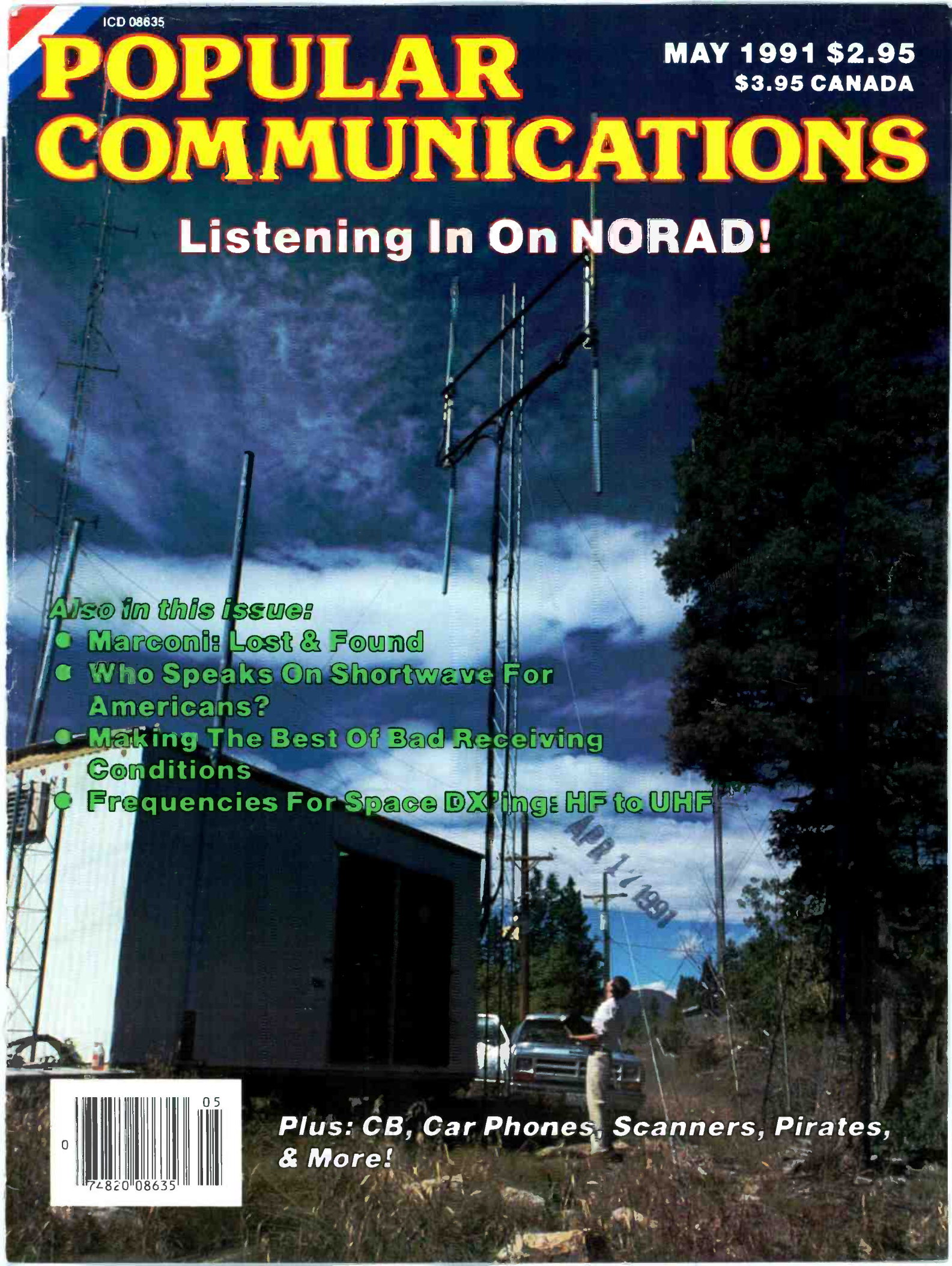
ICD 08635

POPULAR COMMUNICATIONS

MAY 1991 $2.95
$3.95 CANADA

Listening In On NORAD!



Also in this issue:

- Marconi: Lost & Found
- Who Speaks On Shortwave For Americans?
- Making The Best Of Bad Receiving Conditions
- Frequencies For Space DX'ing: HF to UHF

Plus: CB, Car Phones, Scanners, Pirates, & More!

0 74820 08635 05

THE BEST OF BOTH WORLDS.

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

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

Multi-Function Five Inch CRT. Displays frequencies, modes, memory contents, operator-entered notes and function menus. Features a subdisplay area for printed modes such as RTTY, SITOR and PACKET (external T.U. required).

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

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

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

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

ICOM

First in Communications

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

The ICOM EXPERTS

Minutes From Washington, D.C.

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.

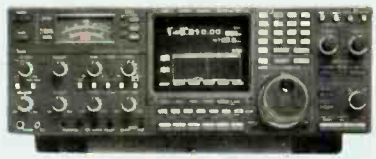
CLASSIC

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 **Call**
EEB Discount Price ~~$4795.00~~ + UPS

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

CLASSIC

ICF2010 RECOGNIZED BY THE EXPERTS AS THE WORLDS BEST PORTABLE RECEIVER, "IT EVEN RIVALS SOME TABLE MODELS".

- AM/CW/LSB/USB .15-30MHz
- FM Wide 76-108MHz
- Air Band AM 116-136MHz
- 32 Memories-Keyboard Entry
- Synchronous Detection
- Separate Multi Function Clock
- 6.2 × 11 .4 × 2 Inches 3.8 Pounds
- Power AC120V Adaptor Incl. Option 12VDC DCC127A 3 "D" Cell, 2 "AA" Not Included
- Free EEB RS-1 Radio Stand With Order

List $429.95 **EEB $349.95** + $6 UPS

CATALOG

NEW 1991

CATALOG

- Full Line SWL Receivers
- Many SWL Antennas
- Scanners & Accessories
- Books, Books & More Books
- Converters, Filters
- Clocks, Speakers & More
- Ask To Be Put On Our Mailing List For Future Publications

FREE Call Or Mail In For Your FREE Copy

NEW

SONY ICF SW 7600

- SW All Bands .1-30 MHz
- FM Stereo With Headphones (Incl)
- 10 Memories & Clock Timer Alarm
- CW SSB (USB, LSB) AM FM
- Keyboard Frequency Entry
- Complete System Including Ext Ant, Headset, Book, AC Adapter
- New Replacement For ICF-2003
- Free EEB RS-1 Radio Stand With Order

List $259.95 **EEB $219.95** + UPS

EEB
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

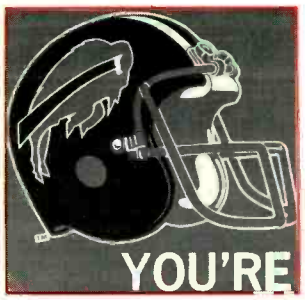
CIRCLE 70 ON READER SERVICE CARD

POPULAR COMMUNICATIONS

MAY 1991 **VOLUME 9, NUMBER 9**

9

16



30

20

FEATURES

Monitoring North American Aerospace Defense Command NORAD, And Other Things You Can Scan In 9

The 225 to 400 MHz Military UHF Band. Here's A Primer For Monitoring This Little Known Action Band!

By Martin Stett, KCT1TC

Double Dutch 16

Scanning The World From The Netherlands, Or Vice Versa, It's A Bit Out Of The Ordinary!

By Chuck Robertson

Marconi: Lost & Found 20

Rare & Faded Images Of One Of Radio's Pioneers In This Photo Festival *By Alice Brannigan*

Books You'll Like 28

A Handy Telephone Repair Manual And More From Harry Helms. *By R.L. Slattery*

POP'COMM Reviews: Somerset Electronics' Microdec™ Multi-made Decoder 51

By POP'COMM Staff

COLUMNS

Broadcast DXing . . . 30
CB Scene . . . 34
Scanning VHF/UHF . . . 37
You Should Know . . . 38
Telephones Enroute . . . 46
Listening Post . . . 48
Ham Column . . . 52
Communications Confidential . . . 54
Satellite View . . . 58
RTTY . . . 62
Pirates Den . . . 67
Washington Pulse . . . 68
How I Got Started . . . 71
Emergency . . . 72

DEPARTMENTS

Beaming In . . . 4
Mailbag . . . 6
Worldband Tuning Tips . . . 40
New Products . . . 44
Communications Shop . . . 76

This month's cover: *USA—Cheyenne Mountain, CO: Craig Franklin, GTE Technician, checks out air phone site on top of mountain. Photo by Larry Mulvehill.*

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 $19.95, two years $38.00, three years $57.00. Canada/Mexico—one year $22.00, two years $42.00, three years $63.00. Foreign—one year $24.00, two years $46.00, three years $69.00. Foreign Air Mail—one year $77.00, two years $152.00, three years $228.00.

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

Postmaster: Please send change of address to Popular Communications, 76 North Broadway, Hicksville, NY 11801.

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. $1129.95 (+$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. ***On special ... CALL***

❒ **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. CALL FOR PRICE

❒ **Sony ICF-2010**

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

❒ **Magnavox AE3805BK**

A digital radio at an analog price. Covers 3.2-7.3 & 9.5-21.7MHZ $119.95 (+$4 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! CALL FOR PRICE.

SHORTWAVE ANTENNAS

❒ **Alpha Delta DX-SWL Sloper**
MW +120-13 meter bands (60'). .... $67.95+$4

❒ **Alpha Delta DX-SWL Sloper-Short**
90-13 meter bands (40'). ..... $57.95+$4

❒ **Eavesdropper** Specify twin lead or coax type
9 SW bands (60-10 meters). ..... $74.95+$4

❒ **McKay Dymek DA100D Active Antenna**
The Cadillac of active antennas! .. $179.95+$4

❒ **Sony AN-1 Active Antenna**
For portables, covers .15-30 MHz. $84.95+$4

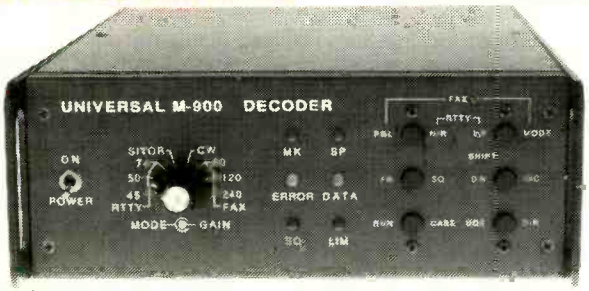
Note: Many more antennas available. See catalog.

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. With video fax and real time clock only $1159.00 **Please write for full details.**

- Morse Code (CW)
- Regular Baudot RTTY
- Bit Inverted&Var. Baudot
- ASCII Low & High Speed
- Sitor Mode A & B
- ARQ-M2 & M4 (TDM)
- ARQ-E and ARQ-E3
- FEC-A and FEC-S
- SWED-ARQ and ARQ-S
- 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 1991 Ed.**
By L.Magne. Graphic presentation of all SWBC stations. Equipment reviews too. $16.95

❒ **Shortwave Receivers Past & Present**
By F.Osterman. Your guide to 200 receivers with new-used value, specs, features. $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 Utility Stations 1991 9th Edition**
By J.Klingenfuss. The definitive guide to utility stations- CW, SSB, FAX and RTTY..... $33.95

❒ **Guide To Facsimile Stations**
By J.Klingenfuss. The complete guide to FAX with freqs., schedules and addresses... $24.95

❒ **World Radio TV Handbook 1991 Edition**
All SWBC stations by country with schedules, addresses, power, etc. Reviews too. .. $19.95

✓ Please add $1 per title for shipping.

COMMUNICATIONS CATALOG

Universal now offers a new combined communications catalog covering shortwave, amateur and scanner equipment. There is also an unbeatable selection of antennas, books, parts and accessories. This huge **92 page** (8½" by 11") publication covers everything for the radio enthusiast. With prices, photos and full descriptions.

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

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

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

Who Speaks On Shortwave For Americans?

Back in the late 1940's, when I first got into SWL'ing, there were many American shortwave broadcasting stations owned by companies such as NBC, CBS, Westinghouse, Crosley, General Electric, and others. An evening at the receiver could fill up the logbook with callsigns such as WCBX, WNRE, WRUL, KGEX, WOOC, WLWL, WRCA, KNBI, WCDA, and the other privately owned commercial shortwave broadcasters.

Some newspapers even carried skeds and frequencies of these stations, plus overseas stations.

But, even as this was taking place, these stations were losing their singular identities as, under contract, most became no more than the facilities used by the evolving *Voice of America* (VoA). Soon enough, the VoA completely absorbed the identities, facilities, operations, and ownership of virtually all of these stations (except WRUL in Scituate, MA—which later became WNYW, and eventually religious station WYFR in Florida).

Then, for a few decades, shortwave broadcasting from the USA consisted of the VoA and AFRTS, plus WRUL, also missionary stations KGEI and WINB. New privately owned American stations were, essentially, a dead issue until about ten years ago. That's when Joe Costello worked a miracle and got the FCC to grant him a license for WRNO. That gave hope that things would get going, and that many new American commercial shortwave broadcasters would soon be rocking the airwaves.

So we waited, and waited. In 1985, we found missionary station WMLK added to the bands, plus the promise of a commercial station proposed to be called NDXE. The following year saw more commercial and non-commercial missionary broadcasters getting ready, like WHRI, KCBI, and KVOH, and several more on the drawing boards. The year 1987 brought forth a commercial religious station, WCSN. We were still waiting for NDXE, but at least 1988 produced commercial station KUSW with lots of good music and a powerhouse signal from Salt Lake City. But, by then, KCBI had gone commercial and became inactive. However, a sweep across the bands revealed that more missionaries had been added—KSDA, KHBN, KFBS, KNLS, etc., etc. Commercial NDXE was still an unfulfilled promise.

In 1989, we welcomed WWCR, a commercial station on 7520 and 15690 kHz. WWCR is owned by a religious group that encourages eclectic programming over its facilities. Several religious-affiliated stations sell some program blocks to secular users, especially from overseas. None seem to broker program time with the gusto and variety of WWCR. WWCR carries homegrown American programming with rock music, former pirates, political views from both ends of the spectrum, and a mix of all sorts of lively listening fare.

In late 1990, once-wonderful rocker KUSW was sold for more than $2-million to a ministry that promptly changed the station's callsign to KTBN and moved its 100 kW signal to 7510 kHz (an uncomfortable 10 kHz away from free-wheeling WWCR's 7520 kHz). KTBN's new owners declared KUSW as having been the "devil's workshop," and thereupon made a bonfire in the station's parking lot and burned the former KUSW's rock music library of records, tapes, and cassettes. Some WWCR listeners began complaining that KTBN's signal was at times splattering WWCR.

With AFRTS having left shortwaves, essentially, when it comes to the USA on shortwave radio, we're looking at the VoA, WWCR, WRNO, WCSN, and many stations airing large amounts of evangelistic programming. Not a big a choice for world listeners to hear much about life in this nation, or the thoughts of its average citizens. I don't have anything against missionary stations, *per se*. Certainly HCJB, *Vatican Radio*, AWR, and TWR are some examples of the world's many religious stations that have long been highly respected members of the international broadcasting community. But, frankly, all American missionary stations aren't HCJB. Not by a long shot.

Nor do I have any blanket squawk against government owned, run, financed, or sponsored broadcasting. Still, I don't think that any comparison of the VoA against broadcasters the caliber of, say, the BBC, or the budget-plagued CBC would put the VoA in the Number 1 slot based upon creativity, variety, wit, entertainment, credibility, or just about any other relevant factors. Yes, the VoA's got enough frequencies, power, and relay stations to boldly present itself to the world, just like Beijing, Moscow, and Havana. Now that I think about it, the FCC gave WYFR almost 40 frequencies, and they're also on 6 Taiwan frequencies. This alone goes a long way towards garnering these stations big audiences without their having to lose any sleep about other factors such as interesting programs.

The CBC's RCI and the BBC have long given the world rich and wonderful insights into the characteristics, wit, views, music, regionalisms, and personalities of the average citizens in their respective nations. If RCI is able to survive its budgetary problems, lets hope it will continue for many more years, and further hope that it won't be too much affected by the CBC's evolution into *Radio One* and *Radio Two*.

Although Gene Reich's VoA *Communications World* has been one of the best DX programs around, most of the rest of what I hear on VoA, I find bland and impersonal. VoA projects the stuffy image of being an official government information outlet. Well, it's what VoA is, so that's cool. If that satisfies the VoA's large audience, then let it be.

But, pardon me, I just don't think it's a great idea for the major American shortwave alternatives to the VoA to consist mainly of stations who tell the world that the lifestyles, religions, or even musical tastes of others are sinful or evil. Such views aren't typical of most Americans. Sure, those who operate these stations are certainly entitled to freely express themselves. But these voices should be presented to the world in perspective, that is, along with an equally loud chorus of shortwave stations presenting a representative assortment of other American images and viewpoints.

So, who speaks for you and me on shortwave? Few enough, indeed. And the prospects don't look especially inviting for any quick breakthroughs in this area.

Yes, Venezuela, Uruguay, Ecuador, Mexico, Brazil, Argentina, and most other nations of the Americas, as well as Indonesia, and countries elsewhere have private commercial shortwave broadcasters. Canada has five shortwave stations in the 49 meter band running from 10 watts to 1 kW relaying AM'ers. Many nations have hundreds of these stations running 1 kW, or far less. How odd that the USA, the nation of "Free Speech," a center of electronic technology, the birthplace of broadcasting, where talented broadcasters abound, and where there are more radios per capita than anywhere in the world, is somehow left out of all of this.

Well, maybe not so odd when you begin checking around for reasons. The FCC's technical requirements for privately owned shortwave stations demand a transmitter with a minimum power output of 50 kW, and fed into an antenna array with a minimum gain factor of 10. A transmitting site to accommodate such an antenna array will need to occupy close to 30 acres.

Depending upon the model and power selected, the transmitter alone could cost from $500,000 to $1-million. Add another

(Continued on page 74)

YOU EXPECT THE WORLD FROM ICOM RECEIVERS

ICOM's IC-R71A and IC-R7000 are the professional's choice for receiving international broadcasts, aircraft, marine, business, emergency services, television, and government bands. These people demand the finest in communications and so do you. ICOM puts the world at your fingertips with the IC-R7000 25-2000MHz* and IC-R71A 0.1-30MHz commercial quality scanning receivers.

Incomparable Frequency Control. Both the IC-R71A and IC-R7000 feature **direct frequency access** via their front keypad, main tuning dial, optional infrared remote control and/or computer interface adapter. **Incredible Flexibility!**

Full Coverage, Maximum Performance. The superb IC-R71A is your key to world-wide SSB, CW, RTTY, AM and FM (optional) communications plus foreign broadcasts in the 100kHz to 30MHz range. It features IF Notch, low noise mixer circuits and a 100db dynamic range. The pacesetting **IC-R7000** receives today's hot areas of interest, including aircraft, marine, public services, amateur, and satellite transmissions in the 25MHz to 2000MHz* range. It includes **all mode operation** low noise circuits plus outstanding sensitivity and selectivity. The IC-R71A/R7000 combination is your window to the world!

The IC-R71A is a shortwave listener's delight. Its **32 tunable memories** store frequency and mode information, and they are single-button reprogrammable **independent of VFO A or VFO B's operations!** Dual width, an adjustable noise blanker, panel selectable RF preamp, and selectable AGC combined with **four scan modes** and all-mode squelch further enhance the IC-R71A's HF reception!

The IC-R7000 features 99 tunable memories and **six scanning modes.** It even scans a band and loads memories 80 to 99 with active frequencies without operator assistance! Additional features include selectable scan speed pause delays, wide/narrow FM reception and high frequency stability.

Options. IC-R7000: RC-12 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket. IC-R71A: RC-11 remote control, EX-310 voice synthesizer, CK-70 DC adapter, MB-12 mobile bracket, FL-32A 500Hz, FL-63A 250Hz and FL-44A filters.

See these quality ICOM receivers at your local authorized ICOM dealer today.

*Specifications of the IC-R7000 guaranteed from 25-1000MHz and 1260-1300MHz. No coverage from 1000-1025MHz.

ICOM America, Inc., 2380-116th Ave. N.E., Bellevue, WA 98004
Customer Service Hotline (206) 454-7619
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

ICOM
First in Communications

CIRCLE NO. 79 ON FREE INFORMATION CARD

MAILBAG

LETTERS TO THE EDITOR

Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted 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.

Radio Row

The February *Beaming In*, entitled "Rowin' Down to Radio Row," brought back a lot of memories. During a summer vacation from school, I used to work in a sleazy luncheonette on the south side of Cortland Street, near those wholesale coffee stores. Being interested in radio, I always enjoyed window shopping those radio stores. I felt that the radio stores on adjacent Chambers Street were better than those on Cortland Street, itself. That was in 1945, when I was 17 years old, just before I entered military service. Now retired, and living in Florida, I wonder if there are any more radio shops like those that used to exist on Radio Row. I always enjoy *Popular Communications*.

Gerald Silver,
Tamarac, FL

I enjoyed "Rowin' Down to Radio Row." I grew up in the Trenton, NJ area and made it to Radio Row only once. When my friends and I needed that kind of excitement, it was easier for us to go to a closer "radio row." That was Federal Street in Camden, NJ. You could pick up great bargains there and the shops were very similar to New York's Radio Row. Incidentally, my dad would have acted very much in the same manner as yours, which made your article all the more personally interesting.

Wes Stillwagon,
Port Charlotte, FL

"Rowin' Down to Radio Row" was one of the best pieces of radio literature I've seen in years. It brought to mind a time in my own life. From 1965 to 1967, I attended school in Japan. Being a radio enthusiast, I had occasional need for various components for my projects. Like you, I'd save my income from odd jobs and birthday money to but those important resistors, tubes, sockets, solder, etc. Tokyo had its own version of Radio Row, a place called Akihabara. You could go there and buy any electronic component manufactured in Japan and Europe. It was an amazing area packed into just over two blocks. The vendors had little stalls, much like a carnival (only more crowded) and usually sold only one specialty item. One stall would sell only resistors, another only wire, another just electrolytic capacitors. Those items overflowed into the aisles and also hung from the ceilings and walls. No prices were displayed, you had to barter. In the late 1950's and early 1960's, I had also been to Rome and bartered for components in the local "radio row" there. Your monthly *Beaming In* editorials are one of the few articles currently in print that rate with the classics such as the old "Carl and Jerry" (by John T. Frye), or the humor of Harbaugh or Karl Kohler which is fondly remembered. *Beaming In* is definitely a high point in my monthly radio reading. *Domo arigato. Motto omoshiroi, deshyo!*

Jean de Bellefeulle,
Santa Clara, CA

I read the article about the Hallicrafters S-40B receiver and enjoyed it very much. My son has one of these receivers. The trouble with the set is that the dial cord on the bandspread has broken and nobody knows how to restring this cord. I would like to purchase a manual for restoring the S-40B. Any help would be greatly appreciated.

John J. Dick,
8636 Belle Rd.,
Harborcreek, PA 16421

If any reader can help John, contact him directly. The dial cords in the S-40 were a source of constant trouble. The dinky tension spring quickly loses its pep and causes the controls to start slipping. You can temporarily counteract that with a couple of turns of adhesive tape to add traction to the tuning shaft. But, soon enough, the black cotton dial cord begins to fray and finally disintegrates from use. That looks to be where you're at now. Replacing either the main or bandspread dialcord requires removing the front panel, replacing the tension spring, and installing new dial cord according to a complex routing that is difficult, if not altogether impossible, to accomplish without the manual.—Editor.

Desert Storm

Thanks for printing my letter in the January issue. As soon as the letter appeared, I began receiving many cards and letters from *POP'COMM* readers, although not all that I received had return addresses so that I could personally reply. Each was sincerely appreciated. As I write this, I'm still in the Persian Gulf area. I listen to the VoA and Armed Forces Saudi Network. Shortwave is my main link for news here.

My address in the USA is: SSGT Michael J. Manning, Box 846, Shaw AFB, SC 29152.

SSG Michael Manning,
Desert Storm,
Persian Gulf

California Calling

Inasmuch as I supplied much of the material for the September, 1990, story on monitoring the California Highway Patrol, I'd like to point out that the frequencies shown were scheduled to be in effect at the time of publication. Delays in the placing the new Benicia Communications Center (where all San Francisco Bay Area dispatchers will be housed) have set back implementation of the new frequency assignments for the CHP's Golden Gate Division. The move to Benicia (in Solano County) is most likely a cost-saving move, and the CHP admits that it's dragging its feet here.

To review, the new color coded frequency pairs are: Turqoise = 42.60/42.14; Violet = 42.16/42.64; Amber = 42.08/42.82; Bronze = 42.12/42.40; Ruby = 42.50/42.28; Aqua = 42.62/42.82; Maroon = 42.94/42.74 MHz. Also recently noted in the San Francisco Bay Area is CHP aircraft/helo radio traffic on Ivory (45.02 MHz).

Reader Gary Webbenhurst (who commented negatively in the January issue *Mailbag* on my information) should lighten up and realize that this isn't brain surgery we're talking about here.

Jan D. Lowry,
Broadcast Pro-File,
P.O. Box 982,
Hollywood, CA 90078-0982

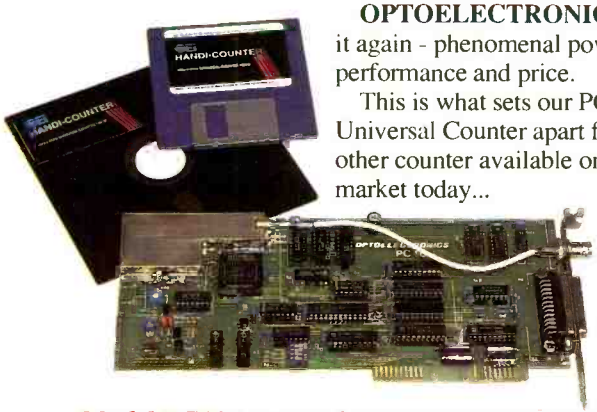
Help, Please!

I'm a retread SWL and CB'er, having recently gotten back in the swing of things. I began in the late 1950's with a Crosley AM/SW table radio and some wire strung through the trees outside my window. I recently acquired a Radio Shack DX-300 receiver and would like to obtain a copy of the operating instructions. The local stores couldn't supply one. I also have a Cobra 142-GTL rig for CB, and am hoping to get into sideband.

Mainly, I'm hoping that someone can give, loan, or photocopy me the DX-300 operating instructions.

Tom McCoy,
3128 Fletcher St.,
Anderson, IN 46016

PUT THE PC10 IN YOUR PC FOR MORE COUNTER POWER.



OPTOELECTRONICS does it again - phenomenal power, performance and price.

This is what sets our PC Based Universal Counter apart from any other counter available on the market today...

Model PC10 Universal Counter Timer Board for the PC. Introductory Price $339.

The PC10 has on board 50 ohm RF input with amplifiers and prescalers to operate as a stand alone 1MHz to 2.4GHz RF counter. TTL level input signals can be connected directly to the miniature 25 pin D connector on the mounting bracket. For low frequency, high impedance inputs, the Model AP10H companion amplifier must be used.

Model AP10H Dual High Impedance Amplifier Head Unit (Not Shown). Introductory price $299.

The AP10H is the companion head unit that supports all PC10 Universal Counter functions from 10Hz to 100MHz with 1 megohm inputs. Input attenuators, low pass filters and trigger levels are software selectable.

Options: TCXO 10 Precision Temperature Compensated Time Base $195. *± 0.2ppm 20°-40°C, 1ppm - year aging.*

- Instant Direct Tune - Set a communications receiver such as ICOM R7000 to frequency detected by counter. Patent pending.
- Data logging and data file creation to keep records or measure frequency drift.
- Menu selection for Units includes CPM/RPM, Hz, KHz, MHz, GHz, Sec, mS, uS and nS.
- Software timebase calibration of 1ppm TCXO timebase.
- Windows 3.0 operating environment with fully developed operating and signal conditioning controls accessible through pull down menus.

In addition to these unique features, PC10 is a down right high performance counter...

- 10 digit 10Hz to 2.4GHz frequency range.
- Measurement Period (Gate Time) continuously variable from 1 milli-second to 28 seconds.
- Reciprocal Counting for high resolution measurement.
- Input sensitivity is less than 10mV from 10Hz to over 1.6GHz.
- Direct count frequencies over 200MHz with 1Hz resolution in 1 sec.

OPTOELECTRONICS

Toll Free Order Line:1-800-327-5912

FL(305)771-2050 • FAX(305)771-2052

5821 NE 14th Avenue • Fort Lauderdale, Florida 33334

"The Largest Dealer of Scanners in the World"

® SCANNER WORLD, USA®

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

SCANNER WORLD EXCLUSIVE

UNIDEN BEARCAT BC205XLT

$259.99 *($7.00 shipping)*

Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHZ.* Features include: Scan delay, memory backup, key pad lock, sidelit liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16"Wx1-3/8"Dx7-1/2" high. (Optional extended 2 yr. warranty $29.99, 3 yr. extended warranty $39.99.)
(*Excludes Cellular)
#CC-008 Heavy Duty Leather Carry Case . $27.99

RADIO SCANNERS AND ACCESSORIES

Bearcat BC145XL	$99.99	(7.00)
Bearcat BC140	94.99	(7.00)
Bearcat BC172XL	139.99	(7.00)
Bearcat BC55XLT	119.99	(7.00)
Bearcat BC800XLT	249.99	(7.00)
Bearcat BC100XLT	189.99	(7.00)
Bearcat BP205/200	34.99	(*)
Bearcat BC210XLT	189.99	(7.00)
Bearcat BC-ONE	129.99	(7.00)
Bearcat AD-100U	14.99	(*)
Bearcat PS-001	12.99	(*)
Bearcat VC-001	12.99	(*)
Bearcat AD-140U	14.99	(*)
Bearcat AT-054	12.99	(*)
President HR2600	219.99	(8.00)
Regency R3020	96.99	(7.00)
Bearcat BC-310A	85.99	(7.00)
Bearcat BC-330A	109.99	(7.00)
Regency MA-917	24.99	(*)
Regency MA-501	14.99	(*)
LifeGard 4	109.99	(4.00)
GRE9001	89.99	(5.00)
GRE8002	79.99	(4.00)
Midland CB Radios	In Stock	
Cobra CB Radios	In Stock	
Uniden CB Radios	In Stock	
Silver Eagle Microphone	69.99	(*)
Antennas	In Stock	
Rechargeable Batteries	In Stock	

BOOKS

Covert Intelligence	8.95	(*)
Air Scan Directory	14.99	(*)
Betty Bearcat (Special)	4.00	(*)
Top Secret (7th)	15.99	(*)
Covert Techniques	9.95	(*)
Tomcat's Big CB	13.95	(*)
World Radio	18.99	(*)
Monitor America	5.99	(*)
Survival Directory	6.95	(*)
Rail Scan	7.95	(*)
Police Call	7.49	(*)
Scanner Modification Handbook	17.99	(*)

TWO-WAY RADIOS REGENCY-RELM

UC102	109.99	(6.00)
UC102 (2 or more)	99.99	(6.00)
RH-256NB	339.99	(9.00)
RH-606B	469.99	(9.00)
WHS-1	399.99	(9.00)
UC-202	134.99	(6.00)

REGENCY TS-1

35 CHANNELS — MOBILE/BASE

Special

$138.99 *($7.00 shipping)*

Features include simple programming of the following frequency ranges: 29-54 MHz, 118-175 MHz, 406-512 MHz. Turboscan, 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 $138.99 plus $7.00 shipping. (Optional extended warranty; 3 years $39.99; 2 years $29.99.)

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.

REGENCY R-4020

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, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A

SHORT WAVE RECEIVER

$168.99

($7.00 shipping)

AM/FM/LW and 12 snortwave bands plus FM stereo, BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

—SHORT WAVE WORLD BAND RECEIVERS AVAILABLE—

Grundig Satellit 500	$548.99	(10.00)
Grundig Yacht Boy 220	106.99	(5.00)
Grundig Cosmopolit	198.99	(7.00)
Grundig Yacht Boy 230	149.99	(5.00)
Grundig Satellit 650	899.99	(20.00)
World Radio & TV Handbook (1991)	18.99	(*)

SPECIAL!! LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER

Cobra

SR-901

AVAILABLE ONLY FROM SCANNER WORLD

ONLY! **$74.99** Each

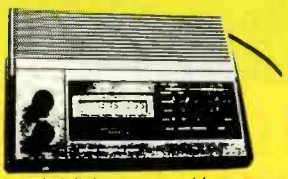
(Plus $6.00 Shipping Each)

$69.99 (2 or more)

Features Include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructrions. Size: 7¼" W x 2" H x 7¼"D. One year factory warranty.
(Optional mobile cigarette lighter cord #901MPC $4.99)

Regency R3020

$96.99 *($7.00 Shipping)*



20 channel digital programmable scanner, frequency coverage 29-54 MHz, 108-136 MHz aircraft, 136-174 MHz, 406-512 MHz. Features: weather key, search, lockout, priority, squelch, AC only, delay button. Size 9½"x2⅜x7"

UNIDEN BEARCAT BC-600XLT

$199.99

($7.00 shipping)

Digitable Programmable 100 Channel Scanner

BC 600XLT covers the followlng frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz. Features compact size of 6-5/16"Wx1-5/8"Hx7-3/8", scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services 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-950XLT

Same features as BC–600XLT but also receives 800-954 MHz. *(Excludes cellular)*

$249.99 *($7.00 shipping)*

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 5W-41, only $19.99 includes rechargeable Ni-Cad batteries, AC adapter/charger and cigarette lighter cord.)

★ SCANNER WORLD HAS BEEN SELLING SCANNERS FOR OVER 21 YEARS

★ ALL MERCHANDISE NEW, IN FACTORY SEALED CARTONS

★ COMPLETE CATALOG PUBLISHED 4 TIMES PER YEAR. FREE UPON REQUEST.

BEARCAT 70XLT 20 CHANNEL DIGITAL HAND-HELD SCANNER

SPECIAL PACKAGE DEAL ONLY **$129.99** *($7.00 Shipping)*

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 vinyl carry-case.

Optional Cigarette Lighter Cord #UA502	$12.99
Heavy-Duty Leather Carry Case #CC002	$22.99

BEARCAT BC-147XLT 16 CHANNEL BASE SCANNER

$99.99 *($7.00 Shipping)*

Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

REGENCY R-2066

$99.99

($7.00 shipping)

Digital programmable, 60 channels, AC base scanner, 30-50 MHz, 144-174 MHz, 406-512 MHz. Size 7⅛"x3"x9". Turbo-Scan scans 40 channels per second, 4 channel banks, weather alert, search, priority, lockout, AC cord, telecopic antenna, plus much more.

EXTENDED WARRANTY SERVICE

This extended service contract is for all scanners, CB radios, radar detectors, and cordless telephones that have been purchased anywhere in the USA in the past 30 days. This extended warranty service begins when your original manufacturer's warranty expires.

1 year extended warranty	only $18.99
2 year extended warranty	only $29.99
3 year extended warranty	only $39.99

ORDERING INFORMATION: Call (518) 436-9606 to place orders or mail orders to Scanner World, USA®, 10 New Scotland Ave., Albany, N.Y. 12208. Orders will be shipped within 24 hours by United Parcel Service if order is accompanied by MasterCard, Visa, cashier's check, money order, COD (COD shipped by United Parcel Service will be cash or money order only). (If a COD package is refused, customer will be billed for shipping and COD charges.) Mail orders with personal or business checks enclosed will be held 4 weeks for bank clearance. Prices, specifications, and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. Scanner World® warehouse in Albany, N.Y. We are not responsible for typographical errors. All merchandise carries full manufacturer's warranty. Bid proposals and purchase orders accepted from government agencies only. Free full line catalog mailed 4 times per year. Merchandise delivered in New York State add 7% sales tax. No returns accepted after 7 days of merchandise receipt. * Add ($) per item, and $3.00* for all accessories ordered at same time. COD orders will be charged an additional $4.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service to street address only. (No P.O. Box). Shipping charges are for continental USA only. All others ask for quote on shipping charge.

Monitoring North American Aerospace Defense Command

NORAD, And Other Things You Can Scan in The 225 to 400 MHz Military UHF Band. Here's a Primer For Monitoring This Little Known Action Band!

BY MARTIN STETT, KCT1TC

Several of today's more sophisticated scanners (like this Realistic PRO-2006) can tune in the exciting 225 to 400 MHz military UHF aero band.

The military UHF band is massive, running from 225 through 400 MHz. This is a chunk of communications spectrum 175 MHz wide, thus making it just about the largest band reserved for any non-broadcast purpose. Yet, for all of this, it's one of the least understood communications band around. Until only a few years ago, scanners didn't even include the band! The only way it could be monitored was on cumbersome military surplus equipment that wasn't able to scan, and could deal with one channel at a time.

While many of today's scanners still ignore these frequencies, those who own popular Radio Shack Realistic PRO-2004, PRO-2005, and PRO-2006 scanners, and Ace Communications AOR scanners AR950, AR1000, AR2500, and AR3000 are among those now lucky enough to have the ability to scan this exciting band. The problem has been that it still hasn't caught on, probably because it has received far less attention than public safety and other forms of scanner monitoring, including the 118 to 137 MHz VHF aero band.

However, the 225 to 400 MHz band is where you can tune in on military aircraft, and that includes air traffic control, training missions, war games, airborne tankers, search and rescue operations, precision flying teams, weather comms, and the very serious operations of NORAD, which is the North American Aerospace Defense Command.

We'll explain some of the basics of this band so that you can join in the growing corps of those of us who find this band so thoroughly fascinating.

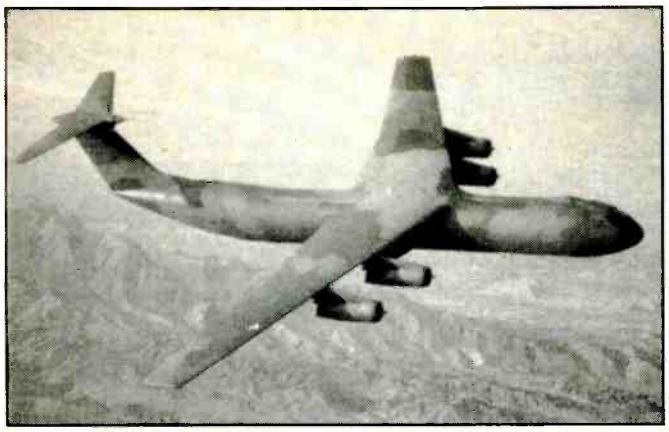
Basics

The most primary things you'll want to know about the band is that in order to copy the aero communications in the 225 to 400 MHz band, your scanner must be set to receive AM (*not* FM) mode. Your local police and fire units use FM, but in the VHF and UHF aero bands, all air/ground and air/air transmissions are in AM mode. Chances are, you'll have to manually set your scanner for AM mode reception here because it will select FM reception for itself in this band if allowed to make its own decision.

Also, and although there are exceptions, the channel separation in this band is 100 kHz. This means that channels are usually spaced 225.1, 225.2, 225.3, 225.4, etc. If you are setting up a search/scan program, the closest you may be able to get to this is by searching at 50 kHz steps. That's OK, you can even search at 12.5 kHz steps, but it will take longer. You may want to consider concentrating on no more than 5 MHz at a time rather than taking on the entire band in one fell swoop.

What Can Be Heard

While it shouldn't surprise you to learn that American and Canadian military air



The USAF's Military Airlift Command has kept 319.4 MHz especially humming for the past few months. The is one of MAC's C-141B StarLifters.

Air refueling operations are coordinated in the UHF aero band. Here, an F-15 Eagle gets a tankful from a KC-10A.

bases have numerous frequencies in this band, many people are somewhat startled to learn that the majority of civilian airports with control towers can operate on several UHF aero band channels in addition to their better known VHF aero frequencies for tower, ground control, approach, etc. These are especially active if there are National Guard, Air Guard, or Reserve squadrons using the facility. These organizations usually also have their own tactical and operational frequencies in the UHF aero band from civilian airports.

Furthermore, the huge Air Route Traffic Control (ARTCC) network that operates throughout the USA and Canada makes heavy use of many frequencies in the UHF aero band. Each center and its remote sites is equipped with about as many UHF frequencies as it has VHF frequencies. The UHF frequencies are primarily used for communications with military aircraft.

Then, there are many commonly used generic or nationwide frequencies active in the UHF aero band. A listing of those you might find of interest accompanies this feature. It isn't intended to include each and every one, but enough of them to get you going, and naturally, not every one shown in our list will produce activity for you.

Eventually you'll find some favorites. I like 319.4 MHz which is used by a large number of Military Airlift Command ground stations at Air Force Bases. That's where you'll hear a lot of "MAC" transports ferrying military personnel and equipment in both directions between North America and overseas points. Or, you might like to monitor 311.0 MHz, which produces comms from bombers of the USAF's Strategic Air Command.

The USAF has dispatchers at most of its bases. In many respects this service is very similar to the Unicom service at civilian airports. It gets interesting when an incoming flight has high ranking military officers aboard who have special ground transportation and accommodation requests radioed ahead for the base dispatcher to handle. These comms are usually found on 372.2 MHz.

FAA Flight Service Stations are active on 255.4 MHz, and can often be heard communicating with National Guard aircraft. If you are located within 200 miles of the Space Shuttle landing area, listen on 259.7 and 296.8 MHz during the landing process and you might hear comms between the Shuttle, camera and other aircraft, and ground units.

Certainly, if you are located near any coastal area, you'll want to monitor 282.8 MHz, and perhaps other USCG channels such as 317.7 and 317.8 MHz. These frequencies can be very exciting.

Monitors in coastal areas can also try to monitor the U.S. Navy's Fleet Area Control and Surveillance Facilities (FACSFAC). These stations have a mission that is officially described as follows: "to provide scheduling, communication links, control, containment, coordination, search/rescue, and a variety of other services to all military and civil aircraft in the Warning Areas and offshore Operating Areas along the US east, west, and Gulf coasts . . . ." The most active FACSFAC frequencies in this band are given in the accompanying listing.

North American Aerospace Defense Command (NORAD)

NORAD is a joint US/Canadian military activity that has the mission of detecting, assessing, and warning of an attack by missiles

The Boeing E-3A AWACS electronics surveillance aircraft is a vital link in NORAD's information gathering network. Check the military UHF aero band for their NORAD comms.

HYPERSCAN

Now You Can Scan Up to 400 Channels in Less Than 16 Seconds!

You'll be "on the scene" of local action in a flash with the Realistic® PRO-2006 scanner. More than 196,000 exciting frequencies are at your command, including the new 800-MHz police and emergency bands. At up to 26 channels per second, you'll scan much faster than most scanners not equipped with the HyperScan® system.

You get ten 40-channel memory banks, a 10-channel monitor bank, search mode and selectable priority function. Frequency coverage is 25-520, 760-823, 851-868 and 896-1300 MHz. Precise ZeroMatic® tuning locks on-frequency for best reception. A backlit LCD display, memory backup and full array of jacks are included.

Take the next big step in communications excitement—check out the Realistic PRO-2006 today. *Available at . . .*

CREATING NEW STANDARDS

RELIABLE QUALITY—Over 1500 engineers and technicians develop, evaluate and test to our exacting standards—*NOBODY COMPARES*

PROMPT SERVICE—Over 7000 drop-off points nationwide insure dependable service to your satisfaction. Over 1,000,000 parts stocked. We service what we sell—*NOBODY COMPARES*

Radio Shack®
AMERICA'S TECHNOLOGY STORE℠

Radio Shack is a division of Tandy Corporation

CIRCLE 131 ON READER SERVICE CARD

Common UHF Aero Band Channels

225.0	USN
229.6	Army & National Guard
231.0	NASA
235.0	USN
235.1	USAF Air Refueling
236.6	USAF Control Towers
237.9	USCG
238.9	USAF Air Refueling
239.8	Weather
240.4	NASA
240.6	NASA USCG USN
240.8	NASA
241.0	NASA Army & National Guard
241.2	NASA
241.4	USN Blue Angels
241.6	NASA
241.8	NASA
242.0	NASA
242.2	USAF/TAC
243.0	Emergency "Guard Band"
245.7	Canadian Snowbirds
250.8	USN Blue Angels
250.85	USAF Thunderbirds
251.6	USN Blue Angels
255.4	FAA Flight Service
256.2	NASA
257.8	USAF Control Towers
259.7	Space Shuttle
260.2	USAF Air Refueling
264.2	USN
266.05	USAF/SAC FEMA
270.6	USN
272.7	FAA Flight Service
273.5	USAF Thunderbirds
273.8	USAF/SAC FEMA
275.1	USN USCG
275.35	USN Blue Angels
275.8	USAF Control Towers
276.5	USAF Air Refueling
276.9	USAF
277.0	USN
277.8	USCG USN Fleet Common
280.5	USAF/TAC
282.5	USAF/TAC
282.7	USAF Air Refueling
282.8	USCG Search & Rescue
283.5	USAF Thunderbirds
283.7	USAF/TAC
283.9	USAF Air Refueling
285.0	USN USCG
285.4	USAF Control Towers
286.9	USAF
289.4	USAF
289.5	USAF
289.7	USAF Air Refueling
289.8	USN
289.9	USAF
292.1	USAF/TAC
293.0	USAF Air Refueling
294.2	USAF
295.4	USAF Air Refueling
295.7	USAF Thunderbirds
295.8	USAF Air Refueling
296.2	USAF
296.8	Space Shuttle
297.0	USAF/MAC
300.6	USN Air/Air
301.0	USN
302.7	USAF
305.4	USAF Direction Finding
305.5	USAF
305.6	USAF/TAC
305.7	USAF/TAC
306.35	USN
306.6	USAF/TAC
307.7	USN Blue Angels
307.85	USN
307.95	USN
309.25	USN
309.35	USN
310.75	USN
310.85	USN
311.0	USAF/SAC Primary
313.6	USAF/TAC
316.5	Canadian Snowbirds
318.3	USAF
319.4	USAF/MAC
319.5	USAF Air Refueling
319.7	USAF Air Refueling
320.2	USN
320.9	USAF Air Refueling
321.0	USAF/SAC Secondary
321.2	USAF/SAC
322.6	USAF Thunderbirds
322.95	USAF
326.3	USAF
335.7	USAF
335.8	USAF
336.1	USAF
338.5	USAF
340.2	USN Control Towers
340.6	USAF
340.8	USAF/MAC
342.2	USAF/SAC USCG
342.5	Weather
343.0	USAF/TAC
343.5	USAF Air Refueling
344.6	Weather
344.7	USAF Air Refueling
345.0	USN
348.6	USAF Control Towers
349.4	USAF/TAC/MAC
354.2	USAF
355.0	USN
357.7	USAF
357.9	USN
358.9	USN
359.4	USN
360.2	USN Control Towers
360.4	USN Blue Angels
363.8	USAF Control Towers
364.2	NORAD Air Intercept Control Channel
364.6	USAF
368.6	USAF
369.1	USAF
370.4	USAF
372.2	USAF Dispatch Frequency
372.8	USAF/MAC
375.2	Weather
375.7	USAF/SAC
376.2	USAF/TAC
378.1	USAF
378.4	USAF/TAC
378.8	USAF
380.55	USN
381.3	USAF/TAC Command Posts
381.7	USCG
381.8	USCG
382.5	USAF/TAC
382.9	USAF Thunderbirds
383.9	USCG
384.4	USN Blue Angels
394.8	USAF
385.0	USN Ports & Harbors
385.25	USN Air/Air
387.4	USN
387.9	USAF/TAC
390.9	USAF/MAC
391.9	USN Blue Angels
395.9	USN Blue Angels
398.5	USAF

or manned bombers on the USA or Canada. This requires a 24-hour vigil be maintained.

NORAD's Space Defense Center (SPADATS) is located deep inside 9,000 ft. Cheyenne Mountain, near Colorado Springs, at the southern end of the Colorado Rockies. Cheyenne Mountain is a solid block of granite. NORAD burrowed through more than two miles of the mountain in order to create its facilities. It took a year of digging, then four years of construction (and $142-million) to complete the 4.5 acre underground complex. Protecting the entrances are blast doors three feet thick and weighing 25-tons each. An alternate Combat Operations Center is underground in North Bay, Ontario.

The NORAD activity is divided into eight regions, each covering a specific geographic area. The Regional Control Centers are at Tyndall AFB, FL; Hancock, NY; North Bay, Ontario; Duluth, MN; Malmstrom AFB, MT; McChord AFB, WA; Luke AFB, AZ; and Elmendorf AFB, AK. Each of these regions is a communications center utilizing a fanned out network of remote transmitters used for communicating with NORAD aircraft.

A large number of NORAD E-3A AWACS surveillance aircraft are kept in the air at all times flying prescribed routes ("orbits"). Some are used for surveillance, but others are training and practicing and can be heard announcing "Tally Ho!" as they spot "angels" and "bogies." Those that are performing actual surveillance feed their data to their Regional Control Centers where it is promptly fed to Cheyenne Mountain for processing. Other data is fed to NORAD HQ from sources including satellites, the Ballistic Missile Early Warning System (BMEWS), the Distant Early Warning (DEW) Line, the Sea-Launched Ballistic Missile Detection System (SLBM), and the US Navy's Space Surveillance System (SPASUR).

You won't have an opportunity to hear much in the way of NORAD comms except those using UHF aero band circuits. You might also be able to copy NORAD on HF frequencies in USB mode on the following frequencies: 4872, 5297, 6708, 9023, 9793, 10194, 10452. 11214, 11284, 11441, 14364, 14894, 18027, and 20855 kHz.

