tromp) 6850 at 2150-2213 with announcer "Pirate Jim." The QSL says they sometimes relay the Voice of Stench on 7410. (McSemek)

Voice of Stench on 7410 at 0008-0024 on 7435 with Dr. Klystron who said power was 1 KW from an old converted RCA broadcast transmitter. Uses the "Rocky" theme and claims to be from the "Great Dismal Swamp" in eastern Virginia, studios "near Warfield, VA." Excellent signal strength. (Ferguson). Also heard by Ed Massey, MS.

Blue Grass Jammer noted on 7420 at 0215 with old bluegrass songs. (Paul Kruzona, MA)

Radio USA with "Mr. Blue Sky" on 7410 at 0303 with hard rock and skits to 0327 sign off. (Raymond Arritt, KS) 7413 at 0308-0343 with punk rock. (Nick Grace, MA)

Voice of Radio Free Indiana, 7415 at 0009 and 0028 with 70's rock and mentions of "Hello Radio" (see **Pirate's Den,** December, '89). Gave Slanesville, WV address. (Arritt) 0009-0020. (Grace) 7416 at 0056. (Tromp)



WKND sent this full size sheet to Jim Kalach in Connecticut.

WRNR on 6250 at 0015 with music, distorted ID. (Grace) Both Nick and McSemek say reports to the announced Hudson, NY address were returned by the post office.

Radio Free Willy with country music on 7406 from 0443-0543, also comedy skits. (Grace)

WXZR Meontological Research Radio on 7435 at 2341-2345 and 7425 at 0441-0453. "Klaus" was the host in one broadcast, "Stanya" in the other. New age and Eskimo music. Talk of liberating Greenland from Denmark and mentions of the "National Front from the Salvation of Greenland." (Grace)

Radio Mexico/WXZR on 7485 at 0546-0559. A joint broadcast with ID' in Spanish by "Radio Mexico" which supposedly was taking a feed of WXZR by phone. Gave Slanesville address. (Grace)

Radio Garbanzo, 7486 at 0152-0220 with "Fearless Fred" playing comedy and rock. Wellsville, NY address given.

East Coast Pirate Radio on 7485 from 0456-0501 with Arlo Guthrie and address at P.O. Box 6527, Baltimore, MS 21219. (Grace)

SBRI hard on 7478 at 1620-1702 with soul music (Tromp)

WJDI on 1621 from 0400-0615 with old pop and rock, fake commercials, frequent ID's as "The Voice of New York" and claiming "2,500 clear watts." (Tromp)

Radio USSR (Scientific Socialists Radio) on 7419 from 0222-0315 with old classical music, "dedicated to the People's Republic of China." At times the station sounded just like the Moscow outlet on 7420. (Tromp)

Nick Grace notes increased pirate activity in the 6800-6950 region. He says WKND, Secret Society Radio, Radio Chesapeake Bay International, Voice of Stench, Radio Garbanzo and WVOD have either shown

up here recently or are planning to in the near future.

Nick also provides some address information taken from a recent A*C*E bulletin: P.O. Box 452, Wellsville, NY 14895 is good for the following stations: KCCA, KFAT, KMUD, KNBS, KROK, KUXN, Lazer 95, Plan 9, Radio Contraband, Radio Emerald Forest, Radio EXP, Radio Garbanzo, R. Free Mumbo-Jumbo, R. North Coast International, R. USA, WQTU, Secret Mountain Laboratory, Toynbee Radio, Voice of Aphrodite, V of Bob, V of Fubar, V of the Golden Eagle, V of Leslter, V of Laryngitis, V of the Rainbow, 74-WKUE, Kray Radio, Zeppelin R. Worldwide and Zodiac Radio.

P.O. Box 628, Slanesville, WV 25444 will work for Howdy Doody Radio, KRUD, Secret Radio, Midnite Radio, One More Voice From America Radio, R. Flatuence, Radio Chesapeake Bay international, R. Comedy Club International, RFM, Voice of the Epileptic Catfish, V of Monotony, V of Stench, WCRP, WENJ, WHIP, WKZP, WOMB, WPUB, WXZR and V of the Purple Pumpkin. (Bulletin of the Association of Clandestine Enthusiasts, via Nick Grace)

Obviously, pirate radio activity continues to be intense and I hope all of you are logging your fair share. I appreciate all the support this column is getting in the form of loggings, station information and copies of QSL's. keep 'em coming! PC

HOW I GOT STARTED

Popular Communications invites readers to submit, in not more than 125 words, how they got started in the communications hobby. Each month, we'll select one and run it, and award its sender with a one year's subscription or subscription extension. We'll accept them (preferably) typewritten, or otherwise easily legible. If your have a photo of yourself taken recently, or when you got started, please include it with your story. We can't return or acknowledge material whether we use it or not. you need submit you story only once, we'll keep it on file and consider it for future issues. All submissions become the property of Popular Communications.

Entries will be judged taking into consideration if they tell a story that is especially interesting, amusing, or otherwise unusual. We reserve the right to make any necessary syntax, spelling, or grammatical corrections, or minor wording changes to improve style.

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

Winner for May: Michael Miranda, Charlotte, NC who told us:

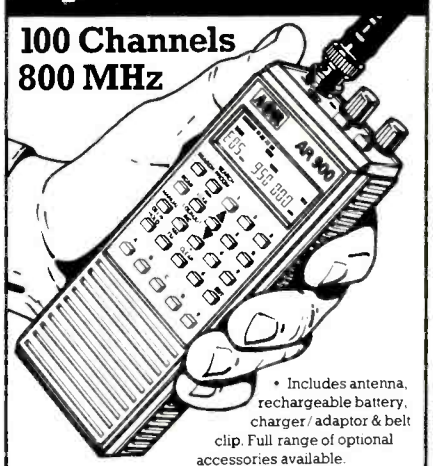
"It's difficult to pinpoint the exact date radio became important to me. Since I had no brothers or sisters, it's a companion I've always had, and I was hooked on mediumwave DX by the time I was 12 years old. We then lived in Buffalo, NY and I found that my 5-tube Admiral could bring in stations like WABC, WPTF, CKLW, and WSM.

"Moving to Florida (in '65), I enjoyed being able to DX Buffalo's WKBW for hometown news, also others like WLW, WDAE, and powerhouse WBT. Even though my best friend in junior high school got a ham ticket (WB4OOL), my own interests remained in the realm of broadcasting. Eventually, I opted for a career in radio which started me announcing at Ft. Lauderdale stations WAXY (FM) and WFTL (AM). Today, I do contract engineering work for WNOW/1130 in Mint Hill, NC, and weekend announcing on that station I first heard as DX in Florida 25 years ago, WBT, Charlotte, NC. Saturday nights we do a program of 1940's and 1950's pop music, and I enjoy receiving calls from other DX'ers from Florida to Canada. My name on the air is Mike Sheridan.

"Radio is my profession and still my hobby. A few years ago I purchased my first SW receiver (SONY ICF-7600-D), and now *POP'COMM* has become an important resource for information." PC

New Scanner by AOR

100 Channels 800 MHz



- Includes antenna, rechargeable battery, charger/adaptor & belt clip. Full range of optional accessories available.
- Covers 27-54 MHz, 108-174 MHz, 406-512 MHz, and 800-950 MHz.
- 5 Scan Banks and 5 Search Banks.
- 25 Day Satisfaction Guarantee, Full Refund if not Satisfied.
- No Frequencies cut out.
- Size: 2" x 5¾" x 1½" wt: 12 oz.

AR900
Total Price, Freight Prepaid (Express Shipping Optional)
$259.00

ACE COMMUNICATIONS
10707 E. 106th St. Indpls., IN 46256
Toll Free 800-445-7717
Visa and MasterCard (COD slightly higher)
In Indiana 317-849-2570 Collect FAX (317) 849-8794

CIRCLE 43 ON READER SERVICE CARD

SHORTWAVE RECEIVERS. HAM RADIOS. ANTENNAS, SCANNERS. Business Radios. ICOM, YAESU, KENWOOD, SONY, MOTOROLA.
... our 40th Year ... Worldwide shipping.
Sales ... Service. Large Showroom. Open 7 days.

WE SHIP WORLDWIDE
Barry Electronics Corp.
WORLD WIDE AMATEUR RADIO SINCE 1950
Your one source for all Radio Equipment!

212-925-7000 or Fax 212-925-7001
512 Broadway, NYC, NY 10012

CIRCLE 44 ON READER SERVICE CARD

★ HAVANA MOON'S ★
"Los Numeros On-Line®"
Int'l E-mail, Articles & "On-Line DXing w/ HM," Harry Helms, Kristin Kaye, Zel Eaton, John Fulford (WA4VPY) & "The AMIGAS."
Based on PORTAL' — The AFFORDABLE "On-Line System"
Call 408/973-9111
★ Reaching Over Thirty Countries ★

NextDay Reception Reports
Two-Color Printing
Rainbow Cardstock
100 200 300
$19.95 $24.95 $29.95
Specify • Receiver
• Antenna
• Your 40-Word Personal Message

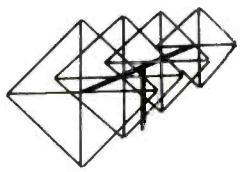
• Command Attention • Send Clear Reports • Speed Replies • Save Time •
Box 50062-P • Provo, UT 84605 • *AntennasWest*

CIRCLE 5 ON READER SERVICE CARD

SE SIGNAL ENGINEERING's High Performance *CB* Antennas

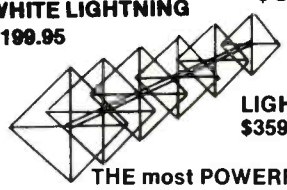
SUPERHAWK $114.95

Goldenrod 45 Mobile Antenna



SPYDER A $35.95

WHITE LIGHTNING $199.95



LIGHTNING 6 $359.95

THE most POWERFUL CB base in the world today!

All SE PATENTED rotary beams are true quads and OUTPERFORM their counter parts (quad/yagi types). SE's patented SFS matching system makes SE QUADS the most technologically advanced antennas in the world today.
If your dealer doesn't have SIGNAL ENGINEERING, write or call for full specs. DEALER inquiries invited.

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

EMERGENCY

COMMUNICATIONS FOR SURVIVAL

BY GORDON WEST, WB6NOA

Instant HF Antenna System

During an emergency communications set-up, quick access to high frequency 3-30 MHz operation is desireable. ham bands like 75 meters, 40 meters, and 20 meters can carry a ton of incoming and outgoing traffic. There are MARS allocations on the edge of these ham bands, too, for military traffic. up in the remote parts of Alaska, there are also specific high frequency emergency channels, too.

Coming up quickly on many different high frequency bands may sound easier than it is. Sure, a mobile whip, or a set of whips, attached to a magnetic mount, mounted on a big metal drum, will serve as a nice H.F. antenna system. But what happens if you have an irregular ground—or no ground at all? There is no way you are going to get a mobile whip system to work without suitable ground plane.

Such was the case when I went up to Santa Cruz and found that the tent mobile command post was smack dab in the middle of a dirt field, with nothing metal around us to ground our antenna system to.

A dipole antenna is fine, but this requires precise cutting for each band of operation, trimming and tweaking, and the wires normally must be fairly straight.

