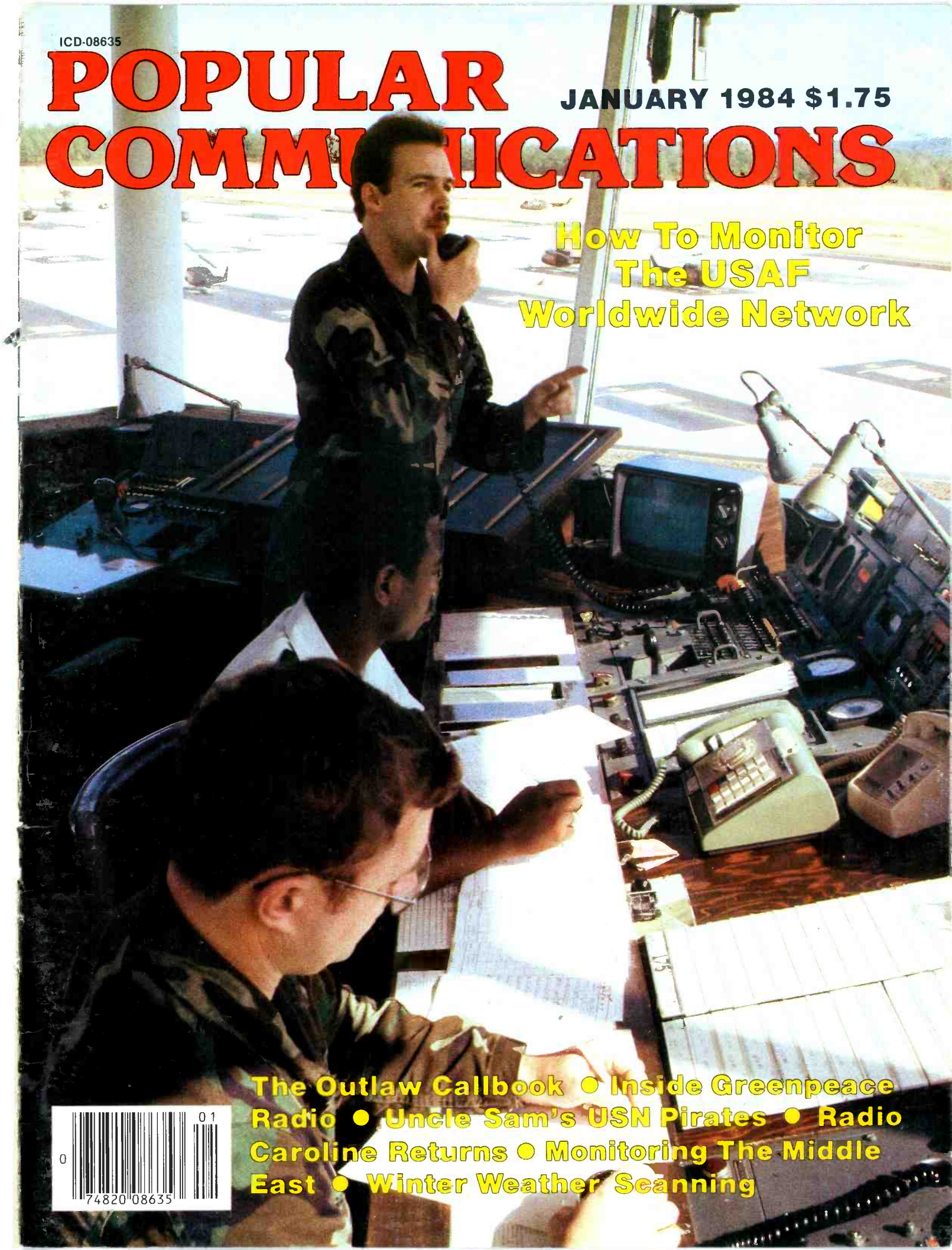
ICD-08635

POPULAR COMMUNICATIONS

JANUARY 1984 $1.75



How To Monitor The USAF Worldwide Network

The Outlaw Callbook • Inside Greenpeace Radio • Uncle Sam's USN Pirates • Radio Caroline Returns • Monitoring The Middle East • Winter Weather Scanning

0 74820 08635 01

Actual slow motion frames from Ham MasterTapes

1. Larry, N2NY, Lee, KA2RNV, Virginia, N2EGJ

2. Lee discharges cap

3. In slow motion it's dazzling

4. Wow. Can we see it again?

You've never seen this, like this, before this!

And you can see it—in color—again and again when you own the N2NY Ham MasterTapes.

Ever see a cap discharge in slow motion? You will on Ham MasterTapes. Ham MasterTapes can perform the dozens of complicated demonstrations necessary for a beginner's understanding of Ham Radio Theory.

Finally, a step-by-step course in Ham Radio Theory is available on color videotape. The Larry Horne N2NY Ham MasterTapes video course is a unique, effective teaching technique expertly produced by New York's leading professionals in studio and field videotape.

☐ Video Graphics highlight important details.

☐ Carefully worked-out demonstrations on video avoid the problem of getting complex gadgets to work on command in front of a class.

☐ Working examples of every ham radio component, device, or system covered in the FCC guide can be clearly understood.

The N2NY Ham MasterTapes give you a basic grasp of concepts that build theory background—not only for passing the FCC tests, but for understanding electronics.

The hobby has long needed better, clearer, high-tech teaching aids to help newcomers into our wonderful world of Ham Radio.

These six-hour tapes cover completely all the material needed to understand Novice and Tech/General Theory and operations, and include the new 200-question FCC syllabus used beginning September 1983.

Only $199.95. Order direct and specify Beta or VHS format. Call or write: Larry Horne, N2NY or Virginia Hamilton, N2EGJ at
Ham MasterTapes
136 East 31st Street
New York, N.Y. 10016 212-673-0680.

Ham MasterTapes™
THE N2NY HAM RADIO COURSE ON VIDEOTAPE

CIRCLE 31 ON READER SERVICE CARD

RECEIVE WEATHER CHARTS IN YOUR HOME!

You can DX and receive weather charts from around the world.

Tune in on free, worldwide government weather services. Some transmitting sites even send weather satellite cloud cover pictures!

You've heard those curious facsimile sounds while tuning through the bands—now capture these signals on paper!

Assemble ALDEN's new radiofacsimile Weather Chart Recorder Kit, hook it up to a stable HF general-coverage receiver, and you're on your way to enjoying a new hobby activity with many practical applications. Amateurs, pilots, and educators can now receive the same graphic printouts of high-quality, detailed weather charts and oceanographic data used by commercial and government personnel.

Easy to assemble—Backed by the ALDEN name.

For over 40 years, ALDEN has led the way in the design and manufacture of the finest weather facsimile recording systems delivered to customers worldwide. This recorder kit includes pre-assembled and tested circuit boards and mechanical assemblies. All fit together in a durable, attractive case that adds the finishing professional touch.

Buy in kit form and save $1,000!

You do the final assembly. You save $1,000. Complete, easy-to-follow illustrated instructions for assembly, checkout, and operation. And ALDEN backs these kits with a one-year limited warranty on all parts.

CIRCLE 112 ON READER SERVICE CARD

Easy to order.

Only $995 for the complete ALDEN Weather Chart Recorder Kit.

To order, fill out and mail the coupon below. For cash orders enclose a check or money order for $995. Add $5 for shipping and handling in the U.S. and Canada, plus applicable sales tax for CA, CO, CT, IA, MA, NY, WI. (Export price is $1250 F.O.B. Westborough, MA. Specify 50 or 60 Hz.) To use your MasterCard or Visa by phone, call (617) 366-8851.

ALDENELECTRONICS

Washington Street, Westborough, MA 01581

NAME: _____

CALLSIGN: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

☐ I've enclosed a check or money order for $995.00 and $5.00 for shipping and handling, plus applicable sales tax.

☐ Charge to: ☐ MasterCard ☐ Visa

ACCOUNT # (ALL DIGITS)

EXPIRATION DATE

SIGNATURE REQUIRED IF USING CREDIT CARD _____

POPCOMM

NEW!

Regency®

Scanners

Communications Electronics,™ the world's largest distributor of radio scanners, introduces new models with special savings on all radio scanners. Chances are the police, fire and weather emergencies you'll read about in tomorrow's paper are coming through on a scanner today.

We give you excellent service because CE distributes more scanners worldwide than *anyone* else. Our warehouse facilities are equipped to process thousands of scanner orders every week. We also export scanners to over 300 countries and military installations. Almost all items are **in stock** for **quick shipment**, so if you're a person who prefers fact to fantasy and who needs to know what's *really* happening around you, order your radio today from CE.

NEW! Regency‡ MX3000

List price $299.95/**CE price $199.00**
6-Band, 30 Channel • No-crystal scanner Search • Lockout • Priority • AC/DC
Bands: 30-50, 144-174, 440-512 MHz.
The *Regency* Touch MX3000 provides the ease of computer controlled, touch-entry programming in a compact-sized scanner for use at home or on the road. Enter your favorite public service frequencies by simply touching the numbered pressure pads. You'll even hear a "beep" tone that lets you know you've made contact.

In addition to scanning the programmed channels, the MX3000 has the ability to search through as much as an entire band for an active frequency. The MX3000 includes channel 1 priority, dual scan speeds, scan or search delay and a brightness switch for day or night operation.

NEW! Regency® HX650

List price $119.95/**CE price $84.00**
5-Band, 6 Channel • Handheld crystal scanner
Bands: 30-50, 146-174, 450-512 MHz.
Now you can tune in any emergency around town, from wherever you are, the second it happens. Advanced circuitry gives you the world's smallest scanner. Our low CE price includes battery charger/A.C. adapter.

NEW! Regency® MX7000

Allow 120-240 days for delivery after receipt of order due to the high demand for this product.
List price $599.95/**CE price $449.00**
10-Band, 20 Channel • Crystalless • AC/DC
Frequency range: 26-27, 30-108, 108-136 AM, 144-174, 440-512, 806-881 MHz., 1.0 GHz., 1.1 GHz.
In addition to normal scanner listening, the MX7000 offers CB, VHF, and UHF TV audio, FM Broadcast, all aircraft bands (civil and military), 800 MHz communications, cellular telephone, and when connected to a printer or CRT, satellite weather pictures.

NEW! JIL SX-200

CE price $269.00/*NEW LOW PRICE*
8-Band, 16 Channel • No-crystal scanner Quartz Clock • AM/FM • AC/DC
Bands: 26-88, 108-180, 380-514 MHz.
Tune Military, F.B.I., Space Satellites, Police & Fire, D.E.A., Defense Department, Aeronautical AM band, Aero Navigation Band, Fish & Game, Immigration, Paramedics, Amateur Radio, Justice Department, State Department, plus thousands of other *restricted* radio frequencies no other scanner is programmed to pick up.

NEW! JIL SX-100

CE price $134.00/*NEW LOW PRICE*
6-Band, 16 Channel • Crystalless • AC/DC
Frequency range: 30-54, 140-174, 410-514 MHz.
The *JIL* SX-100 scanner is a mobile keyboard programmable scanner that puts you in the seat of the action at home or in your car. Compact and good looking, the SX-100 even gives you the time *and* date. It's small size will easily fit in most domestic or foreign cars and it's AC/DC adaptable for home use.

Regency® HX1000

Allow 90-180 days for delivery after receipt of order due to the high demand for this product.
List price $329.95/**CE price $209.00**
6-Band, 20 Channel • No Crystal scanner Search • Lockout • Priority • Scan delay Sidelit liquid crystal display
Frequency range: 30-50, 144-174, 440-512 MHz.
The new handheld *Regency* HX1000 scanner is fully keyboard programmable for the ultimate in versatility. You can scan up to 20 channels at the same time. When you activate the priority control, you automatically override all other calls to listen to your favorite frequency. The LCD display is even sidelit for night use. A die-cast aluminum chasis makes this the most rugged and durable hand-held scanner available. There is even a backup lithium battery to maintain memory for two years. Includes wall charger, carrying case, belt clip, flexible antenna and nicad battery. Reserve your *Regency* HX1000 now.

Regency® R106

List price $149.95/**CE price $99.00**
5-Band, 10 Channel • Crystal scanner • AC/DC
Frequency range: 30-50, 146-174, 450-512 MHz.
A versatile scanner, The *Regency* R-106 is built to provide maximum reception at home or on the road. Rugged cabinet protects the advanced design circuitry allowing you years of dependable listening.

NEW! Regency® D810

List price $399.95/**CE price $259.00**
8-Band, 50 Channel • Crystalless • AC only
Bands: 30-50, 88-108, 118-136, 144-174, 440-512 MHz.
This scanner offers Public service bands, plus Aircraft and FM broadcast stations. You can listen to Bach or a Boeing 747, the Rolling Stones or the riot squad, or any of 50 channels. Plus special direct access keys let you listen to police, fire, emergency, or any of your favorite channels just by pushing a button.

Regency® R1040

List price $199.95/**CE price $129.00**
6-Band, 10 Channel • Crystalless • AC only
Frequency range: 30-50, 144-174, 440-512 MHz.
Now you can enjoy computerized scanner versatility at a price that's less than some crystal units. The *Regency* R1040 lets you in on all the action of police, fire, weather, and emergency calls. You'll even hear mobile telephones.

Programming the R1040 is easy. Merely touch the keyboard and enter any of over 15,000 frequencies on your choice of 10 channels.

TEST ANY SCANNER

Test any scanner purchased from **Communications Electronics™** for 31 days before you decide to keep it. If for any reason you are not completely satisfied, return it in original condition with all parts in 31 days, for a prompt refund (less shipping/handling charges and rebate credits).

OTHER RADIOS & ACCESSORIES

Regency® C403 Scanner	$59.00
***NEW!* Panasonic RF-B50** Shortwave receiver	$129.00
Panasonic RF-9 Shortwave receiver	$84.00
Panasonic RF-799 Shortwave receiver	$219.00
Panasonic RF-2600 Shortwave receiver	$199.00
Panasonic RF-2900 Shortwave receiver	$249.00
Panasonic RF-3100 Shortwave reciever	$269.00
Panasonic RF-6300 Shortwave reciever	$539.00
***NEW!* Bearcat®† 151** Scanner	$169.00
***NEW!* Bearcat® Five-Six** Scanner	$129.00
Bearcat® 300 Scanner	$349.00
Bearcat® 250 Scanner	$279.00
Bearcat® 200 Scanner	$189.00
Bearcat® 210XL Scanner	$229.00
Bearcat® 20/20 Scanner	$289.00
Bearcat® 100 Scanner	$289.00
Bearcat® Weather Alert	$49.00
Freedom Phone® 4000 Cordless telephone	$239.00
Fanon FCT-200 Cordless telephone	$139.00
Fanon 6-HLU Scanner	$99.00
CHB-6 Fanon AC Adapter/Battery Charger	$15.00
CAT-6 Fanon carrying case with belt clip	$15.00
SP55 Carrying case for *Bearcat* Five-Six	$15.00
MA-506 Carring case for *Regency* HX650	$15.00
SCMA-6 Fanon Moble Charger/Audio Amplifier	$49.00
AUC-3 Fanon auto lighter adapter/Battery Charger	$15.00
FB-E Frequency Directory for Eastern U.S.A.	$12.00
FB-W Frequency Directory for Western U.S.A.	$12.00
TSG "Top Secret" Registry of U.S. Government Freq.	$15.00
RRF Railroad Frequency Directory	$10.00
ESD Energy Services Directory	$10.00
ASD Frequency Directory for Aircraft Band	$10.00
SRF Survival Radio Frequency Directory	$10.00
TIC Techniques for Intercepting Comm. Manual	$12.00
CIE Covert Intelligence, Elect. Eavesdropping Man.	$12.00
B-4 1.2 V AAA Ni-Cad batteries (set of four)	$9.00
B-6 1.2 V AA Ni-Cad batteries (set of four)	$12.00
A-135c Crystal certificate	$3.00

Add $3.00 shipping for all *accessories* ordered at the same time. Add $12.00 per shortwave receiver for U.P.S. shipping.

INCREASED PERFORMANCE ANTENNAS

If you want the utmost in performance from your scanner, it is essential that you use an external antenna. We have a base and a mobile antenna specifically designed for receiving all bands. Order **#A60** is a magnet mount mobile antenna and order **#A70** is an all band base station antenna. Price is $35.00 each plus $3.00 for UPS shipping in the continental United States.

BUY WITH CONFIDENCE

To ***get the fastest delivery from CE*** of any scanner, send or phone your order directly to our Scanner Distribution Center.™ Be sure to calculate your price using the CE prices in this ad. 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 30% surcharge for net 30 billing. All sales are subject to availability, acceptance and verification. All sales on accessories are final. 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 unless CE is instructed differently. Minimum *prepaid* order $35.00. Minimum *purchase order* $200.00. Most products that we sell have a manufacturer's warranty. Free copies of warranties on these products are available prior to purchase by writing to CE. International orders are invited with a $20.00 surcharge for special handling *in addition* to shipping charges. All shipments are F.O.B. Ann Arbor, Michigan. No COD's please. Noncertified and foreign checks require bank clearance.

Mail orders to: Communications Electronics,™ Box 1002, Ann Arbor, Michigan 48106 U.S.A. Add $7.00 per scanner for U.P.S. *ground* shipping and handling in the continental U.S.A. If you have a Visa or Master Card, you may call and place a credit card order. Order toll-free in the U.S. Dial 800-521-4414. In Canada, order toll-free by calling 800-265-4828. Telex anytime 810-223-2422. If you are outside the U.S. or in Michigan dial 313-973-8888. Order today.

Scanner Distribution Center™ and CE logos are trademarks of Communications Electronics.™
† *Bearcat* is a federally registered trademark of Electra Company, a Division of Masco Corporation of Indiana.
‡ *Regency* is a federally registered trademark of Regency Electronics Inc.

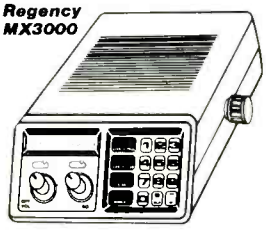
AD #092683

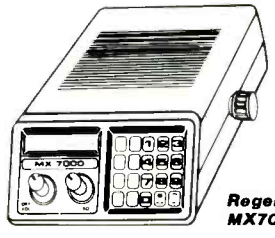
Order Toll Free . . . call 1-800-521-4414

COMMUNICATIONS ELECTRONICS™

Consumer Products Division

818 Phoenix □ Box 1002 □ Ann Arbor, Michigan 48106 U.S.A.
Call toll-free 800-521-4414 or outside U.S.A. 313-973-8888



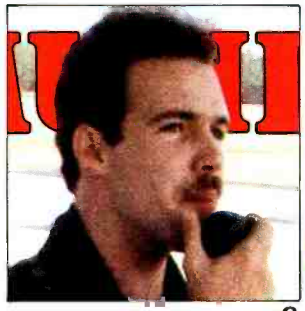


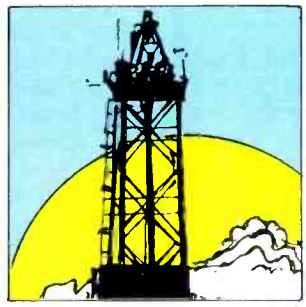
CIRCLE 32 ON READER SERVICE CARD

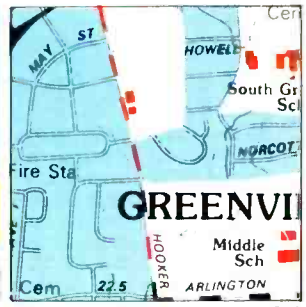
Offices: 76 North Broadway, Hicksville, NY 11801. Telephone 516 681-2922. Popular Communications (ISSN 0733-3315) is published monthly by Popular Communications, Inc. Corporate officers: Richard A. Ross, Pres.; Thomas S. Kneitel, Vice Pres.; Alan M. Dorhoffer, Secretary. Second class postage paid at Hicksville, NY and additional offices. Subscription prices: Domestic—one year $12.00, two years $22.00, three years $32.00. Canada/Mexico—one year $14.00, two years $26.00, three years $38.00. Foreign—one year $16.00, two years $30.00, three years $44.00. Foreign Air Mail—one year $69.00, two years $136.00, three years $203.00.
Postmaster: Please send change of address to Popular Communications, 76 North Broadway, Hicksville, NY 11801

POPULAR COMMUNICATIONS

JANUARY 1984 **VOL. 2, NO.5**


8


16



45

FEATURES

DEPARTMENTS

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

International Broadcasting

After my editorial comments about the Voice of America appeared here a few issues back I received some letters from readers commenting upon the state of international broadcasting, more specifically on the approximately 40 nations which are presently beaming English language programming towards North America, ostensibly for the purpose of being heard by the American and Canadian public at large.

It has long been true that in many areas of the world there are very large audiences tuned to the international shortwave bands. This is not only true in remote regions, but also in cosmopolitan areas of Europe on both sides of the lines which separate eastern and western political philosophies. There is every reason to believe that at any given moment people throughout the world are seated around radio receivers in their homes listening to this programming, sometimes taking considerable effort to do so because the signals are being deliberately jammed. The majority of these people aren't what might be considered to be DXers or SWLs, but are those who seek out international broadcasting stations as their prime source of news, entertainment, and general contact with what's taking place around the world. Shortwave broadcasts could well be their prime source of this material and practically all nations are engaged in making available to these listeners copious helpings of programming in the hopes that their viewpoints will be the ones sought out by those people. This programming consists of entertainment, news, cultural material, and often lots and lots of political propaganda in order to promote one viewpoint and put down several others. The BBC appears to be the most objective broadcaster, with Radio Sweden, the Swiss Broadcasting Service, and a couple of others also reasonably objective. Other major broadcasters string out in all directions (mostly towards east and west) to varying degrees in their ability to analyze, evaluate, and present their thoughts to the world audience.

This programming flies out around the world in so many languages and on so many frequencies that the international broadcasting bands seem to be bursting at the seams. It appears to some people (myself included) that the general impression of some major overseas broadcasters holds that their programming is used and appreciated by North American audiences on a roughly equal basis to listeners in most other areas. This is a fallacy.

It's difficult to tune across the 31 meter international broadcasting band at night without hearing wall-to-wall English language programming beamed to the North American continent from the likes of Radio Moscow and other Eastern European nations. They are laughing up their sleeves; they're jamming most of the programming we are sending into their countries and they figure they're having a ball by offering an endless parade of frequencies for their North American programming which isn't even being jammed. Their use of so many frequencies, in fact, is an old anti-jamming technique—one presently used by the VOA, Radio Liberty, and Radio Free Europe to push their own signals into the Soviet Union and Warsaw Pact nations despite the jammers. What they don't know is that the laugh's probably on most of the international broadcasters who are expending much effort, money, and time to send their English language programming to North America. Their mistake may be in estimating their potential impact and influence on the American and Canadian general public based upon the interest in shortwave reception in their own countries by the public at large.

What they haven't seemed to figure out is that in the United States and Canada the general public is scarcely aware that this programming is taking place at all! Yes, special DX-tip programming has a wide audience amongst radio hobbyists, and there are many, many thousands of North American listeners out there who devote considerable time to seeking out new stations, new frequencies, schedule changes, and who are trying to figure out how to obtain QSL cards. Omitting such persons from consideration, the question is, are there a sufficient number of other persons in North America who regularly sit at the dials of a shortwave receiver for the primary purpose of hearing news and general programming which would justify the amount of frequencies and air time required to pour out all of that programming over the airwaves? Fact is, Radio Moscow could probably reach all of its potential listeners in North America with no more than two frequencies, and that probably goes for all other international broadcasters.

According to a report by K.E. Elliott in the 1982 *World Radio TV Handbook*, a Gallup Poll was taken on behalf of Radio Canada International in 1975. It showed that there were two million persons in the United States who owned shortwave receiving equipment, but only 10% who actually listened once a week or more to monitor major international broadcasters. There was no breakdown given in the *WRTVH* story as to how these figures related to those who were mostly interested in DX hobby pursuits and

(Continued on page 74)

SWL HEADQUARTERS

ELECTRONIC EQUIPMENT BANK THE NAME IN SHORTWAVE LISTENING

NEW FROM KENWOOD

Kenwood R-2000 **VC-10 VHF Converter**

Now you can extend the R-2000 frequency range to cover the VHF bands 118 to 174 MHz with this new VC-10 VHF converter. Easily installed in your R-2000 or EEB will install it for you with R-2000 VC-10 purchase.

VC-10 **$149.95**

Kenwood R-2000* **$499.95**

List $599.95

- 150KHz to 30MHz
- All mode AM-CW-SSB-FM
- 10 Memories (Memorizes Mode)
- Memory Backup
- Memory Scan
- Programmable Band Scan
- 24 Hour Clock-Timer

Option 1—Mechanical Filter **$95**

Option 2—RIT modification **$35**

*Free 90 day extended EEB warranty

SPECIAL PURCHASE

Save $208.00

Yaesu FRG-7700* **$499.95*** **Limited Quantity**

FREE MU-7700 12 Channel Memory
FREE FRT-7700 Antenna Tuner

EEB's best buy now only $499.95 with FREE MU-7700 and FRT-7700 tuner—a $707 value.

*Free Extended 90 day EEB warranty.

Kenwood R-600*

AM-SSB-CW Modes, noise blanker, 30 bands 200KHz to 30 MHz wide/narrow I.F. Filtering. Excellent performance at a budget price.

R-600 ..... List $399.95

Sale $329.00

*Free 90 day extended EEB warranty.

NEW FROM SONY ICF-2002

A new generation receiver. The best features of the famous ICF-2001 PLUS!

- Less than 1/3 the size of 2001
- Low battery drain (4) AA cells (2) AA cells for memory/clock
- 10 station memory presets
- 12/24 hour clock (local or GMT)
- Synthesized PLL tuning—most accurate, drift free method known
- AM, SSB, CW 153KHz to 30MHz
- FM 76 to 108MHz

$249.95

ICOM R-70* **Special purchase $599.95**
Save $150.00

You have read the details on this revolutionary receiver. It's getting rave reviews.

- Frequency Range 100KHz-30MHz
- Pass Band Tuning
- Notch Filter
- Fully Synthesized
- AGC Control Fast/Slow/Off
- Noise Blanker Wide/Narrow

The **Best** just got **Better**

EEB offers the upgraded R-70 SWL Receiver tailored to your needs:

Option 1— AM Wide/Narrow. Switch between AM 6KHz filter and the 2.3KHz SSB filter while in the AM mode.

*Option 2— 2.3KHz Mechanical Filter. Replaces ceramic SSB filter to give much sharper skirt selectivity, wider dynamic range. $95 installed

*Option 3— 8 Pole Crystal Filter. Replaces 2.3KHz ceramic SSB filter—allows you to experience the full potential of this fabulous receiver. $179 installed

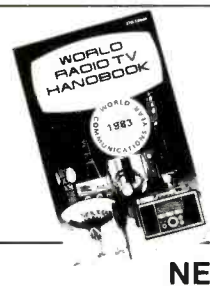
(*Option 1 required for use in the AM mode)

All EEB modified R-70's are realigned for optimum performance.
*Free 90 day extended EEB warranty.

G.E. World Monitor II **SALE $169.96**

Best Buy under $250

- 6 Bands 3.5 to 31 MHz-SWL-MW-FM
- World Power 120/220 V 50/60 Hz
- DC operation from internal batteries
- EEB test results show this receiver to be superior to many selling up to $250. Physical layout and electrical specifications similar to the popular Panasonic RF-2900.



World Radio TV Handbook

1983 SWL Bible In Stock

Reserve your 1984 WRTVH now.

Order by December 31st—Free postage and 1983 pricing.

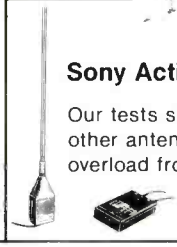
$17.50

postage paid (USA) book rate

NEW FROM SONY

Sony Active Antenna

Our tests show the Sony AN-1 antenna equal to or better than other antennas costing twice as much and less susceptible to overload from strong signals.



Why pay $159? **SONY AN-1** **$79.95**

EEB

- We ship world-wide
- SASE for FREE Catalog
- Foreign 3IRC's Air Mail
- Shipping charges not included
- Prices & specifications subject to change without notice

VISA MasterCard

10 Miles West of Washington, D.C.
Sorry—No COD's
10-5 Tues., Wed., Fri.
10-9 Thursday
10-4 Saturday
Closed Sunday and Monday

Electronic Equipment Bank
516 Mill Street, N.E.
Vienna, Virginia 22180
Order Toll Free 800-368-3270
Virginia 703-938-3350

EEB

CIRCLE 51 ON READER SERVICE CARD

MAILBAG LETTERS TO THE EDITOR

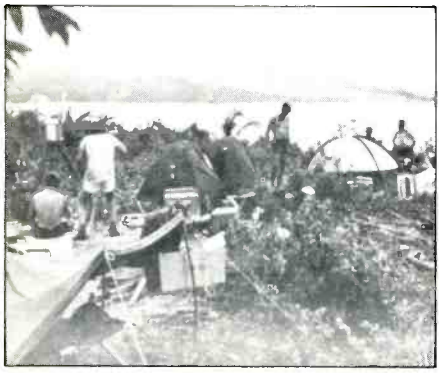
The most interesting questions we receive will be answered here in each issue. Address your questions to: Tom Kneitel, Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801.

Snow White & The Two Dwarves

In the September Mailbag column Tom Kneitel made mention of a station using the tactical callsign "SNOW WHITE" on 32.05 MHz, monitored via skip while working "674" and "711." These stations were heard while taking various range and bearing readings. Be advised this SNOW WHITE is the ID of the geodetic survey vessel USNS HARKNESS (T-AGS 32), designated as Oceanographic Unit Five (OCUNIT 5). The other stations, 674 and 711, are her survey launches. The vessel has been taking surveys in the Pacific, Panama, Navassa Island, Haiti, and the Dominican Republic. Chances are the communications were monitored while they were using PRC-25 or PRC-77 manpack transceivers. The Navy MARS callsign of this unit is NNØCXO. The address of the USNS HARKNESS is FPO New York 09573.

A *POP'COMM* reader
Tennessee

To the many readers who wrote in after that item appeared in September to say that they've also monitored SNOW WHITE: please note.



The photo shows "SNOW WHITES" Range Azimuth Geodetic Site on Faux Cape, Haiti.

Reply Cards

In reading Communications Confidential in *POP'COMM*, I assume that many of the "ute" QSLs you've run were prepared cards which had been supplied to the station for remailing to the monitoring station seeking the QSL. Can you advise me where I can obtain a supply of these cards?

Harry L. Lookabill, WØDPO
Kansas City, MO

Some of those prepared QSLs you've asked about are from my own collection. When I began sending reception reports to "ute" stations in the late 1940's, I quickly realized that the poor QSL response I was getting was because these stations didn't have actual QSL cards and they didn't want to bother writing out verification letters. At that point, I went to a printer in my neighborhood and told him that I wanted cards which I could send to the stations and which they could fill out, sign, and return to me. I wrote out the text and he ran off a batch of these cards. I don't know of any commercial source of such cards, however check around with local printers and I'm sure you'll find one who can print up cards to your specification. —Editor

Deep DX

I was fascinated to learn that most Naval forces have sophisticated underwater communications systems which permit contacts between shore stations and various vessels (surface and underwater types) as well as divers. This system can also be used between the vessels themselves. Presumably this is a non-radio system which uses sonics. What frequencies are used for this communication?

Todd Mullavey, KVA4JG
Norfolk, VA

You're correct in assuming that these systems use sonics instead of radio. The equipment is quite sophisticated and is similar in use to two-way radio; some of it runs almost 1 kW of power and has long-range capabilities. Frequencies below about 3 kHz have the best range with lower attenuation, while those above 8 kHz have a shorter range but higher intelligibility. Tactical NATO frequencies are closely guarded but some of the others known to me include the following. The U.S. Navy uses AN/WZC2A equipment for SSB/CW communications in two bands, 1.45 to 3.1 kHz and also 8.3 to 11.1 kHz. The USN's SC-100 diver/ship system operates on 31.5 kHz. The U.K. has a diver/ship system operating between 40 to 44 kHz and also a G-1720 system which can run voice, CW, and teleprinter communications on 8.087 kHz. The French Navy's ERUS-3 equipment is running voice and CW on 10.5 kHz. Italy's TS-200 SSB/CW system operates between 8.3 and 11.1 kHz, which permits it to interface with the American and other equipments. Most likely, the NATO frequencies are also in the 8.3 to 11.1 kHz band. —Editor

Was This Mystery Ever Solved?

Your story on the death ray frequencies (October '83 issue) was a very concise overview of this rather grisly topic and was far more straight-from-the-shoulder than anything I've yet seen in the media. Wasn't there some talk a few months back about some sort of sinister signal invading areas of the Pacific Northwest? What is the frequency of that signal?

Carl Martin
Bangor, ME

Last March there were various reports of a strange signal coming from sources unknown. The strong signal aroused the alarm of public health officials around Eugene, Oregon, since many local citizens connected the signals with their complaints of ear and throat problems, headaches, and insomnia. There was, it was reported, a 1.1 MHz tone on the 4.750 MHz carrier frequency. Other than the original reports, I never saw any additional information on the signals. If our readers have further information on this, please let us know! —Editor

A Novel Repeater Suggestion

From what I've read about cordless phones, there is a "base" (or pedestal) unit which transmits in the 1650 kHz band and receives on 49 MHz. The base unit transmits to the hand-held units and repeats the signals from the 49 MHz hand-helds in addition to whatever is coming over the telephone line. It made me wonder if one of these base units could be used (without a connection to the telephone line) as a repeater to permit one hand-held to talk to another. It appears to me that by using one of the range-extending antennas being offered, a base unit might be able to be established as a common repeater for several of my friends and I to use to communicate with one another. Is it legal?

Donald Cortese
New Orleans, LA

That's a new one on me! Certainly it's novel and you could probably get it to work, although I can think of at least three other less complicated ways to chat with neighborhood friends. You'd have to ask the FCC if it's legal. —Editor

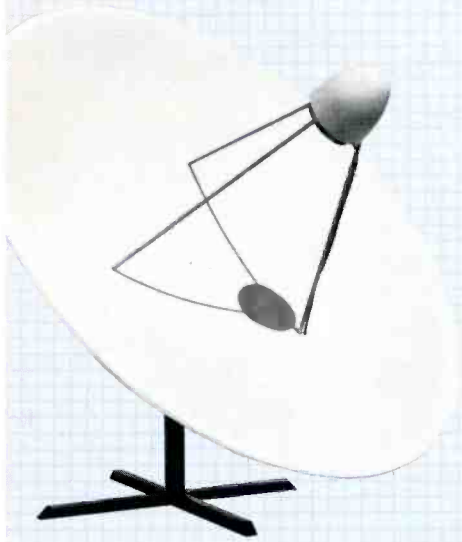
Cover to Cover!

As a ham radio operator, shortwave listener, and scanner enthusiast, I subscribe to numerous publications and magazines (*QST, 73, RCMA, RIB,* etc.). However, *POP'COMM* is the only one of them that I read page for page. Keep up the good work, and please continue with the articles concerning military communications!

David O. Chastain, N5ERD
Blytheville, AR

Thanks, Dave. We have some pretty far out articles in various stages of writing and production. If you've been enthusiastic about what you've read in previous issues, you'll really like what you'll be seeing in the months ahead! —Editor

Make It Easy On Yourself



The GLS-808 System Is Simple To Install

- SINGLE CABLE HOOKUP from downconverter to receiver (125' furnished)
- Integrated LNF (100° or better low noise amplifier, feed horn and polarity control) in one compact package
- LNF mounting hardware furnished

Special Features

- Automatic polarity seeking
- Full function infra-red remote control
- Crystal synthesized tuning for positive channel selection
- Tunable IF filter provides rejection of terrestrial interference signals

Here's What We Do For You!

The GLS-808 has the easy installation that you need — and the features your customers want. Best of all, the complete system is manufactured by Automation Techniques and backed by our one year (limited) warranty for parts and labor at service centers across the U.S. and Canada.

At Automation Techniques. . .
WE MAKE TECHNOLOGY AFFORDABLE!

AUTOMATION TECHNIQUES, INC.

1550 N. 105th E. Ave. Tulsa, OK 74116

1-918-836-2584

PIONEER MEMBER OF SPACE

CIRCLE 64 ON READER SERVICE CARD

Monitoring The

USAF Worldwide Air/Ground Networks

Hear Military Aircraft Of Many Nations!

BY HARRY CAUL, KIL9XL

Those who monitor the shortwave communications bands frequently encounter the large amount of military aircraft traffic; who hasn't listened on these frequencies and heard coded "SKY KING" and "GIANT TALK" messages? There's much to hear, and the frequencies used by the USAF's HF/SSB (High Frequency Single Sideband) and Global Command Control Systems networks offer endless hours of voice traffic which is usually sent "in the clear" (uncoded).

These frequencies reveal not only all types of USAF aircraft, you'll also hear aircraft belonging to the Navy, Marines, Army, Coast Guard, plus occasional aircraft belonging to some of the Allied Forces. Many aircraft stations are easy to indentify, while others have cryptic "tactical" identifiers which tantalize but defy analysis.

Most of these transmissions are carried out in SSB (upper sideband) while several ground stations have backup AM and also RTTY capabilities which can be used upon request. RTTY is at 100 WPM, 850 Hz FSK, 2 kHz center frequency (Space 2425 Hz, Mark 1575 Hz).

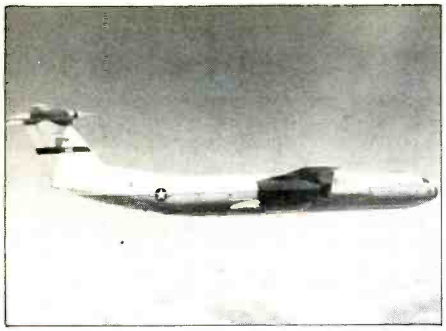
You'll hear transport aircraft, fighters, bombers, Medevac and Airevac operations and practically every other type of aircraft which has a military purpose including weather recon craft and flying fuel tankers! Communications to be monitored include general flight information, direction finding, and emergencies. There's plenty of 'phone patch traffic too as the ground stations in these networks can patch calls through between the aircraft and weather stations as well as practically every USAF ground facility in the nation! Also to be heard are the Presidential and Vice Presidential aircraft (Air Force 1 and Air Force 2), plus numerous special flights containing world diplomats and high VIP's and General Staff military personnel. There's no shortage of interesting listening fare.

U.S. Air Force photo

VIP communications from the diplomats, high ranking military officers, political leaders, Air Force 1 and Air Force 2 are generally handled through the facilities at Andrews Air Force Base in Camp Spring, MD. The stations's callsign is AFA3 and its voice identification is "ANDREWS." While many of the aircraft communicating with Andrews use tactical calls, those using ID's such as "SAM 25776" (etc.) are "Special Air Missions," which is to say that they are VIP flights. Air Force 1 and Air Force 2, of course, are distinctive enough to provide ready recognition. However, if you hear "SAM 2600" you may not know that it is really another ID used by AF-2 but only at times when the Vice President is not aboard. A similar alternate ID is used by AF-1 when the President isn't aboard—it is "SAM 2700."

Andrews handles this VIP traffic on a large number of frequencies and in both upper and lower SSB. Phone patches make up a large portion of the messages they are requested to handle, including calls to the Dept. of State, the White House, and all sorts of other ground facilities, including ones with tactical ID's such as "CRYPTO MAINTENANCE."

Frequencies which Andrews uses at the present time include: 4721, 4731.5, 5700,



A military air lift command C-141B Starlifter, a global transport which can be heard on these frequencies. (U.S. Air Force photo)

The military air lift command's C-130 Hercules. the popularly monitored aircraft. (U.S. Air Force photo)

Many people don't realize the U.S. Army flies a number of aircraft and these can also be monitored on the HF networks. (U.S. Army photo)

A military air lift command C-5A transport. (U.S. Air Force photo)

6680, 6683, 6712, 6715, 6730, 6756, 6760, 7735, 8993, 9004, 9007, 9018, 9023, 9958, 9991, 11035, 11118, 11176, 11180, 11226, 11249, 11460, 11466, 13204, 13212, 13215, 13247, 15048, 17972, 17993, 18027, 20016, 20053, 23265, 25578, and 29899 kHz.