On UHF, you'll certainly want to always monitor 364.2 MHz, which is NORAD's Air Intercept Control Channel (AICC). This is the primary and busiest of NORAD's UHF voice frequencies, and it's used in all NORAD Regions. Very often, contact will be established on 364.2 MHz, and then

North American Aerospace Defense Command

Regions: 364.2

20th NORAD Region: ID= "Oak Grove;" Southeastern & Gulf Coast States. Frequencies: 228.8 234.7 238.5 239.2 251.0 254.8 256.6 263.2 263.4 270.4 273.4 275.0 278.4 278.6 278.8 287.8 289.0 292.7 298.5 302.4 306.4 325.5 338.4 339.4 344.0 346.9 356.0 369.0 375.1 386.2 392.8

21st NORAD Region: ID= "Huntress;" Mid-Atlantic & New England States. Frequencies: 227.1 228.7 228.8 233.5 233.6 234.7 235.6 235.8 236.8 237.8 238.5 239.2 239.4 244.7 251.0 251.8 252.0 254.0 254.8 256.6 258.0 263.2 265.4 270.1 270.4 271.8 273.4 275.0 278.4 278.6 278.8 282.5 283.8 286.7 287.8 288.0 282.8 292.7 292.8 298.5 298.6 298.8 302.4 303.0 303.9 306.4 312.8 316.2 316.4 318.4 325.5 326.4 338.1 338.3 338.4 338.8 341.1 342.1 344.0 346.9 347.4 351.6 351.8 356.0 363.8 357.2 369.0 371.8 375.1 376.2 382.0 386.2 388.2 389.2 390.1 392.8 394.8 399.0

22nd NORAD Region: Northern Maine, Northern Canada, Quebec, Maritime Provinces. Frequencies: 228.9 251.0 256.6 263.6 270.4 274.4

23rd NORAD Region: ID= "Goliath;" Midwestern States & Ontario. Frequencies: 228.6 229.1 233.6 235.9 238.6 239.1 239.4 239.7 251.8 252.0 254.4 258.0 258.8 260.9 261.4 262.2 265.4 271.0 273.4 276.0 277.6 278.2 278.4 279.4 282.6 284.0 284.8 287.7 288.4 289.0 292.4 293.6 293.8 297.7 309.5 312.8 318.4 327.2 328.0 346.9 348.2 348.8 351.5 355.2 357.2 359.8 371.0 374.0 379.0 384.0 386.0 390.2 394.4 396.8 397.8

24th NORAD Region: ID= "Ringmaster;" Central Plains States, Alberta, Saskatchewan, Manitoba. Frequencies: 228.8 228.9 234.6 234.7 238.4 238.5 251.0 254.2 256.6 260.8 263.2 267.0 269.9 270.2 270.4 274.4 275.0 278.4 279.4 281.6 287.8 292.7 292.9 298.5 302.4 306.4 309.4 316.3 320.6 324.0 325.5 327.7 335.6 338.4 341.8 344.0 356.0 369.0 375.1 377.1 386.2 387.8 392.8 398.0

25th NORAD Region: Pacific Northwest, British Columbia. Frequencies: 228.6 235.8 235.9 238.2 238.6 238.7 239.1 239.7 240.0 252.0 260.9 261.4 265.4 271.0 276.4 277.6 278.4 279.4 282.6 287.7 288.4 293.6 293.8 328.0 348.2 351.5 355.2 359.8 374.0 374.2 386.0 390.2 394.2 394.4 397.8

26th NORAD Region: ID= "Sierra Pete;" Southwestern States. Frequencies: 228.6 228.9 234.6 235.9 238.4 238.6 238.9 239.7 252.0 254.2 260.8 260.9 261.4 265.4 267.0 270.2 271.0 272.0 273.4 274.4 277.6 278.4 279.4 280.0 280.1 281.6 282.6 278.4 278.7 287.5 287.7 288.4 293.6 293.8 299.0 309.4 316.3 320.6 324.0 327.9 328.0 336.6 341.8 346.2 346.9 348.2 351.5 355.2 358.4 359.4 358.8 374.0 377.0 386.0 387.0 387.8 390.2 394.0 397.8 397.9 398.0

Alaskan NORAD Region. Frequencies: 236.6 288.4

USN Fleet Area Control & Surveillance Facilities

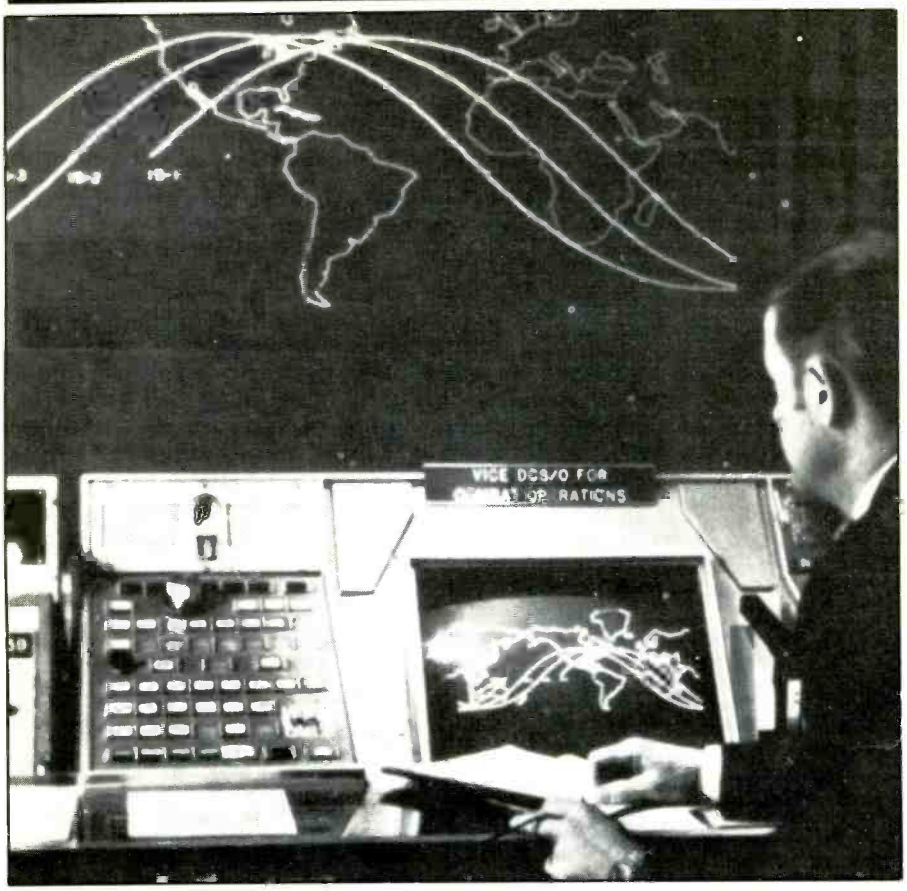
Jacksonville, FL; ID= "Sealord." Frequencies: 267.5 284.5 313.7 369.9

Norfolk (VA Capes), VA; ID= "Giant Killer." Frequencies: 233.7 249.8 251.6 255.0 305.0 310.1 338.1

Pensacola, FL; ID= "Seabreeze." Frequencies: 274.2 275.6 280.7 303.4 306.8 313.2 346.5 353.2 362.8 382.0 383.8 385.2

San Diego, CA; ID= "Beaver." Frequencies: 266.9 272.6 285.7 289.9 314.7 344.1

Whidbey, WA; ID= "Down Rigger." Frequencies: 337.8 360.2



Air Defense Technicians monitor radar screens at the NORAD Regional Operations Control Centre (ROCC) in the underground complex at CFB, North Bay, Ontario. (Canadian Forces photo.)

At the NORAD HQ in Cheyenne Mountain, satellite tracks are carefully monitored and can be projected in advance for a dozen global revolutions.

switched to another frequency used within the Regional Control Center's area. A listing of those frequencies thusfar noted by monitors is given in the accompanying chart, although there are undoubtedly additional frequencies also in use.

Besides the tactical ID's used by the ground stations, the aircraft will be heard using tactical ID's containing words like *Dragnet, Bandsaw, Incognito* and *Footrope*.

All The Help You Can Get

Although there hasn't been an abundance of equipment produced specifically for monitoring the UHF aero band, there are some very useful things available to the hobbyist.

Reception, to some extent, is possible with an all-band scanner antenna. You can also try omnidirectional types made for the 220 or 420 MHz ham bands, or you can trim a VHF ground plane to resonance in the band. Excellent results, however, are being obtained with the only antenna ever specifically designed for scanner use in the UHF military aero band.

This hot performing antenna is the MIL-UHF model MAX System ground plane offered by the Cellular Security Group, 4 Gerring Rd., Gloucester, MA 01930. It's a weatherproof unit, made from silver soldered stainless steel elements peaked for the center of the band. The Model MIL-UHF antenna is $30.95, shipping included to USA addresses (add $5 shipping to Canada).

Reception in weak signal areas can be further improved, if desired, with a *Super Amplifier* made by GRE America. These units, which can give a 20 dB boost to incoming signals between 100 MHz and 1000 MHz, do a good job in the UHF aero band. Many scanner dealers offer these preamplifiers.

Information on the frequencies and locations of specific US and Canadian stations operating in the 225 to 400 MHz UHF aero band is in the *"Top Secret" Registry of US Government Radio Frequencies, 7th Edition*. This book lists the UHF frequencies used at military and civilian airports, all of the ARTCC frequencies and remote sites, plus tactical, operational, and all of the other UHF aero band frequencies you'll definitely want to know about. Thousands of them! The 240 page book is available from leading scanner dealers, or may be obtained by mail from its publisher, CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. From its publisher, it's $19.95, plus $3.50 shipping to any address in North America. Residents of NY State, please add $1.50 sales tax.

You'll enjoy zeroing in on known channels, then searching out additional frequencies. This is a big, sprawling, and exciting band. We know what you like. With the right equipment and information at hand, the UHF aero band is just what you've always been looking for! We hope the information here is enough to have whipped up your appetite and get you started. ■

COMMUNICATIONS ELECTRONICS INC.

Emergency Operations Center has expanded to our new two acre facility and World Headquarters. Because of our growth, CEI is now your *one stop source* for emergency response equipment. When you have a command, control or communications need, essential emergency supplies can be rushed to you by CEI. As always, for over twenty two years, we're ready, willing and able to help.

Our RELM two-way radio transceivers were especially created for government agencies. When you need to talk to police, fire, ambulance, or state, federal and international response forces, RELM transceivers may be quickly programmed for up to 48 frequencies. Listed below, are some of our most asked about transceivers. For additional assistance, call CEI at 313-996-8888.

NEW! RELM® RSP500-A

List price $465.00/**CE price $319.95/SPECIAL**
20 Channel • 5 Watt • Handheld Transceiver
Frequency range: 148-174 MHz. continuous coverage. Will also work 134-148 MHz. with reduced performance.
The *RELM* RSP500B-A is our most popular programmable 5 watt, 20 channel handheld transceiver. You can scan 20 channels at up to 40 channels per second. It includes CTCSS tone and digital coded squelch. Snap on batteries give you plenty of power. Additional features such as time-out timer, busy-channel lockout, cloning, plug-in programming and IBM PC compatability are standard. It is F.C.C. type accepted for data transmission and D.O.C. approved. We recommend also ordering the **BC45** rapid charge 1½ hour desk battery charger for $99.95, a deluxe leather case **LC45** for $48.95 and an external speaker microphone with clip **SM45** for $59.95. Since this radio is programmed with an external programmer, be sure to also order one **PM45** at $74.95 for your radio system.

NEW! RELM® UC102/UC202

List price $128.33/**CE price $79.95/SPECIAL**
CEI understands that all agencies want excellent communications capability, but most departments are strapped for funds. To help, CEI now offers a special package deal on the RELM UC102 one watt transceiver. You get a UC102 handheld transceiver on 154.5700 MHz., flexible antenna, battery charger and battery pack for only $79.95. If you want even more power, order the RELM **UC202** two watt transceiver for $114.95.

NEW! RELM® RH256NB-A

List price $449.95/**CE price $299.95/SPECIAL**
16 Channel • 25 Watt Transceiver • Priority Time-out timer • Off Hook Priority Channel
The *RELM* RH256NB is the updated version of the popular RELM RH256B sixteen-channel VHF land mobile transceiver. The radio technician maintaining your radio system can store up to 16 frequencies without an external programming tool. All radios come with CTCSS tone and scanning capabilities. This transceiver even has a priority function. Be sure to order one set of programming instructions, part # **PI256N** for $10.00 and a service manual, part # **SMRH256N** for $24.95 for the RH256NB. A 60 Watt VHF 150-162 MHz. version called the **RH606B** is available for $429.95. A UHF 15 watt, 16 channel similar version of this radio called the **LMU15B-A** is also available and covers 450-482 MHz. for only $339.95. An external programming unit **SPM2** for $49.95 is needed for programming the LMU15B UHF transceiver.

NEW! RELM® LMV2548B-A

List price $423.33/**CE price $289.95/SPECIAL**
48 Channel • 25 Watt Transceiver • Priority
RELM's new LMV2548B gives you up to 48 channels which can be organized into 4 separate scan areas for convenient grouping of channels and improved communications efficiency. With an external programmer, your radio technician can reprogram this radio in minutes with the **PM100A** programmer for $99.95 without even opening the transceiver. A similar 16 channel, 60 watt unit called the **RMV60B** is available for $489.95. A low band version called the **RML60A** for 30-43.000 MHz. or the **RML60B** for 37-50.000 MHz. is also available for $489.95.

RELM® Programming Tools

If you are the dealer or radio technician maintaining your own radio system, you **must** order a programming tool to activate various transceivers. The **PCKIT010** for $149.95 is designed to program almost all RELM radios by interconnecting between a MS/DOS PC and the radio. The **PM100A** for $99.95 is designed to externally program the RMV60B, RML60A, RML60B and LMV2548 radios. The **SPM2** for $49.95 is for the LMV25B and LMU15B transceivers. The **RMP1** for $49.95 is for the RMU45B transceiver. *Programmers must be used with caution and only by qualified personnel because incorrect programming can cause severe interference and disruption to operating communications systems.*

★★★ *Uniden CB Radios* ★★★

The *Uniden* line of Citizens Band Radio transceivers is designed to give you emergency communications at a reasonable price. Uniden CB radios are so reliable they have a two year limited warranty.

PRO310E-A3 *Uniden* 40 Ch. Portable/Mobile CB . . . $72.95
PRO330E-A3 *Uniden* 40 Ch. Remote mount CB. . . $99.95
GRANT-A3 *Uniden* 40 channel SSB CB mobile $152.95
WASHINGTON-A *Uniden* 40 ch. SSB CB base. . . $209.95
PC122-A3 *Uniden* 40 channel SSB CB mobile . . . $113.95
PC66A-A *Uniden* 40 channel CB Mobile. $78.95
PRO510XL-A3 *Uniden* 40 channel CB Mobile $34.95
PRO520XL-A3 *Uniden* 40 channel CB Mobile $49.95
PRO535E-A *Uniden* 40 channel CB Mobile. $73.95
PRO538W-A *Uniden* 40 ch. weather CB Mobile . . . $78.95
PRO640E-A3 *Uniden* 40 ch. SSB CB mobile $133.95
PRO810E-A *Uniden* 40 channel SSB CB Base. . . $174.95

★★★ *Uniden Radar Detectors* ★★★

Buy the finest *Uniden* radar detectors from CEI today.
CARD-A3 *Uniden* credit card size radar detector. . . $127.95
RD3XL-A3 *Uniden* 3 band radar detector. $124.95
RD9GTL-A *Uniden* "Passport" size radar detector. . . $89.95
RD9XL-A3 *Uniden* "micro" size radar detector . . . $107.95
RD25-A *Uniden* visor mount radar detector. $54.95

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-A3** for only $179.95. 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.
Now...nothing excluded in the 806-912 MHz band.
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.

NEW! Uniden® MR8100-A

Call 313-996-8888 for special CEI pricing
12-Band, 100 Channel • Surveillance scanner
Bands: 29-54, 116-174, 406-512, 806-956 MHz.
The *Uniden* MR8100 surveillance scanner is different from all other scanners. Originally designed for intelligence agencies, fire departments and public safety use, this scanner offers a breakthrough of new and enhanced features. Scan speed is almost 100 channels per second. You get four digit readout past the decimal point. Complete coverage of 800 MHz. band when programmed with a personal computer. Alphanumeric designation of channels, separate speaker, backlit LCD display and more. To activate the many unique features of the Uniden MR8100 a computer interface program is available for $19.95. Due to manufacturers' territorial restrictions, the MR8100 is not available for *direct* shipment from CEI to CA, OR, WA, NV, ID or UT.

NEW! Ranger® RCI2950-A3

List price $549.95/**CE price $259.95/SPECIAL**
10 Meter Mobile Transceiver • Digital VFO Full Band Coverage • All-Mode Operation Backlit liquid crystal display • Repeater Splits RIT • 10 Programmable Memory Positions
Frequency Coverage: 28.0000 MHz. to 29.6999 MHz.
The *Ranger* RCI2950 Mobile 10 Meter Transceiver has everything you need for amateur radio communications. The RF power control feature in the RCI2950 allows you to adjust the RF output power continuously from 1 watt through a full 25 watts output on USB, LSB and CW modes. You get a noise blanker, roger beep, PA mode, mike gain, digital VFO, built-in S/RF/MOD/SWR meter. Frequency selections may be made from a switch on the microphone or the front panel. The RCI2950 gives you AM, FM, USB, LSB or CW operation. For technical info, call Ranger at 619-259-0287.

RELM LMV2548B Only $289.95

OTHER RADIOS AND ACCESSORIES

XC365-A *Uniden* Ultra Clear Plus Cordless Phone. . . $89.95
CT785S-A *Uniden* speakerphone cordless phone. . . $109.95
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
BC70XLT-A *Bearcat* 20 channel scanner. $159.95
BC142XL-A *Bearcat* 10 ch. 10 band scanner. $84.95
BC147XLT-A *Bearcat* 16 ch. 10 band scanner $94.95
BC172XL-A *Bearcat* 20 ch. 11 band scanner. $134.95
BC177XLT-A *Bearcat* 16 ch. 11 band scanner . . . $134.95
BC590XLT-A *Bearcat* 100 ch. 11 band scanner. . . . $194.95
BC760XLT-A *Bearcat* 100 ch. 12 band scanner. . . . $254.95
BC002-A CTCSS tone board for BC590/760XLT. . . . $54.95
BC003-A Switch assembly for BC590/760XLT $22.95
BC855XLT-A *Bearcat* 50 ch. 12 band scanner . . . $199.95
BC1-A *Bearcat* Information scanner with CB $129.95
BC330A-A *Bearcat* Information scanner. $99.95
BC560XLT-A *Bearcat* 16 ch. 10 band scanner $94.95
BP205-A Ni-Cad batt. pack for BC200/BC100XLT. . . $39.95
TRAVELLER2-A *Grundig* shortwave receiver. $89.95
COSMOPOLIT-A *Grundig* shortwave receiver. . . . $199.95
SATELLIT500-A *Grundig* shortwave receiver $679.95
SATELLIT650 *Grundig* shortwave receiver. $949.95
ATS803A-A *Sangean* shortwave receiver. $159.95
74102-A *Midland* emergency weather receiver. . . . $39.95
77116-A *Midland* CB with VHF weather & antenna. . . $66.95
77118-A *Midland* CB mobile with VHF weather. . . . $62.95
77913-A *Midland* CB portable with VHF weather $79.95
76300-A *Midland* CB base station $92.95
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
PWB-A Passport to World Band Radio $16.95
ASD-A Airplane Scanner Directory. $14.95
TSG-G7 "Top Secret" Registry of U.S. Govt. Freq. . . . $16.95
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
SMH-A2 Scanner Modification Handbook, Vol. 2 . . . . $18.95
LIN-A Latest Intelligence by James E. Tunnell. . . . $16.95
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 $15.00 shipping per radio and $4.00 per antenna.

BUY WITH CONFIDENCE

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. 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. Not responsible for typographical errors.

Mail orders to: Communications Electronics,™ Box 1045, Ann Arbor, Michigan 48106 U.S.A. Add $15.00 per radio for U.P.S. *ground* shipping and handling in the continental U.S.A. 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. For credit card order, call toll-free in the U.S. Dial 800-USA-SCAN. For information call 313-996-8888. FAX anytime, dial 313-663-8888. Order today.

Sale dates 3/15/91 — 10/31/91 AD #032591-A

For more information call 1-313-996-8888

Communications Electronics Inc.
Emergency Operations Center
P.O. Box 1045 □ Ann Arbor, Michigan 48106-1045 U.S.A.
For orders call 313-996-8888 or FAX 313-663-8888

Double Dutch

Scanning The World From The Netherlands, or Vice Versa, It's a Bit Out Of The Ordinary!

BY CHUCK ROBERTSON

Pack a couple of scanners in with your wooden clogs, because Holland is one of the few European nations where casual monitoring of the action bands isn't forbidden. And, even if you don't intend leaving your home radio room, you can still travel there via HF and low band VHF when ionospheric conditions permit. And why not? Scanner fans in Holland regularly tune in on North American skip transmissions.

Tiptoe To The Tulips

Most two-way land mobile radio systems in the Netherlands can be found in the so-called European Low Band, which is 68 to 88 MHz, plus additional activity in the ranges 146 to 174 MHz, and 440 to 470 MHz. There is limited use of frequencies above 800 MHz, although cordless phones use the 900 MHz band.

Customs and Border Patrol base stations use the band 154.0875 to 154.4375 MHz, in 12.5 kHz steps. The paired mobile frequencies are 4.6 MHz lower from 149.4875 to 149.8375 MHz. Many repeaters are used.

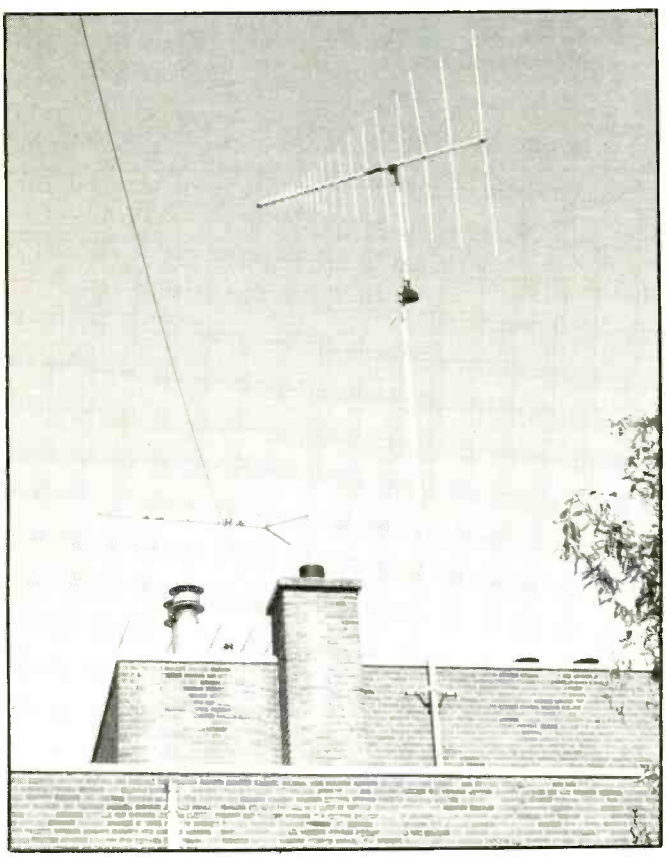
Nationwide police agency bases turn up on 86.5125 MHz, paired with mobile 78.1125 MHz, also 171.10 MHz base/mobile simplex. The police in Amsterdam dispatch on 86.70, 86.975, 87.00, and 87.025 MHz, with mobile channels 8.4 MHz lower (78.30 MHz, etc.).

The VHF marine bands are different than you might expect. Coast stations are in the 160.65 to 162.50 MHz band, with vessels operating on paired frequencies 4.6 MHz lower, 158.05 to 162.65 kHz (25 kHz steps). The extensive system of dikes, dams, and canals is repaired, maintained, and operated using the band from 168.29 to 168.65 MHz (20 kHz steps).

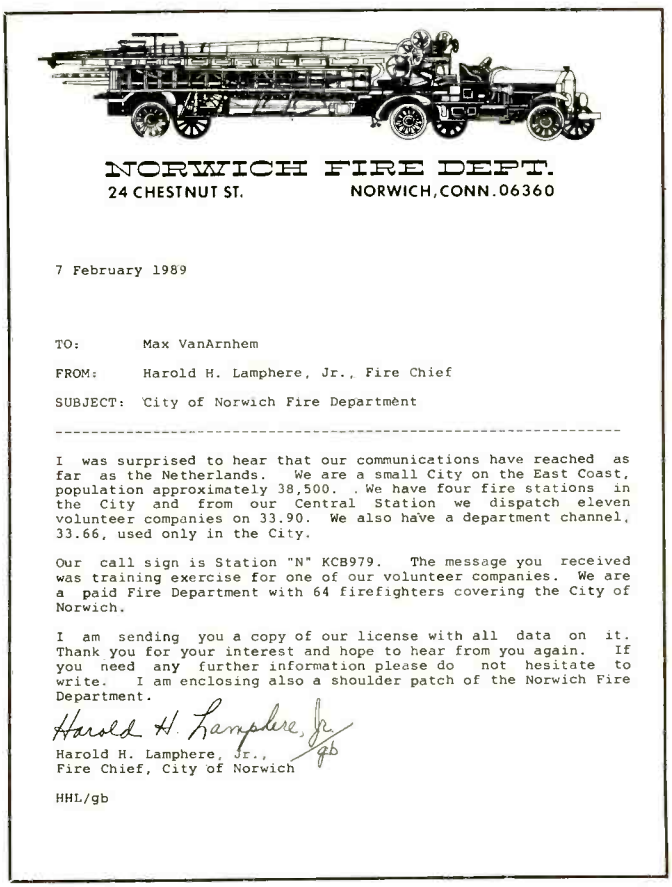
What About 30 to 50 MHz?

The 30 to 50 MHz band is allocated almost exclusively to the Netherlands military. Look for them in 25 kHz steps. There are also some bootleg mobilephone bases and cordless phones here, too. Look for them between 44 and 50 MHz. The mobilephone bases run up to 50 watts.

On 45.125, I logged an illegal mobilephone. A woman was contacting a doctor's office. The town of Veenendaal was mentioned in a phone call on 46.50 MHz. Tulip growers were chatting in a phone call moni-



Antennas used by Max van Arnhem in the Netherlands. The log periodic (center photo) covers 25 to 1200 MHz. To the lower left there are vertical and horizontal FM yagis, plus an HF longwire.



NORWICH FIRE DEPT.
24 CHESTNUT ST. NORWICH, CONN. 06360

7 February 1989

TO: Max VanArnhem

FROM: Harold H. Lamphere, Jr., Fire Chief

SUBJECT: City of Norwich Fire Department

I was surprised to hear that our communications have reached as far as the Netherlands. We are a small City on the East Coast, population approximately 38,500. . We have four fire stations in the City and from our Central Station we dispatch eleven volunteer companies on 33.90. We also have a department channel, 33.66, used only in the City.

Our call sign is Station "N" KCB979. The message you received was training exercise for one of our volunteer companies. We are a paid Fire Department with 64 firefighters covering the City of Norwich.

I am sending you a copy of our license with all data on it. Thank you for your interest and hope to hear from you again. If you need any further information please do not hesitate to write. I am enclosing also a shoulder patch of the Norwich Fire Department.

Harold H. Lamphere, Jr. /gb

Harold H. Lamphere, Jr.,
Fire Chief, City of Norwich

HHL/gb

Max van Arnhem's veri letter from the FD in Norwich, CT is for skip reception on 33.90 MHz.

tored on 45.81 MHz. Two fellows were trying to figure out a car problem while holding down 45.48 MHz.

Some low power radio paging stations are allowed to operate between 39 and 40 MHz. Until last year, electric power utilities also used 39 to 40 MHz, but they've all relocated to 155 MHz.

DX'ers across North America have regularly reported Radio Netherlands' relay stations on 41.15 and 43.15 MHz. Recently these stations have been logged on 41.17 and 43.16 MHz, and may have shifted frequency to avoid skip interference. From what we can ascertain, these are home-brewed 20 watt transmitters fed into ground plane antennas. They use an unusual 100 kHz bandwidth. Regardless of whether you try to monitor them in NFM or WFM mode, they sound rather odd.

These two relay transmitters carry the regular programming of Radio Netherlands, so check your *World Radio TV Handbook* for the skeds.

Double Dutch

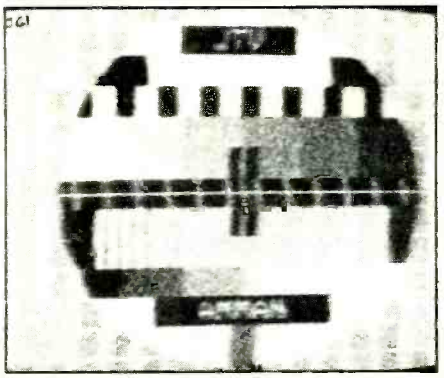
Not all stations that appear to be Dutch are actually in the Netherlands. The naval forces of the Netherlands make frequent

VHF Low Band Allocatons In Netherlands

26.19-88.00: Military. Recent activity noted 40.85, 41.05, & 43.175 MHz.
26.15-26.81: Non-voice paging, AM mode.
26.83-26.93: Water sports (sailing, surfing, diving).
26.95-27.405: CB with 5 watt NFM. Illegals use AM & SSB, & many run higher power. Also outbanders above & below these frequencies.
27.415-27.445: Mobilephones.
27.455-27.995: Unknown use. Possibly low-power emergency. Many outbanders here.
28.00-29.70: Amateur Radio.
29.70-29.995: Probable military.
30.085-30.195: Remote Control (R/C) of models.
35.01-35.19: Remote Control (R/C).
36.62-38.78: Wireless microphones.
39.00-40.00: Non-voice paging, AM mode.
40.665-40.695: Remote control (R/C).
44.00-50.00: Illegal mobile & cordless phones.
47.00-68.00: TV Channels 2 to 4.
49.60-49.90: Legal cordless phones (paired 70.20 to 70.50 MHz frequencies).
50.00-50.45: Amateur Radio.
69.20-69.975: Red Cross, 25 kHz steps.
70.925-70.975: Red Cross.
73.28-73.92: Military Police (paired 8 MHz up).
75.215-75.855: Automobile assistance (paired 2 MHz up).
76.05-77.00: Mobilephone mobiles (phased out?)
81.28-91.92: Military Police (25 kHz steps).
84.285-84.595: Red Cross & Rescue Squads 25 kHz steps, paired mobiles 10 MHz lower
86.075-87.10: Police bases. 12.5 kHz steps, paired mobiles 8.4 MHz lower
86.5125: Nationwide municipal police, paired mobiles 78.1125 MHz.
86.70, 86.975, 8700, 87.025: Amsterdam PD.

Selected Skip Loggings From Dutch DX'ers

26.25: Broadcast auxiliary, Columbus, OH.
26.45: Broadcast auxiliary, Cincinnati, OH.
29.745, 29.755: Radiophones (Arabic).
30.02: Canadian radio pagers.
30.055: Barbados radiophones.
30.31, 30.345, 30.405, 30.445, 30.575: Radiophones (Arabic).
30.86: St. Johns's River Water Mgt., FL.
30.96, 31.00, 31.12, 31.16, 31.20: NY City taxis.
31.025: Arabic two-way comms.
31.25, 31.30, 31.55, 31.65, 31.75, 31.90: Hebrew two-way comms.
31.35: "CVH Radio Aviso" pager in Montevideo, Uruguay.
31.70: Turkish comms.
31.90: Mil comms: Haden Base, Haden Bravo, Haden Echo, Engine 1. "General on Board."
32.315: Police, Brazil.
32.60: USN stas: AK22, FK22, AK2, FK2.
33.10: Qatar, in English; also UN forces on Cyprus.
33.40: Repeater output in English re Cyprus. Might be UN forces.
33.495, 33.60, 33.75: Soviet comms.
33.56: Greek comms.
33.70: Many USA FD's, including Oxford, CT; Kennebunkport, ME; Montgomery Co., PA; Metairie, LA; Caroline Co., MD; Westminster, MA; Little Valley, NY; Randolph, NY; Prospect, CT; Thomaston, ME; Leominster, MA.
33.90: Many USA FD's, including Hamilton Co., OH; Cleveland, OH; Lake George, NY; Norwich, CT; Lancaster Co., PA; Colchester, CT; Norwell, MA; Glens Falls, NY; Warren Co., NY; Warren Co., NY; Wilton, CT; Weston, CT; Easton, MD; Talbot Co., MD; Laconia, NH.
35.22: AZI229 Radio Llamada, Mar del Plata, Argentina.
35.44: Cress Gas Company, Richlandtown, PA.
35.55-35.975: Portuguese pagers from Brazil, AM mode, 25 kHz steps.
35.66: KNKB330 pager, Martinsburg, WV.
35.68: New Rochelle (NY) hospital pager.
36.175, 36.375, 36.425, 36.80, 37.025, 37.43, 37.90, 38.675, 37.76/USB, 37.975, 38.06/LSB, 38.675: Soviet comms.
37.25, 37.40, 37.65, 37.85, 37.90, 38.00, 38.20, 38.30, 38.65, 39.00, 39.05, 39.20, 39.80, 39.95, 40.70: Hebrew comms.
37.46: PA P&L, Sinking Spring, PA.
37.62: Rochester G&E, NY.
37.74: N. East Utilities, CT; Black Warrior Electric, AL; Houston County Electric, TX.
38.65, 38.675, 38.725, 38.75: Police, Pakistan.
38.825, 39.10, 39.15, 39.85: Iran, in Farsi.
39.10: In an Asian language.
39.24: MD State Police, Jessup, MD.
39.50: Ringgold PD, LA; Minden PD, LA; Rock Bridge Co. Sheriff, VA; Oakwood PD, OH; Greenville PD, NH; Bossier City PD, LA.
40.86: Danish & Swedish comms. Possibly also a British Ministry police patrol in Cyprus here.
40.98: UN forces, Cyprus, in English.
41.65: Radio Cadena Nacional, Cartagena, Colombia.
42.06: MO Highway Patrol from Rolla, Lee's Summit, Poplar Bluff, & Sikeston. Also Ontario Provincial Police from Belleville & Kaneta.
42.12: MO Highway Patrol from Sikeston & Willow Springs.
42.42: IN State Police at Seymour & Connersville.
42.50: NC State Highay Patrol, Ashville.
45.52: IL State Police, Sterling.
42.60: IL State Police, DuQuoin.
42.64: NC State Police, Greenville.
42.80: Egypt in English with airline data. Also, some Americans in a Mideast oil field; an RSA PD activity; & some Arabic comms.
42.875: Police in Mbane, Swaziland.
43.065: Radio Yerevan's STL, USSR.
44.27: Oil industry repeater, Trinidad.
44.64: MI Forestry, Jackson, MI.
44.90: Polish comms.
45.70: Radio RCN;s STL, Bogota, Colombia. 30 w. into a 3-element yagi.
45.80: Soviet comms.
45.96: Many Arabic radiophones near here.
46.10: Hebrew comms.
46.46: Peters Twp. FD, PA.
49.16: US oil drilling platforms & vessels.



Joop Prosee picked up this test pattern from Amman, Jordan, on TV Channel E3 (55.25/60.75 MHz). This skip reception was 2,080 miles via Sporadic-E skip.

trips to the Caribbean and can turn up on many frequencies in 25 kHz steps.

Also in the Caribbean, you'll hear Dutch, and English with a Dutch accent, from National Guard stations on the islands of Aruba, Bonaire, and Curacao. These stations use 31.075, 31.175, 31.25, 31.75, and 31.775 MHz with clear voice, also some time domain scrambling. ID's include "Willemstad Company," "Sunray" (communications post), and a vessel that calls itself "007."

A power utility station somewhere uses both Dutch and English on 30.265 MHz ("Channel 1"). Also try 30.275, 30.515, 36.485 (skyways), and 36.985 MHz. Location of all stations is unknown, but probably not the Netherlands.

What sounds like a security company or police agency is noted on 37.00 MHz with talk about the National Bank. A five-tone access burst used is identical to those heard on some French repeaters, so the location of this one is still uncertain.

Of course, many stations that you might think are Dutch are actually stations skipping in from RSA. The differences are only slight between the Dutch language and Afrikaans spoken in the RSA. Moreover, RSA stations are plentiful in the 30 to 50 MHz band, and they are widely reported by listeners. The RSA police stations are great favorites with scanner DX'ers in the Netherlands. From our location in Illinois, we regularly copy twenty RSA police channels in the 30 to 50 MHz band.

Dutch Masters

Of the mail we receive from scanner enthusiasts outside of North America, those who write from Holland never have any shortage of DX loggings. Listener Max van Arnhem has had success in QSL'ing dozens of skip stations he's heard.

Max is still sweating out QSL's from a number of U.S. police stations, plus several RSA police stations, and the police in Lahore (Pakistan) on 38.65 MHz.

Joop Prosee, of Spanbroek, writes to tell us that the scanner skip starts rolling in around 0600 UTC, with plenty of Soviets, and stations thought to be in India, China, Pakistan, and the Himalayan States. A few hours later, the Mideast arrives, sometimes even on VHF high band. TV DX from the Mideast comes through until about 1400 UTC.

Around 1000 UTC, African stations begin to come through, as do paging stations in South America. By 1300 UTC, North American stations are abundant. Favorites are New York City taxi bootleggers on 31.02 and 31.12 MHz; the Kennebunkport (ME) FD on 33.70 MHz; Ontario Provincial Police on 42.06 MHz; Missouri Highway Patrol on 42.06 and 42.12 MHz; and Hamilton County (OH) FD's on 33.90 MHz.

The Hamilton County FD activities are famous among DX'ers in the USA, and have been reported from coast to coast. Extra (unwanted) help is provided by a Jamaican repeater on 36.90 MHz that sometimes picks up these signals via skip and rebroadcasts them far and wide, along with other 33.90 MHz stations.

It's always interesting to learn what DX'ers in other parts of the world are hearing, and that stations you consider as locals are thought of as highly prized rarities by these hobbyists. It's really a small world, and our hobby is universal. ■

John Ashcroft
Governor

Richard C. Rice
Director

DEPARTMENT OF PUBLIC SAFETY
MISSOURI STATE HIGHWAY PATROL
Colonel C. E. Fisher, Superintendent

Address Reply To
Commanding Officer, Troop A
MISSOURI STATE HIGHWAY PATROL
Box 168
Lee's Summit, Missouri 64063
Phone 816-524-1407

December 18, 1989

Dear Max,

After review of the radio logs for station KAA202, I am pleased to confirm your reception of our transmissions of November 26, 1989 at 09:52 to 10:11 central U.S. time on 42.06 Mhz.

Station KAA202 serves 13 counties of West Central Missouri and is located at the southeast corner of Kansas City, Missouri. Troop A radio has been in operation since 1933 and at its current facilities since 1969. Our transmitter is a Professional Electronics Company (PECO) model jkw10 running 1,500 watts output into a 4-bay folded dipole array at 105 meters. The pattern is circular with a minor lobe to the east.

KAA202 is operated and maintained by members of the Communications Division of The Missouri State Highway Patrol. I am the District Field Engineer and responsible for Troop A as well as Troop H which you heard last year. In addition to the main transmitters, we operate installations on 155.370 and 155.475 Mhz for communications with the cities and counties of our area and a system of UHF repeaters that link our patrol car transmissions to the radio control room. We maintain 8 of these repeaters strategically located over the 26 counties area of my district.

I am envious of your ham station as I too am somewhat of a shortwave listener. My interest is primarily in antique receivers and use an Eddystone 730/4 on my desk at work. I am quite proud of it as only a small number made it to the states. I have a varied assortment of receivers dating back to 1921. My one concession to modern equipment is a Kenwood TS-430 that I also use for HF amateur communications under the callsign NØDBX. I have listened many times to the English broadcasts of Radio Nederland and was happy to receive the sticker from you.

Although we do not have "QSL" cards as such, I am enclosing my card and a shoulder patch from our uniform in the hope you might enjoy it.

Enjoy the current sunspot cycle...Good DX.

Cordially,

Darrel L. Nichols
Technical Field Engineer
Missouri State Highway Patrol
Troop A, Lees Summit, Missouri

The Missouri Highway Patrol sent this QSL letter to Dutch DX'er Max van Arnhem for his reception of their signals on 42.06 MHz.

RADIO KKN 959

TELEPHONE 1-318-539-2511

JERRY L. STEPHENS
CHIEF OF POLICE
CITY OF SPRINGHILL
025 CLINIC STREET
SPRINGHILL, LOUISIANA 71075

October 25, 1990

Mr. Max van Arnhem

The Netherlands

Dear Max:

It was quite a surprise to receive your letter and recording of the radio transmission that you monitored. We can definetly confirm that it was Springhill Police Department's transmission. Your reception was much better than ours was on that day. We have had reports in the past of our station being received in Illinois and South Carolina, but never from Europe.

Information you requested is as follows:
Station: Springhill Police Department
Call Sign: KKN959
Frequency: 39.50 mhz
Power: 100 watts.
Antenna is located on top of a tall water tower, and is non-directional.

Troop G, whose call sign is KKA720, is our regional office of the Louisiana State Police, located in Bossier City, Louisiana.

Our radio station serves not only Springhill, but also the small towns of Cullen, Sarepta, Cotton Valley and Shongaloo, as well as the rural areas of the north half of Webster Parish. Parish is Louisiana's name for county. We act as central dispatcher for law enforcement, fire departments and all other emergency personnel in our area.

We also have another frequency, 154.875 mhz, that is used by Springhill city officers only, but it is currently off the air after taking a direct lightning strike last week end.

If you should hear us again, let us know.

Sincerely,

Jerry L. Stephens

A veri letter from the Springhill Police Department, in Louisiana is for 100-watt station KKN959 on crowded 39.50 MHz. They told Max that they had also received DX reports from Illinois and South Carolina!

THE JAPAN RADIO CO.

NRD-535

THE NEXT GENERATION IN HIGH-PERFORMANCE HF RECEIVERS

Once again JRC breaks new ground in shortwave receiver design. The new NRD-535 has all the features SWLs and amateurs have been waiting for. General coverage from 0.1 to 30 MHz in AM, USB, LSB, CW, RTTY, FAX and Narrow FM modes. Advanced ECSS operation for phase-lock AM reception. Variable bandwidth control (BWC). Tuning accuracy to 1 Hz possible with direct digital synthesis. 200 memory channels with scan and sweep operation. Triple Superheterodyne receiving system. Superb sensitivity, selectivity and image rejection. Dual-width noise blanker eliminates impulse noise. Squelch, RF Gain, Attenuator, AGC and Tone controls. Optional RTTY demodulator available. 24 hour clock/timer. Easy to read vacuum fluorescent display with digital S-meter. AC and DC operation. Plus the most comprehensive computer interface found on any radio to date. Call or write today for a full color brochure, price list and dealer information.

JRC Japan Radio Co., Ltd.

MAIN OFFICE: Akasaka Twin Tower (Main), Akasaka 2-chome, Minato-ku, Tokyo 107, JAPAN
Tel.: (03) 584-8836 Telex: 242-5420 JRCTOK J

IN U.S.A.: 430 Park Avenue (2nd Floor), New York, NY 10022
Tel.: (212) 355-1180 FAX: (212) 319-5227 Telex: 961114 JAPAN RADIO NYK

CIRCLE 143 ON READER SERVICE CARD

Marconi: Lost & Found

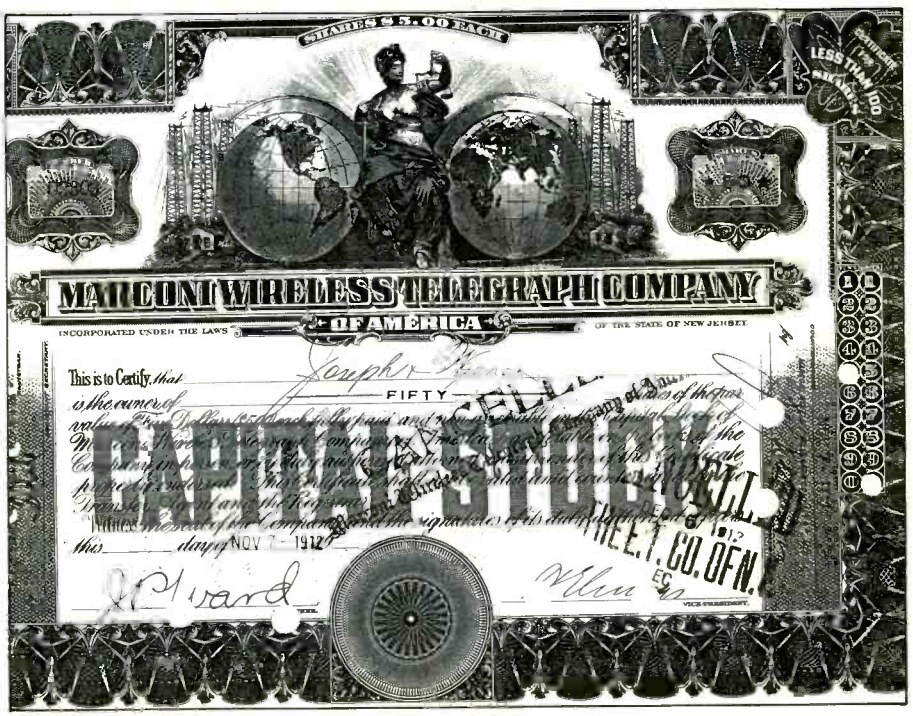
Rare & Faded Images of One of Radio's Pioneers In This Photo Festival

BY ALICE BRANNIGAN

Guglielmo Marchese Marconi (Italian, 1874-1937) was (arguably) the inventor of radio. Certainly, Marconi has remained the person that the general public associates with inventing radio even though historians have long observed that others (Stubblefield, Loomis, Murgas, Fessenden, Reiss, Gray, etc.) worked before or contemporary with (and independent of) Marconi, and Marconi was influenced (to some extent) by their efforts.

Still, Marconi was a brilliant person, and easily the most charismatic and dynamic force in the early days of wireless. So many books and encyclopedia entries have been written about Marconi, there would be little point in our attempting to tell or even summarize the story of his long and spectacular career in the limited space available here.

We can, however, pick up on a few mileposts, some interesting sidelights, plus a few bits of trivia that appear to have fallen between the cracks. Primarily, we can wipe the dust from some long lost and very rarely seen early photos, most of which haven't been available for public view in many decades.



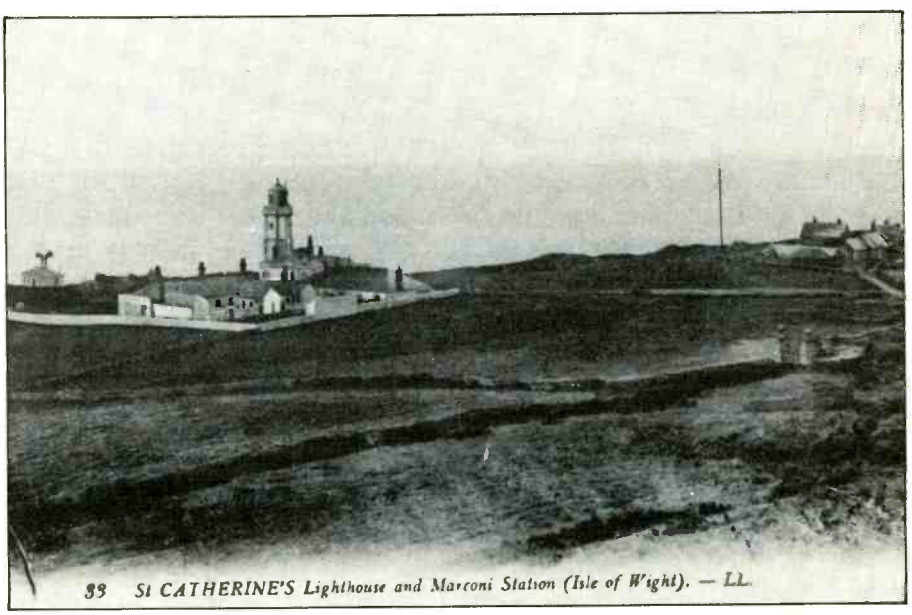
Marconi's American operations were conducted under the name "Marconi Wireless Telegraph Company." This certificate for fifty shares of stock is dated 1912.

Unusual Politics

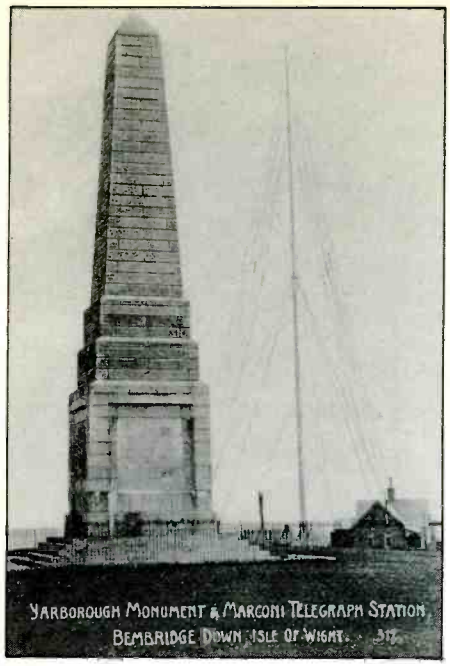
One of Marconi's developments was the ability to direct or "beam" radio signals in one desired direction. At Genoa, in 1917, using VHF wavelengths (2 to 3 meters), he demonstrated that this was a practical idea. In Italian, the word for "beam" is "*a fascio*," and he called this idea his "Beam System" ("*Systema a Fascio*").

Writing about this in the November, 1926, issue of *Radio Broadcast* magazine, Marconi made a statement that looks most peculiar when viewed from a vantage point 65 years after the fact. Talk about wanting to eat your words!

Marconi wrote, "I do not now use any of these words because I am a Fascist and because Fascismo, for the fortunes of Italy, is triumphant. I always claim for myself the honor of having been the first Fascist in radio telegraphy, the first to recognize the desirability of uniting in a beam (*fascio*) the electric rays, as the Honorable Mussolini has first recognized in the political field the necessity of uniting in a *fascio*" all the best energies of the country for the greater greatness of Italy."

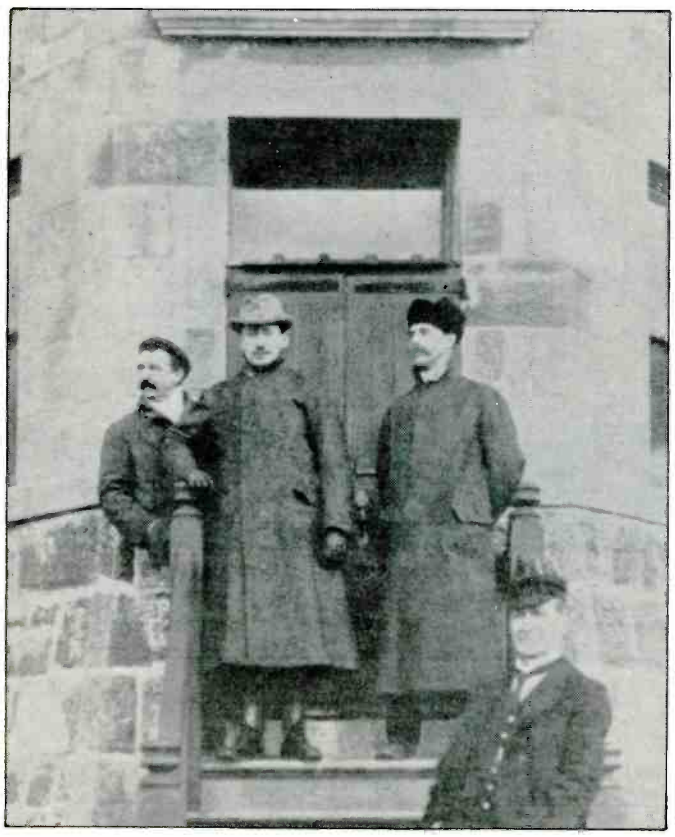


One of Marconi's early Isle of Wight stations was at St. Catherine's Lighthouse. The antenna mast is shown a few hundred feet to the right of the lighthouse in this photo. (Courtesy Roger Bunney, England.)



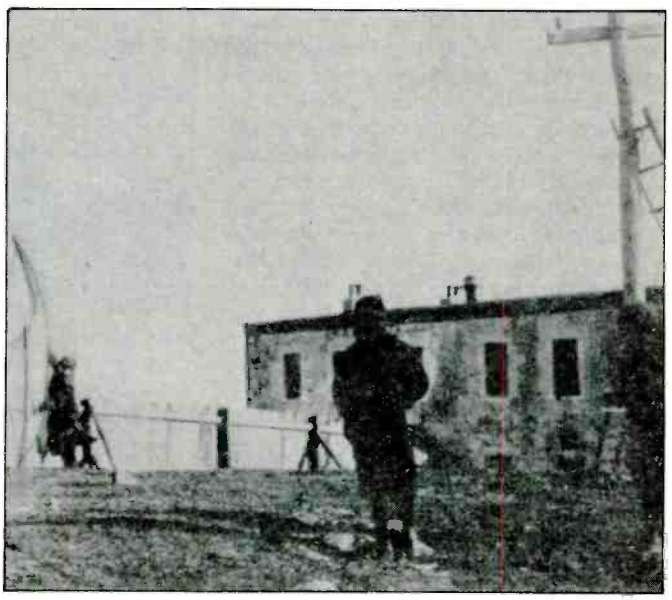
Another Isle of Wight station was at Bembridge Down. The transmitting mast is to the right of the stone monument. (Courtesy Roger Bunney, England.)