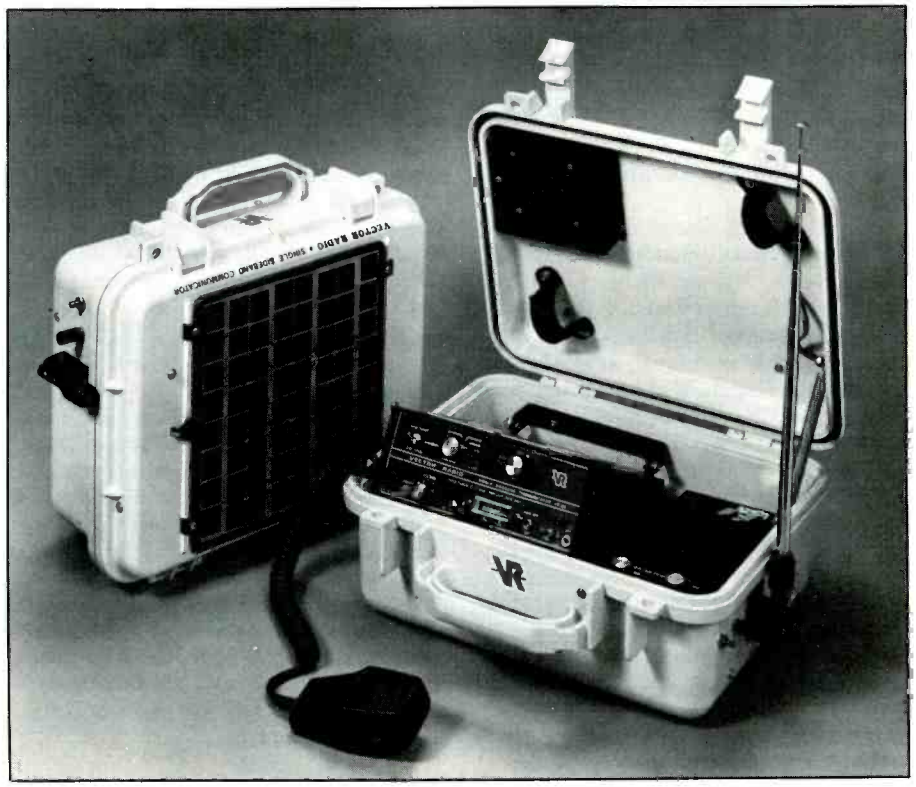
I know, I know, you have heard all about it—it's nothing more than a resistive dummy load that matches your H.F. transceiver, but gives no output. Not true.

Maxcom does work and it will lead to immediate access to the high frequency airwaves with a decent signal. No, the signal won't be as strong as if you were using a conventional, precise-cut dipole, but what's a few S-units if you are normally 40 over S-9 in signal strength?

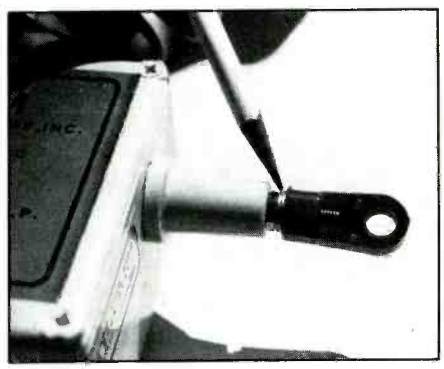
The Maxcom unit can operate like a dipole, or a long wire. Almost any length of wire will make it work as a dipole. As a long wire, it works better if the tail is well-grounded to the earth.

Simply string out the wires as best you can, connect them to Maxcom, and then connect Maxcom to your high frequency transceiver with regular coaxial cable. Your H.F. transceiver will look at the Maxcom load, and instantly put out 100 watts.

This in itself is unique to Maxcom—any other type of antenna matching system could cause your transceiver to dramatically reduce its power output as it senses a slightly or drastically elevated input SWR. In fact, there are some excellent antenna systems out there that work well, but the SWR is relatively high, and this causes the output power of your transceiver to cut back to as little as 20 or 30 watts out. In cases like this, the Maxcom unit will improve your signal.



Maxcom antenna matcher lets this emergency SSB tune to any frequency.



One way to confirm Maxcom's power output-see if you can detect a tiny R.F. spark.

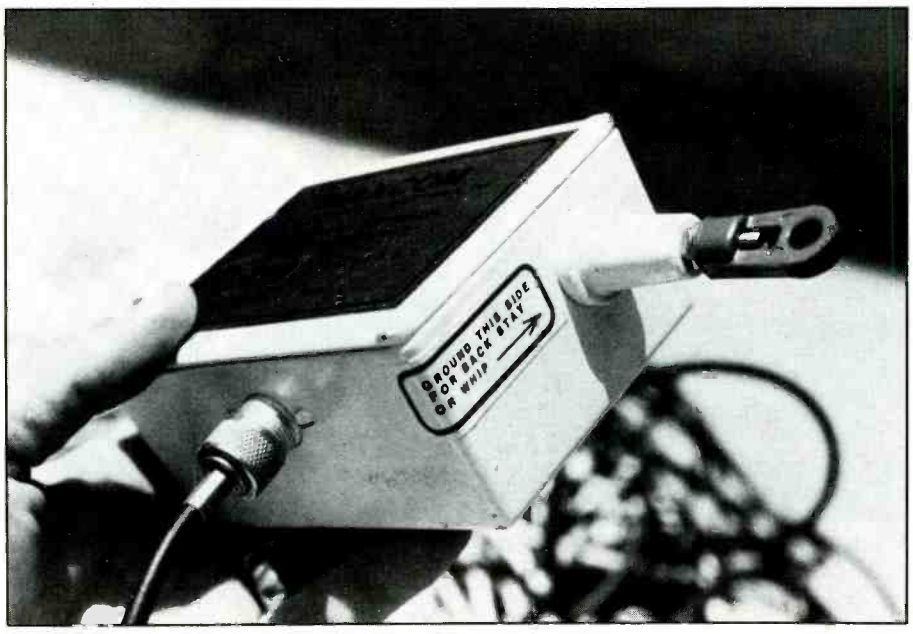
The Maxcom unit is indeed a resistive-type matching network, gobbling up some of your output power in heat-loss. But most important, it does deliver some power into the wires, and gives you a signal out there on the airwaves, instantly.

Since it's solid state, it needs no 12 volts. You can bash it with a hammer, and it will still work—everything on the inside is potted. Nothing moves. You can drop it, kick it, and submerge it, and it will continue to operate. You can't say this about any other type of fully automatic antenna matching device.

In Santa Cruz, one of the wires on our Maxcom unit got a quick brush of electricity from an open generator. No problem—the Maxcom unit protected our rig, and still continued to put out a signal.

Sonny Irons of Maxcom claims, "7,000 Maxcom users around the world have learned to appreciate the indestructibility of this matching device. And I don't believe the station that I am calling is going to give a (expletive deleted) if my signal is an S-7, when another coupler might have given them an S-9," adds Irons. He's right. If you're working on a strong signal net, what's a few S-units to give up when you can get on the air immediately with Maxcom.

So Maxcom has a place in your arsenal of antenna matchers in your emergency communications package. You can load any



This Maxcom will easily handle 250 watts P.E.P. output.

type of rig into it with some sort of output on the wires—I've even loaded my 2-meter transceiver into it, and it works okay. Yes, a dedicated antenna system, or better yet, an $800 fully automatic antenna matcher will indeed put out a greater signal strength—but when the chips are down, and you need to come up on an H.F. net immediately, going to the Maxcom will surely get some kind of signal out there to bounce off the ionosphere and come back down with enough intensity to be read by the other station.

And in an emergency, that's a very important consideration—coming up on the net quickly, and without worry of burning up your new H.F. transceiver. PC

PC SWL $99.00

A Complete Digital Reception System

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 with any IBM PC or Compatible computer. The product consists of:

Demodulator
Digital Signal Processing Software
80 Page Tutorial Reference Manual
World Press 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.

ADVANCED FEATURES:
Tuning Oscilloscope
Digital Waveform Presentation
Auto Calibration and Code Recognition
Continously Tunable Filter Frequencies
Variable Shift
Adjustable CW Filter Sensitivity
Farnsworth Code Compatibility
Unattended Capture and Printing

Software Systems Consulting
150 Avendia Cabrillo "C"
San Clemente, CA 92672
(714) 498-5784

CIRCLE 53 ON READER SERVICE CARD

ART-1

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**

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**

AIR-1

SWL

SWL: A receive only cartridge for CW, RTTY (Baudot & ASCII) for use with Commodore 64/128. Operating program in ROM. **$64.00**

AIRDISK: An AIR-1 type operating program for use with your interface hardware. Both VIC-20 and C64/128 programs on one disk. **$39.95**

AIRDISK

AIR-ROM: Cartridge version of AIRDISK for C64/128 only. **$59.95**

MORSE COACH

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**

G AND G ELECTRONICS
OF MARYLAND
8524 DAKOTA DRIVE, GAITHERSBURG, MD 20877
(301) 258-7373

CIRCLE 50 ON READER SERVICE CARD

Computer Aided Scanning

a new dimension in communications from Datametrics

Now you can enhance your ICOM communications receiver through a powerful computer controlled system by Datametrics, the leader in Computer Aided Scanning. The system is as significant as the digital scanner was five years ago and is changing the way people think about radio communications.

- The Datametrics Communications Manager provides computer control over the ICOM R7000 or R71A receiver.
- Powerful menu driven software includes full monitoring display, digital spectrum analyzer and system editor.
- Innovative hardware design requires no internal connections.
- Comprehensive manual includes step by step instructions, screen displays, and reference information.
- Extends ICOM capabilites including autolog recording facilities, 1000 channel capacity per file, and much more.
- Overcomes ICOM limitations such as ineffective scan delay.

Datametrics, Inc

__ R7000 system ~~$349~~ $299 until
__ R71A system ~~$349~~ June 30
__ Manual and demo disk $15

Requires ICOM receiver and IBM PC with 512K and serial port. The R71A version also requires an ICOM UX-14.

Send check or money order to Datametrics, Inc, 2575 South Bayshore Dr, Suite 8A, Coconut Grove, Fl 33133. 30 return priviledges apply.

CIRCLE 49 ON READER SERVICE CARD

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

There were storm clouds over Radio Canada International last fall—threats that drastic cuts in the Canadian budget might mean that RCI would have to severely curtail its broadcasts or even close down completely. As things turned out RCI has had to absorb only a 12% budget reduction which—though certainly a case of belt tightening—means RCI will continue on much as it has.

As part of its ongoing interest in improving reception of its broadcasts in Asia, RCI has been talking to Korea about the possibility of exchanging transmitter time. RCI would broadcast its Mandarin service for two hours daily via Radio Korea's transmitters and Radio Korea would air its English, Spanish and Korean programs to the Americas via the RCI Sackville transmitter. There were hopes this arrangement could be underway fairly quickly so by now the deed may have already been done! And don't be surprised if RCI pulls off more of these two-way deals, or even simply rents transmitter time on its Sackville facility to other broadcasters.