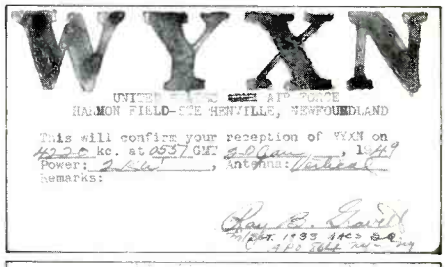
"Capsule" Broadcasts

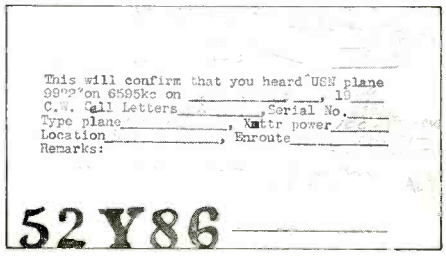
Many USAF ground stations transmit special "Capsule" broadcasts twice each hour at a specified number of minutes past the hour. These transmission schedules are shown in our frequency listing as "H + 15/45" (broadcast at 15 and 45 minutes past each hour the station is operating on the frequency shown). "Capsule" is the general ground-to-aircraft code word which notifies all aircraft of the Military Airlift Command (MAC) that there are messages for one or more of those planes. Those MAC

USAF HF/SSB Stations

Frequency	Location	Operates (GMT)	"CAPSULE" Broadcasts	Mode
3067 kHz	Croughton	2300-0500	H +00/30	SSB
3081 kHz	Lajes	2100-1000	H +05/35	SSB
3144 kHz	Hickam	0600-1700	H +00/30	SSB
4746 kHz	Lajes	2100-1000	H +05/35	SSB
	MacDill	0000-0900	H +20/50	SSB
	McClellan	0400-1600	H +10/40	SSB
4747 kHz	Yokota	1000-2100	H +05/35	SSB
5688 kHz	MacDill	0900-2400	H +20/50	SSB
5703 kHz	Croughton	2100-0800	H +00/30	SSB
5710 kHz	Albrook	0200-1200	H +25/55	SSB
	Elmendorf	On request	none	AM
	Thule	On request	none	AM
	Yokota	On request	none	AM
6727 kHz	Scott	0400-1600	none	SSB
6738 kHz	Andersen	0700-2200	H +20/50	SSB
	Clark	1200-2200	H +25/55	SSB
	Elmendorf	24 hours	H +15/45	SSB
	Hickam	0400-1900	H +00/30	SSB
	Incirlik	0400-1900	H +00/30	SSB
	McClellan	0400-1600	H +10/40	SSB
	Yokota	0900-2400	H +05/35	SSB
6750 kHz	Croughton	24 hours	H +00/30	SSB
	Lajes	24 hours	H +05/35	SSB
	Loring	2400-1200	none	SSB
	MacDill	0000-0900	H +20/50	SSB
6753 kHz	Ascension	0000-0800	H +15/45	SSB
6757 kHz	Croughton	On request	none	AM
8893 kHz	Clark	24 hours	H + 25/55	SSB
8964 kHz	Hickam	24 hours	H +00/30	SSB
8967 kHz	Andersen	24 hours	H +20/50	SSB/AM
	Hickam	On request	none	AM
	Lajes	24 hours	H +05/35	SSB/AM
	MacDill	On request	none	AM
	Thule	24 hours	H +15/45	SSB
	Yokota	24 hours	H +05/35	SSB
8989 kHz	Elmendorf	24 hours	H +15/45	SSB
	MacDill	24 hours	H +20/50	SSB
	McClellan	24 hours	H +10/40	SSB
8993 kHz	Albrook	0000-1400	H +25/55	SSB
	Ascension	24 hours	H +15/45	SSB
	MacDill	24 hours	H +20/50	SSB
9011 kHz	Croughton	0500-2300	H +00/30	SSB
9014 kHz	Loring	1400-1200	none	SSB
	Scott	24 hours	none	SSB
10780 kHz	Cape Radio	On request	none	SSB
11176 kHz	Albrook	24 hours	H +25/55	SSB
	Andersen	24 hours	H +20/50	SSB

aircraft mentioned in the "Capsule" broadcast then respond to the ground station and receive their traffic which many times call for phone patching to various ALCC's (Airlift Theatre Control Centers). These ALCC's all use tactical ID's which are shown in the tactical chart for ground stations accompanying this report.





Alternate Stations

The USAF HF/SSB network has several backup ground facilities which are monitored at times. For instance, AFE71 ("CAPE RADIO") at Patrick Air Force Base in Florida is actually primarily assigned to use as the control station of the USAF's Eastern Test Range. It is also used, however, to communicate with aircraft having difficulty in com-

Frequency	Location	Operates (GMT)	"CAPSULE" Broadcasts	Mode
	Ascension	1800-1000	H +15/45	SSB
	Clark	1500-0200	H +25/55	SSB
	Croughton	0500-2300	H +00/30	SSB
	Elmendorf	24 hours	H +15/45	SSB
11179 kHz	Hickam	24 hours	H +00/30	SSB
	Loring	24 hours	none	SSB
	MacDill	0900-2400	H +20/50	SSB
11182 kHz	Scott	24 hours	none	SSB
11226 kHz	Elmendorf	On request	none	AM
	Lajes	1000-2100	H +05/35	SSB
11228 kHz	Thule	On request	none	AM
11236 kHz	Yokota	24 hours	H +05/35	SSB
11239 kHz	McClellan	24 hours	H +10/40	SSB
11246 kHz	MacDill	24 hours	H +20/50	SSB
13201 kHz	Andersen	24 hours	H +20/50	SSB
	Clark	24 hours	H +25/55	SSB
	Croughton	0800-2100	H +00/30	SSB
	Elmendorf	24 hours	H + 15/45	SSB
	Hickam	1700-0600	H +00/30	SSB
	Thule	24 hours	H +15/45	SSB
	Yokota	2100-1000	H +05/35	SSB
13210 kHz	MadDill	On request	none	AM
13215 kHz	Andersen	On request	none	AM
	Hickam	On request	none	AM
	Incirlik	24 hours	H +10/40	SSB
	Lajes	On request	none	AM
	Yokota	On request	none	AM
13244 kHz	Andersen	1000-1800	H +15/45	SSB
	Lajes	1000-2100	H +05/35	SSB
	MacDill	0900-2400	H +20/50	SSB
15015 kHz	Albrook	1200-0200	H +25/55	SSB
	Ascension	0800-2000	H +15/45	SSB
	Incirlik	24 hours	H +10/40	SSB
	Scott	1400-0200	none	SSB
15031 kHz	McClellan	1600-0400	H +10/40	SSB
15036 kHz	Croughton	On request	none	AM
18002 kHz	Andersen	2200-0700	H +20/50	SSB
	Clark	2200-1200	H +25/55	SSB
	Hickam	1900-0400	H +00/30	SSB
	Loring	1200-2400	none	SSB
	McClellan	1600-0400	H +10/40	SSB
	Yokota	0000-0900	H +05/35	SSB
18019 kHz	Albrook	1400-2400	H +25/55	SSB
	Clark	24 hours	H +25/55	SSB
	MacDill	0900-2400	H +20/50	SSB
20390 kHz	Cape Radio	On request	none	SSB
23227 kHz	Clark	0200-2300	H +25/55	SSB

The Green Lizard is the popular nickname for the Air Force's C-141B Starlifter in camouflage garb. (U.S. Air Force photo)

"MAINSAIL" Monitoring Stations
The USAF Global Command Control Systems Network (GCCS)

Zone 1 (Southeast Asia, including southern China)
Ground Station: "CLARK" (AIC2, Clark Air Base, Manila, Philippines)
Schedule:
6738 kHz Sunset to 2 hours after sunrise
8993 kHz 24 hours
11176 kHz 1300 to 0200 GMT
15015 kHz 2 hours after sunrise to sunset
18002 kHz 2 hours after sunrise to sunset
23227 kHz 0200 to 1300 GMT

Zone 2 (Territory of the Pacific Islands, Australia)
Ground Station: "ANDERSEN" (AIE2, Andersen AFB, Guam)
Schedule:
6738 kHz 24 hours
13201 kHz Sunset to 2 hours after sunrise
18002 kHz Sunset to 2 hours after sunrise

Zone 3 (Japan, northeast China, Mongolia, central Siberia)
Ground Station: "YOKOTA" (AIF2/AIF80, Yokota Air Base, Japan)
Schedule: Same as Zone 2

Zone 4 (Central Pacific south of Hawaii, New Zealand)
Ground Station: "HICKAM" (AGA2, Hickam AFB, Honolulu, Hawaii)
Schedule: Same as Zone 2

Zone 5 (Alaska, northwest Canada, eastern Siberia, north central Pacific)
Ground Station: "ELMENDORF" (AKA5, Elmendorf AFB, Alaska)
Schedule:
6738 kHz 24 hours
13201 kHz 24 hours
18002 kHz 2 hours after sunrise to sunset

Zone 6 (Pacific Ocean from Canada to below Mexico, from 1,000 to 1,500 miles offshore)
Ground Station: "McCLELLAN" (AFI2, McClellan AFB, California)
6727 kHz Sunset to 2 hours after sunrise
6738 kHz Sunset to 2 hours after sunrise
9014 kHz 24 hours
11182 kHz 24 hours
13201 kHz 2 hours after sunrise to sunset
15015 kHz 2 hours after sunrise to sunset
18002 kHz 2 hours after sunrise to sunset

Zone 7 (Continental USA, Canada ex-NWT & some arctic areas)
Ground Station: "SCOTT" (AFG9, Scott AFB, Illinois)
Schedule:
6727 kHz Sunset to 2 hours after sunrise
9014 kHz 24 hours
11182 kHz 24 hours
15015 kHz 2 hours after sunrise to sunset
18002 kHz 2 hours after sunrise to sunset

Zone 8 (Central/So. American & Caribbean, adjacent Atlantic/Pacific waters)
Ground Station: "ALBROOK" (AHF4, Albrook Field, Panama)
Schedule:
8993 kHz 24 hours
13244 kHz 2 hours after sunrise to sunset
15015 kHz 2 hours after sunrise to sunset

Zone 9 (Western No. Atlantic, Gulf of Mexico)
Ground Station: "MacDILL" (AFE8, MacDill AFB, Florida)
Schedule:
5703 kHz Sunset to 2 hours after sunrise
6727 kHz Sunset to 2 hours after sunrise
6750 kHz 24 hours
9011 kHz 2 hours after sunrise to sunset
9014 kHz 24 hours
11176 kHz 24 hours
11182 kHz 24 hours
13201 kHz 2 hours after sunrise to sunset
13244 kHz 2 hours after sunrise to sunset
15015 kHz 2 hours after sunrise to sunset
18002 kHz 2 hours after sunrise to sunset

Zone 10 (Greenland, Arctic waters of eastern Canada)
Ground Station: "THULE" (XPM, Thule Air Base, Greenland)
6738 kHz 24 hours
13201 kHz 24 hours

Zone 11 (Eastern No. Atlantic, Iceland, Scandanavia, most of Europe except Spain/Portugal & Mediterranean nations. Includes all European USSR areas.)
Ground Station: "CROUGHTON" (AJE, Croughton Air Base, England)
5703 kHz Sunset to 2 hours after sunrise
6750 kHz 24 hours
9011 kHz 2 hours after sunrise to sunset
11176 kHz 24 hours
13201 kHz 2 hours after sunrise to sunset
13244 kHz 2 hours after sunrise to sunset
15015 kHz 24 hours

Zone 12 (East-central Atlantic, Spain/Portugal, southern France, N.W. Africa, western Mediterranean)
Ground Station: "LAJES" (CUW2, Lajes Field, Azores)
Schedule: Same as Zone 11

Zone 13 (Africa south of Algeria/Libya/Egypt, Yemen, S.E. Atlantic, Indian Ocean)
Ground Station: "ASCENSION" (AFD14, Ascension Aux. Air Field, Ascension Island)
Schedule:
6738 kHz Sunset to 2 hours after sunrise
8993 kHz 24 hours
11176 kHz 1300 to 0200 GMT
13244 kHz 2 hours after sunrise to sunset
15015 kHz 2 hours after sunrise to sunset
18002 kHz 2 hours after sunrise to sunset

Zone 14 (Italy, S.E. Europe, Middle East, Arabia, eastern Mediterranean, Egypt, Libya, Turkey, Iran & east to portions of India & western China)
Ground Station: "INCIRLIK" (AJG9, Incirlik Air Base, Turkey)
Schedule:
5703 kHz Sunset to 2 hours after sunrise
6738 kHz Sunset to 2 hours after sunrise
6750 kHz 2 hours
9011 kHz 2 hours after sunrise to sunset
11176 kHz 24 hours
13201 kHz 2 hours after sunrise to sunset
15015 kHz 24 hours
23227 kHz 0200 to 1300 GMT

Tactical Callsigns: Ground/Air Units

ABNORMAL 10	Vandenberg AFB, CA
AGAR	EC-135N aircraft used for downrange tracking of missiles
AIREVAC	Evacuation aircraft
BOOKSTORE	White House Communications Center
CAPSULE	General call to all MAC aircraft
CEMENT MIXER	White House Situation Room
CHANDELIER	State Department
CROWN	White House Communications Agency
DENALI	Alaskan ALCC
DISCARD	22nd Air Force Operations
ELECTRIC	National Emergency Command Aircraft
FIRESIDE 1	Langley AFB, VA
FIRESIDE 3	Shaw AFB, SC
FIRESIDE 4	Mountain Home AFB, ID
FIRESIDE 5	Bergstrom AFB, TX
FORMAT	21st Air Force Operations
FURIOUS	South American ALCC
GULL	WC-130 Weather recon aircraft
HILDA	MAC Command HQ
HORNPIPE	Cannon AFB, NM
HOTLIPS	Moody AFB, GA
HOTSHOT	White House
KING	Aerospace Rescue & Recovery Service aircraft
LACTOSE	Shaw AFB, SC
MAC	Military Airlift Command aircraft
MAINSAIL	General call to any Command Control Station
MEDEVAC	Flying hospital aircraft
MIAMI MONITOR	National Hurricane Center, FL
PHANTOM	European ALCC
RAT	USN transport aircraft
RAYMOND 6	George AFB, CA
RAYMOND 7	Cannon AFB, NM
RAYMOND 10	Hurlburt AFB, FL
RAYMOND 14	Holloman AFB, NM
RAYMOND 15	Homestead AFB, FL
RAYMOND 17	Moody AFB, GA
RAYMOND 19	MacDill AFB, FL
RAYMOND 21	Myrtle Beach AFB, SC
RAYMOND 22	Nellis AFB, NV
RAYMOND 24	Tinker AFB, OK
RAYMOND 25	Seymour Johnson AFB, NC
RAYMOND 26	Shaw AFB, SC
RAYMOND 27	Mountain Home AFB, ID
RAYMOND 28	Bergstrom AFB, TX
RINGMASTER	NORAD HQ, CO
ROADRUNNER	WHCA mobile communications unit
SAM	Special Air Mission VIP flight
SPAR	USN VIP flight
SWAN	WC-130 weather recon aircraft
TEAL	WC-130 weather recon aircraft
TONIGHT	Pacific ALCC, Hawaii

municating with "ASCENSION." Other Eastern Test Range facilities which may also be used for this purpose include stations on Ascension, Antigua, and Mahi. The frequencies are 10780 and 23090 kHz.

Station AFL2 ("LORING"), located at Loring AFB in Maine, is designated as a secondary guard station and is used when aircraft flying the North Atlantic routes can't get through to "MacDILL." It's frequencies are shown in the chart.

"Mainsail"

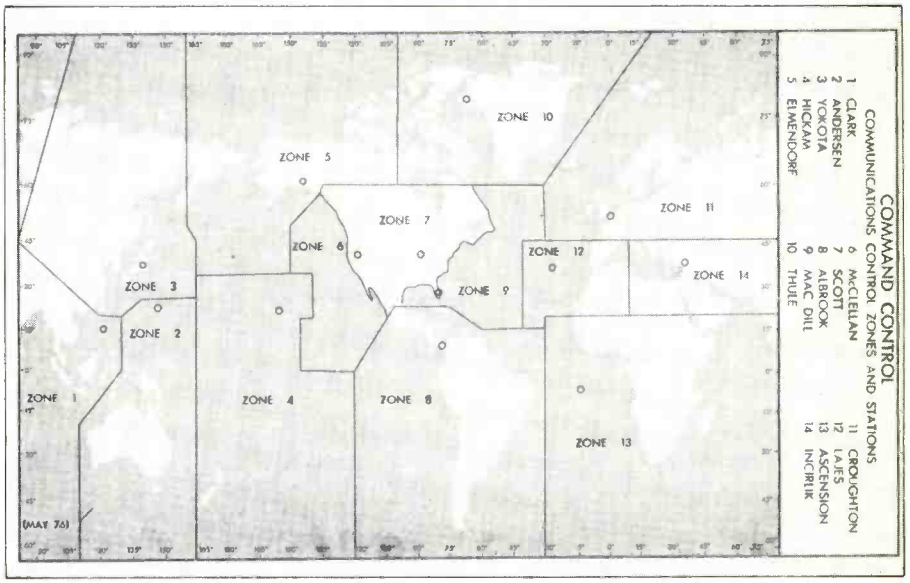
The word "Mainsail" is a general net air/ground call used for initiating so-called "command control" traffic to the USAF's Global Command Control Stations (GCCS). The USAF has segmented the glove into 14 specific Command Control Zones, each zone having a single designated GCCS. "SCOTT" is the GCCS for the Continental United States (CONUS), and this station has the ability to remote control transmitters at Loring AFB, MacDill, and MacClellan AFB in order to maximize its coverage. The GCCS's may provide 'phone patches and/or message services between the aircraft and "MAJCOM" command posts, operations centers, etc. When monitoring "Mainsail" communications you're likely to hear not only tactical ID's from the aircraft and some ground stations, but also various Air Force Bases identifying with their actual names, such as Altus AFB, McChord AFB, etc. However, these ground facilities are not being monitored directly but through the transmitting facilities of the GCCS. Commonly heard tactical calls include the ones consisting of the world "RAYMOND" followed by digits, these are Tactical Air Command (TAC) bases.

Insofar as the ID's used by aircraft communicating with any of these ground stations, some simply identify as "Navy Alpha Bravo 521," "Coast Guard 2101," "Navy Papa Charlie 02," but you'll also hear cryptic ID's such as "Appraise," "Otis 51," "Pastrami." "Rip 19," "Folk 60," "Swan 24," "Ali Baba," "Spar 60," "Edgy 22," and numerous others. Some of these ID's are known outside of the military and they are shown in the accompanying chart of tactical ID's. As for the rest, their meanings are not generally known and most likely are

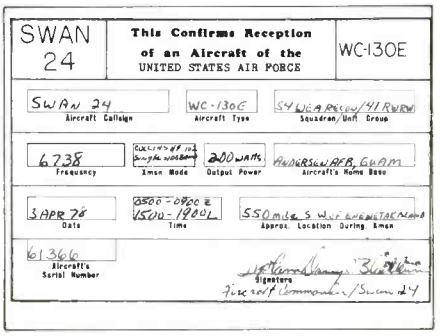
Frequency Use Guide

	250-850 Mi.	850-1725 Mi.	1725+ Mi.
Midnight	3 to 4.7 MHz	6.7 to 8.9 MHz	6.7 to 11.1 MHz
4 a.m.	3 to 4.7 MHz	4.7 to 6.7 MHz	6.7 to 8.9 MHz
8 a.m.	3 to 6.7 MHz	6.7 to 11.1 MHz	11.1 to 18 MHz
Noon	4.7 to 6.7 MHz	8.9 to 13.2 MHz	13.2 to 18 MHz
4 p.m.	4.7 to 6.7 MHz	8.9 to 13.2 MHz	13.2 to 18 MHz
8 p.m.	3 to 6.7 MHz	6.7 to 11.1 MHz	11.1 to 18 MHz

This chart, which indicates the distance between the aircraft and the ground station in statute miles, is used to select the best frequency for communication. Times shown are local time at the ground station. When closer than 250 miles, any frequencies can be used, depending upon operating schedule at ground station for a particular frequency. Actually this chart is a handy reference guide for general monitoring and two-way communications use.



Department of Defense chart.


SWAN 24 — This Confirms Reception of an Aircraft of the UNITED STATES AIR FORCE — WC-130E

SWAN 24 (Aircraft Callsign) | WC-130E (Aircraft Type) | 54 WEA Recon/41 RWRW (Squadron/Unit Group)

6738 (Frequency) | Successful Single Sideband (Xmsn Mode) | 200 Watts (Output Power) | ANDERSEN AFB, GUAM (Aircraft's Home Base)

3 APR 76 (Date) | 0500-0700 Z / 1500-1900 L (Time) | 550 miles S W/C ENIWETAK Atoll (Approx. Location During Xmsn)

61366 (Aircraft's Serial Number) | Signature | Aircraft Commander/Swan 24

Courtesy of SPEEDX.

changed with the passing of time anyway.

In addition to the frequencies shown in this report, there are many specialized channels used by the Strategic Air Command, Tactical Air Command, and other USAF activities. It has been the purpose of this report only to cover VIP communications and those of the HF/SSB and GCCS networks. When monitoring these frequencies, you'll note that traffic decreases and increases as the ebb and flow of world tensions changes. In any event, it's never dull, and with the information provided here you should be able to embark upon a major listening effort which will provide you with a far closer look at the behind-the-scenes factors relating to world events.

Listeners first realized that these networks, or their ancestors, were interesting way back during and just after WWII when most operations were confined to two frequencies, 4220 and 4765 kHz. Forty years later the stations are no less interesting and there are dozens of frequencies in use!

Station Addresses:

Albrook Field, APO New York 09825
Andersen AFB, APO San Francisco 96351
Andrews AFB, Washington DC 20331
Ascension Aux. AFB, via Patrick AFB FL 32925
Clark Air Base, APO San Francisco 96274
Croughton Air Base, APO New York 09378
Elmendorf AFB, AK 99506
Hickam AFB, HI 96853
Incirlik Air Base, APO New York 09283
Lajes Field, APO New York 09406
Loring AFB, ME 04751
MacDill AFB, FL 33608
McClellan AFB, CA 95652
Scott AFB, IL 62225
Thule Air Base, APO New York 09023
Yokota Air Base, APO San Francisco 96292

Some monitors have been successful in obtaining verifications from these stations, so here are their mailing addresses. A typical address might be written out: Chief Radio Officer, USAF, Thule Air Base, APO New York 09023. Note: Do NOT mention any foreign nation's name in an APO address or otherwise you will not be able to send your letter at domestic postage rates and the Post Office will return your letter for insufficient postage.

EAVESDROP ON THE WORLD WITH RADIOTAP™

Shortwave listening can be much more exciting than just monitoring voice broadcasts. The airwaves are full of coded signals; Morse code, Radioteletype, and ASCII. These types of encoding are used to send Government Broadcasts, Weather Data, News Services, and Military Information, to mention just a few.

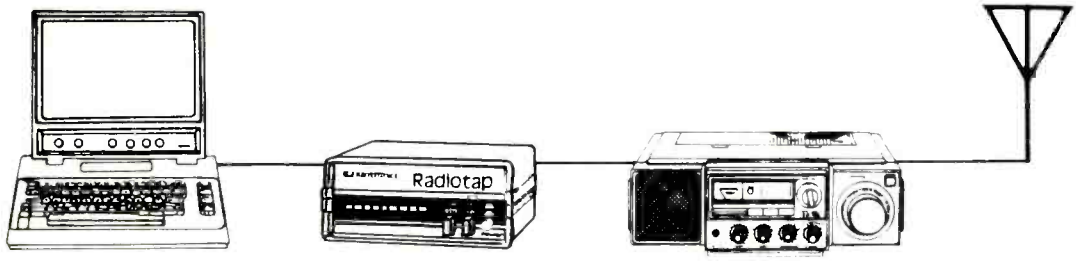
With an inexpensive VIC-20 or Commodore 64 computer and RADIOTAP you can eavesdrop on these coded transmissions and read the messages on your monitor screen. You can even print received messages on a Commodore serial printer.

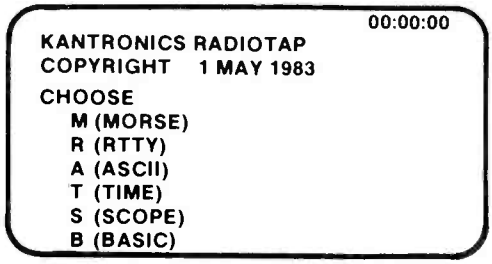
The RADIOTAP system is easy to set up. Simply connect the external speaker output of your receiver to the RADIOTAP tuning unit and connect the tuning unit to the computer. Then plug the RADIOTAP software cartridge into the computer and turn on the power. All necessary cables are provided, and we have included the CONFIDENTIAL FREQUENCY LIST to help you find coded signal frequencies.

RADIOTAP lets you try different ways to decode unconventional signals too. You can use the program to decode inverted, bit-inverted, and signals with altered bit order. RADIOTAP also has a special "SCOPE" feature that lets you use the computer monitor to measure the timing of signals, and then change the baud rate to capture unusual speed signals.

RADIOTAP lets you eavesdrop on a sky full of information with your home computer. Shortwave listening will never be the same.

Radiotap™ System Diagram



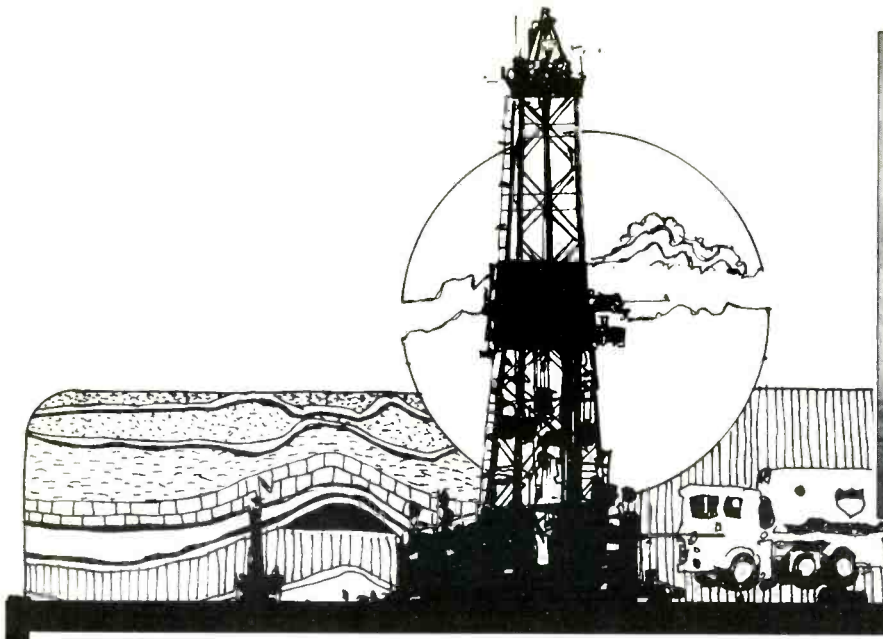


Main Menu

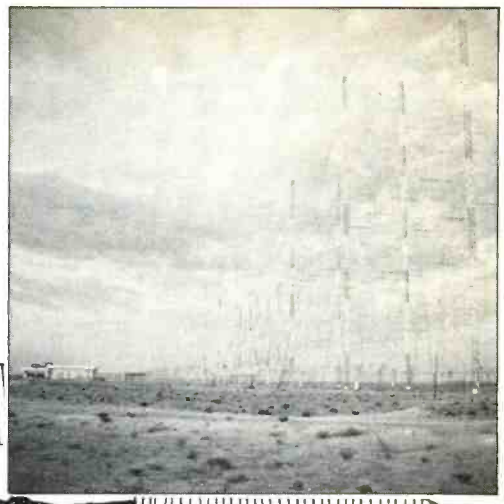
Sugested Retail $199.95

For more information contact:
Kantronics 1202 e. 23rd street Lawrence, Kansas 66044 913-842-7745

CIRCLE 15 ON READER SERVICE CARD



Antennas at Radio Color TV Dubai.



DXing The Desert's Edge!

Monitoring Those Exotic Oil-Rich Mini-Nations.

BY GERRY L. DEXTER

The discovery of oil in the various small states along the Arabian Peninsula has turned those affected from hot, isolated backwaters of the world into hot but rich and modernized lands practically overnight.

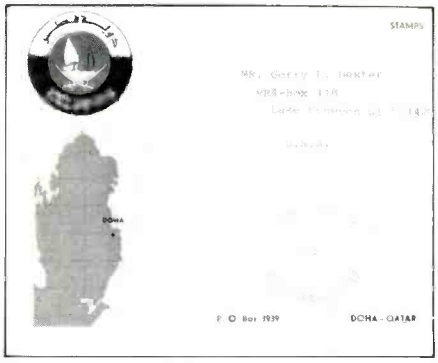
What the developed nations achieved through decades of development came to much of this area in a sort of economic "warp drive" transforming them virtually overnight.

Along with the fancy new buildings, ports, roads, schools, hospitals, and so on came growth in broadcasting. And while broadcasting in the area is still somewhat limited, the stations have discovered the high power game and are busy playing at it. Even so, broadcasts from the lands along the edge of the Arabian Peninsula are not a snap to log, not all of them anyway.

Little English is used and there isn't much in the way of services beamed to this continent. But with just a little effort, one can hear and verify all the stations in the area.

What we're going to do here is travel along the coast of Saudi Arabia and call at the small states that cling to the edge of the Arabian Peninsula.

At the north end of the Persian Gulf, lying against Southern Iraq and across the gulf from Iran, is Kuwait. At the end of World War II, Kuwait was a poor desert kingdom with a severe water shortage problem and little to recommend it. Kuwait existed by fishing, pearling, and trading with its neighbors. Less than thirty years later, Kuwait had the world's highest per capita income and was providing its citizens with free education, subsidized housing, free medical care, free telephones, and collecting no taxes in return. We don't need to tell you what happened! Kuwait City was completely rebuilt. Half of Kuwait's population resides in the capital city and two-thirds of its work force are foreigners who can neither own property nor participate in politics.

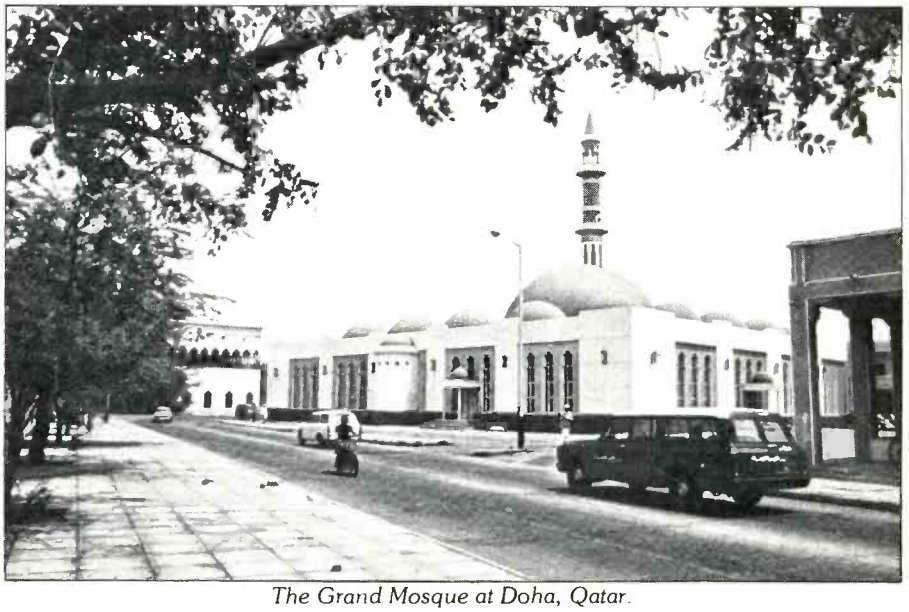


The attractive QSL card from the Qatar Broadcasting Service.

Radio Kuwait came on the air in 1951 using only 500 watts, though that power was doubled the first year. That's quite a difference compared to today. Radio Kuwait's current punch, two 500 kilowatt transmitters, were added in 1979 and another two are planned. All will feed rotating antenna systems.

Radio Kuwait maintains six services:

The Main Program in Arabic from 0230 to



The Grand Mosque at Doha, Qatar.

2215 (to 0015 during the Islamic Holy month of Ramadan) uses a wide number of frequencies at various times. The best possibilities include 9.840 at 0230 sign on, 17.850, 11.990, 11.675, or 9.840 at 0400; around 0500 try 17.850, 15.495, 11.990, 11.675, or 9.840; and at 2100 try 11.650 or 15.495.

The Second Program, also in Arabic only, is broadcast on medium wave only for six hours per day.

The Third Program, the Holy Koran Service, is aired from 0200 to 0500 on 15.495.

The English Language Program of Radio Kuwait is scheduled from 0500 to 0800 on 15.345.

In Urdu, there's a two hour per day broadcast from 1600 to 1800 on 21.545.

And Radio Kuwait's Persian Program is aired on medium wave only from 0800 to 1000. There's also a stereo FM service.

Radio Kuwait's Arabic identification is "Huna al-Kuwait" and the interval signal is a melody played on a clarinet. Reception reports are verified with a folder QSL. Reports can be sent to Radio Kuwait, P.O. Box 397, Kuwait.

Sailing south on the Persian Gulf we must, unfortunately, pass by Bahrain Island. There's no shortwave broadcasting here, though hopefully someday.

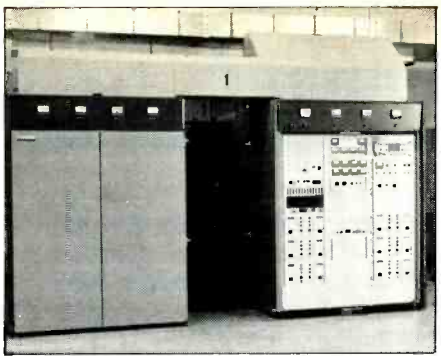
Just south of Bahrain is a lump of land sticking out into the sea called Qatar—an arid, stony, sandy, barren place where oil was discovered in 1949. The capital, Doha, is one of those cities which was little more than a village at the time but is now a modern city with a deepwater port.

Like many of the other countries, the discovery of oil—while a boon to the economy and standard of living—has been a blow to the traditional way of life, at least in public. Western dress is common and there are less restrictions on women. There are more immigrants than there are natives, most of whom are of the Sunni Moslem persuasion.

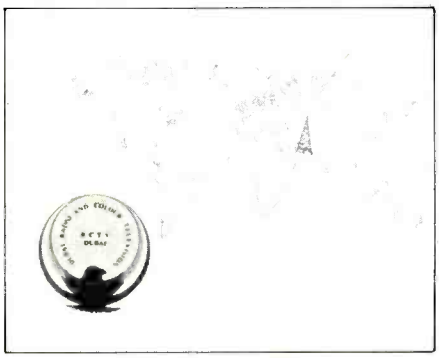
The Qatar Broadcasting Service beams programs mainly to the Arab world but also to North and East Africa, Turkey, and Europe. All the programs on shortwave are in Arabic but there is some English carried on local medium wave outlets. Transmitters are 100 and 250 kilowatts, the latter having gone on the air in 1981. Two talk and two music studios are located about two and a half miles from the transmitting site which is fed by a VHF link.

Programs include news, features, music, Koran recitations, request programs, and religious talks from 0245 to 2130. Best bets are at sign on on 15.505 and 9.570, from 0705 on 9.570, from 1600 on 17.910, and from 1700 on 15.505. Arabic identification is "Indha'at al-Qatar min al-Doha." Reception reports are welcomed and are carefully checked for accuracy. The address is the Qatar Broadcasting Service, P.O. Box 3939, Doha.

Next door to Qatar are the United Arab Emirates, formerly the Trucial States. Seven sheikdoms make up this loose federation—Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Quaiwain, Ras al-Khaimah, and Fujairah. Each is ruled by a sheik who has wide powers. Abu Dhabi and Dubai are the most developed.



One of the high power transmitters of Radio Color Television, Dubai.



RCTV Dubai's QSL.

A shortwave station called "Saut As Sahil" or "The Voice of the Coast" existed in Sharjah as a commercial station operated by the British with local staff. The station used ten kilowatts on 6.040 but disappeared sometime after the British left in 1971 and, at present, Sharjah has no shortwave.

It took less than ten years, from about 1962 to 1970, for oil money to transform a primitive frontier-like town like Abu Dhabi into a very modern city.

From Abu Dhabi, the Voice of the UAE operates a 250 kilowatt transmitter on 9.695 from 1600 to 2130 in Arabic only. The identification is "Saut al-Emirat al-Arabiyah al-Mutaidad min Abu Dhabi." Reception reports go to P.O. Box 637, Abu Dhabi, United Arab Emirates.

Oil was discovered in Dubai in 1969 and Dubai subsequently became home to the major voice from the area, Radio and Color Television Dubai, also known as UAE Radio Dubai, nicknaming itself "The Sunshine Station."

There are three automatic Marconi 300 kilowatt transmitters (and a fourth one planned) at the transmitter site in the desert about 25 miles outside Dubai City. Fourteen antenna arrays are in use. Transmitters are fully automated and controlled from a central, computerized control desk which remembers the times and switching arrangements necessary to conform to the broadcast schedule. Frequency and antenna combinations can be changed from the desk and switching can be done automatically within twenty seconds.

Studio space in the city is limited so, for the present, programming on shortwave amounts mostly to relays of the domestic service with the English newscasts originating from a local FM outlet. New studios are under construction and programs will be expanded when that facility is completed.

The timing of programs to various areas is not the most opportune for the targeted listening area. UAE Radio acknowledges that and says it's caused by having to depend on local program feeds for the shortwave program content and that the new facilities will correct this problem as well.

Look for UAE Radio from 0230 to 2050 daily. Frequencies include 21.695, 21.655, 17.775, 15.430, 15.320, 15.300, 15.140, 11.695, and 11.900. English to North America is scheduled from 0330 to 0415 on 17.775, 15.430, and 11.965.

Reception reports go to P.O. Box 1695, Dubai, United Arab Emirates.

Bordering the UAE is the Sultanate of Oman which faces Iran across the Gulf of Oman and curves around the Saudi toe to face the Arabian Sea as well. It's the oldest independent sovereign Arab state. Due to its geographical position, with its face to the sea and its back to Rub al-Khali, the Saudi Empty Quarter, the Sultanate has developed in isolation and a strongly conservative Moslem tradition exists.

The capital, Muscat, is home to Radio Oman with 50 and 100 kilowatt transmitters

An attractive blue and white sticker from Radio Kuwait.

Radio Kuwait's program schedule.

May We Recommend . . . .

The North American Short Wave Association, P.O. Box 13, Liberty, IN 47353. NASWA has been around since 1961 and now has well over 2,000 members. Their specialty is short wave broadcast (SWBC) coverage and they're good at it. Each month they publish *FRENDX*, a really good 56 page publication filled with columns which are brimming over with news and information on the world of SWBC DX. In addition to *FRENDX*, they also send out a mid-month update consisting of several pages of late breaking frequencies, new stations, schedule changes, etc. Membership in NASWA is $16 per year in North America and includes a First Class Mail subscription to *FRENDX*. A sample copy of *FRENDX* is $1. When writing to the above, please mention POP' COMM!

at Seeb. English is aired from 0900 to 1100 on 11.890 and 9.735. Other times during the 0200 to 2125 broadcast day are all Arabic. Other frequencies used are 9.655 and 9.510. The identification in Arabic is "Indha'at-o Oman min Muscat." Reports go to P.O. Box 600, Muscat.

Off the Omani coast is Masirah Island, site of the British Broadcasting Corporation's Eastern Relay Station which relays BBC Arabic, Hindu, Urdu, and World Service programs on 6.030, 7.140, 7.160, 9.540, 9.605, 11.740, 11.850, 11.945, 11.955, 15.310, 17.770, and 17.825. Chances for a reply are not too good should you try and confirm this direct (P.O. Box 3716, Ruwi Post Office, Muscat). The BBC in London will send an acknowledgement card for your report but it's highly unlikely they'll indicate you heard the Eastern Relay Station.

On the heel of the Arabian Peninsula is the People's Democratic Republic of Yemen. In simpler times it was just Aden. The British controlled the area for 125 years and left in 1967. A series of border clashes, coups, and tribal uprisings followed.

The port of Aden has a deep, natural harbor and the main commercial district lies in the crater of an extinct volcano. In fact, the area is known locally as "The Crater." There are 1300 separate tribes in the country.

Should you ever find you have need of some frankincense or myrrh, the Yemen People's Democratic Republic is the place to go, in particular the island of Socotra some distance off the coast.

The Democratic Yemen Broadcasting Service runs 100 kilowatts from Al-Hiswah on 5.970, 6.005, 7.190, and 11.770 from 0300 to 0630 and 1100 to 2230.

The identification in Arabic is "Idha'at al Jumuriyah al-Yaman al-Dimucratica Ash-Shabaya min Aden." QSLs from this station are somewhat intermittent but with effort can be had. Write P.O. Box 1264, Aden.

The rest of the peninsula's heel is taken up by The Arab Republic of Yemen, sometimes called North Yemen. Facing Ethiopia across the Red Sea, North Yemen saw civil war in the early 1970's as forces loyal to the deposed Imam (backed by Saudi Arabia), and troops loyal to the new republican government (backed by Egypt), fought for several years. The republicans also carried on an on-again, off-again war with South Yemen.

The government station, Radio San'a, operates a 50 kilowatt outlet on 9.780 and is listed to use 100 kilowatts on 4.854. The schedule runs from 0300 to 0700 and 1000 to 2030. There have been some recent receptions of this at their 0300 sign on on 9.780. The Arabic identification is "Idha' at al-Jumuriyah al-Arabiyah al-Yamaniyah." Reception reports go to Radio San'a, Ministry of Information, San'a. Replies are inconsistent.

We're in the Red Sea now and have completed our tour, so we can sail north to the Suez Canal, then into the Mediterranean, on across the Atlantic Ocean and home to log these stations. Or shall we fly so we can be at our receivers sooner?

AEA Brings You The RTTY Breakthrough

NEW MBATEXT™ $109.95 VIC-20 MBATEXT or C-64 MBATEXT

MBATEXT™ is the most advanced MBA (Morse, Baudot, ASCII) software plug-in cartridge available for the VIC-20 or Commodore 64 computer. Compare our outstanding features and price to the competition.