Marconi's station MPD (later 2YT) at Poldhu, Cornwall, from which the first transatlantic message was sent in December, 1901. The original antenna system had 20 wooden masts, each 200 ft. high. In August, 1901, a gale blew down that antenna. The antenna used for the actual test was makeshift, consisting of two 170 ft. masts that supported a cable between them. From that cable dangled almost 60 vertical wires. The antenna system in this photo was installed later.



Marconi (second from left) with his assistants, P.W. Paget and G.S. Kemp, at the Cabot Memorial Tower, St. John's, Newfoundland, for the transatlantic signal test in 1901. The fellow down below is the tower keeper.

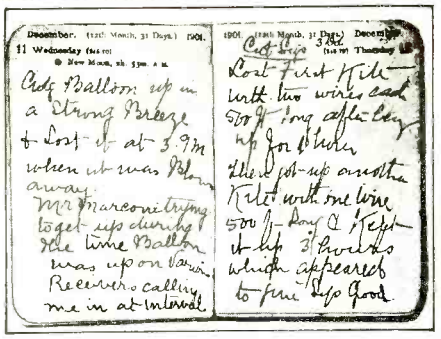
The receiving antenna at St. John's used for the first transatlantic test was a wire held aloft by a kite. Here it is getting ready for launching, with Marconi in the right foreground watching the operation.



Italian dictator Benito Mussolini and his ultra-nationalist Fascist party assumed absolute power (at the invitation of the king) in 1922. The name of the party was taken from fasces, a bundle of rods bound together by a strap. An ax blade protruded from the bundle. Fasces were a symbol of authority in ancient Rome.

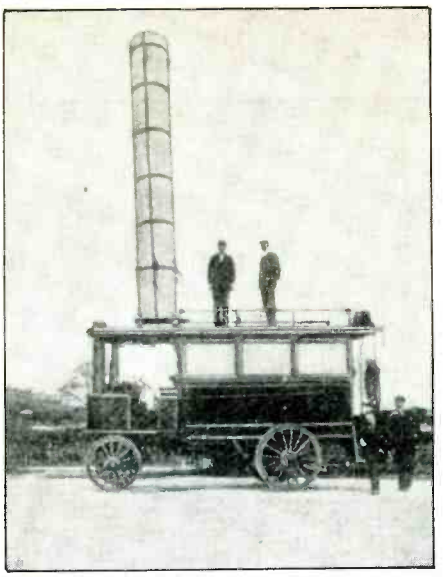
By the mid-1930's, Mussolini had made war on Ethiopia, became involved in the Spanish Civil War, defied the sanctions of the League of Nations, and had become closely associated with Germany's Adolf Hitler before and during WWII. But, in 1926, long before these things happened, Mussolini apparently still looked good to idealistic Italian nationalists.

Adolf Hitler's 1930's and 1940's use of



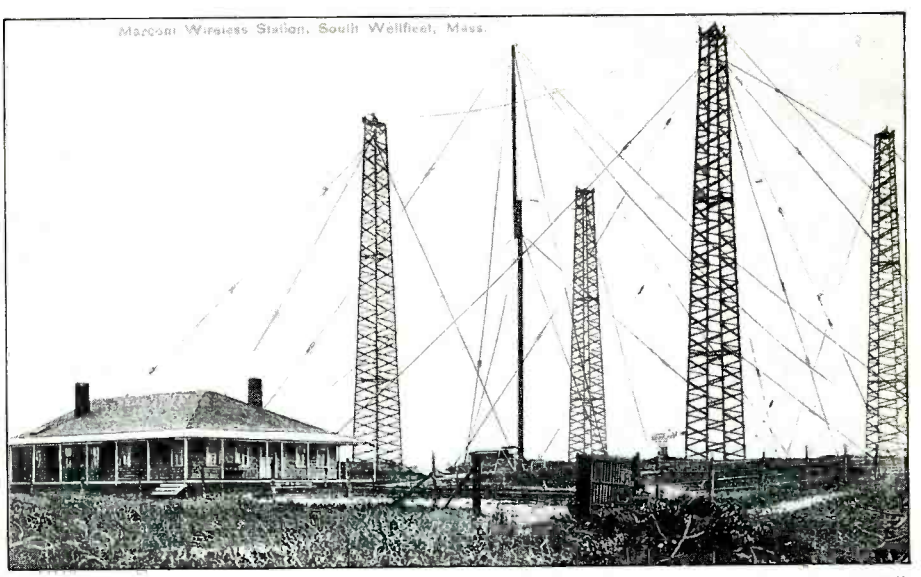
The receiving station logbook at St. John's was maintained by G. S. Kemp. It notes that the first kite antenna was lost.

Marconi (standing) and G.S. Kemp at the receiving and recording apparatus in St. John's, Newfoundland, during the historic transatlantic signal tests of 1901.



In 1901, Marconi tried transmitting and receiving from an automobile. That eighteen foot smokestack on the vehicle's roof is the antenna system.

Marconi station "BA" at Babylon, NY as it looked in 1908. In a recent issue we spotlighted this station, although we didn't use this photo. (Courtesy Alexander Durant, Albany, NY.)



Marconi's rotary spark gap coastal station in South Wellfleet, MA was originally called "CC" (for Cape Cod) when it opened. Later it became WCC, which is still an operation. Originally, "CC" had the same twenty-mast antenna system designed for use at the Poldhu station. Just as it had blown down in Poldhu, it met the same sad fate at the Wellfleet station before it could be used.

the term Fascism to describe his Third Reich, plus Mussolini's own later activities and ties with the Nazis, however, revealed the Fascist political philosophy as a rigid and ruthless police state in which the government controls the religious, political, social, and economic life of the country. After Hitler and Mussolini, the philosophy of Fascism became discredited. Even the word Fascism, itself, still retains a highly distasteful connotation more than 45 years after these dictators left power. Today, reading Marconi's proud, but long forgotten, 1926 homage to Fascism is eerie.

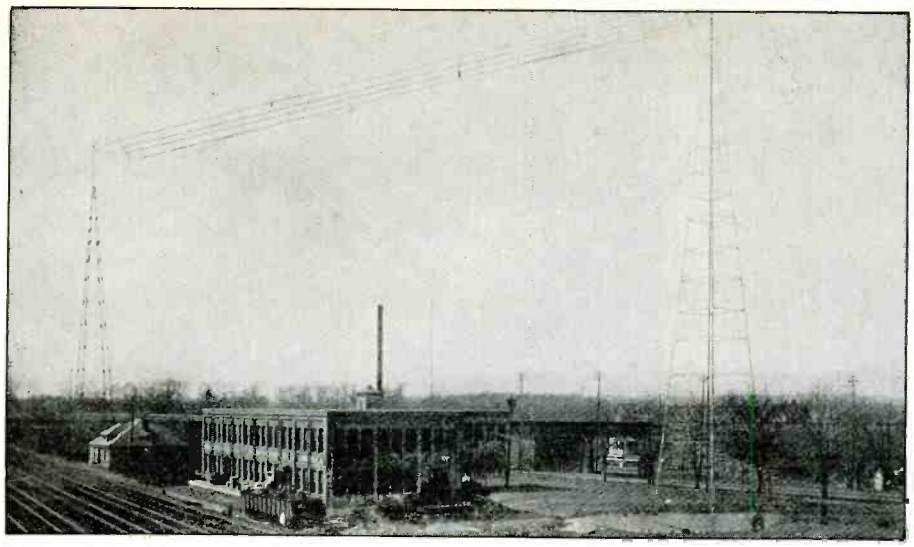
Some Experiments of Interest

His first short range wireless tests were conducted in 1894 at his father's estate. In 1896 he went to England for financing, and some early experiments took place in 1897 and 1898 while he was living in a hut at Alum Bay, near The Needles, Isle of Wight, off the central south UK coast near Southampton. He sent his first readable telegraph signals which were exchanged with a steamer at sea at ranges up to 18 miles. In 1897, he formed the Wireless Telegraph and Signal Co., Ltd., which was formed to install wireless sets in English lightships and lighthouses. In 1900, the company changed its name to Marconi's Wireless Telegraph Co., Ltd. His American operations were conducted under the name Marconi Wireless Telegraph Company.

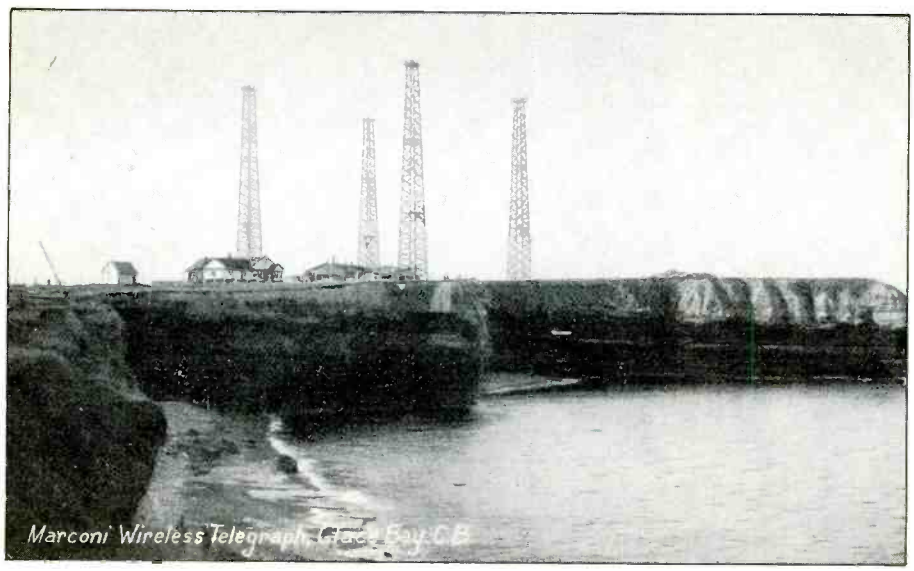
Other Marconi experiments were also conducted from different sites on the Isle of Wight. One station was at Bembridge and probably used for experiments with naval craft. In 1900, a station was established in St. Catherine's Lighthouse there. My colleague, Mr. Roger W. Bunney, of the British magazine *Television*, has kindly provided us with photos of these historic stations on the Isle of Wight.

Using tuned circuits Marconi patented in 1898 and 1900, he demonstrated how to clear up a complaint that some stations were expressing. Neighboring stations came to feel that only one station at a time could be in operation, otherwise they would interfere with one another's transmissions. This limited any practical application of wireless.

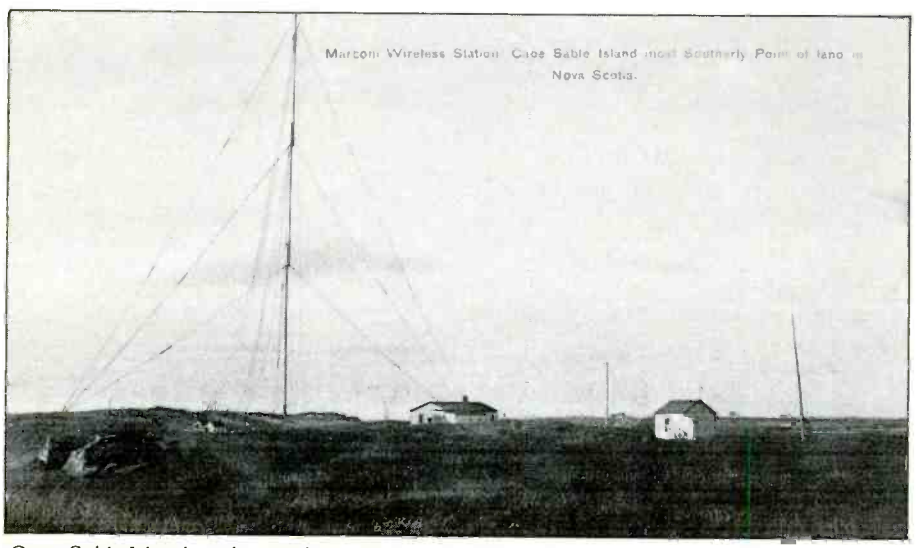
In April of 1899, heavy seas pounded the Goodwin Sands lightship off the English coast. The vessel used its wireless to report that it was in a critical situation, with parts of



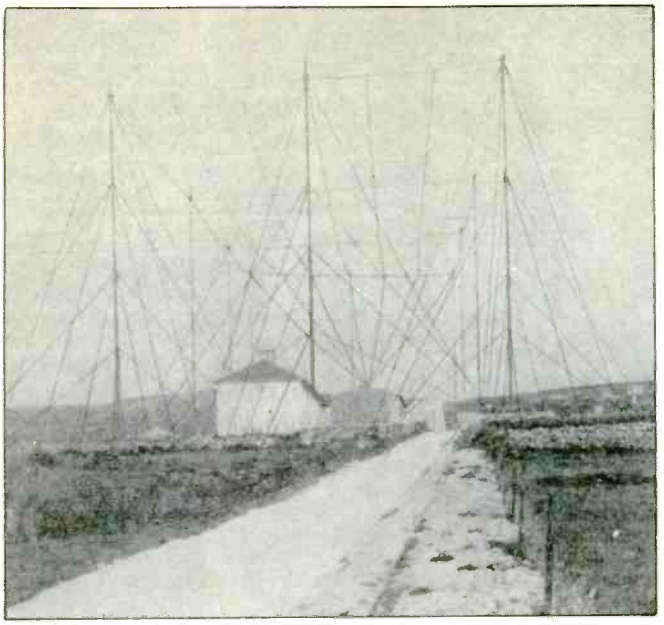
This trackside Marconi station was located in Aldene, NJ. Does anybody know the present name of this community? (We don't.)



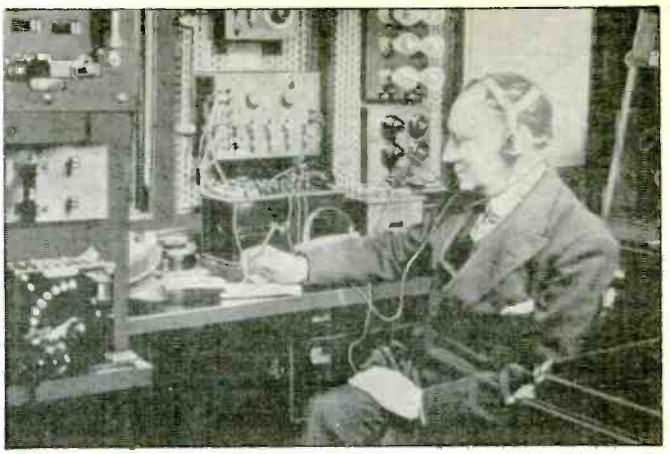
The handsome Marconi station at Glace Bay, on Cape Breton in Nova Scotia in 1909. It was similar to the Poldhu station.



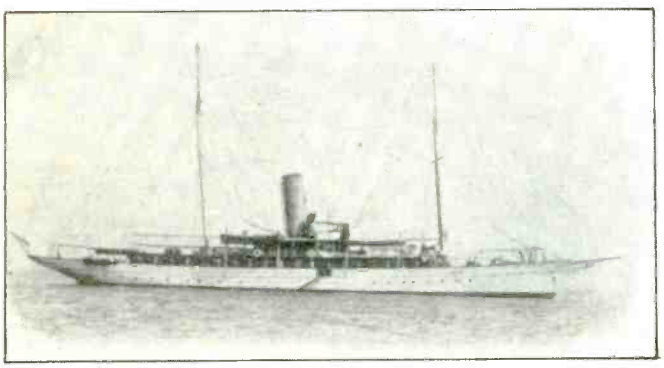
Cape Sable Island, at the southernmost point of Nova Scotia, was an early Marconi station. In 1906, its callsign was "SD," but later became known as VCT. This view is from the early 1900's.



A 1924 view of Marconi's high powered station at Carnarvon, England. This station regularly handled traffic with North America.



Marconi in the radio shack of station MEE, aboard his yacht, "Elettra" in 1924.



Marconi's yacht, "Elettra" sailed the world's oceans.

The "Elettra" was a floating communications lab. This 1924 photo shows Marconi displaying some of his shipboard apparatus.

the deckhouses having been swept away. It was the first wireless distress call from a ship, and it brought help to the vessel and its crew, plus plenty of media coverage to Marconi and his wireless.

On December 12, 1901, wireless signals were first transmitted across the Atlantic from the Marconi station at Poldhu, Cornwall, to the Marconi station at Signal Hill, Newfoundland. The letter "S" was the complete text, but it proved that transoceanic telegraphy was possible. This laid the foundations of worldwide wireless communication.

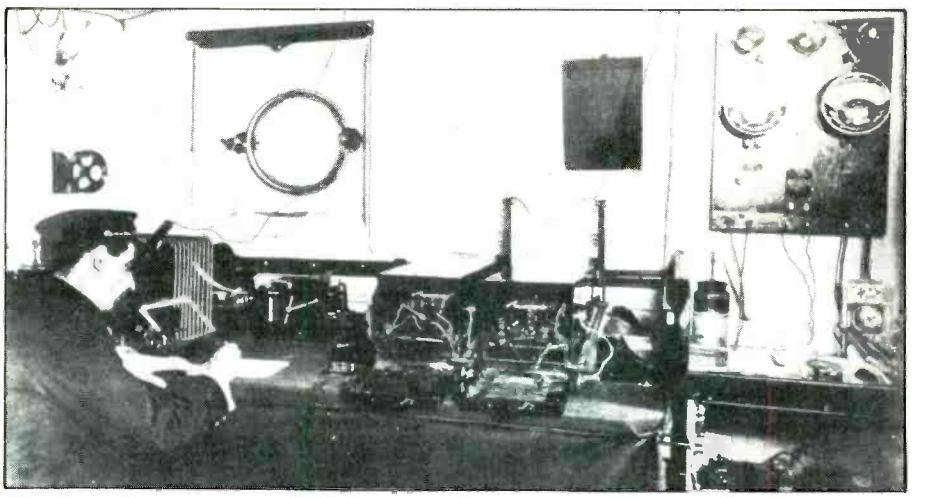
During the winter of 1902, while Marconi was crossing the Atlantic on the *S/S Philadelphia*, noted a peculiar phenomenon. As he wrote in the November '26 issue of *Radio Broadcast*, "I found myself impeded by an unfortunate difficulty caused by the effect of solar light on radio telegraphic transmissions . . . . On account of the effect of the light, at a distance of more than 700 miles all reception became impossible when the sun rose. But with the increase in wavelength I found that this difficulty could also be overcome." He suggested that wavelengths between 1000 and 2000 meters (150 and 200

In 1921, Marconi's station at Chelmsford sent out the first music and voice broadcasts in England. In 1926, under the callsign 2BR, the station operated on 15 and 17 kHz for international traffic. This photo shows Marconi in 1929 at the mike of Chelmsford's shortwave broadcast station G5SW, which ran 25.5 kW on 11750 kHz. This frequency was later taken over by GSD, the BBC's 20 kW station in Daventry.

Marconi's 1926 endorsement of Fascism and Mussolini (left in a 1930's photo taken with Adolf Hitler) came years before he could realize what was to lie ahead under the banner of Fascism.

This first day philatelic cover was issued in 1973 to honor Marconi as the inventor of wireless telegraphy.

In 1978, Special Event ham station KM1CC was set up on Cape Cod to observe the 75th anniversary of Marconi's station at South Wellfleet completing the first two way telegraph contact between the USA and Europe (1903). The KM1CC QSL card showed a youthful Marconi with his spark gear. KM1CC was sponsored by The Town of Barnstable Radio Club (via W1GAY), in Massachusetts.



The "S/S Philadelphia" (ex-S/S Paris, ex-USS Yale, ex-USS Harrisburg/NAKF) had its maiden transatlantic voyage in 1889. This was a 560 ft. long (10,499 GRT) luxury liner (740 1st & 2nd Class passengers, 1,000 in steerage) that once held the Blue Riband for speed. Marconi personally helped to install the ship's wireless equipment (callsign PH, later KSM), and used the on board equipment to make many observations on the use of radio at sea. The station first used 1000 kHz, but later moved to 500 kHz for better results. Normal communications coverage was 60 miles, but an occasional 150 mile contact was achieved. In 1922, on its first voyage to Naples from New York after being laid up for two years, mutiny broke out and the mutineers attempted to sink the ship. When she arrived in Naples, the ship was again laid up and in 1923 it was towed to Genoa and broken up for scrap. This photo shows the radio shack in about 1901, when it was one of the first liners to have wireless aboard.

kHz) be avoided in preference to ones longer than 30,000 meters (10 kHz) in order to defeat the effect sunlight had on signals at certain frequencies.

Regular broadcasting of music and speech was started from the Marconi stations at Writtle, Chelmsford, in 1921, and at Marconi House, London, 1922, before the establishment of the BBC (1922).

Many of Marconi's experiments were carried out from aboard his beautiful ocean-going floating laboratory and yacht, the *Elettra* (Electra).

Marconi's American operations, the Marconi Wireless Telegraph Company, were eventually sold and became the basis for the Radio Corporation of America (RCA).

This month we'll utilize most of our available space under the theory that a picture is worth a thousand words. These are wonderful old graphics you probably have never before seen, showing some of Marconi's stations and experiments. Feast your eyes!

Next month, we'll be back with our usual potpourri. We appreciate your letters, information, comments, old time radio QSL's, photos, picture postcards, and station rosters. Keep 'em coming. ■

BOOKS YOU'LL LIKE

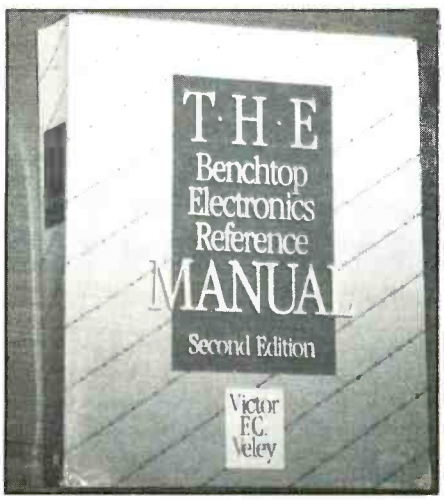
R. L. SLATTERY

Benchtop Reference

If you have a question about DC, AC, solid state devices and circuits, tube circuits, radio communications, electronics math, digital electronics, or virtually any other area of electronics, then *The Benchtop Electronics Reference Manual* can give you the facts, figures, and formulas you need, and fast!

Whether you're into electronics professionally or as a hobbyist, this 764 page manual is a valuable one-stop source of up-to-date information and equations. Covering more than 200 of the most common electronics topics, this is about the most comprehensive and well-rounded one-volume reference you're likely to find covering such a wide range of categories.

There is some basic text describing each topic covered, followed by diagrams and relevant formulas for working things out. The formulas are shown with examples of how they are applied in actual usage. How-



ever, while this book contains a huge amount of data, I don't wish to give the idea that it's an explanatory text for beginners. It's not that at all. It's intended for people who already have a reasonably good understanding of what electronics is all about, but need a book like this to quickly get their hands on a needed formula to solve a design, service, modification, or other working problem.

Some of the formulas are quite complex. That's the way it goes with today's technology. But the number of formulas, and their complexity, is what makes a book such as this so handy, because it's impossible to keep track of all of this heavy information in your memory.

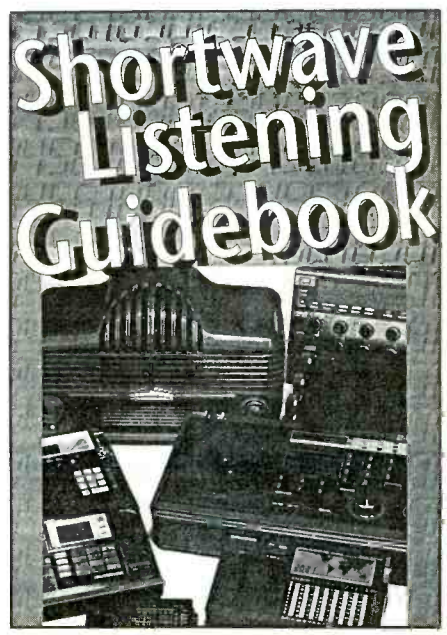
Now, all you've got to do is check the index, which, like so many things in life, starts out at *absolute power* and ends up at *zero*. Between there, you're bound to find the data you need.

The Benchtop Electronics Reference Manual, 2nd Edition, by Victor F.C. Veley is a fine reference volume for the experienced electronics tech, or savvy hobbyist. It's $29.95, plus applicable sales taxes and $3 postage to American addresses ($5 postage elsewhere) from TAB Books, Blue Ridge Summit, PA 17294-0840. Ask for book Number 3414.

Shortwave Listening Guidebook

Harry Helms, AA6FW, is about as knowledgeable a person on the topic of DX listening as can be found anywhere. Not that there aren't plenty of experts, but what gives Harry that extra edge on the majority of the experts is that he's a professional writer, and one of the best and most interesting writers on the DX scene. Furthermore, he's active in practically every aspect of the monitoring hobby from SWBC, to BCB, to RTTY, to utes, and everything else. And the guy's been at it for years!

So, when it comes to rounding up an enormous amount of information, separating the valuable from the meaningless, and then arranging the best information into a useful and interesting form—well, Harry's the main man for the job.



That was the challenge before Harry when he set out to write a well-rounded book that any radio hobbyist, young or old, novice or seasoned, would consider a valued reference on each area of the hobby. A book that could be used by those pursuing the monitoring of SWBC, ham radio, utility stations, mediumwave, FM/TV DX'ing, pirates, clandestines, smugglers, spy stations, guerrillas, mystery stations and whatever.

The result is the *Shortwave Listening Guidebook*, a chunky 318 page illustrated book that you're gonna love! Harry's got everything in this book. Besides close ups of the different types of stations to chase, he explains transmission modes, he sorts through each individual band to tell you about it, he tells you how to buy a receiver to meet your needs, which add-on accessories are worth having, which type of antenna is best for you, and what to do about the antenna if you have only limited space available.

Then, there's a section on how and why radio signals on various frequencies travel from one side of the world to the other. You can use this information to plan your listening to zero in on specific target areas in which you're most interested.

Harry has detailed information on the world's most well known international broadcasters, and discusses how changes in international broadcasting will be affecting the hobby. There are explanations of specialty stations, such as maritime, beacons, fixed, aero, time and frequency stations, and even RTTY operations.

He provides information on keeping station records, sending reception reports, joining clubs, BBS's, and then offers a large appendix of ready-reference information such as international callsign prefixes, codes, radio abbreviations, etc. Plenty more in this book, too.

It's filled with QSL cards, station lists, and all sorts of other things to delight and inform. And, in case you were wondering, this is not . . . repeat *not* a technical book. It's written in straightforward non-tech language that anybody can understand, appreciate, enjoy, and put to instant use.

The hobby has long needed a book like the *Shortwave Listening Guidebook* to present a hip, concise, astute, accurate, and honest guide to the what's going on, and how to get the most enjoyment from a receiver. Yeah, Harry was the one guy who could write this book. He did good. The book is a goldmine just bursting with inside information, and it's written with considerable wit and personality in Harry's distinctive style. Little gems glisten out from practically every page. It will certainly give you a new perspective on things no matter how many decades you've tuned the static! Very highly recommended.

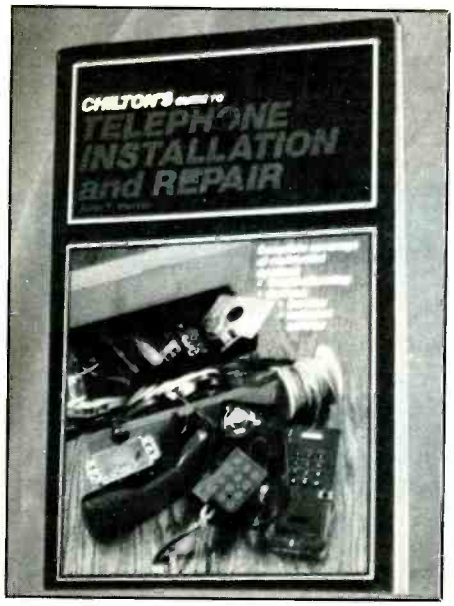
Shortwave Listening Guidebook, by Harry Helms, AA6FW, is available at $16.95, plus $3.50 postage to USA/Canada/APO/FPO, from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State please add $1.27 sales tax.

This Ring's For You

The Chilton Home Handyman Series includes a book entitled, *Guide to Telephone Installation and Repair*, by John T. Martin. It's the kind of book that should bring a smile of joy to all who have attempted to install their own phones in order to save the costs of being raked over the coals by the telco.

The *Guide to Telephone Installation and Repair* is a 192 page illustrated book that covers all kinds of wiring configurations for single homes and multi-unit residences. It also tells about available telephone services and options, including cellular systems. Additionally, there is complete information on how to select the best instrument for your needs.

The intro covers safety warnings, info on cables and cable networks; station wiring, drop wiring and inside wiring; telephone



service areas and normal charges for telco installations.

The troubleshooting section lets you know how much of the repair work you should try yourself and which service breakdowns require telco attention. You'll learn about test gear and procedures.

For the handy person or the helpless novice, the author takes care not to overwhelm you with any more tech data than you require to do the job. A good, comprehensive, consumer-level guide that goes a long way towards ensuring fewer mysterious phone service interruptions that you tend to blame on telco, but are probably within your own repair domain.

The book is available from any of the many national dealers who carry the Chilton guide series of books.

See What You Want?

As we have previously observed, we sometimes receive letters from readers asking if we intend reviewing *this* or *that* book, or suggesting books for review, or asking why certain titles were never reviewed. A few words here on the subject seem to be in order on occasion.

First, we have only a limited space and therefore usually get to look at about three titles per issue. We do not normally solicit, purchase, or request books for review here. Books that appear are chosen from those that are voluntarily sent to us which, in our opinion, will be of the most interest to you. We receive a large number of books from those who want them covered in these pages.

So, obviously, books that aren't submitted are automatically eliminated from the possibility of being reviewed. We assume that if a book isn't submitted to us, there is little reason to write and ask for a review copy in preference to those that are sent in for our consideration.

From those books that are submitted, invariably we eliminate the smattering of books that are blatant, unabashed, wholly derivative spin-offs, rip-offs and imitations primarily attempting to duplicate information and cash in on the success of someone else's earlier publication. Little point in wasting your time with material that (without exception) is never as good as the original, and very often costs more.

We also weed out books that are dreadful or useless on any number of other levels, including ones that are incomprehensible, badly done, dumb, generally shoddy, or those that fall apart the third time they're opened.

So, if we review a book, it's because it was submitted to us, because its concept was the result of someone's original creativity, and because we thought it would be of interest and use to you.

We do welcome and encourage books to be submitted. ■

BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

What's With The New Band? Everybody wants to know what's happening with the new 1605 to 1705 kHz AM broadcast band extension. It became available for use last July, but stations haven't appeared there, or even applied for permits to be constructed for such operation.

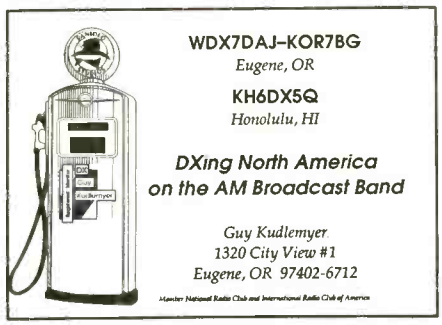
The FCC has been working on a revision of its AM tech standards for the existing band that would also apply to the new frequencies. The revisions look towards reducing interference on all frequencies, and the hope is to have them completed before stations are given the green light for applying for licenses above 1605 kHz. But the revisions aren't yet firmed up.

The FCC had requested public comments regarding the revisions, all of which were to have been filed by last December 10th. However, some engineering firms complained that their comments hadn't been completed because the proposals were so wide ranging and complex. The FCC therefore added another month to the comment period. However, almost one hundred comments had come in, most of which are lengthy and highly technical.

It will still be a long time before all of these comments are studied, then a set of new regulations emerges, and is finally approved. All of this needs to take place before stations can even think about planning operation in the new band.

Rumor Mill: Gary Hamlin, Registered Monitor KNY2AAW, of Utica, NY tells us that he understands WFTL/1400, Ft. Lauderdale, FL is going back to an all-talk format. Greg Patrick, of Richfield, MN advises that WLOL-FM/99.5, in the Twin Cities, was sold for $12-million and became a rare instance of a commercial broadcaster being sold to a public network. The station was sold to Minnesota Public Radio which dropped its pop music format and brought in the classical music that MOR had previously run in the Twin Cities area over KSJN, but with a lesser signal potency.

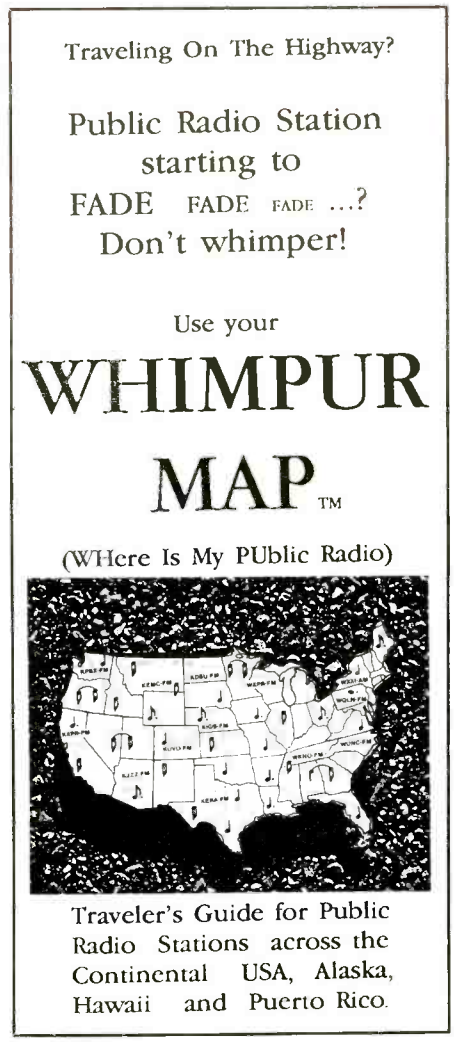
Desert Storm: For those who have written asking about *Desert Storm* broadcast frequencies, we can tell you that (at last count) there are twelve AFRTS transmitters. Three are staffed with military deejays. Listeners in the Dhahran area can hear the local FM outlet on FM 107, which is sent out over 99.6, 99.7, 100.3, and 101.2 MHz from different locations. *Oasis 99.9 FM* operates from Al Jubayl, with relays on 103 and 106 MHz. *Eagle 105 FM*, which is in Eskan Village, is rebroadcast in Riyadh on 107 MHz. In some areas, information, news, and sports are broadcast in some areas on 103 and 106.2 MHz. Note that these frequencies don't coincide with the FM broadcast channels used in North America, although they are in the same band. As a result, military personnel should use tunable receivers rather than digital sets. Many digital receivers designed for North American use can't tune off-channel frequencies. Thanks to Dave Hardin, Box 1411, APO New York, 09021 for this information. Come home soon, Dave!



Here's the station card of BCB DX'er Guy Kudlemyer, Registered Monitor KOR7BG, of Eugene, OR. The gasoline pump represents his interest in collecting oil-company related memorabilia. Think I'll send him my latest Sunoco credit card invoice.

Update: In the January column we ran some information sent in by a reader commenting on Maine stations WDME, WTOS, and WBLM. A letter from Robert F. Fuller, President of the Fuller-Jeffrey Broadcasting Companies, Inc., of Sacramento, CA straightens out the information.

Bob tells us that,"Skowhegan's WTOS is on 105.1, has been there for for a long time and, to my knowledge, has no intention of moving. WBLM then licensed to Lewiston on 107.5 as a Class B exchanged frequencies with WTHT then licensed to Portland



The "Whimpur Map" is a fine guide to NPR stations. It's made in a handy folding-map format.

The FM-3 "Talking Sign" is a complete, self-contained, personal FM broadcasting station with a 200 ft. transmitting range. It doesn't require an FCC license. See text for further information.

Applications Filed For New FM Stations

CA	Long Beach	88.1 MHz	1.25 kW
GA	Sylvania	106.5 MHz	6 kW
IA	Asbury	103.3 MHz	25 kW
IL	Springfield	90.5 MHz	850 watts
IN	Berne	91.1 MHz	25 kW
IN	Seeleyville	95.9 MHz	3 kW
KS	Liberal	105.1 MHz	50 kW
KS	Salina	90.7 MHz	1 kW
KY	Carlisle	100.7 MHz	6 kW
KY	Morehead	96.3 MHz	6 kW
KY	Westwood	99.7 MHz	3 kW
ME	Sanford	88.5 MHz	1 kW
MT	Helena	103.1 MHz	100 kW
NC	Winston-Salem	91.3 MHz	10 kW
OK	Nowata	101.5 MHz	6 kW
TX	Amarillo	100.9 MHz	100 kW
TX	Carthage	104.3 MHz	6 kW
TX	Idalou	105.7 MHz	6 kW
TX	Lubbock	90.1 MHz	1 kW
UT	Salt Lake City	88.3 MHz	500 watts

Applications For AM Facility Changes

(new)	Haiku, HI	1570 kHz	Drop to 500 watts at night.
WOPA	Chicago, IL	1200 kHz	Drop to 1 kW at night.

Construction Permit Cancelled

KPBS-FM	San Diego, CA	89.5 MHz

Applications Filed to Change FM Frequency

KWHO	Weed, CA	100.9 MHz	Move to 102.3 MHz, 5.5 kW.
KWYN	Wynne, AR	92.7 MHz	Move to 92.5 MHz, 25 kW.
WLJC	Beattyville, KY	102.3 MHz	Move to 102.1 MHz, 1.8 kW.
WLTD	Lexington, MS	106.3 MHz	Move to 105.9 MHz, 19 kW.
WTAO-FM	Murphysboro, IL	104.9 MHz	Move to 105.1 MHz, 25 kW.

FM Frequency Change Approved

KTJC	Rayville, LA	92.1 MHz	Move to 92.3 MHz, 6 kW.

Permits Issued For New AM Stations

CA	Bakersfield	1100 kHz
CA	San Martin	1120 kHz
TX	Hamby	880 kHz

Permits Issued For New FM Stations

AL	Ft. Rucker	100.5 MHz	3 kW
AL	Montgomery	96.1 MHz	3 kW
AZ	Buckley	106.9 MHz	6 kW
AZ	Tucson	89.1 MHz	3 kW
AZ	Window Rock	96.1 MHz	26 kW
AZ	Yuma	88.1 MHz	3 kW
CA	S. Oroville	104.9 MHz	3 kW
FL	Graceville	102.1 MHz	3 kW
IN	Salem	97.9 MHz	3 kW
KY	London	92.5 MHz	3 kW
MA	Marion	88.5 MHz	low power
MD	Pocomoke City	106.5 MHz	3 kW
MI	Lexington	96.9 MHz	3 kW
MN	Paynesville	98.9 MHz	50 kW
MO	Ozark	92.9 MHz	3 kW
MS	Flora	97.5 MHz	3 kW
MS	Meridian	102.1 MHz	3 kW
ND	Minot	106.9 MHz	3 kW
NE	Plattsmouth	106.5 MHz	3 kW
NH	Lebanon	100.5 MHz	6 kW
NM	Deming	91.7 MHz	600 watts
NY	Jamestown	89.7 MHz	6 kW
NY	Voorheesville	96.3 MHz	200 watts
OH	Columbus	91.5 MHz	3 kW
OH	Montpelier	104.5 MHz	3 kW
PA	Murrysville	88.1 MHz	100 watts
SC	St. Matthews	93.9 MHz	3 kW
TN	Bolivar	94.9 MHz	6 kW
TX	Bloomington	106.9 MHz	3 kW
TX	Levelland	91.7 MHz	20 kW
TX	Wichita Falls	105.5 MHz	3 kW
WA	Cashmere	101.1 MHz	3 kW
WI	Eau Claire	91.3 MHz	550 watts

AM Station Facility Changes Approved

WCMG	Lawrenceburg, TN	1520 kHz	Move to Columbia, TN.
WCRV	Collierville, TN	640 kHz	Increase days to 50 kW.
WEDE	Eden, NC	830 kHz	Increase to 5 kW/250 w.
WTRN	Tyrone, PA	1340 kHz	Add 250 w. booster at Altoona, PA.

on 102.9, a Class C with 100 kW. The result is WBLM is now a Class C with 100 kW at 102.9 and licensed to Portland. WTHT is now at 107.5, Class B and licensed to Lewiston. The switch in frequencies took place in December of 1989. It is true that at 103.1, WDME-FM is one channel away from the new WBLM at 102.9, and WTOS was never involved in this scenario."

It should be noted that Bob Fuller's company owns WDME, so we appreciate his first-hand knowledge on this. Bob adds that he finds our column "interesting and a lot of fun." Thanks!

This WCTW/1550 bumper sticker from New Castle, IN was sent in by Horace Smith, W9PPD, of Smith Communications, Inc., a two-way radio shop in New Castle. WCTW is presently seeking to change its call letters to WMDH, so this could be a rare item in short order.

Public Radio Finder: We received an excellent public radio station-finder prepared in the format of a fold-up road map. When you open it out, it's enormous! And what great information it offers, like the locations (shown on a map), callsigns, frequencies, and coverage (in miles) of all U.S. (including AL, HI, and PR) public broadcasting stations. Great for traveling, so that you can conveniently segue from one station into another as you move. It's easy to use, and the type is large and clear.

This attractive, clever and helpful NPR station-finder is called the *Whimpur Map* (stands for "WHere Is My PUblic Radio") and you can get one for only $3 (postpaid) from Marjory Lee Enterprises. P.O. Box 11354, Memphis, TN 38111. Put one in the glove compartment of your car or RV!

Low Powered FM Transmitter: Here's something that should interest you. It's a miniature FM (98 to 101 MHz) personal broadcasting station with a 200 ft. transmit-

FM Callsign Changes Approved

New	Was	
KBEL-FM	KWDG	Idabel, OK
KIOT	KMIO	Espanola, NM
KJMX	KDOA	Tulia, TX
KJOJ	KGLF-FM	Freeport, TX
KJZS	KJOJ	Conroe, TX
KKYZ	KXHC	Sierra Vista, AZ
KOQL	KLTE	Oklahoma City, OK
KPCY	KUKC	Pearl City, HI
KQLH	KWDJ	Riverside, CA
KRDS-FM	KTIM-FM	Wickenburg, AZ
KSRD	KUHA	Seward, AK
KTCY	KMKT-FM	Denison, TX
KUEL	KFDC	Ft. Dodge, IA
KYTC	KPLW	Northwood, IA
KYTE	KYQT	Newport, OR
KZNM	KDYC	Grants, NM
WDOT-FM	WMUM	Marathon, FL
WDXR-FM	WXZB	Golconda, IL
WFXF-FM	WFXF	Indianapolis, IN
WKIR	WXZD	Columbus, MS
WMJT	WLFS	Pinconning, MI
WMHE	WUIA	Delta, OH
WMTC-FM	WUMD	Vancleve, KY
WSQC-FM	WZXU	Oneonta, NY
WUMX	WTHZ	Tallahassee, FL
WUNI	WKKY	Moss Point, MS
WWZZ	WCKS	Karns, TN
WYXR	WSNI	Philadelphia, PA
WZCR	WQEZ	Ft. Myers Beach, FL

Callsign Change Requests Withdrawn

Present	Wanted	
KXGC-FM	KIOX-FM	El Campo, TX
WINX	WTKZ	Rockville, MD
WOKG	WAZP	Warren, OH

Changed Shortwave Callsign

New	Was	
KTBN	KUSW	Salt Lake City, UT

AM Callsign Changes Approved

New	Was	
KLIF	KKWM	Dallas, TX
KMZZ	WAYL	Richfield, MN
KQLH	KWDJ	Riverside, CA
KRBE	KKZR	Houston, TX
KYII	KLIF	Dallas, TX
WANR	WOKG	Warren, OH
WFXF	WXTZ	Indianapolis, IN
WHOG	WJOK	Hobson City, AL
WMIZ	WFHM	Vineland, NJ
WNBP	WNCG	Newburyport, MA
WNLS	WYYN	Tallahassee, FL
WPMX	WCFB	Tupelo, MS
WRIT	WPOG	Walterboro, SC
WRNE	WFXP	Pensacola, FL
WRTH	WIL	St. Louis, MO
WSSR	WSEA	Georgetown, DE
WSWL	WPFA	Pensacola, FL

FM Callsign Changes Requested

Now	Seeks	
KHOC	KLVT-FM	Levelland, TX
KSXY	KTHX	Reno, NV
WIGY	WKRH	Bath, ME
WMDH	WMDH-FM	New Castle, IN

Requests For AM Callsign Changes

Now	Seeks	
WCTW	WMDH	New Castle, IN
WKNN	WZZJ	Moss Point, MN
WMQM	WBBP	Memphis, TN

New FM Callsigns Issued

KBVZ	Bridger, WY
KCEY	Huntsville, TX
KDMM	Herington, TX
KIXS	Canton, SD
KJYY	Brush, CO
KXRC	Clarendon, AR
KZMA	Poplar Bluff, MO
WCDA	Voorheesville, NY
WLNB	Ligonier, IN
WLNE-FM	Montgomery, AL
WNTK-FM	Lebanon, OH
WQZM	Mountaintop, PA
WWST	Jeffersonville, GA
WXHT	Meridian, MS
WYMY	Bedford, VA
WYPL	Memphis, TN

ting range. Known as the FM-3 *Talking Sign*, it is designed to continuously broadcast a repeating tape loop (up to 64 seconds in length). A built-in microphone permits the message to be changed as often and as easily as the message on a telephone answering machine. No FCC license is required for fully legal operation since it operates under FCC Part 15 standards.

It's like a TIS station on AM, except that it operates on FM and you don't need a license. Typical uses suggested are for real estate or car sales; directing vehicles on roads or in parking lots; informing visitors at tourist attractions; as a wireless PA system; for broadcasting emergency or other messages to persons in schools, hotels, marinas, campgrounds, RV and trailer parks, stores, factories, drive-in theatres, dorms, hospitals, neighborhoods, apartment houses, stadiums, office buildings. A little imagination can summon up dozens of other applications.

It is small, self-contained, all solid-state, uses 117 VAC power, and may be left unattended to operate around the clock without interruption. The FM-3 sells for $495, and that includes shipping. For further information, contact M.B.R. Distributing, P.O. Box 155, Ramsey, IL 62080, or circle 101 on our Readers' Service. This company is also seeking dealers for the FM-3.

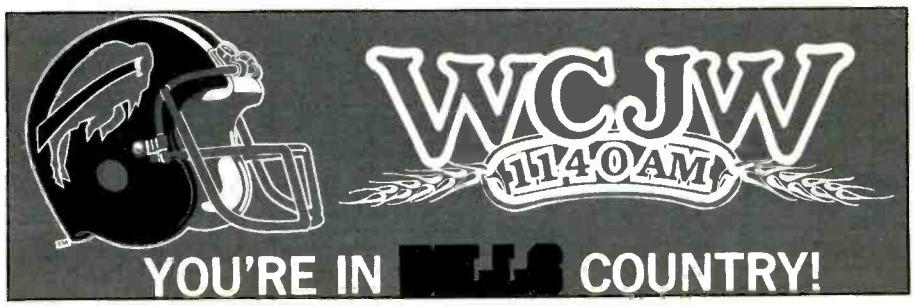
Sham Pain For All!: The FCC has long chafed about what it perceives as persons submitting "sham applications" for new broadcasting stations. That is to say, applications from persons not genuinely interested in establishing an operating broadcasting stations, but primarily seeking to attract profitable buy-outs from others who legitimately desire to obtain station licenses. This has turned into a sleazy non-industry that delays stations from getting on the air while also ripping off broadcasters.

New changes in FCC policies include limiting the amount of money that may be exchanged in such buy-outs to actual out-of-pocket expenses incurred. These, and other stipulations, effectively remove the ability to realize profits from trafficking in sham license applications.

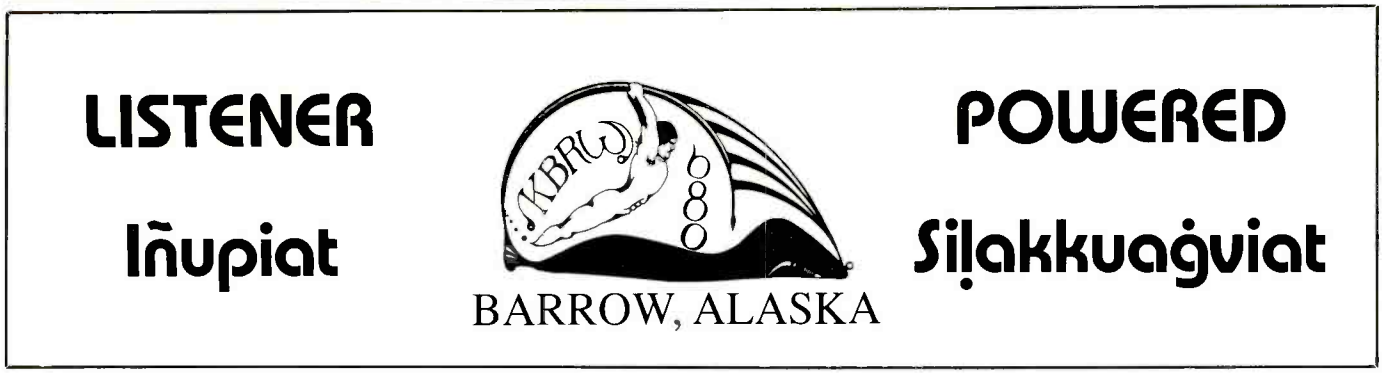
Own These Stations: Former US President Lyndon B. Johnson may have been the only Chief Executive to own broadcasting stations. He owned KLBJ-AM/FM, Austin, TX. Still owned by the late President's family under the corporate name of LBJ Co., the stations recently went up for sale. Asking price is $13.5-million. Expensive, yes, but a lot more of a conversation piece than that ashtray you swiped during the guided tour of the LBJ White House!

Towers of Trouble: Under strict, new, FAA tower regulations now being considered, broadcast stations would find it very difficult to change their transmitting facilities, and it would become practically impossible to erect new broadcasting towers. Needless to say, broadcasters are decidedly unhappy about these prospects.

The FAA claims that they want stricter regulations in order to prevent RF interference to air traffic control communications,



WCJW/1140 is a daytimer in Warsaw, NY that plays country music. During the football season, it carries the Buffalo Bills games. Thanks to Skip Tillingast, Perry, NY for sending it to us.



Dennis Stevens, WA6PGP/KL7, of Barrow, AK sent us a bumper sticker from KBRW/680, which must surely be one of the northernmost broadcasters in the USA. The slogan on the sticker is in both English and the local Eskimo language of Inupiaq.

and also to put a lid on the number of tall objects poking up into the air to become potential flight hazards.

The FCC isn't at all pleased with the FAA's proposals but hasn't been able to influence the FAA away from its hard-line position. The FAA rules, if enacted, would adversely impact on land-mobile and cellular licensees as well as upon broadcasters.