January 24 was the day planned for the introduction of the new 100 kW Radio New Zealand transmitter at Raangitaiki on the north island. The date was picked to coincide with the opening of the Commonwealth Games. The following schedule may be a bit out of date by the time you read it, but, even so, it will serve as a good starting point if you want to check out signals on the new Radio New Zealand:

1700-1900 on 17730 (alternates 17680 or 15485)

1905-2100 on 17730 (alternate 9850)

2100-0000 on 17705 (alternates 17680 or 15485)

0330-0600 on 17705 (alternate 17680 or 15485)

0630-0930 on 17730 (alternate 9850)

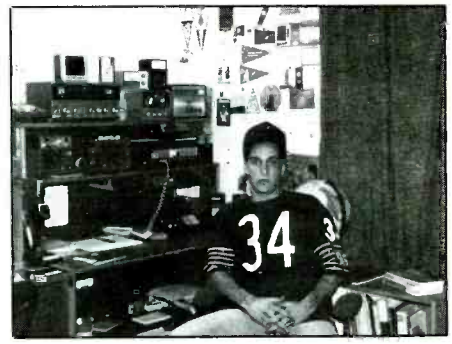
That will answer a couple of reader questions this month. And thanks to John Carson in Norman, Oklahoma for sending the information.

Jibouti is one of the tougher countries to log on the SWBC bands. But that's going to change when Radio France International puts a trio of 500 kW transmitters there as a new relay site. The aim is to improve reception of RFI in Africa and the mideast. It'll be 1991, maybe later, before these get rolling.

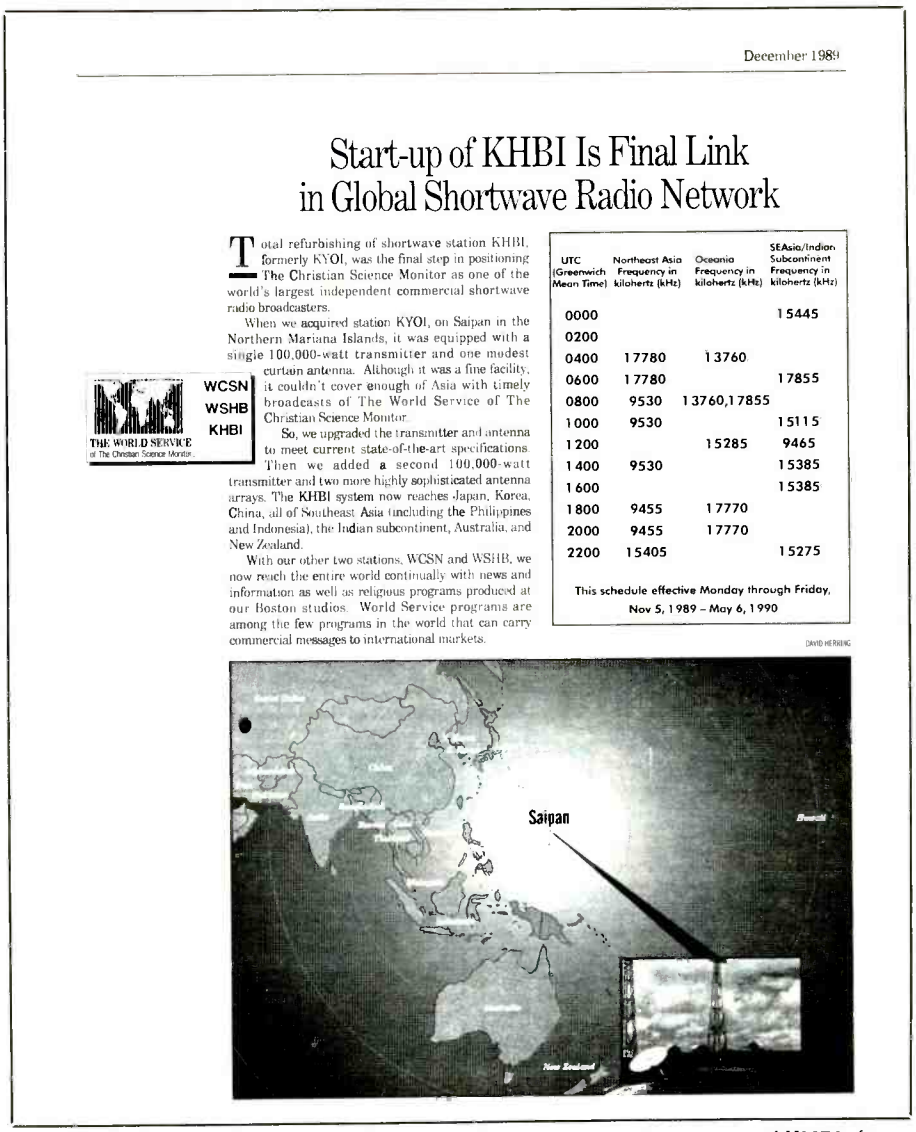
The Voice of Turkey is planning the addition of five—500 kW transmitters to give it a better worldwide signal. It'll be about three years before all of them are active, though the first should be on the air well before.

India continues to expand its shortwave services, though All India Radio remains a difficult station from which to get a listenable signal. New transmitters are now on the air from Leh in Kashmir and Port Blair in the

By now, we may be hearing Radio Korea via the facilities of Radio Canada Interntional. QSL courtesy of Anthony Pannone.



Here is Listening Post reporter Anthony Pannone in his East Haven, CT shack. The main SW receiver is a Kenwood R-600. Anthony is a ham, too. His call is KA1QGC.



December 1989

Start-up of KHBI Is Final Link in Global Shortwave Radio Network

Total refurbishing of shortwave station KHBI, formerly KYOI, was the final step in positioning The Christian Science Monitor as one of the world's largest independent commercial shortwave radio broadcasters.

When we acquired station KYOI, on Saipan in the Northern Mariana Islands, it was equipped with a single 100,000-watt transmitter and one modest curtain antenna. Although it was a fine facility, it couldn't cover enough of Asia with timely broadcasts of The World Service of The Christian Science Monitor.

So, we upgraded the transmitter and antenna to meet current state-of-the-art specifications. Then we added a second 100,000-watt transmitter and two more highly sophisticated antenna arrays. The KHBI system now reaches Japan, Korea, China, all of Southeast Asia (including the Philippines and Indonesia), the Indian subcontinent, Australia, and New Zealand.

With our other two stations, WCSN and WSHB, we now reach the entire world continually with news and information as well as religious programs produced at our Boston studios. World Service programs are among the few programs in the world that can carry commercial messages to international markets.

WCSN
WSHB
KHBI
THE WORLD SERVICE of The Christian Science Monitor

UTC (Greenwich Mean Time)	Northeast Asia Frequency in kilohertz (kHz)	Oceania Frequency in kilohertz (kHz)	SEAsia/Indian Subcontinent Frequency in kilohertz (kHz)
0000			15445
0200			
0400	17780	13760	
0600	17780		17855
0800	9530	13760,17855	
1000	9530		15115
1200		15285	9465
1400	9530		15385
1600			15385
1800	9455	17770	
2000	9455	17770	
2200	15405		15275

This schedule effective Monday through Friday, Nov 5, 1989 – May 6, 1990

DAVID HERRING

The new Christian Science Monitor newsletter announces the start-up of KHBI, formerly KYOI-Saipan.

Andaman and Nicobar Islands (don't ask why they chose to put both on 4760—the best time/frequency bet for reception in North America!)

Also in play now is a new outlet at Shillong in the northeast. Another new outlet at Dodballapur (near Bangalore) was testing in late '89 and into the new year. Other new or improved transmitter sites for All India Radio include Poona, Triyandrum, Bhopal, Kohima, Imphal, Itanagar, Gangtok, Madras and Hyderabad. Once it's all sorted out and in operation we'll have a lot of targets to go after in this country.

As mentioned in a previous column, some of the Radio Nacional stations in Brazil have gone from government to private ownership. That has brought name changes: Radio Nacional Manaus (4945) is now Radio Cabocia, Radio Nacional Boa Vista (4875) has become Super Radio Roraima and Radio Nacional Macapa (4915) now IDs as Radioifusora Macapa.

Radio Australia planned to end its broadcasts "to" North America, Europe and possibly even New Zealand, according to a letter from Marion Leiba to Dr. Adrian Peterson of Indianapolis. As Dr. Peterson notes, however, Radio Australia has not had any broadcasts specifically intended for Europe or North America in several years. The change may be simply one of news emphasis.

The *Christian Science Monitor* is publishing a new newsletter called *Monitor Month* which covers developments on all the organization's media fronts—the newspaper, *MonitorRadio* (the domestic radio program), the shortwave network, the TV show "World Monitor" and the monthly magazine *World Monitor*. You can probably get on the mailing list for this by writing to Monitor Month, One Norway Street, Boston, MA 02115.

The music is the message. Bill Walbesser of Revena, New York writes about monitoring Radio Prague during Czechoslovakia's transition from communism. Bill says that, shortly after the demonstrations began and the government said it would consider making cabinet changes it named a new director for Radio Prague. Then, "on the day the government did name new cabinet ministers—which many Czechoslovaks considered a trick since the communists still retained control—Radio Prague ended its broadcast with the theme from "The Sting"—a story about he exploits of two con men!

"The very next day, when that new government collapsed after another round of demonstrations, Radio Prague ended its broadcast with an instrumental version of the rock tune "Another One Bites the Dust"!

"On December 10th (11th UTC) when an acceptable government was named, Radio Prague played a Czechoslovak version of Bob Dylan's 'The Times, They Are A-Changin'" and announced that it was discontinuing its "Jogging With Radio Prague" program because they had just received previously classified statistics on air pollution in Prague and considered it 'unethical' to promote jogging until the environment in Czechoslovakia improved."

Bill also says he heard the station announce that it would no longer use the term "restructuring" to describe the political changes in the country because the station considered the term to be "Orwellian doublespeak" and would use "reform" instead. Great stuff! Thanks, Bill!

Anthony Pannone of East Haven, CT sends his shack photo this month (where's yours?) and notes that he's a member of the Radio Prague Monitor's Club. Anthony, Radio Africa can be QSL'd by reporting to Pierce International Communications, 10201 Torrence Ave., Suite 320, Cupertino, CA 95014. They arrange the programming for this station.

Our article on logging 100 countries a couple of months back brought a comment from Mike Perry in Texas who notes that some of those on the list don't QSL. Well, the operative word in the article was "logging," Mike. The article was more concerned with that than with QSL'ing. But there is always a way to QSL most any station, never mind what the official policy might be. Figuring out a way to do it is part of the fun and challenge. Mike also says he hasn't had much luck in hearing the Pacific stations and wonders if anyone has any tips. Maybe there's a DX'er nearby who'd like to get together with Mike and compare notes? You can reach him at 3818 Marion Street in Corpus Christie, Texas.

Remember, your SWBC loggings are always welcome. We ask only that you double space and include your last name and state abbreviation on each item. Shack photos, QSL's you don't need returned, station information and schedules, news clippings and your questions and comments are always welcome as well. So, let's hear from you soon and often!

Here are this month's loggings. All times are UTC and language is English unless otherwise noted.