• KEYBOARD OVERLAY instructions to avoid constant referral to the manual • RTTY and ASCII SPEED ESTIMATE MODE • BREAK-IN CW MODE •QSO BUFFER RECORD TOGGLE •WORD PROCESSOR style insertion, deletion, and correction in TEXT EDIT MODE • CW AUTO SPEED TRACKING plus SPEED LOCK • BREAK-IN BUFFER that is easy to use • Low speed FARNSWORTH CW TRANSMISSION (between 5 and 14 WPM) • RE-TRANSMIT RECEIVED TEXT DIRECTLY without need of disk or cassette • DISK, CASSETTE, OR PRINTER storage of message and QSO buffers • RECEIVE AND TRANSMIT 5-99 WPM MORSE • 10 SOFT-PARTITIONED™ MESSAGE (OR TEST) BUFFERS • WORD WRAP • TIME OF DAY CLOCK • PRECOMPOSE SPLIT SCREEN OPERATION • STATUS INDICATORS on screen • EASY START-UP by simply typing SYS 44444 or SYS 33333 • DEDICATED FUNCTION KEYS for quick operation • Ability to IMBED CONTROL FUNCTIONS in type-ahead buffer • WORD OR CHARACTER mode • SELECTABLE BAUDOT UNSHIFT ON SPACE (USOS) •SEND/RECEIVE 60, 67, 75, 100, 132 WPM BAUDOT PLUS 100, 300 BAUD ASCII • RTTY BLANK-FILL and MORSE BT option for idle transmit periods • AUTOMATIC PTT • computer control of TONE REVERSE • MASTER MENU, COMMAND MENU, and OPTIONS MENU makes MBATEXT™ easy to use with no prior experience • INCLUDES CABLE TO INTERFACE WITH AEA model CP-1 COMPUTER PATCH™ • POWERED BY HOST COMPUTER.

NEW MICROPATCH™

MICROPATCH™ IS A NEW LOW-COST, HIGH-PERFORMANCE Morse, Baudot and ASCII SOFTWARE/HARDWARE computer interface package. The MICROPATCH™ model MP-20 or MP-64 incorporates the complete MBATEXT software ROM (described above) for either the VIC-20 or Commodore 64 computers. All circuitry and software is incorporated on a single, plug-in cartridge module featuring the following: • TRUE DUAL CHANNEL MARK AND SPACE MULTI-STAGE 4 POLE, CHEBYSHEV ACTIVE FILTERS • AUTOMATIC THRESHOLD CORRECTION for good copy when one tone is obliterated by QRM or SELECTIVE FADING • EASY, POSITIVE TUNING with TRIPLE LED INDICATOR • NOT a low-cost, low-performance phase-locked loop detector!!! • SWITCH SELECTED 170 Hz or WIDE SHIFT on receive • 800 Hz multi-stage active CW FILTER • AUTOMATIC PTT • RTTY ANTI-SPACE • demodulator circuitry powered by external 12VDC (not supplied) to AVOID OVERLOADING HOST COMPUTER and for maximum EMI ISOLATION • EXAR 2206 SINE GENERATOR for AFSK output • SHIELDED TRANSCEIVER AFSK/PTT INTERFACE CABLE PROVIDED • PLUS or MINUS CW KEYED OUTPUT • FSK keyed output.

The Micropatch is structured for easy upgrading to the AEA Computer Patch ™ advanced interface unit without having to buy a different software package! Simply unplug the external computer interface cable (supplied with the Micropatch) from the Micropatch and plug it into the Computer Patch.

$149.95 MP-20 or MP-64

RECEIVE ONLY VERSIONS **$129.95 MPR-64 or MPR-20**

COMPUTER PATCH™

COMPUTER PATCH™ is the name of our most advanced computer interface equipment for Morse, Baudot, ASCII, or AMTOR operation. The CP-1 will allow you to patch most of the popular personal computers to your transceiver when used with the appropriate AEASOFT™ TU software such as AEA MBATEXT, AMTOR TEXT™, or the MBATEXT RESIDENT ON THE MICROPATCH units. AEA also offers a full feature software package for the Apple II, II plus and IIE; TRS-80 Models I, III and IV; and the IBM-PC. The CP-1 will also work with certain other computers using commonly available software packages.

The CP-1 offers the following advanced and high quality features: • HANDSOME ALL METAL ENCLOSURE FOR MAXIMUM RF IMMUNITY • DUAL CHANNEL, MULTI-STAGE ACTIVE MARK AND SPACE FILTERS • AUTOMATIC THRESHOLD CORRECTION • RECEIVE 170 HZ FIXED OR 100-1000 HZ VARIABLE SHIFT • 800 HZ multi-stage CW FILTER • PRE—LIMITER AND POST-LIMITER FILTERS • SERIAL RS-232 FIELD INSTALLABLE OPTION • 117 VAC WALL ADAPTOR SUPPLIED • PLUS (+) and MINUS (-) CW OUTPUT JACKS • MAGIC EYE STYLE BAR GRAPH TUNING INDICATOR • SCOPE OUTPUT JACKS • NORMAL/REVERSE front panel switch • MANUAL (override) PTT switch • VARIABLE THRESHOLD for CW • ANTI-SPACE RTTY • KEY INPUT JACK for narrow shift CW ID on RTTY, CW practice, or keyboard bypass.

The CP-1 is made in the U.S. with high quality components including double-sided glass epoxy through-hole plated boards, complete with solder mask and silk screened parts designators.

$239.95 CP-1

PACKAGE SPECIALS
$274.95

Combine the VIC-20 or COMM-64 MBATEXT™ software with the CP-1 at time of purchase and you receive a SPECIAL PACKAGE PRICE. NOW the best RTTY COMPUTER INTERFACE SYSTEM is available at prices comparable only to vastly inferior systems.

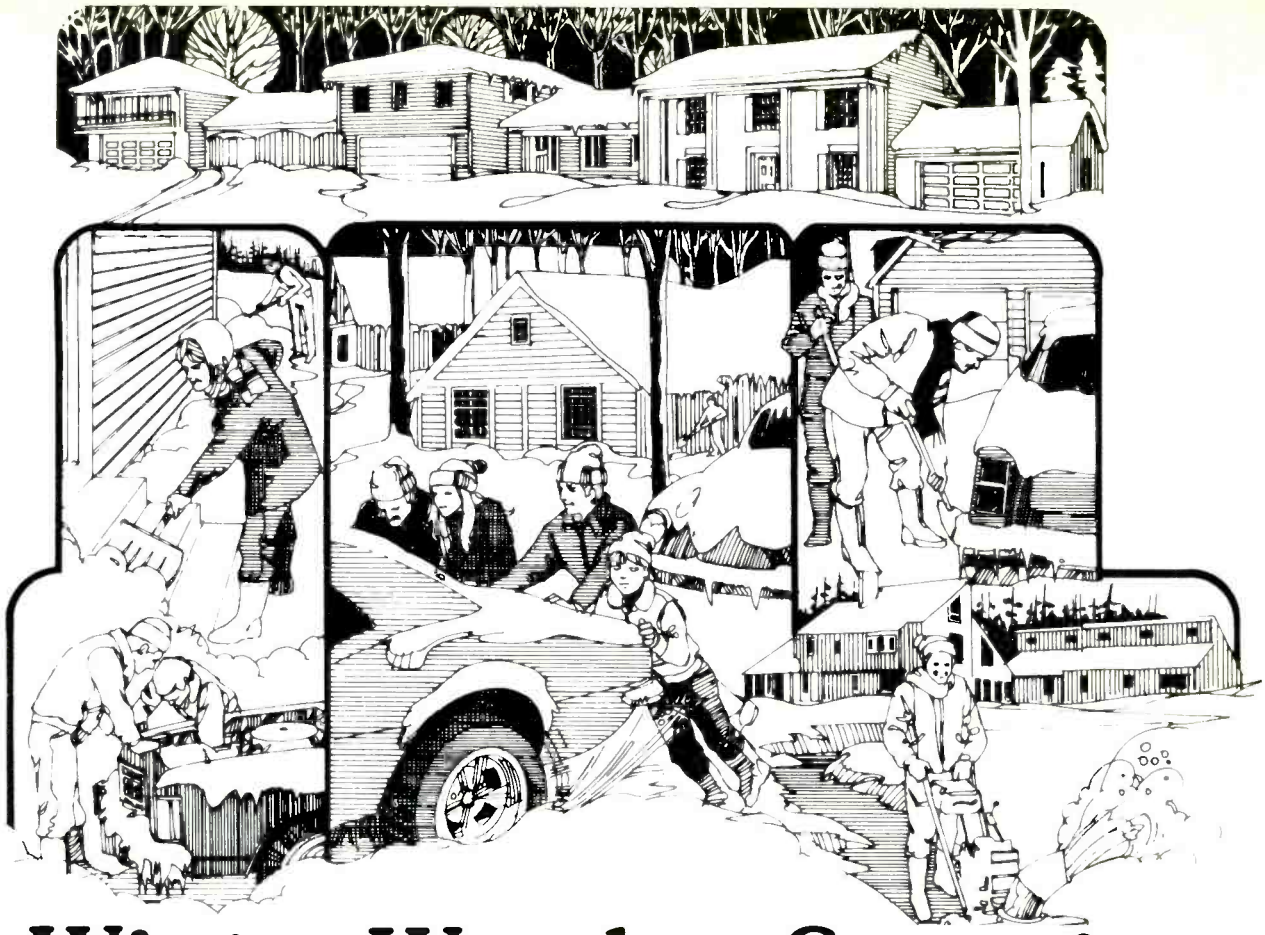
CP-1/20 (CP-1 with VIC 20 MBATEXT) CP-1/64 (CP-1 with C-64 MBATEXT)

Advanced Electronic Applications, Inc.

P.O. BOX C-2160 • LYNNWOOD, WA 98036 • (206) 775-7373 • TELEX; 152579 AEA INTL

10/20/83

Please send all reader inquiries directly.



Winter Weather Scanning

'Tis The Season To Pay Special Attention To Your Scanner!

BY JAN KARASEWICZ, KPA3SU

Being a scanner fan has its rewards as well as its regrets, most especially during the winter.

As for regrets, well it's no fun to bother winterizing the antenna system. That usually means double checking the coaxial cable to see if it needs replacing (pinholes or tears in the black outer covering mean its time for a replacement). I also put silicone on all antenna connectors in order to weatherproof them; a little moisture or ice can do wonders for turning people into former scanner users.

Insofar as rewards go, that's different. Winter brings about lots of interesting activity on the scanner bands, activity which is unique to the season. Guiding it all, of course, is the weather which is peculiar to winter. Therefore, I pay close attention to the events on weather transmissions. Depending upon the area in which you're located, you can probably find activity on any or all of the following frequencies: 162.40 162.475, and 162.55 MHz. Some of the transmissions may be for areas adjacent to your own location.

If you live in an area which is subject to snow and ice on the roads, that brings about several more cold-season possibilities—for instance, listening in on those state, county, and municipal agencies which activate when sand/salt spreading is required, or when snow removal operations are taking place. You'll usually find these activities on the frequencies reserved for the Highway Maintenance Radio Service. Since these frequencies will be different in each area, if you don't know your local frequencies, try putting your scanner on *search* and check out the following bands: 33.02 to 33.10, 37.90 to 37.98, 45.68 to 45.84, 47.02 to 47.40, 150.995 to 151.13, 156.045 to 157.11, 158.985 to 159.195, 453.05 to 453.95 MHz. Chances are the one or more agencies in your area which keep local and major roads clear will be operating within these frequency ranges.

Your municipal, county, and state law enforcement and fire agencies will also have substantially increased activity during winter weather emergencies. The best way to find out these frequencies for your area if you don't already know them is to check with any shop in your area which sells scanners and scanner accessories. They'll be happy to give you the frequencies you're seeking.

Medical emergency frequencies have greatly increased activity during cold weather periods. These can be related to accidents on the road and to persons who must be ferried to doctors or hospitals for treatments. Also included in this category would be search and rescue teams and patrols which are active in mountainous areas. Check out the following frequencies/bands for operations in your own local area: 33.02 to 33.10, 35.02, 35.64 to 35.68, 37.90 to 37.98, 43.64, 43.68, 45.92 to 46.04, 47.46 to 47.66, 150.775, 150.79, 155.16 to 155.40, 453.025 to 453.175, 460.525, 460.55, 462.95 to 463.175, 465.525, 465.55, 467.95 to 468.175 MHz. The American Red Cross is on 47.42 MHz. Most active hospital/ambulance related frequencies appear to be 155.325, 155.355, 155.385, and 155.40 MHz.

Public utilities are often adversely affected by weather emergencies of the ice and snow breed. This would include telephone and electric power companies especially, although many areas of the energy industry will also probably feel the sting of winter. Therefore, all such frequencies are worthy of being monitored for emergency repair activities.

Look for telephone repair crews on the following frequencies and bands: 35.16, 43.16, 151.985, 158.34, 451.175 to

451.675 MHz. Electric power companies can generally be found on these frequencies and bands: 37.46 to 37.86, 47.70 to 48.54, 153.41 to 153.725, 158.13 to 158.265, 451.025 to 451.675 MHz.

Transportation

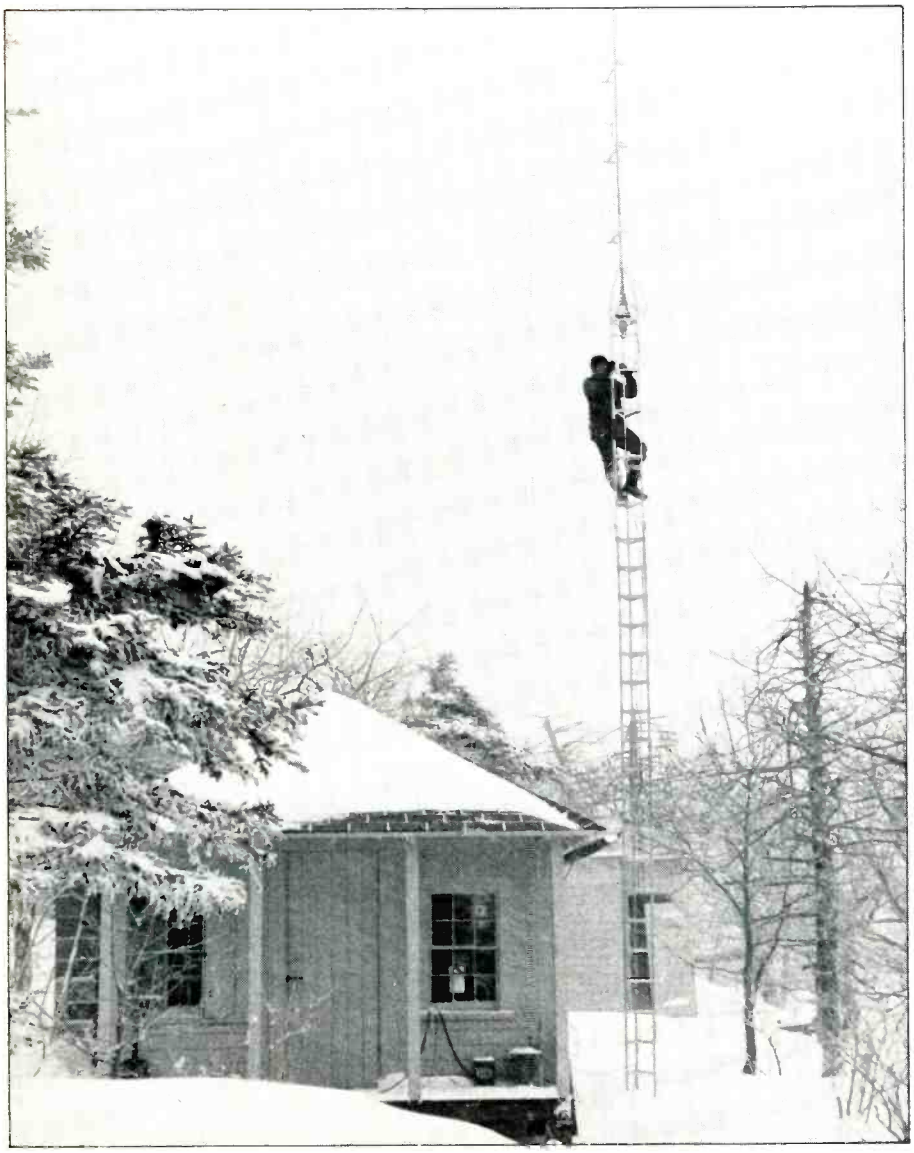
All forms of transportation are hampered by winter weather conditions and therefore can be expected to utilize communications far more than usual. The Coast Guard will be heard issuing navigation broadcasts on 157.10 MHz. Vessels can also be heard contacting the Coast Guard on this frequency after making initial contact on 156.80 MHz, the calling and emergency frequency. Actually, it's always fascinating to keep 156.80 MHz on your scanner if you're near any seashore, large inland lake, or navigable river. Army Engineers are frequently called in during weather emergencies, especially when ice in navigable waterways has caused flooding and other problems. Listen for their operations on 157.125, 163.00, 163.125, 163.4125, and 163.4375 MHz.

Railroad operations can be monitored in profusion during periods of ice and snow. Not only are schedules messed up, but routing changes must be transmitted and snowplows must be dispatched. Look for these communications between 160.215 and 161.565 MHz.

Trucks and buses, of course, are sent into a state of shock during severe winter weather. Look for long-haul truckers to be discussing their problems with the weather on frequencies from 43.86 to 44.44 MHz. Long-haul buses carrying passengers on the Interstates can be monitored 43.70 to 43.84 MHz. Municipal bus transportation services are no less affected by snow and ice on the roads; these vehicles can be found operating between 30.86 and 31.12, also 44.46 and 44.60 MHz.

The swarm of tow trucks and various other service vehicles which tend to private vehicles stuck in the snow can be monitored on 150.815 to 150.965, 157.47 to 157.515, and 452.525 to 452.60 MHz.

Aircraft seeking weather information should be monitored on 122.0 MHz, while miscellaneous aero communications of interest will be found on 122.8, 122.9, 122.95, and 123.0 MHz. Helicopters most often use 123.05 and 123.075 when communicating with one another and with



How many weather related frequencies do you think are in use within earshot of this tender scene?

Vehicles, even if not stuck in the snow, often suffer from cold weather operation. This usually has the police and highway patrol frequencies far more active than usual.

ground facilities. Look for Civil Air Patrol ops on 122.9, 123.1, 148.15, and 149.925 MHz. Airliners checking in with their ground operations offices do so on 128.825 to 132.0 MHz. Naturally, all local airport approach control and control tower frequencies should also be monitored to increased communications activity related to severe weather conditions.

You'll find your area news media (newspapers, broadcast stations) may have reporters out in the field radioing in special reports on local conditions, and these transmissions should be included in your wintertime monitoring activities. Look for newspapers on 173.225, 173.275, 173.325, 452.975, and 453.00 MHz. Broadcast (AM/FM/TV) news crews can usually be monitored between 161.64 and 161.76 MHz, also 450.05 to 450.925, as well as 455.05 to 455.925 MHz.

If you live in an area where there are farmers and ranchers, you may find it of interest to check out the frequencies they normally use since severe winter weather invariably causes these people to have to put in many long hours in order to keep their operations going. Check them out 30.58 to 30.64, 31.28 to 31.96, 33.12, 35.28 to 35.86, 43.02 to 43.52, 151.49 to 151.595, 152.465, 152.48, 152.87, 152.885 to 153.395, 154.49, 154.625, 157.725 to 158.46, and 451.725 to 452.175 MHz.

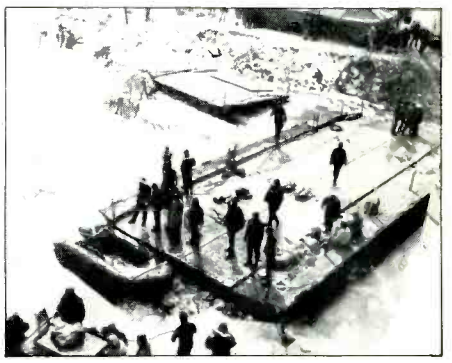
This should give you plenty to monitor, and you can sit snugly in your home and reach out for many miles in all directions (via your scanner) and be almost as much a part of the action as if you were there in person. And you don't have to wear overshoes or ear muffs, or carry a snow shovel to be right on the scene!

Bibliography

Air-Scan, By Tom Kneitel, published by CRB Research.

Energy-Scan, By Tom Kneitel, published by CRB Research.

National Directory of Survival Radio Frequencies, By Tom Kneitel, published by CRB Research.



Military divers on a U.S. Army Engineer's pontoon bridge section prepare to tackle an ice clogged river. Their frequencies are especially busy in severe weather. (U.S. Army photo)

SCANNER WORLD, USA

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

BEARCAT® 100
List Price $449.95
Scanner World Price $279.99
Handheld digital programmable, no crystal portable scanner. 16 channels, search feature. plus more! Frequency range: 30-50, 138-174, 406-512 MHz FM. Included in the package is a flexible rubber antenna, earphone, battery charger/AC adapter, 6 AA Ni-Cad rechargeable batteries and a heavy duty carry case. All for the low price of $279.99.

BEARCAT® 300
List Price $549.95
Scanner World Price $335.99
50 Channel, 7 band, digital programmable, no crystal scanner, AM aircraft and public service band, AC/DC priority channel, search feature, plus more! Frequency range 32-50 FM, 117-136 AM, 144-174 FM, 421-512 MHz FM

BEARCAT® 151
List Price $249.95
Scanner World Price $154.99
10 Channel, 5 band, AC only, digital, programmable, no crystal base scanner. Frequency range: 30-50, 144-174, 440-512 MHz.

BEARCAT® 210XL
List Price $349.95
Scanner World Price $214.99
18 Channel, 6 Band, digital programmable, no crystal AC/DC scanner. Search feature, scan delay, lockout, plus much more! Frequency range: 32-50, 144-174, 421-512 MHz.

RCD LISTEN-IN
Scanner World Price $38.99
Hand held, pocket sized, one channel portable professional FM Pager type receiver with 10 to 30 mile receiving range. Includes telescopic antenna, squelch & volume controls, and crystal. Uses standard 9 volt transistor battery (battery not included). Available in high, low, or UHF Band. Specify frequency needed when ordering. (Optional rubber antennas also available).

REGENCY® MX-3000
List Price $299.95
Scanner World Price $186.99
30 Channel, 5 band, digital programmable, no crystal, AC/DC scanner, mobile design, includes mobile mounting bracket. Priority, delay and much more. Optional mobile cord with cigarette lighter plug $4.95 each. Frequency range: 30-50, 144-174, 440-512 MHz.

JIL SX-100
List Price $269.99
Scanner World Price $138.99
16 channel, 5 band, digital programmable, no crystal scanner. Frequency range 30-54 MHz, 140-174 MHz, 410-514 MHz. AC/DC for base or mobile use, fast-slow scan speed, variable scan delay, quartz digital clock, automatic search, dimensions 8¼"x x 3¼" h x 9 1/8 D. All of the above plus more for the low price of $138.99.

JIL SX200 *only* $269.99

Monitor Crystals—$2.95 each
We stock thousands of crystals for all brands of scanners. Order by frequency number and brand of scanner. If crystal is out of stock, we will supply crystal certificate for prepaid delivery direct to you.

NOTICE
As new items become available in the future, we will add these to our monthly advertisements. If you would like information or prices on merchandise not released as yet by manufacturer, give us a call. For the past 15 years Scanner World has been the #1 Scanner Distributor with the largest on-hand inventory anywhere.

BEARCAT® 250
List Price $429.95
Scanner World Price $265.99
50 Channel, 6 band digital, programmable, no crystal scanner of public service bands. AC/DC. Frequency range: 32-50 FM, 146-174 FM, 420-512 MHz FM. Search, delay, lockout, recall, priority, clock plus much more for only $265.99.

Super Special Package Sale!!

REGENCY HX-650
Pocket Scanner
6 CHANNELS — 4 BANDS

VHF-Lo	30 to 50 MHz
VHF-High	146 to 174 MHz
UHF	450 to 470 MHz
UHF-T	470 to 512 MHz
Small Size	3¾"W x 5½" H x 1"D

Quality features included in the Regency HX-650 are 6 channels - 4 band coverage, lockout switches, manual step switch, scanning speed of 15 channels per second, long lasting LED's, volume & squelch controls, AC adapter/charger jacks.

Scanner World's Special Package Deal Includes the Following:
- Regency HX-650 Pocket Scanner
- MA-506 Carry Case
- Set of 4 AAA Nickel Cadmium Batteries
- 6 Monitor Crystals (specify frequencies needed or we will include certificates for unknown frequencies)
- Flexible Rubber Ducky Antenna
- AC Adapter & Charger

Scanner World Package Price
$109.99
(Plus $5.50 Shipping)

WILSON WH-2510
List Price $663.00
Scanner World Package Price $479.99
CITI-COM Plus Transceiver, 2-way radio fully programmable in transmit or receive mode plus CTCSS, Private Line, Channel guard. No crystals to buy. 10 channels, high band (134 to 174 MHz) maximum frequency spread 6 MHz, transmit output 25 watts, priority, 10 channel scan, plus more. Comes with mobile microphone, mobile mounting bracket, mobile antenna, easy programming instructions, and cable assemblies for hookup. (UHF model available package price $569.99) Plus $5.50 Shipping.

RADAR DETECTORS

Whistler Spectrum*	$214.99
Whistler Remote Spectrum*	214.99
Whistler Q2000*	189.99
Whistler Q1000*	169.99
Whistler Q1200*	116.99
Fox XK	84.99
Fox XK Remote	99.99
Superfox Vixen*	139.99
Superfox Remote*	189.99
Fox Super-Trucker*	229.99
Fox XKMR (Motorcycle)	119.99
Regency RS1	94.99
Regency RS2*	142.99
Regency RS3 Remote*	173.99

*Above units marked with * are superheterodyne type*

All Band Monitor Antennas
For added receiver gain, includes cable and connectors for scanning monitors.

Magnetic Mobile Antenna (ANT-1)	29.99
Trunk Mount Mobile Antenna (ANT-2)	27.99
Mirror or Light Bar Mount Mobile Antenna (ANT-3)	25.99
Gutter Clip Mobile Antenna (ANT-4)	25.99
Hole Mount Mobile Antenna (ANT-5)	22.99
Base Antenna with 50' Cable & Connectors (ANT-6)	29.99

For Shipping, please add $2.50 per antenna in Continental USA

MOST MERCHANDISE IN STOCK FOR IMMEDIATE SAME DAY SHIPMENT

REGENCY M100 AC/DC 10 Channel LHU Digital	$179.99
REGENCY HX-650 Pocket Scanner with AC Adapter, Rubber Antenna & Charger	82.99
REGENCY MA-506 Carry Case for HX-650 & H-604	12.99
REGENCY K-100 AC/DC 10 Channel HLU	148.99
REGENCY POLARIS MT-5500 Marine	259.99
REGENCY R1040 AC 10 Channel Programmable Base Scanner	128.99
REGENCY D100 AC 10 Channel LHU Digital	154.99
REGENCY C403 AC 4 Channel Crystal HLU	66.99
REGENCY E106 AC/DC 10 Channel HLU Crystal	114.99
REGENCY R106 AC//DC 10 Channel HLU Crystal	96.99
REGENCY D810 AC 50 Channel HLU & Air Digital	249.99
REGENCY D300 AC/DC 30 Channel HLU Digital	179.99
FANON M8HLU 8 Channel Mini Mobile Crystal	99.99
FANON PSK-1 AC adapter for M8HLU	12.99
FANON SlimLine 6-HLU Handheld Crystal Scanner	103.99
FANON CHB-6 Charger/AC Adapter for Slim 6	12.99
FANON CAT-6 Carrying Case with Belt Clip	11.99
FANON AUC-4 Autolighter Adapter//Charger	12.99
FANON SCMA-6 Mobile Adapter/Charger/Amplifier for Slim Line 6 HLU	39.99
FANON PSK-6 Base Power Supply for SCMA-6	14.99
FANON FCT-200 Cordless Telephone	124.99
BEARCAT® 20/20 40 Channel Digital Scanner	275.99
BEARCAT® 200 16 Channel Digital Scanner	174.99
BEARCAT® 5 HLU AC Crystal Scanner	88.99
BEARCAT® Weather Alert BC-WA	39.99
BEARCAT® 160 HLU 16 Channel Base Scanner	159.99
BEARCAT® FIVE-SIX Pocket Scanner	126.99
BEARCAT® SP-55 Carry Case for BC 5/6	12.99
BEARCAT BC-260 AC/DC Scanner	269.99
BEARCAT® DX-1000 Shortwave Radio	519.99
FBE BEARCAT Frequency Directory Eastern USA	10.99
FBW BEARCAT Frequency Directory Western USA	10.99
Air Scan Directory	7.95
Railroad Frequency Directory	7.95
Covert Intelligency: Electronic Eavesdropping	8.95
Covert Techniques for Intercepting	9.95
Top Secret Registry of US Gov't Frequencies	12.95
Energy Scan Directory	5.95
Survival Radio Frequency Directory	6.95
Complete Guide to Scanners and Monitors	9.95
B-4 Set of 4 Triple AAA Ni-Cad Batteries	8.99
B-6 Set of 4 Double AA Ni-Cad Batteries	7.99
A-20 Replacement Telescopic Antenna for Bearcat® Base Scanner	4.95
Motorola Type 1.3 volt Ni-Cad Pager Battery	4.59
Wilson WAH-2080 High Band 100 Watt Amplifier	209.99
Russell Rubber Duckie Hi-Lo-UHF	15.99

BEARCAT 20/20
List Price $439.99
Scanner World Price $275.99
40 Channel, (2 banks of 20 each), 7 band, digital programmable, no crystal scanner. Frequency range 32-50 MHz FM, 118-136 AM Aircraft, 144-174 MHz FM, Public Service, 421-512 MHz Public Service. AC/DC, Search, Mobile Mounting Bracket an AC & DC Cords included.

VISA MasterCard

CIRCLE 18 ON READER SERVICE CARD

Ordering Information
Call (518) 436-9606 to place orders by phone or mail orders to ***Scanner World,*** 10 New Scotland Ave., Albany, NY 12208. Orders will be shipped same day received by United Parcel Service. ***Scanner World*** accepts VISA, MasterCard. C.O.D. shipments by United Parcel will be for cash or certified checks only. Mail orders with personal or business checks will be held 3 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All Shipments are F.O.B. ***Scanner World*** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase Orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax.

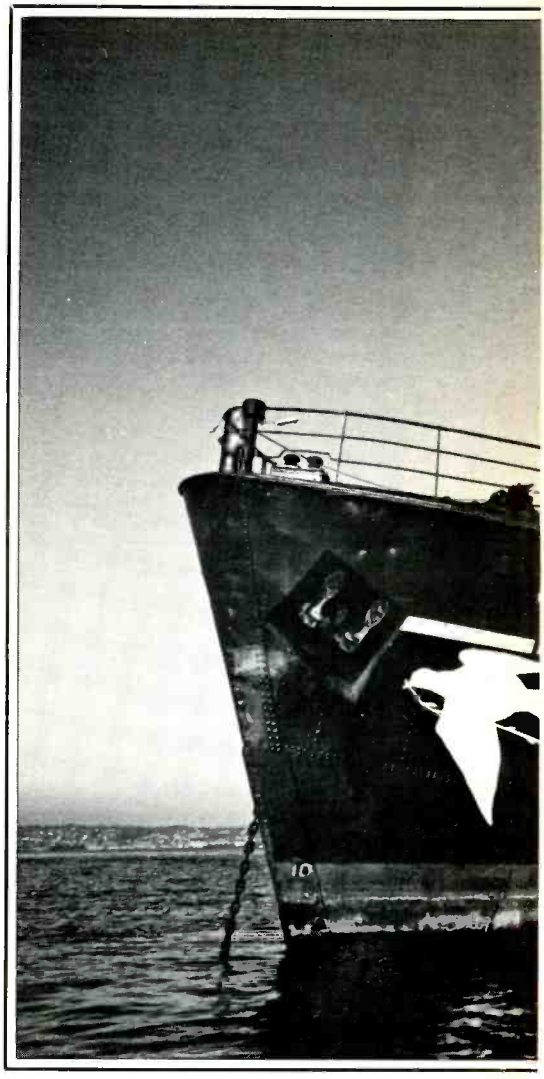
Shipping Charges
Add $3.00 per scanner, $2.50 per antenna and $2.50 for all accessories ordered at same time. (Example: 1 scanner and 1 antenna has total shipping charge of $5.50.) C.O.D. shipments will be charged an additional $2.50 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, please ask for special shipping quote.

Greenpeace Radio

The Russians Have Chased It And Jammed It, But It's Still There!

BY DICK DILLMAN, N6VS

Dick Dillman, N6VS, station manager and chief operator at Greenpeace (and also the author of this article) exchanged traffic via CW with the Rainbow Warrier *while the ship was being chased by the Russians. (Photo by Laura Barnaby)*



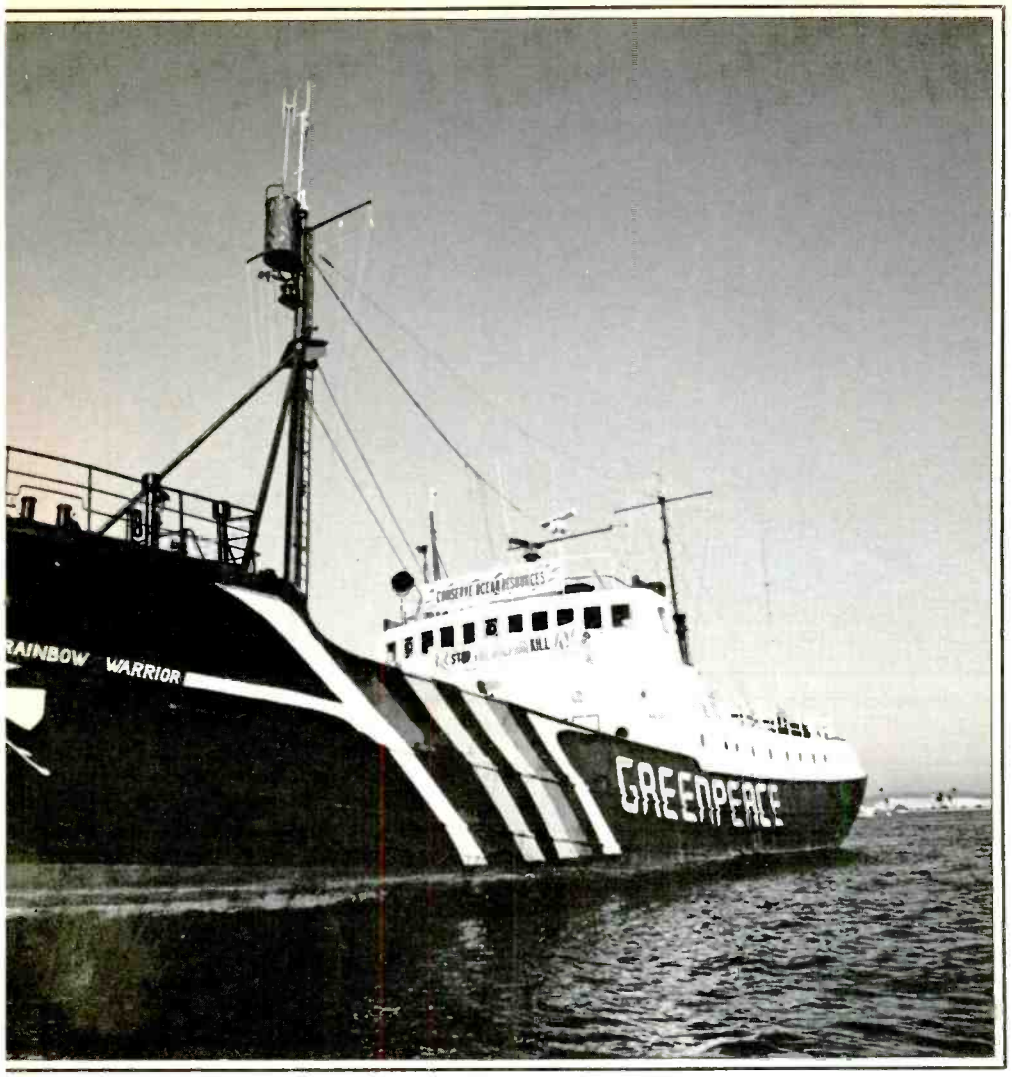
"We have spotted a vessel on an intercept course. It's a Russian warship and they are demanding that we stop immediately and allow them to put personnel aboard. We're still inside the 12 mile limit. The closest ship is in very tight maneuvers with us now. Two minutes to 12 mile limit. This is getting hairy. They're playing chicken with us. The last pass was only 20 feet away going full tilt."

That was the message received from the Greenpeace vessel *Rainbow Warrior* on July 18, 1983, as it was being pursued at high speed in the Bering Sea by two Russian warships, a merchant ship, and two military helicopters. Members of the ship's crew had gone ashore earlier that morning at the Russian whale processing station at Loreno, Siberia to document the illegal whaling conducted there. The Russians quickly arrested the shore party and now they wanted the ship, too. That would have been a disaster since they would have certainly confiscated the film showing their illegal whaling operation, evidence which we intended to bring before the International Whaling Commission which was meeting in England even as the chase was going on. Peter Willcox, captain of the *Rainbow Warrior*, refused all orders to stop and, with a display of superior seamanship, guided the 10 knot *Rainbow Warrior* as it evaded the Russian warships capable of twice its speed.

The chase lasted for hours as the enraged Russians pursued the vessel well beyond the 12 mile limit. Lloyd Anderson, N6BMI, Radio Officer aboard the *Rainbow Warrior*, observed the action from the bridge and sent a minute by minute description of the action to the station operated by Greenpeace Radio in San Francisco. Radio propagation had been poor during the voyage from San Francisco to the Bering Sea, and on the day of the chase only the weakest of signals could be exchanged. Even the powerful commercial station KMI, operated by AT&T, could not get through. But by using CW and sending carefully, Lloyd was able to get the details of the chase to the outside world.

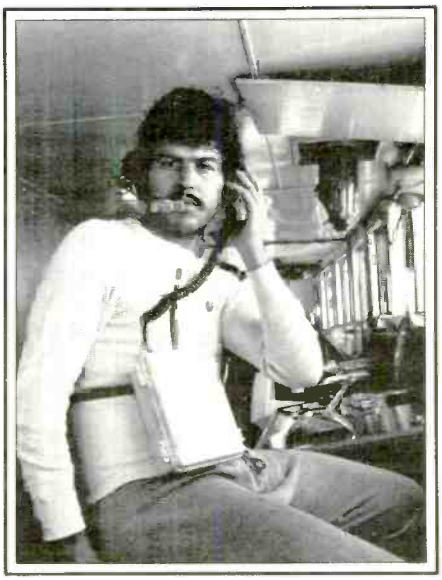
The situation was very tense since it was unclear how far the Russians would go in their attempts to stop the *Rainbow Warrior*. The merchant ship crossed the *Rainbow Warrior's* bow at such close range that it seemed one could reach out and touch it, while the helicopters continued to buzz the ship at alarmingly low altitudes. At one point, crewmen were seen to enter the forward gun turret on the warship. Finally, well outside their territorial waters, the Russians broke off the chase and the *Rainbow Warrior* was able to return safely to Nome, Alaska. Dispatches containing the telegraphed descriptions of the action were sent in near real time by telex from the station in San Francisco to the Greenpeace offices and to news services around the world.

Greenpeace Radio is the communications arm of Greenpeace, an environmental organization probably best known for confronting the whaling fleets of the USSR on the high seas. For such campaigns to be successful, reliable long distance communications are essential. It was soon found that such communications, as provided by public coast stations, are extremely expensive. As a result, Greenpeace established its own communications operation in 1977. Our primary mission today is still to provide reliable contact with the ships and boats Greenpeace operates around the world. To accomplish this, a combination of commercial and amateur frequencies are used, depending on the nature of the traffic to be passed and the equipment aboard the particular ship. The amateur station operates under the call N6VS and the commercial coast station has the call KMC-237. At this point in the sunspot cycle, amateur operations are



The Rainbow Warrior's back-up and emergency communications system, as assembled by Lloyd Anderson, N6BMI. (Photo by Rick Dawson)

Lloyd Anderson, N6BMI, at the operating position in the Rainbow Warrier. (Photo by Rick Dawson)



Rainbow Warrior crewmember Louis Barreto demonstrates the ICOM diagonal line pelican box combination transceiver. (Photo by Rick Dawson)

conducted almost exclusively on 14 MHz with commercial operations usually split between 8 and 12 MHz. The coast station is licensed for 18 marine HF voice frequencies between 4 and 22 MHz and for operation in the marine VHF band.

The *Rainbow Warrior* radio room was completely rebuilt before the voyage to the Bering Sea. The equipment aboard includes a Drake TR-7/R-7 combination for amateur work driving an Alpha 76 amplifier. An emergency portable station consisting of a Kenwood TS430S and a Dentron amplifier can be used as a back up or it can be placed ashore when such communications are required. A Texas Instruments 3000 synthesized HF transceiver is used for the commercial channels, but it can be tuned to the amateur bands as well. The ship's commercial call is GSZY. A Kenwood R-2000 was installed to provide the capability of scanning several HF channels, something which is often necessary when attempting to gather intelligence on target vessels. A Bearcat 300 scanner is used to keep an ear on things above 30 MHz. There is a separate marine VHF for the radio room along with a VHF direction finder. An LF/MF/HF direction finder is also available. An Alden FAX machine with built-in receiver is used to provide graphic weather information. The antennas consist of several center fed flat tops, a 23 ft. HF whip, a Hustler 4-BTV trap vertical and a Hustler mobile whip along with an assortment of VHF and DF antennas. All antennas and equipment terminate at an antenna patch bay and separate high capacity batteries and a charging system are provided for the radio room equipment.

High speed inflatable speedboats known as Zodiacs are the vessels Greenpeace uses for front line action at sea. They are quite fast and very maneuverable. Radio communications with the Zodiacs is vital for the coordination of the campaign as well as the safety of the campaigners. When operating at high speed in the open ocean, the Zodiacs bounce along from wave top to wave top, generating enormous G forces and drenching everything aboard. Add to that the noise of a high-powered outboard at full throttle and you have a challenging radio installation.