For it's part, the FCC has become extra aware of the fact that some broadcasters and other radio users neglect to provide the required painting and lighting on their towers. Recently, the agency inspected 1,000 towers and found that 160 of them were inadequately or improperly painted and/or lighted. The licensees using the towers were fined a total of $350,000 for their failure to meet these requirements.

Under existing regulations, antenna towers are supposed to be distinctively painted (and repainted as necessary) with alternating sections of bright orange and white. A red light must be at the top of the tower, and if it's a very tall tower it may also need additional lights on the sides. Note that, through space leasing arrangements, many towers are shared by a large number of users (broadcasters, land mobile, radio paging, etc.). Although the owner of the tower must maintain the proper painting and lighting, each individual user shares the blame and could be held separately responsible by the FCC should that tower be improperly painted or lit by its owner. If each leasee were given the typical $2,000 FCC fine, a single tower accommodating twenty five licensees could be a source of $50,000 in fines.

FCC licensees are required to check their tower lights once every 24 hours for outages or malfunctions. When any steady-burning light at the top of the tower, or any flashing obstruction light on the tower stops working, licensees must promptly report the outage to the nearest FAA Flight Service Station unless they can correct the problem within 30 minutes. The FAA also must be contacted again when the outage has been repaired. When any steady-burning side intermediate light goes out, the problem must be corrected as soon as possible, but the FAA need not be notified.

When assigning painting and lighting requirements for a specific tower, the FCC considers factors such as tower height, location to nearby airports, FAA recommendations, and Part 17 of the FCC Rules and Regulations.

The KWMW Tower: In Maljamar, NM FM'caster KWMW was ordered to forfeit $10,000 for violation of the FCC rules relating to the proper lighting of its tower.

In defense of itself, KWMW's owners said that its tower met FAA requirements. Furthermore, the station said that it had hired a contractor to build the tower in compliance with FAA and FCC regulations, and had relied upon that contractor to do the work properly. Also, KWMW noted that it had no history of prior offenses, and that such a large amount was not only unreasonable, it would also threaten KWMW's existence.

The FCC said that, regardless of the fact that the tower job had been contracted out, it still didn't relieve KWMW from being responsible for having the tower lit properly as described in its construction permit. KWMW's owners corrected the situation as soon as it was brought to their attention by the FCC, however that cut no ice with Uncle Charlie, who said that once the Big Badge Man has to bring such an oversight to a station's attention, it's too late for tears. The unsympathetic FCC demanded payment in full.

Another $10,000 Fine: One more station to recently feel the sting of the FCC's wrath has been KDKO, an AM'er in Littleton, CO. The FCC claimed KDKO had "repeated" violations of the FCC regulations.

Several apparent violations were involved, including failing to change from their daytime power to their night power and directional antenna pattern. The FCC also claimed that the station failed to cease operations within three hours after a malfunction in the remote system was noted. The remote system allows a station to control the transmitter power, and turn the transmitter on and off, from the studio. KDKO was also accused by the FCC of operating an unlicensed studio-transmitter link (STL). An STL is a (usually microwave) transmitter that allows a station to send its studio programming to the distant transmitter.

We hope you send us news clippings and photos relating to AM and FM broadcasters, also bumper stickers, decals, and any thoughts or comments you have on these topics. ■

CB SCENE

27 MHz COMMUNICATIONS ACTIVITIES

BY BILL SANDERS, SSB-295

If you've ever looked through the window of an 18-wheeler to put an eyeball on the CB unit installed there, you may have noted that professional drivers don't always use the same equipment as hobbyists. It's just that there are several sub-markets out there in CB-land, and truckers are one of them.

For those who have a need for a extra-rugged, high-performance AM mobile rig, this month we'll give you a look at Midland's Model 77-160 *Road Max*. This is a new trucker CB unit, although anybody can buy one and put it to a demanding task.

The *Road Max* was designed with extra-sensitive (0.75 uV/10 dB S/N+N) ears. And it has a special circuit to boost your voice through a busy channel. It has a high-visibility amber digital readout with night dimming, with a multi-color graduated scale power output and signal strength metering system. Among the other features are a manual tuning dial, a rotary RF gain control to reduce receiver sensitivity, instant Channel 19, PA system, 4-pin mike connector, and it's got generous-sized knobs and a full-size mike for those big bear-paws truckers have. A heavy-duty heat sink allows extended operation with mismatched or defective antennas without causing failure of the RF finals.

There's a slide rail mount, allowing tracking of the unit up to three inches forward or reverse of the mounting bracket. In addition, there's a quick-release bracket and power cord. There are still more features in this all-metal, ruggedized professional rig that was designed for the kind of rough handling, physical vibration, mistreatment and continuous operation that is far beyond what most hobby-oriented sets will ever need to face.

If you've got a mean installation, Midland's *Road Max* might just be the brawling brute to assign the task. For further information on Midland's Model 77-160 *Road Max* CB rig, check with Midland Consumer Communications Division, 1690 North Topping, Kansas City, MO 64120, or circle 101 on our Readers' Service.

Freeband Comments Continue

Comments keep arriving on the topic of so-called *Outbanding* or *Freebanding*, which is to say unauthorized two-way hobby comms taking place in North America below CB Channel 1 and also between Channel 40 (27.405 MHz) and the low frequency edge of the 10 meter ham band (28.000 MHz).

A reader in New Mexico sent in a copy of an "open letter" letter another area operator submitted to the *Satellite Group*, an outbander club whose members (at least some of them) have been hassled by the FCC. That letter suggests the club petition the FCC for 26 through 28 MHz to be allocated for all-mode operation, unlimited power, and FCC attention to the band only in instances of interference. Nothing like being unrealistic. That brainstorm has a less than zero chance of being given any consideration by the FCC.

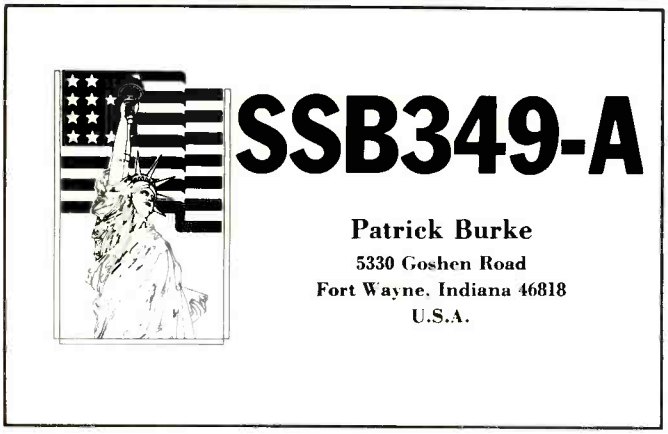
Jeff, outbander OZ-2151, of Grand Rapids, MI writes to say that outbanders have evolved their own operating procedures, techniques and conversational topics that are unique to their hobby. Jeff takes offense when people tell outbanders that they should get ham tickets and legalize their operations by shifting to the nearby 10 meter ham band where they can chat with their pals. Jeff feels that most outbanders could get ham tickets if they wanted them. It's just that many outbanders enjoy what outbanding offers and elect not to move into ham radio as a direct replacement since it's not quite the same thing as they're seeking.

Moreover, Jeff can't understand why *POP'COMM* doesn't give a lot of coverage and encouragement to outbanding, since it's obviously not going to go away quietly, even if we are indifferent towards the hobby. He doesn't understand why we have a pirate radio column, but we continue to ignore outbanders. Jeff's letter has not been the only one to express such sentiments.

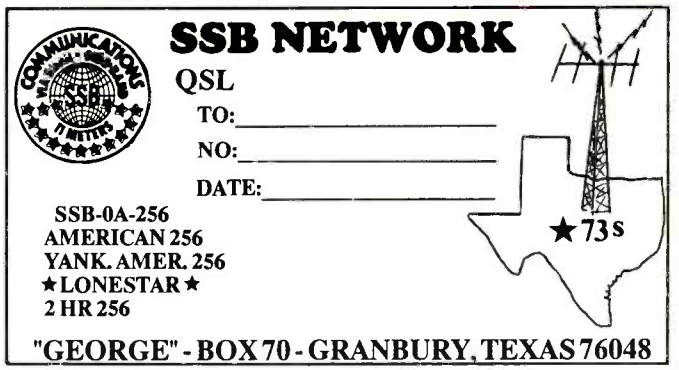
First of all, we have not ignored outbanding. We are discussing it here, now, and we have discussed it in the past. This is far more coverage than the topic has ever received in any other publication, save two or three publications run off in small quantities on mimeo machines for exclusive distribution

Midland's trucker rig is known as "Road Max."

Dave Daoust, Jr., SSB Network member SSB-810D, of LaCrosse County, Wisconsin tells us that he monitors the upper side of Channel 16. On AM, as "Bluejay," he monitors Channel 3.



Pat Burke, SSB Network member SSB-349A, sent along this newly designed QSL. He collects patches and decals.



George, in The Lone Star State, is known on the air by his SSB Network number, which is SSB-0A256. We like his QSL!

to the faithful. Other national publications either don't know it exists, or, if they do know about it, they prefer not to comment on the controversial topic.

POP'COMM doesn't encourage its readers to do anything that stands a chance of getting them busted, fined, hassled, or their equipment confiscated by the FCC. With respect to pirate broadcasters, we don't suggest that anybody set up a pirate broadcast station, and we run reports of all such stations that are caught. We would like to see the rules changed so that people don't need to become pirates. However, there is nothing either unethical or illegal about just listening to pirate broadcasters, so we present information on their skeds in order for readers to listen in. We neither encourage, nor tell people how to go on the air, though.

Outbanding is a participatory two-way hobby, unlike pirate broadcasting where a person can merely listen. In order to be an outbander, you have to violate FCC rules and set yourself up for fines and other major fed problems. This we definitely do not encourage, sympathetic as we are for the plight of outbanders to achieve legal status with the FCC. We support the fight for such legal status, but we don't recommend anybody try outbanding until the FCC grants it legal status, which may never happen.

We are willing to give outbanding some general coverage and support the concept of legalization. We have drawn the line at what we feel would be encouraging illegal activity that could get our readers fined, etc., especially in view of FCC enforcement efforts to shut down outbanders. We would question the value of any publication, newsletter, or club that encouraged or instructed its readers or members in the art of doing something that stood a chance of getting them burned by the FCC. An outbanding friend of ours was socked with a $1,000 FCC fine two years ago. We don't suggest your becoming involved in any hobby in which $1,000 FCC sanctions are a part of the fun and relaxation, nor do we want to be responsible for it happening to anybody.

This QSL bearing the number "473" was sent in by Peter Urae, of Kelowna, B.C.

Moreover, we cannot understand how or why anyone would seriously wonder why we refuse to use these pages to recommend activities that are so blatantly illegal, and which would put our readers in FCC jeopardy.

As it turns out, Steve Rogovich, of Virginia Beach, VA sent us a big newspaper clipping from the *Virginia Pilot-Ledger Star* of Norfolk that describes how five local outbanders were caught and fined $1,000 each. According to the lengthy story, new FCC mobile monitoring equipment has replaced the old rotating loop antennas, and tracking down stations has become very simple.

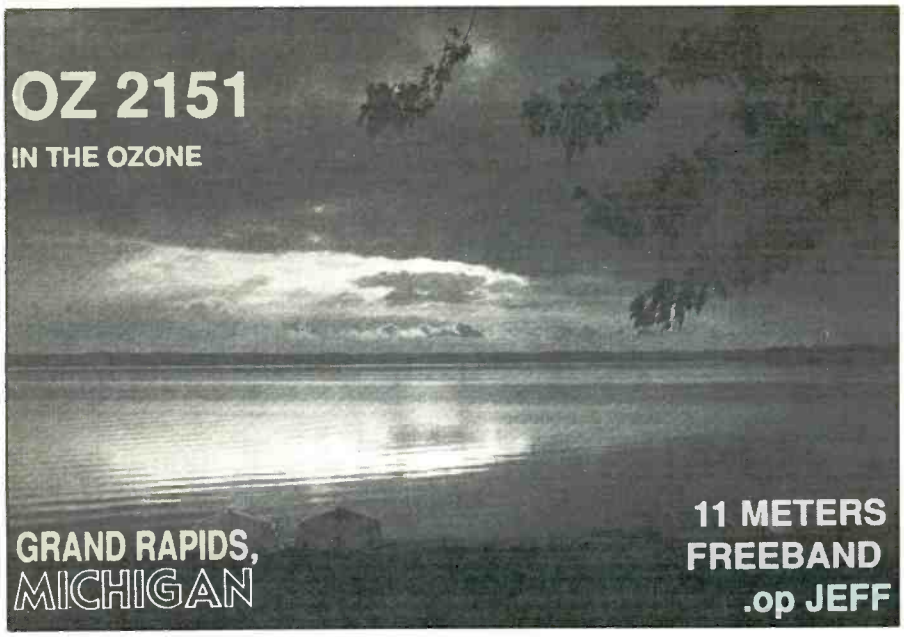
What the story referred to was only a small piece of a massive two-day FCC nationwide blitz last December against outbanders. During those two days, 144 outbanders operating between 25 and 28 MHz were identified by FCC personnel from 35 field offices. The operators of the 144 stations were issued fines that totaled $147,000.

The outbanders located were from all states, plus the DC and PR. The highest concentrations were in FL, CA, MI, TX, and AZ. Typical stations raided were using modified CB or ham equipment, plus linear amplifiers. Operators caught, according to the FCC, were members of groups known as *World Wide Sideband, Satellite, Alfa Tango, Whiskey Jack, Unidad, Truckers, Eagles International* and *Old Timers*.

That's about as good a reason as we can think of to suggest battling on paper for outbanding rights rather than on the air.

Report from British Columbia

Peter Urae, of Kelowna, BC, Canada writes to tell us that he lives in the Okanagan



Freeband operator Jeff, OZ-2151, sent us his QSL and some interesting comments.

Our DX QSL for May comes from 27-RP-505, who is located in Iceland. It was submitted by Bert, SSB Network member SSB-35F, of Texas.

Valley area of BC. There are approximately 100 CB'ers in this area, and the local gang likes to hang out on Channel 22. Peter's known as "473" on the air, and he passed along his attractive QSL depicting a Lake Okanogan cruise ship, the *M/V Fintry Queen*. He says this is a really beautiful area, and any visitors are welcome to give a shout on 22.

Questions, We Get Questions

What with the travel season looming ahead, here's a question I've been asked a number of times every summer. I just got a letter from Woody Perkins, of Kingsport, TN who asked it again. The Woodman notes that he has a mobile rig installed in his travel trailer that operates from the trailer's 12 VDC outlet. There's no problem when he's not hooked up to 120 VAC at a campground, but when he does hook up he gets a loud "buzzy" noise in the CB. I've gotten this same question about motor homes and mobile homes.

Most RV's have two electrical systems: a 12 VDC source where a storage battery feeds a special low voltage wiring system, and a regular 120 VAC system that functions only when the RV is plugged in to 120 VAC (such as as a campsite or trailer park). When the hookup is made to the campsite's 120 VAC source, an automatic switching device fires up an inverter that takes the 120 VAC and changes it to 12 VDC to run all 12 VDC systems such as pumps, inside lights, heating system, refrigerator (which can also run on propane), pilot light ignitors, and is also used to recharge the storage battery. Additional 12 VDC devices may also be plugged in, such as fans, etc.

These inverters are usually putting out a very rough, pulsating DC voltage which is fine for battery charging and running many DC appliances. But the pulsations come barging through the CB set's power line filters and you hear it as a raspy hum. This may also make such power unsuited to running certain TV's, VCR's, and cellular phones.

If you are having this problem, no easy solution comes to mind. I've tried several approaches without satisfactory results. You might try to rig up a method for disconnecting the battery from the charger/inverter when you operate the CB rig, the reconnecting it when it needs a charge. You can get many hours of CB operation from a good 12V storage battery before you begin to run it down. Another possibility would be to pick up a regulated 12 VDC power supply of suitable size at an electronics store and run it from one of the RV's 120 VAC power outlets in order to operate your 12 VDC CB, TV, VCR, and cellular while you're running on "land voltage."

Whatever you do, do not try solving your problem by putting a large electrolytic capacitor across the 12 VDC line to smooth it out. Without thinking, I tried it . . . and promptly zapped a half dozen transistors in a rig! Seems that the big capacitor smoothes out pulsating DC, but raises the output voltage to near the peak value of the pulses. In my expensive goof, the reading was 41 VDC!

One last thought on this. RV's often come delivered with really chintzy storage batteries that have relatively short life spans. If your RV's storage battery is some unknown brand, you might wish to spend a few bucks to replace it with a heavy-duty truck or marine *Sears, Auto-Lite, Exide* or similar national brand storage battery that will provide reliable service over a long period of time.

We'll be looking forward to hearing from you with thoughts and opinions, CB QSL's, shack photos, CB activity news, and your questions. ■

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

It will soon be warm outside; time for vacation monitoring and snagging some DX catches on VHF low band as the skip starts rolling in again on a daily basis from various areas.

POP'COMM resident low-and skip expert, Chuck Robertson, of Creal Springs, Illinois, says that the new expert Illinois State Police District 22 headquarters is in operation and the barracks is using 42.90 MHz simplex for dispatch. Other normal Illinois State Police VHF high-band frequencies such as 155.460 and 155.475 are in use at the new Ullin barracks, which replaces the former District 13-A barracks at Cairo, IL.

Derek D.S. Walcott of Christiansted, St. Croix, U.S. Virgin Islands, asks whether AOR's AR900 scanner can be modified to receive military aircraft frequencies between 225 and 400 MHz. We don't know of any tricks and have not heard of any modifications that would accomplish this. It's doubtful that such reception would be possible with this unit. As I keep saying, if there is a certain band you want to listen to, make sure your new scanner has the capability to receive it. At best, most scanners can be modified to receive a little bit out of band, but almost none can be modified or tricked to receive an entirely different band than the scanner is set up to receive.

From Baltimore, Maryland, Joe Bagrowski, N3FOE, says that the Maryland Port Police have stopped using 154.725 in favor of an 800 MHz trunked system. The new frequencies used are 852.8625, 853.3125, 853.8625, 854.1125 and 854.6625. The Port Authority maintenance and crane departments are still on 154.055, but plan to switch to 800 MHz within three to four years.

Pat Libretti of New Paltz, New York, bought a Uniden Bearcat 800XLT with the understanding that the radio's 800 MHz band was unblocked to allow full reception of cellular frequencies. What he didn't know until he bought the radio was that the scanner searched in 12.5 kHz steps and that cellular channels are spaced 30 kHz apart. Pat wonders whether this will affect his ability to tune in cellular communications. This channel-spacing problem is the same on other Uniden scanners, such as the Bearcat 200/205XLT and the 760/950XLT. It is not a problem, however, for radios such as the Radio Shack Realistic line of PRO-2004, 2005 and 2006 scanners, which can search the cellular band in 30 kHz steps. If your radio searches cellular in 12.5 kHz steps, the reception will be a little off-frequency for some channels, on the money for others and not even close for some other channels. It's basically how the 12.5 kHz spacing falls upon the 30 kHz channels up and down the band. For instance, you probably would have no difficulty hearing a cellular channel that was 2.5 kHz off frequency from what your scanner was searching. However, if it was closer to about 6 kHz off frequency, it might be tougher to tune in the communications, let alone just skip over it, especially with the low power of cellular phones and relay stations. It should be noted, however, that you still will hear plenty of cellular communications.

Here's the innovative portable listening post of Jerry Oglesbee of Sour Lake, Texas. Because he lives in the hurricane alley of the Texas coast, he needs to leave his home in a hurry and all his radios are ready to go. Two CB walkie-talkies give him communications with his wife and the Uniden Bearcat 100XLT and 205XLT as well as a Regency HX2200 let him scan all the action. A Sangean 803A shortwave receiver and tiny TVs also get stuffed into the suitcase.

Pat also passes along a few good frequencies for the sheriff's office in Dutchess County, New York: 30.04, base to car; 39.30, car to base; 45.62, drug task force; 39.14, sheriff's car; and 39.38 and 39.44, detectives.

Eric T. Owen, Registered Monitor, KFL4EI, of Sarasota, Florida, says he's taken notice here in Scanning VHF/UHF of other hobbyists who want to descramble analog speech/inversion (duck-quacking type) scrambling on their local police channels. Eric says a kit (part No. SS-7, case part No. CSS-7) is available from Ramsey Electronics Inc., 793 Canning Parkway, Victor, New York 14564. This kit is small, compact and easy to use, according to Eric. After putting together the kit, Eric found that it would not, however, descramble the digital speech-inversion systems. Anyone interested in this unit should write to them for a free catalog.

Eric also sends in a list of frequencies for Sarasota County in Florida: 154.770, Sarasota County sheriff F-1; 154.950, Sarasota County sheriff F-2; 155.175, Sarasota County sheriff F-3; 154.875, Sarasota County sheriff F-4; 155.025, Sarasota County sheriff F-6; 460.075, Sarasota city police F-1; 460.125, Sarasota city police F-2; 460.175, Sarasota city police F-3; 46.16, Sarasota Metro fire F-1; 46.36, Sarasota Metro fire F-2; 154.235, Sarasota city fire F-1; 154.310, Sarasota city fire F-2; 158.835, Sarasota County School board; 155.760, Sarasota County animal control; 463.7125, Sun-N-Fun RV Resort; 173.275, New York Times (must be a lot of sunbirds keeping up on the news at home down there for the Times to set up a radio system in Florida!) Eric also notes that itinerant frequencies (such as 151.625, 464.500 and 464.550) should be checked because they are used at many condo complexes and beaches in the area.

David F. Lahrman of Mason, Ohio, says that he's a new *POP'COMM* reader who was pointed our way by the Voice of America. David photographs military aircraft arriving for air shows and at local airports. He owns an inexpensive receiver to tune in the 108-136 MHz aero band, however, he says he hears the towers but never the planes. He's interested in getting a scanner that can tune in the planes and wants to know where to turn for frequency information. See the feature story in this month's *POP'COMM*, Dave!

If you have a question about scanning or communications, we welcome your input here at Scanning VHF/UHF. We also welcome photos of your listening post, dispatch centers and antenna farms. Write to: Chuck Gysi, N2DUP, Scanning VHF/UHF, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. ■

YOU SHOULD KNOW

HARRY HELMS, AA6FW

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

Making The Best Of Bad Propagation

Ah yes, a free evening and you decide to spend a little time DX'ing. You decide to check WWV at 18 minutes after the hour for the latest propagation forecast, and . . . uh, oh. The nice man on WWV tells you that the geomagnetic field is active and the K-index is higher than the prime interest rate. Heck, even WWV itself sounds "watery" and is a couple of S-units below its normal strength. So much for DX tonight, you think . . . wonder if the local video store finally has that copy of *Samson and the Wax Museum* I've been looking for.

Just a minute, sport. Don't bag DX'ing for the night just yet. Some of my best DX catches have been made in "lousy" conditions, and some of yours can, too!

So Just What Are "Lousy Conditions" Anyway?

Maybe the best way to understand bad DX conditions (and why they sometimes aren't) is to look at what "good" conditions are. If WWV were to forecast a quiet geomagnetic field, with a low K-index reading (such as 3 or less), and a high level of solar flux (such as above 100), most people would say that DX conditions would be good. So how do these three elements go into producing "good" DX conditions?

Okay, we all know that DX signals reach our listening posts by refracting off the ionosphere; we can think of the ionosphere as a "radio mirror." If the geomagnetic field is quiet, the ionosphere is like a highly polished mirror that easily reflects light. However, if the geomagnetic field is unsettled, the ionosphere is a mirror that's dirty or warped—it still reflects, but not as well. And if the geomagnetic field is active, it's as if a mirror has been dropped and cracked in several different places!

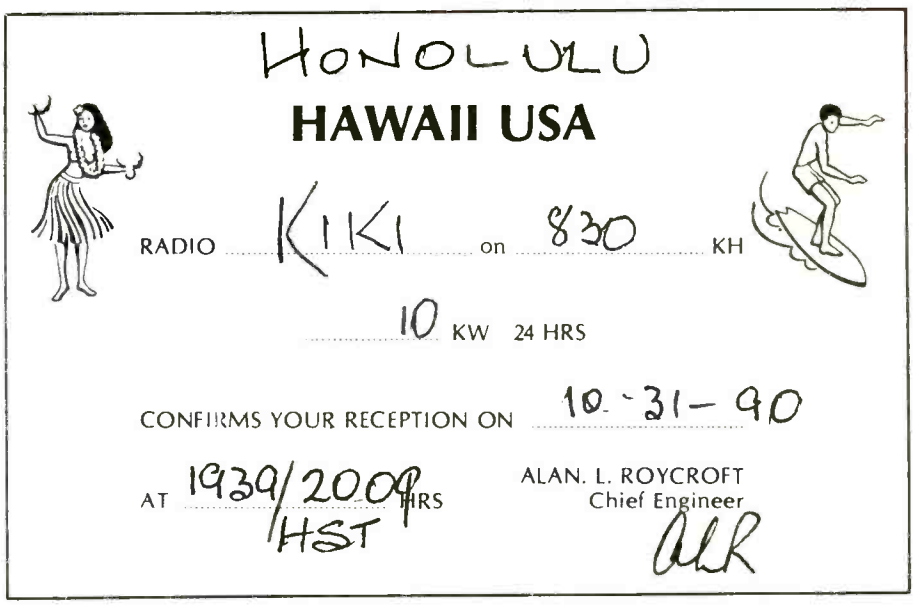
The K-index reading measures the effects of solar particles entering the Earth's magnetic field. If the Sun is pumping out a lot of electrons and protons, these can upset the ionosphere and make it more prone to *absorb* instead of refract signals. If the K-index reading is high, signals will be weaker or blocked altogether by ionospheric absorption. Not too surprisingly, a high K-index reading is usually associated with an active ionosphere.

The Sun is itself a radiator of radio waves. The solar flux is the measurement of the strength of the radio energy the Sun is "transmitting" on 2695 MHz. The higher the solar flux number, the more likely that higher frequencies (above 20 MHz) will be open for DX.

So let's suppose that WWV is forecasting "good DX conditions" of a quiet geomagnetic field, low K-index reading, and a high solar flux. If we were to listen on 49 and 31 meters in the evening, we might have a strong, steady reception of stations such as Radio Moscow on 6020 kHz or Deutsche Welle on 9645 kHz. That's not bad, but—let's face it—those two stations aren't DX.

Now let's suppose that the geomagnetic field is active, the K-index is over 7, and the solar flux is low. (In such conditions, just hearing WWV might be difficult.) Time to go to the video store to rent a copy of *Gidget Goes Psychotic*? Well, take another listen to those two frequencies first. On 6020 kHz, Radio Moscow's signal is cruddy. In fact, it's being interfered with by another station on the same channel. Listen . . . it's now rising above Radio Moscow—good grief, it's XEUM, all 250 watts of it, in Veracruz, Mexico! What about 9645 kHz? A quick check

(Continued on page 42)



HONOLULU
HAWAII USA

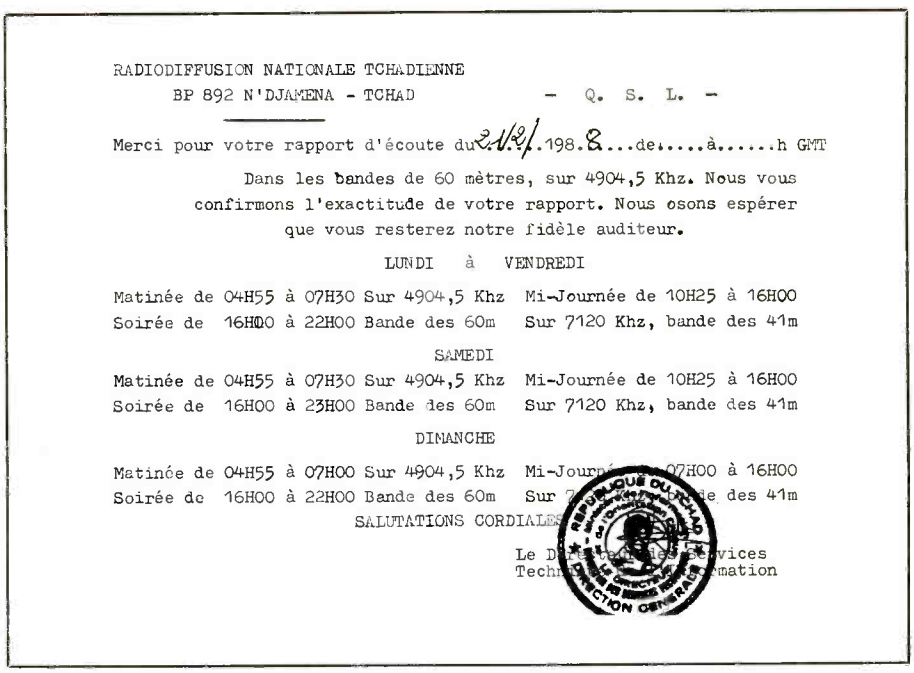
RADIO KIKI on 830 KH

10 KW 24 HRS

CONFIRMS YOUR RECEPTION ON 10-31-90

AT 1939/2009 HRS HST

ALAN. L. ROYCROFT
Chief Engineer



RADIODIFFUSION NATIONALE TCHADIENNE
BP 892 N'DJAMENA - TCHAD — Q. S. L. —

Merci pour votre rapport d'écoute du 24/2/.198.8...de.....à.....h GMT

Dans les bandes de 60 mètres, sur 4904,5 Khz. Nous vous confirmons l'exactitude de votre rapport. Nous osons espérer que vous resterez notre fidèle auditeur.

LUNDI à VENDREDI

Matinée de 04H55 à 07H30 Sur 4904,5 Khz Mi-Journée de 10H25 à 16H00
Soirée de 16H00 à 22H00 Bande des 60m Sur 7120 Khz, bande des 41m

SAMEDI

Matinée de 04H55 à 07H30 Sur 4904,5 Khz Mi-Journée de 10H25 à 16H00
Soirée de 16H00 à 23H00 Bande des 60m Sur 7120 Khz, bande des 41m

DIMANCHE

Matinée de 04H55 à 07H00 Sur 4904,5 Khz Mi-Journ... 07H00 à 16H00
Soirée de 16H00 à 22H00 Bande des 60m Sur 7... de des 41m

SALUTATIONS CORDIALES

Le D... Services
Tech... mation

OPTOELECTRONICS

"the State of the Art"

The new 10 digit LCD Handi-Counters™ from Optoelectronics redefine the state of the art. Our new HIGH SPEED ASIC (230MHz) makes the difference.

Select from our family of LCD, LED as well as computer based counters.

Model	8030	3000	2600H	2600HA	2210A	1300H/A	PC10
Function	Freq, Period Ratio, Interval Avg, Prescale	Freq, Period Ratio, Interval, Avg, Prescale	Frequency	Frequency	Frequency	Frequency	*
Range	10Hz-2.6GHz	10Hz-2.6GHz	1MHz-2.6GHz	1MHz-2.6GHz	10Hz-2.4GHz	1MHz-1.3GHz	1Hz-2.4GHz
Display	10 Digit LCD w/Function Annunciators	10 Digit LCD w/Function Annunciators	10 Digit LCD	10 Digit LCD	8 Digit LED	8Digit LED	14 Digit Monitor
RF Signal Strength Indicator	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	•	•	•	•
Price	$579.	$375.	$325.	$225.	$239.	$179.	**$339.

Sensitivity: <1 to <10mV typical. Time Base: ±1.ppm.; ±.5ppm. add $75 - LED Models; ±.2ppm add $80. - LCD Models. Nicads & AC charger/adapter included. Carry case and a full line of probes and antennas are available. One year parts & labor warranty on all products.

* PC10: Universal Counter Timer Board for the PC. Windows 3.0 based software. Frequency, Period, Ratio, Time Interval, Pulse Width, Reciprocal Count, Data Logging, Direct Tune a Radio Receiver, Auto Calibrate, Configure Units of Time & Frequency.

* *Price includes on board 50ohm, 2.5MHz to 2.4GHz input. Companion model AP10H, Dual High Impedance Amplifier is an additional $299.

FACTORY DIRECT ORDER LINE

1-800-327-5912

FL(305)771-2050 • FAX(305)771-2052

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

Visa, MC, COD, Cash, M.O. acceptec. Personal Check allow 3 weeks. 5% Shipping, Handling, (Maximum $10) U.S. & Canada. 15% outside continental U.S.A.

POP'COMM's World Band Tuning Tips

May, 1991

This Pop'Comm feature is designed to help you hear 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.

The list includes broadcasts in many languages besides English and most of the transmissions are not beamed to North America. Keep in mind that stations make frequent changes in their broadcast times and frequencies. Changes in propagation conditions may also make some stations difficult or impossible to receive. Your own equipment and receiving location will also have a bearing on what stations you are able to hear.

Note: EE, SS, FF, etc. are abbreviations for English, Spanish, French and so on. Some frequencies may vary slightly from those given in this list. All times are in UTC.

Freq.	Station/Country	UTC	Notes
2325	VL8T, Australia	1000	
2390	R. Huayacocotla, Mexico	0100	SS
3200	TWR, Swaziland	0300	local
3215	R. Oranje, S. Africa	0300	sign on
3270	R. Namibias	0400	vernacular
3290	R. Central, PNG	1100	EE/pidgin
3300	R. Cultural, Guatemala	1000	SS
3320	R. RSA, S. Africa	0330	Afrikaans
3345	R. Northern, PNG	1100	EE/pidgin
3365	R. Rebelde, Cuba	0500	SS
3370	R. Tezulutlan, Guatemala	0045	SS
3390	R. Zaracay, Ecuador	0230	SS
4000	R. Bafousssam, Cameroon	0500	EE
4300	R. Moderna, Peru	0900	SS
4719	RRI Ujung Pandang, Indonesia	1200	II
4750	R. Bertoua, Cameroon	0500	
4755	Sani Radio, Honduras	1200	SS
4760	Yunan PBS, China	1200	CC
4765	RTV Congolaise	0400	FF
4770	R. Nigeria	0500	EE
4790	R. Atlantida, Peru	0200	SS
4795	LV de los Caras, Ecuador	0200	SS
4805	Rdf. Amazonas, Brazil	0030	PP
4810	R. Orion, S. Africa	0345	Afrikaans
4815	RTV Burkina, Burkina Faso	0600	FF
4820	LV Evangelica, Honduras	0200	SS
4825	R. Cancao Nova, Brazil	0100	PP
4830	R. Tachira, Venezuela	0300	SS
4835	RTV Mali	0557	sign on, FF
4839	R. Reloj, Costa Rica	0200	SS, from 4832
4845	R. Mauritania	0700	FF
4865	LV del Cinaruco, Colombia	0400	SS
4870	ORTB Benin	0600	FF
4875	RRI Sorong, Indonesia	1130	Indo
4875	V of Jinling, China	1200	CC
4885	R. Clube do Para, Brazil	0300	PP
4890	R. Centinela del Sur, Ecuador	0200	SS
4910	LV de Mosquitia, Honduras	0300	EE
4911	Em. Gran Colombia, Ecuador	0200	SS
4915	GBC, Ghana	0600	EE
4915	R. Cora, Peru	0930	SS, sign on
4920	ABC, Australia	1130	
4930	R. Barahona, Dominican Rep	0100	SS
4960	R. Federacion, Ecuador	0030	SS
4965	R. Santa Fe, Colombia	0900	SS, also eves.
4970	R. Rumbos, Venezuela	0200	SS
4975	R. Tupi, Brazil	2300	SS
4980	Ecos del Torbes, Venezuela	0300	SS
5015	Arkhangelsk R., USSR	0300	RR
5020	LV du Sahel, Niger	0600	FF
5035	RTV Centrafricaine, Cent. Af. Rep.	0430	FF, sign on
5040	LV de Nahuala, Guatemala	1100	SS
5045	R. Cultura do Para, Brazil	0900	PP
5047	RTT Togo	0600	FF
5055	RFO Fr. Guiana	0400	FF
5286	R. Moundou, Chad	0455	sign on, FF
5930	R. Prague Int'l, Czechoslovakia	0300	EE
5955	LV de Centauros, Colombia	0400	SS
6005	RIAS, Germany	0530	GG
6005	CFCX, Canada	2330	
6010	R. Mil, Mexico	0500	SS
6020	R. Netherlands	0030	
6030	Suddeutscher Rundfunk, Germany	0500	GG
6055	Holy Medina Radio, Iraq	2300	AA
6070	CFRX, Canada	24hrs	
6088	R. Esperanza, Chile	0900	SS
6090	R. Luxembourg	2330	
6116	LV del Llano, Colombia	0600	SS
6135	Swiss R. Int'l	0400	EE
6150	Caracol, Colombia	0500	SS
6155	R. Austria Int'l	0830	GG
6160	CKZN, Canada	1130	
6175	Faro del Caribe, Costa Rica	1100	SS
6185	R. Educacion, Mexico	0500	SS
6280	King of Hope, Lebanon	0500	
6326	V of the Khmer (Clandestine)	1300	Cambodian
6570	Defense Forces Broadcasting, Myanmar	1200	Burmese
6575	R. Pyongyang, N. Korea	1230	SS
7130	Yemen Broadcasting Service	0300	AA, sign on
7190	R. Africa, Eq. Guiana	2230	EE, religious
7230	AWR, Italy	0730	sign on, EE/FF
7255	V of Nigeria	0500	sign on
7265	Sudwestfunk, Germany	0500	GG
7270	R. Prague Int'l, Czechoslovakia	0400	EE
7365	KNLS, Alaska	1500	EE
7376	R. For Peace Int'l, C. Rica	0200	EE. USB
7412	All India Radio	2200	EE
7430	V of Greece	0600	Greek
7445	V of Asia, Taiwan	1300	CC
7465	V of Israel	2200	EE
7475	RTT Tunisia	0600	AA
7480	Swiss R. Int'l	1330	via China
7510	KTBN, Utah	eves	ex-KUSW
7520	WWCR, Tennessee	0400	
7600	HD2IOA, Ecuador	0200	time signals
7670	Bulgarian Radio, Stolnick	0300	sign on, Bulgarian
9022	VOIRI, Iran	1930	EE
9044	Iran's Flag of Freedom (clandestine)	0345	Farsi
9115	R. Continental, Argentina	2300	SS, feeder
9345	R. Pyongyang, N. Korea	1200	EE
9410	V of Greece	0130	
9445	V of Turkey	0400	EE
9465	WMLK, Pennsylvania	0500	
9475	R. Cairo, Egypt	0200	EE
9480	R. Tirana, Albania	0430	EE
9500	R. Tirana, Albania	0530	EE

Freq.	Station/Country	UTC	Notes
9520	R. Budapest, Hungary	0130	EE
9525	R. Marti, Washington DC	0330	SS
9530	R. Moscow	0200	
9535	TWR, Bonaire	0330	EE
9535	R. Veritas, Philippines	1230	EE, others
9560	V of Ethiopia	1600	EE
9565	R. Universo, Brazil	0100	PP, religious
9565	All India Radio	1400	EE
9570	R. Romania Int'l	0200	EE
9575	RAI, Italy	0100	EE
9575	R. Mediterranean, Morocco	0745	FF
9580	R. Australia	1100	
9595	R. Tanpa, Japan	1200	JJ
9590	R. Norway Int'l	1300	EE weekends
9605	Vatican Radio	0050	EE
9615	R. Denmark	0130	Danish, via Norway
9620	Swiss R. Int'l	1300	via China
9625	CBC No. Service, Canada	1230	EE
9630	Spanish National Radio	0000	EE
9640	Ecos del Torbes, Venezuela	1100	SS
9645	R. Bandeirantes, Brazil	0800	PP
9655	R. Thailand	1200	Thai
9660	ABC, Australia	0800	
9680	XEQQ, Mexico	0600	SS, irreg.
9680	VOFC, Taiwan	0300	via WYFR
9680	R. Portugal	2345	PP
9695	R. Sweden	0200	EE
9700	R. New Zealand	0700	
9705	R. Nacional, Brazil	2200	PP
9725	R. Lira, Costa Rica	1130	EE
9735	R. Nacional, Paraguay	0000	SS
9740	BBC England	1130	via Singapore
9750	R. Havana Cuba	0430	EE
9750	R. Korea, S. Korea	1245	EE
9765	V of the Mediterranean, Malta	0600	sign on
9775	CBPB-2, China	1100	Korean
9800	R. France Int'l	0330	via Fr. Guiana
9815	IRRS, Italy	0700	EE
9830	FEBC, Philippines	1000	CC
9835	R. Budapest, Hungary	1000	CC
9860	R. Netherlands	2100	EE
9870	R. Austria Int'l	0130	EE
9870	KTWR, Guam	1300	CC
9900	Cairo, Egypt	2130	EE
9925	BRT, Belgium	0030	EE
9935	R. Macedonia, Greece	2000	Greek
9950	All India Radio	1415	
9977	R. Pyongyang, N. Korea	1100	EE
11335	R. Pyongyang, N. Korea	1145	EE
11585	V of Israel	2230	EE
11590	V of the Strait, China	1100	CC
11620	All India Radio	2000	
11645	V of Greece	0130	EE
11680	KGEI, California	0200	RR
11685	R. Beijing	0430	via Fr. Guiana
11705	R. Sweden	0200	EE
11710	RAE, Argentina	0100	
11715	KNLS, Alaska	0800	EE
11734	R. Tanzania, Zanzibar	1700	vernacular
11735	R. Yugoslavia	0030	EE
11750	R. Sofia, Bulgaria	0400	EE
11755	R. Finland Int'l	0715	EE
11765	R. Sofia Bulgaria	2030	EE
11770	All India Radio	1230	EE
11775	HCJB, Ecuador	0045	
11790	R. Vilnius, Lithuania	2200	EE
11790	R. Yerevan, Armenia	0250	EE
11800	R. Australia	0500	
11810	R. Baghdad	0300	EE
11820	R. Havana Cuba	0240	EE
11830	R. Iraq	0300	EE
11835	R. Japan	2300	EE, via Gabon
11835	SLBC, Sri Lanka	1100	EE
11835	R. El Espectador, Urugay	1100	EE
11840	R. Portugal	0230	EE
11840	R. Beijing	0430	via Canada
1160	V of Peace, Iraq	2100	EE
11865	R. Japan	1415	EE
11880	Spanish National Radio	0100	EE
11890	R. Oman	1700	AA
11895	VOIRI, Iran	200	EE
11900	R. RSA, S. Africa	0400	EE
11910	R. Budapest, Hungary	0230	EE
11930	R. Moscow	2300	
11940	BBC, England	0430	via Lesotho
11940	R. Romania Int'l	0400	EE
11945	UAE Radio	0330	EE
11990	R. Prague Int'l, Czechoslovakia	0000	EE
12015	R. Ulan Bator, Mongolia	0900	EE
12020	V of Vietnam	1400	JJ
12035	Swiss R. Int'l	0400	EE
12050	R. Cairo, Egypt	0200	AA
12077	Kol Israel	2300	FF/Hebrew
12085	R. Damascus, Syria	2115	EE
12105	V of Greece	2300	Greek
13610	R. Baghdad	0230	AA
13650	R. Pyongyang, N. Korea	1300	EE
13655	R. Jordan	1200	EE
13660	R. Baghdad	2100	EE
13670	R. Canada Int'l	2130	
13675	UAE Radio	1700	AA
13730	R. Austrai Int'l	0130	EE
13760	WHRI, Indiana	1800	
13770	Deutsche Welle, Germany	0500	
14917	R. Kiribati	0630	
15020	All India Radio	1445	Sinhalese
15060	BSKSA, Saudi Arabia	0400	sign on
15070	BBC, England	1530	
15084	VOIRI, Iran	0300	Farsi
15095	R. Damascus, Syria	1845	AA
15100	R. Beijing	0000	EE
15100	FEBC, Philippines	1100	EE, others
15105	RTM Morocco	2030	AA
15140	R. Nacional, Chile	2000	SS
15145	WINB, Pennsylvania	2330	
15150	R. Canada Int'l	2130	FF
15170	R. Tahiti	0430	FF
15180	Vatican Radio	0050	EE
15190	RTVC, Congo	1500	FF
15195	R. France Int'l	1245	EE
15195	R. Bangladesh	1230	EE
15215	R. Algiers	2200	Sahara Libre program
15265	Radiobras, Brazil	1900	EE
15270	HCJB, Ecuador	2000	
15275	KHBI, Saipan	2300	EE
15275	R. Canada Int'l	0445	via Austria
15285	Qatar Broadcasting Service	0300	AA
15285	R. Portugal	1200	FF
15345	RAE, Argentina	2030	
15345	TWR, Bonaire	1300	EE
15350	R. Luxembourg	0030	EE
15395	Spanish National Radio	1930	EE
15400	UAE Radio	0330	EE
15400	R. Finland Int'l	1300	
15400	BBC, England	2130	via Ascension
15415	R. Jamahiriya, Libya	1900	AA
15430	R. Austria Int'l	1330	EE
15445	R. Nacional Amazonia, Brazil	2100	PP
15470	R. Tashkent, Uzbek	1200	EE
15475	Africa No. One, Gabon	1730	FF
15495	BSKSA, Saudi Arabia	1900	AA
15525	Swiss R. Int'l	2100	EE
15575	R. Korea, S. Korea	0000	EE
15605	R. Pakistan	1700	local
15610	KSDA, Guam	2300	
15770	INBS, Iceland	2300	Icelandic
17595	RTM Morocco	1530	EE
17630	Africa No. One, Gabon	1230	FF
17665	R. Kiev, Ukraine	2200	
17675	R. New Zealand	0345	
17695	Br. Forces Broadcasting	1300	
17705	R. Beijing	0000	EE
17740	R. Tashkent, Uzbek	1200	EE
17745	R. Algiers	1945	EE
17755	BSKSA, Saudi Arabia	0500	AA
17775	KVOH, California	2300	SS
17810	R. Japan	2200	JJ
17820	R. Canada Int'l	1830	EE
17862	R. Nacional, Colombia	2200	SS
17900	RAI, Italy	1445	Italian
21490	R. Austria Int'l	11430	EE
21535	Qatar Broadcasting Service	1200	AA
21555	R. Yugoslavia	1300	EE
21655	R. Romania Int'l	1300	EE
21695	Swiss R. Int'l	1300	EE
21700	R. Japan	1730	EE via Gabon
21705	R. Norway	1900	NN (EE weekends)
21745	R. Netherlands	1330	DD
21800	BRT, Belgium	1400	EE
21840	RAI, Italy	1330	Italian
25730	R. Norway Int'l	1600	EE/weekends
25950	HCJB, Ecuador	1300	SSB

You Should Know *(from page 38)*

there shows Deutsche Welle gone, and Radio Bandeirantes in Brazil owning the channel instead. Zowie! Two great DX catches in one evening!

But wait a minute . . . how come such terrific DX can be heard when conditions are supposed to be so bad?

Bad For Them, Good For Us!

The solution to this paradox lies in the fact that the propagation predictions you hear on WWV and from other sources are for *high latitude* paths. This basically means the areas between the polar regions and the tropics, such as a path from London to New York, or a path from Costa Rica to Hawaii isn't considered "high latitude." Nor is any signal that crosses the equator on its way to us, like one from Central Africa to North America.

The Earth's poles are where particles from the Sun enter the ionosphere. As a result, the ionosphere near the polar regions is the first area to become unsettled and experience degraded reception due to solar activity. In fact, the ionosphere over the poles is usually continuously active, and this causes the "polar flutter" heard on signals from Asia which arrive over the North Pole. During a major solar event, the solar particles entering at the poles spread "downward" toward the equator, and the ionosphere along paths such as the one from London to New York can become as unsettled as the one over the North Pole. In such conditions, even powerhouse international broadcasters from Europe can have many dB's knocked off their signals. Stations such as Radio Japan or Radio Beijing can be almost impossible to hear in eastern North America. Lousy reception conditions due to increased solar radiation are often accompanied by auroral displays, and thus such receptions are called "auroral."

A time for weeping and wailing? If you have your heart set on hearing your letter read on the mailbag show on *Radio Euromendacity* or *The Voice of Sloth*, perhaps so. But if you'd like to hear some stations from Latin America, Africa, or the Pacific that are normally blocked by the powerhouses, you're in luck! Since the disturbed areas of the ionosphere seldom reach to the tropics, any signal which is last propagated off the ionosphere in those "undisturbed" areas can reach you without difficulty. And that means DX!

Looking For The Good Stuff

So all you have to do is listen for WWV to forecast an active or unsettled geomagnetic field and a high K-index and you're in business, right? Not quite. For one thing, the forecasts you hear on WWV aren't transmitted live; instead, they're several hours old by the time you hear them. Many solar events, such as solar flares, can cause disturbed reception conditions within minutes. While WWV is a good guide, nothing beats checking the bands for yourself.

Another important point is that effects of unsettled ionospheric conditions are often noted first on lower frequencies. One of my favorite places to check is on the standard AM broadcast band. I generally check the few remaining "clear" channels, such as 830 (home WCCO, Minneapolis), 1040 (WHO, Des Moines, Iowa), and 1520 (KOMA on Oklahoma City). These can be heard any night at my home in San Diego during normal reception conditions. If they are missing or weak, it's a good sign that's something's up and that unsettled conditions might occur on the shortwave frequencies. You can make up your own list of "beacon" stations on the AM band from about a thousand miles away which are normally audible at your location. Often, some good DX can be heard just while checking those beacons. For example, last August I tuned to 830 kHz one evening to check on WCCO's signal strength. Conditions were unsettled, and instead of WCCO I was treated to clear reception of Radio Belize from Central America! At other times, KIKI in Honolulu will dominate 830 kHz in San Diego instead of WCCO.

Another possible beacon is WWC itself. I've managed to hear time signal station LOL in Argentina on both 5000 and 10000

kHz when WWV is weakened by poor conditions.

Working Your Way Up

It doesn't take a lot of ionospheric activity to make the AM broadcast band ill, so just because conditions are disturbed there doesn't mean anything unusual will be heard on 49 and 31 meters. The best way to find out what's happening is to tune upward from the AM broadcast band.

Since most stations on the 90 (3200-3400-kHz) and 60 meter (4750-5060 kHz) broadcast bands are from the tropics anyway, you probably won't notice too much difference on them unless you're an experienced DX'er. (And if you're an experienced DX'er, you already know this stuff anyway!) The two most productive areas to check are usually the 49 (5959-6200 kHz) and 41 (7100-7300 kHz) meter broadcasting bands. The latter can be really productive when QRM from stateside hams is reduced, allowing some primo stuff from Central and South Africa, the pacific, and Southeast Asia to come through. During your local evenings 49 meters will often yield all sorts of goodies from Latin America; rarities from Southeast Asia sometimes make it through beginning a couple of hours before your local dawn.

The upper limit where an ionospheric disturbance would give you an edge in hearing stations to the south is 31 meters (9500-9950 kHz or thereabouts); above 10 MHz, unsettled reception conditions usually mean lousy reception from *everywhere*. However, check those frequencies anyway, particularly during the daylight hours. The 15100 to 15500 kHz range often gives good reception of South America during the afternoon hours when high latitude paths are disrupted. I can remember some afternoons when almost no Europeans could be heard on 19 meters, yet there were plenty of stations from Brazil, Colombia, and Chile.

So don't be too quick to pull the plug if WWV says conditions are "supposed" to be no good. A little tuning and a little luck can make those propagation experts look silly. Propagation experts—what do they know anyway? Fie! ■

Editor's Note: Harry Helms is the editor of the Umbra et Lux newsletter, c/o DX/SWL Press, 10606-8 Camino Ruiz #174, San Diego, CA 92126.

NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

Rugged Trio Of Marine Radios Offer Auto Scan, Built-In Memory

On the open seas, Inter-Coastal Waters or a placid lake, the ability to communicate with land-based stations and other vessels is a necessity. That's why Panasonic makes three high-performance VHF radiotelephones that are reliable enough to go on any voyage.

The dash-mounted KX-G2200 and KX-G2220, and the hand-held KX-G1500 are all rugged units designed to meet high water resistance standards, the highest in the marine electronics industry. (JIS 6).

Unlike most marine radios, which are pre-programmed to start at Channel 16—the international emergency channel—when the unit is turned on, Panasonic's marine radios permit the user to start with either Channel 16 or the last frequency tuned before the unit was turned off.

The top-of-the-line KX-G2220 and the mobile KX-G1500 also offer Tri-Watch, an unusual feature that enables the use to monitor Channel 16 and another memory channel while listening to a third channel.

Another key feature, shared by all three models, is automatic dual mode scanning. In the first mode, the unit scans all frequencies and automatically locks on to the first frequency in use. In the second mode, the unit scans all frequencies and pauses for four seconds on each frequency with a carrier. All the radios are equipped with easy-to-use channel up/down scanning keys. The KX-G2220 offers the added conveniences of a rotary dial tuner, hailer and intercom as standard features.

Small and lightweight (2.2 pounds), the KX-G2220 and KX-G2200 are spacesavers too, and can be mounted on a console or flush-mounted, with an optional flush-mount kit. The KX-G2220's unusual accordian-like front panel design enables the user to tilt the panel up or down 10 degrees for optimal viewing angle. Both models also feature bright, LCD displays with seven-step dimmer controls that make them easy to read under most lighting conditions.

In addition to serving as a vital communications lifeline, the KX-G2220 can also be used as an external public address and intercom system. When connected to a vessel's hailing speaker, the unit can be used to hail other boats or address people on shore. When connected with another speaker, the intercom function permits the user to easily communicate throughout the boat.

The 1.2-pound KX-G1500 is equipped with a rechargeable NiCad battery, flexible antenna with BNC, three-step RF power output for selecting 1, 3 or 6 watts, and a safety key lock. A full line of optional accessories is also available, including speaker microphone, long-life battery pack, desktop charger, 12-Volt cigarette lighter charger, and carrying case.

For more information, contact Panasonic Co., One Panasonic Way, Secaucus, NJ 07094.

Time-Tested Radio Updated

For nearly a decade, the RH256 has been used by professionals in just about every business and industry imaginable. Now, the new improved RH256NB is ready to take its place.

The RH256NB retains its classic style and design integrity so former RH256 owners will immediately feel comfortable with the new radio. Redesigned volume and squelch controls and knobs are larger, easier to use and recessed for protection. Programming and operational functions remain the same.

The major changes in the RH256NB have been made inside the radio. The RH256NB incorporates Track Tuning to cover an expanded 12 MHz frequency spread without re-turning. The voltage control oscillator now incorporates Surface Mount Devices for improved stability. CTCSS is built-in and programmable for 50 different tones on receive and transmit.

A large full function, backlit keyboard provides immediate access to any of the RH256NB's sixteen channels. Additional built-in features include scan, scan delay, priority channel, time-out-timer, low RF power output indicator, keypad beep, off-hook scan, off-hook to priority channel, power up on channel one (1), transmit carrier turn-off delay, and RELM's two year limited warranty.

For more information about the RH256NB or the name of your nearest authorized RELM Two-Way Dealer, contact RELM Communications, Inc., 7707 Records Street, Indianapolis, IN 46226.

Communications Terminal

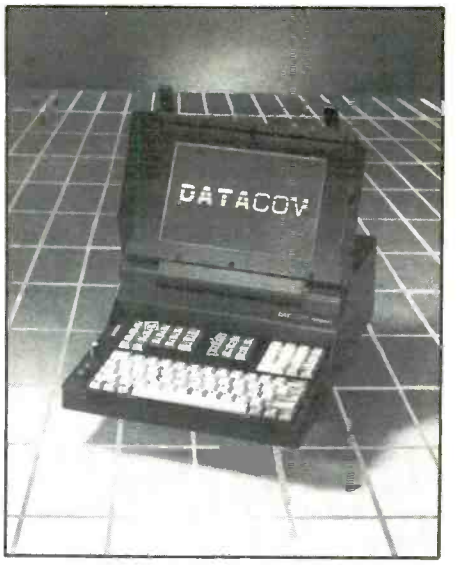
Trans World Communications announced a new family of Data Communications Terminals—the TW9000 "DATACOM" Series. The TW9000 provides the integrated facilities of both a data communications terminal and a sophisticated radio controller in a rugged and compact package, similar to a lap-top computer. The DATACOM has been specifically designed to provide advanced data communications capabilities over HF-SSB (high frequency single sideband) radio paths.

As a communications terminal, the DATACOM provides all standard modes of HF data communications including standard RTTY (Baudot or ASCII), SITOR (ARQ/FEC), PACKET (AX.25) and CW modes. When outfitted with the optional disk drive, the DATACOM terminal can be utilized to efficiently file data transfer between stations.

As a radio controller, the DATACOM provides full frequency, channel and mode control of an associated TRANSWORLD RT and TW100 Series Transceiver. Optional protocols can also be provided for other brands of radios.

The DATACOM Terminal utilizes easy-to-use menu-driven software to provide the ultimate in operator flexibility. A split-screen display provides convenient viewing of incoming and outgoing messages with full wordwrap and other word processing features.

The entire terminal is packaged in a rugged metal case, similar to a lap-top computer. The DATACOM's fold-down display and keyboard are fully protected when not in use. The display utilizes the very latest state-of-the-art backlit "Film Super Twist" technology.



The heart of the DATACOM Terminal is its powerful microcomputer with 512K of onboard RAM, 300K of ROM and 128K of battery backed-up message storage RAM. Options are available for 3½ floppy drives and/or a 40MB hard drive. When not in use as a communications terminal, the DATACOM can be used an MS-DOS PC.

For further information contact: Robert E. LaRose, VP/Marketing, Trans World Communications, Inc., 304 Enterprise Street, Escondido, CA 92029, or circle 105 on our Readers' Service.

TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

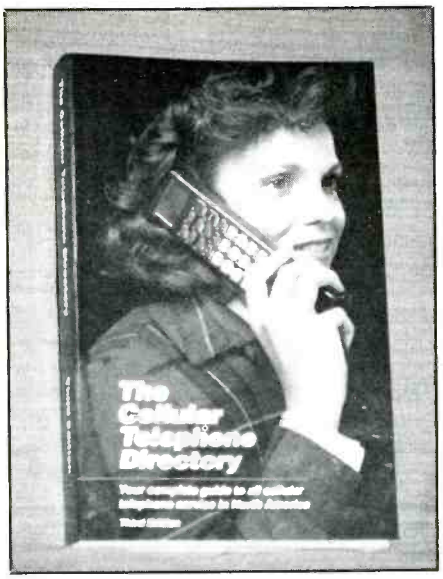
The general public remains in a quandary about the fact that cellular calls can be so easily monitored. In recent months I've been invited on listener call-in talk shows on radio stations such as KING (Seattle), WWL (New Orleans), WRC (Washington, DC), and others. Surprisingly, many who called in expressed complete disbelief and anger at the information. This, despite a considerable amount of earlier mass media coverage in *USA Today* and many local newspapers and other broadcast media. But a lot of callers didn't believe that they could be overheard.

Of those who realized that their conversations were easily monitored, one irate caller had a classic observation. He said that he figured once something as useful as cellular phones came along to help the public, some jerks would come along and ruin it all by devising the scanner. I pointed out that cellulars didn't turn up until the early 1980's, while the scanner had been invented in 1968.

Some callers expressed sentiments that looked upon those who listened to cellular calls as "sick," or "voyeurs," or "peeping toms," or similar. Still, nobody could explain to me why being entertained by real-life dramas taking place should somehow be considered less worthy a pastime than spending time in front of a TV set watching *Dallas, As The World Turns, General Hospital, All My Children, Peyton Place,* and the rest of the popular pseudo-dramas that the public has loved for decades on TV, and before those, the old radio soaps like *One Man's Family* and *Stella Dallas*.

It was very difficult to get the point across that, traditionally, communications security has been the responsibility of those who desire that privacy. That has long meant the utilization of various complex and often expensive technical and crypto methods to achieve that privacy. In the case of cellular privacy, we have the bizarre situation where a law was passed that is alleged to bypass all known technical and crypto methods of ensuring privacy. That law purports to assure communications privacy by the simple expediency of stating that, even though car phones can be tuned in and understood as easily as broadcasting stations, people aren't allowed to listen to them. How absolutely clever!

Anybody who thinks that this ensures any privacy at all is naive on a level that calls for a belief in the Tooth Fairy. But, that's what the public is when it comes to comprehending even the most basic concepts relating to telecommunications. That's why the cellular industry cooked up the law, that's how it was sponsored and rubber stamped through both houses of Congress. The expectation of privacy is still how cellulars are represented to the unsophisticated public.



This new 3rd Edition of The Cellular Telephone Directory is the latest guide to cellular service throughout North America. It's the updated edition of a popular guide.

This interesting cellular phone is also a pager. Not only that, it has no external antenna! It's the Universal Cellular. Inc. PagerPhone.

I used to feel badly about the gullible public being fed all of this "expectation of privacy" nonsense. The cellular industry must feel that if the public learns the truth about the total lack of privacy, people won't buy or use cellulars. However, it's obvious that the truth has now been given an ample amount of media coverage to get the facts through. Hard to believe, but the public actually prefers to believe the fantasy about the efficacy of a *Mickey Mouse* law that proclaims privacy solely on the basis of nobody being allowed to listen in. Instead of being annoyed at the deception, when given the chance to do so the public is quite willing to defend and argue on behalf of this hollow expectation of privacy. I'm still willing to keep trying to get the message through, but I'm no longer as sorry for the public as I used to be.

Cellulars are certainly unbeatable as useful communications tools for people on the go, but current technology just doesn't give them the same privacy factor as landline telephones. So what? The industry should tell this to the public. Cellulars will still be just as popular, anyway.

Did the Law Get Teeth?

Monitoring people repeatedly ask if anybody has ever gotten stung with the ECPA, which is the federal law that made it illegal to listen to cellular calls. Most people don't realize it, but the ECPA isn't a law that the FCC is supposed to enforce. It is supposed to be enforced by the U.S. Dept. of Justice, which has stated that it doesn't expect to be doing much enforcement of the ECPA, except in any instances of the most blatant alleged violations.

That's what surprised me not long ago when I heard from a woman in a large Georgia city. She told me that she felt she and her husband were about to be indicted for violating the ECPA. Although she strongly denied any wrongdoing, the high points of the story she told, as I recall it, were that someone had made tapes of cellular calls made by a local political bigwig. Apparently the conversations were somewhat unflattering, so when the tapes ended up in the hands of the politico's enemies, they made big waves.

In the course of events, copies of the tapes ended up in the hands of the person whose calls were alleged to have been recorded. He turned the tapes over to the U.S. Attorney along with the name of this lady and her husband, demanding that charges be brought for violation of the ECPA.

The woman said that "police" showed up with a warrant and removed from her home electronic equipment, tapes, and other materials that they claimed were evidence. Also, she felt that her telephone was being tapped.

I don't know how this turned out, but it's the type of alleged ECPA violation that, if

true, would be pursued by the U.S. Dept. of Justice. Someone showing up with tape recordings and filing a complaint against a specific person would make it hard to ignore, no matter how reluctant the Dept. of Justice might be to enforce the ECPA under normal circumstances.

All this by way of observing that there are limits to everything. Even the ridiculous ECPA, if violated blatantly enough, can obviously be used to bash someone over the head. You'd think that common sense would dictate against making tapes of volatile political conversations, and then distributing them within the political community. Definitely cruising for a bruising.

The ECPA may be a paper tiger, but a paper cut stings even worse than one from a sharp knife. Use common sense.

Overseas Cellular Update

Nokia-Mobira, of Largo, FL signed a $22-million contract for its NMT-900 portable cellulars to be used in Thailand. This is in addition to $15-million worth of another of their portables signed for Thailand a few months earlier. There are three cellular systems in Thailand serving about 60,000 subscribers, plus some subscribers in neighboring Malaysia. The system is growing at 5,000 per month.

Nokia also finalized a $10-million deal to sell their cellular equipment in Mexico exclusively through IUSACELL. The contract calls for 20,000 Nokia mobile, portable, and handheld cellulars to be shipped.

Millicom Incorporated, of New York, NY has worked out arrangements with the Soviet Ministry of Communications to provide cellular service in the USSR, starting with Moscow. The Moscow system is to be established on 450 MHz by Millicom, and will be the second cellular system there.

CommStruct International Inc., of Vestal, NY signed a deal with the PTT of the Byelorussian SSR to construct and operate a cellular system there. Service will kick off in the middle of this year with 4,000 subscribers in the city of Minsk, but will have an eventual capacity of 200,000 subscribers. Cellular service is anxiously awaited inasmuch as getting a landline phone in Minsk means going on a waiting list with more than 700,000 people ahead of you. It's a 10 year wait!

A group of companies led by BellSouth Corp., of Atlanta, GA has signed a contract to operate a cellular system in Uruguay. The system will cost $10-million to put into operation, and will begin service in Montevideo by the middle of this year. Later this year, service will open in the resort center of Maldonado/Punta del Este.

All New Cellular Directory

The popular *Cellular Telephone Directory* has been updated and expanded into a 3rd Edition. This new 576-page book contains 136 pages more than the previous edition. This big book is a complete guide to all cellular services in North America (USA, Canada, Mexico, Caribbean, plus Hong Kong as an extra). There are more than 230 maps showing signal coverage. Each city with cellular service is listed along with how to send and receive calls there as a regular subscriber or as a roamer, the names and addresses of all *Wireline* and *Non-Wireline* local cellular service suppliers, all of their rates (including for roamers) and billing policies, their office hours, all of their significant phone numbers (business office, repair service, roamer access, emergency and hotline numbers, etc.).

A handy toll-free reservation section shows airline, hotel, rental car, and travel service numbers. Another section provides a large index of cellular companies and the out-of-town companies with which they have roaming agreements.

This is the total guide to cellular service. If you own a cellular (or are going to get one), this is the book that tells you where service exists, and how to access that service. If you're a monitoring enthusiast, it's an invaluable reference to all cellular systems and their service areas. Just the thing for roaming in this summer!

The new expanded 3rd Edition of *The Cellular Telephone Directory* is $16.95, plus $3.50 postage to addresses in North America, from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. Residents of NY State please add $1.27 sales tax.

Oops! They Made A Slight Error!

A reader in Texas passed along a brochure called *A Cellular Glossary* provided to him by the Cellular Telecommunications Industry Association (CTIA). CTIA is the group that provides information to the public on cellular phones. We'll overlook that the four-page publication ignores the question of lack of privacy. But what caught our eye was the CTIA's misinformation that Block A (Non-Wireline) cellular systems operate between 824 and 849 MHz, while Block B (Wireline) systems operate between 869 and 894 MHz.

The correct information is that all Non-Wireline system mobile units operate from 824 to 835 MHz, while these systems' cell site frequencies are between 869 and 880 MHz. All Wireline system mobile units operate between 835 and 849 MHz, while their cell sites use from 880 to 894 MHz. Frequencies are spaced at 30 kHz intervals. Normally, mobile unit transmissions are repeated through the cell sites. Some frequencies are used only for equipment control purposes. This holds true for cellular services throughout North America, plus many other areas of the world.

Let's hope they get it right.

New Hardware

Universal Cellular, Inc. brought out a novel combo cellular and pager. Called *PagerPhone*, it's the first time a pocket-sized cellular phone has been available containing a pager.

The built-in alphanumeric pager displays messages of up to 256 characters, and is intended to be used with the *Universal Paging* system that is a nationwide roamer paging service that automatically forwards all beeper messages to this unit throughout the nation.

The cellular phone and pager has a hidden antenna, and another good feature is the availability of ten NAM's for listing the phone in lots of different places to save on roamer charges. There's a memory section that stores up to 90 names and numbers. The battery is a 1200 milliamp-hour type offering at least 12 hours of standby time. This can be extended to 100 hours using the pager function to receive incoming messages. There are over two hours of continuous talk-time.

An optional conversion kit enables this set to upgrade from a .6 watt unit to a 3 watt hands-free mobile phone.

The MSRP (including pager activation) of the *PagerPhone* is $1,895. A reasonable price for this advance piece of hardware.

For more information on the *PagerPhone* contact Universal Cellular, Inc., 3365 Miraloma Ave., Anaheim, CA 92806, or circle 103 on our Readers' Service.

Why not join us next month. We are always looking for your opinions and questions. ■

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

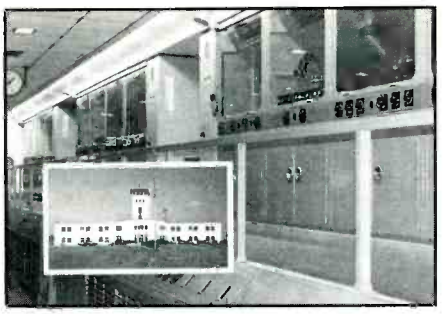
Shortwave radio continues to mirror the wild and weird times in which we live. Would you believe that the religious broadcaster IBRA Radio has gotten the go-ahead to air programs over the USSR's All-Union Radio? In addition to carrying IBRA on longwave, mediumwave and FM, the USSR will also air it on their domestic shortwave outlets, which means we'll probably be able to hear the broadcasts. We don't yet have information as to times and frequencies, however.

Another eye-opener is a recent agreement between Radio Moscow and Radio Beijing to establish a reciprical relay of each other's programs! Radio Moscow will use Chinese transmitting facilities for its beams to Asia and Radio Beijing will use Radio Moscow transmitters to reach parts of Europe and the Gulf region. No schedules at hand yet, but we'll pass them on later.

Another relay which should now be in full operation is the new Radio Japan transmitting site in Sri Lanka, comprised of two 300 kW units. The middle east and southeast Asia are the targets for this facility. Frequency and schedule information is still very sketchy, but you might watch 11840 in the early mornings (though Radio Moscow via Havana hangs out here, too) or 9720 at various times. Other frequencies are sure to turn up later.

The word is that shortwave from Nicaragua is to return before long and there'll be more than just the government's voice on the air. The government station will be called Radio Nicaragua (as opposed to the Voice of Nicaragua as it was known under the the Sandinistas) and will probably use 5950. Watch for the return of Radio Zinica in Bluefields, possibly to its old 6120 frequency. Other private organizations said to be planning on shortwave include Radio Nicaragua International and Radio Miskut—once a clandestine—will come back as a licensed station, slated for 5970. And Radio Informaciones de Centro America—probably to be know as Radio Rica—is supposed to use 10 kW on 4920 (where it will undoubtedly interfere with Ecuador's Radio Quito—don't they check these things in advance?) All of this comes from a report by Jeff White on Media Network over Radio Netherlands. Of course, it's anyone's guess as to how soon, or even if, any of these will show up on the bands.

The high power parade seems never to end! There's another big float being put together right now, though it won't pass by your reviewing stand for at least a couple of years. The Catholic Eternal World TV Network (EWTN) is in the first stages of setting up a worldwide shortwave network which may rival that of Vatican Radio itself. EWTN will put two high power outlets on from Rome and three will be sited at Birmingham, Alabama, where EWTN has its headquarters. A third site is, yet to be named, will be somewhere in Asia or the Pacific. The US and Italian stations are scheduled to open in 1993.



This VOA QSL commemorates the closing of the old Crosley transmitters at the VOA's Bethany, Ohio plant, which were taken out of operation on November 7, 1989. The transmitters signed on in 1942. Three new 250 kW transmitters should come on from Bethany around mid-year. (Thanks to John Vodenik at the Bethany station.)

Here's John P. Meyers at his Spokane, Washington shack.

William Roseboro of North Carolina kicked off his SWL career with a DX-65, but has already moved up to a DX-440.

The Bhutan Broadcasting Service is said to be testing the new 50 kW transmitter we were told was coming sometime ago. Tests are apparently underway now using 5023, 6035 and 9615. 5023's 5 kilowatt transmitter has been heard by a few DX'ers here over the past couple of years, but, so far, not a single QSL has been received. If 5023 continues to be active and uses the 50 kW unit we should have a better chance of hearing Bhutan when the fall/winter DX season rolls 'round again. Thanks to Sweden Calling DX'ers via the Ontario DX Association's *DX Ontario* bulletin for that info.

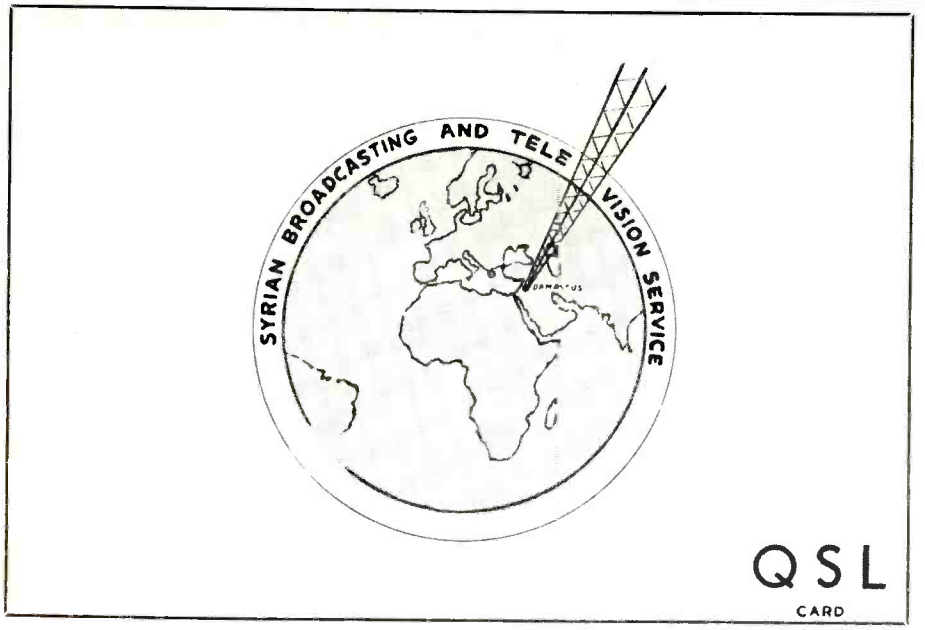
Speaking of the Ontario DX Association, the club's ham radio station, VE3ODX, conducts the ODXA ham net on Sundays at 1700 on or about 7068, lower sideband. The net shares shortwave tips and other information and everyone is welcome to tune in or check in, if you have your ham license. Information about ODXA is available from PO Box 161, Station A, Willowdale, Ontario M2N 5S8.

The North American Shortwave Association (45 Wildflower Road, Levittown, PA 19057) has been encouraging the formation of local or area chapters so members (non-members, too, we'd guess) can get together to socialize and exchange tips and such. The first such group to be formed covered the Philadelphia area and now others are forming in other metro areas. Information about the northeast Ohio group can be had from Mike Fanerys (216) 661-2443; in Philadelphia from Dan Cashin (215) 446-7831; in the Boston area it's Paul Graveline at (508) 470-1971 and in the New York area send a self-addressed, stamped envelope to Box 6624, Jersey City, NJ 07036. Incidentally, when writing to any club for information and a sample bulletin be sure to include a dollar or two to help defray their expenses.

IN THE MAIL: Kevin Story was delighted to have the mailman stop at his Texas shack and deliver a QSL from the always chancy Radio Damascus, via registered mail, no less. Bill Walbesser topped that by receiving two QSL's from them, one of which he shares with us this month. Incidentally, Bill's always fine reports are missing this month due to pressures of work, but Bill promises to be back with more log reports soon.

Jim Ross of Washington was delighted with the great buy he got on a used ICOM R-70, which now joins his Sony 2010 in the shack. Jim has upgraded his ham rig, too, with a used ICOM transceiver, and promises a shack photo soon.

William Roseboro of Hamlet, North



It's usually a tough battle to get a reply from Radio Damascus, but Kevin Story and Bill Walbesser have recently scored. (Thanks Bill Walbesser)

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

Carolina says he owned a Radio Shack DX-65 for five years and just recently got around to trying out the shortwave frequencies. We were quickly hooked and soon upgraded to a DX-440. William is retired from the US Army. Thanks for the photo and we anticipate your reports, too.

Before we get to this month's logs here's the usual reminder that we do welcome your loggings. Just remember to prepare them by country, leave some room between each so we can cut them apart and place your last name and state abbreviation after each. We also welcome your shack photos, spare QSL's for illustrations, schedules, clippings and, certainly, your general letters. Let's hear from you often!

Here are this month's logs. Language reported is English unless otherwise indicated and all times are UTC.

Alaska: KNLS on 11700 in RR at 2117 with religious program. (Judkins, VA)

Algeria: Radio Algiers, 9510 at 1830 in AA with music. News in EE at 1900. (Story, TX) 9535 at 1909 in FF with western rock. (Johnson, IL)

Antigua: BBC relay, 5975 at 0302 with news. (Moser, PA) 11760 at 2006 with news. (Bevens, MA)

Deutsche Welle relay, 9545 at 0303. (Moser, PA)

Ascension Island: BBC relay on 21470 at 1651. (Moser, PA) 21660 at 1939. (Bevens, MA)

Australia: Radio Australia, 6060//9660 at 1432; 13605 at 1357 in CC; 187855 at 0709 and 21740 at 2205. (Carson, OK) 9580 at 0945; 1140. (Johnson, IL; Moser, PA) 13705 at 0744; 15160 at 1456 into sign on; 17630 at 0250 and 21740 at 0025 with sign on. (Bevens, MA)

ABC Brisbane on 9660 at 0759, ID and news. (Bevens, MA)

Austria: Radio Austria International, via Canada, 6015 at 0530 with sign on. (Moser, PA) 9875 at 0137. (Smiley, WI) 11780 at 1430. (Johnson, IL) 13730 at 1636 in FF. (Judkins, VA)

Belgium: BRT, 9925 at 0000 sign on in SS. (Reyes, Mexixo) 13675 from 1000 to 1025 when switched to Dutch, then FF from 1030. 15515 in EE to Africa at 1850. (Judkins, VA)

RTBF, 15540 at 1750 in FF, better than //17635. (Moser, PA)

Benin: ORTB, 4870 at 2254 with slow music, FF announcement, anthem and off at 2300. (Johnson, IL)

Brazil: Radio Clube do Para, 4885 at 0932 in PP with music, commercials. (Judkins, VA)

Radio Nacional Amazonia, 11780 at 0948. DJ with echo effects and talk in PP over music. (Johnson, IL)

Radio Guaiba, 6000 at 0827 with PP ID "Radio Guaiba, Porta Alegre" and song title. (Johnson, IL)

Radiobras, 11745 in EE at 0247. (Ross, WA) (Have they resumed the 0200 EE to North America? editor)

Bulgaria: Radio Sofia, 7115//11720 at 0400 and 11765 at 0730. (Carson, OK) 97000//11680 at 0030 with Music From Bulgaria. (Moser, PA) 11660 at 2310. (Ross, WA) 15160 at 0744. (Bevens, MA)

Burkina Faso: Radio Burkina, 4815 at 0615 with hi-life music, FF announcer, IS. (Johnson, IL) 0700 with music, man in FF. (Moser, PA)

Cameroon: CRTV Garoua, 5015 at 0523 in EE with music and talk, into FF at 0530 after ID. (Johnson, IL)

Canada: Radio Canada International, 5960 at 0006, 11950 at 2235, 13720 at 0255 and 17820 to Europe at 1515. (Carson, OK) 9535 to Brazil in PP at 0015. (Judkins, VA) 0241 in EE. (Moser, PA) 9755 at 0030. (Perry, TX) 13670//15260//17820 in EE to 1900 then to FF to 1930, both transmissions beamed to Africa. Also noted on unlisted 25540 at same time. Also GG at 1736 on 15325. (Judkins, VA)

CFRX relay of CFRB, Toronto, on 6070 at 0047 with talk show and ID. (Bevens, MA)

CHNX relay of CHNS on 6130 at 0044. (Bevens, MA) 0718. (Moser, PA)

Chile: Radio Nacional, 15140 in SS at 0025. (Reyes, Mexico) 0100, with ID in SS at 0101. (Bevens, MA)

China: Radio Beijing, 11445 in SS at 2330. Woman with classical music program. (Johnson, IL) 11600 at 1202. (Moser, PA) 11790 in SS at 2309 and 15100 in SS at 0140. (Judkins, VA) 17705 at 0024. (Ross, WA)

CPBS-1 in CC with music on 4460 at 1520. (Ross, WA)

Xinjiang PBS in CC on 3990.1 at 1505. (Ross, WA)

Colombia: Ondas del Meta, 4885 in SS at 1022. Heard a cat meow during a talk segment! (Johnson, IL)

La Voz del Llano, 6116 at 2345 with rapid fire delivery in SS with lots of mentions of Bogota. (Johnson, IL)

Costa Rica: Radio Reloj, 6006 at 0900 in SS with man announcer and many ID's, commercials, public service announcements and LA music. (Johnson, IL)

Radio Lira, TIAWR, 1053 with SS and EE sign on, 1058 with "The Quiet Hour" program ID at 1127 giving mailing address as PO Box 1177, Alajuela, Costa Rica. (Zamora, ND)

Radio for Peace International, 7375.2 USB at 0050 with UN program, ads for (RFPI) t-shirts (Johnson, IL) 0719. Also 21656 at 2224. (Carson, OK) 13630 at 0320. 0508. (Smiley, WI; Judkins, VA)

Cuba: Radio Havana Cuba at 0406 on 9505. (Moser, PA)

Cyprus: BBC Relay, 11850 at 2017. (Bevens, MA)

Czechoslovakia: Radio Prague International, 5930 at 0300. (Carson, OK) Here and //7345 at 0257 with music, IS, ID in Czech and EE, news in EE. (Moser, PA) 11680 at 0301. 11990 at 2112. (Ross, WA)

Denmark: Radio Denmark, via Norway, 21705 at 1330 sign on in EE and Danish. (Perry, TX)

Dominican Republic: Radio Barahona, Barahona, 4930 at 0032 with Latin tunes, ID's for MW and SW outlets and one for "Radio Barahona Internacional." (Johnson, IL)

Egypt: Radio Cairo, 9475 at 0236. (Moser, PA) 9670 at 2058 in AA and 9675 at 0249 in EE. (Ross, WA) 9900 at 2124 in EE to 2240 into AA. (Carson, OK) 15255 at 1315. Tentative. (Northrup, MO) (EE? editor)

Ecuador: HCJB, 9610 at 0710. (Moser, PAAA) 15155 at 0032. (Bevens, MA) 15160 at 117 in SS. (Judkins, VA) 25950USB in GG at 2122. (Carson, OK)

HD2IOA time station, 3810 at 0830 with time announcements every 60 seconds. (Judkins, VA)

Radio Rio Amazonas, 4870 at 1100 with national anthem, talk in SS, music. (Johnson, IL)

England: BBC, 3955 at 0633. (Bevens, MA) 7325 at 0305 and 9590 at 0030. (Moser, PA) 9410//9515//9740//9750//9760//12095//15070//15260//17695//21470 at 1550. 15070 at 1709 to North America and 15260 via Canada to North America. 17640 at 1741, 17760 to abrupt 2100 sign off. (Judkins, VA) 17695 at 1346 and 21470 at 1417. (Carson, OK)

British Forces Broadcasting Service, via BBC, 13745 at 0220 to 0230 close with pops and messages to British troops from home. (Judkins, VA)

Finland: Radio Finland International, 11705 with reggae and rap. Some of the rap (by a group called N.W.A.) was full of foul, four letter words. Also at 0500 on 7135 in FF and at 1235 in EE on 21635 and 21645. (Judkins, VA) 9790 at 0320 in FF. (Moser, PA)

French Guiana: RFI relay, 9800 at 0324 in FF. (Moser, PA)

Gabon: Africa No. One, 9580 at 0640 in FF. (Moser, PA) 15475 at 1948 in FF with hi-life music. (Johnson, IL)

Ghana: GBC-2, 3366 at 2134 with African music, many ID's GBC-1, 4915 at 2129 in vernaculars. (Bevens, MA)

Germany: Deutsche Welle, 3995 at 0054 with ham QRM. (Judkins, VA) 5060 at 0501 with news. (Moser, PA) 9545 at 0329 and 9670 at 0517. (Carson, OK) 11795 at 1955 in GG. (Perry, TX)

Bayerischer Rundfunk, 6085 at 0705 in GG with US pops, commercial barrage. (Johnson, IL)

Radio Free Europe, 7245 and 9725 at 0705 in Czech or Slovak. (Judkins, VA)

Greece: Voice of Greece, 7420 with FF news and 1930, into Greek 1940. //9395. Also 2330 on 9425

and 11645. (Judkins, VA) 9420 at 0340. (Moser, PA) 11645 in Greek at 0431. (Ross, WA)

Guam: KTWR on 11650 at 1510 with EE religion. (Moser, PA)

Guatemala: Radio K'ekchi', 4844.4 at 1125 with SS ID and mention of Alta Verpaz and "musica del Christiana." (Johnson, IL)

Radio Cultural, 3300 in SS at 0110. (Judkins, VA) 0331. (Moser, PA)

Radio Tezutlan, Coban, 4835 at 0253 in SS. Lots of marimba music. Sign off at 0310. (Judkins, VA)

Hawaii: WWVH time station, 15000 at 0243, woman with time announcements. (Moser, PA)

Honduras: La Voz Evangelica, 4820, SS and religious programs at 2345; 0315; 0326. (Johnson, IL; Judkins, VA; Moser, PA)

Hungary: Radio Budapest, 6110 at 0232, 9835 at 0145 and 11910 at 0229. (Carson, OK) 9835 to South America in SS at 2318. (Judkins, VA)

India: All India Radio, Bhopal, 3315 at 1302, tentative, with Indian-type music, talks in unidentified language. (Johnson, IL)

All India Radio, Delhi, 4860 at 1320, sitar music, unidentifed language. (Johnson, IL) 9565 at 1435 to Southeast Asia and off at 1500. 11620 at 2055 with Indian music, ID, news. (Zamora, ND) 1905. (Moser, PA)

Indonesia: Radio Republik Indonesia, Ujung Pandang, 4719.3 at 1400 with slow Indo-pops, man and woman announcers in II. (Johnson, IL)

RRI, Fak Fak, 4789.7 at 1340, tentative, in presumed II. Faded or off by 1400. (Johnson, IL)

Iran: VOIRI 9022 at 1953 in EE. (Moser, PA) ending FF at 9128, into EE 1930 beamed to Europe. (Judkins, VA) 1945. (Trindall, ONT)

Israel: Kol Israel, 9388 in Hebrew at 0536 with commercials, commentary, correspondents reports, top 40 format. Same on 17545 at 1746. (Judkins, VA) 0200 in EE on 9435. (Bevens, MA) 11605 at 2000. (Moser, PA) 12077 at 2027, into FF. (Ross, WA) 17575 at 1446 in RR. (Johnson, IL)

Italy: RAI on 11800 at 1936 sign on to Great Britain in EE, off at 1955. (Zamora, ND)

Japan: Radio Japan, 5960, via Canada, at 0300. 15325 via French Guiana at 0300, also 17825 and 21610. (Judkins, VA) 9505 at 1508. (Johnson, IL) 11870 at 0550, into JJ at 0600. (Carson, IL)

Radio Tanpa, 3925 at 1514 in JJ. (Ross, WA)

Jordan: Radio Jordan, 9560 with non-stop pops from 1430 to 1500 ID and then news of the Arab world. (Story, TX) 2025. (Ross, WA)

Lesotho: BBC relay, 3255 at 0306 with news. (Moser, PA)

Libya: Voice of the Great Homeland on 15415 in AA at 2056. (Ross, WA)

Lithuania: Radio Vilnius, 7400 at 2300 with news and features. (Johnson, IL) 17690 at 2316. (Bevens, MA) Here and //17720 at 2324, off at 2329. (Carson, OK)

Luxembourg: Radio Luxembourg, 6090 at 0044 with rock. (Moser, PA) 15350 in EE at 1517 with rock/pop. (Johnson, IL)

Madagascar: Radio Netherlands relay, 15570 at 1639 in African service. (Moser, PA)

Malaysia: Radio Malaysia, Sarawak, 4950 at 1330 with orchestral and pop music, into presumed news in CC at 1400. (Story, TX)

Mali: RTM in FF with talks by man at 0654 on 7285. (Moser, PA) Here and 9635//11960 at 0712 in FF. Sounded like obituary reports. (Johnson, IL)

Malta: Voice of Mediterranean, 9765 at 0600 sign on with Bible readings. (Judkins, VA) 0613. (Carson, OK)

Mauritania: ORTM, 4845 at 0656 in FF. (Moser, PA) 0730. (Johnson, IL)

Mexico: Radio Educacion, 6185 at 2200 in SS. (Reyes, Mexico)

La Hora Exacta, XEQK, 9555 at 1500 in SS. (Reyes, Mexico)

Radio UNAM, 9600 at 1500 in SS with news. (Reyes, Mexico)

La Voz del la America Latina, XEWW, 9515, relaying 900 mediumwave in SS at 1500. (Reyes, Mexico)

Radio Mil, 6010 at 1700 in SS. (Reyes, Mexico)

Monaco: Trans World Radio, 9480 at 0735 with IS and sign on, into EE religion. (Moser, PA) 9435 at 0806 with religion. (Carson, OK)

Morocco: RT Marocaine, 15335 at 1655 with woman in AA, better than //15360. (Moser, PA)

VOA Tangier relay, 15205 at 1703. (Moser, PA)

Niger: La Voix du Zahel on 5020 at 0515 in FF with African music. (Bevens, MA)

Nigeria: Radio Nigeria, 7255 with program preview 0454 and sign on with morning program for Africa. (Judkins, VA) 0650. (Smiley, WI)

Netherlands: Radio Netherlands, 6020 at 0042. (Moser, PA) Here and 9895 at 2230. (Judkins, VA)

Netherlands Antilles: Radio Netherlands Bonaire relay, 6165 at 0043. (Moser, PA) 9630//15560 at 0952 and 1725 in SSB test on 2151USB in Dutch. (Carson, OK)

Trans World Radio, Bonaire, 11815 at 1100 sign on with "Morning Sounds." (Zamora, ND) 15345 at 1315 with religion. (Northrup, MO)

New Zealand: Radio New Zealand International, 9855 at 0839 with National Radio ID. (Bevens, MA) 15485 at 1900 with news. (Johnson, IL) 17675 at 0353. (Judkins, VA) 0258 with cricket. (Ross, WA)

North Korea: Radio Pyongyang, 9977 at 1152. (Moser, PA) 13650 at 2322. (Ross, WA) 15115 at 0012; 0026. (Bevens, MA; Ross, WA) 15340 at 0657. (Carson, OK)

Northern Marianas: Herald Broadcasting, KHBI, 9530 at 1418 with features. (Johnson, IL; Moser, PA)

Norway: Radio Norway, 11850 at 2100 in NN with EE ID's at 2100 and 2110. (Vaage, CA) 15235 at 1325 in unidentified language. (Northrup, MO) 21705 in EE/NN at 1400. (Carson, OK)

Oman: Radio Oman, 6085 at 2003 with Mideast music. (Moser, PA)

Pakistan: Radio Pakistan, 9735 wit EE news and comment, into unidentified language. (Story, TX)

Paraguay: Radio Nacional, 9735, SS with music at 2339. (Moser, PA)

Peru: Radio Cora, 4915 at 0952 with easy listening SS music, YL with time announcement before each song. (Johnson, IL) 0221 in SS. (Reyes, Mexico)

Philippines: VOA Poro relay, 15155 at 1200 with IS, ID. QRM from France. (Moser, PA)

Portugal: Radio Portugal, 9705 at 0235. (Smiley, WI) 15250 at 2113 to Europe. (Judkins, VA)

Poland: Radio Polonia, 7270 at 0630 with ID, news, //9675. (Bevens, MA) 9675 at 0632; 0633; 0637. (Johnson, IL; Moser, PA; Carson, OK)

Romania: Radio Romania International, 7195 at 2108. (Judkins, VA) 9510 at 0404, better than 9570. (Moser, PA) 9570 at 0358 with IS, 0400 sign on. 11940 at 0437. (Carson, OK)

Rwanda: Deutsche Welle Kigali relay, 17800 at 1157 with IS and closing. (Moser, PA)

Saudi Arabia: BSKSA on 9720, just audible at 1700 with flute IS, news and ID. (Story, TX)

Seychelles: Far East Broadcasting Assn, 9585 at 1831, woman with ID as "Radio FEBA" (she pronounced it "Fay-bah"), FF with IS and classical music. Also 11860 at 1700 with religious programs in three different African languages in half hour blocks, beginning with Omoro. Off at 1831. (Johnson, IL)

Singapore: BBC Far Eastern relay on 9740 at 1153. (Moser, PA)

Somalia: Radio Mogadishu, 7200 at 0353 in presumed Somali. No ID heard. (Perry, TX)

South Africa: Radio RSA, 15365 in FF at 1805 with news for west Africa. (Judkins, VA) 17815 at 0358 with announcement for Radio RSA French Service. (Bevens, MA)

Radio Oranje, 3215 at 0326 in Afrikaans. EE ID at 0330. (Perry, TX)

South Korea: Radio Korea, 9570 with 0001 sign on, news. (Zamora, ND) 15575 at 0025. Commentary, music, cultural items. (Judkins, VA)

Spain: Spanish National Radio, 9630 at 0046 with Spanish rock, EE announcements. (Moser, PA) 0535. (Judkins, VA) 11790 at 1955 with news, off at 1959. (Zamora, ND) 11880 at 0023. (Ross, WA) 15110 with IS at 1923, frequencies 1929, program 1930. (Judkins, VA)

Sudan: Sudan Radio on 9435 at 0458 in AA. (Ross, WA)

Sweden: Radio Sweden, 11705 at 0230 with IS, sign on in non-EE. (Moser, PA) 17880 at 1532. (Carson, OK) 21500 at 1535. (Judkins, VA)

Switzerland: Swiss Radio International, 6165 at 0753, into FF at 0800. 12035 at 0205. (Carson, OK) 9885 with EE sign on at 0400. (Moser, PA) 1831 to Africa. (Judkins, VA) 15570 in GG at 1315. (Northrup, MO)

Syria: Radio Damascus, 12085 at 2043 with music;

(Continued on page 74)

Somerset Electronics' Microdec™ Multi-mode Decoder

Most of the decoders (also known as terminal units, demodulators, or modems) we have reviewed have been either software-based or, at least, required the use of a computer to implement operation. This is not the case with Somerset Electronics' MICRODEC™ series of "stand alone" decoder units. Operation with a computer for increased versatility is possible, but not necessary with the MICRODEC™. This design is just the "ticket" for the monitor who may not yet own a computer system. Plus, the MICRODEC™ with its rechargeable battery option can be used on vacation trips as a portable decoder along with your favorite portable shortwave receiver. This review covers the basic MICRODEC™ unit Model MD-100.

What can it do?

The MICRODEC™ MD-100 multi-mode decoder receives Morse code (CW), Baudot RTTY (radio teletype), and ASCII (American National Standard Code for Information Interchange). It also includes a code practice oscillator/reader for those wishing to improve their CW skills. The unit has "auto-tracking" speed adjustment, plus a built-in software filter for Morse code signals. Baudot RTTY is received at 170 Hz or 850 Hz shift at all the standard speeds—60, 67, 75, and 100 WPM. ASCII, the coded character set used by computer communications systems, is received at 110 and 300 baud which respectively equate to approximately 100 and 300 WPM. The volume control ganged to the power switch controls the built-in speaker volume. Also, a 9-pin D-Sub connector on the back panel permits RS-232C serial connection to a computer for further versality. Models 200 and 300 permit operation on AMTOR/SITOR as well as "bit-inverted" ASCII. Additionally, the Model 300 receives Weather FAX transmission, plus includes a parallel printer output. Readout on all models is accomplished by a front panel mounted eight character alphanumeric LED display.

Installation of the MICRODEC™ is simple! After connecting the power adapter to the unit, connect the receiver audio output to the MICRODEC™'s signal input. That's all! Of course, if you wish to connect the RS-232C serial output to a computer, you must interface the unit via a serial cable to the serial input of the computer. This allows the display of the received information on the computer's video monitor, storage of the information to disk, and "hardcopy" from a printer. The CW key plugs into the unit's "code key input" for use as a code practice oscillator/reader.

Operation of the MICRODEC™ on CW is quite simple; the built-in microprocessor constantly adjusts for changes in the incoming code speed. Audio input level from the receiver, however, can be a bit critical, but with experience adjustment comes easily. The unit will copy speeds up to 70 WPM.

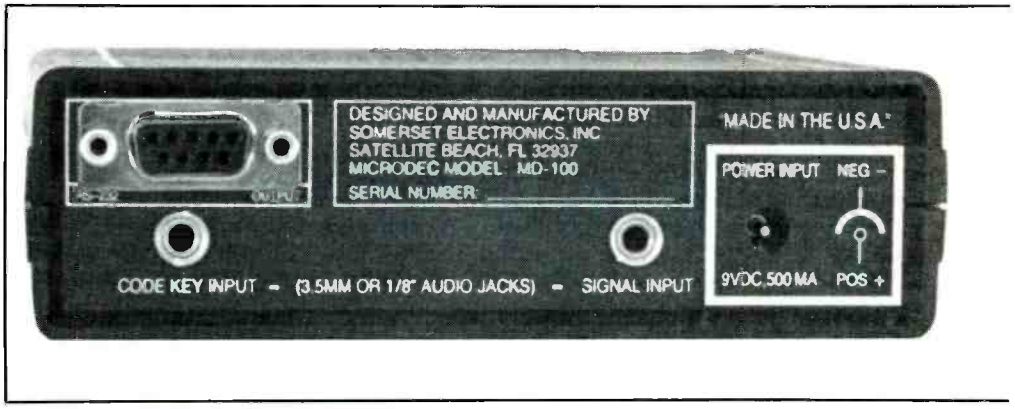
Operation on RTTY or ASCII requires manual selection of code and data rate by a push-button on the unit's front panel. After selection of the code and speed, the unit effectively copies all but the weakest of signals. Experience will permit easy determination of data rate and code.

A signal strength indicator LED on the front panel aids in tuning on all modes.

The MICRODEC™ series of decoders adds a new dimension for the shortwave monitor or ham—portability! The battery option is very valuable, especially for those with portable shortwave receivers. The construction is quite rugged with high quality epoxy glass printed circuit boards used throughout. Overall, the impression of the MICRODEC™ was of high quality construction and performance at a reasonable price. Plus, the well-written instruction manual includes all pertinent information in an easy reading style.

Contact Somerset Electronics, Inc., 1290 Highway A1A, Satellite Beach, FL 32937 for more information. Suggested retail list price of the basic MD-100 is $299.95. Please contact the manufacturer for price information.

Reviewed by POP'COMM staff.



THE HAM COLUMN

KIRK KLEINSCHMIDT, NT0Z
AMERICAN RADIO RELAY LEAGUE HQ

GETTING STARTED AS A RADIO AMATEUR

Traffic Handling Is For Everyone

Whether you're an old-timer with an Extra Class license or a new codeless Technician, the exciting world of traffic handling has a place for you. If you're tired of making casual contacts or chasing DX, why not check in to a traffic net? This is Amateur Radio public service and emergency training at its finest. Traffic nets carry free radiogram messages all over the country (internationally, too) on behalf of hams and non-ham third parties.

The first time you tune in a traffic net, you might be puzzled by the strange transmissions you hear. If you're interested in checking in, don't be intimidated by the abbreviations or "shorthand," or afraid you won't be able to follow proper procedures. It isn't that mysterious and there are even slow-speed CW nets for folks who haven't gotten past 10 WPM with Morse code.

Beginners HF Traffic Nets

Here's a *partial* listing of CW nets that welcome slow-speed Morse code operators. Most are NTS traffic nets; listen to see what kind of operation is conducted on each. There are also HF SSB (phone) nets and nets on plenty of local FM repeaters on 2 meters, 220 MHz and elsewhere.

kHz	Net Name	Days	UTC
80 Meters			
3680	Virginia Slow Net	Dy	2330
3702	Tennessee Slow Net	M-F	0000
3702	West Coast Slow-Speed Net	Dy	0230
3705	Illinois Training Net	Dy	0100
3705	Indiana Code Net	Dy	0100
3708	Ohio Slow Net	Dy	2310
3710	Minnesota Slow-Speed Net	Dy	0000
3714	Hit and Bounce Slow Traffic Net	Dy	1230
3715	All-Florida Slow Traffic Net	Dy	0100
	Eastern Massachusetts/Rhode Island Slow Net	Dy	0200
	Carolinas Slow Net (NC/SC)	Dy	2300
	Colorado-Wyoming Net	Dy	0230
3717	Maryland Slow Net	Dy	0030
3720	New England Novice Net	Dy	1015
40 Meters			
7114	Hit and Bounce Slow Traffic Net	Dy	1230
7115	Carolinas Slow Net (North and South Carolina)	Dy	2300
7137	Nebraska Novice Net	Dy	0200
7145	North Dakota Slow Net	S	2300
15 Meters			
21,110	Planetary Citizen Novices Net	TuTh	2100
21,150	Slowfist Net (Connecticut, New York, New Jersey)	TTh	0100

Listen First

There are traffic nets on almost all HF ham bands, using Morse code (CW) and phone (voice). Many local nets meet on VHF and UHF frequencies (generally on FM repeaters). These nets usually last less than a half-hour or so. *The ARRL Net Directory* makes them easy to find (see the sidebar).

After listening a few times, you'll begin to make sense of the net procedures. The purpose of most traffic nets is to pass messages through the ARRL National Traffic System (NTS).

A net is run by a Net Control System (NCS) responsible for checking everyone in, keeping track of who's on frequency, who has traffic to send and who's willing to receive messages. When someone volunteers to take traffic, the NCS will instruct the sending and receiving stations to move to a nearby frequency to pass the traffic.

Checking In

When you find the net, set your radio directly on the NCS's frequency before attempting to check in. The NCS has to handle dozens of stations and doesn't need the hassle of trying to copy somebody who's off frequency!

Suppose the NCS is me, NT0Z, and you're WA1YUA. Here's how checking into the 10-meter Imaginary Traffic Net (on phone) would sound (it's abbreviated somewhat because of space restrictions!):

NCS: "Calling ITN ITN, this is NT0Z, net control."

You: "WA1YUA."

NCS: "WA1YUA, go ahead."

You: "This is WA1YUA, good evening, [I have] no traffic."

NCS: "WA1YUA, good evening, please stand by. Other stations wishing to check in, please do so now."

Other operators who are on frequency waiting to check in will do so just as you have.

Now You're In — What's Next?

You're now checked into the net. Be prepared for the NCS to ask you for your name and QTH. He may do it as soon as you check in, when he checks you out, or right after he closes the net. He'll also introduce himself then, and invite you to continue checking in to the net.

The Net Control will continue to check in stations and will be sending stations off to other frequencies to pass traffic. After a while, you'll hear the NCS begin dismissing participants. First, he'll call you.

NCS: WA1YUA?" (He might send just the last three letters of your call sign.)

You: "YUA." (Just send something brief that indicates your presence.)