Albania: Radio Tirana, 7215 at 2230. (Walbesser, NY) 9760 at 2330. (Neff, FL; Perry, TX) //11825 at 2335. (Carson, OK)

AntiguaA: Deutsche Welle relay at 1400 with ID on 17715. (Walbesser, NY)

Armenian SSR: Radio Yerevan, 15510 at 1230 in unidentified language, no ID noted. (Northrup, CT)

Australia: Radio Australia, 9580 at 1310. (Aquilante, RI) 9655 at 0700. (Carson, OK) 15320 at 0327. (Carpenter, OH) 17795 at 0012. (Pannone, CT)

ABC Perth on 15425 at 0800; 0810. (London, MN; Johnson, IL)

Austria: Radio Austria International, 6015 (via Canada, editor) at 0535 and 0538. (Strawn, TX; Walbesser, NY) 6155 at 0543, 9870 at 0230 in GG and 11825 at 2335. (Norman, OK) 9875 at 0140. (Perry, TX) 21475 at 1130. (Carpenter, OH)

Bangladesh: Radio Bangladesh, 15195 at 1230 with news and "Panorama". (London, MN)

Belgium: BRT on 9925 at 0030, 0035. (Perry, TX; Reynolds, MO) 13675 at 1830. (London, MN)

Brazil: Radiobras, 11745 at 0158 with IS and commercials. (Carson, OK) 0200, 0214. (Perry, TX; Reynolds, MO)

Radio nacional Amazonia, 11780 in PP commercials, IDs at 0822. (Carpenter, OH) 0830 with music. (Johnson, IL)

ALPHA DELTA Model DX-EE
Limited Space High Performance
Multi-Band Dipole

- **"No-Trap" design provides exceptional broad spectrum receive coverage from 5 MHz thru 30 MHz. Covers world-band broadcasts and "utility" frequencies in a single antenna.**
- **2 kW transmit capability in the 7, 14, 21, and 28 MHz ranges without a tuner. Broad HF range transmit coverage with a widerange tuner.**
- **Designed for rooftop, attic, and condo installations where space is at a premium. Only 40 ft. overall length.**

• kW size components, stainless steel hardware, and 12 GA. copper wire means the **Model DX-EE** has less loss than light-duty receive-only antennas. The Alpha Delta design concept does not permit the use of small, lossy traps as found in other brands. If you put RF power in the small trap-type models they will "smoke"—not what you want in a precision antenna!

• Frequency selection in the **Model DX-EE** is by a combination of special broadband RF choke-resonators **and** full size radiators on various ranges. An antenna loaded with a number of traps in each wire is so narrowbanded, its useful ranges are severely limited.

• Special hardware and connector arrangement on the **Model DX-EE** accepts **either** balanced or coax feed. With other brands you have to make a choice of models.

• The instructions with **Model DX-EE** show how to tune it for transmit. For receive applications no tuning is necessary. Since it comes assembled, just take it out of the box, put it up and enjoy great DX!

Model DX-EE . . . $84.95 ea. at your Alpha Delta dealer. Add $4.00 shipping & handling for direct orders in the U.S. Exports quoted.

MasterCard VISA **ALPHA DELTA COMMUNICATIONS, INC.**

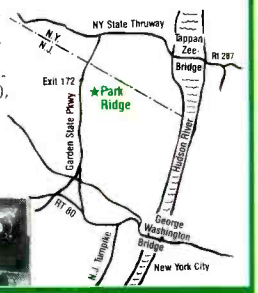
P.O. Box 571, Centerville, Ohio 45459 • (513) 435-4772 AA

CIRCLE 42 ON READER SERVICE CARD

GILFER — first in Shortwave

JRC NRD-525 "No. 1 receiver outside the commercial/military bracket... way ahead of the competition... outstanding in all modes... a best buy." — *R. Lichte*. CPU control, 0.15-30MHz, computer interface, 200 memories, PBT, blanker, notch, scan/sweep, clock. **DATONG FL-3 AUDIO FILTER** (atop NRD 525) Automatic, tunable 12 pole filtering makes weak sigs audible, removes noise, hetrodynes; dual notch plus hi/lo pass filters.

VISIT GILFER'S STORE
Easy to find, accessible from New York City. Take Garden State Parkway (NE portion of N.J.), Exit 172. Gilfer is in the center of Park Ridge, opposite the Borough Hall. Store hours: M–F 10am–5pm, Sat. 10am–3pm.



Order operators: 1-800-GILFER-1
(1-800-445-3371) NJ 201/391-7887

GILFER SHORTWAVE
52 Park Ave.• Park Ridge, NJ 07656

CIRCLE 4 ON READER SERVICE CARD

CHANNEL CLEANER™

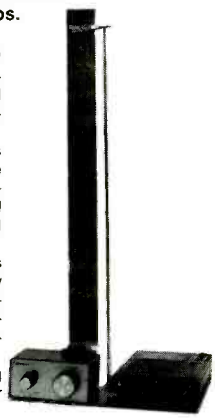
- **New reception principle.**
- **Reduce interference 15-30 dB.**
- **For small portable radios.**

Bugged by interference? Two stations on one frequency and you can't understand either one? Splatter? Heterodynes?

Channel Cleaner™ solves these problems. Simply place your radio on Channel Cleaner's platform. Tune **Channel Cleaner™** and rotate it to null out the interference.

Channel Cleaner™ makes a directional radio frequency shadow that shades your radio's antenna from the interference. Reception in all other directions is normal.

Experience this exciting new development. Order your **Channel Cleaner™** today.



Model PA-420 Channel Cleaner™ $79.95 + $4 shipping/handling in U.S. & Canada. California residents add sales tax.

MasterCard VISA

Send for FREE catalog that shows our complete line of antennas, preamplifiers, and filters.

PALOMAR ENGINEERS
BOX 455, ESCONDIDO, CA 92025
Phone: (619) 747-3343

Abbreviation 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**

Radio Cultura do Para, 5045 in PP with folk music, announcements and ID at 0811. (Carpenter, OH)

Bulgaria: Radio Sofia, 7115 at 0400-0457. (Perry, TX) 11680 at 0057 sign off. (Walbesser, NY) 11730 at 0400. (Reynolds, MO)

Cameroon: CRTV Yaounde, 4850 at 2208-2233 with news in FF, music, woman announcer. (Tuchscherer, WI)

Canada: Radio Canada International, 5960 at 0143. (Reynolds, MO) 6150 at 0600 and 13650//15315 at 1550. (Carson, OK) 9755 at 0045. (Neff, FL) 15140 at 2015 in FF. (Strawn, TX) 15325 in FF at 1703. (Walbesser, NY)

CBC Northern Quebec Service, 9625 at 0600. (Carson, OK)

CFRX relay CFRB on 6070 at 0604. (Carson, OK) 1350 (Aquilante, RI)

CKZN St. John's, 6160 at 1036 with CBN relay. (Neff, FL)

Chad: Radiodiffusion Tchadienne, 4904.5 at 0430 with children's choir, announcer in FF. (Johnson, IL)

China: Radio Beijing, 9665 at 1132. (Foss, AK) 9770// 11715 (both via Mali, editor) at 0000. (Pannone, CT) 11660 at 1201. (Neff, FL)

CPBS-2 at 0820 on 15030 in unidentified Chinese dialect. (Johnson, IL)

Guizhou PBS, Guiyang, 7275 at 1209 in CC. (Foss, AK)

Colombia: La Voz del Cinaruco, 4865 in SS at 0805 with ID, Caracol news. (Carpenter, OH)

La Voz del Rio Arauca, 4895 at 0939 with RCN (Radio Cadena Nacionl, editor) news, commercials ID in SS. (Carpenter, OH)

Caracol Bogota, 5075 in SS at 0415 with news, commercials, ID. (Carpenter, OH)

Caracol Neiva, 4945 at 0808 in SS with news, commercials, ID. (Carpenter, OH) 0713 with music. (Reynolds, MO)

Armonias del Caqueta, 4915 at 1015 in SS. (Johnson, IL)

Costa Rica: Adventist World Radio, 9725 at 1250. (Neff, FL) 1300. (London, MN) 0020 with "The Story Hour" (Tuchscherer, WI)

Radio For Peace Interntional, 7375 USB at 0240, as late as 0705. (Carson, OK) 0100 and 0400, //13660. (London, MN; Johnson, IL) 21565 at 0337 (//7375, 13660) (Reynolds, MO) 2200. (Neff, FL)

TIFC, 5055 at 0200 in SS, 0310 in EE. (Perry, TX)

Cuba: Radio Rebelde, 5025 in SS at 1140, 0205. (Neff, FL; Johnson, IL)

Radio Havana Cuba, 5965 at 0536. (Carson, OK) 9710 at 0351. (Walbesser, NY) 1160 at 0500. (Strawn, TX) 11820 at 0230. (Perry, TX)

Czechoslovakia: Radio Prague, 5930 at 0100 sign on; 0303. (Pannone, CT; Reynolds, MO) 7345 at 0306. (Carpenter, OH) 9540 at 0305 (Aquilante, RI) 13715 at 0135 (Johnson, IL) 11990 at 0330. (Perry, TX) 0100 all these frequencies plus 11680. (Walbesser, NY)

Denmark: Radio Denmark, 11790, new frequency, 0006 in Danish, EE ID 0015. (Tuchscherer, WI) 15165 at 2100 with EE ID. (Vaage, CA)

Dominican Republic: Radio Amanecer, 6025 at 0358-0405 sign off in SS and EE, asking for reports. (Tuchscherer, WI)

Radio Clarin 9950 at 0100 with anti-Cuban program. (London, NH)

East Germany: Radio Berlin International, 11785 at 0412. (Reynolds, MO) 13610 in GG at 0529 with IS, sign on. (Carpenter, OH) 13693 at 0233 and 15125 at 0443. (Carson, OK)

Ecuador: HCJB, 3220 at 0435 in SS. (Mierzwinski, PA) 9745 at 0150. (Perry, TX) 11775 at 0540. (Carson, OK) 15155 at 0226. (Walbesser, NY) 17890 at 1610. (Pannone, CT)

Egypt: Radio Cairo, 9475 at 0219. (Pannone, CT)

England: BBC on 5975 (via Antigua, editor) at 0000. (Aquilante, RI) 7325 at 0013. 17640 at 1750. (Pannone, CT)

Equatorial Guinea: Radio Nacional, Bata, 5003.6 at 2142-2202 close with African music, and SS songs, ID in SS. (Tuchscherer, WI)

Finland: Radio Finland International, 9645 with ID in EE at 0000. (Vaage, CA)

France: Radio France International, 7135 at 0328 with news. (Reynolds, MO)

French Guiana: RFI relay at 0315 on 11995. (Reynolds, MO)

RFO Guyane, 5055 at 0735 with music and FF talks. Tentative. (Johnson, IL)

Gabon: Africa Number One, 9580// 15475 at 1935 in FF with music. (Johnson, IL) 15475 at 2006 with FF ID and music. (Strawn, TX)

Ghana: GBC-1, 4915 at 0529 with drums, African music. (johnson, IL)

Greece: Voice of Greece, 11645 in Greek at 1110. (Foss, AK) 0131 with ID, news. (Johnson, IL)

Guam: KTWR, 11910 at 1616-1637 with music variety. YI with ID at 1632. (Tuchscherer, WI)

Guatemala: TGNA, Radio Cultural, 3300 at 0300 with "Through the Bible." (Perry, TX)

Radio Tezulutlan, 4835 in SS at 1054 with sermon, ID, announcements, folk and easy listening music. (Carpenter, OH)

Guam: KTWR, 11910 at 1616-1637 with music variety. YL with ID at 1632. (Tuchscherer, WI)

Guatemala: TGNA, Radio Cultural, 3300 at 0300 with "Through the Bible." (Perry, TX)