Several solutions have been tried over the years, but the one that has proven most successful is also simple and relatively inexpensive. We use Icom IC-M12 marine VHF hand-helds housed in waterproof fiberglass enclosures known as Pelican boxes. The boxes are lined with high density foam and the earphone, microphone, and antenna

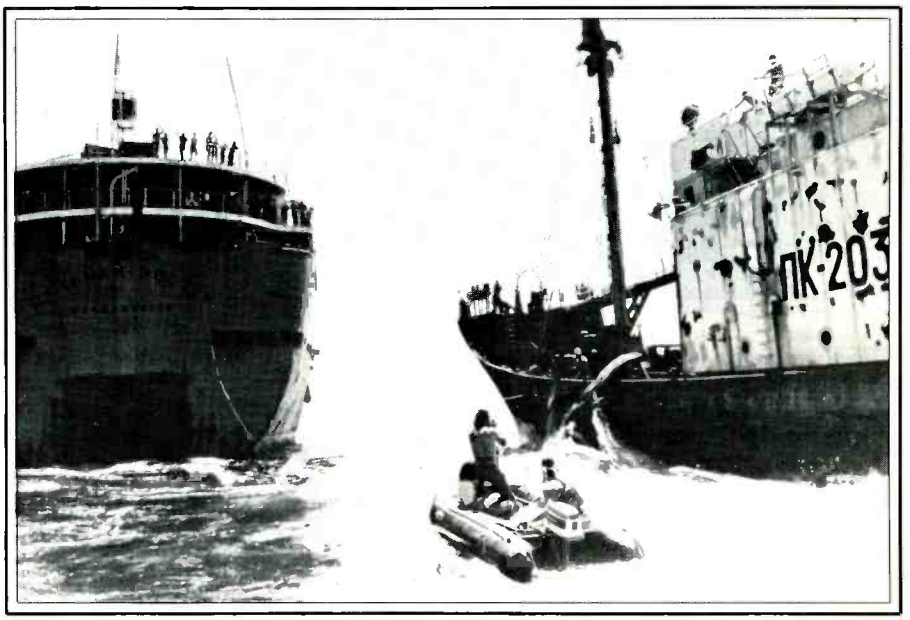
leads are brought out through O-ring sealed connectors mounted on the box. A headset and boom microphone arrangement is used to permit hands-free operation of the boat and allow the operator to hear radio transmissions over the engine noise. The Pelican box can be mounted on the boat with bungee cords and connected to the 6 dB fiberglass antenna mounted on the transom, or it can be strapped to the body of the operator, in which case a rubber duck antenna is used. Antennas are still a problem since even the best grade of fiberglass whip does not last long before breaking. We hope to try the aluminum and fiberglass antennas made by MORAD for the next campaign. The Icoms have proven themselves to be excellent radios mechanically and electrically, fully up to the harsh treatment we give them.

The first Greenpeace Radio coast station was built at Fort Mason in San Francisco in 1977 in the same building which housed the Greenpeace offices. After several years of operation, the offices were moved to another location on Fort Mason and the site for the station was lost. Since then, Greenpeace Radio has operated out of a house in the Potrero District of San Francisco. The present equipment includes a Drake TR7 and a Kenwood TS520 for amateur work driving a Collins 30L1 amplifier. A Motorola Modar transceiver is used for the VHF coast station and several receivers, including a Collins 51J4, are used for HF monitoring. Various exciters are used for commercial work, the most recent being a Benmar crystal controlled transceiver. An Alden model 519 FAX machine is used to record weather charts to help provide weather information for Greenpeace ships not equipped with their own FAX recorders. A phone patch with several phone lines is available along with the telex terminal in the form of a Kaypro II computer. This computer has been an excellent performer. It is operated immediately adjacent to the communications gear, yet it is completely unaffected by the strong RF fields and generates virtually no RF interference itself.

The restrictions imposed on the Greenpeace Radio shore operation by the surrounding urban environment have been severe. The level of electrical noise is always high, making the weak signals we often deal with very difficult to copy. Zoning regulations prohibit the erection of our log periodic antenna. This antenna, with a continuous coverage frequency range of 6 to 30 MHz, would greatly improve our capabilities, but its large size (40 ft. boom) would be out of place in a city neighborhood. The mains at the present station are limited to 120V, which just barely supports the 30L1 at full power. An Alpha 77 amplifier is part of our equipment inventory but the power is not presently available to run it. A new home for Greenpeace Radio is obviously needed, preferably one on a rural mountaintop with plenty of electrical power. A search for such a spot is currently underway.

In the last few years, Greenpeace has undertaken several land-based campaigns.

Greenpeace crew members confront Russian whalers aboard the DALNIY VOSTOK *(killer boat tied alongside). (Photo by Kazumi Tanaka)*



Greenpeace crew members in Zodiac confront Soviet whalers. In background appears the Soviet factory ship, the VLADIVOSTOK *and a "killer" boat with dead whales being transferred to the factory ship. (Photo by Rex Weyler)*

Local Greenpeace offices first tried to use CB radio to provide the needed communications links. This proved unworkable and Greenpeace Radio was asked to provide a reliable communications system. The result was a portable, multi-channel UHF repeater along with several Motorola HT220 handhelds and a Fujitsu-Ten under dash mobile. The repeater was built to our specifications by Maggiore Labs and may be operated from battery power or commercial mains. In its first use, it was installed in a communications van which was parked at a site overlooking the area of the action. It proved to be a great success, providing solid, interference-free communications. We are currently authorized to use five frequencies, two repeater pairs, and a simplex channel. The call sign is KAD-4020.

When Greenpeace Radio is asked to provide communications for a land-based campaign, our first step is to obtain topographic maps of the target area and the surrounding high terrain. From this we determine the possible repeater locations and plot out the coverage which would be expected from each site. Next, a local inspection is made to determine such things as road access, power availability, and local weather conditions. On-the-air tests are often conducted at this point to determine the real world feasibility of the proposed path. If the tests confirm the

The Greenpeace Radio System

Station KMC237 San Francisco

4126.4 kHz	16588.5
4145.0	16591.6
4420.8	16594.7
6220.0	22125.4
6223.0	22128.5
6523.3	22131.6
8292.5	22134.7
8295.6	156.35 MHz
12430.6	156.425
12433.7	156.80
12436.8	

Station KD2860
122.90 MHz
123.10

Station WYK432
47.42 MHz

Station KAD4020
462.60-462.725 MHz band

Station N6VS
14 MHz band

predicted coverage area, plans are made for the transport and deployment of the equipment and personnel needed.

When researching the communications possibilities for a recent land-based campaign, a UHF path simply could not be found and this created a problem. The campaign personnel would be operating under difficult conditions and were strictly limited in the weight of equipment they could carry beyond what was necessary for their survival. The solution was found in the form of portable 10 watt HF SSB radios made by Spillsbury Communications in Canada. These radios are extremely rugged and easy to operate. They weigh only 8 lbs. including their "D" battery power supply. Their performance was amazing and they provided reliable communications over a 500 mile path using lightweight dipole antennas.

It is sometimes necessary to set up a temporary shore station for contact with a Greenpeace ship. During the 1981 campaign against the killing of Harp seal pups in Newfoundland, our base of operation was, as usual, Ma Decker's boarding house in St. Anthony, on the northern tip of the island. Ma had put up Greenpeacers many times before during previous seal campaigns and had no objections when asked for permission to put up an antenna on her house. Scrambling around on the steeply pitched, ice covered roof in the middle of a Newfoundland winter was an adventure in itself, but the job was done. Continuous contact was maintained with the *Rainbow Warrior* as it maneuvered among the ice floes.

Aircraft are often involved in Greenpeace campaigns ashore and at sea. They are used for spotting and the transport of personnel and supplies. Greenpeace pilots are used but the aircraft are rented which precludes the installation of our own communications equipment. This means that coordination with the aircraft must be done on the aircraft band, using the radios already installed in the aircraft. Greenpeace Radio is licensed for operation as an aerodrome station and for the use of hand-held radios operating in the aircraft band. We use a Terra TPX-10 six channel hand-held and a Terra TPX-750 all channel synthesized hand-held for portable work. The base station is an antique single channel Gonset Communicator and uses the callsign KD-2860.

Greenpeace Radio works closely with the Red Cross and the other local, state, and federal disaster relief agencies. We are licensed for a base station and several portables and mobiles on the national Red Cross frequency of 4742 MHz. The call of the base station is WYK-432. The portables and mobiles operate under the license of the Golden Gate chapter and use numerical callsigns. We have found that the capability to communicate on this channel provides a vital link between amateur communications and the Red Cross chapter during actual emergencies and drills.

Jamming has not been a major problem in most campaigns, but it has occurred. In the 1977 whale campaign, for example, there were two Greenpeace ships operating in the Pacific: the *Ohana Kai* from Hawaii and the *James Bay* from Vancouver. Naturally, there was a rivalry between the two ships. Commercial channels were being used to work the two ships and, while working the *James Bay*, laughter could be heard in the background. It sounded like visitors to the *James Bay* radio room were laughing at the *Ohana Kai*, which had suffered constant delays in getting to sea. The next night the laughter was there again but much stronger. It was obvious now that it was not coming from the *James Bay*. It had a diabolical, sinister, maniacal sound. With the selective fading and phase shift typical of shortwave propagation, it was enough to make your hair stand on end. We finally figured out that it was one of those joke shop laugh boxes being held up to the microphone and used as a jammer by the operator on one of the Russian whaling ships. It was effective too, with its broad range of audio frequencies.

Jamming is sometimes more of a problem on marine VHF when operations are being carried out near heavily populated harbors. With everyone in the area listening, it's almost certain that someone will not like what they hear. When this occurs during contacts with the marine operator, we often switch to HF and work KMI, since few local vessels are equipped for HF operation.

Plans for the future of Greenpeace Radio include the location of a new site for the station as a first priority. Only after a new home is secured will the shore station be able to realize its full potential. The recent authorization for Amateurs to use SITOR on the HF bands appears to offer an economical way to provide the boats with a hard copy send/receive capability at reasonable cost, something which has been needed for some time. We are currently researching the possibility of installing a pilot system. The addition of the Kaypro II has also made it possible to run an HF propagation program, a modified version of MINIMUF, to permit us to predict HF communications paths. We also use a computer program to predict UHF/VHF paths. We expect that this computer will play an increasingly important part in Greenpeace Radio operations.

Mr. Dick Dillman, N6VS, is a volunteer radio officer for Greenpeace who joined them in 1977 specifically to construct and operate the radio communications system.

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

BY DARREN LENO, WDØEWJ

"Pirate radio station leaving rather than walk FCC plank!!" was the title of a newspaper article that appeared in the *Indianapolis Star*, and which was clipped and sent to us by Thomas McKeon of Indiana.

POP'COMM reported in this column recently the story of Jolly Roger Radio, an unlicensed FM pirate that had been broadcasting from Bloomington, Indiana regularly since the beginning of 1983.

The Star article reported that JRR is planning on "weighing anchor and preparing to set sail for Britain." Specifically, London.

The 27-year-old Chief Operator of JRR, the Flying Dutchman, was quoted as saying, "I'll pirate 'til the day I die. I simply feel I should move the base out of Bloomington, and the reason for that is that I don't feel the battle for Free Radio can be won here."

The Dutchman denies that the FCC threats to fine him and throw him in jail had anything to do with his decision to move to London, and that he had been considering the move for quite some time.

"I've always been fascinated with the idea of radio that was free, not regulated by the government or controlled by advertising dollars," the Dutchman said.

Europe

Across the Atlantic, things are as active as usual.

Podney Sixe of Cornwall, England says a very popular English pirate has decided to close shop. European Music Radio, first heard on the air in May, 1976, made their final broadcast back in June of 1983, 6 months ago. EMR offered its programming to all of Europe, broadcasting in Swedish, French, German, and Dutch as well as English, on the 48 meter band.

Patient DXers may wish to try their hand at logging the following Euro-pirates. Their addresses are included for QSL reports.

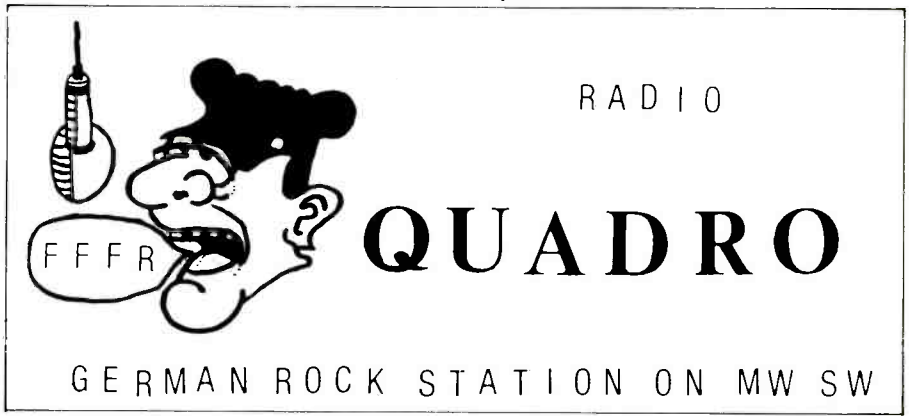
Station	Frequency	GMT
Radio King Kong Int.	6245 kHz	0845
adrs: RKKI, PO Box 211, D-7146, Tamm, W. Germany		
Radio Galactica	6306 kHz	1015
PO Box 60, B-2510 Mortsel, Belgium		
Radio Titanic Int.	6260 kHz	0930
PO Box 41, 7700AA, Dedemsvaart, Holland		
Radio Northern Hemisphere	6245/6306 kHz	0900
8 Prior Close, Wistaston, Crewe, Cheshire		
Radio Freedom Int.	9420 kHz	0900
Dept. R, 67 Elm Row, Edinburgh EH7 4AQ, Ireland		

Please note that Radio Freedom is said to operate every first and third Sunday of the month at the time and frequency noted above. The rest are fairly sporadic, and if you manage to hear one of them, no doubt you'll be the envy of your DX club.

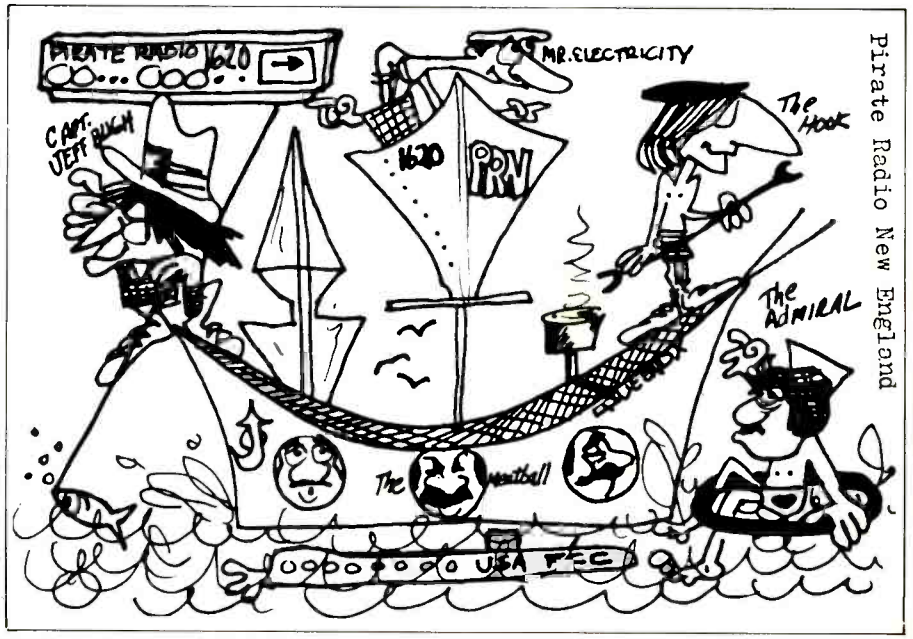
Well, last month we talked about the

Paul Royce of Wisconsin received this QSL for his reception of La Voz Del CID.

While many pirates come and go in a matter of months, PRN is an exception that has weathered the years.



QSL from Radio Quadro in Germany.



Christmas pirates; pirates that usually pop up on the bands during the Christmas Holidays and on Christmas Eve itself. This month we'll take a look at the New Year's pirates which are, simply, pirates that have a history of appearing on the radio during the much celebrated holiday of New Year's Eve. I am hoping that you have picked up this issue of *POP'COMM* during December so you will be able to make some use out of this information. If you purchased this magazine in January, just hang on to it until next New Year's Eve; chances are the same pirates (and maybe some new ones) will show for us again.

One year ago this month in New York City—KPRC delighted listeners in the north east with their New Year's broadcast, featuring a phone-in talk show. The show began around 0600 on 1616 kHz. Reports go to PO Box 747, Exeter, NH 03833.

PRN, Pirate Radio New England, was heard on 1620 kHz beginning about 0500 GMT. The show featured the famous PRN staff, including Mr. Electricity and Capt. Jeff Bliegh. Reception reports go to PRN, PO Box 40554, Washington, DC 20016.

WGUT with Gus Guts and Huey Hughes cheered up 1630 kHz with their professional and entertaining talk show and 1950 vintage music. I am very impressed with these two announcers, who sound like they should be employed at a big gun legal radio station like WABC or WLS. If they show up again on 1630 at 0400 GMT or so, you are undoubtedly in for a treat.

Although not much happened last New Year's on the shortwave bands, this year could be different. Remember, the best places to look for SW pirates is between 7350 and 7450 kHz, especially 7425 kHz, 6200 to 6300 kHz, and possibly the 6900-7000 kHz range. An infrequent, but occasionally active area to watch is just below the beginning of the 80 meter ham band. Take an occasional sweep through 3400 to 3500 kHz and see what's happening.

Another Bust!

Radio North Star Int'l, a pirate famous for its quality programs and, especially, for broadcasting on the obscure frequency of 13787 kHz, was closed recently by FCC officials. The operator is supposedly preparing for a fine of $750. Evidently, the station was 45 minutes into a transmission when the FCC knocked on its doors. Possibly, we'll have more on this soon.

Thank you to all who have been writing in with information and remarks about the Pirates Den. Special thanks to A*C*E, George Zeller, Podney Sixe, and Paul Royce. If you have something you think would be of interest to the readers of this column, by all means, please write. My address: The Pirates Den, c/o *Popular Communications*, 76 North Broadway, Hicksville, NY 11801. Hope to hear from you soon. Until then, best wishes for a happy and productive 1984!

Selected English Language Broadcasts

Winter 1984

BY GERRY L. DEXTER

Note: This list was accurate at the time of compilation. Hundreds of English language broadcasts are to be found on shortwave every day. This is a representative sampling, not intended as a complete reference. Some stations will have only part of their broadcasts in English during a given hour. Others will start, for example, on the half hour. These are indicated by (30), (15), (45) indicating the starting time in minutes past the hour. Other stations will run their English segments into the following hour or even for several hours continuously and are not necessarily carried over in this listing. Some major broadcasters such as the BBC, Voice of America, and Radio Moscow maintain virtual 24 hour per day broadcasts in English. All times are GMT.

Time	Station/Country	Frequencies
0000	Radio Sofia, Bulgaria	9.700, 11.710, 15.110
	REE, Spain	9.630, 11.880
	Tirana, Albania	7.065
	Austrian Radio	9.770 (30)
	Radio Prague, Czechoslovakia	6.055
	Vatican Radio	6.015, 9.605, 11.845 (15)
	Radio Beijing, China	15.120, 17.855
	Voice of Israel	9.815, 9.895, 11.640, 11.655
	Radio Berlin International, East Germany	11.975
	BRT, Belgium	9.880
	Radio Canada International	5.960, 9.755
	Radio Japan	15.300, 17.825
0100	REE Spain	9.630, 11.880
	RAE, Argentina	11.710, 15.345
	Radiobras, Brazil	15.290
	Radio Canada International	9.755
	Voice of Nicaragua	5.950
	Radio Tirana, Albania	7.120
	Radio Prague, Czechoslovakia	9.740, 11.990
	Voice of Germany, W. Germany	6.040, 6.085, 6.145, 9.545, 9.565, 9.590, 11.865, 15.105
	Voice of Greece	9.420, 9.865, 11.645 (30)
	Radio Budapest, Hungary	9.835, 11.910, 12.000, 15.220 (30)
	RAI, Italy	9.575
	Radio Luxembourg	6.090
	Swiss Radio International	6.135, 9.725, 11.715, 11.740, 15.305 (45)
	Radio Beijing, China	15.120, 17.855
	SLBC, Sri Lanka	15.425
	Voice of Free China, Taiwan	11.825, 15.345, 17.890
	Radio Japan	17.795
	Voice of Israel	11.655
	Radio New Zealand	17.705
	Austrian Radio	5.945
0200	Radio Earth (R. Clarin) Dominican Republic	11.700
	HCJB, Ecuador	9.745, 15.155
	Radio Prague, Czechoslovakia	7.345
	Radio Berlin International, E. Germany	9.560, 11.840, 11.890 (30)
	Radio Netherlands	6.165, 9.590
	Radio Polania, Poland	6.095, 6.135, 9.525, 11.815, 15.120
	Radio Sweden	9.695, 11.705, 17.840
	Radio Cairo, Egypt	9.475, 12.000
	Radio RSA, South Africa	5.980, 6.020, 9.615
	Radio Beijing, China	15.120
	Voice of Israel	9.815, 11.650, 12.025
	Radio Lebanon	11.955
	Voice of Free China, Taiwan	11.740
	Radio Budapest, Hungary	9.585, 9.835, 11.910, 15.220
	Radio Canada International	5.960
	Radio Bucharest, Roumania	5.990, 9.755, 11.845
	Radio Havana Cuba	11.930
	Radio Australia	15.320, 17.795
0300	UAE Radio, Dubai	15.320, 15.435, 17.775 (30)
	Radio Havana Cuba	11760, 11.930
	TIFC, Costa Rica	5.055
	HRVC, Honduras	4.820
	Radio Tirana, Albania	7.300
	Radio Dublin International, Ireland	6.910
	Radio Polania, Poland	6.095, 6.135, 9.525, 11.815
	Radio Portugal	6.075, 11.925
	Radio Japan	17.755
	Voice of Free China	5.985, 11.825, 15.345, 17.800, 17.890
	Voice of Turkey	11.740
	UAE Radio, Dubai	11.730, 15.435, 17.775
	Radio Australia	17.895, 21.680, 21.740
	Radio Budapest, Hungary	6.025, 9.585, 9.835, 11.910, 12.000, 15.220
	Austrian Radio	5.945
	Radio Prague, Czechoslovakia	7.345, 11.990
	Voice of Greece	11.645
	Radio New Zealand	17.705
0400	Radio Sofia, Bulgaria	7.115, 11.840
	Radio Belize, Belize	3.285
	Radio Havana Cuba	11.930
	Voice of Nicaragua	5.950
	Radio France International	7.135, 11.735
	RAI, Italy	11.800, 15.330
	Radio Bucharest, Roumania	11.810, 11.940
	Radio Southwest Africa, Namibia (Southwest Africa)	4.965
	FEBA, Seychelles	15.200
	Radio RSA, South Africa	4.990
	Radio Australia	15.115
	HRVC, Honduras	4.820
	Voice of Kenya	4.950
	SCR, Swaziland	4.980
	Austrian Radio	5.945, 9.770
	Radio New Zealand	15.485, 17.705
0500	REE, Spain	9.630, 11.880 (30)
	UAE Radio, Dubai	17.775, 17.830 (30)
	HCJB, Ecuador	6.095
	Voice of Germany, W. Germany	5.960, 9.545, 9.690, 11.705, 11.905
	Radio Portugal	9.575
	SABC, South Africa	4.835, 4.880
	Capital Radio, Transki (South Africa)	3.930

JANUARY SW SPECIALS From SPECTRONICS

The new Sony 2002 is here!

Reg. $249.95
INTRODUCTORY SPECIAL
$224.95
Plus $3.00 UPS

MAKE WAY FOR THE NEW LEADER IN SW!

We didn't think that Sony could top the 2001, but they did!

FEATURES

Ten memory channels • 12/24 hour quartz clock • PLL tuning for drift-free performance • Dual conversion Superheterodyne for high sensitivity • SSB/CW

SPECIFICATIONS

150 kHz-30 MHz AM, 76-108 MHz FM • 1 uV sensitivity @ 6 dB S/N @ 10 MHz • 72 dB @ 10 MHz image ratio • 3 kHz @ −6 dB

9 Band Sony ICF-7600A

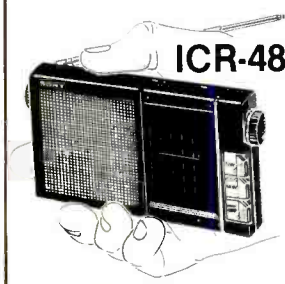
Reg. $144.95
$109.95
Plus $2.00 UPS

"An obvious choice for travelling shortwave listeners" . . . WRTH

FEATURES & SPECIFICATIONS

7 SW bands, MW & FM • Dual conversion, superheterodyne on SW • High stability • Sensitivity: 0.8 uV @ 6dB S/N @ 11.8 MHz. • Selectivity: Less than ± 8 kHz @ −50 dB

SONY 6-BAND Pocket World Receiver



ICR-4800

Reg. $89.95
$69.95
plus $2.00 UPS

• 6-band pocket world receiver—SW 1-5, plus MW • Extremely compact and lightweight—palm sized! • SW band spread dial-easy tuning • Tuning indicator • FET RT amplifier for clean, low-noise reception along with high sensitivity and selectivity • Soft-touch band selectors also turn on the unit • Locking power-off switch • Only 2 15/16" x 5¼" x ⅞"

SUPER CLOSEOUT!

Reg. $179.95
Now only **$96.50**
plus $3.00 UPS

SONY ICF-6500W

"The 6500W performs on a par with models in the $200-300 price range" (World Radio TV Handbook)

• Digital LCD display for accuracy
• Dual Conversion Superheterodyne
• BFO for SSB/CW • 1 uV Sensitivity
• AFC for FM • AC/DC power

KEN-TECH® 24-HOUR SWL ALARM CLOCK

$19.95
Plus $1.50 UPS

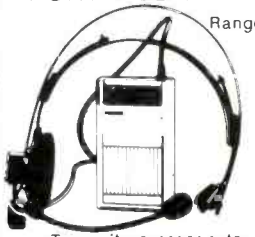
• 1 Yr. Warrantee
• Electronic digital alarm clock
• .7 inch red LED numerals
• 24-hour memory alarm
• Drowse control
• Dark brown walnut grain
• 2¼"H × 6¼"W × 3¼"D

TALKMAN

Lightweight, portable, hands-free operation.

PORTABLE TRANSCEIVER

Range up to 1/2 mile.



$39.95 ea.
plus $2.00 shipping
for Business

• Warehousing
• Construction
• Loading
• Surveying
• Hospitals for Sports & Recreation
• Coaching
• Skating
• Racing
• Hiking
• Boating
• Fishing
• Camping

• Transmit messages automatically - just speak into the mike on headset • Adjustable headset -comfort -fitting earpiece with volume control and moveable mike • Portable and convenient - Rugged, yet lightweight. Weighs less than 9 oz. Secures to belt or pocket • No license required to operate • Great for sports, recreation, and business.

VERY LIMITED QUANTITY

SAVE $$$

AM/FM/AIR PUBLIC SAFETY

ONLY **$69.95** plus $2.00 UPS

THE NEW PANASONIC RF-1405 HAS IT ALL!

Portability and practicality are built right in to this newest Panasonic receiver, not to mention LOW PRICE!

- AC/DC power
- AM 525-1610 KHz.
- FM 88-108 MHz.
- AIR 108-136 MHz.
- PSB 136-174 MHz.

FAMOUS "EAVESDROPPER" SW RECEIVING ANTENNA

$59.95 POSTPAID

- AUTOMATIC BANDSWITCHING!
- COMPLETELY WEATHERPROOF!
- 60, 49, 41, 31, 25, 19, 16, 13 & 11M BANDS!
- COMPLETE, NO ASSEMBLY NEEDED!

All the world's shortwave broadcast bands are yours with the Eavesdropper All-Band antenna. Individually tuned traps make the Eavesdropper work like seven separate antennas, each tuned to a different international broadcast band. Also covers 11, and 60M bands as well. Its 100 foot, 72 ohm balanced feedline provides an exact match to the antenna on every band. Comes completely assembled, and ready to install with 50 ft. of 450 lb. test nylon rope. Overall length: 42' 10" Wire: #14 copper clad steel. Bandswitching: Automatic. Impedance to rcvr: 50-75 ohms balanced. **Only $59.95**

SPECTRONICS, INC
1009 GARFIELD ST. OAK PARK, IL 60304

PHONE
(312) 848-6777

MasterCard VISA

CIRCLE 21 ON READER SERVICE CARD

Time	Station/Country	Frequencies
	Radio Australia	15.320, 15.425
	Radio New Zealand	17.705
	Radio Japan	15.300
	Radio Casino, Costa Rica	5.954
	Radio RSA, South Africa	9.765
0600	Radio Canada International	11.960
	Ghana Broadcasting Corp.	4.915
	ELWA, Liberia	3.230, 4.765
	Voice of Nigeria	7.255
	Radio RSA, South Africa	17.780
	SIBC, Solomon Islands	9.545
	Voice of Free China, Taiwan	5.985 (10)
	Radio New Zealand	11.960, 15.485
	Radio Kiribati	16.433 (Singlesideband)
	UAE Radio, Dubai	17.775, 17.830
	REE, Spain	9.630, 11.880
	Vatican Radio	15.190 (15)
0700	TWR, Monaco	7.160 (25)
	Radio Cook Islands	11.760
	Radio Japan	15.300
	GBC, Guyana	5.950
	Radio Australia	5.995, 15.115
	Radio Havana Cuba	9.525
	SIBC, Solomon Islands	9.545
	HCJB Ecuador	9.720
	Radio Berlin International, E. Germany	9.560
0800	GBS, Guyana	5.950
	Radio Berlin International, E. Germany	9.560
	Voice of Indonesia	15.150
	Radio Japan	11.875, 15.235
	Radio Australia	5.995, 15.115, 15.425
	Radio Netherlands	9.770
	HCJB Ecuador	9.720, 11.835
0900	Radio Japan	9.505
	Falkland Islands Broadcasting Station	3.958
	Radio Pyongyang, N. Korea	11.830
	HCJB, Ecuador	11.935
	Radio Australia	15.115, 17.725
	Radio Oman	9.735, 11.890
	NBC, Papua New Guinea	4.890
1000	UAE Radio, Dubai	17.775
	SLBC, Sri Lanka	11.835, 15.120
	Radio New Zealand	11.960
	Radio Australia	5.995
	Radio Malaysia	7.160
	Radio Korea, S. Korea	9.570
	All India Radio	15.320
	Radio Afghanistan	15.255
	Radio Norway	15.205, 15.225 (Sunday only)
	BSKSA, Saudi Arabia	11.855
1100	Radio Pyongyang, N. Korea	9.977
	Radio Korea, S. Korea	7.295
	Radio Australia	5.995, 6.045, 9.580
	Radio Japan	9.505
	Radio Pakistan	17.660
	SLBC, Sri Lanka	15.120
	Radio Finland	15.400, 17.800
	SIBC, Solomon Islands	9.545
	4VEH, Haiti	11.835
1200	Austrian Radio	15.165, 15.275 (30)
	Radio Finland	15.400, 7.800
	Radio Berlin International, E. Germany	21.465
	Voice of Greece	17.565 (30)
	Radio Bangladesh	15.280 (30)
	Radio Ulan Bator, Mongolia	12.070
	Radio Australia	5.995, 9.580
	Radio Thailand	9.650, 11.905

Time	Station/Country	Frequencies
	Radio Beijing, China	11.600
	HCJB Ecuador	11.740, 15.115, 17.890
	Kampuchea	9.695, 11.940
	Tashkent, Uzbek, USSR	11.785, 15.460
1300	HCJB, Ecuador	15.115
	Radio Japan	9.505
	Radio Malaysia	4.950
	Voice of Vietnam	15.010
	Radio Australia	5.995, 6.045, 9.580
	KTWR, Guam	9.510
	Radio Finland	21.475
1400	HCJB, Ecuador	17.890
	BRT Belgium	17.610, 21.815
	Radio Netherlands	17.605
	Radio Sweden	17.860
	Voice of Indonesia	11.790, 15.150
	Radio Korea, S. Korea	9.750, 15.575, 15.600
	Radio Nepal	9.590 (30)
	Voice of Free China, Taiwan	15.575
	Voice of Israel	15.615
	Radio Pyongyang, N. Korea	9.977, 11.860
	Radio Canada International	11.955, 15.240, 17.820
	Radio Beijing, China	15.245
1500	Radio Havana Cuba	11.760
	Swiss Radio International	17.830
	Radio Japan	9.505
	Radio Australia	5.995, 9.580
	FEBA, Seychelles	15.200
	Radio Beijing, China	17.770
	FEBC, Philippines	15.440
	SLBC, Sri Lanka	9.720, 15.425
	Radio Aman, Jordan	9.560
1600	Radio France International	15.300, 17.620, 17.795, 21.620
	Radio Budapest, Hungary	9.585, 9.835, 11.910, 15.160
	Radio Beijing, China	11.755, 17.700
	Radio Pakistan	11.667, 15.455, 15.565, 17.640, 17.660
	Voice of Vietnam	15.010
	Radio Japan	15.235
	Radio New Zealand	17.705
1700	Radio Norway International	15.205, 21.730 (Sunday only)
	Radio Budapest, Hungary	9.585, 9.835, 11.910, 15.220
	Radio Pakistan	11.670, 15.515
	Radio Japan	9.505, 11.815
	BSKSA, Saudi Arabia	11.855
1800	Swiss Radio International	17.850 (15)
	Radio Kuwait	11.675
	Radio Canada International	11.825, 15.260, 15.325
1900	Radio Norway International	17.715 (Sunday)
	Radio Afghanistan	15.070
	Radio Japan	15.300
	Radio Kuwait	11.675
	Radio Australia	11.725
	HCJB, Ecuador	21.480
	Radio Abidjan, Ivory Coast	11.920
	BRT, Belgium	15.590
2000	Radio Berlin International, East Germany	9.620 (30)
	Radio Netherlands	11.730
	Radio Portugal	11.925
	REE, Spain	15.125
	Radio Algiers	17.745
	Voice of Israel	15.585, 17.633
	Radio Kuwait	11.675
	Voice of Vietnam	10.040
	Radio New Zealand	15.485
	Voice of Islamic Republic of Iran	15.084, 9.022
2100	Radio Canada International	11.945
	Austrian Radio	5.945
	BRT, Belgium	6.225
	Radio RSA, South Africa	11.900
	All India Radio	11.620
	Voice of Free China	11.825, 15.345, 17.800, 17.890 (40)
	Radio Budapest, Hungary	9.585, 9.835, 11.910, 12.000
	Radio Sofia, Bulgaria	15.140
	HCJB, Ecuador	15.295, 21.480
2200	HCJB, Ecuador	15.250
	Radio Free Grenada	15.045
	Radio Tirana, Albania	9.480
	Radio Norway International	15.225 (Sunday only)
	Radio Jamahiriyah, Libya	11.816
	SLBC, Sierra Leone	5.980
	Voice of Turkey	11.900
	All India Radio	11.620
	Radio Japan	17.755
	Voice of Israel	9.815
2300	Radio Free Grenada	15.045
	Radio Berlin International, E. Germany	9.730, 11.975 (15)
	Radio Sweden	11.710, 15.270
	Radio Korea, S. Korea	11.810
	Radio Japan	9.645, 11.740, 15.235, 17.795
	Radio Sofia, Bulgaria	9.700, 11.720, 15.110
	4VEH, Haiti	11.835
	Voice of Vietnam	12.035
	Radio Kiev, Ukrain, USSR	9.685, 15.180, 17.860

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

Electronic Security

It's important to protect your electronic equipment from intruders or burglars. Many of you have written in outlining all of the modifications you have made on your radio equipment and communications gear. It would be devastating if someone broke in and took everything. Although you might be able to replace the equipment under insurance, all of those mods will be lost forever.

Putting a burglar alarm system on line at your home or office—even in your car—is not all that hard. It's also not expensive. Professional burglar alarm manufacturers are popping up everywhere with state-of-the-art equipment. The alarm business has never been better, and this means a good variety of equipment at competitive pricing. Alarm manufacturers are constantly trying to outdo their competition by offering the most sophisticated system ever at a reasonable price.

Several Systems

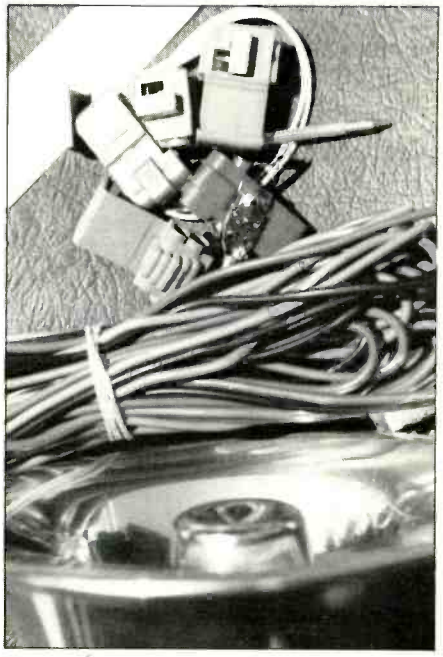
Before jumping into a burglar alarm system, let's review the many varieties that are available.

The least expensive system sold everywhere from dime stores to electronic convenience centers is the Ultrasonic alarm. The inexpensive ultrasonic system consists of a separate ultrasonic transmitter and a separate ultrasonic receiver. The ultrasonic transmitter sends out acoustic (audio) waves around 23,000 Hz (23 kHz). They are driven with a 2-watt amplifier built into the ultrasonic transmitter. Although it's unlikely you will hear these waves, some people say they can. Others complain of headaches when ultrasonic equipment is used near them. Dogs will often go a little crazy when they hear the sound of the ultrasonic transmitter.

Although the inexpensive ultrasonic systems are great for filling up a room with the audio security waves, they may false trigger. Warm air currents, jingling of keys, a phone bell, sirens, drapes moving in the wind, and even household pets may possibly trigger the ultrasonic alarm system. Except for special applications where nothing is going to move in the protected area, I would recommend you look to a more sophisticated setup to protect your home electronics.

Radar alarms operate on an RF frequency of 10.525 GHz, the X band. This is the same frequency band used by police radar systems.

The radar alarm sends out radio waves and receives them with an accompanying receiver. The power output may be up to 20 milliwatts. The radar waves can easily protect a large room or office facility. They may also transmit through drywall for a limited range.



The makings of a hard wired alarm system.

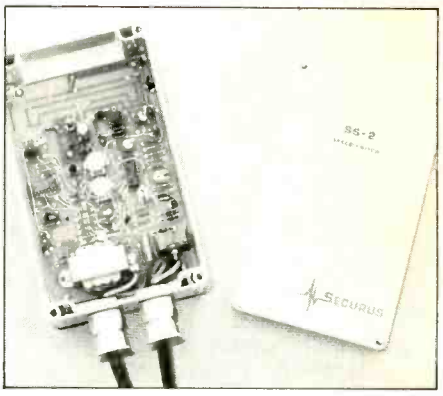
Similar to the ultrasonic system, a Doppler shift occurs when something moves and disturbs the waves. This Doppler shift is detected in the receiver, and an alarm is activated. In other words, anything moving will trigger the alarm. If you plan to protect an area where there is a chance of pets, venetian blinds blowing in the breeze, or other moving objects disrupting the radar waves, better think twice about this type of system. Although fire and police sirens and wind currents won't set it off, anything that moves just a little bit may! You can actually have the system too sensitive for home applications.

Most professionals in the home and office burglar alarm business recommend hard-wired alarm systems. This type of system consists of wire loops and sensors that protect entryways and specialized pieces of electronic equipment. You can put a sensor on just about anything to include your desk chair or even that large radio receiver.

Although the installation of a hard-wired system is more time-consuming, the chances of a false alarm are dramatically reduced. With a hard-wired system, the only time you are going to get a false is if you make a mistake and open up a protected area without turning off the alarm system!

Closed-Loop Versus Open-Loop Systems

In security language, the loop is the circuit into which various sensors are wired in your house or at your business. A closed-loop



The Securus security sensor detects movement up to 100 feet.

New style "keyless" locks operate by means of buttons.

strings sensors like old-style Christmas tree lights—in series. A series system is vulnerable if one sensor becomes faulty—none of the other sensors will work until the one faulty sensor is fixed. Similar to Christmas tree lights that use the series circuit, if one light goes out, they all go out.

If you installed a closed-loop protection system and a sensor malfunctioned when you were away from home, the alarm would go through its cycle and from then on your entire house or business would be unprotected until the problem sensor is fixed. (Most alarms have an automatic reset after a certain time limit.)

An open-loop system has no current flowing during its normal protected operation. All sensors are wired in parallel on an open-loop system. Not only is installation considerably easier, but failure of one of the sensors does not affect the others. Open-cir-

cuit sensors—by the nature of their design—resist swinging shut regardless of the severity of a shock when a door is slammed or someone walks upstairs. Because electrical current never runs through an open-loop system, the potential problem of electrolysis is also totally avoided which will keep your sensors "fresh" for many years.

It is true that cutting a wire on a closed-loop system will cause it to alarm, but an intruder must first get inside to cut the wires. By that time the alarm is already tripped and latched in, and cutting a sensor wire won't do anything to stop it. Many alarm manufacturers produce control units that may operate on either open- or closed-loop systems. This allows the owner and installer to make a decision as to whether to go closed- or open-loop. I prefer the open-loop system.

When the main control center recognizes an interruption to the normal loop circuit, it activates a series of selected alarms.

You may wish to have only an inside alarm bell sound. You may also wish to have an outside as well as inside alarm sound, or have the unit automatically dial up your local police department.

There are also electronic horns that synthesize voice words, such as "burglar," "fire," or "help."