NCS: "Thanks for checking in; hope to see you again here soon. I have no traffic for you and you're excused from the net. 73 and good evening."

You: "Thanks, see you later, 73 from WA1YUA."

More Information

That's easy, you say, but what if there's traffic that needs to be handled? Or what if you have traffic to send? Because I can only provide a brief introduction to traffic handling in this column, let me refer you to a couple of excellent sources of information.

In addition to listing hundreds of nets, traffic and otherwise, around the country, the proper procedure for writing and sending messages can be found in detail in *The ARRL Net Directory*. (Send me $1 and I'll send you a copy.)

The ARRL Operating Manual is another good source. It contains a comprehensive section on traffic handling. If you can't find it at your local library, it's available from the ARRL.

The February 1991 issue of *QST* features an excellent beginner's article on CW traffic handling on the Novice bands. It's called "CW Traffic Nets: Take the Plunge," and if you can't locate a copy send me an SASE and I'll send you a copy.

CW traffic nets are a sure-fire way for Novice or Technician hams to build Morse code proficiency and have fun, but operators with General, Advanced and Extra Class license enjoy CW nets, too. If you'd like to sharpen your code skill, learn net procedures, meet new people or just want a good reason to fire up the rig and paddle, a CW net is just the thing.

Send your QSL cards, questions, letters, photos and requests for information or the previously mentioned items to me at ARRL, Department PCN, 225 Main Street, Newington, CT 06111.

Traffic nets are fun, rewarding and a great public service. Tune in to one soon! ■

BY DON SCHIMMEL

COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

A big thanks to all those who sent in articles on "Spy Activity" and "Spy Transmissions." Judging from the continued activity we are seeing on the airwaves, these signals are here to stay for awhile. One article in particular spoke of reports of 400 Soviet spies still working in former East Berlin.

A note from an individual signing as "mr. U.K. Anonymous" told of an amusing incident which took place in late 1990. A Government Minister in Northern Ireland was talking about ex-Prime Minister Mrs. Thatcher on his car phone. He said he wished "that old cow would hurry up and resign." Unfortunately for him, a paramilitary group not only intercepted the call but recorded it and sent it to various news media to create maximum embarrassment. He had to deliver an apology to Mrs. Thatcher.

Perry Crabill, Jr., Va and Jeff Hollis, WV both reported hearing some unusual signals among the beacon signals. The transmissions which somewhat resemble a fast rate FAX signal were detected on 241, 249, 261, and 269 kHz. It is possible these are some type of Radio-navigational signals and may have been relocated to the lower frequencies from the 1600-1700 kHz band due to the impending expansion of the broadcast band. I have checked various references, but have not as yet come up with a precise identification. Perhaps some of our readers can fill us in on these signals.

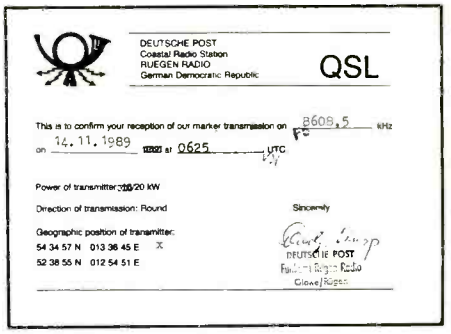
If you monitor SHARES HF links during disasters such as Hurricans Hugo you should be aware that the Department of Veterans Affairs also plays a part in disaster communications. Located at the Martinsburg WV Veterans Affairs Medical Center is the Emergency Facilities Operations Office which operated 24 hours a day in monitoring the course of Hurricane Hugo and provided emergency assistance as required for various Department of Veterans Affairs facilities. The Martinsburg EFO office has nationwide coordinating responsibilities for emergency management efforts for the Departments of Veterans Affairs and works very closely with the Public Health Service, Department of Defense and the Federal Emergency Management Agency. Our thanks to Charlie McAtee, WV for this information.

Charlie also provided an article from the Hagerstown, MD Morning Herald which described the $4.7 million upgrade to the Washington-Moscow Hotline. This modernization program took 9 months to complete and includes updated transmitters, control consoles, and receivers plus two 50-foot satellite dishes. The equipment installation is located at Ft. Detrick, MD. "The Detrick Earth Station is one of two U.S. terminals that are part of an intercontinental satellite communication link between the superpower capitals. The upgraded control room has an eight-panel console in the middle of which are two television screens, one showing a map of the world. Computer terminals flank each side of the console while 14 computer banks, about 6½ feet high, dot the room. Three digital clocks hang on the wall showing times in Moscow, Greenwich and Washington. On each side of the middle consoles are two gray telephones. The hotline, unlike popular belief, does not have a red telephone. A U.S. president's message is encoded somewhere near Washington, DC and transmitted to Fort Detrick. The message is then enhanced and sent to two Soviet satellites 23,300 miles above the earth. The satellites send the message to receiving stations near Moscow. The commo system is checked by technicians every hour while the satellite link is tested every six hours."

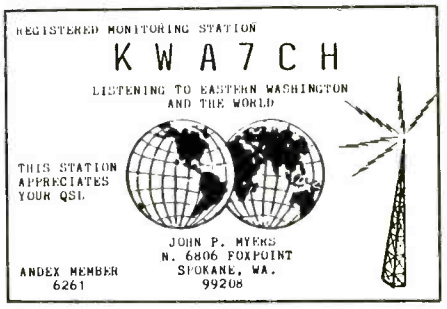
Several readers have queried about "Ocean Gate Radio." This is station WOO, owned by AT&T. Its transmitters are located along the New Jersey central coast on Goodluck Point at the Southern Mouth of the Toms River. The exact coordinates are 39:56N and 74:07W.

A letter postmarked Northern Virginia and signed "The Old Communicator" said "Anyone who has been in the communications game for any amount of time recognizes what the KKN frequencies are. The old telegraphers used to call such links "Order Wires" while the more modern term is "Operator Service Channel" or like words. Normally you do not expect to see actual traffic passed on such links. Instead you would see signal checks, QSY requests, and the various Q and Z signals associated with communications circuits to those normally used and therefore some messages could be passed from time to time as has been observed by many monitors."

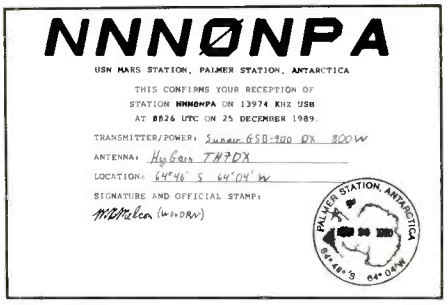
According to an anonymous contributor a 12 July 1990 notice was sent to the CAP Region/Wing Communications offices re-



Hugh Hawkins, MS mailed his reception report 14 Nov 89 & received the QSL 13 Nov 90 (354 days). It was postmarked 27 Sept 90 (thus taking 47 days service mail). Hugh added "I wonder if 'Unification' had anything to do with getting this QSL?"

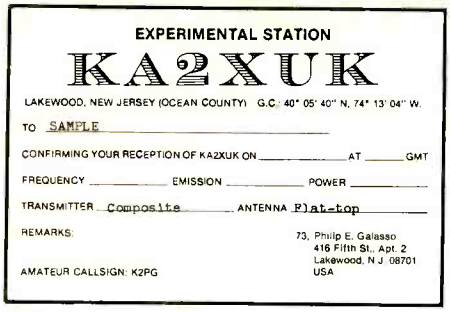


Registered Monitor Station card used by John P. Myers, WA.



This PFC was returned to Dave Sabo, CA.

This photo of Air Force 2 was taken by Charlie McAtee, WV when Vice President Quayle visited Martinsburg, WV.



EXPERIMENTAL STATION

KA2XUK

LAKEWOOD, NEW JERSEY (OCEAN COUNTY) G.C.: 40° 05' 40" N, 74° 13' 04" W.

TO SAMPLE

CONFIRMING YOUR RECEPTION OF KA2XUK ON _____ AT _____ GMT

FREQUENCY _____ EMISSION _____ POWER _____

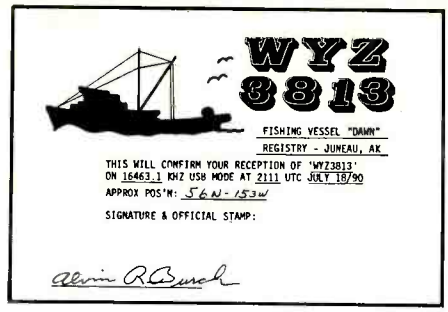
TRANSMITTER Composite ANTENNA Flat-top

REMARKS:

73, Philip E. Galasso
416 Fifth St., Apt. 2
Lakewood, N.J. 08701
USA

AMATEUR CALLSIGN: K2PG

Philip Galasso, NJ sent out this card for a QSL of his Experimental Station transmissions.



Here is a copy of a PFC made up by Steve McDonald, BC, Canada.

minding all concerned that conversion to the below listed HF frequencies was mandatory effective 15 January 1991.

The listed frequencies are amendments to frequencies that were thought to be correct. All the list frequencies are "window/dial/reference/carrier" frequencies (what you see on your dial when you tune for SSB, USB). The "Assigned frequency" is 1.5 kHz above the listed frequencies. All frequencies are in kHz.

2371.0	4506.0	4804.0	11975.0
2374.0	4509.0	4627.0	14902.0
4273.0	4582.0	4630.0	20873.0
4466.0	4585.0	7635.0	26617.0
4469.0	4601.0	7920.0	26620.0

As some of you may already be aware, 1991 is the 50th Anniversary of the Civil Air Patrol thus this would be a good year to QSL CAP stations.

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)**

Utility Intercepts

198: Beacon DIW, Dixon, NC at 0127. (Ed.)

205: Beacon COR, Corcoran, Salyer Farms, CA at 0830. (Vaage, CA)

209: Beacon SYS, Somerset, PA at 0129. (Ed.)

212: Beacon TS, Timmins, Ont., Canada at 0132. (Ed.)

218: Beacon YUY, Rouyn, PQ, Canada at 0136. (Ed.)

302: Beacon L, Point Loma Light Station, CA at 1305. (Vaage, CA)

317: Beacon CBE, Cumberland, MD at 0139. (Ed.)

320: Beacon HTN, Wiley Field, Horton, Miles City, MT at 1308. (Vaage, CA)

350: Beacon NUC, Sherman Field, San Clemente Is. CA at 1257. (Vaage, CA)

359: Beacon BO, Air Terminal-Ustik, Boise, ID at 1310. (Vaage, CA)

364: Beacon TZ, Winchester, VA at 0730. (Ed.)

385: Beacon WL, Williams Lake, BC, Canada at 1300. (Vaage, CA)

401: Beacon QQ, Comox CFB, BC, Canada at 0348. (Vaage, CA)

404: Beacon YSL, St. Leonard, NB, Canada at 0142. (Ed.)

524: Beacon HEH, Newark, OH at 0148. (Ed.)

2919.2: Two OM/EE apparently on fishing vessels w/4x language. USB at 0241. (Ed.)

3067: Andrews AFB, MD in USB at 1121. YL opr has fits of laughter while giving coded msg. (Margolis, IL)

3208: CW station sending 5L grps w/space after each 10th grp. Hrd at 0135. (DP, NC)

3379: CW stn at 0108 sending 18 grps of mixed 3L/F. Dual w/4708 kHz. WGY912, FEMA, Mt. Weather, Berryville, VA. (DP, NC)

4088.2: Barge tfc. YL control, O/SS OM/EE oprs. One Captain indicates he northbound on the Tennessee river. USB at 1205. (Ed.)

4125.4: Barge tfc. OM/EE oprs giving loads, mile markers, etc. USB at 1201. (Ed.)

4232: CW stn at 1210 w/5L grps. Pause after every 10 grps. (Ed.)

4436: WJ1U u/i in CW at 1250 sending CQ SS DE WJ1U. Then into QSO's. What does "SS" stand for in the call-up? Weak sig under hvy QRM but contacts made w/other stns. One of the other calls may have started with "K9". (DP, NC)

4722: MVU, West Drayton, England in USB at 0130 w/wx. (DP, NC)

4740: YL/EE rptng 15431 between 2000-20005. Then Ready x2 22, 22 and into 5F grps. (Mason, England)

5015: YL/GG rptng November Uniform w/tones between 20000-2005. Then 5F grps for 559 and 368. (Mason, England) YL/GG w/3 + 2F grps in AM at 0607. (Scalzo, PQ, Canada)

5340: YL/GG w/5F msgs for 55268/01829/96913 after Swedish Rhapsody music box tune. Here every Saturday at 2000 and simulcast on 6507 and 4778 kHz. (Mason, England)

YL/GG every Saturday w/883 Strich zero zero from 2100-2105. Rptd hour later on 5624 kHz. Never any msgs. (Mason, England)

5695: YL/GG w/251 at 2200. At 2205 447 447 32 32 and into 5F grps. Ended w/00000. (Mason, England)

6474: U/i CW stn at 0110 send foll heading: CP BT FM KST RADIO SVC CP 3/12 12 1200Z BT TOATE NAVELE BT. (DP, NC) Appeared be Italian Navy but unable confirm. (Ed.)

6697.6: Hotel Three Romeo in USB at 1302 send Flash precedence msg in the "Blind" to 6XE which was apparently a relay because sub-heading was FROM U4A TO 6XE BT. Then short text of three 3-character grps BT Authentication Romeo Oscar and down at 1304. (Ed.)

6840: YL/EE with 1-0 count and 144 from 2300-2310. At same time YL with EZI2 and OM/Romanian w/5F grps after "Skylark" gypsy tune. (Mason, England)

6854: YL/SS w5F grps in AM at 0711. (Scalzo, PQ, Canada)

7613: Two CW oprs at 1312 in Spanish chatter. One insists on having name of other opr then sends PRO PRO BT QRU NIL AS 3 88444 AR EE and down at 1320. Nothing further hrd. (Ed.)

7740: YL/GG rptng Whiskey Lima w/electronic tones between 1900-1905. Then 5F grps for 115 and 522. (Mason, England)

8004: EXXZ (Soviet ship) DE CMU967 (Santiago de Cuba, Cuba) in CW. CMU967 prev hrd sending 5L grps mixed w/cyrillic characters. (White, ME)

8078: YL/EE w3 + 2F grps in AM at 0029. (Margolis, IL)

8090: USCG still running 1 May 1990 announcement as follows: "USCG COMMUNICATION STATION PORTSMOUTH VA/NMN SELCAL 1097 WILL SHIFT EFFECTIVE 01 MAY 90 TO AUTOMATED SITOR/TELEX. OBS, AMVER, MEDICO, DISTRESS/HRGENT ARE AVAILABLE. QSO NMN SELCAL 1097 FOR FURTHER INFO." Dropped at 1328. (Ed.)

8160: Victor 21 in USB at 1353 in comms w/Victor 5. (Margolis, IL)

8168.5: Charlie Foxtrot Golf Forward in USB at 2351 wkg Charlie Foxtrot Golf. (Margolis, IL)

8240: YL/EE rptng 139 from 2000-2005. Then 52 52 and into 5F grps. YL pronounces 8 as "ate." Ended at 2017 w/00000. (Mason, England)

8514: WLO, Mobile, AL in CW from 1510-30 w/tfc list & wx. (McAtee, WV)

8970: YL/GG rptng 101 x3, 36511, 41 between 1100-1105. Then 5 tones and into 5F grps. Few weeks later at same time and freq, YL w/100 x3, 37508,41. (Mason, England)

9161.4: EC3Y in CW at 1038 w/VVV mkr. Location & id unknown. Possibly Spanish Naval callsign? (Scalzo, PQ, Canada)

9218: U/i CW stn at 0055 sending 5L grps, rptng each group twice and always sending a comma between rptd grps and next grps. (DP,NC)

9248: DE 2N8Z 2N8Z OSKID OSKID then into 5L grps in CW at 0634. (Scalzo, PQ, Canada)

10125: CW stn at 1725 sends WQL WQL QSY 7951 QSA0 QSY 6858 QTC5. Both freqs checked, nil hrd. (White, ME)

10820: YL/EE w/Kilo Papa Alpha Two (Mossad) in AM at 0519. Off at 0520. (Scalzo, PQ, Canada)

11246: McDill AFB to T7FIV w/coded tfc at 0559 in USB. (Scalzo, PQ, Canada)

13047: SVA, Athens, Greece w/DE SVA then into high speed coded tfc. CW at 0614. (Scalzo, PQ, Canada)

13259.2: U/i CW stn at 1520 w/SS plaintext msg. Poss Mexican AF. (Ed.)

13382.4: NDL and ADL in CW at 1424. Very bad QRM. 5L grps being passed. (This is Ethiopian Diplomatic link) (Ed.)

13415: PCW1 in CW at 1920 w/id mkr. This is MFA, The Hague, Holland. (Margolis, IL)

14393: U/i stn in CW at 1315 w/5F grps, Zero cut as ltr T. Auto sent at fast speed. (Margolis, IL)

14641: EBA, Madrid Radio/Naval, Spain w/wx in SS. Also sends wx at 0830 UTC. CW at 1702. (Ed.)

14703: YL/EE in AM at 1532 w/5F grps. (Margolis, IL)

15647.3: PCW1, The Hague, Netherlands w/cw mkr at 2332. (Scalzo, PQ, Canada)

16414: YL/Yiddish in USB at 1443 w/3 + 3F grps. (Margolis, IL)

17003.8: HKB, Barranquilla, Colombia w/CQ DE HKB mkr. CW at 0055. (Scalzo, PQ, Canada)

17182: ICB, Genoa, Italy in CW at 1752 w/tfc in II & VVV mkr. (Margolis, IL)

18525: KKN50, US Dept of State in CW at 1956 w/mkr. (Scalzo, PQ, Canada)

19100: MFA, Jakarta, Indonesia in USB at 1410. One OM/opr wkg 2nd OM to collect garbled RTTY text. (Margolis, IL)

19588: CW stn at 1907 w/5L grps using cut nbrs ADGIMNRTUW. (Margolis, IL)

20002: OXM, Ittoqqorttoormiit, Greenland in CW at 1159 w/id marker btwn FAX wx chart xmsns. (Margolis, IL)

20065: Portishead Aero, England in USB at 1343 wkg various a/c for p/p's, flite plans, etc. (Margolis, IL)

23142: Portishead Aero, England in USB at 1544 w/pp's to London from Nigerian Airways flight aloft. (Margolis, IL)

23407.8: SOY240B, PAP, Warsaw, Poland in CW at 1454 w/nx in Polish. (Margolis, IL)

25487: CKN, Canmil, Vancouver, BC, Canada in CW at 1327 w/CQ QSL mkr. (Margolis, IL)

26039.8: Mobile stn 47502 in U.K. in USB comms w/OM in Poland at 1336. (Margolis, IL)

SATELLITE VIEW

BY DONALD E. DICKERSON, N9CUE

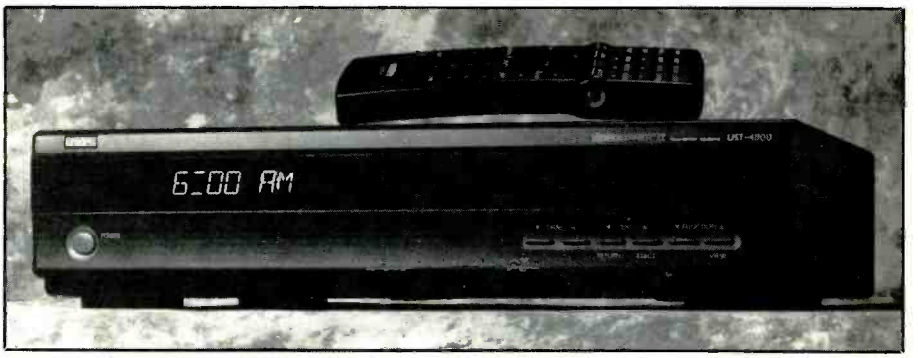
INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

Where To Look

Last month we talked about the equipment requirements for listening to signals from space. This month you will be shown where to look. The accompanying charts shows some HF channels used for Shuttle rebroadcast and manned spaceflight search and rescue operations. The chart should give you enough information to fill most of your receiver's memory without any difficulty.

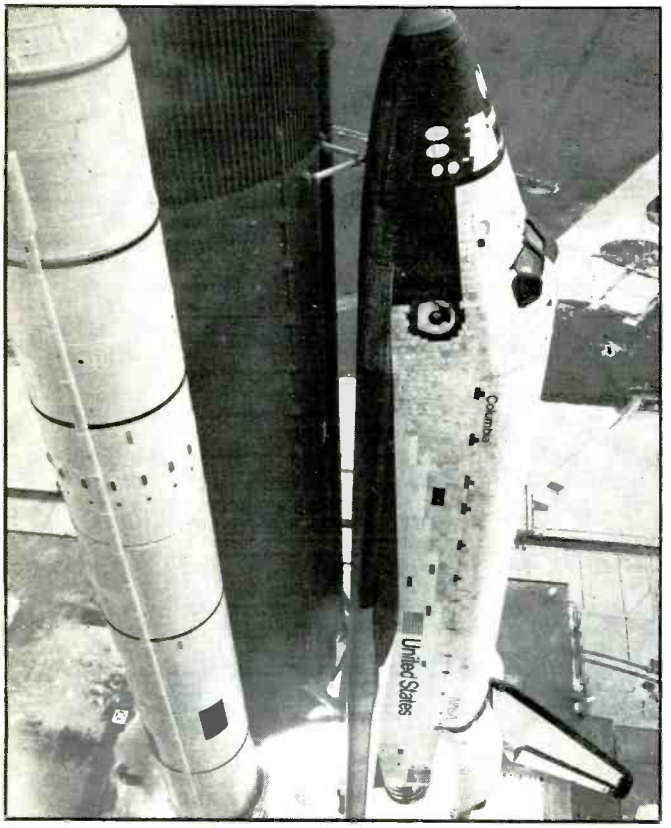
Now let's take a look at some recent developments in the world of satellite communications.

The ANIK-D Connection - Deutsche Welle English programs are now being carried by three European Satellites. Astra 1A (19.2° E) transponder 2 (11.229 MHz) carries German on a 7.38 MHz subcarrier and International programming on 7.56 MHz. Eutelsat (13° E) transponder 27 (11.153 MHz) carries German on a 7.02 MHz subcarrier and international programming on 7.20 MHz. DFS (23.5° E) carries DW programming on transponder 4 (12.625 MHz) with German on channel 3 M1 and 3 M2. This is a special digital modulation technique an requires a special receiver. DW programs are also relayed to Sackville Canada through ANIK-D. The North American Cable Radio Service C-Span relays the English transmissions from DW to over 440,000 subscribers by cable. Radio Canada also relays the English programs to North America by shortwave.

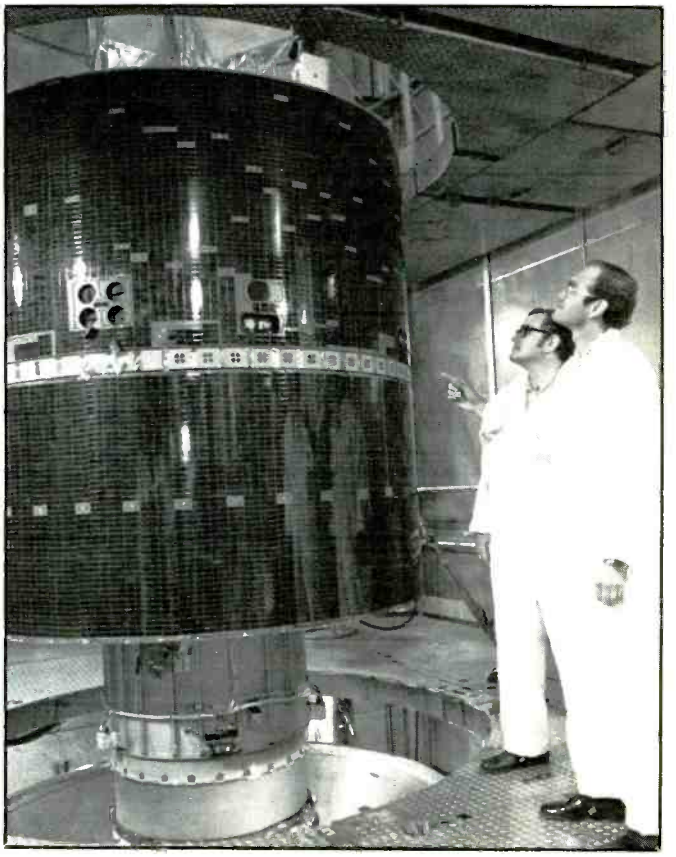


The UST 4800.

Vista - The R.L. Drake company has unveiled its new video scrambling system for business television transmissions. Vista is an acronym for Video Scrambling Transmission Algorithm. This is a medium system designed for business, industry, financial and educational institutions. Vista has two advantages over the security systems. It is cost



The Space Shuttle Colombia preparing for its third orbital test flight. The photo was taken moments after its rocket boosters were ignited.



The NATO 3 Military satellite.

POP'COMM's BOOKSTORE BOOK IDEAS

(800) 457-7373 8AM-5PM EDST CALL TOLL FREE

Shipping and handling: $3.75 to US and Canadian address via US mail. Shipping via UPS Brown $5.00 to US address only. COD orders add an additional $5.00. UPS Red or Blue cost plus $3.75 handling. All other orders shipped via US mail F.O.B. Greenville, NH, USA plus a $3.75 handling charge

Reference

THE 1991 ARRL HANDBOOK

Revised and updated with the latest in Amateur technology, now is the time to order your very own copy of the world famous ARRL HANDBOOK. In addition to being the definitive reference value for your Ham shack, there are plenty of projects for every interest in Amateur Radio – from antennas for every application to the latest state-of-the-art projects -- you'll find it all in the 1991 HANDBOOK. Over 1100 pages. ©1990.

❑ AR-HB91 Hardbound $24.95

Study Guides

AMECO STUDY GUIDES

Designed for VEC Exams

AMECO Study Guides are taken from the latest FCC/VEC Exam question pool. Each book has the latest questions along with the ARRL/VEC multiple choice answers, immediately followed by a full discussion explaining each question. While nothing can guarantee that you will pass, AMECO study guides will make sure that you are fully prepared and ready to go. Written in clear, concise, easy-to-read format, each question is fully explained. Novice and General books are cross referenced to AMECO's 102-01 for a more thorough explanation.

❑ 27-01 Novice Class	} You need both for No-code license	$5.95
❑ 28-01 Technician Class		$4.95
❑ 12-01 General Class		$5.95
❑ 26-01 Advanced Class		$4.95
❑ 17-01 Extra Class		$5.95
❑ 102-01 Radio Amateur Theory Course		$6.95

NEW BOOKS

PRACTICAL ANTENNA HANDBOOK

BY Joe Carr, K4IPV

A comprehensive blend of theory and practical antenna applications make this new book by noted author Carr, a valuable book to have on hand. Features detailed analysis and construction information for all kinds of antennas, an explanation of the secrets of radio propagation, theory and use of transmission lines, a comprehensive overview of the radio spectrum as well as 22 BASIC programs for designing antennas. Learn from an expert — get this book today. © 1990 1st edition 448 pages

❑ T-3270 Softbound $21.95

REFLECTIONS- Transmission Lines and Antennas

by Walt Maxwell, W2DU

Over the years, many myths and half truths have become "fact." Noted antenna expert Maxwell debunks them with clear, concise and accurate explanations. The first seven chapters are taken from his QST column "Another Look At Reflections." Seventeen additional chapters contain new and unpublished material covering matching networks, antennas and how to use Smith charts. Also available is a MS-DOS disk with programs taken from the book. © 1990 1st Edition 384 pages

❑ AR-RTLA	Hardbound	$19.95
❑ FAR-RTLADOS	(MS-DOS Disk)	$9.95
❑ AR-RTDOS	Program and disk $2 off	$27.90

PASSPORT TO WORLDBAND RADIO 1991 Edition

Brand new, fully revised and expanded. Now includes a bigger and better SWL'S buyer's guide. Also includes all the latest broadcast schedules from countries around the world. Great reference text for Hams as well as the serious SWL and casual listener ©1990

❑ IBS-RDI91 Softbound $16.95

UNDERGROUND FREQUENCY GUIDE

by Harry Helms

The shortwave bands are filled with mysterious and unusual stations. Some are believed to send messages to spies and secret agents. Others come from drug smugglers, rebels and related clandestine groups. The only way to keep track of what is going on is to have Helm's new book. Over 500 listings with frequencies, times and broadcast formats make this a valuable book for the SWL. © 1990 86 pages

❑ HH-UFG Softbound $10.95

SPORTS AND ENTERTAINMENT FREQUENCIES

complied by Bob Grove

Handy little book to have. Listings include the NFL, Blue Angels, Hotels and Casinos as well as press, shopping malls, and fast food restaurants. Also includes NASCAR, CART and Indy pit crew and driver frequencies! © 1991 70 pages

❑ GE-SEF Softbound $9.95

SHORTWAVE RECEIVERS Past and Present

edited by Fred Osterman

Put together to help the beginning SWL decide which radio to buy. Also a great reference for the experienced listener to have on hand. Full of handy facts. Includes evaluation of the radio's capabilities. © 1989

❑ UE-SRPP Softbound $6.95

QTC I Have a Message For You

by "SPARKS" Ray Redwood

Memories of what it was like to be shipboard radio operator by a 40 year veteran. The author wrote this book for all of the radio operators who have ever gone to sea and to let the public know that radio operators will always be an important part of international marine commerce. Fascinating recollections of voyages, ports, people and the many other aspects of a life at sea. Great fun reading! © 1989 1st edition 375 pages

❑ RR-QTC	Softbound $8.95
❑ RR-QTCH	Hardbound $14.95

M STREET DIRECTORY 1990 Edition

Complete Industry Guide to AM and FM Broadcasters US and Canada

Comprehensive listing of broadcasters. Full of helpful information for the BC SWL. Has location frequency, program formats plus much more. The book to have if you tune the broadcast bands. © 1990 640 pages

❑ MST-J Softbound $29.95

WIRELESS COMMUNICATION IN THE US

by Thorn Mayes

This fascinating history is all about the inventors, engineers and promoters that brought radio into use. Spark and ARC transmitters used shipboard and on costal stations are described so you can almost hear and smell them. Old timers will be able to relive their past. Newcomers will learn more about the roots of radio communication. Great story. © 1989

❑ WM-WCUS Softbound $29.95

AND PART OF WHICH I WAS Recollections Of A Research Engineer

by George H Brown

George Brown was one of radio's pioneers. His career began in the Roaring 20's as a college researcher. From there, he went on to work in both radio and the development of TV technology. He is a co-author with Lewis and Epstein of one of the most definitive pieces every done on ground systems. Full of recollections of meetings with some of the most famous people in the history of radio. © 1982 revised 342 pages.

❑ GHB Hardbound $19.95

IONSOUND ver. 3.19

by Jacob Handwerker, W1FM

Wonder when and on what frequency you'll be able to find that last DX country you need for honor roll? IONSOUND is a state-of-the-art software tool designed to predict ionospheric propagation to any part of the world. Using the latest in propagation engineering models, this handy tool is a valuable addition to the active ham's software library. Can be customized for a number of different variables. Menu driven for ease of use. Manual in an ASCII printable file is included. Math co-processor recommended but not required. IBM PCs and compatibles.

❑ ION5	(5.25" disk MS-DOS Computers)	$29.95
❑ ION3	(3.5" disk MS-DOS Computers)	$31.95

TRAVELER'S GUIDE TO WORLD RADIO 1991 EDITION

English Language Broadcast Guide

Covers AM/FM/SW broadcasts for 51 major cities around the world — from Abu Dhabi to Zurich. Handy pocket book size is convenient to take when you travel. Easy-to-use format makes looking up information a snap. © 1990 128 pages

❑ BB-TG Softbound $9.95

THE WONDERFUL WORLD OF HAM RADIO: an Introduction for young people. by Richard Skolnik

Written with the youngster in mind, this is a great book for the "soon to be ham." Answers many of the most often asked questions in a simple easy-to-understand format. ©1990 39 pages

❑ MFJ-WWHR Softbound $7.95

LATEST INTELLIGENCE An International directory of codes by James Tunnell

Finally, there's a key to the terms, phrases, acronyms, and abbreviations used by the military, law enforcement and other government agencies. Over 35,000 terms are explained and defined in a simple, easy-to-understand manner. Great for scanner ops and SWL's. Fully up-to-date ©1991 305 pages

❑ T-3531 Softbound $16.96

WORLD RADIO TV HANDBOOK 1991 Edition

Loaded with the latest callsigns, frequencies and other important information for radio and TV broadcasting around the world. Covers LF, MF, shortwave and TV services. Also has equipment reviews and other special features. ©1991. 45th Edition.

❑ GL-WRTV91 Softbound $19.95

Fun Reading

1991 EQUIPMENT BUYER'S GUIDE

Fully up-to-date. Complete listing of equipment available from the various equipment and accessory manufacturers. Includes radios and accessories plus helpful hints and tips and a complete listing of addresses and telephone numbers. ©1990

❑ CQ-EQP91 Softbound $4.95

1991 ANTENNA BUYER'S GUIDE

Looking for the latest in antennas? It's all here in theCQ Antenna Buyer's Guide. Crammed full of articles, product information and a who's who section listing all of the manufacturers and importers. Get your's now and start planning for antenna projects. ©1991

❑ CQ-ANT91 Softbound $4.95

TOMMY ROCKFORD BOOKS by Walter Tompkins, K6ATX

These thrilling stories introduced a whole generation of Hams to the wonderful world of Amateur Radio. Great reading, and gift ideas for all levels of Amateur Radio Interest. Each story is full of action packed excitement.

❑ AR-DV	Death Valley QTH	Softbound $4.95
❑ AR-SO	SOS At Midnight	Softbound $4.95
❑ AR-CQ	CQ Ghost Ship	Softbound $4.95
❑ AR-DX	DX Brings Danger	Softbound $4.95
❑ AR-GC	Grand Canyon QSO	Softbound $4.95
❑ AR-MO	Murder by QRM	Softbound $4.95
❑ AR-TR	All 6 books, Reg. $29.70 Save $4.75	$24.95

Get Your Novice Ticket

TUNE IN THE WORLD WITH HAM RADIO by ARRL staff 8th Edition

NOW INCLUDES TWO C-90 CODE STUDY TAPES!

This package has been revised to cover new digital and voice Novice requirements and contains THE goodies needed by the beginner to get started in Amateur Radio. Assuming that you have no prior knowledge of radio, the reader is taught how to pass the Novice exam, both code and theory, and how to set up a station. Unique code study method makes learning the Morse code easy as 1-2-3. And it's full of illustrations to help clarify difficult technical points. 160 pages ©1990 8th Edition.

❑ AR-HR Softbound $18.95

CQ Bookstore Main St Greenville, NH 03048 Div of CQ Communications Inc PC-B91
(603) 878-1441 • FAX (603) 878-1951

effective and user friendly. The desk top or rack mounted integrated receiver decoder (IRD) can support an encrypted asynchronous data channel of up to 9600 baud. For more information call (513) 866-2421.

Video Guide - Uniden is making life a little simpler for the average consumer. When they decided to market a state-of-the-art Satellite Receiver, the UST-4800, instead of including the usual incoherent, somewhat mystical and totally useless instruction manual—anyone who has a VCR will know what I am talking about—an honest-to-god user-friendly instructional video accompanies the UTS-4800. (I've come to the conclusion that most writers of technical manuals are close cousins to the lawyers or insurance underwriters.) The Video's blonde bombshell . . . or rather hostess, will make operating the 4800 simple. Now if I can just figure out how to work this VCR!

Baylin Publications has announced a new version 1.1 software program for IBM and compatibles, the TVRO System Analysis and Antenna Aiming. It is designed for professionals or the technically oriented TVRO owner. The program includes such factors as cutoff angle, noise weight, pre-emphasis, peak-to-peak conversion noise bandwidth and works on NTSC, PAL and SECAM (three different video formats). It included 10 variable parameters like path loss, antenna gain, signal-to-noise, etc. The aiming portion of the program calculates azimuth and elevation angles and range to all satellites within view of your location. The names and latitudes of all worldwide c and Ku-band broadcast satellites currently in service and to be launched by 1995 are listed. This user friendly portion of the program simply requires you to type in your latitude

Frequency (MHz)	Source	Type	Mode
2.182 MHz	Ship/Aircraft	Search & Rescue	SSB
3.023	Ship/Aircraft	Search & Rescue	SSB
3.850	Johnson (NASA)	Shuttle	SSB
3.860	Goddard (NASA)	Shuttle	SSB
5.680	Ship/Aircraft	Search & Rescue	SSB
7.185	Goddard	Shuttle	SSB
7.227	Johnson	Shuttle	SSB
8.364	Ship/Aircraft	Search & Rescue	SSB
14.280	Johnson	Shuttle	SSB
14.295	Goddard	Shuttle	SSB
14.993	Ship/Aircraft	Search & Rescue	SSB
19.993	Ship/Aircraft	Search & Rescue	SSB
21.380	Johnson	Shuttle	SSB
21.395	Goddard	Shuttle	SSB
28.400	Johnson	Shuttle	SSB
28.645	Goddard	Shuttle	SSB
29.357-29.403	RS/10	Amateur	SSB/CW
29.407-29.453	RS/11	Amateur	SSB/CW
121.750	Aircraft	Search & Rescue	SSB/CW
136.11	KIKU (Satellite)	Experimental	FM/TLM
136.37	ATS 3 (Satellite)	Experimental	FM/TLM
136.38	Goes 1,2,3	Weather sat	FM/TLM
137.17	Marces B2	Experimental	FM/TLM
137.50	NOAA 10	Weather sat	FM/TLM
137.62	NOAA 9	Weather sat	FM/TLM
137.77	NOAA 11	Weather sat	FM/TLM
137.85	Meteor (USSR)	Weather sat	FM/TLM
142.00	Mir/Soyuz	Manned space	WBFM/TLM
142.415	Mir/Soyuz	Manned space	WBFM/TLM
142.600	Mir/Soyuz	Manned space	WBFM/TLM
143.145	Mir/Soyuz	Manned space	WBFM/TLM
143.625	Mir/Soyuz	Manned space	WBFM/TLM
143.825	Mir/Soyuz	Manned space	WBFM/TLM
145.550	Mir/Soyuz	Amateur	FM
145.810-145.987	Oscar 10	Amateur	SSB/CW/TLM
145.812-145.985	Oscar 13	Amateur	SSB/CW/TLM
145.825	Oscar 17 (Dove)	Amateur (Brazil)	FM
145.825	UoSat II	Amateur (UK)	TLM
145.850	Fuji 20	Amateur (Japan)	TLM
149.5-149.9	NavSats	Navigation (USSR)	TLM
150.0	NavSats	Navigation (USA)	TLM
154.2	NASA	uplink	various

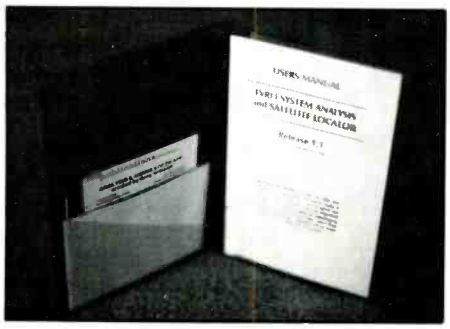
Filming of Uniden instructional video.

NASA's latest prototype planetary rover.

Frequency (MHz)	Source	Type	Mode
166.0	Salyut/Mir	Manned space	TLM
180.0	Chinasat	Experimental	TLM
192.0	Mir	Manned space	TLM
225.0-265.0	DSCS/Skynet/NATO	Military	FM/TLM
243.0-280.0	Leasat/Syncom	Military	FM/TLM
243.0-280.0	FltSat	Military	FM/TLM
248.0-258.0	Marisat	Military	FM/TLM
259.7	Shuttle	Manned space	FM/PM
279.0	Space suits	EVA	FM/PM
296.8	Shuttle	Manned space	FM/PM
325.0-400.0	Various	Experimental	FM/FM
400.0-406.0	Radiosonde	Weather balloons	TLM
406.0	Search & Rescue	Beacons	TLM
435.070	UoSat 14	Amateur	FSK
435.120	UoSat	Amateur	FSK
435.795-435.900	Fuji 20	Amateur	FSK
435.715-436.005	Oscar 13	Amateur	SSB/CW/TLM
437.05	Oscar 16	Amateur	AFSK
437.075	Oscar 18	Amateur	PSK
437.153	Oscar 19	Amateur	PSK
460.0-470.0	Various	Weather Sats	TLM
700.0-726.0	Ekran	TV (USSR)	FM/AM
922.0-980.0	Various	Space Probes	TLM
1246.0-1256.0	Various	Early Warning	TLM
1427.0-1434.0	White Cloud	Ocean spysat	TLM
1535.0-1543.0	Various	Maritime Mobile	FDM/SSB
1544.0	SarSat (Satellite)	Search & Rescue	Beacons
1646.6-1707.0	Various	Weather Sat	TLM/FAX
1775.7-2202.0	USAF/NASA	Milsat uplink	Voice/data
2211.0	TDRSS	Shuttle relay	Data/TLM
2212.0	NATO 3	Milsat	Voice/data
2214.0	Shuttle	TV downlink	TV/PM
2217.0	Shuttle	command	TLM
2227.3	NATO	Milsat	Voice/data
2232.5	TDRSS	Shuttle relay	Voice/data
2250.0	Shuttle	downlink	Voice/data
2262.5	Fltsatcom	Milsat	Voice/data
2272.0	TDRSS	Shuttle relay	Voice/data
2287.5	Shuttle	downlink	Voice/data
2273.0-2401.0	Space probes	various	TLM/data
2500.0-5760.0	Int'l telesats	TV/Telecom	various

and longitude. For more information write: Baylin Publications, 1905 Mariposa, Bolder, CO 80302 and request their free catalog.

Tandy Teleport - The Tandy Corporation is setting up a state-of-the-art satellite communications network on the top of Tandy's new Technology Center in Fort Worth. The network will connect all of Tandy's divisions, subsidiary, R & D Centers and manufacturing plants in the US. The teleport, as it is being called, will have its own studios and will be capable of transmitting secure broadcast-quality video and digital audio as well as data to any downlink, including news and commercial broadcast stations across the country. They will also establish international links.



TVRO's user-friendly instruction manual.

DELTA - Move over NSA, NASA now claims to have the world's fastest supercomputer. Known as the Delta, this 32 billion floating point operations per second super computer is scheduled for installation at Caltech in Pasadena, California in May. Maybe NSA can upgrade the CRAY.

GPS - The Global Positioning System satellite are aiding researchers in the development of automated landing systems for spacecraft and aircraft. NASA has used a 737 to make 35 successful automated landings. Four to eight GPS satellites, of the 15 in orbit, were visible and used during each of the test landings. It is hoped this satellite system and developing technology can be put to use in commercial aircraft and in future manned space missions

See you next month. ■

RTTY

BY ROBERT MARGOLIS

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

Whozit, wherezit, whatzit? I came across an unidentified station on 10700 kHz at 1555 UTC, sending five-letter grouped messages and in a language that appeared to be from the Far East. But considerable garbling hampered any efforts to clearly identify the language of the 50-baud transmission. Thought one of you readers might have some savvy about the language and would share your revelation with me to end my bout with insomnia.

Some of the words spotted, including garbling were, ". . . laf toesimaos . . . idonga . . . ngmaif nuyg tam . . . gif trong dos . . . deoss giff tao danlg thoii ioiss . . . khongg bnets . . . gionf fairrhintr nhuyaoukx doss chueozf om nukaif naye taocungf fair bii . . . laf kairrpthahj cos . . . hang cuongff ki& nos sasn tao lnn omazss . . . ."

Fred Hetherington of Florida tells me he got a "tweet" recently, when he found "Little Bird" sending RY's and foxes on 13868 kHz, 50 baud, at 1930 UTC. The station identifier read "de Little Bird testing," he says. Was it a "cheep" thrill, Fred?

From time to time I've reported on seeing test transmissions from the U.S. Navy that show some peculiarities before going into crypto mode. I came across another one recently on 16619 kHz where a half a line of RY's would be followed by VVMGTNCNJBH and then encryption. This pattern occurred several times between tuning in the station at 1721 and its leaving the air at 1726. I still have not received an answer as to why a certain string of letters always appears between the RY's and the encrypted text. Any thoughts, gang? P.S. The transmission speed was 75 baud.

```
   1/2   NDO NDO NDO   1/2   NDO NDO NDO   1/2

4646464646464646464646464646464646464646464646464

NDO NDO NDO   1/2   NDO NDO NDO   1/2   NDO NDO NDO   1/2

4646464646464646464646464646464646464646464646464

NDO NDO NDO   1/2   NDO NDO NDO   1/2   NDO NDO N
O   1/2

4646464646464646464646464646464646464646464646464

NDO NDO NDO   1/2   ARXMUF/.1(? EI/.((4/.D EIFK7
```

For several years, the so-called callsign "NDO" was said to be a product of the former East German Embassy at Havana, Cuba. Since the GDR no longer exists, RTTY monitors are having to start over at Square One to determine what station uses this callsign. It has been logged on 17490 kHz a number of times. The callsign "YBU" has also appeared on that frequency. Jerry Domokur of Ohio bagged this intercept on the same frequency at 1650 UTC, at 50 baud.

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

RTTY Intercepts

2137.5: WLC, Rogers City R., MI, w Great Lakes wx forecast, FEC at 0130. ("Bunky," IL)

2773.7: Un-ID w foxes & 10 count, FDM 75 baud at 0420. (Hal Bilodeau, IL)

3696: "RPTIH," Horta Navrad, Azores, w foxes & RYRY, 50 baud at 0000. (Fred Hetherington, FL) "RPFN," Monsanto Navrad, Portugal, w a navarea from the USCG to "RPTI," 50 baud at 0903. (Jerry Domokur, OH)

4461: WLO, Mobile R., AL, w "marine telex wx sked," FEC at 0120. Some type wx forecast can be found every hour at 35 mins after the hour. (Domokur, OH)

4515: USN or USMC MARS sta NNN0YNS w foxes, 10 count, & RYRY, 75 baud at 0141. (Domokur, OH)

4489: GFL26, Bracknell Meteo, England, w coded wx at 0134 50 baud. (Domokur, OH)

4570: HZN46, Jeddah Meteo, Saudi Arabia, w coded wx, 100 baud at 0305. (Ed.)

4583: DDK2, Hamburg Meteo, Germany, w coded wx at 0216, 50 baud. (Harold Manthey, NY)

4607: "51COS" of the Spanish Navy, w RYRY, 50 baud at 0141. (Manthey, NY)

4813: LZA8, Sofia Mateo, Bulgaria, w coded wx, 50 baud at 0143. (Manthey, NY)

5059.5: CUW20, USAF, Lajes AB, Azores, w RYRY, 50 baud at 0120. ("Bunky," IL)

5117: U.S. Army MARS sta AAT5CA w ARQ tfc to AAV5QS at 0026. (Domokur, OH)

5337.4: RDM78, Tbilisi Meteo, USSR, w coded wx, 50 baud at 0151. (Manthey, NY)

5393: FDY, French Air Force, Orleans, France, w RYRY & le bricks, 50 baud at 0234. (Manthey, NY)

5459.3: VOA, Tangier, Morocco, wx nx at 2301, 75 baud. (Mark, Gribble, VA)

5740: HZN, Jeddah Meteo, Saudi Arabia w wx data for Jordan, 50 baud at 0030. (Manthey, NY)

5867: GYA, Royal Navy, London, England, w foxes, 75 baud at 0245. ("Bunky," IL)

6765: Un-ID w maritime-type tfc in FF, ARQ at 0412, in re drums of fuel aboard ship. (Bilodeau, IL)

6776.5: XTU, ASECNA, Ouagadougou, Burkina Faso, w aero wx, ARQ-M2/96. (Paul Scalzo, PQ) Time not given—Ed.

6835: GFL22, Bracknell Meteo, England, w sunspot & solar terr. cond. data at 0532, 50 baud. (Gribble, VA)

6880: USMC MARS sta NNN0MCL w a monthly net participation rpt to NNN0PPE, 75 baud at 2245. (Domokur, OH)

6942.3: 5TZ, ASECNA, Nouadhibou, Mauritania, w coded wxd 2300-0001, ARQ-E3/48. (Domokur, OH)

7402.5: JMG3, Tokyo Meteo, Japan, w coded wx at 1343, 50 baud. (Ed.)

7560: ROK27, Tass, Moscow, USSR, w nx in FF, 50 baud at 1312. (Ed.)

7565: YIX75, INA, Baghdad, Iraq, w nx in AA, 50 baud at 1314. (Ed.)

7602.5: Un-ID w foxes & 10 count at 0200, 75 baud. (Hetherington, FL)

7610: SUA231, MENA, Cairo, Egypt, w RYRY, 50 baud at 2323. (Gribble, VA)

7625.5: TZH, ASECNA, Bamako, Mali, w RYRY, 50 baud at 0028. (Manthey, NY) Correct c/s here is TZH42—Ed.

7685: USMC MARS sta NNN0EPT w relay of MARSgrams from NNN0MSD to NNN0GAR, 75 baud at 2220. (Domokur, OH)

7755: SUA34, MENA, Cairo, Egypt, w nx in AA at 2226, 50 baud. (Domokur, OH) Same sta on 7756 kHz w nx in AA at 2155. (Gribble, VA) and at 0100. (Hetherington, FL)

7832.4: USAF MARS stas AFA1DA & AFA1KS w tfc to each other, 45 baud at 0032. (Domokur, OH)

```
ZCZC VAP828 BCR198
GBXX CO VG 036
ZZTTAVATICANEX36/34 Q
AUSMARYONCK2QQT TERRACENOJGGLEN EYRE HALL BASSETT
ONLY ROOM POSSEBLE. GLRS 28/ YEMEXSEOP CNME AT 6869441
IMMEDIATELY DRCY DY VLFJGG  QSTOQEESSAGE LEFT FER ME IF NECESSARY STOP
  DAVIDMHKJRZ
COL.38 WI_YIYORRQ
NNNN
```

Telex message from HVH, PTT, Vatican City, was monitored on 10754 kHz at 1519 UTC, ARQ-M2/96, channel B. (Logged by Robert Margolis)

```
COU COU COU ED

RSRYRYRYRYRYJYGRRYJYRYRYRYRYRYRYRYRYRYRYRYRYRYRYCYRYRYRYRYRYRHIYRYR

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYGYPYCYRYRYRYRYRYRYCHRYRYRYRYR

COU COU COU ED
RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRHRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYR

RYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRYRXRYRYRYR
N
RYRYRYRYRYRYRYRYRYRYRYRYRYRMV
```

Harold Manthey of New York State submitted this printout, identifying it as "COU, Havana, Cuba." In reality, this is a test transmission, with the test tape sent in reverse, by 7OC, Khoraksar Aero, Yemen. "ED" reversed is "DE" and "COU" becomes "UOC." Substituting "7" for "U" gives the correct ID: 7OC. Many other RTTY monitors have mistaken this wrongly-sent transmission throughout the years, so Harold's got lots of company. The 50-baud transmission was on 5878 kHz at 0255 UTC.CCCC

7955: LRN85, Dyn, Buenos Aires, Argentina, w nx in SS at 2330, 75 baud. (Gribble, VA)

8136: XVM2, VNA, Hanoi, Vietnam, w nx in VV, 50 baud at 1045. (Hetherington, FL)

8140: CLN219, PL, Havana, Cuba, w nx in EE at 0910, 50 baud. (Gribble, VA)

8441: "78IJU," of the Spanish Navy, w RYRY & SGSG, 100 bd at 0224. (Michael McFerrin, MI)

8626.5: GYU, Royal Navy, Gibraltar, w "de GYU" rptd, 75 baud at 0241. (Ed.)