Radio Tezulutlan, 4835 in SS at 1054 with sermon, ID, announcements, folk and easy listening music. (Carpenter, OH)

Honduras: HRVC, La Voz Evangelica, 4820 at 0300 in SS. (Perry, TX)

Hungary: Radio Budapest, 9835 at 0030, 0330. (Pannone, CT; Johnson, IL)

India: All India Radio, 9565 at 1300. (London, MN) 15250 at 1321 with commentary. (Neff, FL)

Iran: VOIRI, 9022 at 1945 with news. (Pannone, CT)

Iraq: Radio Baghdad, 11765, new frequency, 1720 to 1757 close. Mideast music, woman announcer, some AA news. (Tuchscherer, WI) 2200 on 13660 in EE. (London, MN)

Israel: Voice of Israel, 7410 at 0500 with sign on, into news in Hebrew. (Carson, OK) 11605 at 2039 with ID, news. (Johnson, IL) Here and //12080//15615 at 0200. (Pannone, CT)

Italy: AWR Forli, 7125 at 0645 with religious program, ID. (Johnson, IL)

RAI, 11800 at 0100 with news. (Perry, TX)

Japan: Radio Japan, 5960, via Canada, at 0150. (Aquilante, RI) 11835 at 2348. (Walbesser, NY) 21610 at 0304. (Reynolds, MO)

Jordan: Radio Jordan 9560 at 1915, 2000, 2037. (Johnson, IL; London, MN; Perry, TX)

Kiribati: Radio Kiribati, 14918 at 0557 with music, news in EE. (Johnson, IL)

Liberia: VOA Relay, 15445 at 2045, "Nightline Africa." (Johnson, IL)

Libya: Radio Jamahiriyah, 15450 at 1816 with news. (Pannone, CT) (AA? editor)

Lithuania: Radio Vilnius, 7400 at 2258 with IS, 2300 sign on. 15180 at 2306, 17665 and 17690 at 2258. (Carson, OK)

Luxembourg: Radio Luxembourg, 6090 at 2317 with music. (Pannone, CT) 0000 with pop. (London, MN)

Mali: Radio Beijing relay, 11715 at 0304, 0336.

(Reynolds, MO; Walbesser, NY)

Radiodiffusion Malienne, 4835 at 0620 with talk in FF, ID, chants. (Carson, OK)

Malta: Radio Mediterranean, 6110 at 2231 with ID, music, weather. (Neff, FL)

Deutsche Welle relay on 11810 at 0350 with IS and site ID. (London, MN)

Monaco: Trans World Radio, 9485 at 0823 with "Insight For Living", ID 08456. (Carson, OK) 11735 at 0730 in unidentified language, IS. Not listed here but clearly their IS. (Johnson, IL)

Netherlands: Radio Netherlands, 12150 at 0506. (Carson, OK) 15560//17605 (Bonaire, editor) and 21685 (also Bonaire) at 1832. (Pannone, CT)

Netherlands Antilles: Radio Netherlands relay, Bonaire, 11720 at 0350. (Carson, OK) 15135 at 0241. (Walbesser, NY) 15315 at 0052. (Vaage, CA)

Trans World Radio, 9535 at 0455. (Carson, OK) 11930 at 0300. (Reynolds, MO)

New Zealand: Radio New Zealand on 9850 at 1155, 17705 at 0333. (Reynolds, MO) 17705 at 0400 in EE, then Maori. (Johnson, IL)

Nigeria: Voice of Nigeria, 7255 at 0515, 0517, 0530. (Perry, TX; Reynolds, MO; Carson, OK)

North Korea: Radio Pyongyang, 11735 at 1105. (Neff, FL) 15115 at 0000, 0015. (Carson, OK; Pannone, CT)

Norway: Radio Norway International, 11865 with ID in EE at 0430 and at 0445 sign off. Mondays UTC on 15310 at 1500, 15305//21730 at 1700 21730 at 2000. (Vaage, CA)

Peru: Radio Atlantida, Iquitos, 4790 in SS at 0935 with folk music, announcements, ID. (Carpenter, OH)

Radio Portugal, 9680 at 0240 but badly QRM'd by VOFC, co-channel and 9705 at 0243. (Perry, TX 1180 at 0015 in PP. (Johnson, IL) 15285 at 2040 in PP with ID. (Strawn, TX)

QATAR: Qatar Broadcasting Station, 9535 at 1920 in AA. Tentative. (Johnson, IL)

Romania: Radio Bucharest, 5990//9510//9570 at 0200 with ID, news. (Pannone, CT) 15335 at 0658. (Carson, OK)

Saudi Arabia: BSKSA, 9705//9720 at 1705 with ID, news, music. Weak. (Pannone, CT) 9720 at 1830. (Johnson, IL)

Seychelles: FEBA, 11865 at 1514-1531 with "Back to the Bible". Lost to VOA at 1531. (Tuchscherer, WI)

BBC Relay on 11750 at 0245. (Carson, OK)

Solomon Islands: SIBC, 9545 at 0730 with commercials, ID, news. (Johnson, IL)

South Africa: Radio RSA, 9580 at 0235. (Aquilante, RI) 9615 at 0208. (Reynolds, MO) 21535 at 1557 in EE and Chichewa, 21595 at 1539, 25790 at 1541. (Carson, OK)

Radio Five, 4880 at 0330, 0340. (Perry, TX; Johnson, IL)

South Korea: Radio Korea, 9750 at 1410. (Neff, FL) 15575 at 1400 and 0750. (Carson, OK) 2330. (Strawn, TX)

Spain: Spanish National Radio, 9630 at 0000, 0135. (Walbesser, NY; Aquilante, RI) 11880 at 0149. (Carson, OK)

Sweden: Radio Sweden, 9695 at 0320. (Vaage, CA) 17880 at 1430 with ID. (Walbesser, NY)

Switzerland: Swiss Radio International, 9735 at 0205. (Aquilante, RI) 12035 at 0427. (Reynolds, MO) 9885 at 0205, 13635 at 1425 in FF/GG, 15430 in EE at 1516. (Carson, OK) 17830 at 1530. (Vaage, CA)

Syria: Radio Damascus, 12085 at 2013 with ID, news. (Johnson, IL)

Tahiti: Radio Tahiti, 15171 at 0435 with island music. (Johnson, IL)

Taiwan: Voice of Free China, via WYFR, 5950 at 0230. (Walbesser, NY) 9680 at 0225. (Perry, TX)

Turkey: Voice of Turkey, 9445 at 2310. (Carson, OK) 9460 at 1927 with Turkish music, (Johnson, IL)

Ukraine SSR: Radio Kiev, 7400 at 0300 and 9765 at 0308. (Carson, OK) 17665 at 0000. (London, MN)

United Arab Emirates: Voice of the UAE, Abu Dhabi, 9590//11985//13605 at 2200. (London, MN) 13605 at 2215. (Strawn, TX)

UAE Radio, Dubai, 15400 at 0330 with news. (Johnson, IL) 21605 at 1605, 1615. (Neff, FL; Perry, TX)

United States: WSHB, 9455 at 0652. (Carson, OK)

WCSN at 1705 on 21640. (Neff, FL)

WRNO on 7355 at 0205, 15420 at 1600. (Carson, OK)

KUSW at 2210 on 15580. (Pannone, CT) 15650 at 1925. (Neff, FL)

WMLK on 9465 at 0648. (Carson, OK)

WHRI on 13760 at 2203. (Carson, OK) 21840 at 1600. (Neff, FL)

Radio Marti, via VOA at 2335. (Neff, FL)

WWCR on 7420 at 0409. (Carpenter, OH) 15690 at 1945. (Neff, FL)

USSR: Radio Moscow, 5910 at 0608, 7400 at 0318, 7345 at 0553, 15295 at 0716, 15475 at 1456 and 17890 at 0548. (Carson, OK) 7165 at 0105 and 12000 at 1410. (Aquilante, RI) 9720 at 0250. (Reynolds, MO) 18730 USB feeder in East European language at 1235. (Northrup, CT)

Radio Peace and Progres, 7330 at 1210 in CC. (Foss, AK)

Vatican City: Vatican Radio, 6185 at 0559. (Reynolds, MO) 6248//9645//11740 at 0720 in unidentified language. (Johnson, IL) 9605 at 0102. (Neff, FL)

Venezuela: Radio Continental, Barinas, 4940 in SS with ID, music at 0905. (Johnson, IL)

Radio Mara, Maracaibo, 3275 at 0450 in SS with talk, music, IDs. (Mierzwinski, PA)

Radio Rumbos, Caracas, 4970 in SS at 0953 with Latin pops, amnts, ID. (Carpenter, OH)

Ecos del Torbes, 4980 at 0953 with Latin music, anmts, ID. (Carpenter, OH) 0315 in SS to 0359 sign off. (Reynolds, MO)

Vietnam: Voice of Vietnam, 10010 at 1104 with woman in VV. (Foss, AK)

West Germany: Deutsche Welle, 11865 (via Malta) at 0128. 13780 at 2138. (Carson, OK) 15275 with news in GG at 2020. (Strawn, TX)

Radio Free Europe, 17725 at 1315 in East European language with news. Also 17735 at 1315 in East European language. (Northrup, CT)

Yugoslavia: Radio Yugoslavia, 9660 at 2200, 2210. (Walbesser, NY; Neff, FL)

That does it. Raise your glass to the following:

Michael Aquilante, Johnston, RI; Mike Perry, Corpus Christi, TX; Anthony Pannone, East Haven, CT; Marty Foss, Anchorage, AK; Frank Mierzwinski, Mt. Penn, PA; George Neff, Lutz, FL; John Tuchscherer, Neenah, WI; Cliff J. Reynolds, Hazelwood, MO; John Spenser Carson, Jr; Norman, OK; William Walbeser, Ravena, NY; Bill Strawn, N9FFN, Graham, TX; Bjorn F. Vaage, Granada Hills, CA; Tim J. Johnson, Galesburg, IL; Clem Carpenter, Cincinnati, OH; Chris London, Princeton, MN and M.M. Northrup, Danbury, CT.

Until next month, good listening! PC

BEAT THE BEAR IN THE AIR
For info on the Sport of Spybusting
Write or Call:
Spybuster™
Dept. PC, 4949 S. 25-A, Tipp City, OH 45371
513 - 667-2461

DX Helper
Macintosh Software W7HR
MUF Map • MUF Plot
Gray Line • Great Circle
Prefix, Zone, Oblast
WWV Alert • CW Drill
$39.95 ppd Info $1
Antennas West
Box 50062-X, Provo, UT 84605
(801) 373-8425 See band openings on the map before they happen!
CIRCLE 5 ON READER SERVICE CARD

Order Back Issues of
POPULAR COMMUNICATIONS

JRC NRD-525 HF Receiver
• Receive 90 kHz to 34 MHz V/UHF With Optional CMK-165 Converter
• 200 Memory Channels
• AM, FM, U/LSB, RTTY, FAX
• Multi Scan Feature
CALL TODAY!

ICOM IC-R71A
SUPERIOR PERFORMANCE RECEIVER
• USB, LSB, AM, RTTY and Optional FM
• Covers .1 to 30 MHz
• 32 Memory Channels
• Multi Scanning Functions
• Keyboard Frequency Entry
CALL TODAY!