You might also tie into your alarm system a small 27 MHz transmitter that will send out an electronic page signal on frequencies near Citizens Band. You might also qualify for alarm paging frequencies near 72 MHz, too. Companies such as Page Alert of Gardena, California, offer small paging receivers that will automatically let you know once your alarm system has been activated.

One of the beauties about a loop-alarm system is that you can go about your business or home with the alarm turned on without tripping it if you are careful. Here at my house, I have two stages on the loop system. At night, everything is wired up, including all doors, backyard gates, my dune buggy parked outside, and just about everything else that might be tampered with. If any wires are either shorted or cut, or any door or gate opened, the alarm system goes off. I can select whether or not it wakes me up gently or blasts me out of the bed and wakes up the neighbors, too.

During the day, the outside perimeter is turned off, but all of my equipment is still protected. Sensors will detect when any major piece of equipment is moved. This would include the electric typewriter, individual pieces of amateur radio equipment, recording equipment, and just about anything else that normally stays in one place during a normal day's operation.

Installation

Installation of a loop-alarm system takes about a day. The wires you are running are similar to twisted-pair telephone wires, 24 gauge. They are so small that you can put them just about anywhere. They can easily hide in molding or just about anywhere that they are slightly out of sight.

You don't need to wire every single entry point up the first day. With the open-loop systems, wire in as many sensors as you have time for. Then each weekend add a few more. Keep adding and keep adding, and you will finally have an inpenetrable home or office.

When you switch the alarm on, it will automatically test all the sensors. If it detects that any one sensor has malfunctioned or is not latched in (you forgot to close the sliding glass door), the alarm will not set. It will beep and flash at you telling you to check out all sensors to locate an open entry area. You can develop a series of switches to isolate which portion of the house or office is having the problem. Then it's simply a case of looking over your notes, checking out each sensor, and then discovering that somebody has left one of the unused windows ajar.

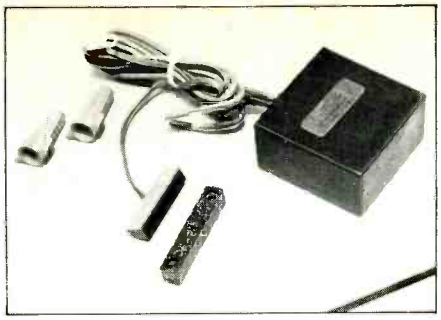
If your alarm box indicates that everything is set, throw the switch and you are on the air. Momentary blackouts or a local lightning strike won't disturb a thing—the alarm circuitry takes care of all that.

You can spend under $100 with a radar or ultrasonic alarm and have it do a reasonable job. Be prepared to get up several times to reset it, because it may false due to a variety of common causes.

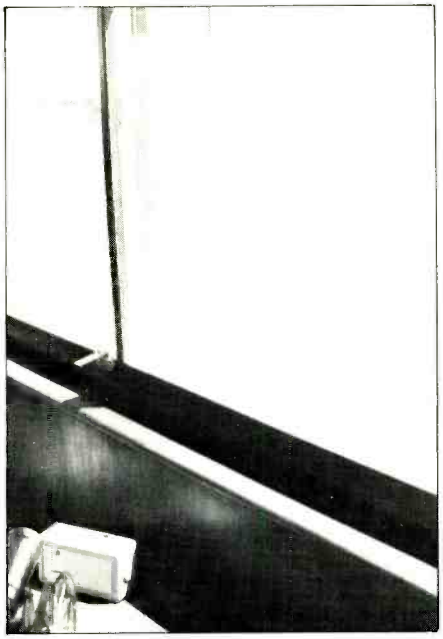
If you opt to spend $300 or $400 on an alarm system, chances are you may never have a false, unless you accidentally trigger it yourself. That's a good way to test your system! The hard-wired alarms generally will last a great deal longer than the less expensive radar or ultrasonic alarms that always seem to "wear out."

One manufacturer of a closed/open loop alarm system specifically makes alarms for the hobby radio user. The alarms lend themselves perfectly for installation to guard against intruders and those that may wish to steal your radio equipment. They can be used in cars, boats, businesses, and at home. They will send to any *Popular Communications* reader a detailed catalog on their alarm system. Write to Cordmar Industries, Inc., 8800 N. Bayshore Drive, Miami, Florida 33138, and ask for their Radio Room Alarm System, and tell them that Gordo sent you.

Until you get that new alarm system on line, keep a watch on your equipment and don't let anyone know what type of radio gear you may have behind those closed doors!



Hand-wired magnetic switches.



Small and inconspicuous, the radar alarm sensor sits on a tabletop protecting the household.

The Seeker microwave intrusion alarm.

Uncle Sam's Navy Pirates

Changing Radio Callsigns As Often As They Changed Their Flags – These Pirates Were On A Secret WWII Mission!

BY HARRY COOPER

Kapitaenleutnant Reinhard Hardegen was the U-boat Command's "Ace of Aces" in early 1942. This flamboyant German submarine commander won his Iron Cross by sinking some 100,000 tons of allied shipping off the American east coast in January of 1942 during the opening thrust of *Operation Paukenschlag*. To sink some of his victims, Hardegen even took the U-123 right into New York Harbor, venturing up the Hudson River as far north as the Narrows on one occasion!

It was evening of 26 March 1942 and U-123 was again on station off America's east coast, when her lookouts spotted a small, 3,200 ton tramp steamer slowly plodding southward battling heavy seas, occasionally letting off clouds of sooty black smoke. She looked easy, too easy, so Hardegen called upon his Navigation Officer and a Midshipman for their opinion. They too saw this lone American merchant ship as a ripe plum to be plucked easily from the tree. Hardegen made the decision to attack on the surface, using a torpedo rather than the U-123's 4.1 inch deck gun.

Hardegen maneuvered U-123 to a point within 650 yards of the unsuspecting ship, the gathering darkness helping him to maintain cover. A single torpedo flashed almost silently from the bow tube, and in a few seconds an explosion blew into the air at the bow of the ship. She slowed, then stopped dead in the water. As Hardegen and his Watch Officer looked on, fires broke out on the decks of the victim ship.

The U-boat radio operator intercepted the distress call on 500 kHz, which he relayed to Hardegen on the bridge. "WKCA, *Caroline* torpedoed, burning, position 36° N, 70° W."

The rusty old ship began to list slightly, but she didn't settle in the water. One of the lifeboats dropped into the water, filled with men, and began to draw away from the stricken ship. A second lifeboat still hung in the davits. U-123 was now coming slowly around *Caroline's* stern, and Hardegen saw more men attempting to get into the other lifeboat.

"Let the men get away from the ship," Hardegen ordered. "Don't want to shoot them up as well."

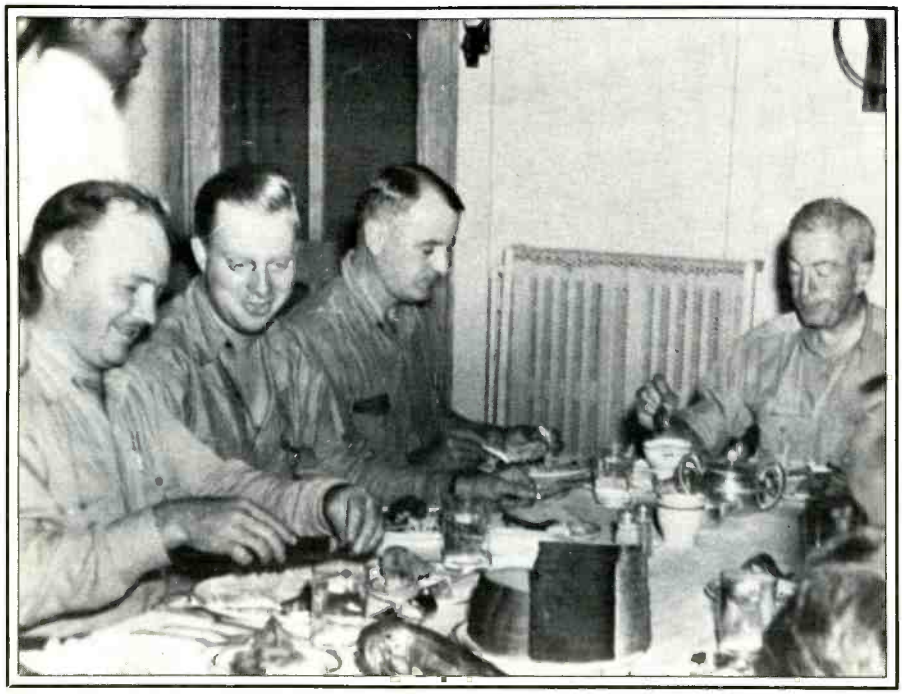
A decent gesture, but Hardegen could hardly be expected to know that this ship carried *double* the number of crew she should have. The crewmen he watched abandoning ship were known as the *the panic party*. Their task was to convince an attacking U-boat skipper that he had done his job, and that the crew was leaving the helpless ship for the U-boat to finish off at will. The deck fires were carefully set in controlled tubs to give the effect of a doomed ship. More American sailors were hiding aboard *Caroline*—not merchant seamen, but U.S. Navy seamen—and they waited for the right moment to spring their trap on this unsuspecting Iron Cross hero.

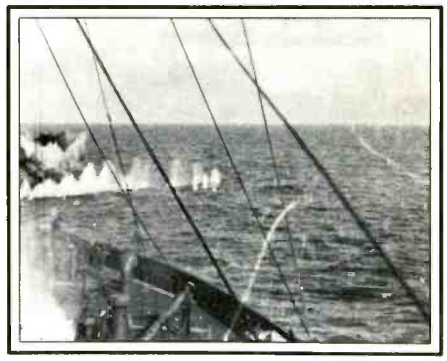
As the lifeboats pulled away from the *Caroline*, Hardegen thought he detected the deserted ship beginning to move ever so slowly in the direction of his U-boat. Impos-

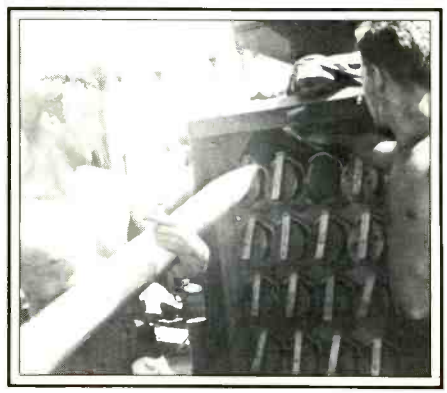
In the wardroom of Big Horn. *Commander Lewis Farley at the head of the table. The ship's doctor is at far left, with Lt. Ed. Mack beside him.*

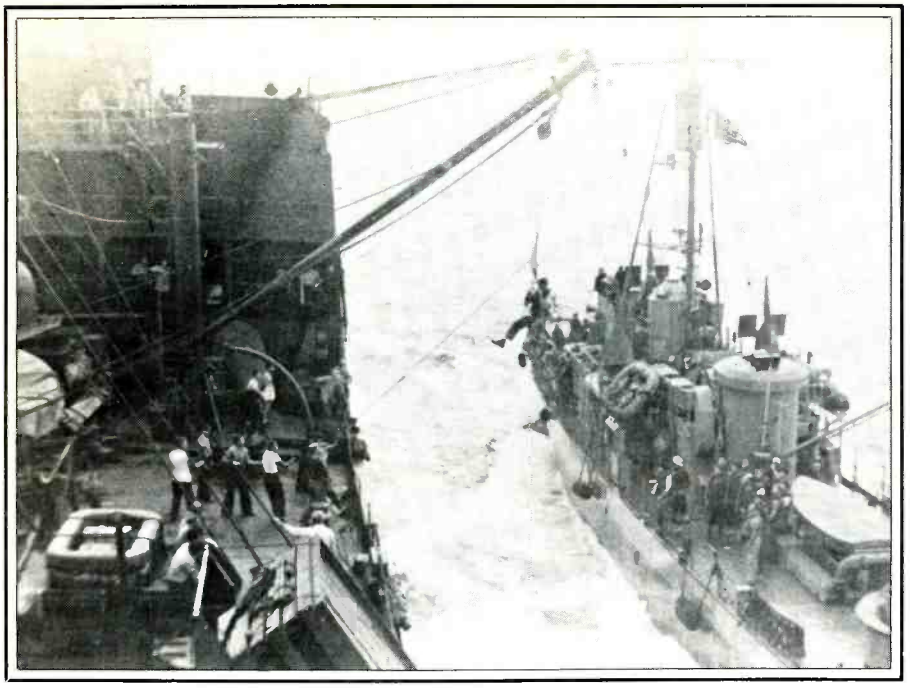
Big Horn's *hedgehog detonates on a submerged U-boat.*

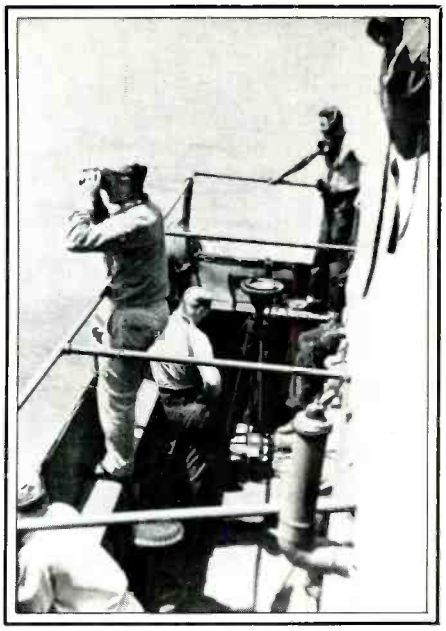
Ammunition racks on Big Horn.











Supply Officer Lt. Ed Mack of Chicago, transferring from one of the patrol craft to Big Horn.

Big Horn's *Bridge Officer keeps a sharp look-out for U-boats.*

The duty of the patrol craft was to rescue survivors of Big Horn *in the event of U-boat attack—if there were survivors!*

sible, the crew had abandoned. Still, he ordered half-speed ahead on the twin diesels and began a slow turn to starboard. *Caroline* matched the moves of the U-boat. But how, Hardegen wondered. The ship was empty.

Caroline suddenly bolted to full speed, heading straight for the side of U-123. Trap doors flew open on the tramp steamer, canvasses were torn away, hidden seamen scrambled across the decks, the Jolly Roger joined the stars and stripes on the flaghoist, and gunfire blazed from guns hidden along *Caroline's* decks! The trap had been sprung, and the hunter had become the sitting duck! Machine guns chattered! Water spewed into the air around U-123 as U.S. Navy shells hit nearby.

Totally caught by surprise, Hardegen now realized the trap into which he had been lured! Black smoke belched from the U-boat's twin diesels as she tried to escape. Two shells exploded close astern, and another alongside, washing tons of sea water over the decks of the fleeing U-boat. Blazing white-hot machine gun tracer bullets cluttered through the conning tower! Hardegen's Midshipman clutched his side, groaned, and fell to the deck. A violent explosion roared inside the U-boat; she was hurt!

Hardegen ordered the bridge cleared of everyone but himself and one of his officers; then the hatches were dogged down and the watertight doors were shut.

Turning his attention back to the *Caroline*, he saw large black objects hurtling through the air in the direction of U-123—depth charges! Stunned, he realized that Germany's top U-boat Ace had been fooled like a rank amateur!

Project LQ

What manner of ship was this *Caroline*, to tackle a German U-boat? When Japan opened hostilities against the United States that fateful day in December of 1941, the German High Command was taken by surprise as much as America herself. But Hitler quickly ordered Admiral Doenitz to dispatch a force of U-boats to raid along the American coast. Doenitz could send only five boats, but they caused so much havoc in January of 1942 up and down the eastern seaboard from the Gulf of St. Lawrence to Cape Hatteras, that Doenitz sent back more and more U-boats to patrol the entire American coast from Maine to the Gulf ports of New Orleans, Galveston, Pensacola, and Pascagoula.

The U.S. Navy was powerless to stop them! The "all powerful American Navy" existed solely in the minds of Navy planners and Admirals. In truth, America had virtually nothing along its eastern shores that could remotely serve as a U-boat hunter/killer. The United States needed time, and *Caroline* and others in America's *pirate* fleet would buy that time.

The birth of "Project LQ" occurred on 19 February 1942, when a man walked into Riggs National Bank in Washington, DC and deposited half a million dollars into the accounts of Mr. F.J. Horne and Mr. W.S. Farber. "Mr. Horne" was in reality Vice Admiral Horne of the U.S. Navy. "Mr. Farber" was Rear Admiral William Farber, Horne's assistant. The money was further broken out into dummy companies; $50,000 went into the account of the Eagle Fishing Company, $100,000 went into the account of the Asterion Shipping Co., and another $100,000 went into the operating fund of the Atik Shipping Co.

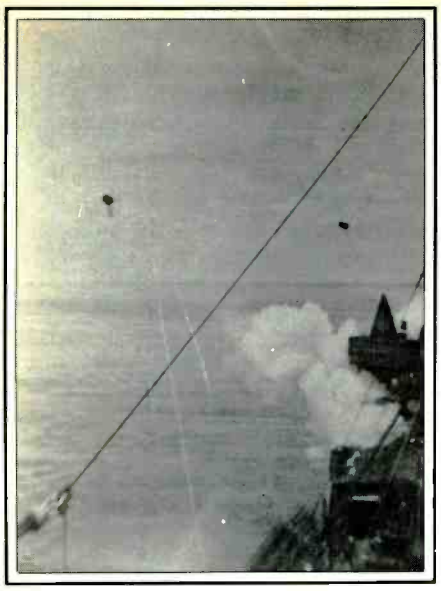
Each of these three "companies" owned one vessel. The Eagle Fishing Company "owned" a 133 foot diesel-powered New England trawler named *Wave*. Asterion Shipping Company "owned" the ancient 3,200 ton steamer *Evelyn*, and the Atik Shipping Company "owned" her 3,200 ton sister ship *Caroline*.

In February of 1942, the three ships were brought into the Portsmouth Navy Yard for outfitting. They were given a dazzling array of ordnance, including heavy guns concealed by camouflage nets and break-away bulkheads, depth charges, machine guns, and the latest in sonar, radar, and radio communications equipment.

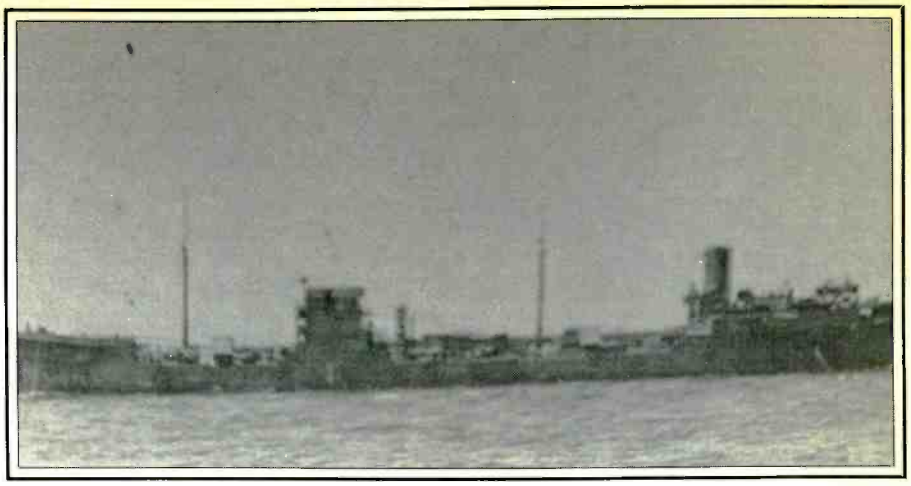
The trawler *Wave* was renamed the *USS Eagle*. The steamer *Evelyn* became *USS Asterion*, and *Caroline* was *USS Atik*.

Both the *Evelyn* and the *Caroline* had been built in 1912 and had sailed for 30 years as merchant vessels for the A.H. Bull Shipping Line. In 1912, the *Evelyn's* radio callsign was KZP, but that was later changed to WKCE when ship callsigns went to 4-letter formats. The *Caroline* was originally assigned the call KZG, later changed to WKCA.

The trawler *Wave (USS Eagle*, AM132)



USS Big Horn *lays down a depth charge pattern over a U-boat.*



USS Big Horn *(alias* Gulf Dawn*) on station. Aft mast was artificially extended to match the HFDF foremast.*

The after battery on USS Big Horn.

was a 314 ton vessel built in 1938. Later she would be renamed the *USS Captor* (PYc40). As participants in "Project LQ," the vessels would continue to use their long established civilian identities and radio call-signs, however they also had the option to use fictitious names, fictitious radio call-signs, and fly flags of various nationalities.

U.S. Navy Commander Lewis Farley briefed his three skippers on Q-ship operations and techniques. All orders were verbal. Nothing was put down on paper. These skippers and their officers had been hand-picked by Farley for this mission, and on 23 March 1942, Lt. Commanders Harry Hicks *(Atik,* a/k/a *SS Caroline),* G.W. Legwen *(Asterion,* a/k/a/ *SS Evelyn),* and L.F. Rogers (*Eagle,* a/k/a trawler *Wave*) headed their decoy ships to sea, knowing they were on their own if they ran into trouble. The Navy had nothing to send to their aid.

Caroline's encounter with U-123 took place only three days after she departed port. She had definitely given Hardegen and his U-boat crew a fierce battle, but she had allowed the submarine to withdraw out of range and escape.

U-123 Returns

Caroline was still stopped dead in the water, waiting for the U-boat to return. Her *panic party* had re-boarded, stored the lifeboats back in their racks, and extinguished the controlled fires they had set on deck. *Caroline* waited to resume battle with U-123, but she no longer enjoyed the element of surprise. The sheep's clothing was off the wolf, and when the U-boat returned it was submerged to periscope depth.

No longer the fool who was caught in a trap, Hardegen was again Germany's top U-boat skipper. He carefully brought U-123 into attack position, undetected by the crew of the *Caroline.* When his sights lined up on Caroline's engine room, he gave the command to fire! The torpedoman's hand hit the firing button. A single torpedo sped on its way. *Caroline's* 30 year career on the high seas, three days of which were spent as an undercover U.S. Navy Q-boat, appeared to be over.

Twenty four seconds after Hardegen's order to fire, *Caroline* was rocked by a thundering explosion which forced the bow under water as far as the bridge, causing her stern to lift so high out of the water that Hardegen could see the propeller still turning helplessly in the air.

At 0530 on 27 March, Hardegen brought U-123 back to the surface, but this time out of range of *Caroline's* guns. He would not allow himself to be tricked a second time. This time there was no trick, *Caroline* was finished. Just before 0600, three heavy explosions echoed across the water, *Caroline's* bow shot skyward, then the entire ship slid beneath the waves. None of the lifeboats—or the crew—were ever seen again!

Second Thoughts

The Navy's top brass were now having second thoughts about "Project LQ," but there was still no effective defense force on the east coast. The U-boats were still running unchecked across America's vital shipping lanes. There was no choice but to continue "Project LQ."

The Gulf Sea Frontier Command decided that since the East Coast Command had Q-boats, they would get into the act as well. They decided upon sail power for their decoy activity, obtaining a two-masted schooner named *Alice,* which they turned into a Q-boat. But when the German saboteurs that U-584 dropped off on a Florida beach near Jacksonville were nabbed by the FBI, they carried a complete set of the conversion plans of *Alice. Alice* was quickly recalled and decommissioned.

By this time, Cmdr. Farley had enough of "desk sailing." He obtained a former Gulf Oil Company, 7,100 ton, 425 ft., tanker called the *Gulfdawn* (callsign WONK). This vessel had been built in 1938, but it was given a new name when it became a Q-boat *(USS Big Horn,* AO-45, then IX-207). The vessel's tanks were filled with sealed oil drums to keep her afloat, even if she were to be ripped open by torpedoes. The latest weaponry was installed, including 3-inch guns, many .50-cal. machine guns (some on tracks so they could be slid into their hiding places), depth charges, 2½-inch hedgehogs, "mousetraps," radar, sonar, and a high frequency radio direction finder

(HFDF, commonly nicknamed "huff duff") with which to pin down the locations of marauding U-boats.

The only gun visable on *Big Horn* was the after battery's 3-inch gun, commanded by a Chicagoan, Lt. Ed Mack. The two large spotlights, unheard of on tankers of this vessel's type, were disguised with broomsticks and canvas covering. Probably the most grim reminder of *Big Horn's* role in this infant war were the two small patrol craft that followed her just out of sight over the horizon. It was the sole duty of these patrol craft to pick up any of *Big Horn's* survivors fortunate enough to be left alive after the anticipated U-boat attack!

The crew of the *Big Horn* was mostly made up of "brig releases," men who were serving time in the Navy's jails. Since the life expectancy of a Q-boat was short, at best, the men could volunteer for this duty and have their sentences dropped when (and if) they returned. The hazardous duty pay was great.

Big Horn always took the "coffin corner" in convoy, seemingly straggling astern of the main body of ships, hoping to entice a U-boat to the surface and attack with her deck guns rather than wasting a torpedo. *Big Horn*, like other Q-boats, was a slow and unmaneuverable ship, and she had to hope that the U-boat fell for the ruse and fought it out on the surface. The Q-boats were no match for U-boats once their true intentions were realized by the German skippers. They had to sink the U-boat on their first attack, or suffer certain destruction by counterattack. *Caroline* had proven this most dramatically and tragically.

Since they all wore civilian clothes and used the flags and radio callsign of nearly every neutral and Allied country at one time or another, the officers and men of *Big Horn* knew that they would be shot as spies if they were ever captured. The Stars and Stripes were shown when the ship was at general quarters. Then the fictitious nationality flag was hauled down, Old Glory would snap to the flagstaff, along with the skull and crossbones of the Jolly Roger!

Big Horn came under attack five times during her short career, the first time off St. Paul's rocks in South America. Another time she was so far from the U-boat that she had to fire on the roll to lob her shells the full distance. She encountered her third U-boat off Recife, Brazil and the fourth off the Florida coast. Her fifth time under fire was again off the Florida coast, but this time she wasn't attacked by a German U-boat—but by a flight of U.S. Navy planes! At the time, *Big Horn* was flying one of her fictitious nationality flags and communicating via radio with another vessel while using an equally phony radio callsign. The Naval aircraft spotted the vessel in an area where it didn't seem to belong; that coupled with the use of a callsign which didn't check out in their records made her look so suspicious that it brought about the air attack. Before she could run up the Stars and Stripes and get on the air with adequate identification signals, she was machine gunned several times by the American fighters. Fortunately, there were no injuries and the damage was light.

The final straw for "Project LQ" came with the *Irene Forsythe*, a beautiful three-masted schooner which the Navy renamed the *Aeolis*. Even though her commander, Lt. Cdr. Richard Parmenter, was an anti-submarine expert, the jinxes which seemed to follow "Project LQ" right from the start showed *Aeolis* no mercy. The boat sailed into a hurricane off Bermuda and had to limp, badly damaged, into Hamilton Sound for repairs. No further records remain about this vessel, but a rumor later circulating among seamen during the war said that she was sunk by machine gun fire from a U-boat she attacked.

A Failure?

On the surface, the Q-ship project seemed to have been a total failure. *Caroline/Atik* was sunk three days into the operation; *Alice* was in and out of service before ever seeing action; *Irene Forsythe/Aeolis* was apparently sunk attacking a U-boat. The three remaining ships, *Evelyn/Asterion*, *Wave/Eagle*, and *Gulfdawn/Big Horn* were removed from anti-submarine duty and given weather-reporting duties. None of the six vessels in "Project LQ" ever sunk a German U-boat.

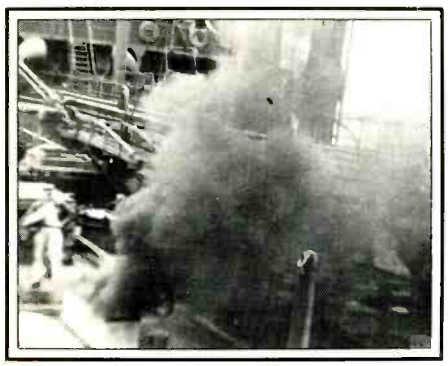
Disasterous as the project might seem to have been, the men of the Q-ships were the courage and guts that the U.S. Navy needed during those bleak, early days of the war when there were no ships. They helped to hold the line while America was taking a terrible beating along her eastern shores until other measures could be taken. Ultimately, the dreaded U-boats became nothing more than "iron coffins" for fully 75% of the cream of the German Navy.

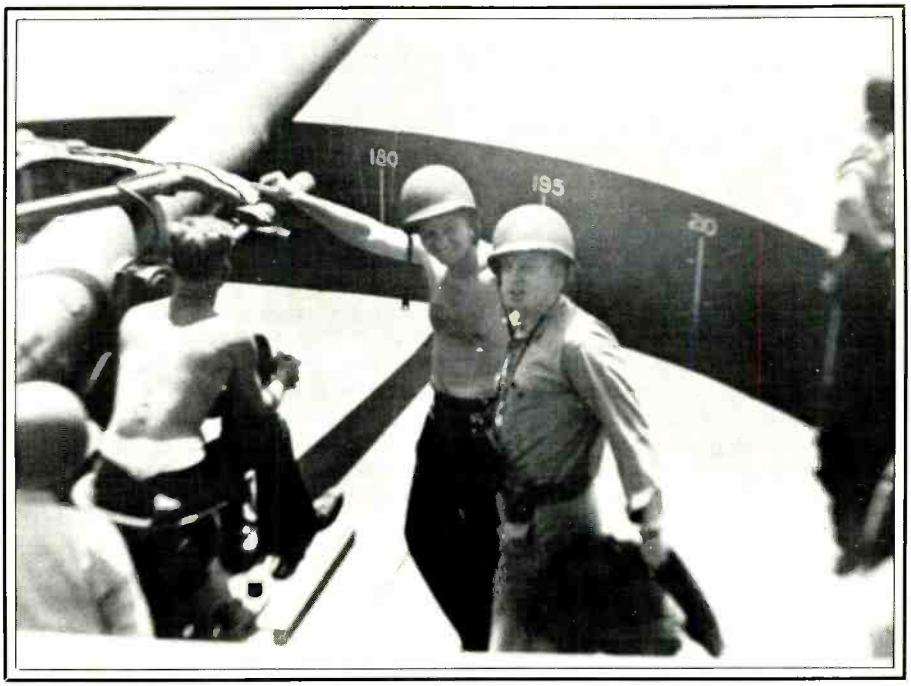
About the author: Harry Cooper has written many articles for leading boating/yachting publications, as well as travel and auto racing magazines. He is presently writing a book about the secret western hemisphere supply bases used by U-boats during WWII. He's done extensive research on U-boats and is considered one of the world's foremost authorities on their activities. Harry runs an organization called SHARKHUNTERS (P.O. Box 137, Fox Lake IL 60020) for U-boat researchers.

The Jolly Roger flew alongside the Stars & Stripes whenever Big Horn *went to Battle Stations!*

There were controlled fires set on board the "Q" ships to trick the attacking U-boat into thinking the ship was in mortal danger.

Chicagoan Ed. Mack (wearing the shirt) commands the after battery on USS Big Horn.





The Return Of Radio Caroline

Rising From The Depths Of The Sea, "The" Pirate Broadcaster Is Back On The Air!

BY CLIVE RICHARDSON

When last heard from, the final message from Radio Caroline was "From all of us, for the moment, goodbye and God bless." The last (and to its many fans and supporters) tragic words from Radio Caroline were uttered on March 20th, 1980, only minutes before the station settled to the bottom in the storm-tossed seas of the Thames Estuary. Now, like Aphrodite, rising from the depths of the sea—Radio Caroline, the world's most well-known high-seas pirate broadcasting station, has risen to again take its place on the airwaves. The Radio Caroline saga is perhaps no less stormy than the weather conditions which sent it to the deep six almost three years ago.

Radio Caroline has long been fondly known as "The Lady" to her friends, and those who recall the glory days of offshore pirate broadcasting of the 1960's and 1970's will always retain Radio Caroline in their memories as the most prominent of all offshore broadcasters of the era. Ask people to search their memories and most of them will quickly say that Caroline and her offshore colleagues died in the mid-1970's, yet Caroline has doggedly clung to life now for 20 years. It wasn't easy.

A Stormy Career

The actual ship that hosted Radio Caroline during her halcyon years started life as a three-masted steel schooner in 1921. Built in Kiel, Germany, she was converted to a motor cruiser in 1927. For the next 30 years, the *Olga* (or *Margarethe*, as she later became) travelled the North Sea until she fell into disuse. The ship was purchased by a Swedish company (with American backers) and was turned into a broadcasting ship which identified itself on the air as Radio Nord. Two 10 kw transmitters (neither was licensed) gave the station a very potent signal from its position off Stockholm. It was great while it lasted, but that was only two short years. At that time the Swedish government legislated against pirate broadcasting; by 1962 Radio Nord was silenced.

Renamed *Bon Jour*, and then again renamed *Magda Maria*, the crusty old lady broadcast only occasionally over the next few years and even made a trip to the USA before heading back to Europe and eventually dropping anchor off Essex in Britain. On March 28th, 1964, the ship was given yet another new name, the *Mi Amigo*. On May 9th, 1964, she began broadcasting under the identification Radio Atlanta. In July of 1964 the station merged with and became known on the air as Radio Caroline. The station was named after President John F. Kennedy's daughter.

As Radio Atlanta, the station was operating on 1507 kHz. When the station became Radio Caroline, the frequency changed to 940 kHz.

Although a varied career thus ensued, the vital statistics aren't enough to explain the popularity of Radio Caroline. Nor can we explain what is so special about this station that she has long been thought of so fondly and what convinced her present backers that the station simply could not be silenced forever just because it was sent to the bottom of the sea by inclement weather.

The Caroline Saga

We need to take a quick look at social history to try to comprehend the station's immense appeal. In the early 1960's, teenagers were gaining an identity of their own. These were the heirs to the so-called Beat Generation; by the 1960's they were called *flower children* by some, *hippies* by others, or just plain teenagers by most. They had their own unique brand of music, dress codes, social life. Moreover, they seemed to have lots of money to spend.

Auntie Beeb, the staid old BBC, maintained staunch resistance to the onslaught of contemporary music and was steadfastly presenting stuffy dance band music despite the growing dissatisfaction with its programming. Radio Caroline, as the first of its type, played Merseybeat pop and lots of specialties, soul, ska, psychedelic sounds, and rock. The enthusiastic DJ's were young, informal, hip, and they spoke the language of young people. They also knew their facts about the artists and rock groups, the new trends in music, the latest groups and their forthcoming albums. Without the rigid constraints of the BBC, Caroline could play lengthy album tracks, Top Twenty music, and could easily relate to the upbeat lifestyle of its listeners.

Over the years Caroline developed its style for a "young, mobile, and moderately-intelligent audience," as described in the words of Ian Anderson, one-time engineer on Caroline and historian of the station.

In 1966, the station installed a 50 kw Centennial Electronics transmitter (it still retained the 10 kw transmitters as stand-by rigs) to feed into its ¼-wavelength antenna. Over the years the station survived fire, mutiny, impounding by Dutch authorites, being washed ashore on the Essex coast, sinking, and (most importantly) the 1967 Marine Broadcasting (Offences) Act which firmly declared offshore broadcasting from Britain's territorial waters to be blatantly illegal.

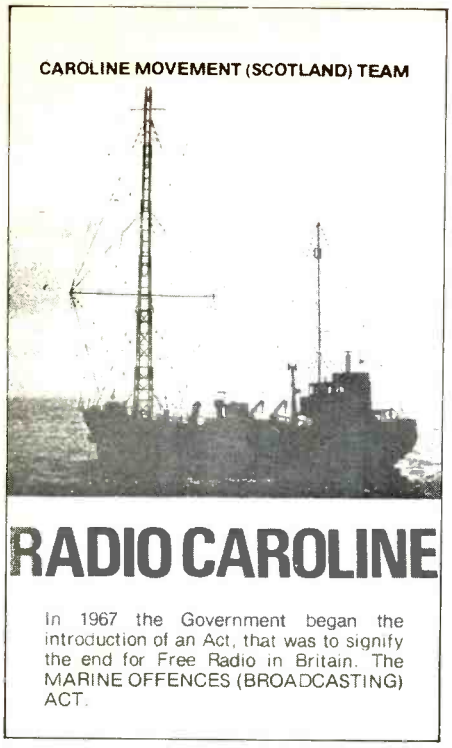
Caroline's popularity and lead was followed by about a dozen other offshore broadcasters and, as time has shown, it became a situation that could hardly be regarded complacently by the British Government or Civil Service. The much-protected monopoly on broadcasting was threatened, in their opinion, by the anarchy of the offshore pirates.

It was claimed that the offshore stations caused interference to "authorized" broadcasting services and emergency services. They said that there were no frequencies available for such broadcasts, that the stations went against democratic standards of broadcasting, that stations operating without safeguards and guidelines were totally intolerable. These arguments, no matter how valid or boldly (and often) they may have been presented to the public, made little difference to the eagerly-listening fans who fell within the potential audience of four million. Neither did the claims make any difference to the offshore broadcasters.

So the Marine Broadcasting (Offences) act was passed, offering stiff penalties for offenders. Prison sentences and fines were the crowbars used by this legislation in order to pry the offshore broadcasters from the airwaves. In Caroline's case, at least, the legislation did not have noticeable success.

Supplies were ferried to the ship. Holland became the haven for off-duty DJ's on shore leave and, to its dismay, the Government came to realize that there seemed to be no one person they could hold responsible or investigate since the station was run almost on a co-op basis without a formal hierarchy of leadership!

Caroline tried several frequencies over the years, sometimes using two separate programs simultaneously on different frequencies. Even the transmitter power fluctuated along with the price and availability of fuel oil to run the station's two generators. At times there were non-English language programs presented for audiences on the European continent. The traditional format of the station underwent a major modification in 1972 with the introduction of "L.A." or Loving Awareness, a concept promoted by

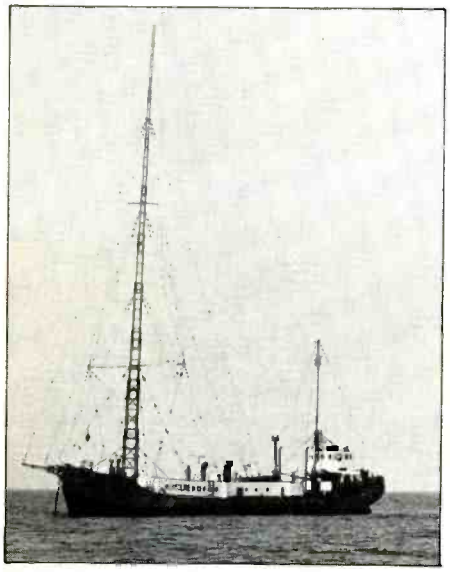


In the early 1970's, Radio Caroline sent this brochure to its listeners in order to explain its plight.

Ronan O'Rahilly, the founder and mentor of Radio Caroline. L.A. was a sort-of self-awareness philosophy project in order to insure love, peace, change in the individual, and improvement on how the individual relates to others. Although a popular philosophy at the time, there were more persons who felt that this philosophical material detracted from the station rather than enhanced it.

In The Silt

After March 20th, 1980, of course, all of this was moot since the ship, transmitter, antenna, record library, and everything else physical that belonged to Radio Caroline was lying in the silt of the Thames Estuary.



Radio Caroline before she slid beneath the waves.

Plans for a "new" Radio Caroline, supposedly to be heavily backed by American dollars, were quickly announced. It was then stated that a new vessel, the *Imagine*, was being prepared. This ship would have more space aboard and would be sporting a 300 foot antenna. The guiding light would again be the venerable Ronan O'Rahilly, who still was saying that L.A. would be an integral part of Radio Caroline's existence. All sorts of on-the-air dates were announced, but the date most often mentioned was about March 10th, 1982. An operating frequency of 716 kHz was also announced.

As fate (and perhaps the fickle finger of finances) would have it, the new Radio Caroline arrived back on the air on August 21st, 1983—about 17 months late and on 963 kHz, but with a 50 kw transmitter which is being heard well throughout the listening area. The promised 300 foot antenna is in place and doing a fine job. Since the vessel is in international waters, the British Government has no ability to silence the station. Supplies are being ferried from locations in Spain. Assisting O'Rahilly with promotional and advertising help is the popular American radio personality, Wolfman Jack.

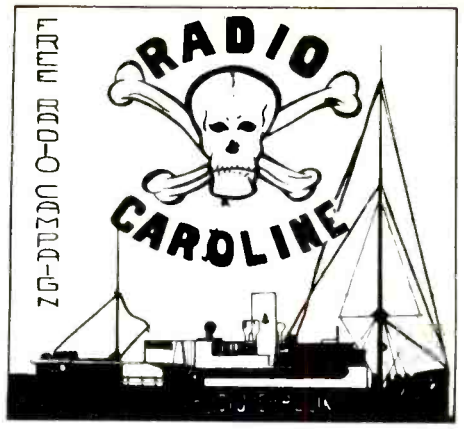
There has been talk of a possible shortwave outlet for Radio Caroline, as well as considerations for AM stereocasting. Additional programs to the European continent in various languages may also be transmitted at a later date. For now, there's plenty of rock music going out over Caroline's transmitter and the hope is that there will also be a copious amount of advertising revenue coming in, especially from American companies.

The new Radio Caroline is located aboard a converted former Icelandic trawler which, as promised, is now named *Imagine*—after the well-known John Lennon song of the same name.

The Question

I still have not answered the question of what has made Radio Caroline so special. It certainly seems that the station's main claim to fame was that it smashed the traditional mold of broadcasting. Although, in the long run, the British Government had considerable success in breaking the back (and spirit) of the pirates, it did come to realize that the stations were actually offering something the people wanted to hear. So Radio 1, a so-called pop-oriented "young" station, was launched from various locations on 1053, 1089, and 1485 kHz. Some of the former pirate station DJ's were even hired by Radio 1. There are also a number of independent (non-BBC) local stations now on the air which offer programming aimed at a contemporary audience.