9290: FUJ, French Navy, Noumea, New Caledonia, w local wx forecast in FF foll by encryption, 75 baud at 0928. (Hetherington, FL)

9395: HMF84, KCNA, Pyongyang, North Korea, w nx in FF, 50 baud at 2150. (Gribble, VA)

9994: CSY65, Santa Maria Aero, Azores, w coded wx at 0113, 50 baud. (Manthey, NY)

10132: TNL55, Brazzaville Aero, Congo, w aero wx at 0534, 50 baud. (Dallas Williams, CO)

10215: HZN48, Jeddah Meteo, Saudi Arabia, w coded wx, 100 baud at 2232. (Ed.)

10540: CSY, Santa Maria Aero, Azores, w coded wx & a msg for a Mexican mil. wx sta. op section. Was 50 baud at 0032. (Domokur, OH)

10506: 6OM, Muqdisho Aero, Somalia, w RYRY at 0113, 50 baud. (McFerrin, MI)

10610: SUA251, MENA, Cairo, Egypt, w nx in EE at 1815, foll by "end cast" at 1817, 50 baud. Nx xmsn in FF begins at 1823. (Ed.)

10633: SYC, Cairo Aero, Egypt, w aero wx & msgs at 2230, 50 baud. (Domokur, OH)

10675: REM51, Tass, Moscow, USSR, w nx in FF, 50 baud at 1810. (Ed.)

10754: HVH, PTT, Vatican City, w "Test from Vatican City" & 1 line of quick brown fox. Was ARQ-M2/96, channel B, at 1500. (Ed.)

10755: Un-ID w continuous RYRY, 1045-1116, then "HR17 USA" foll by more run-on RYRY past 1225. Was 75 baud. (Hetherington, FL)

10756.5: CUL, Monsanto Navrad, Portugal, idling in ARQ mode, 1831-2-35, then "naoclas" (unclassified) msgs in PP until 2042, foll by long period of idling again. (Ed.)

10800: "RFLI," French Navy, Fort de France, Martinique, w tfc to Cayenne at 1138, ARQ-E3/72. (Domokur, OH)

11012.5: JAL21, Jiji, Tokyo, Japan, w nx in SS at 0930, 50 baud. (Hetherington, FL)

11905.8: MKD, RAF, Akrotiri, Cyprus, w RYI's, foxes & 10 count at 0118, 50 baud. (Domokur, OH)

11138.5: PWN33, Natal Navrad, Brazil, w RYRY, 75 baud at 0000. (Hetherington, FL)

```
LGTZT
NH
ZA N ORK NRTQE_DUMI 150_7___2_)    KWMV_R NR KP55 00 5/5.11.10 GOD.
9Z
     V SWOTVETUBIE S GORNATA NAXA TB34+.-  09)7IHME OTSVAS SDO
PISMMINJ 1206 O 08/11.1990  PODPIQANI VARACII+-
DEPARTWZIRANQVG ATNITE I IZV_GATNITE SWUJITELI.NE SA POLUQENI
DEKLARACIUFOT    1. MANUXA STOEVA IL_EVAHO
     MOLY SROQNM_WK_RMIRATE OTFEL +KADRI', KOI O
BRECITIRANITEISLU(+3)B ,?.3)-65 - 0908/-5 5-AA ?
__8_2=_
4=8+ ,4  ( 5 00 5/11.12.=NX.      ,       ,FAVOV
A
LGBL
G
OOKI
OK  OKS NWFW
O
RPVO PMO PMO VYRYRYRYRYR____YRYRYRYRYRYRYRYRYRYRYRYRYRY_
PMO PMO PMO WYRYRYRYRYRYRYRYRYRYRYRYGQRYRYRYRYRYRYRYRYGQRY
QMO PMO PMO RYRYRYRYRYRYRYRYRYRYRYRYRYRYRRYRYRYRYRYRYRYRY
PMG PMO PM RYRYJYRYRYRQJYRYRYRY
YRYRYRYRYRYRYRYRYRYRYRYRYRY
PMO PMO PMO RYRYRYRYRYRYCYRYRYRYRYRYRYRYRYYYRYRYRYRYRYRYRY
PMO PMO PMO RYRYRYRYRYRYRYRYRYRYRY___YRYRYRYRXK___Q
```

Bulgarian-language telex to New York City from MFA, Sofia, Bulgaria, and RY's signoff, with "PMO" callsign, ran 16015 kHz from 1536 to 1541 UTC, at 75 baud. (Logged by Robert Margolis)

```
ZCZC 173 ETQPI
IPEG

BT

UNCLAS CC01

EX JADE DOME 8/90

SUBJ: CHEF CRAIG

1. CHEF CRAIG HAS ALSO TAKEN A PART POSITION AS A MAST LIGHTER DUE

TO THE SUDDEN BURNOUT OF A 500 W BULB.

2. CHEF CRAIG WILL NOW HOLD A FLASH LIGHT TO ILLUMINATE MAST DURING

DAY.

3. KOB DESCRIPTION TO FOLLOW.

EXERCISE EXERCISE EXERCISE

BT

NNNN
```

A light-hearted moment between RTTY operators came as a Canadian military unit at Winnipeg, Manitoba, sent this training exercise message. Jerry Domokur of Ohio was on hand to receive it over his RTTY decoder on 13410 kHz at 0244 UTC, FDM 50 baud.

11175: 5HD, Dar es Salaam Aero, Tanzania, w RYRY at 0153, 50 baud. (Manthey, NY)

11275: ZKX, Whenuapai Navrad, New Zealand, w RYRY, foxes, 10 count; 75 baud at 0335. (Joe Palkovic, FL, via Hetherington, FL)

11293.7: KNY29, Egyptian Embassy, Washington, DC, w 5F msgs to Cairo, ARQ at 0030. (Hetherington, FL)

11342: "Zulu Cinco Bravo" w mil. tfc in SS that mentd "avion C-48 con copiloto." Was 50 baud at 0025. (Domokur, OH)

11450.5: RDD77, Moscow Meteo, USSR, w coded wx, 50 baud at 1425. (Ed.)

11459.5: ZLK35, Weedons Meteo, New Zealand, w coded wx at 1203, 75 baud. (Hetherington, FL)

11491.3: Un-ID w nx of Australia in EE, ARQ at 0340. (Gribble, VA)

11541: 7OC, Khormaksar Aero, Yemen, w RYRY, 50 baud at 2250. ("Bunky," IL)

11604: UZJ3, Tanjug, Belgrade, Yugoslavia, w nx in EE, 50 baud at 0440. ("Bunky," IL & Domokur, OH)

11638: DDK8, Hamburg Meteo, Germany, w coded wx at 0146, 50 baud. (Manthey, NY)

12175: HMF42, KCNA, Jungsan, North Korea, w nx in EE at 0410, 50 baud. (Domokur, OH) Ditto at 2200. (Hetherington, FL)

12212.5: YZO7, Tanjug, Belgrade, Yugoslavia, w nx in EE, 50 baud at 1642. (Ed.)

12312: 5YE, Nairobi Meteo, Kenya, w coded wx at 0201, 50 baud. (Domokur, OH)

12842.5: PBC312, Goeree Island Navrad, Netherlands, w RYRY, 75 baud at 0229. (Scalzo, PQ)

12901: GYA, Royal Navy, London, England, w a test tape at 0241, 75 baud. (Williams, CO)

12902: PWZ33, Rio de Janeiro Navrad, Brazil, w wx & tfc in PP, 50 baud at 0219. (Williams, CO)

13378.5: CUA, PTT, Lisbon, Portugal, w telexes to Vatican City, ARQ-M2/96 at 1715. (Peter T., England)

13410: Un-ID mil. w "Exercise Jade Dome" tfc at 0244, FDM 50 baud. (Domokur, OH) Apparently Canadian mil., Winnipeg, MB—Ed.

13440: YZJ5, Tanjug, Belgrade, Yugoslavia, w nx in EE at 0400, 50 baud ("Bunky," IL)

13461.7: Un-ID w "12.12.12.12.12.12.12 PHG PHG" rptd, 75 baud, 1245-1246, then to bad CW. (Peter T., England)

13504: RPFN, Monsanto Navrad, Portugal, w test to RPTIH, 50 baud at 2134. (Peter T., England)

13505: Un-ID w auto sent & manually typed tfc in RR that mentd Leningrad, Moscow, & Sweden. Was 50 baud, 1839-1843. (Ed.)

13523.5: CCS, Santiago Navrad, Chile, w 5L msgs to "ZUWJ," 100 baud at 2239. (Ed.)

13579: UN-ID w 5F grps, 75 baud at 1854, then off the air w no s/off. (Peter T., England)

13655: 6UV73, Dakar Meteo, Senegal, w coded wx at 0314, 50 baud. (Domokur, OH)

13732: Seemingly endless 4646 (not RYRY) with no CR or LF, 50 baud, at 0320-0602 & 1316 the next day. About every 10th charac was an up shift to make sure the print was 4646. (Williams, CO) Freq most often used by FUF, French Navy, Fort de France, Martinique, but never before at 50 baud. Assign a "?" to this one's ID—Ed.

13737: 5YD7, Nairobi Aero, Kenya, w RYRY at 2046, 50 baud. (Don Schimmel, WV)

13803: RCR78, Khabarovsk Meteo, USSR, w coded wx at 1000, 50 baud. (Hetherington, FL)

13830: KAA60, FCC, Grand Isle, NE, w tfc in the clear, i.e., not bit inverted, to 13 other FCC stas answering in return, 45 baud. (Hetherington, FL) Time not given—Ed.

13857: Un-ID Cuban diplo w 5F grps to Hanoi, 50 baud at 0450. (Williams, CO)

13875: TAD, MFA, Ankara, Turkey, w a telex in Turk & 5L grps to Tel Aviv, Israel, 75 baud at 2045. (Hetherington, FL)

13897.5: CLP1, MFA, Havana, Cuba, w tfc in SS & encrypted, 50 baud at 0448. (Williams, CO)

13898.4: CLP1 w crypto after ZZZZZ at 0504, 50 baud. (Williams, CO)

13941.5: Un-ID sta w c/s "KD8" w 5L msgs & tfc/FF

```
NAVAREA IV 1699/90(14). NORTH ATLANTIC.
SEISMIC SURVEY IN PROGRESS UNTIL FURTHER NOTICE BY VESSEL
TOWING 900 METER LONG CABLE WITH TAILBUOY IN AREA BOUND BY
46-55-30N 48-56-54W, 46-50-48N 48-44-06W, 46-55-30W, 48-44-06W,
46-50-48N 48-56-54W.
BT
NAVAREA IV 1698/90(11). STRAITS OF FLORIDA.
1. SUBSURFACE OPERATIONS 131400Z TO 132200Z DEC ALTERNATE
   141400Z TO 142200Z DEC BY VESSEL DEPLOYING UNDERWATER ARRAY
   WITHIN 12 MILES OF 24-17N 81-58W.
2. CANCEL THIS MSG 142300Z DEC.
BT
NAVAREAV 1697/90(GEN).
. NAVAREA IV MESSAGES IN FORCE 121800Z DEC 90.  ONLY THOSE
   MESSAGES ISS_ED DURINGTHE LAST SIX WEEKS ARE LISTED HEREIN.
   1990 SERIES: 1494(11), 1496(25), 1507(14), 1516(24), 1525(11),
   1532(GEN), 1562(25), 1568(24), 1580(24), 1594(11), 1595(27),
   1596(14), 1598(24), 1600(11), 1603(11,28), 1607(11), 1614(11),
   1623(25), 1625(11), 1628(13), 1634(14), 1644(11), 1651(27),
   1652(27), 1653(13), 1656(14), 1659(26), 1660(14), 1661(GEN),
   1668(11), 1670(14), 1672(,1, 1673(11), 1674(11), 1675(11),
   1677(11), 1679(11), 1680(24), 1686(26), 1688(14), 1689(12),
   1692(GEN), 1695(GEN).
2. THE QUARTERLY SUMMARY OF ALL NAVAREA IV MESSAGES IN FORCE AS OF
   13 SEP 90 IS GIVEN IN SEC III OF N/M 39/90.
BT
NAVAREA IV 1696/90(GEN).
1. UPON RECEIPT_OF NM 30/90, CANCEL NAVAREA IV 1257/89.
2. CANCEL NAVAREA IV 966/87, 1460/90, 1463/90, 1467/90, 1470/90,
   1586/90, 1587/90, 1615/90, 1624/9_____6_/90, 1683/90.
3. CANCEL THIS MSG.
BT
CQ DE NMF AS FOR HYDROLANTS AR_CQ CQ CQ DE NMF
BT
HYDROLANT 2033/90(52,53). TUNISIA. GUNNERY.
1. GUNNERY EXERCISES 13 DEC WITHIN 30 MILES OF 38-10N 09-10E.
2. _:-,:3) 58' .' 14 DEC.
BT
HYDROLANT 2032/90(52). STRAIT OF GIBRALTAR.
CHART 52039 (1ST ED).
1. TWO CURRENT METERS, MARKED BY BUOYS_ Y_LLOW, FL 4 SEC,
   ESTABLISHED IN 36-00.7N 05-38.9W.
2. _ANCEL HYDROLANT 1966/90(53).
BT
```

NMF, U.S. Coast Guard, Boston, MA, sent these navarea and hydrolant messages in FEC mode on 13021 kHz at 1712. (Logged by Robert Margolis)

to "BDY," FEC. S/off 1950 w "QRU BC AR". (Hetherington, FL)

13996.5: STK70, Khartoum Aero, Sudan, w aero wx at 0130, 50 baud. (Hetherington, FL)

14354: Un-ID w 5F grps, 50 baud at 1225. (Don Schimmel, WV)

14461: Un-ID w foxes & 10 count at 1230, 75 baud. (Hetherington, FL)

14497.5: CSY, Santa Maria Aero, Azores, w aero wx at 1144, 50 baud. (Domokur, OH) CSY w RYRY at 1644. (Schimmel, WV)

14608.5: A Brazilian warship, w c/s PWBL, w RYRY to PWN33, Natal Navrad, Brazil, 50 baud at 0215. (Palkovic, FL, via Hetherington, FL) PWN33 & warship c/s PWJP wkg each other at 0130, 50 baud. ("Bunky," IL) "Bunky" also reported logging PWBL w RYRY (50 baud) to PWN33, when he tuned to 23017 kHz at 1230—Ed.

14635: "RFLI," French Navy, Fort de France, Martinique, w nx in FF, ARQ-E3/72 at 1747. (Ed.)

14646.5: Guessing Canadian Forces Amateur Radio Stations. VE9LBQ, "CRC, Ottawa," xmtng to P19STC; HI9STE to VE9LBW; & PO8SLO to VE9JC__ (last ltr not printed). All were 300-baud packet after 1905. (Ed.)

14719: OST58, Oostende R., Belgium, w tfc list, FEC at 1621. (Manthey, NY)

14760: BAT3, Xinhua, Beijing, China, w nx in EE at 1816, 50 baud. (McFerrin, MI)

14936.2: USMC MARS sta NNN0TCZ w MARSgrams, ARQ at 2053. (Ed.)

14960: "RFFXL," French Mil., Beirut, Lebanon, w RYRY, le bricks & 10 count, ARQ-E/72 at 1414. (Peter T., England)

15670:HGM36, MTI, Budapest, Hungary, w nx in SS, 50 baud at 1620. (Gribble, VA)

16003.5: Un-ID w tfc in Bulgarian at 2141, 75 baud. (Domokur, OH)

16057: USN MARS sta NNN0TQH w long list of freqs to be used between USA & Saudi Arabia for MARS tfc during Op Desert Shield. Was 300-baud packet to NNN0TSP at 1500. (Ed.)

16136: BZR66, Xinhua, Beijing, China, w RYRY & QRA, 75 baud at 1142. (Peter T., England)

16246: VOA, Tangier, Morocco, w msgs to Greenville, NC, FDM 75 baud at 1445. (Domokur, OH)

16303: Cuban Embassy, Lima, Peru, w a cable in 5F grps, 50 baud at 2116. (Domokur, OH)

17443: BZG48, Xinhua, Beijing, China, w nx in FF, 50 baud at 1421. (Manthey, NY)

18032: Un-ID w "BZQU BZQU BZQU RYRY . . . ," 75 baud at 1552. Xmsn last about ½ min. (Ed.)

18033.5: French Embassy, Pointe-a-Pitre, Guadeloupe, w 5L msgs & tfc in FF, ARQ6-90/200 at 1845. (Ed.)

18065: CLP1, MFA, Havana, Cuba, w prensamin-rex, 50 baud at 1510. (Ed.)

18111: FDY, French Air Force, Orleans, France, w RYRY & le bricks, 50 baud at 2030. (Gribble, VA)

18125: RND70, Tass, Moscow, USSR, w RYRY, 50 baud at 1810. (Manthey, NY) Same w nx in EE at 2039. (Gribble, VA)

18210: KUP, Jamba, Angola, w nx in EE at 1900, 50 baud. (Hetherington, FL)

18363.5: 9PL, Kinshasa Aero, Zaire, w aero wx, 50 baud at 2041. (Domokur, OH) 9PL w RYRY at 0015. ("Bunky," IL)

18514: Un-ID w tfc in GG & s/off, ARQ at 1405. ("Bunky," IL)

18577: Un-ID Swedish diplo w tfc in Swedish, SWED-ARQ, 1454-1509. (Ed.)

18602: LOL, Buenos Aires Navrad, Argentian, w RYRY & clg ZRH, 75 baud at 2030. ("Bunky," IL)

18635: CLP1, MFA, Havana, Cuba, w prensamin-rex, 50 baud at 1322. (Schimmel, WV)

18905.7-18907.7: GXQ, British Army, London, England, w RYI's, foxes, & 10 count on 10 FDM channels, 50 baud at 1550. (Ed.)

19117.3: MFA, Jakarta, Indonesia, w nx in Indonesian, ARQ at 1519. (Manthey, NY)

19654.4: Un-ID mil w tfc re upcoming rugby/golf tourns & mil officers who'll attend, ARQ at 1230. Could not stick with this one as I had to get to work ("Bunky," IL) Wish you played hookey from work instead. This sta is not listed in my database and further obs would've been valuable. I doubt that it was "Irish mil." tfc as you noted in your logsheet for reasons too numerous to list here—Ed.

19845: RWZ74, Tass, Moscow, USSR, w nx in EE at 1240, 50 baud. ("Bunky," IL)

19867.6: YZJ4, Tanjug, Belgrade, Yugoslavia, w nx in SS at 1549, 50 baud. (Scalzo, PQ)

20085: ISX20, ANSA, Rome, Italy, w nx in EE, 50 baud at 1500. ("Bunky," IL)

20101: ANSA, Rome, Italy, w nx in FF at 1215, 50 baud. Was quite weak. I have not seen ANSA on this freq before ("Bunky," IL) Probably a spur of ISX20 on 20085 kHz—Ed.

20238: PWN33, Natal Navrad, Brazil, w RYRY & 10 count ^{s} msgs in PP, 50 baud at 2005. (Hetherington, FL)

20451.6: Un-ID w crypto grps in FEC at 2245. ("Bunky," IL)

20514.6: Un-ID w 2-way tfc in FF, 50 baud at 1340. ("Bunky," IL) My database shows FDY, French AF, Orleans, France, w xmsns on 20515 kHz—Ed.

20609.5: Un-ID Swiss diplo w 5L grps, ARQ at 1220 & tfc in FF at 1250. ("Bunky," IL)

20662: Un-ID w 5F grps, 50 baud at 1255. ("Bunky," IL)

20835.5: CLP1, MFA, Havana, Cuba, w prensaminrex at 2345, 50 baud. ("Bunky," IL)

21862: Un-ID w unclas naval tfc in SS at 2005, 75 baud. (Domokur, OH)

22728.9: MKD, RAF, Akrotiri, Cyprus, w RYI's, FDM 50 baud at 1409. (McFerrin, MI)

22731.5: CLP23, Cuban Embassy, Lagos, Nigeria, w relay of tfc from other Cuban embs in Africa, 50 baud at 1845. (Hetherington, FL)


```
17385 KHZ  UNID STA W/5 DIGIT NO GRPS AT 2045 THEN TEXT AT 2054.
WAS 425/50R. AT 2057 SENT CHIRPY, SLOPPY CW - REPEATING NO'S
TO OTHER STN.                COPIED BY "Bunky - IL"
(((((((((((((( WHAT LANGUAGE IS THIS ? ))))))))))))))))
------------------------------------------------------------

911       31

39694 87734 90225 15817 96390 34961 31065 88525 52886 #9784 4
983!885480 30002 54044 65853 48029 80070 10357 79934 96872
36455 24514 73932 19750 87802 65738 5566 02930857154 70158
74515 32903 64026 /1667

912     24

73069 8572 5 89759 62242 98273 04402 0.799 88002 29334 -6207
25547 45(32 .-5 26328 88791 15762 46835 69128 29321 98694
17974 28620 38536 47590

913    61

34832 8420 22548 23747 88110 60478 09017 0665 76102 144318
69212 40316 0#952 1 380,#0350 38729 079/4 81660 9676 0402
75WP R0316 ///////

75120 40824 50789 36258 70991 99727 18169 85427 40670 746;73
70119 82035 62714 05799 81336 26416,12368 42957 87590 72599
22818 15255 94582 1526. 93563 43303 72738 69275 19 15 57793

OK      W19    96760      OK
--------
1    78 333  333  333  555  955  555

NR 01143   L  P OIGYMBU DAIBHENIN D I DAB TONGBOGEN

30 IL HANZIYEGZENGSEIOA GOANLYENHAN ZOSENZUNGANG TONGSINSA
GIZAEUI ZILMUNEI DAIHAN     OIGYOBU DAIBYENIN DAIDAB YOZI.

  DAIBYENINEUN ILAKEUGA KUUEIITEU CHIMGONGHAGO BYENGHAOHAN
GESGOA GOANLYENHAYE IMI CHENMYENGHAN ULIEUI UENCHIGZEG LIBZANG
SANGGIHAGO DAEUMGOA GAOI ENGEUBHAM

L LULINEUN HANNALAEUI LYENGTOOANZENGGMA ZAZUGUENI DALEUN NALAEI
EUIHAYE CHIMHAIDOINEUN GESGOAPGAEUN ILI SEIGYEI NEUZIYEG
EISEDO GEU NUGUE GEIDO HEYONGOIYESECEUN ANDOIMYE
OUNZAINGMUNZEIDEULEUN MULYEGEI EUIHAISEGA ANILA PYENGHOEZEG
BANGBEBEULO HACGYELDOIYEYW H NDANUN PLIBTANGEUL ILGOANHAGEI
GYENTINAGOISSDAN

  ULINEUN ILEHAN TIBZANGEULONBUTE ILAKEUEUI GUEPITEU CHIMGONGOA
BYENGHMDO BANDAIHWMYE DDOHAN IGZSEIL GIHOILO  VANZIYEGEI MULZEGEUL
DAIDAIZEGEKLO ZIBGYELSIKIGO ZENMYENZEGIM GUNSAZEG GENSEBEUL
```

"Bunky," of Illinois submitted this intercept with the question, "What language is this?" It is Romanized Korean and is used by the North Koreans in RTTY messages from their overseas embassies.

22865: 5YEB, Nairobi Meteo, Kenya, w badly garbled meteo msgs at 1900. 50 baud. (Hetherington, FL)

22882: Un-ID w crypto after VCVC at 1555 & XPXP at 1609, 75 baud. (Domokur, OH) It's "DFZG," MFA, Belgrade, Yugoslavia—Ed.

22883: "Strange language to or from ambassador in "Otawa" 75 baud at 1655. (Hetherington, FL) See the preceding & following loggings for the most likely ID—Ed.

22888: "DFZG," MFA, Belgrade, w nx in EE, 75 baud at 1548. (Hetherington, FL), and in SC at 1548. (Domokur, OH)

22896: "C37A" w foxes, RYRY + QSY 25 ZHA 5 to "6XM8," 100 baud at 1725. (Domokur, OH)

22915: Un-ID Cuban diplo w RYRY (w/o ID), 50 baud at 1706, foll at 1707 w circulars from embassies at Accra, Ghana; Lagos, Nigeria, & Sao Tome. S/off w/o ID at 1721, then to CW at 1724. This freq is a new one for Cuban diplo tfc. Up until Dec. '89 the freq was used by FTW91, DIPLO, Le Vernet, France, which gave it up when it moved to a satellite. (Ed.)

22947: "RPFN," Monsanto Navrad, Portugal, w RYRY, foxes, & 10 count, 75 baud at 1520. (Hetherington, FL)

23014: GYA, Royal Navy, London, England, w foxes & 10 count at 1820, 75 baud. (Hetherington, FL)

23052: CLP25, Cuban Embassy, Maputo, Mozambique, w telexes in SS, 100 baud at 1755. (Ed.)

23382: MKD, RAF, Akrotiri, Cyprus, w RYI's & foxes at 1320, 50 baud. (Manthey, NY)

23841: Un-ID French military w "controle de cle," ARQ-E3/192 at 1919. (Domokur, OH)

24790: ISX24, ANSA, Rome, Italy, w nx in EE at 1500, 50 baud. ("Bunky," IL)

26158: UJY, Kalingrad R., USSR, w RYRY & giving freq of 22300.5 kHz, 50 baud at 1230. ("Bunky," IL) This freq is also commonly used by UJY—Ed.

26878.5: Un-ID w 5F grps at 1345, 75 baud. (Hetherington, FL)

29460.6: DMK, MFA, Bonn, Germany, w msgs in GG to Buenos Aires, Argentina; Santiago, Chile: & Montevideo, Uruguay, 1610-1730. ARQ-E/96. (Hetherington, FL)

PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

One of the newer pirates is **Omega Radio**, which hasn't got a transmitter of its own. According to the station's own "Dick Tator", Omega Radio has been relayed by Radio USA and is likely to continue that arrangement for some time to come. Omega Radio's format is designed "to stimulate spiritual awareness as to the urgency of these days we're living in and how they relate to the radio fulfillment of Biblical prophecy." Also, "to familiarize the free radio audience with some of the more obscure forms of contemporary and progressive Christian rock." Listener response is "strongly" encouraged, via the Wellsville or Blue Ridge Summitt maildrops.

The Voice of Bono says the FCC office in its area is quite active, so the station has shied away from owning its own transmitter and relies on other pirate stations to carry its programming. VOB is now looking for a "semi-regular" outlet for its shows and can offer professional quality production services in exchange for airtime. Interested pirate station operators can contact the Voice of Bono at P.O. Box 6527, Baltimore, MD 21219.

A*C*E - The Association of Clandestine Enthusiasts has instituted a pirate QSL awards program, open to all pirate enthusiasts. There are three award categories as follows: number of different stations QSL'd on frequencies below 2 MHz and on the FM band, available in increments of 10; number of stations QSL'd between 2 and 30 MHz, in steps of 20; and number of different countries QSL'd with a minimum of three. To apply, send copies of your pirate QSL's with $1 plus a first class stamp to: A*C*E Awards, RD1, Box 15A, Belfast, NY 14711. If you want your certificate mailed unfolded, enclose an extra unit of postage.

Omega Radio says it's "Clandestined to become your favorite free radio station." They have a very attractive gold and black QSL card.

The 1991 edition of George Zeller's *Pirate Radio Directory* is out and it's indispensible if you DX shortwave pirate stations. The new edition describes over 150 pirates active last year, including formats, frequencies and addresses. Cost is $8.95 plus $2 shipping from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147. Many shortwave equipment dealers stock it also.

Pirate activity continues to be high. Joshua Wilkes in Kentucky heard pirate **CKLW** on 7413 at 0032 with host John Lodge playing Motown songs, commercial parodies and commercials off "TV 50". William Hassig of Illinois had this one at 0030, giving the familiar P.O. Box 109, Blue Ridge Summitt, PA 17214 address. Robert Ross of Ontario also had them at this time.

Skip Harwood of California found **Radio Anarchy** on 7417 at 0210. Skip got a card from the station saying they'd use 9900 and he found them there one day at 0100 with a program of Norwegian music.

The Voice of Anarchy was heard by Hassig on 7413 at 2210 playing music related to the Vietnam War and announcing "From Chicago, Illinois, this is the Voice of Anarchy." No maildrop announced.

One Voice Radio was heard by Hassig on about 7410 at 0230 giving the Blue Ridge Summitt address.

KUSA was the first pirate log for Ron Bruckman of Maryland who heard this one on 7415LSB at 0600. The format ranged from hard rock to easy listening. The station claimed to be in Wisconsin but gave no address. They noted they'd be broadcasting to Europe on 26000 with 1500 watts and encourage listeners to send their views on the Mideast Crisis to the Iraqi embassy.

Radio Police aka **Police Radio** was heard by Mark Heuer of Indiana on 7411 at 2245 and again on 7415 at 2302 with top 40 music. Ross had them on 7413.6 to closing a couple of minutes later.

Wilkes found **Hope Radio International** on 7414 at 2333-0020 with "Jus Disgustin', the Cajun Chef". He also had them on 7414 at 0411 with heavy metal, t-shirt offers, comic commercials and the Radio Animal with pirate news. Ross had them on 7414.36 at 2335.

Action Radio was picked up by Wilkes in Kentucky on 7416 at 2344 with comedy commercials and reggae music. Doug Bauer of New York found them at 2250 on 7420.

The same two DX'ers report **Bucky Beaver**. Bauer heard it running co-channel with Action Radio Wilkes heard it in QSO with Hope Radio.

Wilkes also found **EPR – Experimental Propagation Research**, hosted by Becky and a Jimmy Stewart impersonator. This was on 7416 at 2255.

Canada's Robert Ross continues to enjoy a lot of pirate loggings. He heard **4th of July Radio** on 7415 at 0055 with a spoof on professional wrestling.

Bob had **WHO** on 7415 at 0058 announcing 50 watts and playing eerie music and funny commercials.

He heard the **Voice of Oz**, also announcing as **Radio Free Oz** on 7410 at 0247 with DJ Howard E. Lyon and music by Fleetwood Mac and others.

Another Ross log was **Radio Boner International**, on 7413 and 7415 between 2019 and 2031 sign off. The broadcast included the song "We Want the Airwaves."

And Ross had **Secret Mountain Laboratory** on 7415.87 at 2006 with country rock and hillbilly music, ID and mentions of the Wellsville maildrop.

That'll do it for this time. Keep those cards and letters coming folks! Remember that we are now largely avoiding reporting pirate QSO's: I think most of us are much more interested in actual broadcasts. Pirate operators are encouraged to write and let us know about your operation, plans, equipment and so on.

Happy pirating!

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Pirate Radio Station Shut Down, Operator Fined $2,000 By FCC

A pirate radio station in the Kingston, NY area was shut down and its operator was fined $2,000, the Federal Communications Commission said.

The FCC's national monitoring network, observed an unauthorized radio station on 1620 kHz which is just above the standard AM broadcast band. Using mobile radio-direction finding equipment, electronics engineers from the FCC's New York City office located the station in the Kingston area.

The operator of the station, David Schneider of West Shokan, NY was fined for repeated unlicensed radio operation.

The unauthorized broadcast station was playing popular music and gave "WDJI" as its call letters. The station announcer boasted that "WJDI so far has eluded Federal authorities by moving our transmitter and studio several times a week." The announcer also gave P.O. Box number in Kingston for listener reports.

Continuous Operation By VHF Ship Station Transmitters Limited

The Commission amended Part 80 of the rules to require that VHF ship station transmitters be equipped with (1) an automatic timing device that deactivates the transmitter after an uninterrupted transmission period of more than five minutes and (2) a device that provides an indication that the timer has deactivated the transmitter.

VHF channels in the 156-162 MHz band are used in the maritime mobile service by ship stations to communicate with other ship stations or with coast stations. Channels are available for safety communications, calling, operational and navigational purposes and public correspondence.

The Commission noted that while VHF channels may be used to meet a variety of communications requirements their primary purpose is to provide for the safety of life and property at sea. Therefore, it is extremely important to minimize interference on these channels. Requiring VHF transmitters to cease operation automatically after a five minute period of uninterrupted operation will reduce the number of "stuck carriers," that is, a continuous signal radiated by the inadvertent operation of a marine VHF transmitter.

All VHF ship station transmitters that are either manufactured in or imported into the United States, on or after August 1, 1993, or initially installed on or after August 1, 1994, must be equipped with an automatic timing device that deactivates the transmitter and reverts the transmitter to the receive mode after an uninterrupted transmission period of five minutes, plus or minus 10 percent. Additionally, such transmitters must have a device that indicates when the automatic timer has deactivated the transmitter. VHF ship station transmitters initially installed before August 1, 1994, are authorized for use indefinitely at the same maritime station.

Security Coding Requirements For Cordless Telephones Adopted

The Commission amended Parts 15 and 68 of its rules to require cordless telephones to be equipped with security provisions that protect the public switched telephone network from unintentional line seizure and telephone dialing. The Commission took this action to reduce the harm being caused by cordless telephones to the "911" Emergency Services Telephone System and to the telephone network in general.

The 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 a conversation.

The Commission noted that interference to the public switched telephone network from cordless telephones is a growing problem. There appears to be evidence, it said, that the "911" Emergency Services Telephone System is being adversely affected by unintentional dialing by cordless telephones. Cordless telephone security coding, which could provide an effective solution to these problems, is not being implemented at a satisfactory rate on a voluntary basis by manufacturers. There is no indication that the percentage of cordless telephones being marketed with security coding is significantly increasing or that marketplace forces will eventually cause such features to become standard on cordless telephones. Regulation is needed to protect the public switched network, the Commission said, and, based on the comments received on this matter, a digital security coding requirement of a minimum of 256 combinations will offer a satisfactory means for achieving this objective, provided such codes are varied adequately.

Cordless telephones will be required to incorporate circuitry which makes use of a digital security code in the dialing/ringing function to provide protection against unintentional ringing by the handset. Access to the telephone network will be permitted only if the code transmitted by the handset matches the code in the base unit. Similarly, ringing of the handset will be permitted only if the code transmitted by the base unit matches the code in the handset.

The Commission noted that it was conceivable that its objectives in establishing a security code requirement might not be achieved if steps were not taken to ensure variation of the codes in geographic areas. For example, manufacturers could use the same fixed code for all their production. Thus, units marketed in a given location could all be set to the identical code. Therefore, the Commission set requirements to ensure variation in cordless telephone codes as part of the production process and said the rules have been crafted in a way that will provide manufacturers with flexibility in how they will satisfy this requirement.

FCC Amends Rules To Relocate Novice And Technician Operator Frequency Privileges In The 80 Meter Band

The Commission amended its rules to relocate Novice and Technician Operator Class control operator frequency privileges in the 80 meter (m) amateur service band from the 50 kHz segment at 3700-3750 kHz to the segment at 3675-3725 kHz. This rule change will reduce the amount of mutual interference between United States amateur stations and Canadian amateur stations, and provide Novice and Technician Class control operators with more opportunities to improve their telegraphy skills.

Commission rules authorize amateur stations with a control operator holding a Novice or Technician operator license to transmit telegraphy in the 80 m Novice segment. This segment is designed so that beginning amateur radiotelegraphers can gain actual experience in sending and receiving telegraphy messages. In Canada, however, frequencies in the upper half of the 80 m Novice segment are used by amateur stations for telephony transmission, thus creating the potential for interference when U.S. station transmits telegraphy on the same channel and at the time as the Canadian station. Relocation of the 80 m Novice segment to 3675-3725 kHz provides a solution to the mutual interference problem.

The Commission, however, declined to adopt a proposal by the American Radio Relay League to expand the 80 m Novice segment by 25 kHz. Although the Novice

and Technician Class operators would have access to a larger frequency segment in the 80 m band, they would have to share it with large frequency segment in the 80 m band, they would have to share it with large numbers of United States stations transmitting with a higher power. Rather than less interference to stations, the Commission said that the likelihood existed for more.

Rules Governing Stolen Vehicle Recovery Systems Clarified

The Commission clarified certain aspects of its *Report and Order* amending its rules to provide for stolen vehicle recovery systems.

In 1989, the Commission adopted an order which modified the Table of Allocations to include 173.075 MHz for stolen vehicle recovery systems (SVRS) and established SVRS service rules. These rules provide that SVRSs are limited to recovering stolen vehicles and are not authorized for general purpose vehicle tracking or monitoring. In that Order, the Commission declined to establish such technical standards as vehicle identification numbering techniques, vehicle target transmitter/receiver compatibility, uniform protocols, compatible manufacturing standards, the Commission expressed concern that the process would significantly delay the introduction of this new service.

Seeking reconsideration and clarification, Vehicle Security Electronics, Inc. (VSE) and METS, Inc., asked the Commission to reconsider its decision with respect to mandatory compatibility and protocol standards. The petitioners contended that without such standards, the Lo-Jack Corporation, which initially petitioned the Commission for this service, would have a monopoly. In addition, METS sought clarification of the legality of a feature in its proposed SVRS that would enable its system to track a subscriber's vehicle seconds after an unauthorized entry. Claiming interference to other systems, VSE asked that the Commission prohibit an anti-jamming feature of the Lo-Jack system which self-activates the mobile transponder unit whenever the unit fails to receive a communication from the base station within a 24-hour period.

The Commission stated its belief that mandated compatibility and protocol standards were unnecessary and that any necessary coordination between adjacent licensees operating different SVRS could be effected by informal agreements. The Commission continues to believe that implementation of this service would be greatly delayed if it were to mandate such standards and that licensees operating SVRS may be forced to modify their systems at considerable expense. However, if experience shows that standards are necessary, the Commission reserves the right to impose them at some future time.

With respect to the Lo-Jack Corporation, the Commission said that no evidence existed to demonstrate that Lo-Jack is establishing a monopoly in this service because of a lack of standards. The SVRS rules provide that multiple systems may be established in any given area, and the petitioners have failed to demonstrate that local law enforcement officials are unwilling to consider systems other than Lo-Jack's (or multiple systems) in the same area.

The Commission said that tracking of a suspected stolen vehicle prior to the filing of a stolen vehicle report is permitted. While the rule prohibits general tracking and monitoring, the Commission does not consider system activation when a theft has likely occurred due to general tracking.

Finally, the Commission said that mobile transmitters should not be automatically activated as part of an anti-jamming feature. The Commission believes that the limited benefits of Lo-Jack's anti-jamming feature are outweighed by any interference it might cause. The Commission noted that Lo-Jack has indicated an ability to reprogram its mobile units not to utilize the anti-jamming feature.

FCC Proposes Establishment Of Interactive Video Data Service In The 218-218.5 MHz Band

The Commission proposed establishing an interactive video data service (IDVS). The Commission proposes to allocate 500 kHz in the 218-218.5 MHz band and proposes to split this allocation into two 250 kHz segments. The proposed IVDS system will allow viewers to respond to queries associated with television programming, order products and services, and offer downloading of educational and other information. In order to provide as much flexibility as possible in the type of services that may be offered and to minimize licensing burdens, the Commission has proposed to treat IVDS as a new Personal Radio Service under Part 95 of its rules. The new service would be know as the "Interactive Video Data Service."

The Commission said it believed that IVDS systems will provide the public with a convenient method for interacting with all forms of video programming, including commercial and educational broadcast television, cable television and direct broadcast satellite service. The Commission said that one of the outgrowths of advancing technology was the advent of interactive computer services which allow users to access information and services via computers. IVDS would provide a similar capability to television viewers.

This proposal was initiated by TV Answer, Inc., which, following testing of its experimental system, asked the Commission to establish a primary allocation of 500 kHz in 216-222 MHz band for an interactive television viewer response system. Although comments were generally supportive, concerns were raised concerning the possibility of interference to television channel 13 operations. To address this concern, TV Answer revised its system to protect television channel 13.

To accommodate this new service, comments are requested on the amount of spectrum needed for interactive video data services. Specifically, commenters should address whether the 500 kHz is adequate to meet the needs of IVDS system operators and viewers, and the possibility of operating IVDS systems with less than 500 kHz. Commenters are also asked to address whether additional spectrum is needed to accommodate multiple service providers and future growth in demand for IVDS.

In developing technical requirements for IVDS operation, the Commission said its principal goals are to ensure that harmful interference is not caused to TV channel 13 service, which operates on the nearby 210.0-216.0 MHz band, and to adjacent Automated Maritime Telecommunications System operations; and, to provide as much flexibility for the use of alternative IVDS technologies as possible.

The Commission believes that the approach for avoiding interference to TV channel 13 employed in the revised TV Answer system generally provides an acceptable model for the development of technical requirements. However, the Commission also believes that additional provisions are needed in the transition area near the TV channel 13 Grade B contour. Comments are therefore requested.

Because of the potential for a large number of IVDS transmitters which may be in use, a blanket licensing procedure for this service has been proposed. All cell transmitter stations and response transmitter (in-home) units would be licensed to the system licensee. The Commission believes that this approach is appropriate because the service would be offered on a subscription basis with all stations controlled by the licensee. Comments are requested on this approach.

Finally, in order to reduce the filing of speculative applications by entities having no real intention of implementing such systems and to avoid the potential for warehousing of IVDS spectrum, the Commission has proposed requiring successful applicants to construct at least 10 percent of the proposed all transmitter stations within five years, with periodic progress reports. Licensees would forfeit their license if they fail to meet these requirements. A five year license term for IVDS licensees is proposed. Comments are requested on this approach and proposals for other criteria are invited.

Private Radio User Advisory

The Commission receives numerous public inquiries about letters sent by private firms that have the appearances of official government correspondence. These letters

often use words like "licensing," "federal," "business," and "radio" in the firm's name or on the firm's stationery. People receiving these letters are often left with the impression that the correspondence is being issued by the Federal Communications Commission. These private companies are *not* part of the Commission or any other government agency even if such keywords as these are part of the company's name.

A number of these private companies offer to assist radio users in filling out and submitting FCC forms to apply for a radio license or to renew an existing or an expired radio station license. Private companies obtain a radio user's name and address by reviewing applications and licenses, which the Commission must make available to the public. Radio users receiving such correspondence need to recognize that just because a copy of their FCC application or license is enclosed, a letter may not be from the FCC.

The Private Radio Bureau neither encourages nor discourages radio users from using these firms. Such a decision is completely at the discretion of the applicant. The fees charged by these private firms need be paid only if a radio user first chooses to use the services of that company. Radio station licensees, applicants for radio station licenses, and members of the public should be careful to distinguish between official government correspondence issued by the Federal Communications Commission and letters issued by private firms soliciting business. A private radio applicant or licensee unsure whether a letter is from the Commission or a private company should contact the Licensing Division at (717) 337-1212.

In addition to the above, some private companies also send letters to licensees offering to sell their abridged versions of the FCC's Rules. Many licensees find these publication useful in understanding the private radio rules. While licensees are responsible for *knowing* and *obeying* the rules that govern their specific radio service, the vast majority of private radio licensees are not required to have a copy of the Rules. Only compulsory ship licensees are required to actually *possess* copies of the Rules that govern their radio service. The Commission's Rules (Title 47 or Code of Federal Regulations or "47 C.F.R.") are available for review at many libraries, particularly law school and federal agency law libraries, participating in the Federal Depository Program. Copies of the Rules are also available for purchase from the Government Printing Office, Washington, DC.

The GPO telephone number is (202) 783-3238. Two paperback volumes of Title 47, "Parts 0 to 19" and "Part 80 to End," relate to private radio licensees. Updated versions are available in October each year.

FCC Amends Rules To Implement Final Acts Of 1987 Mobile WARC

The Commission amended its rules to continue the implementation of the Final Acts of the 1987 World Administrative Radio Conference for Mobile Services (1987 Mobile WARC). Specifically, the amendments substantially revise the channelling plans in the high frequency bands between 4000-27500 kHz (HF bands) allocated exclusively to the maritime mobile service.

These revisions reflect an increase in frequency spectrum for automated digital selective calling (DSC), narrow-band direct-printing (NBDP), and radiotelephony (voice), and a decrease in frequency spectrum for manual Morse code telegraphy. DSC and NBDP are modern techniques for conducting radio communications. DSC is a system used to establish contact with a station or group of stations automatically by means of radio. DSC essentially provides direct dialing capability to the maritime community for conducting voice communications. NBDP is a system used to provide (printed) messages automatically by means of radio. Operation on these new frequencies may not begin until July 1, 1991.

To accomplish the changes from manual to automated technologies, the existing maritime frequencies between 4000-27500 kHz were also rearranged. At 0001 hours Coordinated Universal Time (UTC) on July 1, 1991, over 9,000 public and private coast stations must change frequency in accordance with revisions to the international Radio Regulations adopted at the 1987 Mobile WARC. Over 40,000 ship stations also will need to change frequency as of that date. Coast station licenses that were issued over the past year include both sets of frequencies (i.e., one valid until June 30, 1991, and the other effective July 1, 1991). On or about April 1, 1991, the remaining licensees will be sent a direct mailing showing the frequencies that are effective July 1, 1991. Ship stations do not need an updated license because their band authorization remain valid. They must change, however, to the new operating frequencies to conduct communications.

This is the second in a series of three proceedings to implement the Final Acts of the 1987 Mobile WARC. These amendments will bring the United States into conformance with the international provisions without delay. By taking this action now, the Commission will give all parties the longest possible time to effect the necessary changes. The FCC noted, however, that the U.S. Senate has not ratified the Final Acts of the 1987 Mobile WARC. Should any provision of the Final Acts not be ratified as written, further amendments of the rules may be required.

Automated Maritime Telecommunications Systems To Be Allowed Nationwide

The Commission has amended its rules to permit Automated Maritime Telecommunications Systems (AMTS) operations on a nationwide basis. AMTS provides automated voice and data communications, somewhat like a cellular phone system, for tugs and barges to use as they move along an entire waterway.

The current rules permit AMTS to serve the Mississippi River Systems, the Gulf Intracoastal Waterway (GIWW) and Gulf of Mexico. One AMTS has been authorized, Waterway Communications System, Inc., operating in the Mississippi River System and the GIWW.

The Commission had proposed permit-

ting AMTS operations in the 216-220 MHz band on a nationwide basis and relaxing mileage restrictions on coast stations operating on frequencies below 217.000 MHz in the vicinity of a TV channel 13 station.

In this First Report and Order, the Commission is allowing AMTS operations nationwide. However, the FCC deferred consideration of issues pertaining to restrictions on coast stations' use of frequencies below 217 MHz in the vicinity of channel 13 until it considers issues raised by TV Answer, Inc.'s petition for rulemaking seeking a portion of the 216-222 MHz band for a new interactive video and data service. The Commission adopted a Notice of Proposed Rulemaking on TV Answer's proposal today.

The AMTS band, at 216-220 MHz, is adjacent to TV channel 13, which is at 210-216 MHz. When the Commission established the AMTS, it found potential for interference to reception of television, particularly channel 13 and also channel 10, and adopted rules to minimize this possibility. There are 80 channels in the AMTS, divided into four groups of 20, Groups A, B, C and D. Group C and D frequencies are closest to Channel 13. Applicants proposing to locate a coast station on Group A or B frequencies within 105 miles of a channel 13 station or 80 miles of a channel 10 station must submit an engineering study showing the means of avoiding interference within the Grade B contour of any affected TV station. More severe restrictions apply to the Group C and D frequencies. They cannot be used at all for coast stations within 105 miles of a channel 13 station.

The Commission noted that there have been no cases of interference involving Waterway Communications' system since it began operations in 1986. Waterway operates on Group A and B frequencies (above 217 MHz).

The Commission said that, while the time had come to make available the benefits of AMTS on a nationwide basis, it would delay the full use of the Group C and D frequencies pending the outcome of the TV Answer petition. This will allow full use of the A and B channels rather than allow the band to lie fallow in most parts of the country, it added.

Therefore, the Commission said it would make Group A and B channels available for AMTS service on U.S. waters nationwide and modify the requirement that an AMTS system cover 60 percent of a waterway. It also simplified licensing by providing a system licensing approach, which authorizes AMTS users without licensing individual mobiles.

The Commission said that the changes in the availability of the Group A and B channels nationwide would not increase interference. It said the AMTS rules require applicants to design systems to avoid interference and to eliminate interference should it occur. Licensees will be required to eliminate TV interference caused by their stations within 90 days or cease operations. ■

HOW I GOT STARTED

Popular Communications invites readers to submit, in approximately 150 words or less, how they got started in the communications hobby. We'll accept them (preferably) typewritten, or otherwise easily legible. If you 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 or not it is used. You need submit your story only once; we'll keep it on file to consider it for future issues. All entries become the property of *Popular Communications*.

Entries will be evaluated taking into account if the story they tell is especially interesting, unusual, or amusing. We reserve the right to make any necessary editorial changes to correct grammar and improve style.

Each month, we'll select one winner. That person will receive a 1-year gift subscription (or subscription extension if already a subscriber) to *Popular Communications*.

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

Our Winner For May

The winning entry this month was sent in by Walt Petersen, W2JDH, of Deland, Florida. He told us:

In 1950, my friend Ron and I were both 11 years old. We wanted to have our own communications system, and my dad suggested a battery-run buzzer system. We strung out a pair of wires down clothesline poles (4 city lots) between our houses. That permitted us to "talk" haltingly via CW.

"Adolph, the custodian at our school, was studying to be a ham and invited us to practice our CW with him. After school hours, seated next to the school furnace, we tapped out CW, and then studied radio theory. In July of 1951, Adolph became W2FSL. Ron and I became Novice licensees WN2JCO and WN2JDH. Inasmuch as July of 1951 was when the Novice license came into existence, it may well be possible that Ron received the first Novice license ever issued. Neither of us heard another Novice callsign for weeks after our licenses arrived.

"I'm still active as W2JDH, and I earn my living in electronics. I owe much of it to these two fellows and the interest we shared in communications. Adolph, W2FSL, is 90 years old and lives in upstate New York. Ron Schiller, W2JCO/W5YVS, lives near Atlanta, Georgia. After 40 years, we are all still in contact with one another."

EMERGENCY

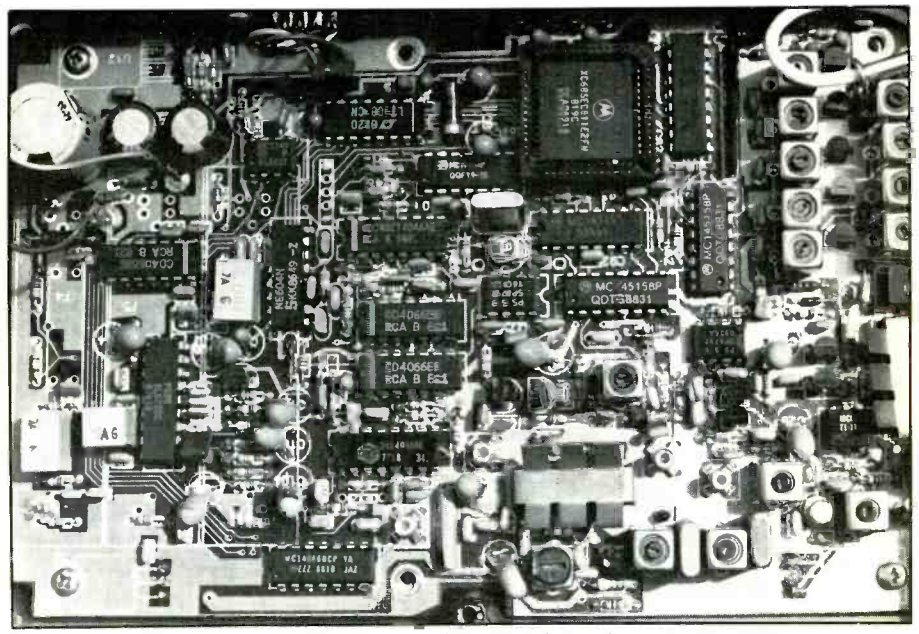
COMMUNICATIONS FOR SURVIVAL

BY GORDON WEST, WB6NOA

PC-Controlled HF Receiver

If your emergency mobile command post or emergency operating center uses a PC-type computer, imagine the possibilities of plugging into a little magic box that turns the computer into a 9,999 channel shortwave set. This would allow a computerized scan of high frequency weather channels, single sideband ham frequencies, or instant selection of weather facsimile reception to track major storms.