ICOM IC-R9000
THE FINE ART OF LISTENING
• Continuous, All-Mode Receiver Covers 100 kHz to 2 GHz
• 1,000 Memories
• Advanced CRT Display
• Direct Digital Synthesizer System
CALL FOR ALL DETAILS!

KENWOOD R-5000
HIGH PERFORMANCE RECEIVER
• Covers 100 kHz to 905 MHz (VHF Option)
• 100 Memories
• Keyboard or Main Dial Station Selection
• Programmable Scanning
CALL TODAY FOR DETAILS!

Amateur and SWL Accessories
HAMTRONICS, INC.
M, T, W (9-6)
Th, F (9-8)
Sat (9-3)
4033 Brownsville Road, Trevose, PA 19047
For Service & Info (215) 357-1400 For Orders (800) 426-2820 FAX 215-355-8958
CIRCLE 68 ON READER SERVICE CARD

COMMUNICATIONS SHOP

Advertising Rates: SCAN members and *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 groups, 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 (specifiy 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 scopy 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.

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 $24.95 ppd. in the US (NY residents add $1.87 sales tax). (Quantity discounts available for classes.) PASS Publishing, P.O. Box 570, Stony Brook, NY 11780.

WANTED—PRO2004's in non-working condition. Wanted for parts will pay reasonable price. Must have all internal parts. Send description and price wanted to Lester Jernigan, P.O. Box 5212, Jacksonville, AR 72026.

Interested in FM CB radio? For more information send SASE business envelope plus $3 to GMRS, 107 West Caldwell, Phoenix, AZ 85041.

THE NEW YORK MONITOR NEWSLETTER—a monthly Newsletter that provides CB'ers with the latest up-to-the-minute Technical information—Radio Repair and Modification—Phase Lock Loop (PLL) Circuit/Expander—**2 YEAR COURSE IN ELECTRONIC COMMUNICATION** and much much more!! $24 per year mail to **LORD/WYATT COMMUNICATIONS, P.O. Box 030128PCD, Brooklyn, NY 11203-0001.**

HURRY! Get in the **WORLDWIDE CB DIRECTORY**. Correspond with CB'ers all over the world. For free info rush a (#10) SASE to: **WORLDWIDE CB DIRECTORY, P.O. BOX 19786, Dept. C, New Orleans, LA 70119.**

AM/FM/TV BROADCAST BAND AIRCHECKS of metropolitan New York, N.J. & CT. area stations. Caught a NY station in the dead of night? Verify your logs with top-quality airchecks. Send your requirements for a free price quote to: AiResponse, 553 E. Fulton St., Long Beach, NY 11561-2416.

PRO-2004/5 OWNERS: Search-and-Store finds elusive frequencies while you work or sleep. Internal no-holes installation—Key-board control—retain present functions. Wired-tested-postpaid: Ten channel $24.95 (check)—Selectable to 255 channels $44.95 Key Research, POB 5054P, Cary, NC 27511.

PRIVACY PROBLEM—NEED INFORMATION? New Electronics Surveillance, Debugging, Protection Catalog $5.00 Kits—Assembled. TECHNOLOGY SERVICES, 829G Ginette, Gretna, LA 70056.

SURVEILLANCE-COUNTERMEASURES! Transmitters, detectors, phone security, night vision, stunguns, secret devices, restricted books, **MORE! GUARANTEED LOWEST PRICES! HUGE CATALOG $5.00 (REFUNDABLE)** protector P.O. Box 520294, Salt Lake City, UT 84152.

COMMUNICATIONS INTELLIGENCE GATHERING AND ANALYSIS program. $29.95 IBM Compatible. Stores Frequency, Date, Time, Call Sign, Mode and Notes. Date/Time may be automatically appended. During data entry, existing entries may be searched and displayed. Upon entry of Frequency, system displays "normal" allocation for given frequency. Built in complete help file. Can use to analyze data by sorting, selecting and listing on any record. The Computer Handyman, PO Box 503, Carmel, IN 46032-9867 (317) 844-6672.

NEW VIDEO—SPYCRAFT: INSIDE SECRETS OF ESPIONAGE AND SURVEILLANCE. Come on a true-to-life countersurveillance mission with a man who was a real-life James Bond. This is the most authentic look inside the spy trade ever produced—a hands-on training film! Color, over 50 minutes, (nonreturnable) $59.95. CEP, Incorporated, Box 865-9PT, Boulder, Colorado 80306, (303) 443-2294.

CW Lite is the **easiest** Morse code training method in the world, bar none! And it is the **fastest**, too. Just close your eyes and relax. This powerful **hypnosis cassette tape** does the rest. **Subliminals** speed you along! Only $14.95 ppd in US (NY residents add $1.12 tax). Order today! **PASS Publishing**, Box 570, Stony Brook, NY 11790.

VIDEOCIPHER II Manuals. Volume 1 - HARDWARE. Volume 2 - SOFTWARE. $32.45 each. Volume 3 - PROJECTS/SOFTWARE - $42.45. Volume 4 - REPAIR/SOFTWARE - $94.45. Volume 5 - DOCUMENTATION - $42.45. Volume 6 - EXPERIMENTATION - $42.45. CLONE HACKERS BIBLE - $34.95. CABLE HACKERS BIBLE - $32.45. **COD's** 1-602-782-2316. 0100-032 Software Catalog - $3.00 **TELECODE** Box 6426-PC, Yuma, AZ 85366-6426.

"ANARC Guide To US Monitoring Laws": texts of state scanner laws and the ECPA with concise interpretations by Frank Terranella. $7.50 postpaid from ANARC Publications, P.O. Box 143, Falls Church, VA 22046.

THE OUTLAW REPORTS - Secret insider information on spy schools, ID change, precious gems, explosives, auto theft, super sources for suppliers of security gear, unusual weapons, electronics and more. Softcover, 180pp, $28.50ppd. CEP, P.O. Box 865-OZT, Boulder, CO 80306.

BC-200XLT W/CELL $289. R-4030 W/CELL $279. BC-950XLT W/CELL $299. Radio Shack PRO-2004/05 MODS! CALL!! CB Radios, Converters, Ham Gear, More!! Free Shipping! New 1990 Catalog $1.00 6 page used inventory .25. SAME DAY COD SHIPPING!! GALAXY, BOX-1202, AKRON, OHIO-44309 (216) 376-2402 EST. WE TAKE TRADES!!

CODES, CIPHERS, AND SECRET LANGUAGES - Thomas Jefferson's cipher wheel, heliograph signals, Morse code, American Indian signs, Esperanto and much more. With quizzes and brain teasers for each section, this book is filled with fun and intrigue! Order today! Hardcover, 272pp. Send $21.45ppd to Paladin Press, P.O. Box 1307-9IZA, Boulder, Colorado 80306. (303) 443-7250.

WANTED: Someone who would like to donate a used twenty channel programmable scanner to a bedridden gentleman. Willing to pay all shipping charges. Call collect anytime (304) 232-3563.

ONE TOLL-PHONE CALL COULD EARN YOU $500. We are a nationwide market leader in the fire/water restoration business and we are looking for people across the country, **LIKE YOU,** to join our team. If you are interested in learning more about our **FIRE SPOTTERS NETWORK,** please apply to J. Winn, P.O. Box 1888, South San Francisco, CA 94083-1888.

DISCOUNT BOOKS, SCANNERS, ANTENNAS: We have radio books and frequency books by TAB, SAM's, ARRL, CRB, McGraw Hill and others, many at discount prices. FREE catalog. DOYLE COMMUNICATIONS, Route 8, Box 18, Lake Pleasant, NY 12108 (518) 548-5515.

COMMODORE 64 HAM PROGRAMS—8 disk sides over 200 Ham programs—$16.95. 25¢ stamp gets unusual software catalog of Utilities, Games, Adult and British Disks. Home-Spun Software, Box 1064-PC, Estero, FL 33928.

BEST PRICES: **CB RADIOS** and **ACCESSORIES,** Radar Detectors, Scanners. Free list. CRS Communications, 1692 Central Park Ave., Yonkers, NY 10710.

LEARN VCR Cleaning, Repair. Huge Profits! Secrets Revealed! No Experience Necessary. Better than Viejo at 1/7 the cost. 400+ page book, with 704 illustrations, $24.95, postpaid. Worthington Publishing, 6907-202J Halifax River Drive, Tampa, FL 33617, or call (813) 988-5751 for C.O.D., Visa, or MC. Money-back guarantee.

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 $24.95 ppd. in the US (NY residents add $1.87 sales tax). (Quantity discounts available for classes.) PASS Publishing, P.O. Box 570, Stony Brook, NY 11780.

BUGGED? WIRETAPPED? Find out fast! Factory direct countermeasures equipment catalog $1. Capri Electronics, Box 589W, Bayfield, CO 81122.

PRO-2004/5 OWNERS: Search-and-Store finds elusive frequencies while you work or sleep. Internal no-holes installation—Keyboard control Retain present functions. Wired-tested-postpaid: Ten channel $24.95 (check)—Selectable to 255 channels $44.95—Key Research, POB 5054P, Cary, NC 27511.

Exciting! New radio club now formings in the New York City Tri-State area. If you're a radio buff and wish to join a 461 to 465 MHz repeater club and you own a UHF transceiver then send your name, address and phone number to David M. Torres, 215 West 94 Street, New York, NY 10025 for info.

CHECK THIS OUT! SONY PCM-701ES Audio/video processor converts your mono or stereo audio source (yhour stereo system, shortwave, scanner, packett, Morse or RTTY tones) into a digital type video signal for recording or playback on your home VCR. (Much like D.A.T.) absolutely no tape hiss! Round out your stereo or ham shack. Save and replay your favorite music, intercepts and QSOs! $650 ERIC 703-998-5228.

AMIGA, MACINTOSH, ATARI XL/XE/ST Communications public domain software $4.00 disk. SASE specifying computer for catalog! KD Hamsoft, Box 1646, Orange Park, FL 32067-1646.

WANTED: Magnavox/Philips Shortwave D2924 (1983) or similar. Ken McCoy, 9747 South Oswego; Tulsa, OK 74137 or 1-918-298-1657.

PAY TV AND SATELLITE DESCRAMBLING 1990 edition. Best edition yet. Check out the world of video descrambling. Turn-ons, descrambling circuits, cable countermeasures, pirate counter-counter measures. **ONLY** $14.95. Also, Scrambling News monthly $19.95/yr. Catalog $1 or call 716-874-2088. COD's OK. **SCRAMBLING NEWS, 1552Q Hertel Ave., Buffalo, NY 14216.**

MTC-101 Microphone Test Center—repair and test any CB microphone only $54.95 S/H included—send to **LORD/WYATT COMMUNICATIONS,** 30 East 54 Street, Brooklyn, NY 11203-718-493-3778 7 PM-10 PM EST $15.00.

Finders Guide contains the best merchandise for the best prices. Discounts on land, homes, generators and hundreds of other items. Headings include homes, weapons, health, knives, electronics, optics, learning materials, everything between the best speakers to language programs. Send money orders only for $15.00 to Frank Litton, 1617 Ogden Ave., Lisle, IL 60532.

WANTED: Shortwave converter, Automotive radio type (12 VDC) in working condition. Reasonable price. Steve Walley, 24447 Atwood Ave., Moreno Valley, CA 92388.

For Sale: Universal M7000 with video FAX option, excellent condition, all manuals—$750. Includes shipping and ins. Call Carl, (717) 457-4728 or write, 313 Bennett St., Duryea, PA 18642.