Almost more importantly, Caroline's reputation as THE offshore pirate radio station seems to have earned it a very special place in every listener's heart. The station has always had its problems, going off the air for extended periods, and its philosophical outlook towards the end of its previous period of operation did leave something to be desired. But it has a romance, a mystique, an aura of its very own; some might wish to call



it charisma. Maybe because it bucked the system and won, or because it has fiercely clung to life against seemingly overpowering odds, people look upon it with affection and were heartened at its return last August.

As Ian Anderson said, "The pirate radio station overcame . . . by an informal business organization, a steady source of idealistic backers and the enthusiasm of young broadcasters who were willing to put up with a lot for the chance to play rock 'n roll . . ."

Insofar as "putting up with a lot" goes, it appears that Radio Caroline's spot in the center of controversy may not yet be over. Almost as soon as it went on the air last August, it came under fire from several low-power university-based broadcasters who also operate on 963 kHz. Things have *never* been easy for Caroline.

SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Reader Inquiries

Nat Cohen of Grass Valley, California, says he's purchased several military surplus vehicles which he's restoring for various uses, including survival operations. He's having a problem with obtaining information and parts concerning the communications equipment for these vehicles. He wonders if we can direct him to any source for what he requires. My suggestion for one possible source is Fred J. Lindig Radio Specialties, P.O. Box 11493, Tucson, AZ 85734-1493. This company has a catalog (costs $1, refundable with first order) relating to vehicle restorations, mil communications gear, mounts, antennas, and other ex-GI items.

From Utica, Mississippi comes a card from Larry Tilden that reports he is having difficulty obtaining BA-37 or BA-38 batteries which are required to power his BC-611 hand-held military transceiver. Larry, you can get adapter units which will permit the use of standard batteries in a BC-611. Units are also available for utilizing standard batteries in the AN/PRC-6 and AN/PRT-4. Details are available from TNM Enterprises, P.O. Box 2331, Anaheim, CA 92804. For those several others who have written in asking about the BA-399/U mil battery required for the AN/PRT-4 helmet walkie-talkie, these can be obtained from B. Asbury, 56 Harvester Ave., Batavia, NY 14020. Check with the supplier regarding prices and availability.

Charles Mosconi, Woodbridge, Virginia says that when he was in military service he once saw a room "gone over" by intelligence specialists using a device which could detect any hidden transmitters (bugs) which might have been placed there. He wonders if we can identify the equipment and advise where such a device can be purchased. Unfortunately the descriptive data provided by Charles wasn't sufficient to permit an exact identification, however one unit which can be used for this purpose, and which is available on the surplus market, is the RF-204/U RF interference detection set. These sell for about $110 (new) and one source we know of is Frank Moreland, 3748 Yosemite, San Diego, CA 92109.

I continue to receive constant inquiries asking about companies that can supply military surplus communications equipment in small single-unit lots or in lots ranging up to 25 or 50 or more. Four reliable sources offering a nice selection of transmitters, receivers, hand-held units, manpacks, and other commo equipment are: Fair Radio Sales, P.O. Box 1105, Lima, OH 45802; Michael P. Murphy, 11621 Valle Vista Rd., Lakeside, CA 92040 (catalog $1 plus self addressed stamped long envelope); Baytronics, Box 591, Sandusky, OH 44870; and Western Wireless Inc., 4840 Tahoe Circle, Martinez, CA 94553 (catalog $3). If these four companies can't supply what you want in the way of mil surplus commo gear, then it probably doesn't exist. By obtaining the catalogs of these four companies, you'll have a pretty complete picture of just which equipment is available on the surplus market.

Topographic Maps

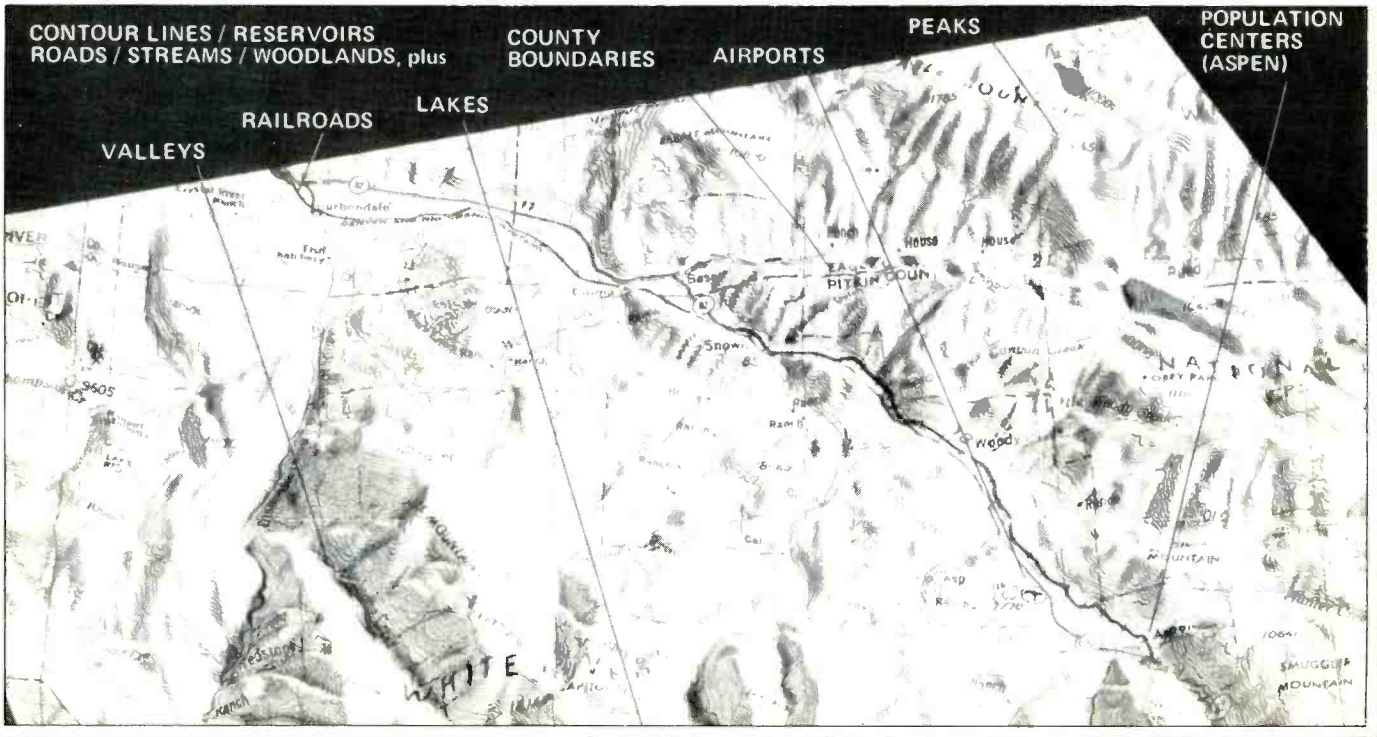
As a special treat to kick off the new year, we are presenting a special feature this month, submitted to the column by reader Dennis G. Brewer of North Carolina. Anybody who has ever considered establishing a communications system in a remote area can attest to the importance of being thoroughly familiar with the "lay of the land" in order to check out obstructions, signal paths, elevations above sea level, etc. Dennis offers some suggestions on an easy and relatively inexpensive way of doing this.

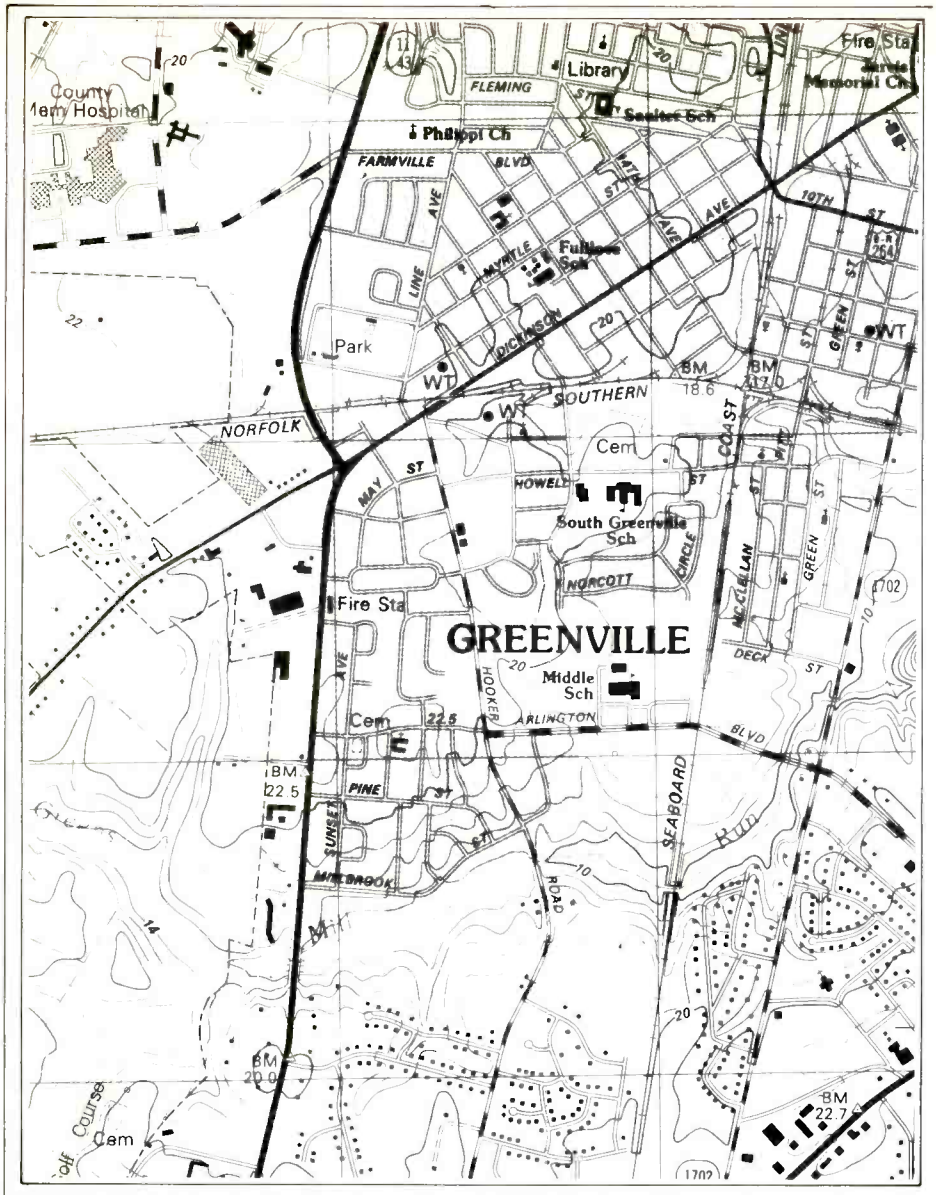
The U.S. Government publishes topographic maps that should be of interest to survivalists and anyone else at all curious about his or her surroundings.

"Topographic" indicates that the maps show elevations—the "lay of the land" in other words—where the hills and valleys are located.

The maps most likely to be of interest to survivalists are designated as the "7.5-minute series." Each map covers a 7.5-minute square (in latitude and longitude). One inch

Hubbard produces a series of 3-D raised relief maps which are highly detailed and worth having.





This is a same-size reproduction of a portion of a U.S. Geological Survey topographic map.

on the map equals 2,000 feet on the ground.

These maps are not your standard road maps! They are exquisitely detailed—roads, trails, rivers, large ditches, dams, railroads, township lines, swamps, campsites, woodland, orchards, transmission lines, even buildings and some fence lines!

Inspection of the maps of your "neighborhood" is almost certain to turn up some surprises. My family, for example, regularly vacations in a certain place that we thought we knew pretty well. Maps revealed roads that we never knew existed—and an old railroad right-of-way . . . complete with a tunnel! We discovered structures in areas nearly inaccessible in the dry summer weather. We can't help but wonder about the snowy winter.

If you like to hike, hunt, build antennas—or just wonder what is beyond the forest or over the ridge—you will love these maps. They're outrageously inexpensive, too! Just $2.00 each, postpaid!!

You can get a free index of any state (as well as Puerto Rico, U.S. Virgin Islands, Guam, American Samoa, and Antarctica) and a booklet describing topographic maps by writing to the U.S. Geological Survey office covering your primary area of interest. East of the Mississippi River: Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202. West of the Mississippi: Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225.

Editor's postscript: As some additional information to the interesting and useful ideas presented by Dennis, I'd like to mention that another source of maps are those produced by Hubbard, Box 104, Northbrook, IL 60062. Hubbard produces 3-D raised relief maps which are pretty fantastic. These are made from hard plastic and you can actually see and feel the contour of the land surface. The Hubbard maps are large size and available for select mountainous areas of eastern and western USA, plus Hawaii. Prices are less than $14 per map (shipping extra). Write to Hubbard for a catalog.

RTTY

BY JOSEPH JESSON

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

New RTTY software packages seem to be released monthly as various low-cost demodulators are introduced to market. RAK Electronics, Box 1585, Orange Park, FL 32067-1585 announced two RTTY software packages to interface either the Commodore 64 or VIC-20 with a TTL compatible terminal unit such as the MFJ1224/5 or the HRA Electronics TU-II. At $19.95 plus $2.00 S & H for the RAK software combined with the low-cost VIC-20 and MFJ unit, this comprises the least expensive full-screen RTTY system. This also allows reception of 5 to 30 wpm morse code in addition to 45 to 100 baud Baudot.

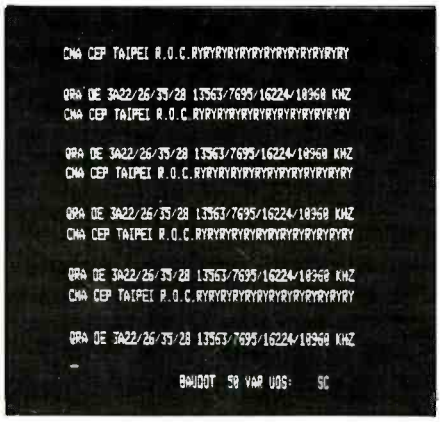
The HAM transmitting version, the RTTY II converts the Commodore 64 and VIC-20 computer into a bidirectional video display RTTY terminal. Features include split screen operation, four 255 character user definable messages, and four preset messages, including RTTY CQ, RY test, time transmission, and CW ID. A total of 16 different functions and controls are available.

Keep in mind, however, that a serious penalty in readability is paid if a Commodore VIC-20 is used. Ever try to read a 22 character line that will wrap around four times to complete a sentence? An awkward, chopped-up display results. This is fine at first, but wears on one during extensive usage. The Commodore 64 or a standard 80 × 24 display is certainly preferable to the limited character density of the VIC-20. It still is the lowest cost introduction to RTTY with the exception of the single line portable RTTY units such as the minireader.

Several of our readers have inquired as to the proper interpretation of the RTTY weather format. In 1878, the directors of the national weather services established the International Meteorological Organization (IMO) whose aim was the orderly observation of the weather. After World War II, the IMO was reorganized as the World Meteorological Organization (WMO) and in 1951 the United Nations recognized the WMO as a specialized agency. The WMO exists to promote the application of meteorology to agriculture, shipping, aviation, and many other human endeavors. This requires a massive worldwide exchange of meteorological information for forecasting and extensive research. More than 130 countries now collaborate in a surface network of 7000 observing stations!

Surface weather observation involves the measurement of certain parameters that, taken together, give a full description of the meteorological state of the lower atmosphere at any one time period. The most familiar parameters are pressure, temperature, humidity, cloudiness, visibility, wind, precipitation, and sunshine.

These form the core or basis of the many other variations possible. Pressure is the parameter that forms the center of most synoptic or overall analyses. Synoptic analysis means the use of meteorological data obtained simultaneously over a wide area for the purpose of presenting a comprehensive and hopefully instantaneous picture of the state of the atmosphere. This instantaneous weather snapshot is made possible by RTTY communications and other forms of communications. Actually, a three hour maximum time span is considered by WMO to be instantaneous. Figure 1 outlines the RTTY numeric code used in transmitting synoptic weather information. This outline represents a brief review of the measurement and observations taken at full synoptic stations, some every half hour but most every three hours from midnight GMT.



A marker slip from an RTTY station in Tapei, Republic of Free China. This station has been monitored on 7695, 10960, 13563, and 16224 kHz.

Using a global network of over 7000 land stations and over 5000 passenger and merchant ships that make observations at sea, a broad weather picture is obtained. After all, one observation post will not give us much understanding of the general atmospheric conditions but many such stations all observing with the same regularity will give us a synoptic time-changing overall pattern. This surface observation is complemented by the meteorological satellites used for detecting closed forms and measurements of radiation (usually infrared). Surface observation cooperation is fostered by the World Meteorological Organization, but the actual facilities are provided by the national meteorological services.

The observations of the weather are translated into Baudot numbers and transmitted to each national meteorological center by RTTY.

By using HF, this weather information is made available to all countries from a large area quickly. Several million coded figures are received daily. Referring to Figure 1, we can see how the numeric Baudot numbers are broken down. The first three numbers indicate the specific station. For example, 405 refers to Washington.

Frequency	Time	Baudot Rate	Shift	Phase	Location
4061.0 kHz	0100 GMT	75 baud	850 Hz	Normal	Miami, FL
6835.0 kHz	0300 GMT	50 baud	425 Hz	Reverse	England
7483.0 kHz	2200 GMT	50 baud	425 Hz	Normal	Dakar, Senegal
8140.0 kHz	0400 GMT	75 baud	850 Hz	Normal	Miami, FL
13737.0 kHz	2100 GMT	50 baud	425 Hz	Normal	Nairobi, Kenya
14880.0 kHz	1300 GMT	50 baud	850 Hz	Reverse	Tokyo, Japan
18094.0 kHz	0130 GMT	50 baud	850 Hz	Reverse	Buenos Aires, Argentina

Figure 1

Intercepts

Frequency (kHz)	Callsign	Location	Agency	Time GMT	Mode
17509	KRH51	London, England	US Embassy	1500	100/850N
17545.5	FTR54	Paris, France	AFP News (Spanish)	1520	67/425N
17567	CLN570	Havana, Cuba	Prensa Latina	1504	67/425N
18405	RCT57	Nikolayev, Ukranian SSR	TASS (French)	1515	67/425R
18671	FTS67/H3	Paris, France	AFP News (English)	1519	67/425N
19070.6		Rabat, Morocco	MAP News (French)	1529	67/425R
19171.1		Rabat, Morocco	MAP News (French)	1530	67/425R
19235	RWW70	Moscow, USSR	TASS News (French)	1532	67/425R
19830	RWW76	Moscow, USSR	TASS News (Portugal)	1538	67/425R
19850	WFK39	New York, NY	AP (testing)	1540	67/850N
19865	YZJ4	Belgrade, Yugo.	Tangung News (Spanish)	1541	67/425N
20078	FTU8	Paris, France	Min. For. Affairs	1544	67/425N
20318.5	FTU31A	Paris, France	AFP News (Spanish)	1628	67/425N
20330.4		?	News (French)	1630	67/425N
20560		Tripoli, Libya	JANA News (English)	1633	67/425R
20785.9	CNM92	Rabat, Morocco	MAP News (French)	1637	67/425R
20957.1		?	News (Spanish)	1639	67/425N

Figure 2: These are selected listings from the RTTY log of Tom Kneitel, NY.

Symbolic Form of Message
iii Nddff VVwwW PPPTT $N_hC_LhC_MC_M$ $T_dT_d$app 7RRR$_t$5

Sample Coded Message
405 83220 12716 24731 67292 30228 74542

Explanation Of Symbols And Map Entries

Symbols in order as they appear in the message	*Explanation of symbols and decode of example above*
iii	Station number 405 - Washington
N	Total amount of cloud 8 - completely covered
dd	True direction from which wind is blowing 32 - 320° - NW
ff	Wind speed in knots 20 - 20 knots
VV	Visibility in miles and fractions 12 - 13/15 or 3/4 miles
ww	Present weather 71 - continuous slight snow
W	Past weather 6 - rain
ppp	Barometric Pressure (in millibars) reduced to seal level 247 - 1024.7 mb.
TT	Current air temperature 31 - 31°F
N_h	Fraction of sky covered by low or middle cloud 6 - 7 or 8 tenths
C_L	Cloud type 7 - Fractostratus and/or Fractocumulus of bad weather
h	Height of base of cloud 2 - 300 to 599 feet
C_M	Cloud type 9 - Altocumulus of chaotic sky
C_H	Cloud type 2 - Dense cirrus in patches
T_dT_d	Temperature of dewpoint 30 - 30°F
a	Characteristic of barograph trace 2 - rising steadily or unsteadily
pp	Pressure change in 3 hours preceding observation 25 - 3.8 millibars
7	Indicator figure
RR	Amount of precipitation 45 - 0.45 inches
R_t	Time precipitation began or ended 4 - 3 to 4 hours ago
s	Depth of snow on ground

A complete station directory can be obtained from NOAA, National Weather Service, Communications Division, Grammax Building, 8060 13th Street, Silver Springs, MD 20910, Att: W53; and the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, *World Wide Marine Weather Broadcasts*, Stock #D03-018-00071-7, price $2.00. Also from the U.S. Government Printing Office is available a general weather catalog #5B-234 issued June 18, 1976. An excellent source of meteorological stations listed by country is the *World Wide Radioteletype Stations in Frequency Order*, list "R", by Klingenfuss. This lists in Chapter VII many countries (from Afghanistan to Viet Nam) that transmit weather coded data. Universal Electronics, 4555 Groves Road, Suite 3, Columbus, OH 43227 sells list "R" for $12. Listed after the station number is total cloud cover, wind direction, wind speed, visibility (in miles), present weather, past weather, barometric pressure, current air temperature, low or middle cloud cover, cloud type, height of base of cloud, secondary cloud types, temperature of dewpoint, barometric tendency, pressure change in 3 hours preceding observation, indicator, amount of precipitation, time of precipitation, and depth of snow (if any) on ground. Quite a complete weather observation! Now, to receive the weather codes, please turn off your "unshift on space" or USOS switches. Since the weather codes are transmitted as strictly numeric codes, USOS will switch the display to a letters mode upon reception of a space character. Of course, we do not want to mix letters in a numeric format. Some of the more recent sampling of meteorological RTTY signals can be found by tuning to the frequency listings in Figure 1.

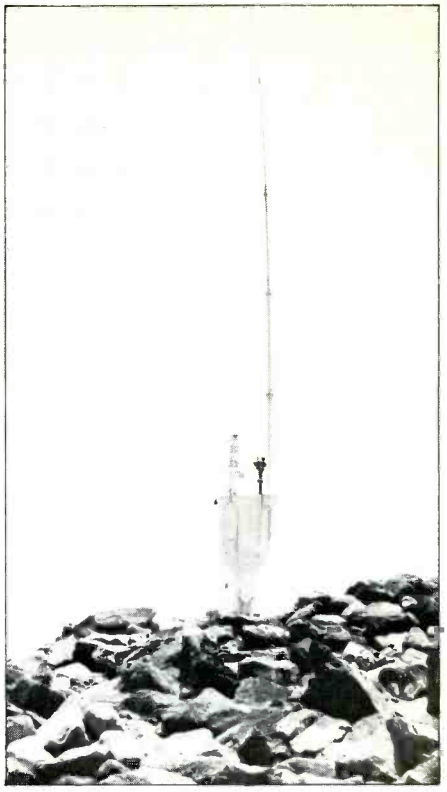
CALLING ALL SOUTHERN CALIF. DX'ERS!

SCADS is having a gathering and invites all SWL's and radio fans! The get-together will be 18 February, 1984, at the Mercury Bank Room, 4140 Long Beach Blvd., Long Beach, CA, 10 AM to 4 PM PST. There will be a potluck lunch, raffle awards, door prizes, auction. A film on the BBC will be shown and there will be equipment displays, plus a guest speaker, a Q & A session. Radio station giveaway goodies and local club displays are a part of the day. For more information, send a #10 legal size SASE to SCADS, 3809 Rose Ave., Long Beach, CA 90807-4334. Thanks to Stew MacKenzie of ASWLC and SCADS for letting us know about this. Hope you can be there, these gatherings are always interesting and enjoyable. All of us here at POP'COMM want to wish ASWLC all of the best on the club's 25th year as a hobby group!

Beacon Monitoring Techniques

How To Monitor The Really Low Bands

BY MICHAEL MIDEKE, WB6EER



Marine beacon M, 310 kHz, Morro Bay, California. Operated and maintained by USCG. Power level 15 watts, signal has been copied as far away as the Oregon coast. (All photos this article by Michael Mideke)

A few especially hardy or stubborn souls have always made a pastime of monitoring the Low Frequency spectrum. Until recently, this activity has been complicated by the necessity of obtaining special receivers and by the amount of tedious research required to identify signals. With the appearance of an increasing number of general coverage receivers and converters that will tune down to at least 150 kHz, it becomes possible for the casual listener to see what can be heard below the broadcast band. Thanks to The Longwave Club of America and the dedicated efforts of members Ken Stryker and John Clements, the comprehensive *Beacon Guide* and other resources are available for the identification of thousands of signals in the Low Frequency region.

Between 150 and 500 kHz, at least seven types of signals may be found (see listing appended). This article will be concerned with the two types of transmissions likely to be most easily heard and identified by the casual listener: Broadcasting and Non Directional Beacons (NDBs).

The Low Frequency broadcast band extends from 155 through 281 kHz. There is no LF broadcasting in North or South America, but many stations running 500 kw and more are active in Europe, North Africa, and Asia. Many listeners on the east coast of North America are able to hear European and North African broadcasts. East Asian stations are regularly copied on the west coast of North America. Some of the more successful listeners in the inland states are able to copy a few LF broadcast signals. Listeners located mid-continent from the Canadian border north have a good chance of hearing broadcasters from both Europe and East Asia.

Here are some LF broadcasters that have been frequently reported by North American members of The Long Wave Club of America over the past two years:

Europe/North Africa

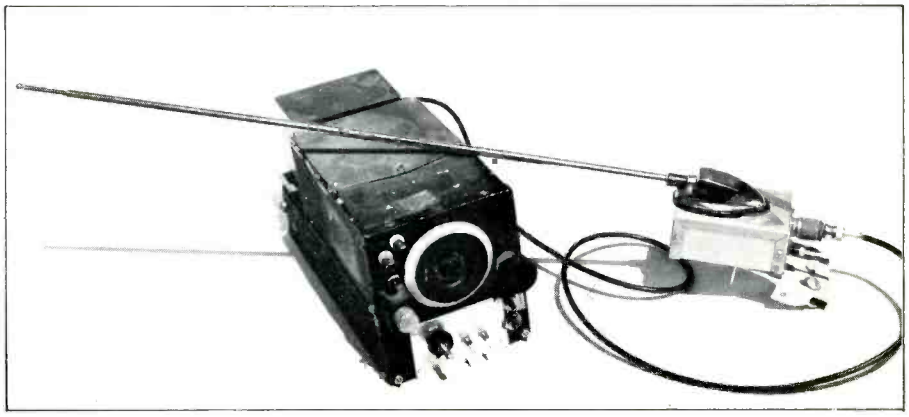
155 kHz	Brasov, Romania
164 kHz	Allouis, France
185 kHz	Europe #1 (W. Germany)
200 kHz	BBC2, Droitwich
209 kHz	Azilal, Morocco

East Asia

155 kHz	Khabarovsk, USSR
182 kHz	Petropavalosk, USSR
191 kHz	Blagoveschensk, USSR
245 kHz	Vladivostok, USSR

DXing LF broadcasters is mainly an activity for winter nights. A path of darkness between transmitter and listener is practically essential over the long distances involved. However, spectacular signal enhancement can occur at dawn and sunset and the long

BC453 receiver and tuned active whip antenna. Receiver has been converted to solid state by the author and modified to cover 160-500 kHz in two bands. active whip also constructed by the author, includes variable inductor to tune whip and a pre-amplifier.



wave DXer soon learns to take advantage of these magic moments.

Non Directional Beacons

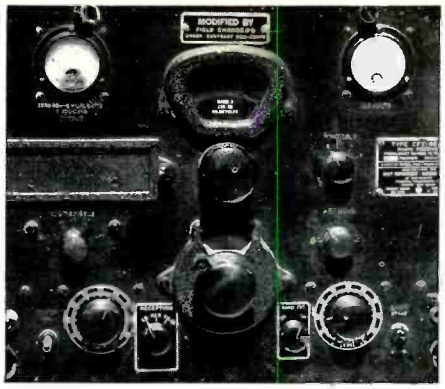
There are thousands of Non Directional Beacons (NDBs) operating between 194 and 415 kHz and in a small additional band between 512 and 532 kHz. Most such beacons operate around the clock, 365 days a year and the majority have just one purpose—to mark a particular place for the convenience of ship and air traffic. This is achieved by the continuously repeated broadcast of an assigned identifier (IDENT) in International Morse Code. Idents are run at a fairly slow speed, so even if you don't know the code they can be easily copied by writing down the dots and dashes and looking up the letters. If you miss it the first time, don't worry, it's sure to repeat. A little serious DXing on the beacon band and the listener may well find that he has memorized the code with very little pain and strain!

In addition to the ident, a few high power stations provide continuous or scheduled weather information and Notices To Airmen. These transmissions are conventional AM phone and they can provide useful weather updates as well as good clues to stations' locations. Most listeners will find they are within easy daytime range of several NDBs and at least one voice weather outlet.

NDBs are classified according to Aeronautical and Marine service. The two types of beacons can be distinguished by frequency and by transmission format. Aeronautical beacons have exclusive use of 200-285 kHz and 325-415 kHz. Maritime beacons have primary use of 285-325 kHz, shared with inland Aeronautical beacons on a non-interference basis. American and Canadian marine beacons will transmit idents consisting of one or two characters for 50 seconds, followed by a 10 second dash. In some cases three or more Marine beacons will operate sequentially on a single frequency. Each beacon in the sequence will transmit 50 seconds of ident and a 10 second dash, then it will be silent until its turn comes around again. Frequently, the DXer will find he can hear only one or two elements of a five beacon sequence and it becomes quite challenging to try to dig out the missing beacons.

American Aeronautical beacons virtually all have an ident consisting of three characters with a repetition rate between 6 and 12 seconds. Canadian Aero beacons are readily identifiable because each repetition of the ident is followed by a short dash. Canadian Aero idents may consist of either two or three characters, and numerals as well as letters may be used.

Natural and man-made noises are practically always a problem on LF, but noise can often be waited out or steps can be taken to reduce its severity. Any effort that leads to more signals being heard inspires attempts to dig still deeper into the background, resulting in still more signals being heard. So it is not really surprising that a fair number of dedicated enthusiasts devote a large part of their listening time to frequencies below 500



RBA receiver. TRF with BFO tracking TRF circuits from 15 to 600 kHz in 4 bands. Weighs 100 lbs., with power supply another 80 lbs., consumes only 60 watts! Works very well and a delight to tune.

kHz. Some have managed to log and identify well over 1,000 beacons, representing many states and countries, several continents, distances of 5,000 miles and more. Several times in my few years of DXing the beacon band I have decided that I've logged about everything I could expect to hear except for new signals (worldwide, new beacons are being assigned frequencies and idents at a rate of 20 to 50 per month) only to find whole new realms appearing either at the whim of propagation or as a result of my technical efforts.

During winter months, the long nighttime hours are often nearly or completely free of atmospheric noise. At such times, propagation will be observed to vary on a continual basis, with signals fading on periods of anywhere from a couple of minutes to an hour or more. As any given frequency may be simultaneously occupied by as many as forty (or even more) beacons in different locations; on a good evening, it is possible to leave the receiver set on one spot for hours at a time, observing several signals in a complex fading pattern which will eventually bring many or all into the clear long enough to identify. Add a loop or other directional antenna and the game becomes even more fascinating.

Surprises abound on longwave. I have been listening late in the evening to a strong voice weather station only 100 miles away and heard PJG in the Netherlands Antilles come fading up on the same frequency until it was perfectly readable! Ordinary daytime propagation for all but the most powerful NDBs is at most around 300 miles. However, occasional variations in the D layer brought about by geomagnetic disturbances will create enhanced propagation conditions which bring daytime signals from 900 to 1300 miles up to easily readable levels. Such openings tend to occur during the winter with mid-morning and mid-afternoon peaks. Frequently, the opening is directional to north or south. There are always exceptions. Summertime openings have been observed and the phenomenon is not always directional. From my location on the Central California coast I have sometimes copied Victoria, B.C.; Lethbridge, Alta; Circle, MT; Albuquerque, NM; and El Paso, TX at a single short midday listening session.

Dawn is a special time on longwave. Here on the west coast I find that about 45 minutes before sunrise most of the signals and noise from the east have disappeared and conditions are just right for reception of signals from across the Pacific. Beginning in late June or early July, beacons from New Zealand, Australia, New Guinea, and the Polynesian Islands can sometimes be heard. By August, the southernmost signals are heard only rarely but several Hawaiian signals appear, including some beacons running as little as 15 watts. In September, the emphasis shifts north to Japan and by October and November a few beacons along the Siberian Coast, the Siberian broadcast stations, and a few Alaskan NDBs are the extent of the dawn "catch" from my location.

Such signals don't last for long and they do not appear every morning by any means, so this is a waiting game in which a well-devised listening strategy will pay off. Listeners in other locations will find the dawn effect has different characteristics. Even a few degrees of latitude along the coast can make surprising differences as to what can be heard when. Every location has its peculiar advantages and problems and no location will exactly duplicate results obtainable somewhere else.

Sunset propagation can also be dramatic on longwave. Sometimes a couple of the more effective east coast beacons can be heard well before dark in California. East coast listeners have a good shot at European beacons and broadcasters around sunset, before noise and interference from the west become a problem.

Receivers And Techniques

The aspiring longwave listener has many possible choices of receiving equipment. Many general coverage receivers now reach down to at least 150 kHz. Some perform better than others, and in general you get what you pay for in new equipment. Practically all receivers will benefit from the use of external antenna tuning and impedance matching circuitry. Some receivers and converters will be virtually useless without such help. At least two companies (Palomar and MFJ) offer receiving converters which permit copy to 10 kHz or lower, using a communications or general coverage receiver as a tunable first IF at 3.5 or 4 MHz. These converters work quite well, with attainable results generally limited by the quality of the receiver employed. Again, antenna tuning and matching will prove desirable if not essential.

Very fine military surplus receivers of modern design are sometimes available, usually at fairly high cost. The older surplus gear should not be neglected. Often it can be had for the hauling or for a few dollars at radio flea markets. Many listeners are obtaining excellent results with TRF receivers such as the RBL and RBA "boat anchors" which may be over 40 years old. At the frequencies

Selected Non-Directional Beacons

Frequency (kHz)	Ident	Location	Frequency (kHz)	Ident	Location
194	TUK	Nantucket, MA	275	GUY	Guyman, OK
198	HAH	Jacksonville, NC	286	OE	Dry Tortugas Lt. Stn., FL
210	MQ	Miyako, Honshu Is., Japan	352	RG	Raratonga, Cook Is.
212	BCY	Boise City, OK	364	HA	Howe Atoll, Societie Is.
216	CLB	Wilmington, NC	380	LIO	Puerto Limon, Costa Rica
227	MPR	McPherson, KS	382	YEA	Empress, Alta. Canada
233	YJ	Victoria, BC, Canada	391	DDP	Dorado, Puerto Rico
236	GNI	Grand Isle, LA (voice weather stn)	393	JNZ	Jennings, LA
248	YQL	Lethbridge, Alta. Canada	396	ZBB	Bimini, Bahamas
266	ICK	Metlakatla, Annette Is., AK	405	YXL	Sioux Lookout, Ont. Canada
266	YYU	Kapuskasing, Ont. Canada	405	Y5	Clear Lake, Man. Canada
272	UVR	Varadero, Cuba	413	TAM	Tampico, Mexico
272	YQA	Muskola, Ont. Canada	415	RPB	Republican, KS

of interest, Tuned Radio Frequency (TRF) designs can be highly effective and some of the older military gear was very well designed and constructed. The BC453 receiver (190-550 kHz), fondly remembered by many Hams as the "Q5ER," is still an excellent receiver. It can be found for as little as 50 cents at flea markets! Several experimenters have had good luck with solid-state conversions of the BC453; in fact for some the conversion and modification of these receivers has become almost a hobby in itself.

For information about using a converter, check with MFJ Enterprises (Mississippi State, MS 39762) about their Model 331 or Model MFJ-332. Also contact Palomar Engineers (1924-F West Mission Blvd., Escondido, CA 92025) for specs of their VLF equipment.

Many listeners will be disappointed in their first attempts to hear signals on the low bands. Typically they will hear a few weak signals buried in a combination of roaring noise and a welter of misplaced AM broadcast signals, plus an assortment of grinding and throbbing sounds. At this point it is easy to switch the thing off, blaming receiver or location or both. In many cases, the only fault of the receiver is that it is placed in an environment filled with extremely intense RF fields on undesired frequencies. These signals make their way into the receiver's front end and create all sorts of havoc.

What is needed is an antenna tuner or pre-selector or filter to reduce the intensity of out-of-band signals reaching the receiver, hopefully eliminating front-end overloading with all of its disastrous consequences. Several units are available commercially. However, this is an area where it is not difficult to "roll your own;" a few hours playing with a few inductors and a couple of variable capacitors variously arranged between antenna, receiver, and ground can be both instructive and rewarding. You can't hurt the receiver and you *CAN* hear the results of your efforts. *But be absolutely sure there is no AC line voltage present on any exposed part of the receiver.*

A carefully designed and constructed LF antenna tuner can have sufficiently narrow passband to substantially reduce the amount

MFJ's Model 332 VLF converter is a convenient route to take for monitoring signals between 10 and 500 kHz.

of broadband noise reaching the receiver. Noise is mainly broadband, signals are narrowband; if the receiver is inhaling more spectrum than the signal occupies, the signal to noise ratio is degraded. While antenna tuning can improve receiver performance, it is no solution to big noise problems. If the receiver must be operated from the AC lines, then a good line filter is in order. If the receiver has the option of battery operation, it may prove worthwhile to use battery power even from the home listening post. It may be necessary to establish a separate ground for the receiver, as well isolated as possible from existing utility grounds. Wire antennas should be run at right angles to powerlines and away from noise sources insofar as possible. Loop antennas should be tuned to the desired frequency and oriented to null worst noise or to peak the desired signal, whichever works best. Whips should be located in the quietest available location.

In general, except when listening for voice signals, the most effective reception will be obtained with BFO (CW position) using a narrow IF bandwidth if available and a reasonably sharp audio filter, bearing in mind that when distortion interferes with intelligibility you have gone too far! Most NDBs do not actually modulate a carrier; rather, they generate two signals separated by the desired audio beat frequency. One signal is continuously on while the other is keyed according to the ident. So, a selective receiver in the "CW" position will tune the keyed portion of the beacon transmission just like any other CW signal. Good selectivity will eliminate the "carrier" signal, along with a great deal of noise and interference.

Here is a list of beacons whose signals have been consistently heard outside their immediate coverage area during the past two years. Thanks to the "Loggings" section of *The Lowdown* for much of this information. As far as is known at present, all listed stations are presently on the air on the listed frequencies, but frequencies and idents do change inpredictably. Happy listening and good luck!

Resources:

The Longwave Club of America
45 Wildflower Road
Levittown, PA 19057
$10 per year. Includes subscription and contributing privileges to *The Lowdown*—20 to 30 pages of good information every month.

The Beacon Guide by Clements and Stryker. Lists over 5500 beacons by frequency and ident. Update sheets published in *The Lowdown*. LWCA members $6, non members $7. Century Print Shop, 6059 Essex St., Riverside, CA 92504-1599. Check or money order payable to Don Erickson.

Distribution Of Main Users: 150-500 kHz

150-200	Military
150-200	"Carrier Current" power grid telemetry
160-190	1 Watt experimenters
155-281	Broadcast (Europe, Asia, Africa)
194-285	Aeronautical beacons
285-325	Marine beacons primary, Aero secondary
325-415	Aeronautical beacons
415-500	Maritime Mobile and Shore Communications, shared with some military and soon to be shared with Aeronautical beacons

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

It sounds like it's science fiction, but soon radio signals containing bursts of data will be bounced off meteor trails in Alaska.

The new Meteor Burst Communications System, recently approved by the Federal Communications Commission, allows a large network of remote transmitters to be tied together for the collection and transmission of data. The new system to be used by the state of Alaska will enable the state to collect aviation weather data from many isolated areas that may be either dangerous or inaccessible for human operators.

A meteor burst radio system uses a computer-aided switching system coupled with special transmitters to bounce radio signals off the ionized, or charged, particles left behind by a passing meteor. The meteor trails are continually produced in the Earth's atmosphere at altitudes of 50 to 75 miles. Radio signals that are bounced off these charged trails can be received at distances up to 1,250 miles away. Although the meteor trails last for only a few seconds, the system works because billions of meteors are constantly entering the atmosphere.

In the system approved for the state of Alaska, a base station would control the flow of data from up to 1,000 remote transmitter sites. The base station transmits a coded digital signal until it picks up a meteor trail and is received at a remote transmitter site. When the remote transmitter receives that signal, it transmits any information it has collected in a high-speed burst back to the base station as long as the meteor trail remains available.

"The ability to communicate by reflecting radio waves off of ionized meteor trails was recognized around 1951," the FCC said in its six page decision authorizing the establishment of the service. However, advances in technology such as solid-state electronics and computers did not allow such a system to become more reliable and affordable until the 1970's, the FCC added.