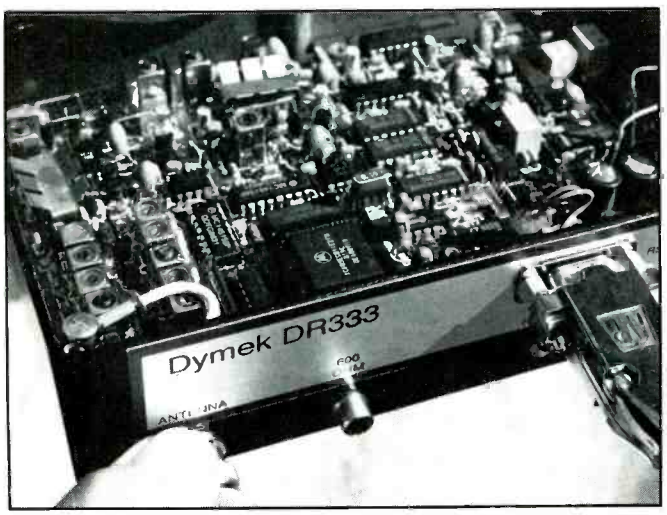
"Frequency, mode, bandwidth, IF and audio levels are controlled with computer speed from this tiny box," comments Wes Olson, communications consultant to shortwave equipment builder, George McKay. "As many as 9,999 channels may be stored, and 999 upper-lower band scans may be accomplished on your own home computer when tied into the tiny receiver box," adds Olson. Many of you may recall that George McKay is the legend behind the McKay Dymek DR-33 high-fidelity shortwave set used by broadcast band DX'ers throughout the world.



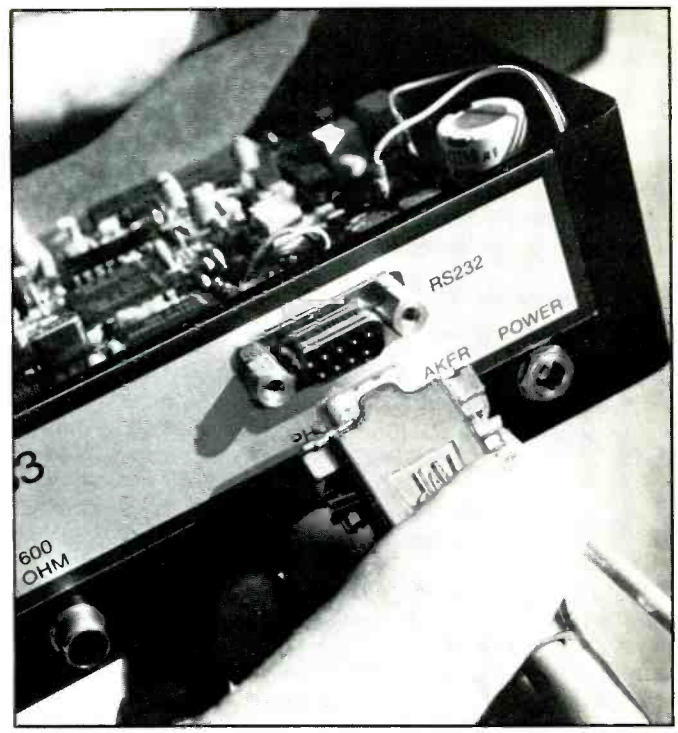
Close-up view of the insides of the digital signal process receiver.

The receiver is completely enclosed within an RF-shielded box, and pulls in frequencies from 10 kHz to 29.999 MHz in AM, upper sideband, or lower sideband. In our exclusive Popular Communications "first unit review," we measured AM sensitivity as better than 1 microvolt, frequency stability after 2 minutes of warm-up as better than 10 ppm, and dynamic range of 100 + dB. The little receiver runs on 12 volts direct current, and power consumption was less than 500 milliamps (½ amp) at normal volume settings.

Digital signal processing (DSP) is what makes this tiny receiver so unique and compatible with almost any type of IBM PC computer system. "Here is an output jack for an 8-ohm audio speaker or headphones, plus an auxiliary jack for a tape re-



There are no controls to adjust on the black box receiver—the computer does it all.



Your PC home computer simply plugs into the back of the DSP receiver.

corder," adds Olson. "The design engineer of this DSP receiver asks to be kept confidential, but I can assure you his background in building military equipment is extensive," adds Olson. The unit is ideal for field use on a portable computer that may only contain 256K and RAM and a single 360K disk. An RS232 serial data port plugs into the computer com port, and the computer now acts as the operating control for the radio set.

All conventional receiver functions, plus the parameters of channels and scans, are displayed on the computer screen. Queues and prompts for the operator let the receiver operate with ease. Scan data may be logged in the computer memory, and retrieved by conventional means at the operator's option for conversion to hard copy or other storage.

During our testing, we were surprised not to hear many birdies on the high frequency band. This "birdy-free" reception was achieved by plugging into the little receiver's 50-ohm, antenna socket, good quality coax out to be a big mobile whip antenna 30 feet away. "As long as the communicators are using a well-shielded and FCC-approved computer, high frequency reception should be clean as a whistle," comments Wes Olson.

When this tiny digital signal processing receiver is tied into a home-style computer with hard disk, optional software may also achieve the capabilities of spectrum analyzer. This would allow you to bracket an upper and lower frequency displayed on the screen, and look for activity between 2 given spots. We found it took a couple of seconds for the spectrum picture to be painted, so we chose to look at 500 kHz of spectrum to check for signal activity. There was no mistaking when the display would pass over an active signal.

There are absolutely no user controls on the receiver itself. Everything works off of the computer. This allows you to bury the RF-shield receiver out of the way, in your emergency mobile unit or EOC. After 3 hours of operating, the unit remains as cool as a clam, and we were amazed at the parameters of the receiver we could control through digital signal processing from our portable and home computer system.

The receiver model number is aptly named "DR-333," similar to the model number of the very popular DR-33 McKay Dymek shortwave receiver. "Any emergency communicator using a conventional high-frequency receiver will find this general coverage computer receiver easy to learn with the software supplied, in minutes," adds Olson. The suggested retail price is under $1,500.

Olson indicates they are right now working on a VHF/UHF version of this same receiver for scanner enthusiasts on FM frequencies. Expect to see this product available sometime this fall.

For application notes on this unique receiver, write ICI Communications, PO Box 19553-113, Irvine, CA 92713. ■

Listening Post *(from page 50)*

2055 Mideast music; woman with news at 2104. (Ross, WA; Moser, PA)

Taiwan: Voice of Free China, 11740 at 0207. (Carson, OK)

Thailand: Radio Thailand, 9665 with news at 1300, just under co-channel R. Rumbos, Venezuela. (Story, TX)

Tunisia: RT Tunisienne, 7475 at 06750, strong in AA. (Judkins, VA) 11550 in AA at 0423; 0430. (Ross, WA; Perry, TX)

Togo: RT Togolaise, 5047 at 0525 with chimes IS and FF sign on. (Moser, PA)

Turkey: Voice of Turkey on 9445 at 0000 in TT; 0415 in EE. (Judkins, VA) 9825 in GG at 2044. (Ross, WA)

Ukraine SSR: Radio Kiev on 5905 at 1511. (Ross, WA) 17690 at 0053 in EE to 0100, then Ukrainian. (Carson, OK)

Unidentified: 7255 at 0405 in possible AA. Also 3365 at 0209 in SS. (Perry, TX) 7572 USB with EE sports interview. (Judkins, VA) Probably a VOA feeder. Editor)

United Arab Emirates: UAE Radio, Dubai, 13675 at 0330. (Carson, OK) 21605 at 1330-1400 and again at 1600-1630. (Trindall, ONT)

United States: KTBN (ex-KUSW) 7510 with religion at 0530. (Judkins, VA)

WHRI, 7315 and 9495 at 0010 with PP to Europe and South America. (Judkins, VA)

WMLK, 9465 at 0621, ID and address at 0635. (Carson, OK)

Uruguay: Radio El Espectador, 11835 at 0028 with sports in SS. (Reyes, Mexico)

USSR: Radio Moscow, RR ID as "Gostel Radio" at 1448 on 6035. 7115 at 0335 in EE. Also 7270 at 0632, 17700 at 2315, 17795 at 1413 and 17810 at 1507. (Carson, OK) 7175 at 0658. (Moser, PA) 9685//9765//11840//15475 at 1830. 17790//17810 at 1520 and 17780//21450 at 1540. (Judkins, VA)

Radio Moscow feeder outlets: 9180 USB in RR at 0710; 13745 USB in RR at 0620 and 15490 USB at 0200 sign on in RR. (Judkins, VA)

Vladivostok or Yerevan Radio, 4040 with music at 1504, in RR. (Ross, WA)

Petropavlovsk-Kamchatka Radio at 1510 in RR on 4485. (Ross, WA)

Radio Peace and Progress, 15495 at 1315 in unidentified language. (Northrup, MO)

Vatican: Vatican Radio, 9605 at 0050. (Moser, PA) 11745 at 0212 with IS to SS sign on at 0215. (Carson, OK)

Venezuela: Radio Valera, 4840 in SS with music and commercials at 0911. (Judkins, VA) Station ID, jingle at 1014. (Johnson, IL)

Radio Tachira, 4830, music and occasional ID's at 0245. (Judkins, VA) 0309 with drama and commercials in SS. (Moser, PA)

Vietnam: Voice of Vietnam, 9840 at 2333 with Vietnamese music and features in EE. (Carson, OK)

Yemen: San'a, in possible AA at 1518 on 5950, heavy QRM. (Ross, WA)

Yugoslavia: Radio Yugoslavia, 5955 at 2130 sign on on FF, then EE at 2000. Also 15165 at 1930 to western Europe. (Judkins, VA) 11735 at 0110. (Moser, PA) 17725//21715 at 1300 with IS, world and home news. (Carson, OK)

That's the lot. Let's raise our cups to the following:

Miguel Angel Reyes, Morelia, Mexico; Paul Judkins, Manassas, VA; Daniel Trindall, Green Valley, Ontario; Jim Ross, Vancouver, WA; William Moser, New Cumberland, PA; Mark A. Northrup, Gladstone, MO; Edward Bevens, Avon, MA; Larry R. Zamora, Grand Forks, ND; John Carson, Jr., Norman, OK; Kevin Story, Midland, TX; Bjorn F. Vaage, Granada Hills, CA; Tim Johnson, Galesburg, IL; Mike Perry, Beeville, TX and Gerald Smiley, Milwaukee, WI.

Until next month—good listening!

Beaming In

(from page 4)

$100,000 for the antenna system. Then total in the cost of the land, the physical structure to shelter the station, the cost of studio equipment, surveys, environmental impact studies, engineering expenses, legal fees, and paying for the great amount of electricity to run the transmitter. The transmitting site will need to be located in a rural area, and so it might also be necessary for the station owner to pay for bringing the electricity to that location. These, plus many other incidental costs (salaries, studio equipment, programming, etc.) mean that unless one has easy access to at least $1-million to $2-million to get the project rolling, then there's no point in thinking about it as a serious possibility.

That's not all, however. The prospective shortwave broadcaster must be able to convince the FCC that the station to be built is primarily intended for serving listeners beyond the borders of the USA. That is to say, it must be running sufficient power, and the antenna system must have sufficient gain and be so oriented that the station can convincingly support its claims of being able to deliver a high level signal to one or more specific overseas areas, such as Europe, or Asia, or wherever. Each proposed service area could well require a completely different antenna array.

The FCC frowns on any hint that a broadcaster has intentions of establishing a shortwave station in the USA that is being put on the air to mainly cater to American audiences. That audience, the agency apparently feels, is the sole property of domestic AM, FM, and TV broadcasters.

Yet, thusfar, most American advertisers don't seem overly enthusiastic about running commercials on stations that are established to serve only an overseas audience. This could be a serious marketing error since there are 2.8-million nonmilitary Americans living abroad, most of them in Europe. These people, as well as the millions of others around the world who speak English, are an audience waiting to be addressed by sharp American firms via commercial shortwave broadcasters. Can you imagine what aggressive broadcaster Ted Turner could accomplish with a commercial shortwave station, if given a chance?

But can you blame broadcasters who investigate the possibilities of opening a purely commercial shortwave station from becoming readily dissuaded from doing so when they find out what's involved, including the restrictions? They get the message that they'll be entering a market where it's going to be very tough staying in business.

Not-for-profit missionary stations deal with these things without the mundane worries of paying taxes, or the need to line up advertisers to pay the bills. Donations and offerings from listeners, perhaps bolstered by some brokered programming revenue, are sufficient to allow them to thrive on shortwave. I'm not knocking it, merely pointing out why there are so many missionary shortwave stations in the USA. But, unfortunately, that's also why there are so few of any other kind!

Fact is, international shortwave is a bonanza to the multi-billion dollar televangelism industry. The USA is where the concept of instant-salvation, media-based religion was invented, where it grew and came to fruition. We Americans do it best. Thanks to domestic radio, TV, satellites, and cable, many powerful and wealthy national media ministries have risen. Despite those ministries that have fallen in scandal, this is obviously a popular movement that brings many people happiness and, incidentally, can be extremely lucrative.

But domestic televangelism is highly competitive, so the field has become saturated. Therefore, it was an astute move on the part of several media ministries to open up shortwave broadcasting as an untapped frontier. It's an effective and expedient way to reach out to distant areas. The revenue comes in and enables them to become self-perpetuating by buying, building and operating additional broadcast media. At least one of the American shortwave missionary broadcasters is mostly a relay of the audio portion of their domestic TV programming!

If these broadcasts bring salvation, then that's fine. I'm all for the world getting salvation—as much salvation as it can handle. But, something is lopsided. The overwhelming proliferation of these stations, in the face of the scarcity of purely commercial American shortwave broadcasters, serves only to make commercial stations all the more conspicuous by their absence.

Wouldn't you think that a government agency would be doing everything possible to innovate, fight for, and ensure the success of all who look to it for regulation, licensing and guidance, and also work for the benefit of the public? One could come to the conclusion that the FCC has deliberately established regulations to virtually eliminate the likelihood of commercial shortwave broadcasting stations existing in the USA.

The only two possibilities are that it was either done intentionally, or it wasn't. If it wasn't intentional, then why not scrap these awful regulations and make it so that commercial shortwave broadcasting becomes feasible, and licenses can be more reasonably obtained? I mean something realistic, like a minimum of 1 to 5 kW fed into a dipole antenna or rotatable beam, and no stipulations as to where the signals shouldn't be heard. Allow the stations to originate programming, or relay the programs of their sagging AM affiliates.

If it was intentional, then the public is entitled to some explanation as to why this aspect of broadcasting is being hamstrung by regulations that don't allow it to do the same

thing as other broadcasters in the Americas. Explain why there can be stations like 1 kW *Radio Anhanguera* licensed on 11830 kHz to someone in Brazil, or a 500 watt *Radio Super Q* on 9680 kHz operated by a guy in Mexico City—but Americans can't put stations generally equivalent on the air.

I perceive the regulations as having been set up as a one-two punch to depress the development of commercial shortwave broadcasting. Let's face it, if the FCC were to announce that they might liberalize the regulations to open the way for these stations, commercial FM and especially AM broadcasters would lash out against what they would initially view as new competition for a market-share of the listeners and advertising dollars.

Yet, for millions of Americans who don't live in major cities, it's no longer possible to comfortably listen to AM radio at night. After sunset, most frequencies are a jumble. The few 50 kW stations that can be pulled through are subject to fading and noise. Local stations running with reduced night power and/or directional night antenna patterns are often marginal more than 25 miles away. Outside urban areas, nighttime AM radio can sound pretty crummy on a clock radio, an AM/FM table radio, or anything less than a good communications receiver.

But, if you've got a communications receiver, or a world band portable, why bother? You can switch right over to shortwave and take your pick of hundreds of clear signals so long as you aren't interested in much variety when it comes to American stations. Truth is, this could be developed into a spectacular new market for American broadcasters to enter with 5 kW or less, or lots more power for those who wanted to reach the world market with their programs and commercials.

Let's see some new 19, 22, and 49 meter band commercial stations. Maybe the FCC should try to get the ITU to go along with letting 1 to 5 kW American commercial stations with dipole antennas use the 60, 90, and 120 meter regional broadcasting bands. Such operations wouldn't interfere with existing broadcasting since these bands aren't presently used within the Western Hemisphere, and two-way use there is less than it was when those rules were drawn up.

The question is whether FCC regulations are being used to artificially manipulate the natural evolution of broadcasting. If so, should regulations be used for such a purpose?

I might be wrong. Perhaps it only seems as though the regulations have been deliberately weighted against the development of commercial shortwave broadcasting in the USA. Could be that I've added up 1 and 1 and gotten a sum of 3. If so, I'd appreciate better information and insight.

Still, numbers don't lie. Somehow there should be a chorus of widely divergent shortwave voices depicting the majority of Americans and our many lifestyles and habits, our wit, music, racial and ethnic heritages, political and religious beliefs, commercial products, and points of view.

The USA stands out in the Western Hemisphere by making it difficult for commercial shortwave broadcasters to exist. Too few Americans have access to a shortwave broadcast microphone. We need, and are entitled to, suitable representation. If WYFR can have 37 frequencies, surely there can't be any logical reason to continue to make it so difficult for Americans to obtain licenses for commercial shortwave broadcast use.

A cursory tune across the international broadcasting bands might give you the idea that the VoA may have enough frequencies. And it sounds like an American missionary station is operating about every 25 kHz. For now, it sounds to me as if we have a sufficient number of both of these types of shortwave stations dotted across the international bands. Now it's time to spice things up with an equal number of purely commercial stations in order to round out this image. It's time for some answers and some action. What do you think? Why not let me know?

This issue is dedicated to the Allied Forces in the Persian Gulf. Our thoughts are with you. We salute you, and look forward to your returning home soon, and safely. You're doing just fine! ■

COMMUNICATIONS SHOP

Advertising Rates: *POP'COMM* subscribers are entitled to one FREE 30-word, non-commercial classified ad per year. Enclose subscription name label with ad copy. For those people not in the previously mentioned group, non-commercial ads are 30 cents per word, including abbreviations and addresses; minimum charge $6.00 per issue. Ads from firms offering commercial products or services are $1.00 per word; minimum charge $20.00 per issue. Boldface words are $1.20 each (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.

SCANNER MODIFICATION INSTRUCTION MANUAL. Cellular modification instructions for the PRO2005, PRO2006, PRO34, BC760XLT, BC950XLT, BC200XLT & BC205XLT. Remote Control for PRO2005, PRO2006, BC760XLT & BC950XLT. Transportable power ideas. Increase PRO2006 speed. Pictures, diagrams, list of over 1300 frequencies, more. Only $10. Above individual cellular instructions (specify) $3. Individual remote instructions $3. Add 100 Channels to the BC100XLT $5. BC200XLT with cellular $249, BC760XLT with $279. Catalog and copy of **EAVESDROPPING for FUN and PROFIT** $3. CC, MO or COD (COD $20 min.) to: RF PRODUCTS, PO Box 1084, Montgomery, Alabama 36101 (205) 244-2050.

ICOM IC-R1 Communications Receiver - Handheld portable scanner. Wideband frequency coverage: 100 kHz to 1300 MHz continuous coverage. Signal strength indicator. 100 memories. 10 banks of search frequencies. FM, Wide FM and AM modes. Selectable channel separation: 0.5, 5, 8, 9, 10, 12.5, 15, 20, 25, 30, 50 kHz. Clock and power on/off timers. Built-in NiCd battery. Many other features. Uses same accessories as other ICOM handhelds. Includes AC adapter/charger, antenna, carrying strap, and belt clip. Dimensions 1.9"W × 4"H × 1.4"D, weight 9.9 oz. New with warranty. $495. (703) 222-7554.

PAN-COM INT'L CATALOG. Over 350 Kits, Plans, Books about Licensed/unlicensed AM/FM broadcasting, Ham/CB/SW/DX amplifiers, 1750M transmitters, Surveillance devices, Computers/Software, Science Projects, MORE. $1.00 refundable. Box 130-P05, Paradise, CA 95967.

DESCRAMBLERS: OAK M35B, $39.95. Also **Jerrold, Zenith, Scientific Atlanta,** etc. Guaranteed. Cable Plus, 14417 Chase #481-K Panorama City, CA 91402. 1-800-822-9955.

FOR SALE: Used Viejo's VCR & FAX manuals and videos $100 each plus S/H. Pop'Comm issues 1984-90 $100 plus S/H. MT 1987-90 $75 plus S/H. Dan Smith 844 S. 32nd St., Springfield, OR 97478. (503) 726-1986.

HELP! Verify my KCS9190 CB callsign from 1969. Can you look me up in your callbook and send a copy? Callsign in Feb 91 issue was a misprint. Michael D. Neff, 832 Diamond Drive, Gaithersburg, MD 20878.

RARE Midland AM/SSB Handheld. 20KC slide, crystal control 12 v power, extant jack spkr jack. Like new $125.00. (602) 535-5774. Bob.

FOR SALE: Realistic PRO-2005. 400 ch, 1300 MHz, teles. ant. cellular modified. Like new - $325. Will ship (315) 442-6758. Ken.

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 + $3.50 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.

WANTED: A manual and/or schematic for a Hallicrafters SX-99 receiver. Will pay copying costs and postage. Call Paul (10am-4pm EST) at 1-800-631-4461 EXT 277.

COLLECTOR seeks tube type Citizens Band radio base stations. Must be clean, complete and in good working order. Please write to Louis J. Femine, 440 Inglewood Circle, Las Vegas, Nevada 89123.

FOR SALE: PRO 2020 $150.00, PRO 2009 $75.00. Both are in working condition. John L. Boresta, 17 Saccheri Ct., Staten Island, NY 10308. (718) 317-7738.

FREDERICK FDM DEMODULATORS, Models 1202-RA, RB, RE and RF. Approx. 65 pieces, used & unused, most tested and working. $10 ea, sold ONLY AS A SINGLE LOT, pickup only, will not pack. Call Webb at Electrovalue, M-F, 10am-5pm NJ time: (201) 267-1117.

FOR SALE: Realistic TRC -210 handheld CB Radio, 40 channels, with case and external mike. In good condition $50.00. O.B.O. Darrin Kossky, 2312 Onondaga Avenue, Placentia, California, 92670, (714) 996-3770.

REALISTIC DX302 Shortwave Receiver 150. Lorad XR70 Programmable 25 watt Boch. V.H.F.-F.M. High band Scanning Transceiver With C.T.C.S.S. 200. videocipher VC 11 300. R.D. Carter, Box 418, Vass, NC 28394. MO only.

JRC NRD-525 Receiver, Like New, $895. George Miller, 2723 Saddle Ridge Lake Dr., Marietta, GA 30062.

SCANNER MODIFICATION HANDBOOK Vol. 2 by Bill Cheek ("Doctor Rigormortis"). Big 220-page book with 18 more mods for PRO-2004/5/6, PRO-34, PRO-2022, BC-760/950XL, BC-200/205XL, now available. $17.95 plus $3.50 shipping. NY State residents include $1.35 tax. If both books, (Vol. 1 & 2) are ordered at the same time, send only $4.50 shipping. Order from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725.

COMMODORE 64 HAM PROGRAMS—8 disk sides over 200 Ham programs--$16.95. 29¢ stamp gets unusual software catalog of Utilities, Games, Adult and British Disks. Home-Spun Software, Box 1064-PC, Estero, FL 33928.

MTC-101 Microphone Test Center—repair and test any CB microphone only $64.95 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.

CBs, Scanners, radar detectors and accessories at discount prices. Cobra, Uniden, Wilson, etc. C.O.D., Visa and Mastercard accepted. Toll free orderline available. C&H Distributing, PO Box 2286, Coeur d'Alene, ID 83814. (208) 667-5459.

ICOM R-9000 $4,000, **Universal M-7000** $900; both mint condition. **ICOM R-70** excellent condition $350. All with original boxes. Terry (505) 897-4252.

GRE super converters and amplifiers, connectors, Coax, ARRL books, Surplus tubes. ATKINSON & SMITH, INC., 17 Lewis St., Eatontown, N.J. 07724. 1-800-542-2447.

LICENSED EXPORT DEALER LOOKING FOR MANUFACTURERS OR WHOLESALERS OF EXPORT CB EQUIPMENT. IF I CAN USE YOUR INFORMATION I WILL SEND $10.00 FOR YOUR HELP. AAA EXPORT RADIO, PO BOX, 13782, SAVANNAH GA 31406.

MEN OF ACTION AND ADVENTURE - Order our 50-page catalog! Books and videos on surveillance and countersurveillance, espionage, private investigation, new identity, improvised explosives, revenge, firearms, survival, and many other outrageous and controversial subjects. Get yours today! Send $1.00 to: PALADIN PRESS, P.O. Box 1307-1EP, Boulder, Colorado 80306.

PRC-41/A 225-400 MHz, 115 volt power supply, handset and antenna $200 OBO. PRC-47, 2-12 MHz, $200 OBO. Larry Brown, Box 1312, Sonora, TX 76950.

INDIVIDUALS needed to record radio stations in California. Will pay! Write: PO Box 51554, Durham, NC 27717.

Uniden HR-2510: Complete Modifications For Frequency Coverage, Modulation, RF Output, R.I.T., and More - $10. N. Keith, 351-A Ferdinand, Longwood, 32750.

PRO-2004/5/6 OWNERS: Search-and-Store finds unknown frequencies automatically. Internal no-holes installation - Keyboard control - Wired-tested-postpaid: Ten channel $24.95 - Selectable to 255 channels $44.95. US checks or MO. SASE for information. Key Research, POB 846P, Cary, NC 27512-0846.

NEW UNIQUE! CB LOG BOOK Limited offer, send $5.00 to BERMAN PUBLISHING, Suite 155, 17090 Van Buren Blvd, Riverside, CA 92504

BLIND, Bedridden, veteran. Seeking donations of shortwave radio, used fax machine, wp, pc, and I also love music. Would like to receive letters from all over the country. Please call Richard Lewis at (213) 938-5347, or write 5909 West 6th St, Hollywood, CA 90036.

WEATHER INSTRUMENTS. Increase your shack's weather monitoring capabilities. Affordable anemometers with digital readout of wind direction and speed, lightning storm sensors, and many other devices including complete computerized weather stations for IBM/compatibles. Free catalog/stamp appreciated. KA5HUT, POB 309P, Cresson, TX 76035.

NEW! 7th Edition: Top Secret Registry of Government Radio Frequencies, by Tom Kneitel. Grown to gigantic 240-pages! 1000's of new listings, frequencies, stations for all scanner owners, nationwide. Includes: FBI, DEA, Customs, Secret Service, FCC, Immigration, Border Patrol, U.S. Attorney, ATF, Treasury, Fed. Prisons, U.S. Marshal, CIA, Postal Service, NSA, NORAD, USAF, USN, Army, USMC, FAA, NASA, DOE, NRC, FEMA, Dept. Agriculture, National Parks, USCG, EPA, DOT, V.A., UHF aero (225 to 400 MHz) listings, bugs & surveillance freqs, agents' lingo, codes, many more agencies, lots more info! Expanded Canadian listings. Only $19.95, plus $3.50 postage to N. American addresses. NY State residents add $1.50 sales tax. Order now from CRB Research Books, P.O. Box 56, Commack, NY 11725. Dealer Inquiries Invited.

BUY direct our top quality uninterruptible power system—at substantial savings. These extremely reliable products available in wide range of power rating to accommodate a variety of user needs. Write today for free catalog, features a broad range of our power conditioning products. Send us your name, address, plus $1 for postage & handling to: ALPINE INDUSTRIES, 9126 Medill, Franklin Park, IL 60131.

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 $3.50 postage to North America) from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725. (NYS residents add sales tax). Dealer inquiries invited.

SCANNER FREQUENCY SEARCH SERVICE. Hear all there is to hear! SASE to: Heald, 6886P Jefferson Street, North Branch, MI 48461.

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 $3.50 postage to USA/Canada/APO/FPO) from CRB Research. Box 56, Commack, NY 11725. NY residents add sales tax. Dealer inquiries invited.

CANADIAN'S Discounted prices on Uniden Scanner's, CB's Cordless and Cellular Phones and Accessories. Send for FREE listing or request quotation. Cellular Communications, 83 Galaxy Blvd, #39 Rexdale, ONT M9W 5X6.

TRAVEL! HIGH INCOME! Radio Officers needed for shipboard employment. Must have FCC Second Class Radio-Telegraph license and background in electronics. Salary approximately $4,000 monthly to start including vacation plus full benefits. Rae Echols, W7FFF, American Radio Association, 5700 Hammonds Ferry Road, Linthicum Heights, MD 21090.

WOW! UNDERSTANDING & REPAIRING CB RADIOS by Lou Franklin. Giant 380-page technical book picks up where THE "SCREWDRIVER EXPERTS" GUIDE leaves off. Includes circuit descriptions and troubleshooting guide for virtually all CB radios: 23 and 40-channel, crystal and PLL, solid-state and tube, AM, FM, SSB, CW, American, British and export models. Covers test equipment, transistor basics, synthesizers, receivers, transmitters, power supplies, T/R switching, antennas, interference, parts and accessory sources. Over 350 illustrations plus huge subject index. Moneyback Guarantee! Only $29.95 plus $3.50 U.S. & Canadian Air Mail, VISA/MC accepted. Free catalog of unique CB books, plans, and modification kits with order. Catalog only, $2. CBC INTERNATIONAL INC., BOX 31500PC, Phoenix, AZ 85046. Thousands of satisfied customers since 1976.

RADIO MONITORS NEWSLETTER OF MARYLAND FOR THE SERIOUS SHORTWAVE AND SCANNER LISTENERS. PO Box 394, Hampstead, MD 21074. For a one year subscription: $15.00. Sample copy: one dollar.

MOTOROLA TWO WAY RADIOS, Radius Mobiles and Portables from $197.00, Three Year Warranty, Synthesized Models Available, MC/VISA, DATACOM 1-800-654-3660 EST.

AMAZING DEVICE STOPS EAVESDROPPERS! Locks out extensions, autostarts. Easy, quick fix. Plans $20.00. Parts $10.00. $3.00 S&H. **FREE** gift with order. SpyTex, PO Box 1258PC2, Austin, Texas 78718-1258.

Radio Newyork International! Listen for us every Sunday night at 9 pm (Eastern), 8 pm (Central), 6 pm (Pacific) over WWCR, 7435 kHz. All of your favorites: Al Weiner, Randi Steele, Dan Lewis, Pirate Joe, John P. Lightning, & more! Live call-in at 1-(800)-736-9764. QSL's (send SASE) from RNI, PO Box 270, Flushing, NY 11352. Spend your Sunday nights with RNI!

FREE ICOM, YAESU, KENWOOD TRANSCEIVER MODIFICATIONS! SCANNER MODIFICATIONS AND KEYBOARD TRICKS ALSO! **NO PARTS TO BUY!** (207) 674-3556 FOR TAPED INFORMATION.

Amateur Radio no Morse code requirement license approved by FCC effective Feb. 14, '91. Complete details with question and answer pools, rules & regulations. Send $15.00 for everything you need to obtain Amateur license to Dan Mobley, 1800 Williams St., Valdosta, GA 31602.

NO-CODE weekend ham class May 17-19 taught by Gordon West, Holiday Inn, New London, CT. $175. Pre-register (617) 449-6204.

BC-200, BC-205, R-4030 OWNERS. MODS to improve reception, increase battery performance and release blocked 800 MHz frequencies. **EASY**, how to instructions, diagrams and parts. **ONLY $10.00 COMPLETE!** Or **SASE** for details. RF Tronics, Dept PC, 15 Butterwood Road, Agawam, Mass 01001.

PAY TV AND SATELLITE DESCRAMBLING 1991 EDITION IS OUR BIGGEST AND BEST EVER VOLUME OF DESCRAMBLING CIRCUITS, TURN-ONS AND BYPASSES FOR CABLE, WIRELESS AND SATELLITE TV. ONLY $14.95. OTHER EDITIONS OF THE PAY TV SERIES ARE ALSO AVAILABLE. **VOLUME 1** (THE BASICS OF ALL SYSTEMS) $14.95. **BUILD SATELLITE SYSTEMS UNDER $600** $12.95. **WIRELESS CABLE HANDBOOK** $9.95. ANY 3/$29.95 OR 5/$44.95. **SCRAMBLING NEWS MONTHLY** HAS THE LATEST INFORMATION ON THE "PLAIN VANILLA" DESCRAMBLERS WHICH EMULATE B-MAC, VCII PLUS AND ORION. PLUS THE LATEST NEWS, CIRCUITS ETC. $19.95/YR. SAMPLE $3. ALL NEW CATALOG $1. C.O.D.'S ARE OK (716) 874-2088.

SCANNER/HAM RADIO/CB MODIFICATION HANDBOOKS; FREQUENCY DIRECTORIES - AERONAUTICAL, GOVERNMENT, MILITARY; books by CRB, TAB, SAM'S, ARRL; others. GRE products. Phone Orders, VISA/MC. CATALOG SAMPLER - FREE or full CATALOG $1.00 (refundable) **DOYLE COMMUNICATIONS-DPC**, Route 8 - Box 18, Lake Pleasant, NY 12108. (518) 548-5515.

Scanners, CBs, Antennas, Frequency books, Marine Two-Way, VHF handi-talkies. Write for free brochure. HPR, Box 19224, Denver, CO 80219.

NEW AR-2500 $469, AOR-3000 $895, AR-1000 $455, BC-200xlt WITH CELLULAR $259, BC-760xlt WITH CELLULAR $289, SHORTWAVES, CBs, SCANNERS, ANTENNAS, MUCH MORE!! NEW 1991 NEW AND USED GEAR PRICE SHEETS $1.25. WE TAKE TRADES!! FREE SHIPPING & INSURANCE. GALAXY, BOX 1202, AKRON, OHIO 44309, (216) 376-2402 9-5 EST.

RADIO SHACK PRO-2006 - $369.95. Add $7.50 S/H. Send certified check or M/O to: Bowers Communications, Box 62, Aberdeen, MD 21001-0062. Brand new units! Complete factory warranty!

FOR SALE: A pair of 5 channel Aerotron walkie-talkies on California Highway Patrol frequencies (low band), in working condition. Included are the batteries, and rubber duckie antennas. Radios $75.00 each, charger $45.00. Contact: Jim Rosenbluth, PO Box 21143, Washington, DC 20009.

FREE CLASSIFIED ADS. (Deadline: May 10, 100 word maximum) in the SWL. The only SWL/scanner classified publication. Buy/sell/swap shortwave receivers, scanners, freqs., hamgear, computers, more. For free ad or free sample issue call - 800-745-8951 anytime, or write Brendale's/SWL's, POB 1135, Pepperell, MA 01463.

COMMUNICATION AT ITS BEST. AR-1000, $379, AR-2500 $463, AR-3000 $879, BC200XLT $269. We also sell a variety of CBs, Radar Detectors, Phones, Ans. Machines and Accessories. **FREE SHIPPING**. V/MC. **Turbo Electronics**, PO Box 8034, Hicksville, NY 11802. Questions Welcomed. (516) 938-1946.

801-SCAN - ULTIMATE SCANNING SYSTEM for DOS PCs! 801-SCAN for ICOM R7000 or R9000 transforms your receiver! Version 3 now includes full event logging. Upgrade to serious software! IBM/clone w/640K required. Program from $94.95, interfaces from $59.95. Demo program $2.55. Specify receiver. Check or M.O. only. Free information. 801-SCAN, 397 Dal-Rich Village #212, Richardson, TX 75080.

AVOID COSTLY MICROCHIP DISASTER with special conductive charcoal foam pads! Each pad (10¾" x 2⅝" x ⅜") safely and conveniently holds up to 70 microchips while eliminating static electricity and avoiding band leads. Mail ck or MO for $8.95 + $2 S/H to: Lyonn Export and Import, 1011 Fairchild Ave., Cleveland, OH 44113.

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.**

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.

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.

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-D, Salt Lake City, UT 84152.

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.

MAKE BIG $$$! Become an American Electronics Dealer! Great profit opportunities for new businesses since 1965. Call Todd Parker, 1-800-872-1373.

MONITORING THE **CALIFORNIA HIGHWAY PATROL**. Much more than frequency listings! Nine chapters include beats, coverage, communications, even expanded 10-codes. 1991 edition only $8.95. Taibo - 448 Ignacio #172 - Novato, CA 94949.

IRAQI RADIO LICENSE! CB, Ham, Broadcasting, etc! Outrageous, colorful, hilarious! Big 5 x 8 size! Gives you the right to invade all bands, annex them, hold them hostage, then run any power, try any mode, and use the best equipment you can steal! Not only suitable for framing, but 2 are sent absolutely FREE upon request and a #10 SASE. CRB Research Books, Inc., PO Box 56-X, Commack, NY 11725.

225-400 MC RECEIVERS Tunable, Government Reconditioned. Satcom Antennas 240-270 MC Military Helical Type. New (419) 726-2249.

SURVEILLANCE - Audio/Video/Infra-red/Laser. Law Enforcement, Industrial, Private. 500 Item Catalog $7.00. Security Systems, 3017E Hudson, New Orleans, Louisiana 70131.

WANTED: Collins 51SI in excellent condition. Write stating price/condition or needs if willing to trade for collectable tubed audio components. Consider Drake R7A. Jim Widgren, 25 Marbeth Circle, Miller Place, New York, 11764.

WANTED: Pre-1970 lists of US radio stations, especially 1945-1960. White's Radio Log, Broadcasting Yearbook, etc. Will also purchase photocopies of same. Ralph Marson, 8070 Busch, Centerline, MI 48015.

INTERESTED IN TOURING ROMANIA, meeting hams and teaching newcomers the basics? Send letter with interests and relevant experience to: NEW ROMANIA COMMUNICATIONS, PO Box 192102, San Francisco, CA 94119-2102.

BEARCAT 300 excellent condition includes owners and shop manuals - $185. Will ship UPS. Eddie Muro, PO Box 308, Cedarhurst, NY 11516, (506) 791-7630.

CORRESPOND or exchange information and ideas on cassette with a ham in New England area about Ham, SWL, Utility Monitoring, Scanning and related things. KB5JBS, HCR-9, Box 28C, Mena, AR 71953.

FCC GENERAL RADIOTELEPHONE LICENSE CORRESPONDENCE COURSE. Also: Digital Electronics; BASIC Language; Computers; Electronics; Engineering; Drafting. Most courses just $39.50! Satisfaction guaranteed. Free information. American Technical Institute, 730 S. Pleasantburg Dr., Suite 486, Greenville, SC 29607.

TOUCH-TONE DECODER. Decode, store, and display touch-tone (DTMF) digits directly from your **scanner, tape recorder, telephone line**, or virtually any audio source. Decode dialed numbers received on **cordless, cellular!** PC board now available! Information for SASE. HB Technologies, POB 2771-P, Spring Valley, CA 91979.

GET DAILY-UPDATED SHORTWAVE FREQUENCY LISTINGS WITH YOUR COMPUTER! Hundreds of reception reports are input and sorted to bring you up-to-the-minute information. Dial the DOWNLOAD AMERICA BBS. Free access. International messaging. Multi-line. 24 hours/day. Modem number (203) 676-1708.

WANTED: USED Kenwood R5000, TS440S, ICOM R71A, JRC NRD525, NRD515, Sony ICF2010, or Realistic PRO2005. Send description, price to: Don P., 2520 E. 32, Tulsa, OK 74105, (918) 742-3755.

INTERESTED IN OLD TIME RADIO? Join North American Radio Archives—a non-profit organization. We have thousands of radio programs in our lending library. NARA, Box 366, Lexington, KY 40506.

OFFICIAL AERONAUTICAL Frequency Directory. A 416 page directory covering high frequencies, very high frequencies, UHF 225-400 MHz military, 450-470 MHz and 800-950 MHz frequencies. Frequencies are listed by Community, Service, License, Frequency, Call Sign, and Comments. Included is General System Information, Federal Communication Commission Frequency Allocation Charts, and information on the new Aeronautical Radio Repeater System at most major airports. Also included are the Air Carrier Company Designators. Send $21.95 plus $2.05 shipping and handling to Official Scanner Guide, Post Office Box 712, Londonderry, NH 03053.

BAND ALLOCATION PROGRAM: For IBM compatible computers. Covers from 28 to 512 MHz, will look up by service or by frequency, also has 10-code decoder at a touch of a button. Only $29.95, send check or money order to M. Meadows, 1917 E. Market St., New Albany, IN 47150.

ONTARIO SCANNER FREQUENCY DIRECTORY. New 430 Page directory! 11,600 large easy to ready listings. Most accurate, up-to-date information available. An invaluable reference book. Only $21.00 plus $3 postage. (Ontario residents add $1.92 tax). Canscan, PO Box 3009, Tecumseh PS, Windsor, Ontario N8N 2M3.

NEW ENGLAND SCANNER OWNERS. Write for a catalogue of the complete series of **OFFICIAL Scanner Guides** for the New England States. Send stamped, self-addressed envelope to receive our current catalogue. **OFFICIAL Scanner Guide**, Post Office Box 712, Londonderry, NH 03053.

THERE'S MORE TO DX THAN SHORTWAVE! TV-FM is hot now and mediumwave AM always abounds with DX. Veteran DX'er John Zondlo shows you how to get the most from these DX-packed bands in Discover Dx'ing, the ultimate intro to TV-FM-AM DX'ing. Send $5, Discover DX'ing, Box 770228, OKC, OK 73177.

RIBBONINKER. Simple tool allows anyone to re-link computer ribbons for pennies. $29 + $4 shipping. For more information: Jack Schmidling Productions, Dept P, 4501 Moody, Chicago, IL 60630.

WANTED: Realistic Channel 9 Monitors for new REACT team. Will pay top dollar. Please contact Dave Daoust Jr., N8585 Hanson Rd., Holmen, WI 54636.

WANTED: TU-35B Repeater Tone Unit for a Kenwood TR-2600A. Contact Richard V. Thurtle N8GDM, 201 Cherry St., Battle Creek, MI 49017.

FOR SALE: Sony PRO-80, Regency HX2200 with cellular Sangean small digital portable. Will sell separately. Best offer. J.R. Drake, (416) 699-8052.

Order Form

Please print in block letters.

POPULAR COMMUNICATIONS 76 North Broadway, Hicksville, NY 11801

Name _____

Street _____

City _____

State _____ Zip _____

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

Advertiser's Index

AMC Sales, Inc. 63
ARRL 73
Ace Communications, IN . . . . . 80, Cov. III
Antenna Specialists 75
Antenna Supermarket 53
Antennas West 29, 36, 77
Antique Radio Classified 27
Ashton ITC 45
Barry Electronics 66
CBC International 65
CRB Research 44, 71, 75
Cellular Security Group 47
Communications Electronics 15
DECO 77
Datametrics 45
Delta Research 43
Diamond Systems 70
Electrolert 29
Electron Processing 61
Electronic Engineering 66
Electronic Equipment Bank 1
Excellent Technology 36
Franklin Video Group, The 65
G & G Electronics 43
GRE America, Inc. 53
Gilfer Shortwave 76
Hamtronics, Inc. 77
ICOM . . . . . Cov. II, 5, 42
Japan Radio Co., Ltd 19
JoGunn Ent. 63
Kenwood U.S.A. Corp. . . . . Cov. IV
Lentini Communications 65
MFJ Enterprises, Inc. 23
Microcraft Corp 33
Monitoring Times 29
Moonbeam Press 72
OEI OPTOelectronics 7, 39
Pacific Cable Co. 27
Palomar Engineers 76
POP'COMM Bookshop 59
QSL Kit 66
Radio Shack 11
React International 78
Republic Cable Products, Inc. 36
SGC, Inc 13
Scanner World, USA 8
Signal Engineering 64
Software Systems Consulting 44, 65
Somerset Electronics 50
Universal SW Radio 3, 13

ACE COMMUNICATIONS

AOR Scanners.

Great Performance. Great Service. Great Value.

Free Freight
25-Day Money-Back Guarantee
Toll-Free Service and Support
No Credit Card Surcharge
One Year Warranty

AR1000 $399

1000 Channels. 8-600MHz, 805-1300MHz

Standard Features:

- Extremely compact size.
- Continuous coverage (except UHF TV 600-805)
- Antenna attenuator switch, 10db.
- Manual tuning knob.
- Earphone jack, 3.5mm.
- AM, FM and wide band FM tuning modes.
- Backlighted LCD display.
- 10 Scan Banks, 10 Search Banks.
- Selectable Priority Channel.
- Delay, Hold Features.
- Selectable Search Increments, 5-955KHz.
- Permanent memory backup.
- 4 AA Ni Cad batteries included.
- AC adaptor/charger.
- Carry Case.
- Cigarette Lighter Charger.
- Belt Clip.
- Earphone.

Options:

External Speaker. Mobile Mount.	MS190	$19.50
Extended Warranty. 2/3 yrs		$45/$55

Specifications:

Coverage:	8-600, 805,1300MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM
Speed:	20 ch/sec. scan. 40 ch/sec. search
IF:	561.225, 58.075, 455KHz or 10.7MHz
Increments:	5 to 955KHz selectable/ 5 or 12.5 steps.
Audio:	.4 Watts
Power:	Input 9 - 13.8 V. DC
Antenna:	BNC
Display:	LCD
Dimensions:	6 7/8H x 1 3/4D x 2 1/2W. 12oz wt.

AR950 $239

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

Standard Features:

- Extremely compact size.
- Unrestricted 800MHz coverage.
- 100 channels permanent memory.
- Earphone Jack & Attenuator.
- Delay, Hold features.
- Channel 1 Priority.
- 5 Scan Banks, 5 Search Banks.
- Telescopic and Flexible Antennas w/ BNC connector.
- AC & DC Power cords w/ mtng hardware.
- One Year Limited Warranty.

Options:

Base type antenna 25 to 1000MHz w 50'coax.	AS300	$59.95
Mag Mnt Mobile Antenna. 15' coax.	MA100	$25.00
Cigarette Lighter power adaptor.	CP100	$4.00
External Speaker with mobile mount.	MS100	$19.50
Extended Warranty. 2/3 yrs		$40/$55

Specifications:

Coverage:	27-54, 108-174, 406-512, 830-950MHz
Sensitivity:	.4uV Lo,Hi. .8uV Air. .5uV UHF. 1.0uV 800
Scan Speed:	15 ch/sec.
IF:	21.4MHz, 455KHz
Increments:	10,12.5,25,30
Audio:	1W
Power:	12.8VDC, 200MA
Antenna:	BNC
Display:	LCD w/backlight
Dimensions:	2 1/4H x 5 5/8W x 6 1/2D. 14oz wt.

We offer 100's of communications products.

ACE COMMUNICATIONS

AR2500 $499

2016 Channels. 1 MHz to 1500 MHz

Standard Features

- Continuous coverage
- AM, FM, wide band FM, & BFO for SSB, CW.
- 64 Scan Banks.
- 16 Search Banks.
- RS232 port built in.
- Includes AC/DC pwr crd. Antenna, Mntng Brckt.
- One Year Limited Warranty.

Options:

Earphone.	EP200	$2.00
External Speaker. Mobile Mount.	MS190	$19.50
Extended Warranty. 2/3 yrs.		$65/75
Mobile Mounting Bracket.	MM1	$14.90
RS232 Control Package (software & cable) offers spectrum display and database.	SCS2	$295.00

Specifications:

Coverage:	1 MHz - 1500MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM/SSB/CW
Speed:	38 ch/sec. scan. 38 ch/sec. search
IF:	750.00, 45.0275, 5.5MHz 455KHz
Increments:	5,12,5,25 KHz
Audio:	1.2 Watts at 4 ohms
Power:	Input 13.8 V. DC 300mA
Antenna:	BNC
Display:	LCD, backlighted.
Dimensions:	2 1/4H x 5 5/8W x 6 1/2D Wt. 1lb.

AR3000 $995

400 Channels. 100KHz to 2036MHz.

Standard Features:

- Extremely compact size.
- Continuous coverage
- Attenuation Programmable by Channel.
- Manual tuning knob.
- Tuning increments down to 50Hz.
- AM, FM, wide band FM, LSB, USB, CW modes.
- Backlighted LCD display.
- 4 Scan and Search Banks, Lockout in Search.
- 4 Priority Channels.
- RS232 control through DB25 connector.
- Delay, Hold Features.
- 15 band pass filters, GaAsFET RF amp.
- Sleep and Alarm Features.
- AC adaptor/charger. DC power cord.
- Telescopic Antenna.

Options:

Earphone.	EP200	$2.00
External Speaker. Mobile Mount.	MS190	$19.50
Extended Warranty. 2/3 yrs.		$65/75
Mobile Mounting Bracket.	MM1	$14.90
RS232 Control Package (software & cable) offers spectrum display and database.	SCS3	$295.00

Specifications:

Coverage:	100KHz - 2036MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM/SSB/CW
Speed:	20 ch/sec. scan. 20ch/sec. search
IF:	736.23, (352.23) (198.63) 45.0275, 455KHz
Increments:	50Hz and greater
Selectivity:	2.4Khz/-6db (SSB) 12KHz/-6db (NFM/AM)
Audio:	1.2 Watts at 4 ohms
Power:	Input 13.8 V. DC 500mA
Antenna:	BNC
Display:	LCD
Dimensions:	3 1/7H x 5 2/5W x 7 7/8D Wt. 2lb 10oz.

To Order Call 1•800•445•7717

In All 50 States and Canada. 24 Hours a Day. Fax Orders: 1-800-448-1084, 24 Hours a Day.
ACE Communications Monitor Division 10707 E. 106th Street, Fishers, IN 46038
Int'l Voice# 317-842-7115. Int'l Fax# 317-849-8794.
Service and Support Lines: Mon-Fri 9a.m. to 9p.m., Saturday 10-4. EST
MasterCard, Visa, American Express, Checks, Approved P.O.'s. & C.O.D. (add 5.00)
Prices and specifications subject to change.

CIRCLE 137 ON READER SERVICE CARD

KENWOOD

Hear it All!

R-5000
R-2000
High performance receivers

Scan the world bands 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.

(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 mode, 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.

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

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, squelch for narrow FM, illuminated keys, and a "beeper" to confirm keyboard operation.

Optional Accessory

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

KENWOOD U.S.A. CORPORATION
COMMUNICATIONS & TEST EQUIPMENT GROUP
P.O. BOX 22745, 2201 E. Dominguez Street
Long Beach, CA 90801-5745
KENWOOD ELECTRONICS CANADA INC.
P.O. BOX 1075, 959 Gana Court
Mississauga, Ontario, Canada L4T 4C2

KENWOOD

...pacesetter in Amateur Radio