WORLD'S MOST UNUSUAL Communications Books! A large selection of outstanding titles covering scanners, "confidential" frequency registries, bugging, wire tapping, electronic surveillance, covert communications, computers, espionage, monitoring, and more! New titles being added constantly! Ask for our large new FREE catalog. CRB Research, Box 56-PC, Commack, NY 11725.

ELECTRONIC SPYING is the name of the game. It's also the title of a startling book which reveals the closely guarded methods & equipment used by professionals & amateurs who eavesdrop on homes & businesses with (sometimes) legal and (usually) illegal *bugs & wiretaps*. Written in non-technical language everyone can easily understand, ELECTRONIC SPYING has photos & illustrations clearly revealing exactly how they do it & where they get the equipment (much of it inexpensive & easily available). Leaves nothing to the imagination! Latest techniques covered & offers an in-depth wealth of information on the ever increasing electronic invasion unavailable from any other source. This book is used by law enforcement agencies as a reference manual. Only $8.95 (plus $1.00 postage) per copy from CRB Research, P.O. Box 56, Commack, N.Y. 11725. (NY residents add sales tax.)

SIDEBAND OPERATORS! Join the oldest/largest network of 27 MHz SSB operators. Now more than 100,000 strong! Send self-addressed stamped long (#10) envelope for FREE details and application (no obligation). SSB Network, P.O. Box 908, Smithtown, NY 11787.

COMMUNICATIONS PLANS, BOOKS, KITS! AM/FM broadcasting (licensed/unlicensed), 1750 Meter transceivers, Ham/CB amplifiers, surveillance bugs, more. FREE catalog. PANCOM, Box 130-P11, Paradise, CA 95967.

PRO-2005 OWNERS—Restore 30 kHz step and full frequency coverage for $29.50 plus $5.00 S & H. Mail receiver with money order or certified check to WESTERN RADIO, 6626 E. Broadway, Tucson, Arizona 85710.

Tune In On Telephone Calls. Tom Kneitel's new 160-page book. Everything you need to know 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 $2 postage to USA/Canada/APO/FPO) from CRB Research. Box 56, Commack, NY 11725. NY residents add sales tax. Dealer inquiries invited.

NEW! 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. CB CITY INTERNATIONAL, BOX 31500PC, Phoenix, AZ 85046. Thousands of satisfied customers since 1976.

Radio New York International official off the air recording of our first broadcast live from the good ship Sarah. $15.00 gets you a 60 minute cassette, plus an official letter and certificate from the RNI staff. RNI, Monticello, Maine 04760.

TELEVISION SETS made before 1946 wanted for substantial cash. Especially interested in "mirror-in-the-lid" and spinning disc sets. Finder's fee paid for leads. Arnold Chase, 9 Rushleigh Road, West Hartford, CT 06117 (203) 521-5280.

BUGGED? COUNTERMEASURE SWEEPS. Telephones, Offices, Watercraft, Aircraft. Confidentiality Assured. Write or call for a free eavesdrop brochure and estimate. Central States Investigations, 1007 West Jefferson Street, Suite 160, Sprfld, IL 62702-4835. AC/217 525-9499.

PROPAGANDA TAPES! Authentic, rare recordings of WWII German and Japanese shortwave broadcasts by "Tokyo Rose," Axis Sally," others. Cassette $9.95. D-W Research, 4548 Auburn Blvd., #231-B, Sacramento, CA 95841.

INTRODUCING INTERNATIONAL RADIO—by Kenneth MacHarg. Non-technical beginner's guide to shortwave. From bookstores, or for $3.95 plus $1 shipping from: Radio, Box 1345, Jeffersonville, IN 47131.

CABLE TV CONVERTERS. Scientific Atlanta, Jerrold, Oak, Zenith, Hamlin. Many others. "New" MTS Stereo Add-On. Visa, M/C & Amex **1-800-826-7623. B&B Inc., P.O. Box 21-327, St. Paul, MN 55121.**

TOMCAT'S BIG CB HANDBOOK, by Tom Kneitel. Just published, 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 $2 postage to North America) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. (NYS residents add sales tax). Dealer inquiries invited.

PRO2004 OWNERS-400 CHANNELS/30 CPS SCAN RATE KIT-$35.00 INSTALLED-$55.00. LESTER JERNIGAN, P.O. Box 5212, Jacksonville, AR 72076.

SCANNER FREQUENCY SEARCH SERVICE. Hear all there is to hear! SASE to: Heald, 6886P Jefferson Street, North Branch, MI 48461.

NEW! AIR-SCAN 5TH EDITION by Tom Kneitel. Complete guide to aero comms. Now in gigantic 192-page large-size format containing 60,000 + listings, including 2-30 MHz HF, 118 to 174 MHz VHF, 406 to 512 MHz UHF, and 800 MHz listings. Covers civil, military, private, and unlisted landing areas, heliports, and seaplane bases. Control towers, ground, approach/departure, FSS, unicoms, multicoms, crop dusters, air-ambulances, federal ops, traffic 'copters, aviation business, airline enroute, airport security/fire, etc. throughout USA. All Canadian mil, civilian airports and seaplane bases listed, plus lots more, including how-to text on aero monitoring. Most comprehensive aero frequency guide ever compiled. Only $14.95 + $2 postage to USA/Canada/APO/FPO. NY State residents add $1.13 sales tax. From: CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725, or ask your favorite communications dealer.

HEAR YOUR GOV'T. IN ACTION! The gigantic 6th Edition of Kneitel's TOP SECRET REGISTRY OF U.S. Gov't. Radio Freqs., the ultimate scanner directory. Revised/Expanded to cover 80 + agencies, 192 large-size pages, 125,000 listings: freqs., many locations, callsigns, tactical ID's, codenames, agent buzzwords, freq. usage/designator codes, code signals. Latest info: FBI, DEA, Secret Service, FCC, ATF, Immigration, Customs, Border patrol, CIA, NSA, Nat'l Forests, Nat'l Parks, GSA, FEMA, Treasury, Marshals, NASA, FAA, EPA, all Armed Forces, bug/surveillance freqs., much more, plus UHF Aero and many Canadian freqs. Extra: Most important 2-25 MHz HF freqs. included. Contains more and digs deeper than ever before! New 6th Ed. is $17.95, add $1 postage for 4th Class mail to N. American addresses, or $3 for First Class mail. You Ain't Heard Nothin' Yet! Get your copy now. CRB Research, P.O. Box 56, Commack, NY 11725. NY Residents add sales tax. (Dealer inquiries invited—write on company letterhead.)

SCANNER MODIFICATION HANDBOOK by Bill Cheek ("Doctor Rigormortis"). New 160-page book. More than 20 performance improvement modifications. Simple step-by-step instructions, many photos. Primarily PRO-2004 & PRO-2005, some for PRO-34, BC-200/205XLT, BC-750XLT, BC-750XLT. 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! Just issued, latest info. Only $17.95, plus $2 postage to addresses in USA/Canada. Residents of NY State add $1.35 tax. CRB Research Books, P.O. Box 56, Commack, NY 11725.

BEST PRICES: CB **RADIOS and ACCESSORIES**, Radar Detectors, Scanners. Free list. CRS Communications, 1692 Central Park Ave., Yonkers, NY 10710.

PARTS SOURCES LIST, OVER 100 SOURCES INCLUDING MANUFACTURERS. IDEAL FOR HOBBYISTS, TECHNICIANS, HAMS. $18.00 PPD. R. RAINES, BOX 150, CHESTERHILL, OHIO 43728.

COMMUNICATIONS INTELLIGENCE GATHERING AND ANALYSIS PROGRAM. $29.95 IBM Compatible. Free Details. The Computer Handyman, P.O. Box 503, Carmel, IN 46032-9867 (317) 844-6672.

Limited Space Dipoles. T2FD Antennas, Matching Transformers. SASE for flyer. Basic Radio Devices, 824 West 25th Street, Holland, Michigan 49423.

ICOM R7000 + IBM-PC + 801-SCAN = ULTIMATE SCANNING SYSTEM! Scan 1800 channels in 200 banks. Scan faster, with quick control of scanned bank, delay mode, etc. Version 2 has MANY more advanced features, the best scanning system for the R7000! IBM/clonew/512K required. Program with external interface (use your RS-232): $134.95. With internal I/F: $149.95. Demo program (R7000 NOT required): $3.55. Free information. 801-SCAN Suite 212, 397 Dal-Rich Village, Richardson, TX 75080.

SURVEILLANCE/COUNTERSURVEILLANCE devices catalog. Camera's, bug detectors, video camera detectors, transmitters, communications, and much more. Catalog $3.00. DSP P.O. Box 1275-PC. Redondo Beach, CA 90278.

NORTHEAST SCANNING NEWS: A monthly UHF/VHF scanner publication for readers from Maine to Virginia. 52 pages per issue. Over 500 subscribers. For sample copy, send $2.00 cash, check or money order made payable to: LES MATTSON and mail to NESN, 212-P West Broad Street, Paulsboro, NJ 08066.

WANTED: Modification details or plans for PRO-2004/2005 for elimination of tone guard on blocked frequencies and transmissions. Contact: Dave Elliston, c/o Camp Tawingo, Huntsville, Ontario POA-1KO, 705-789-8576.

I'll pay $20 to be allowed to listen for one hour to an FM subcarrier receiver in the S.F. area. I need to listen before I buy one myself. (415) 843-8626.

WANTED: Circuit diagram, other info. TOKI 150B BLOCK SATELLITE RECEIVER. What is IF from dish? Why won't modern LNBs work? Cliff Brown, RR3, CONN, Ont., Canada, NOG 1NO.

Ampex AG500-2 2 track reel to reel magnetic tape recorder, 7.5/3.75 IPS. Portable case. CBS 410 FM Stereo Audimax Peak level controller, rack mount. Best offers. Marlow Saady, 141-60 84th Rd., Apt. 3E, Briarwood, NY 11435.

I make $2000/week recycling PURE GOLD from electronic scrap! You can too! FREE REPORT (worth $25). Call recorded message: 1-900-246-2323 ($2 min.)

FOR SALE: Regency HX1500 Handheld Scanner—$130, INFOTECH M6000 V.6—$550, Kenwood R500 With Options—$750, ICOM R71A, Loaded—$750, Dressier Active SW Antenna—$75, AEA, CP-1 Computer Patch—$65, ALL in perfect condition (415) 332-3742.

Advertiser's Index

AMC Sales, Inc. 47
ARRL 67
Ace Communications, IN 24, 29, 71
Alpha Delta 75
Antenna Supermarket 77
Antennas West 53, 71, 77
Antique Radio Classified 27
Associated Radio 16
Barry Electronics 71
CBC International 67
CRB Research 33
Communications Electronics 23
DECO 53
Datacom, Int 7
Datametrics 73
Electrolert, Inc. 77
Electron Processing 63
Electronic Engineering 67
Elec. Equip. Bank 1
G & G Electronics 73
GRE America, Inc. 69
Gilfer Shortwave 76
Hamtronics, Inc 77
ICOM . . . . . 42, Cov. II
JoGunn Ent 33
Kenwood U.S.A. Corp. . . . . Cov. IV
MFJ Enterprises, Inc. 29
Medicine Man 67
Microcraft Corporation 59
Moonbeam Press 71
OPTOelectronics 3
Pacific Cable Co. 59
Palomar Engineers 76
POP'COMM Book Shop 53
RF Limited 50
Radio Shack 11
React, International 16
Republic Cable Pdts., Inc. 27
Scanner World, USA . . . . . Cov. III
Signal Engineering 71
Software Systems Consulting 59, 73
Somerset Electronics 27
Tiare Publications 59
Universal SW Radio 5

Reach this dynamic audience with your advertising message, contact Don Allen, N9ALK at (217) 344-8653.