"Meteor burst communications can provide an alternative mode of operation to conventional skywave propagation, microwave or satellite systems," the FCC said. "Further, the ability to transmit from remote or hazardous locations without the need for a human operator will contribute to improving individual safety."

The two frequencies—one for the base station and the other for the remote transmitters—allocated by the FCC for use in Alaska are 42.40 and 44.10 MHz. The FCC also allocated a pair of frequencies for private systems in Alaska. These frequencies, 44.20 and 45.90 MHz, might be used by mineral exploration companies as well as scientists and firms interested in avalanche prediction.

Speaking of QSL cards, how 'bout the radio room owned by Charlie in Trenton, New Jersey?

The Commission will issue only developmental licenses to those applying in the new service, however, to safeguard against possible problems such as television interference.

Although this may be new for Alaska, the federal government has operated meteor burst communications systems for some time. One such system, operated by the Department of Agriculture in the west, collects and transmits information on snow depths and ice flows in remote locations.

Tricking The BC-220FB

Alan O'Connell of New Ross, Ireland, sends along some tips on getting the Bearcat 220FB to search out of band. Our readers outside the United States and Canada who have these "foreign band" Bearcat scanners might want to try this trick on their radios (the "foreign band" Bearcat units include the 66-88 MHz midband).

In order to search the 50-54 MHz amateur band, Alan says he uses the following technique:

Press "50"
"Enter"
"Limit/hold"
"66"
"Limit/hold"
"Search"
"Limit/hold"
"Search."

The radio then should search between 50 and 66 MHz. Both the lower limit (50 MHz) and the upper limit (66 MHz) already are programmable into the radio. Alan says he also has "tricked" his BC-220FB to search between 174 and 420.450 MHz as well using the above technique. However, he notes the set suffers severely from "birdies" above 330 MHz.

Alan also notes that with further experimentation, the scanner receives in the AM mode between 136 and 144 MHz (some military aircraft in the United States operates in the AM mode in this band). Also, the channel spacing is 25 kHz, the same as the 118-136 MHz aircraft band on the radio.

Alan goes on to say that the out-of-band frequencies cannot be entered into the radio's memory. However, a frequency such as 66.005 MHz can be memorized once the set is programmed to search between 50 and 88 MHz. The scanner retains the 5 kHz spacing in the 30-50 MHz band, right through the 66-88 MHz band, even though the normal search spacing is 12.5 kHz in this range.

Call Temps

Have you been hearing some callsigns lately that sound more like telephone numbers? Perhaps they really are telephone numbers.

The FCC recently amended Part 90, the rules for all land mobile radio services, to allow for temporary licensing for all new users of existing shared repeaters or base stations. So while the user waits for the license to come back from the FCC, the business or agency uses a callsign of WT followed by

The Bearcat 220 has a foreign version that operates on different frequency bands than the one normally available in the U.S.

their phone number for up to 180 days. Stations operating in the General Mobile Radio Service (462.550-462.725 MHz) use WT followed by the home or business telephone number of the user.

Temporary licensing has been allowed in the business radio service since 1980 and previously in the citizens band and maritime radio services. But now, all land mobile services are eligible to put their radios on the air immediately if they follow the FCC's new guidelines.

A Glut?

Just when the scanner market was beginning to look like there wasn't much interest from the manufacturers in developing new units for hobbyists—bingo! As you saw in the October issue of *POP'COMM*, there are at least a dozen new units hitting the market all of a sudden—from units for low-budget hobbyists and beginners to high-tech units for the top of the line.

One new scanner drawing interest from active monitors is the Regency MX7000, a 20-channel unit that covers most frequencies from 26-1100 MHz. It has selectable AM and FM. The unit can tune FM broadcast and innumerable other services, including the 800 MHz land mobile bands, cellular telephone systems, and microwave transmitters. The unit even has a jack so that it can be connected either to a printer or TV screen to receive weather satellites!

Regency's new MX-7000 wide band scanner.

Now if the manufacturers can figure out ways to receive even more of the technological advances, i.e. DVP, packet, amplitude compandored sideband . . . .

Mailbag

Peter Prichard of Krebs, Oklahoma, writes in to say he heard a station on 45.10 one morning identify as "Somerset County Police Radio Network." He theorized it may have been Somerset County, New Jersey, that he was hearing.

Actually, Peter, you were hearing Somerset County, Pennsylvania, and their correct callsign is KGG601. (Somerset County, New Jersey, operates on 39.18 MHz and I wouldn't be surprised if you hear them some day as well.) He says he was able to listen to the station clearly for at least four hours.

Peter does raise an interesting question about how to obtain QSLs from stations he hears on his scanner, especially when he doesn't have an address. In the case of the Somerset County station, your letter probably would be delivered if you addressed it either to the chief dispatcher or communications director in care of the Somerset County Police Radio Network in Somerset, Pennsylvania, which is the county seat of that county and is where the transmitter is located. Generally your letter will get through without a street address for most public safety agencies. There's usually only one police department in a town, so if you address it to the police chief, include the name of the department or agency and the town, it should get there. It wouldn't hurt to call the post office for the zip code of the town to help rout your letter faster.

In order to make your letter more meaningful to the department or agency you heard, include sufficient details about what you heard to indicate it actually was their station (such as "Headquarters" contacted Car 90 at 1304 EST, Car 92 at 1306 EST, Car 93 at 1313 EST, etc.). Be careful about including actual details about what you heard as that might cause problems with the Communications Act of 1934, which governs the divulging of intercepted radio communications.

Also, include details on how well the station was received. The most helpful information will include details such as: Were other stations also being heard via skip on the same channel at the same time? Was the station you were listening to interfering with any other stations? Are you able to receive their station on a regular basis?

Be polite in your request, explain about your hobby, describe your radio equipment and antenna, and don't hesitate to ask for details about the station you heard. It helps to make your QSL more meaningful for both you and to whom you sent the letter.

Clarence C. Neimann of Hardwick, Minnesota, writes in to say he's having problems with some type of power surge noise he con-

tinuously heard on some channels on his scanner. It's really hard for us here to diagnose problems by letter not knowing all the circumstances. In many cases, the problems seem to be due to "local" interference. In this case, Clarence, you might very well have some sort of problem locally that is causing interference, which is why the manufacturer can't find any problems when you send back the scanner for repair. Local problems could range from nearby power lines, electric fences, a video game in a bar, etc. There are lots of possible causes; check around and you might just find the source.

Eric E. Rector of South Bend, Indiana, also has a "local" problem. Anytime he tries to listen to the local police on UHF and VHF high band, he gets a mix of mobile telephone, weather, and the other police channels themselves. The problem you seem to be experiencing is intermodulation because you are too close to all the transmitters of all those agencies. And close doesn't have to be real close, either; even being line of sight of the transmitters will cause problems.

There are a few scanner frequency stations that have their own QSL cards (as shown here), but usually it means sending them a prepared card to return to you.

I used to live up high on a hill just outside a major city and every time a certain business downtown would page on 151.775 MHz, it would lock up my scanner with the weather channel (162.475 MHz) and the paging. The weather channel and paging channel are 10.7 MHz apart—the intermediate frequency (IF) of the scanner and that's why I never could listen to high band during the day—unless I enjoyed a little paging and weather with my listening. I experienced the problem even though I was at least 10 miles from the weather transmitter (but line of sight) and just as far from the paging transmitter. I also experienced similar problems on UHF because the city's police department operated on UHF and with all the business and other activity on UHF, a lot of channels would come in together.

Take a drive around the neighborhood, Eric, and I'm sure you'll find you're quite close to the police and weather transmitters you described. You might even want to ask the police where their transmitters are to confirm how close you are to them.

To get rid of the problem won't be very easy. You might want to try just using an indoor antenna to see if that clears up some of the problem. You also might want to try installing a notch filter between your antenna and the radio. The notch filter helps eliminate the image problems you are having with the front end of your receiver being overloaded. But if you are a severe case (like next door to the transmitters), even the notch filter may not help.

We Want You

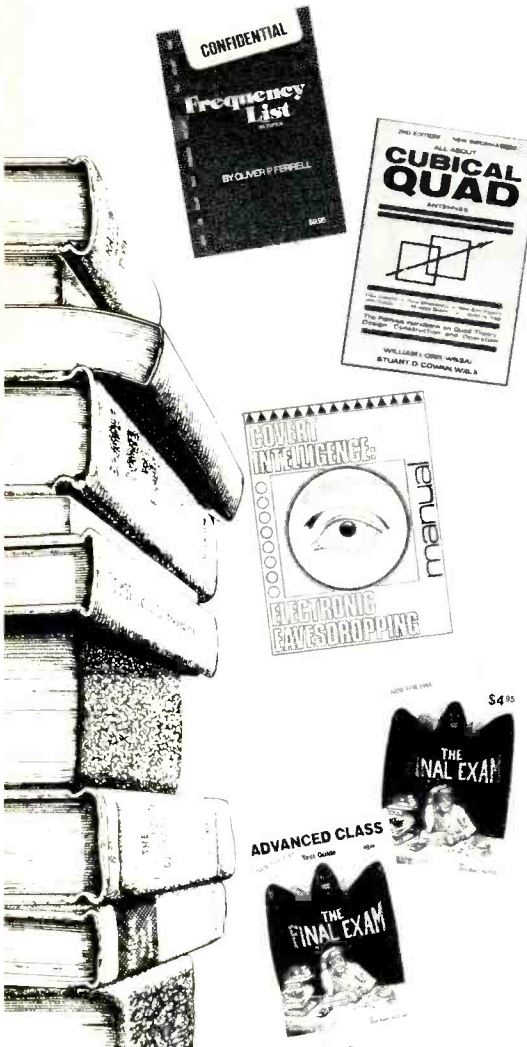
OK, faithful readers—that's right. We want you. Actually, a picture of you will do quite nicely.

We need pictures of your monitoring stations, either base or mobile, to show others what your setup looks like. Even if you don't have a zillion dollars worth of radio gear cluttering the top of a desk, we still want pictures of your station. In fact, we'd like to see you operating the radios in the picture if you can arrange it as well.

And not only would we like to see pictures of your stations, we'd like some frequencies from you as well. What do you listen to on a regular basis? What hot frequencies do you keep plugged in your scanner? Do you have a list of radio codes you'd like to share?

Send in your pictures and frequencies. The column will be only as good as you, our readers, make it. You may send your photos and lists to: Chuck Gysi, N2DUP, Scanner Scene, *Popular Communications*, 76 N. Broadway, Hicksville, NY 11801. We're waiting to hear from *you!*

POPULAR COMMUNICATIONS BOOK SHOP



Guide To RTTY Frequencies 2nd ed.
Details on 5500 RTTY stations/frequencies in two lists. "Real" press schedules, inside information on new RTTY techniques, etc. 192 pages, paperback, $9.95. Order #G205.

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

The Radio Publications Group—The "Bill Orr Series"
These easy reading classics belong in the library of any active ham. Loaded with practical how-to information, with tables, charts, and formulas arranged for handy reference.
Beam Antenna Handbook, 200 pages, paperback, $7.95. Order #R143.
Wire Antennas, 192 pages, paperback, $7.95. Order #R144.
Antenna Handbook, 192 pages, paperback, $7.95. Order #R145.
Cubical Quad Antennas, 112 pages, paperback, $6.95. Order #R146.
VHF Handbook, 336 pages, paperback, $11.95. Order #R147.
Interference Handbook, by W.R. Nelson, 247 pages, paperback, $9.95. Order #R172.

The Final Exam
by Dick Bash, KL7IHP
Amateur radio license exam manuals proven highly successful in helping hams pass the FCC tests. Material for the books was obtained by interviewing actual applicants for the exams and collecting and researching the questions they had on the exams.
General Class, 123 pages, paperback, $9.95. Order #B153.
Advanced Class, 108 pages, paperback, $9.95. Order #B154.
Extra Class, 108 pages, paperback, $9.95. Order #B155.
Novice Class, 104 pages, paperback, $4.95. Order #B163.

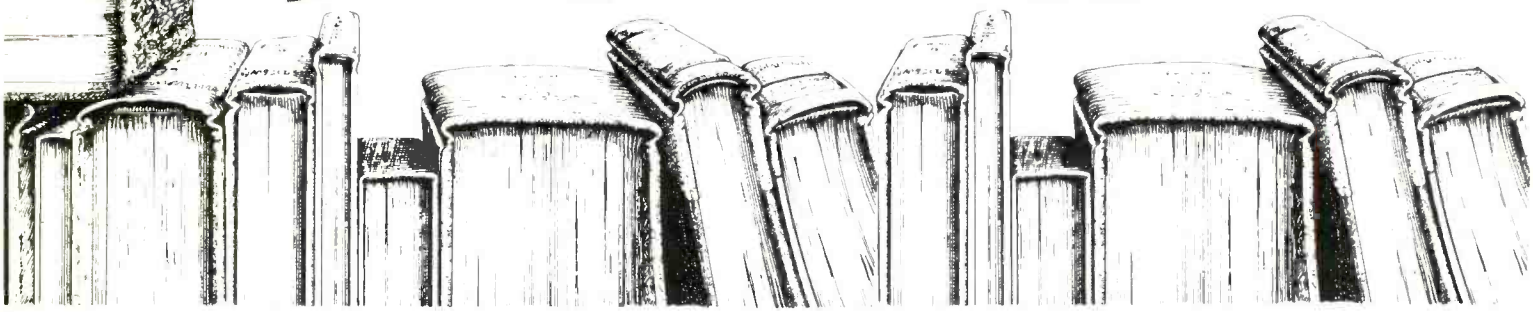
Confidential Frequency List 5th ed.
by Perry Ferrell
Bigger than the 4th edition, this new book has 30% more stations listed, more than 7500 operating between 4-28 MHz. Listings by frequency and callsign. Complete list of Coastal CW stations plus Embassy, Aeronautical, Military, Time Sigs, Feeders, VOLMET, FAX, INTERPOL, etc. Details on schedules, emergency channels, alternates, and never-before-published IDs. Paperback, $9.95. Order #G196.

Air-Scan, Directory of VHF Aero Band (108 to 136 MHz) Stations, 3rd ed.
by Tom Kneitel, K2AES
More than 30,000 listings in U.S., Canada, and Mexico—Control Towers, Unicoms, Multicoms, Approach/Departure frequencies, Flight Service Stations, Air Route Traffic Control Centers, airline frequencies, search/rescue, etc. 80 pages, paperback, $7.95. Order #C152B.

Covert Intelligence:
Electronic Eavesdropping Manual
Illustrated guide to using hidden transmitters and telephone taps for intelligence gathering, covering both theory and application. Detailed text enhanced by many graphs, charts, schematics, illustrations, field tests of equipment. Paperback, $8.95. Order #C191.

Covert Techniques
For Intercepting Communications
A revealing inside look at how many federal agencies (some you never heard of) regularly "screen" phone, telex, and other "private communications." Here's the how, why, and "who" of it all. Most likely your own private communications have been checked by an intelligence computer or agent. Find out about it in this book. Paperback, $8.95. Order #C192.

World Press Services Frequencies
by Thomas Harrington
A comprehensive manual covering the field of radioteletype news monitoring—antennas, receivers, terminal units, monitors, and more. Contains 3 master lists of times of transmission, frequencies, plus ITU list of over 50 news services worldwide. 84 pages, paperback, $8.95. Order #U173.



POPULAR COMMUNICATIONS

76 N. Broadway, Hicksville, NY 11801 Order Date:_____

Name_____

Address_____

City_____

State_____ Zip_____

☐ Check ☐ MasterCard ☐ VISA

Card No._____ Expires_____

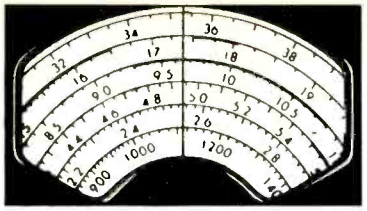
X_____

Signature required on all charge orders.

QTY.	ORDER #	TITLE	PRICE	TOTAL

Shipping charges $2.00 per order. Shipping charges waived on orders of $50.00 or more. Books shipped best way. All orders are processed the day they are received, but please allow 30 days for delivery within North America.

Book Total	
Shipping Charge	
Grand Total	



COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

Reader Dan Nicholson of Missouri sends along a photo of his listening post. Like so many listeners, Dan has added a microcomputer to his set of DXing tools. Note that Dan uses a Radio Shack SX-190 receiver which was manufactured for Radio Shack by Trio-Kenwood. I once owned one and was quite pleased with it . . . and I wish I hadn't sold it! Our thanks to Dan for the look at his shack!

George Osier of New York has had great success in getting verifications and other material from time signal stations. He has sent along verifications from JJY, Japan, and YVTO, Venezuela. As you can see, time signal station QSLs can be just as fancy as those from shortwave broadcast stations. Our thanks to George for sharing them with us!

"The Voice Of The Jaguar"

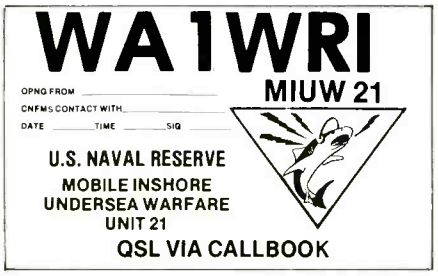
Now that would be a great name for a pirate radio station! However, it's an apt description for a rather puzzling station first mentioned in this column back in the September, 1983 issue. At that time, Terry Lindley of Alabama reported hearing a station on 15411 kHz at 0711 which was nothing more than a male voice describing a Jaguar automobile, repeating continuously, in SSB.

After the September column appeared, George Zeller of Ohio wrote to report he had received the same transmission on 5200 kHz at 0410. George reports that it sounded like the repeating tapes used at auto shows and exhibitions. A second letter was received from Gene Krolak of Michigan who reported hearing the same thing on 5200 kHz from 0722 to 0804. He reports that at one point there was an interruption in the transmission and a sound similar to a tape being rewound.

So what is this? I feel it is most likely a military station testing using the Jaguar tape or an unauthorized testing of a transmitter by a private company or individual. Has anyone else heard this station or have a clue as to what it is?

Nicaragua Claims C.I.A. Is Behind Numbers Stations!

Reader Joe Erwin of Virginia heard the shortwave broadcaster La Voz de Nicaragua on May 26, 1983 and sent them a reception report. They sent him a verification letter and a bonus—a book titled *C.I.A. Conspiracy in Nicaragua*. In it, Nicaragua claims C.I.A. agents there received coded messages via shortwave radio!



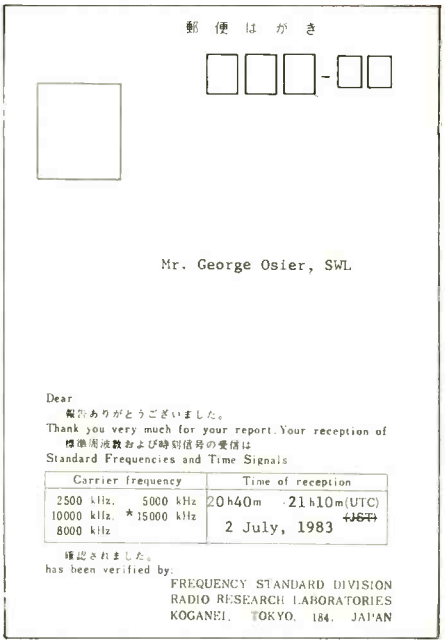
QSL from a USNR station.

Joe sent copies of sections of this book to me. The book purports to be the story of Marlene Moncada, who was supposedly recruited by the C.I.A. while employed by the Nicaraguan embassy in Honduras. Shortly before returning to Nicaragua, she says she was trained by the C.I.A. in secret writing and decoding of radio messages. (She was also supposedly given notebooks whose pages turned into chewing gum when placed in your mouth.) The messages would be decoded by the "one-time" pad method discused in *POP'COMM* previously. To get the codepads, it was necessary for her to come to the United States. The pads themselves were smuggled back to Nicaragua inside wooden "folk sculptures." To receive the messages, she was given a Sony ICF-2001 receiver.

This sounds like typical propaganda so far. What takes it out of the ordinary is some of the evidence the Nicaraguan book contains. For example, Marlene was supposed to listen for the messages on 9074 kHz . . . a common frequency for four-digit Spanish numbers stations. One of the illustrations in the book was of one of the pads that was to be used to decode the messages. On the pad are columns of four-digit groups! The Nicaraguan book also reproduced some of the translated messages supposedly transmitted on 9074 kHz.

In dealing with something like the Nicaraguan claims, you must always be alert to the possibility of "disinformation," which is the practice of planting deliberately misleading information about activities and practices. For example, if the four-digit Spanish numbers on 9074 kHz were actually transmitted from Cuba, the Nicaraguan effort could be part of a disinformation campaign to point to the C.I.A. as the source of the numbers stations. The possibility of a disinformation campaign cannot be ruled out here, but this evidence does fit into the widely-held theory that four-digit Spanish numbers stations originate from American sources while five-digit stations originate from Cuba.

An artist's sample for a proposed QSL card from The Vikings, station 3YFG, a sailing vessel built in conjunction with a Kirk Douglas film.



QSL from time signal station JJY, 15,000 kHz, received by George Osier.

Our thanks to Joe Erwin for passing along this fascinating material!

More On Nicaragua

The September 12, 1983 issue of *New York* magazine carried a story about the guerrilla war against the Sandanista regime in Nicaragua carried out by the "contras." Contra leader Eden Pastora, the legendary "Commander Zero" of the Sandanista victory, has since broken with the Managua government. The photo here shows Pastora seated in front of a modern ham transceiver, which the *New York* article claims he uses to argue with Sandanista troops in the field! The transceiver shown covers the ham bands in one MHz wide segments (3-4

Don Nicholson sent us this nice photo of his monitoring station.

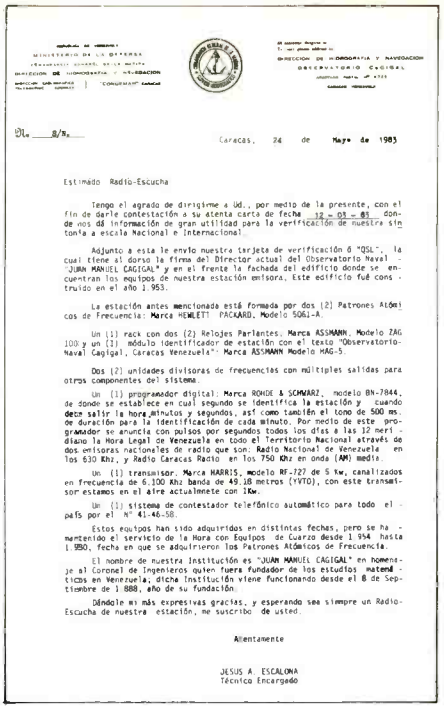
MHz, 7-8 MHz, etc.) in SSB, CW, AM, and FM modes, making it ideal for guerrilla communications. This story underlines a point made in this column several issues ago—the frequencies in and around the various ham bands are excellent places to look for various unusual radio activity!

Direction-Finding With Loops

Look through the ads here in *POP'COMM* and you'll see various advertisers offering what are known as "loop antennas." These antennas are manufactured by such firms as McKay-Dymek, Palomar and others. Basically, a loop antenna is a compact indoor antenna that receives in a figure-8 pattern. This means, for example, that a loop could receive stations located to the north and south well but would "reject" (have decreased signal pickup) for stations located to the east or west. Loops are mounted so they can be rotated, enabling a DXer to reduce interference from stations located at right angles away from the station you want to receive. Loop antennas also allow you to do direction-finding.

Two or more listeners using loops can determine where a station is located with a high degree of accuracy. For example, suppose two listeners, one in New York and the other in Oregon, coordinate their efforts and try to determine where a station is located. By using loops and corrected compasses, it would be possible for both listeners to determine accurate bearings for the station's location. Lines can be drawn from these bearings and extended until they intersect. If the bearings from our New York and Oregon listeners intersected at Dallas, Texas, then that would be where the station they monitored would be located.

It is also possible to determine with a good degree of accuracy where a station is located by using a loop yourself. The secret is to keep records of bearing of stations whose locations are known and comparing these against stations whose locations are a mystery. For example, if a five-digit Spanish numbers station was located on approximately the same bearing as Radio Havana Cuba, that would be a strong piece of evidence the station was located in Cuba. If, however, it was located on the same bearing as WWV, then obviously Cuba would be an



Caracas, 24 de Mayo de 1983

Estimado Radio-Escucha

Tengo el agrado de dirigirme a Ud., por medio de la presente, con el fin de darle contestación a su atenta carta de fecha 12 - 01 - 83 donde nos dá información de gran utilidad para la verificación de nuestra señal a escala Nacional e Internacional.

Adjunto a esta le envio nuestra tarjeta de verificación ó "QSL", la cual tiene al dorso la firma del Director actual del Observatorio Naval "JUAN MANUEL CAGIGAL" y en el frente la fachada del edificio donde se encuentran los equipos de nuestra estación emisora. Este edificio fué construido en el año 1.953.

La estación antes mencionada está formada por dos (2) Patrones Atómicos de Frecuencia: Marca HEWLETT PACKARD, Modelo 5061-A.

Un (1) rack con dos (2) Relojes Parlantes, Marca ASSMANN, Modelo ZAG 100 y un (1) módulo identificador de estación con el texto "Observatorio Naval Cagigal, Caracas Venezuela". Marca ASSMANN Modelo MAG-5.

Dos (2) unidades divisoras de frecuencias con múltiples salidas para otros componentes del sistema.

Un (1) programador digital. Marca ROHDE & SCHWARZ, modelo BN-7844, de donde se establece en cual segundo se identifica la estación y cuando debe salir la hora, minutos y segundos, así como también el tono de 500 ms. de duración para la identificación de cada minuto. Por medio de este programador se anuncia con pulsos por segundos todos los días a las 12 meridiano la Hora Legal de Venezuela en todo el Territorio Nacional através de dos emisoras nacionales de radio que son: Radio Nacional de Venezuela en los 630 Khz. y Radio Caracas Radio en los 750 Khz en onda (AM) media.

Un (1) transmisor. Marca HARRIS, modelo RF-727 de 5 kw, canalizados en frecuencia de 6.100 Khz banda de 49.18 metros (YVTO), con este transmisor estamos en el aire actualmente con 1Kw.

Un (1) sistema de contestador telefónico automático para todo el país por el Nº 41-46-58.

Estos equipos han sido adquiridos en distintas fechas, pero se han mantenido al servicio de la Hora con Equipos de Cuarzo desde 1.954 hasta 1.950, fecha en que se adquirieron los Patrones Atómicos de Frecuencia.

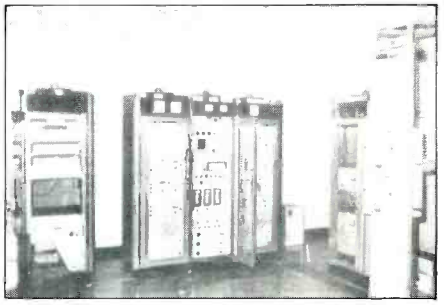
El nombre de nuestra Institución es "JUAN MANUEL CAGIGAL" en homenaje al Coronel de Ingenieros quien fuera fundador de los estudios matemáticos en Venezuela, dicha Institución viene funcionando desde el 8 de Septiembre de 1.888, año de su fundación.

Dándole mi más expresivas gracias, y esperando sea siempre un Radio-Escucha de nuestra estación, me suscribo de usted.

Atentamente

JESUS A. ESCALONA
Técnico Encargado

Verification letter received by George Osier from time signal station YVTO, 6100 kHz.



Transmitter room at station YVTO.

unlikely location for the station! (Much of the evidence pointing to stateside transmitter sites for various numbers stations has been accumulated through such direction-finding techniques.)

Any listener interested in doing serious research into determining the locations of various unidentified stations should equip themselves with a loop. I would especially like to hear from any listeners with loops who would be interested in taking part in coordinated monitoring activities designed to pin down the locations of various stations.

Ask Uncle

Speaking of direction-finding, some of the most sophisticated direction-finding equipment is owned by our own Federal Communications Commission. Since most of you reading this column are American taxpayers, you have a right to make sure this equipment (paid for with your taxes) is fully utilized. The next time you hear a strange station—such as a numbers station, an unknown beacon or time signal, an unidentified network, etc.—why not try to ask the FCC to take a bearing and tell you what you're hearing? To help you along, here's the locations and phone numbers of some FCC monitoring stations:

Powder Springs, GA: (404) 943-5420
Grand Island, NE: (308) 382-4296
Laurel, MD: (301) 655-4000
Belfast, ME: (207) 338-4088
Douglas, AZ: (602) 364-2133
Fort Lauderdale, FL: (305) 473-9845

If you do happen to ask the FCC to locate and identify some unknown signals, please pass along the results to Communications Confidential—particularly if you ask them to locate any numbers stations!

Cryptology And Microcomputers

Odds are that many of you reading this column own a microcomputer of some sort. (I prepare this column each month on an Osborne I microcomputer using the WordStar word processing program.) If so, you may be interested in a book by Caxton C. Foster called *Cryptanalysis for Microcomputers* published by Hayden Press. In it, you'll find detailed descriptions of various encoding and decoding schemes (such as the one-time pad system) along with BASIC programs to allow you to generate your own codes and cyphers. While it won't let you decode numbers stations transmissions with your microcomputer, it will give you a better insight into how codes are generated and used. You should be able to find this book in many microcomputer book sections.

On a separate note, I would like to hear from readers who are using microcomputers in their DXing and who have modems in their microcomputer systems.

Broadcast Support Transmissions

In our September, 1983 column, we had a report of an unidentified ABC-TV broadcast relay on 26392 kHz. John Tomaszkiewicz of Omaha, Nebraska writes that 26100-26500 kHz is allocated for transmitting television audio to production assistance, camera, and remote unit personnel. These stations operate in the FM mode with a maximum of 1.5 watts of power. In the Omaha area, John reports that WOWT-TV operates two such transmitters on 26150 and 26450 kHz. Many thanks for the info, John! How about the rest of you monitoring this range and seeing if any stations in your area use such transmitters? Report any you run across to Communications Confidential!

From The Mailbag

Robert Comeau of Nova Scotia writes that utility station WMH is soliciting reception reports of their new transmitters on 6351.5, 8610, and 17093.6 kHz. Their address is the same one given in the September, 1983 edition of this column—Marine Radio WMH, Dundalk Marine Terminal, 2700 Broening Highway, Baltimore, MD 21222. The person soliciting the reports is Chuck Reville, K3FT, Records Chief. All three frequencies will be CW. Thanks for the

MENSAJE NUMERO UNO X RECIBI TU CARTA MENSAJE NUMERO DOS X NO HE RECIBIDO TU CARTA NUMERO UNO X CREO SE PERDIO X NO TE PREOCUPES X ESCRIBIME OTRA VEZ X TE ANOTO DE NUEVO LA DIRECCION X SR X FELIPE CASTRO TORRES X APARTADO POSTAL DIECINUEVE GUION SEIS TRES CINCO REPITO APARTADO POSTAL DIECINUEVE GUION SEIS TRES CINCO X MEXICO DIECINUEVE DF X ESPERA OTRO MENSAJE CON REQUISITOS X MEJORES SALUDOS X SUERTE X LINDA CRISTAL X FIN FIN FIN X
Note: este Mensaje fue radiada por la CIA el 1-2-83

Message Number One. I received your letter message number two. I have not received your letter number one. I think it got lost. Do not worry. Write me again. I'm giving you the address again. Mr. Felipe Castro Torres, P.O. Box Nineteen Dash Six Three Five repeat P.O. Box Nineteen Dash Six Three Five. Mexico nineteen DF. Wait for another message with requirements. Best Regards. Luck. Linda Cristal. End End End.
Note: This message was broadcast by the CIA on February 1, 1983.

Decoded spy message supposedly transmitted by the C.I.A.

MENSAJE NUMERO CUATRO X HE RECIBIDO TUS CARTAS NUMEROS SIETE NUMERO OCHO TAMBIEN NUMERO NUEVE X EL CUATRO DE ESTE MES A LAS SIETE DE LA MANANA REPITO EL CUATRO DE ESTE MES A LAS SIETE DE LA MANANA DEBES DIRIGIRTE DEL RESTAURANTE ARAGON DOS CUADRAS ABAJO X AHI HAY UN POSTE AMARILLO DE MADERA Y AL LADO EN UN CUBO VIEJO UN PAQUETE CONTENIENDO LA BOTELLA DE VINO QUE TE HABLO BOBY X GUARDALA ESPERA OPORTUNIDAD X NO TE DESESPERES X EN EL PALO A LA ALTURA DE CINTURA DEBES PONER RAYA CON TIZA X SALUDOS X LINDA CRISTAL X FIN FIN FIN X
Note: este Mensaje fue radiado por la CIA el 31-5-83

Message Number Four. I have received your letters Number Seven, Number Eight also Number Nine. The fourth of this month at seven in the morning repeat the fourth of this month at seven in the morning you must go two blocks west of the Aragon Restaurant. There is a yellow wooden post there and at its side in an old bucket a package containing the bottle of wine that Boby told you about. Put it away wait for an opportunity. Do not despair. At waist level put a chalk line on the pole. Regards. Linda Cristal. End End End.
Note: This message was broadcast by the CIA on May 31, 1983.

Spy message supposedly transmitted by the C.I.A. on 9074 kHz.

information! Robert also mentioned he would like to see more Canadian reporters to Communications Confidential, a suggestion I heartily endorse!

Listening Reports

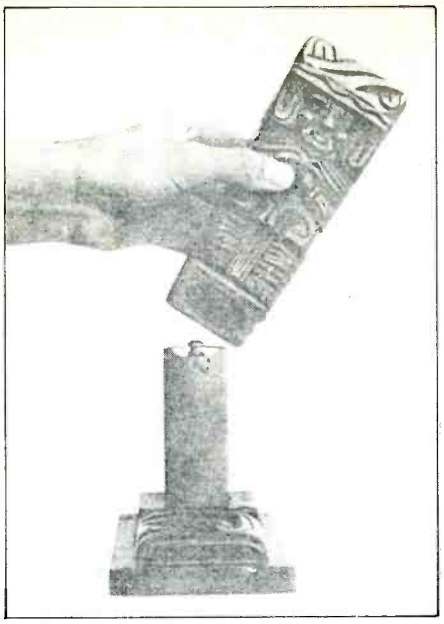
Here are this month's listening reports. All times are in GMT. We'd like to see your reports here; send them in the format you see here and include enough details to make your reports useful to other readers of this column. (For example, include the sex of any speakers, languages spoken, number of digits in code groups, etc.) Send your reports to Harry Helms, P.O. Box 157, Rockefeller Center Station, New York, NY 10185.

This month we have included items supplied by members of the American Shortwave Listeners Club (ASWLC) and the Association of Clandestine Enthusiasts (ACE). ASWLC covers the entire gamut of utility stations as well as shortwave broadcast and AM/FM DX; their address is 16182 Ballad Lane, Huntington Beach, CA 92649. ACE covers exclusively pirate stations, numbers stations, and other "underground" radio; their address is Box 452, Moorhead, MN 56560. Both clubs will send you membership details and a sample bulletin for $1.00; be sure to tell both that Communications Confidential sent you!

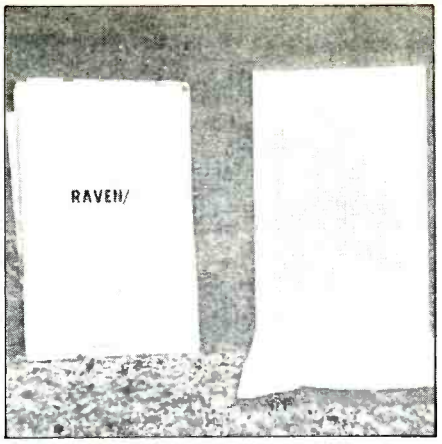
2670: NMC, U.S. Coast Guard, San Francisco, CA, fishing report read by man in SSB 0244. (Stewart Mackenzie, CA)
3807: Russian language number groups 2124. (David Markwick, England/ACE)
4100: Five-digit Spanish numbers station with female announcer; transmission ended at 0120 with "final, final." (Thad Adamaszek, OH) Thad has submitted another great list of numbers stations loggings this month. (Editor)
4232: "DE X5M" repeated in CW 0034. (Robert Comeau, NF) For several years now there have been reports of stations on CW using calls beginning with "X," followed by a digit and another letter. These calls do not follow any international callsign sequence nor are their locations known. (Editor)

Nicaraguan leader Eden Pastora argues almost daily with Sandinista troops using a modern transceiver designed for amateur use. These transmissions are adjacent to the ham bands. (Photograph by Michael Kramer)

4368: FFL, St. Lys Radio, France, point-to-point telephone circuit voice marker in French with male announcer and short musical interval, repeated 0202. Was in SSB. (George Osier, NY) Good catch, George. Voice markers of this type are becoming increasingly rare. (Editor)
4380.5: CCS, Santiago Naval Radio, Chile in CW at 0340. (Kneitel, NY)
4391: WOM, Miami, FL, ship traffic in SSB 0325. (Stewart Mackenzie, CA)
4585: Several Civil Air Patrol (CAP) stations in SSB 2145 in search operation for crashed light airplane; stations used prefix "Lola" and a numerical suffix. (Tom Lewandowski, NY)
4615: IDR, Italian Navy, Rome, Italy, "VVV" marker in CW 0215. (Jon Morrison, ME)
4669: Four-digit Spanish numbers station with female announcer 0210. (Jon Morrison, ME)
4670: Four-digit Spanish numbers station with female announcer 0210; was parallel to 5810 kHz. Another four-digit transmission was heard on this frequency and on 5810 kHz at the same time 11 days later. (Thad Adamaszek, OH)
5500: Russian number groups beginning 2100; opens with bugle call. (David Markwick, England/ACE)
5690: NOR, U.S. Coast Guard, San Diego, California, working various aircraft in SSB 0215. (Stewart Mackenzie, CA)
5720: Scrambled transmissions heard here 0204; more than one station was heard. An "attention" tone was heard being used. Good signals. (Dan Nicholson, MO) Very interesting! (Editor)
5754: "E8C" telling "H8H" that he was experiencing "generator trouble" and would call back later in SSB 0133. (Dan Nicholson, MO) Likely military traffic of some sort. (Editor)
5810: Four-digit Spanish numbers station with female announcer 0212. (Thad Adamasek, OH) If you haven't heard a numbers station, try this frequency during the night hours. (Editor)
5820: Five-digit French numbers station 2100. (David Markwick, England/ACE)
6100: YVTO, Caracas, Venezuela, time signals 0355. (Jon Morrison, ME)
6102.8: "VR30" heard in CW with "VVV" marker at 1920, 1200, and 2130; also caught on 12995.8 kHz at 1425 and on 17161.7 kHz at 1245. The sets of VVV are sent from six to nine times. (George Zeller, OH) I've looked but cannot find this station listed anywhere. However, George correctly points out that the reception times and frequencies strongly indicate the station is located somewhere in eastern North America. (Editor)
6204: Five-digit German numbers station with female announcer 0020. (George Osier, NY)
6337: ZRQ2/3/5/6, Simonstown Naval Radio, Rep. So. Africa, in CW at 0355. (Tom Kneitel, NY)
6386.3: ZSJ4, Cape Radio, Capetown, South Africa, CQ marker in CQ 0204. (Fred Lesnick, ON)
6386.7: Silvermine Naval Radio, Rep. of So. Africa, in CW at 0411. (Tom Kneitel, NY)
6388.8: CTP, Oeira Naval Radio, Portugal, in CW at 0413. (Tom Kneitel, NY)
6395.5: ZLB3, Awarua, N.Z., in CW at 0415. (Tom Kneitel, NY)
6405: UVD, Magadan Radio, Magadan, USSR, "DE UVD" in CW 0108. (Fred Lesnick, ON)
6463.4: HKB, Barranquilla Radio, Barranquilla, Colombia, CQ marker in CW 0247. (Fred Lesnick, ON)
6467: HPN60, Canal Radio, Panama, CQ marker in CW 0318. (Fred Lesnick, ON)
6487.5: VRT, Bermuda Radio, Bermuda, V marker in CW 0051. (Fred Lesnick, ON)
6506.4: This is an active frequency for U.S. Coast Guard stations in SSB during the evening hours. Here are some of those heard: NMA, Miami, FL; NMN, Portsmouth, VA; and NMO, Honolulu, HI. (Brent Levit, TX/ASWLC)
6604: WSY70, Federal Aviation Administration (FAA), Kennedy Airport, New York, aviation weather read by man in SSB 0240. (Stewart Mackenzie, CA)
6697: "Foxtrot" broadcast in SSB 1715 to "Skyking." (Tom Lewandowski, NY)
6702: Air Force Two with Andrews AFB 1224; Air Force One noted with a phone patch to "Crown" (the White House communications center). (Henry Ponder, NC)



"Folk sculpture" in which code pads were hidden.



"One-time" pads, with columns of four-digit groups, supposedly used to decode messages sent on 9074 kHz.