THE PROS SUBSCRIBE.

SHOULDN'T YOU?

Several professional monitoring agencies, in fact, have subscriptions to **Monitoring Times**. That's because every month **Monitoring Times** offers the latest in:

- International Broadcasting
- Utility Monitoring
- Scanners
- Shortwave and Longwave
- Satellites
- Electronic Projects
- Listening Tips
- Frequency Lists
- Broadcasting Schedules
- News-breaking Articles
- Features
- Exclusive Interviews
- Insights from the Experts
- New Product Reviews & Tests

Jammed with up-to-date information and concisely written by the top writers in the field, **Monitoring Times** is considered indispensable reading by top government agencies.

From longwave to microwave, if *you* are interested in communications, **Monitoring Times** is your foremost guide to international broadcasters; new equipment and accessories; profiles of government, military, police and fire networks; home projects; and tips on monitoring everything from air-to-ground and ship-to-shore to radioteletype, facsimile and space communications.

Order your subscription today before another issue goes by: only $18 per year in the U.S.; $26 per year for foreign and Canada. For a sample issue, send $2 (foreign, send 5 IRCs).

MONITORING TIMES

Your authoritative source, every month.

P.O. Box 98
Brasstown, N.C. 28902

☐ Yes, begin my subscription to Monitoring Times. I've enclosed a check.
☐ Send me a sample issue. Enclosed is a check for $2.
☐ For MC/VISA orders, call 704-837-9200.

Name

Street

City State Zip

CIRCLE 6 ON READER SERVICE CARD

"The Largest Dealer of Scanners in the World"

SCANNER WORLD, USA®

Scanner World, USA

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

REGENCY R-4010
$106.99
($7.00 Shipping each)

10 channel hand-held scanner. (Same Scanner as Bearcat 55XLT), 29-54 MHz, 136-174 MHz, 406-512 MHz, digital programmable, keyboard lock switch, lockout, includes rubber flex antenna.(Optional accessory SW-41, only $19.99 includes rechargeable Ni-Cad batteries, AC adapter/charger and cigarette lighter cord.)

REGENCY Z-60
$119.99
($7.00 shipping)

Programmable 60 channel. AC/DC, digital, 30-50 MHz, 88-108 MHz, 118-136 MHz 144-174 MHz, 440-512 MHz, priority, clock, lockout, telescopic antenna, AC/DC cord, search, delay.

Uniden Bearcat BC-400XLT


$99.99
($7.00 shipping)

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

COBRA SR—925
$99.99
(plus $7.00 shipping each)

Digital programmable, 16 channel AC/DC mobile/base with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz Covering aircraft, marine, police, fire, weather, trains, public service, plus much more. Features include: digital display, priority, scan delay, weather button, channel lockout search, scan speed, automatic squelch, memory backup. One year factory warranty, external speaker jack. (Extended warranty 2 years extra $29.99, 3 years extra $39.99.)

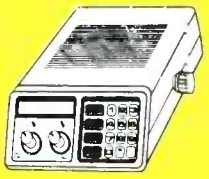
REGENCY R-4020 *"NEW FOR 1990"*
100 Channel Digital Programmable Hand-Held Scanner
$174.99
($7.00 Shipping)

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden this is the exact duplicate of the Bearcat 100XLT for a much lower price. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, weather search, delay, keypad lock, search function, earphone jack, channel lockout AC/DC operation, scans 15 channels per second, track tuning.

Special package deal includes following accessories: AC adapter charger, rchargeable Ni-Cad battery pack, flexible rubber antenna, heavy duty carry case.

UNIDEN RD9XL RADAR DETECTOR
SPECIAL LOW PRICE OF ONLY
$129.99
($7.00 Shipping)

RD9XL has been rated best radar detector for 1990 by Car & Driver Magazine. Better than Passport, Whistler, and all others. RD9XL includes cigarette lighter cord, mute/audio switch, city/highway switch, mounting bracket, carry case, signal strength meter, dual tone audible alarm, bright warning lamp, plus the very small size of only 2-5/32" W x 3⅛" D x 11/16" H.

—SPECIAL— MX-3000


Special Regency®

$139.99 *($7.00 shipping)*

30 CHANNELS — MOBILE/BASE

Features include simple programming of the following frequency ranges: 30-50 MHz, 144-174 MHz, 440-512 MHz. Digital display, priority, search, lockout, delay, dim control, top mounted speaker one year factory warranty. Includes AC & DC cords, mobile mounting bracket, telescope antenna. All for only $149.99 plus $7.00 shipping (optional extended warranty: 3 years $39.99; 2 years $29.99.) MX3000 Service Manual $5.00.

REGENCY R-2066
$109.99
($7.00 shipping)

Digital programmable, 60 channels, AC base scanner, 30-50 MHz, 144-174 MHz, 406-512 MHz. Size 7½"x3"x9". Turbo-Scan scans 40 channels per second, 4 channel banks, weather alert, search, priority, lockout, AC cord, telescopic antenna, plus much more.

UNIDEN Bearcat BC-600 XLT
$199.99
($7.00 shipping)

Digital Programmable 100 Channel Scanner

BC 600 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8"D, scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied one year factory warranty, search, direct channel access, track tuning, service search including pre-programmed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only $24.99 plus a CTCSS tone board is available for only $59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #600MPC $4.99.

BEARCAT BC-950 XLT
Same features as BC—600XLT but also receives 800-954 MHz. *(Excludes cellular)*

$249.99
($7.00 shipping)

Regency TS-1
$149.99
($7.00 shipping)

Same style Scanner as MX3000. But also includes Turbo-Scan, Aircraft, and a total of 35 channels.

BEARCAT 70XLT
20 CHANNEL HAND-HELD SCANNER

SPECIAL PACKAGE DEAL **$169.99**
($7.00 shipping each)

Small size 6"Hx1"Dx2¾"W, full digital readout priority, search, channel lockout, scan delay, key lock. Covers following frequencies: 29-54 mhz, 136-174 MHZ, 406-512 mhz. Package includes rubber antenna, rechargeable Ni-Cad battery pack, AC adapter/charger and carry case.

Uniden Bearcat Scanners Programmable

BC-55XLT	Hand-held 10 channel	$119.99	($6.00)
BA-5	Ni-Cad batteries for 55 XLT	$15.99	(*)
AD-100u	AC adapter/charger 55XLT/50XL	$12.99	(*)
BP-205	Rechargeable battery pack for 100 XLT/205 XLT	$34.99	(*)
BC-70 XLT	Hand-held, 20 channel	$169.99	($7.00)
BC-100 XLT	Hand-held, 100 channel	$199.99	($7.00)
BC-140	10 channel, AC/DC, L/H/U	$94.99	($6.00)
BC-145 XL	16 channel, AC/DC L/H/U	$99.99	($6.00)
BC-175 XL	16 channel, AC/DC, L/H/U/Air	$139.99	($7.00)
BC-200 XLT	Same Scanner as BC-205 XLT		
BC-205 XLT	200 channel, hand-held, multi band	$259.99	($7.00)
BC-210 XLT	40 channel, AC/DC, L/H/U/Air	$189.99	($7.00)
BC-400 XLT	16 channel mobile, L/H/U	$99.99	($7.00)
BC-560 XLT	Same Scanner as BC 400 XLT		
BC-590 XLT	Same Scanner as BC 600 XLT		
BC-600 XLT	100 channel, L/H/U/Air, AC/DC	$199.99	($7.00)
BC-760 XLT	Same Scanner as BC 950 XLT		
BC-950 XLT	100 channel, AC/DC, multi-band	$249.99	($7.00)
BC-800 XLT	40 channel, AC/DC multi-band	$264.99	($7.00)
BC-One	Pre-programmed information radio mobile	$129.99	($7.00)

Regency Scanners and Two-Way

R-4010	10 channel, hand-held, L/H/U	$106.99	($7.00)
MX-3000	30 channel mobile, AC/DC, L/H/U	$139.99	($7.00)
TS-1	35 channel mobile, AC/DC, L/H/U/Air	$149.99	($7.00)
Z-60	60 channel base, AC/DC, L/H/U/Air	$119.99	($7.00)
MA-917	Ni-Cad battery for HX 1000, HX 1200	$24.99	($3.00)
RH-256B	High band two-way with antenna	$329.99	($9.00)
RH-606B	High band two-way with antenna	$469.99	($9.00)
UC-102	High band hand-held two-way	$109.99	($5.50)
WHS-1	Synthesized hand-held two-way High Band	$459.99	($9.00)

We Also Stock CB Radios, Radar Detectors, Cordless Phones, Antennas, and Accessories

All merchandise new in factory sealed cartons.

SCANNER WORLD EXCLUSIVE UNIDEN BEARCAT BC205XLT
$259.99
($7.00 shipping each)

Digital programmable 200 Channel hand held portable scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54MHz, 118-174MHz, 406-512MHz, 806-956MHz * Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/chapter, flexible rubber antenna carry case are all included. Size is 2-11/16"Wx1-3/8"Dx7-1/2" high(Optional extended 2 yr. warranty $29.99, 3 yr extended warranty $39.99) *(Excludes Cellular)

ORDERING INFORMATION

Call (518) 436-9606 to place orders by phone or mail orders to Scanner World, USA 10 New Scotland Av., Albany NY 12208. Orders will be shipped same day received by United Parcel Service. Scanner World accepts Visa, MasterCard (COD shipments by United Parcel will be cash or certified checks only). Mail orders with personal or business checks will be held 4 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid proposals and Purchase orders accepted only from Government agencies. Free full line catalogue available upon request. New York State Resident add 7% sales tax. Any claims must be made within 7 days of merchandise receipt.

(*) Add ($) per scanner, and $3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional $3.50 per package. Full insurance is included in shipping charges. All orders are shipped by United parcel Service. Shipping charges are for continental USA only. Outside of continental USA, ask for shipping charge per scanner.

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

CIRCLE 71 ON READER SERVICE CARD

Scanner World, USA • 10 New Scotland Ave. • Albany, New York 12208 • (518) 436-9606

Scanner World, USA • 10 New Scotland Ave. • Albany, New York 12208 • (518) 436-9606

Wide Band Receivers...

ICOM has broken the barriers with it's 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 1.9"W 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 systems, 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 mobiling or base operation.

IC-R72. The IC-R72 continuously receives 100kHz—30MHz in SSB, AM and CW modes with very high sensitivity. An optional UT-8 provides FM reception. Additional features include: Noise blanker, five scanning systems, AC/DC operation, internal backup battery, built-in clock and ICOM's DDS System. The IC-R72 boasts a 100 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 ICOMs current line of professional quality receivers... the IC-R71A, 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 Toll-Free Literature Request Hotline 1-800-999-9877.

ICOM
First in Communications

CIRCLE 115 ON READER SERVICE CARD

...That Go The Distance.

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. R1R72290