6738: Air Force Two running phone patch through McClellan AFB, CA to Scott AFB, IL, in SSB 0330. (Craig Rose, CA) Welcome to the column, Craig!
6750: AFL, U.S. Air Force, Loring AFB, ME, in SSB 0400 running radio checks. (Tom Lewandowski, NY)
6760: "Presscard" with military tactical traffic in SSB 0355. (Stewart Mackenzie, CA)
6840: "Charlie India Oscar Two" repeated by woman 0245, accent had last word pronounced as "ahs-kar." Two weeks later, pips were heard on this frequency 0325, then a long pip at 0330 and into letter groups in CW, four letters per group. (Thad Adamaszek, OH) An excellent listing, Thad! There has been much speculation as to what the purpose of the various "three phonetics/one digit" transmissions are for, with one popular theory being that they are "markers" for various spy/numbers activity or diplomatic traffic. This reception seems to be evidence to support that theory. Also interesting is the use of pips as a lead-in to a "spy" message. Could this be an explanation for the next report and similar unidentified time signals reported in this column recently? (Editor)
6840: Unidentified time signals here 1029-1055, perhaps EBC, Cadiz, Spain? (Peggy Thompson, CA) Welcome to *POP'COMM* and the column, Peggy! Doubt this station is EBC, however; there would be a lot of daylight between you and Spain at that hour, making propagation along the path very difficult. Maybe a new Asian time signal station? Readers, keep an eye on this frequency. (Editor)
6984: GIC26B, Associated Press, London, England, running AP news in English, RTTY 425/66R at 0430. (Tom Kneitel, NY)
7600: HD210A, Guayaquil, Ecuador, time signals 0420. (Jon Morrison, ME and Tom Kneitel, NY)
7605: "Victor Kilo Victor Two" in AM repeated 2347. (George Osier, NY) Some have suggested these type of transmissions originate from embassies, particularly those belonging to Eastern Bloc nations. How about you readers in the Washington and Ottawa areas checking this out with a portable receiver? Similar to 6840 kHz operations. (Editor)
7724: KRH50, U.S. Embassy, London, England, in CW at 0240. (Tom Kneitel, NY)
8313: Five-digit German numbers station with female announcer 2229; transmission began normally but then went into a "⅔" pattern and later into a "½" pattern—very obvious! Very strong signals, much stronger than a typical German numbers station. Off at 2245. (George Osier, NY) Excellent catch, George! This is the first report I've seen of a German numbers station with the "½" or ⅔" pattern. All previous reports were of Spanish numbers stations. The "½" or "⅔" refers to numbers stations which read digits in groups of five but with a distinct and apparently deliberate pause between the second and third or third and fourth digits of each group. (Editor)
8417: "318" repeated twice by female in Spanish, then a count from one to zero repeated twice, followed by four-digit groups in Spanish 0404. (Thad Adamaszek, OH)
8700: YUR, Rijeka, Yugoslavia, calling CQ in CW at 0329. (Tom Kneitel, NY)
8828: KSF70, FAA, Oakland, CA, aviation weather read by man in SSB 0335. (Stewart Mackenzie, CA)
8927: "Charlie India Oscar Two" repeated by female 0149. (Robert Comeau, NF)
9020: AFE8, U.S. Air Force, MacDill AFB, FL, working "Tree Beam" in SB 0350. (Tom Lewandowski, NY)
9040: Five-digit German numbers station with female announcer 2330 in SSB. Opened with "Hotel Kilo" repeated, then synthesized tones for several minutes, a few three-digit number groups, and then into five-digit blocks. (Tom Lewandowski, NY)
9050: Five-digit German numbers station with female announcer 0209. (Thad Adamaszek, OH)
9074: Four-digit Spanish numbers station with female announcer 1100, good signals. (Jon Morrison, ME) Four-digit Spanish numbers station with female announcer 0109. Opened with "uno ocho cero" (180) repeated twice, followed by a count from one to ten in Spanish. This was followed by ten time pulses, then announcer said "grupo doce, quatro, cinco" twice and then into four-digit groups. (George Osier, NY) Four-digit Spanish numbers station with female announcer on 9075 kHz at 0110; opened with beeps, "grupo 45" repeated, and into four-digit groups. (Thad Adamaszek, OH)
9265: Five-digit German numbers station with female announcer 0114. (Thad Adamaszek, OH)
9325: Five-digit German numbers station with female announcer 2213, was in SSB. (George Osier, NY)
9975: Five-digit German numbers station with female announcer 0203, transmission opened with a series of double beeps. (Thad Adamaszek, OH)
10004: RID, Irkutsk, USSR, time signals, and CW identification 1149. (Fred Lesnick, ON)
10390: Interpol CW net 1815, passing traffic related to stolen gold and jewelry. (Tom Lewandowski, NY)
10470: Five-digit German numbers station with female announcer 0206; was in SSB. (Thad Adamaszek, OH)
11243: "Eyelash," "Muzzle," and "Skyking" passing coded traffic in SSB 1809. (George Osier, NY)
11482: Five-digit German numbers station with female announcer 1821. (George Osier, NY)
11533: Four-digit Spanish numbers station with female announcer 0148; at 0149 a loud buzzing noise wiped out the station and continued until 0152. There was no trace of the numbers station, but rapid CW was heard on the frequency. (George Osier, NY) An interesting reception, George! (Editor) "545" in Spanish repeated from 1200-1210, then RTTY bursts from 1210-1212. Excellent signals and was in parallel to 12157 kHz. (Jon Morrison, ME) Another excellent reception! (Editor)
11546: Five-digit German numbers station with female announcer 0118, was in SSB. (George Osier, NY)
12095: Five-digit German numbers station with female announcer 0127; was in SSB. (Thad Adamaszek, OH)
12682.5: LFC, Rogaland Radio, Norway, CQ marker in CW 0350. (Tom Lewandowski, NY)
12690: UJY, Kalingrad Radio, Kalingrad, USSR, CQ marker in CW 0340. (Tom Lewandowski, NY) Also reported at 2358. (Tom Kneitel, NY)
13030: FUF, Frency Navy, Fort-de-France, Martinique, "VVV" marker in CW 1605. (Jon Morrison, ME)
13031: VRN60, Hong Kong, CW marker 1155, "VRN60 DE VRN PSE QSO VPS." (George Zeller, OH)
13090: UAT, Moscow, USSR, "DE UAT" marker in CW 1616 (Jon Morrison, ME)
13202: JIA, Tokyo, Japan, aviation weather report read in English by man at 0410, SSB mode. (Stewart Mackenzie, CA)
13340: CLP1, Havana, Cuba, calling CLP13 in CW 2330 and into five-letter groups. (Don Schimmel, VA)
13382: GFT, Bracknell Radio, Bracknell, England, CQ marker in CW 1900. (Jon Morrison, ME)
13428: "107" transmitting five-figure groups in CW 2041, all numbers sent normally except that zero sent as "T." (Don Schimmel, VA)
13429: Five-digit Spanish numbers station with female announcer 2129. Signal was strong but audio distorted; suddenly shifts up 20 kHz in frequency and then down to 13248 kHz. Bad hum; shift back up 20 kHz and back down again twice more. When audio ended a sound like a tape flapping could be heard in the background. (Don Schimmel, VA)
13453: Four-digit Spanish numbers station with female announcer 1130. (Jon Morrison, ME)
13468: "902 902 902 T T T" in CW 2311. (Don Schimmel, Va)
13512: Six-figure CW groups, five groups per message, 2313; similar to transmissions previously heard on 13395 and 14583 kHz. (Don Schimmel, VA)
13526.5: CCS, Chilean Navy, Santiago, Chile, "VVV" marker in CW 2054. (Don Schimmel, VA)
13704.7: Spanish language traffic net in SSB 1712, appears to be part of inter-American military net. (Don Schimmel, VA)
13808: Pips at 0127; long pip at 0130 and into female reading Spanish numbers in four three-digit groups repeated over and over. (Thad Adamaszek, OH) Now this is unusual! A good logging, Thad! Readers, check out this frequency from time to time. (Editor)
13814: KRH50, U.S. Embassy, London, England, QRA marker in CW 1745. (Don Schimmel, VA)
14361: KWS78, U.S. Embassy, Athens, Greece, QRA marker in CW 2352. (Brian Graham, NY)
14470: This frequency and 14477 kHz are used by the U.S. Navy for ship-to-shore telephone traffic in SSB. Navy personnel are prohibited to mention their location or missions in conversations. (Trevor Stanley, AZ)
14507: Unidentified CW traffic 0210; probably Soviet since characters IM, OE, OT, and AA used. (Don Schimmel, VA)
14555.2: RIW, Khiva, Uzbek SSR, USSR, Soviet ship station RMUE in CW 1735. (Don Schimmel, VA)
14556: RIW, Soviet Navy, Khiva, USSR, 0419 calling ships in CW. (Brian Graham, NY)
15000: LOL, Buenos Aires, Argentina, time signals, CW identification repeated three times 2349. (Fred Lesnick, ON)
15024: RKTAO, possibly a Soviet aircraft, working COL, Havana, Cuba in CW 0104. (Dale Unger, PA/ASWLC)
16587.1: KHT, Cedar Rapids, IA, ship traffic in SSB 1646. (Dale Unger, PA/ASWLC)
16735: HLG, Seoul Radio, S. Korea, in CW at 2253. (Tom Kneitel, NY)
16861.7: PKI, Jakarta Radio, Jakarta, Indonesia, CQ marker in CW 1445; weak signal. (George Zeller, OH)
16893: "VVV DE YHM" marker in CW 1701. (G. J. Harris, APO San Francisco) This is a call allocated to Indonesia. Anyone have a location for this station? (Editor)
16870.4: DZJ, Manila Radio, Manila, Philippines, call repeated in CW 1635. (Fred Lesnick, ON)
16948: RCV, Soviet Navy, Moscow, USSR calling CQ at 2215 via CW. (Tom Kneitel, NY)
16951.5: 6WW, French Navy, Dakar, Senegal, CQ marker in CW 1725. (Tom Lewandowski, NY)
17173: A9M, Bahrain Radio, Bahrain, "DE A9M" marker in CW 1741. (G. J. Harris, APO San Francisco)
17976: "June Day" and "Tea Bag" reading coded messages in SSB around 1545. Other tactical calls heard included "Stampede," "Ovation," "Creation," and "Yule Tree." (Dan Nicholson, MO) All these calls are military tactical. (Editor)

Many thanks for the super support this month! See all of you next month in Communications Confidential!

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Report On Future Private Land Mobile Telecommunications Requirements

The Commission's Private Radio Bureau announced the availability of its Final Report on *Future Private Land Mobile Telecommunications Requirements*, PR Docket 82-10.

The study was prepared by the Private Radio Bureau's Planning Staff to provide projections of future private land mobile telecommunications requirements through the end of the century. As the third and last phase of PR Docket 82-10 *(Notice of Inquiry, Interim Report* and this *Final Report)*, this report consolidates the available information regarding future private land mobile telecommunications requirements, including comments submitted in PR Docket 82-10 in response to the *Notice of Inquiry* and the *Interim Report*.

The report projects spectrum requirements for 26 metropolitan areas. It reviews spectrum efficient technologies, which are currently in use and those which may have future private land mobile applications, and estimates their future impact on spectrum requirements. The technologies reviewed include trunking, digital emissions, narrowband systems, and cellular systems. The report concludes that additional spectrum is needed over the next 15-20 years to meet private land mobile requirements in the major urban areas even with increased employment of spectrum efficient technologies and equipment. Alternative means of meeting the projected spectrum requirements are also discussed.

The report may be reviewed at the FCC Library, Room 639, 1919 M Street, N.W., Washington, DC 20554, and a limited number of copies are available at the FCC Office of Public Affairs, Room 207, 1919 M Street, N.W., Washington, DC 20554, (202) 254-7574. Copies may be purchased from the International Transcription Services, telephone (202) 296-7322 in Washington, DC, and (703) 352-2400 in Fairfax, Virginia.

Permit Digital Electronic Message Services At 18 GHz

The Commission has adopted rules to permit allocation of part of the 18 GHz band to Digital Termination Systems (DTS) for digital electronic message service and to make DTS frequencies available to private users.

In addition, the Commission rechannelized certain segments of the 18 GHz band to permit narrower bandwidth channel assignments. Little use is made of this band due to its wideband channelization, poor cost competitiveness with other high-capacity communications facilities, the shortened path lengths of several kilometers required for reliability of these systems of high-channel density and problems with service restoration of such high-capacity systems.

It noted that lower capacity microwave systems at 18 GHz using narrowband channels could be attractive for telephone, utility, railroad, and oil companies, particularly because of congestion at lower frequencies.

The key modifications affecting Parts 2, 21, 74, 94 of the rules are:

- Allocation of two 100 MHz bands consisting of 10 two-way channels each 10 MHz wide at 18.360-18.460 and 18.940-19.040 GHz for DTS;
- Rechannelization of the 18.460-18.940 GHz band to provide for both 10 and 20 MHz channel widths;
- Rechannelization of the 18.640-18.700 and 18.880-18.940 GHz bands to provide for 12 pairs of 5 MHz wide channels;
- Allowing private radio licensees under Part 94 to use the 10.6 and 18 GHz bands for DTS;
- Adoption of frequency stability standards at 18 GHz for DTS stations and narrowband internodal links, operational-fixed point-to-point stations and non-DTS operations.

Action by the Commission September 9, 1983, by Second Report and Order (FCC 83-392). Commissioners Fowler (Chairman), Quello, Dawson, and Rivera.

Rules Amended For 800 MHz Private Systems

The Commission amended Part 90 of the rules to simplify the method of determining a station's theoretical service area for systems operating in the 800 MHz band.

Under the new rules, a 20 mile radius around the transmitter, rather than a 40 dBu field intensity contour will be the criterion used to determine market service area. This amendment eliminates the need for licensees to make complicated field strength calculations required under the present 40 dBu contour method.

The Commission noted that defining market service area in terms of a mileage radius instead of a field strength contour makes the rule clearly less difficult and less expensive for the private land mobile user, as well as easier to administer for the Commission. It added that it would consider rule waivers in cases where defining service area in terms of a 20 mile radius would preclude operations which otherwise would be allowed under a 40 dBu contour rule.

New Experimental Stations

The Commission, by its Office of Science and Technology, Frequency Liaison Branch, took the following actions:

KM2XML, ITEK Corp., Lexington, Massachusetts and Hawthorne, California. Research station to operate on 9800 and 10,300 MHz to conduct in-plant test of an airborne sensor to airborne relay to ground station data link system for export.

KM2XNN, Geostar Corp., South Lake Tahoe, California. Developmental station to operate on 1999.0 and 2492.0 MHz for purpose of simulating the operating characteristics of the Geostar Satellite system to demonstrate and verify theoretically predicted accuracy, S/N ratio and timing requirement of the Geostar radiodetermination system.

KM2XNV, Atlantic Scientific Corp., Melbourne, Florida. Research station to operate on 948.5 MHz to assess the feasibility of a lightning location system suing time-of-arrival electromagnetic waveform sensing techniques.

KM2XNW, Litton Systems, Inc., Van Nuys, California. Research station is scheduled to operate on 2900-3100 MHz band to test radar prior to shipment to the Kingdom of Saudi Arabia.

KM2XNX, Hughes Aircraft Company, Malibu, California. Research station to operate on 3625-4200; 5850-6425; 10950-11700; 14000-14500 MHz bands to be used as part of an antenna test range to obtain antenna characteristic for the Intelsat VI Satellite.

KM2XNY, HDS, Inc., Reston, Virginia. Developmental station to operate on 18.61; 18.65; and 18.75 GHz to test and develop microwave radios prior to type acceptance.

KM2XNZ, Univ. of Alaska, Fairbanks, Alaska. Research station to operate on 3192.5; 5736.5; 9941.5; and 12256.5 kHz to provide communications to research groups located in the field.

KM2XOA, Telsat Corp., Houston, Texas. Developmental station to operate on various discrete frequencies between 21,825 and 23,175 MHz to develop microwave equipment.

KM2XOB, Colorado Electro-Optics, Inc., Boulder, Colorado. Developmental station to operate on 928.000-928.350 and 952.000-952.350 MHz bands to develop a modulation scheme that is spectrally efficient and reliable, to test prior to type acceptance and develop parts necessary for the system.

KM2XOC, Nordby Supply Company, Seattle, Washington. Research station to operate on 121.5 and 243.0 MHz to conduct tests on recertification of inflatable life rafts.

KM2XOF, Electrocom, Inc., Groton, Connecticut. Research station to operate on 467.325 MHz to provide a data link in connection with a research project.

KM2XOH, Aeroquip Corp., Area of Barrington, Illinois. Research station to operate

on 160.920 and 161.190 MHz to test equipment to assure no interference to radios or radar equipment will occur.

KM2XOI and KM2XOI, Geostar, Corp. Minden, Nevada and Kern, California. Developmental stations to operate on 1999.0 and 2492.0 MHz for purpose of simulating the operating characteristics of the Geostar Satellite system to demonstrate and verify theoretically predicted accuracy, S/N ratio, and timing requirement of the Geostar radiodetermination system.

KM2XOK, Rensselaer Polytechnic Institute, Troy, New York. Research station to operate on 158.460; 461.825; 461.925; 466.825; 466.925 MHz to measure the relative usefulness of radio communication location system.

KM2XOL, Ecology Department, Southern Connecticut. Research station to operate on 216.0-216.1 MHz band to conduct behavior and ecology study via telemetry.

KM2XOP, GTE Communications Products Corp., Needham, Massachusetts. Research station to operate on various frequency bands to conduct exploratory research into techniques for self adaptive operation of two-way communication equipment in the HF band.

Private 800 MHz Applicants No Longer Have To Show Purchase Orders

The FCC's Private Radio Bureau will no longer require applicants for private land mobile licenses in the 800 MHz bands to submit copies of equipment purchase orders with their applications.

Previously, the Bureau had required purchase orders as proof of an applicant's ability to make immediate use of requested frequencies, as prescribed in Section 90.127 of FCC rules. But new rules governing 800 MHz licensing have made the purchase orders unnecessary.

Applicants are still required to submit other supplementary information as specified in rule Sections 90.356 (for trunked systems) and 90.607 (for conventional systems). Both sections are reproduced on the back of this notice.

The rules governing 800 MHz licensing and operation are in Part 90, Subparts M (trunked) and S (conventional) as published in the *Federal Register* of September 16, 1982, pages 41027-41045 and in the October 1982 edition of Title 47 of the Code of Federal Regulations (47 CFR), available from the U.S. Government Printing Office. For more information, applicants should refer to the rules or contact the bureau's Licensing Division by writing to FCC, Gettysburg, PA 17325, or calling (717) 337-1212.

FCC Issues New Radio Equipment List

The Federal Communications Commission's January 1983 Radio Equipment List is now available. The list contains equipment considered by the FCC as acceptable for Licensing in the following services: Experimental Radio; Domestic Public Radio; Radio Broadcast; Experimental, Auxiliary, and Special Broadcast; Cable Television Relay; Stations on Land in Maritime Services and Alaska-Public Fixed Stations; Stations on Shipboard in Maritime Services; Aviation; Private Land Mobile Radio; Private Operational-Fixed (Microwave); and Amateur Radio.

Inquiries concerning listing of equipment may be sent to the FCC Laboratory P.O. Box 429, Columbia, MD 21045. Telephone (301) 725-1585.

Copies of the Radio Equipment List are available for reference in the Public Reference Room, Room 239, at the FCC's central office at 1919 M Street NW, Washington, DC and at each of the Commission's field offices. Copies of the list may be purchased from the ITS, Rm 315, 1200 19th St. NW, Washington, DC 20554, telephone (202) 296-7322. Mail orders may be sent to ITS, 4006 University Drive, Fairfax, VA 22030. The cost is $50.00, plus postage.

Copies of breakout listing of Citizens Radio (CB) transceivers and of broadcast transmitters and translators also are available from the ITS. The cost is $10.00 per list (approximately 100 pages each).

Use Of Volunteers For Amateur Examinations Approved

The Commission authorized volunteers to prepare and administer examinations for amateur radio operator licenses above the Novice Class.

This change will offset the limitations in opportunity for amateurs to take the examinations that have resulted from funding and personnel cutbacks. The exams at present are administered by FCC personnel, usually at Field Operations Bureau offices. In some areas they now are given only once a year, and the number of remote locations has been reduced.

Legislation enacted in September 1982 authorized the FCC to use licensed amateurs on a voluntary and unpaid basis to prepare and administer amateur exams.

Under the program, individuals and organizations will propose questions for all examinations based on the FCC's Study Guide for the Amateur Radio Operator License Examinations. The FCC will issue lists of approved questions which it will draw on for exams.

Written examinations will be administered by three-person teams of examiners who will report to regional Volunteer Examiner-Coordinators (VECs). The VECs will assist in an orderly flow of information to and from the Commission, coordinate the efforts of volunteer examiners and minimize the likelihood of fraud or abuse. In a departure from the proposed rules, the Commission has decided to substitute regional VECs for nationwide VECs. The regions will correspond to the present amateur licensing callsign districts.

Specific qualifications to participate in the volunteer program are spelled out to eliminate any possible conflicts of interest.

This action does not change the procedures recently adopted for the use of volunteers in the preparation and administration of examinations for the novice class amateur radio operator license in P.R. Docket 82-727.

Facsimile Service Available To High Seas Vessels

The Commission amended its rules to provide for maritime mobile use of facsimile communications between coast stations and vessels on the high seas by the use of high frequencies (3-30 MHz).

The Commission said it was unnecessary to adopt detailed equipment standards beyond spectrum characteristics (e.g. emission, power, bandwidth, and frequency tolerance), since facsimile communications will primarily be between vessels and shore facilities of the vessel operator, thus assuring equipment compatibility. Further, it said, the absence of detailed standards will provide for maximum user flexibility and encourage innovation.

GMRS Temporary Permit Rules Become Effective — Form 574-T Available

On January 20, 1983, the Commission adopted new rule amendments in Parts 1, 2, and 95, Subpart A, pertaining to the establishment of a Temporary Permit for users in the General Mobile Radio Service (GMRS). The effective date of those rules was delayed pending Office of Management and Budget approval of the new Temporary Permit form. The new form (FCC Form 574-T) has now been approved and is available in FCC field offices.

The rule amendments to Parts 1, 2, and 95, Subpart A, which are contained in Appendix A to the Report and Order of January 20, 1983 (PR Docket No. 82-184; FCC 83-21; 48 FR 4783, February 3, 1983) became effective September 26, 1983.

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

We have lots of news, comments, questions, and loggings this month, so let's get right to them.

Another page can be turned in the story of Radio Cuba Independiente y Democratica. About August 19, 1983, the government of the Dominican Republic ordered Radio Clarin to stop carrying the CID "Radio Maximo Gomez" service following complaints from the government of Cuba. Clarin complied but the Dominican Republic's broadcaster's association raised objections about the procedure used by the government.

About two weeks later, Radio Clarin was heard to carry anti-Cuban programming but without any mention of C.I.D., so it's unknown at the moment who is producing the new anti-Castro programming. C.I.D., meantime, has appealed to Radio Clarin to reinstate the program. So, 11.700 remains a good spot to watch for developments in the Caribbean-Central American radio war.

World Music Radio, a program service based in Holland, is now aired over the Irish quasi-pirate station, Radio Dublin International. The WMR broadcasts are scheduled from 0700 to 0900 on Sundays, repeated from 0100 to 0300 Mondays (GMT) on Radio Dublin's 6.910 frequency. The last half hour of each transmission will feature DX tips from Andy Sennitt, Assistant Editor of the *World Radio TV Handbook*.

Some years ago, World Music Radio was aired over Radio Andorra (until the station ceased broadcasting) and more recently was aired on the Italian pirate, Radio Milano International.

Reception reports on WMR's broadcasts will be verified with a QSL card. Reports should include three International Reply Coupons and be addressed to World Music Radio, P.O. Box 4078, 1009 AB Amsterdam, The Netherlands.

Thanks to Larry Magne of International Broadcasting Services Ltd. for forwarding this information.

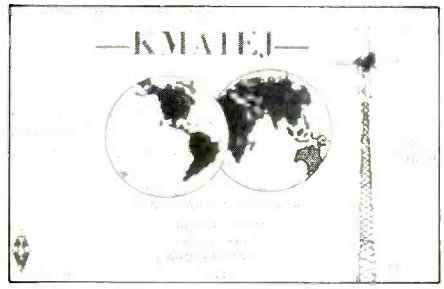
The Association of North American Radio Clubs has asked us to advise readers that ANARC's popular publication *Choosing A Receiver* by Harold Sellers has been sold out. A new edition is in preparation and we'll let you know when it's ready.

If you happen to hear any of the Papua New Guinea regional stations announcing as "Radio Kundu," relax. You don't have something new. The National Broadcasting Commission has renamed its services. The provincial services, formerly Radio Three, have taken this new name. Kundu is a Pidgin word for a type of ceremonial drum common in village cultural life.

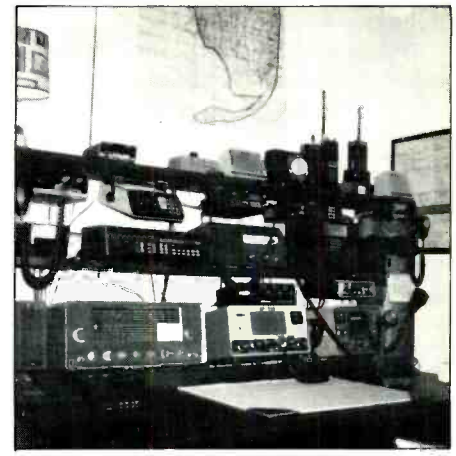
Radio One, the PNG national network, has become the Karai Service. Karai is the Motu word for cockatoo which, according to the BBC newsletter, is one of the few birds in Papua New Guinea which can be taught to speak. The second national network, formerly the Radio Two commercial service, has become the Kalang Service. Kalang is another Pidgin word meaning, variously, the gold-lipped pearlshell, or an earring or a long feather—all highly prized objects used locally as a medium of exchange. So the name is a fitting one since it's for the commercial service.

Bobby Raymer of Cookeville, Tennessee owns this shack, well equipped for multimode reception.

Here's Carl's shack in California with the National SW54 on top of the Panasonic RF3100.



An SWL or Monitor's card can add a special touch to reception reports. This attractive one belongs to Bob Adams in Massachusetts. Why not send your card to us?



SWL and ham operator Edward Charles Wolf, N4GOZ of Pompano Beach, Florida keeps in touch with the world in both transmitting and monitoring activities.

Mail Call

Leading off this month are bravos from Brazil. Carlos Alberto T.V. Frazano writes from Osasco in Sao Paulo state to say how much he enjoys *POP'COMM* and The Listening Post. Carlos has been a DXer for a number of years and his activities have included writing and publishing the first booklet about the shortwave listening hobby in Brazil. We're looking forward to having more information from Carlos in future months.

George R. Neff of Niles, Ohio has two years of SWLing under his belt, using a Panasonic RF-2600 receiver. George puts anywhere from one to five hours a day in at the dials. George mentions learning some minimal French and Spanish to aid in station identification and report writing and notes that Radio Netherlands has material available on this subject. There is a booklet on Latin American DXing which includes sample report forms in Spanish and Portuguese, but we don't know if any of their material covers French. There are a lot of answers to be had in the various Radio Netherlands booklets and info sheets available, however. For a copy of their *Listener Services Catalogue*, write Media Network, English Section, Radio Netherlands, P.O. Box 222, 1200 JG Hilversum, Holland.

Another Panasonic RF-2600 user is James Wildman of Cape Elizabeth, Maine. James is also using an adaptation of the "DXers Dipole" featured in the April, 1983 *POP'COMM*, along with MFJ antenna tuners and active antenna accessories.

George Osier of Norfolk, New York checks in to report recent QSLs from Radio Free Grenada, Ecos del Torbes in Venezuela, and the Caribbean Beacon on 1,610

kiloHertz. He hopes the latter qualifies as shortwave. That's pretty much up to you, George. At the Listening Post, we more or less use the country and station-counting guidelines of the North American Shortwave Association and they start shortwave from 2.000 MHz. But there's no law that says you can't count anything over 1,605 as shortwave if you wish.

The year 1968 is when James W. McKee of Winston-Salem, North Carolina got busy with his first shortwave receiver. He's been inactive for a number of years and wants information about a code used to report reception to stations. You're probably talking about the SINPO code, James. In this arrangement the letters stand for strength, interference, noise (static), propagation (fading), and overall quality, respectively. Numbers from 1 to 5 are assigned to each letter to indicate the signal strength, how much or how little interference or fading was a factor and so on. Thus, SINPO 55555 indicates perfect reception. The other extreme is SINPO 11111. More common readings might look like SINPO 43443—meaning fairly good strength, moderate interference, slight static and fading, and overall fair quality. Other variations on the code are SINFO, which simply uses "F" for fading instead of "P," and "SIO" which eliminates the reporting of fading or noise.

Paul Gordon of Meriden, Connecticut has gotten interested in sending reception reports and collecting QSL cards and would like to know how to go about it. Well, Paul, that's a long story. Essentially, you need to report the frequency, time and date (in GMT or UTC), give the station some information on how well they were heard and provide as much detail as possible about the program items you heard. One day we'll be doing a feature article on reception reports and QSLing that'll cover all the bases.

Bobby Raymer of Cookeville, Tennessee, uses a Realistic DX-160 and Kenwood R-1000 for shortwave broadcast monitoring. He's very active in monitoring other bands and is president of the local Jack Daniels Single Sideband Radio Club. Wonder what they serve at meetings? A check of his shack photo shows quite a line-up of equipment!

Larry Rempala of Lisle, Illinois is curious about Radio Earth International. REI is a program carried by Radio Clarin and not a station with its own transmitter. Programs are taped in studios in Curacao and flown to the Dominican Republic. The Chicago area connection is simply an office since principals of Radio Earth are from that area.

Seven years went into developing the listening station operated by Edward Chris Wolf and he's got it to the point now where he can pretty much cover the entire spectrum. He operates a ham station, N4GOZ and uses a Sony 2001 for shortwave listening. The shack was put together with the idea of having a "survival radio system" available in the event of hurricanes or other disasters.

Carl L. (he prefers we don't use his last name) of Castro Valley, California, has gotten back into shortwave listening and bought two scanners thanks to *POP'COMM*. For shortwave he's using a Panasonic RF-3100 with an old National SW54. Carl wonders about the dating and cost of the National. I'm not an expert Carl, but if pressed to make a stab at it, I would say the SW54 dates to the early 1950's and was probably priced at around $50 to $60.

So how come we haven't found a letter from *you* in the mailbox yet? Let's have your news, comments, suggestions, loggings, shack photos, and good quality copies of your more interesting QSLs. It's time you joined in the fun!

Here's the attractive QSL card issued by Ecos del Torbes in Venezuela. This one belongs to George Osier in New York.

The Voice of Nicaragua has sent this nice pennant to some of its listeners. Thomas J. McKeon of Indianapolis got this one.

Listening Reports

Here's what's on. Remember, all times are GMT.

Alaska The new station, KNLS, heard on 11.820 from 0900 sign on to 1000 with a brief horn interval signal, English opening ID, then seemingly an ID in Russian followed by an hour of big band music. (Lazarus, LA) On 9.690 at 1300 with music, talk in Chinese, religious music, "Chariots of Fire" theme at 1330 with identification, address, and sign off at 1330. (Paszkiewicz, WI)

Angola Emissora Provincial de Namibe, tentatively noted on 5.013 at 0505 to 0610 after Radio Truth signed off. In Portuguese with highlife music. (Crawford, FL)

Argentina Radiodifusora Argentian al Exterior (RAE) on 6.060 in Spanish with news and music at 0100. (Krzemien, IL)

Austria Austrian Radio noted on 11.665 at 0515 in German with waltzes and classical music, parallel to 15.165. (Mackenzie, CA)

Australia Radio Australia on 15.120 at 0600 with bird call interval signal, sign on in English, newscast, and DX program. Parallel to 15.160, 17.795, 15.240, and 9.570. At 1805 in English on 11.725 with world news and pop music. On 15.160 at 0445 in English with concert music. (Mackenzie, CA) Regional outlet VLH9 at Lyndhurst heard at 1200 on 9.680 with news, time check, and "Sunday Recital." (Paszkiewicz, WI)

Belgium Belgian Radio and TV on 15.570 in Dutch with pop music and man announcer. (Mackenzie, CA)

Benin The regional station at Parakou heard at 0550 on 5.025, two announcers, and upbeat African rhythms. (Konen, WI)

Bolivia 3.310 Radio San Miguel, tentatively noted at 1029 to 1039 and 1015 to 1025 with Latin music. (Lazarus, LA) Radio Illimani on 6.025 heard at 0047 with Latin ballads, U.S. pops, with interference from AFRTS on 6.030. (Konen, WI)

Brazil Radio Nacional Amazonia heard on 6.120 from sign on at 0752 with good signal. Sign on with chimes to 0758 when had opening announcement by man with bossa nova music in background. (Lazarus, LA) On 15.445 at 2150 in Portuguese with sports events, identifications, and ads. (Mackenzie, CA) Radio Bras on 15.290 at 0200 to 0300 in English with news, commentary, tourist news, and Brazilian music. (Mackenzie, CA) Radio Anhanguera at Goiania on 4.915 found at 0156 to 0300 with a drama, Brazilian music, ads, and ID. (Konen, WI) Radio Universo at Curitiba on 6.020 heard at 0718 with Latin music, many jingles, and interference from the VOA also on 6.020 from 0728. (Konen, WI) Radio Cultura do Para, with religious program at 0857 on 5.045, starting to fade out by 0928. (Konen, WI)

Bulgaria Radio Sofia on 15.100 heard with news, weather, commentary, and schedule information from 0000 to 0100, in English. (Adams, MA)

Burma The Burma Broadcasting Service is scheduled on 7.185 from 0030 to 0230, on 9.730 from 0330 to 0730, and on 5.985 and 5.040 from 0930 to 1600. English is scheduled at 0200, 0700, and 1430. (Stephens, AL)

Cameroon Radio Douala, the new regional station, heard on 4.795 at 0445 to 0500 when had news headlines in English, African music, and local languages. (Crawford, FL) Heard from 0501 to 0525, tentatively, with news in French and English and program of choral music. (Lazarus, LA) The National Service from Yaounde heard on 4.971 at 0535 in English. (Crawford, FL)

Canada CHNX from Halifax, Nova Scotia, heard on 6.130 at 1907 to 1918 with pop music and local ads. QSL received was signed by Kurt J. Arsenault, Chief Engineer. (Greenberg, NY)

China Radio Beijing found on 15.520 at 1235 to 1255 in English with news and commentary. (Adams, MA) The Xizang People's Broadcasting Station from Lhasa, Tibet, heard on 4.750 at 2330 to 0010 at very weak level, with programs in Chinese. (Crawford, FL) Radio Beijing on 17.680 at 0350 in English with "Music From China," in parallel to 15.385 and 17.855. (Mackenzie, CA)

Clandestines Radio Quince (15) de Septiembre, anti-Sandinista, heard on 6.901 from 0240 to 0341 with continuous talks by man and woman in Spanish with many mentions of the Fuerza Democratica Nicaraguense. Closing prayer by woman at 0335, anthem, and sign off. (Lazarus, LA) Radio Miskus, 6.965, heard from 2233 to 2317 sign off with political talks by man in Spanish and presumed Miskito language. Guitar melody and anthem at sign off. (Lazarus, LA) La Voz de Sandino on 6.215 at 0438 to 0504 sign off with a powerhouse signal. Talks in Spanish, English, and presumed Miskito. English identification as "The Voice of Sandino, The Voice of Free Nicaragua, member of the ARDE radio communications system, coming to you from this high mountain

Taken at a California DXers gathering, here is a photo of (l. to r.) Mr. and Mrs. Stew Mackenzie, Bill, Don Schmidt, Len and Bob Syphax. (Photo courtesy of Bob Syphas, KA7DBW)

QSA		QRM		QRN		QSB		QRK	
Signal strength		**I**nterference		atmospheric **N**oise		**P**ropagation disturbance		**O**verall merit	
5	excellent	5	NIL	5	NIL	5	NIL	5	excellent
4	good	4	slight	4	slight	4	slight	4	good
3	fair	3	moderate	3	moderate	3	moderate	3	fair
2	poor	2	severe	2	severe	2	severe	2	poor
1	barely audible	1	extreme	1	extreme	1	extreme	1	unusable

The breakdown of the SINPO code.

which someday will be broadcasting from Managua or Bluefields." (Lazarus, LA) (All of the above are anti-Nicaraguan government. Editor)

Radio Truth, believed to operate from South Africa, heard on 5.015 with bird call interval signal at 0430 sign on, pop tune, identification, and anti-Mugabe (Zimbabwe) propaganda. (Crawford, FL) At 0438, very poor to 0455 with bird call and then off 0459. (Konen, WI)

Anti-Iranian clandestine Radio Vatan heard on 15.555 at 0455 in Farsi with Hindi-type music and woman with identification at 0459. (Mackenzie, CA)

La Voz de Alpha 66 noted at 0101 sign on to 0129 sign off on 7.038 with anti-Castro talk, trumpet fanfares, identification, and off with martial music. (Konen, WI)

Colombia Radio Super, Medellin, heard at 0945, man and woman announcers and frequent "Super" identifications. La Voz de Huila at Neiva noted at 0455 with frequent identifications, Colombian popular music, interference from the Voice of Germany. Ecos del Combeima at Ibaque on 4.785 at 0545 with several identification announcements by man announcer, Latin music. This one too is part of the Super network. Also from Neiva, Radio Colosal on 4.945 heard at 0608 with uptempo Colombian popular music. (all Konen, WI) Radio Nacional heard at 0325 on 15.335 in Spanish, with music from *Porgy and Bess*. (Mackenzie, CA)

Costa Rica Radio Casino from Puerto Limon, with music program in English at 0520 on 5.954. Identifications every 15 minutes. (Stephens, AL) Radio Reloj on 4.832 at 0330 with IDs every 20 minutes. (Stephens, AL)

Cuba "Radio Mayak" (a Russian program service. Editor) on 4.765 with interval signal, time pips, sign on by man in Russian at 0600, then news read by woman. (Konen, WI) (This outlet, along with one or two others on the lower bands, are assumed by knowledgeable DXers to be from Cuba due to the strength and the fact that they can be heard even in the daytime in places like Florida.)

Cyprus The BBC East Mediterranean Relay heard with World Service programming on 15.420 at 0533 with "Words And Music" program. (Mackenzie, CA)

Denmark Radio Denmark noted at 0023 on 11.715 with program details, news, and commentary in English. (Adams, MA)

Dominican Republic Radio Earth, via Radio Clarin, 11.700 heard from 0200 to 0300 in English with news, music, cultural notes, and Rudy Espinal with steel band music. (Mackenzie, CA) 0342 to 0436. (Trombley, MA) (From an 0330 start time to an 0200 start time, Radio Earth is reported to now begin their broadcast at 0100. Editor)

Ecuador Radio Quito, La Voz de la Capital, on 4.920 in Spanish from 0341 to 0409. Classical music, identification, and advertisements. (Wildman, ME) Radio Jesus del Gran Poder on 5.050 at 1024 with a mass, identification at 1100 followed by news. (Konen, WI) Time station HD2IOA at Guayaquil heard on 7.600 at 0317, woman with time announcements each minute, identification and frequency announcement by man at 0400. (Konen, WI) HCJB on 15.155 with Clayton Howard and "DX Party Line" at 0230 to 0300 when into news. Parallel to 9.745. (Mackenzie, CA)

England BBC World Service on 12.095 at 0325 with "The World Today." (Mackenzie, CA) In Arabic on 15.235 at 0358. (Mackenzie, CA)

France Radio France International in English from 0430 to 0500 on 11.705 with news and commentary. Voice of Germany sign on at 0455 blocked further reception. (Mackenzie, CA)

French Guiana RFO Cayenne heard on 5.055 at 0917 with man announcer in French, French pop music, time pips, and news at 0930. Parallel to 6.170 and good reception. (Paszkiewicz, WI)

Greece The VOA relay at Kavala heard with VOA News in English at 0405 on 11.925. (Mackenzie, CA)

Guatemala La Voz de Nahuala from the town of the same name, heard on 3360 with marimba instrumentals, man announcer briefly between each selection at 1015. (Konen, WI)

Hungary Radio Budapest on 15.220 in English at 0300 with news and commentary. (Krzemien, IL)

Iceland Icelandic State Broadcasting Service logged on 13.797 in Icelandic at 1900 with news and local weather. (Krzemien, IL)

International Waters The Voice of Peace, presumed the one heard on 6.240 to sign off around 0040. Very weak but occasional pop music was heard. Suffered from long, deep fades. (Crawford, FL)

Israel The Voice of Israel with commentary on 11.655 at 0000, in English. (Adams, MA) On 15.105 at 0500 sign on in English with news and weather, into French at 0515. Parallel to 9.815. On 12.025 at 0340 in Russian, parallel to 15.105, 11.655, and 9.815, the latter two frequencies were jammed. On 15.615 at 0440 in Hebrew with jazz program. (Mackenzie, CA)

Japan Radio Japan noted on 9.505 at 1710 in English with news, commentary, and music. On 15.260, the Far East Network was heard at 0350 in English with a sports interview. (Mackenzie, CA)

Kuwait Radio Kuwait's home service found on 15.495 at 0335 in Arabic with Koran recitations. (Mackenzie, CA)

Liberia The VOA Relay at Monrovia heard on 15.600 at 2120 in English with a press interview. (Mackenzie, CA)

Libya The SPLAJBC in Arabic at 2045 in 17.930 with Arabic music. (Mackenzie, CA)

Lesotho Radio Lesotho noted on 4.800 from 0405 to 0500 with vernacular program, woman announcer, African music, advertisement for Hammill Tobacco at 0459, in English followed by religious program from the Catholic Cathedral in Maseru. (Crawford, FL)

Luxembourg Radio Luxembourg on 6.090 in English at 0130 with top 40 songs. (Krzemien, IL)

Mali Radio Nationale du Mali at 2355 on 5.995, man in talk, stringed instrument. Weak signal under an open carrier, strong tone at 2347 blocked signal completely. (Konen, WI)

Montserrat The Deutsche Welle Relay station on 11.705 in English at 0500 with world news and "Microphone on Europe." (Krzemien, IL)

Netherlands Radio Netherlands heard at 1450 on 17.605 in English. (Adams, MA)

New Zealand The Pacific Service of Radio New Zealand is scheduled from 1800 to 2100 on 11.960 and 15.485; 2115 to 0515 on 11.705 and 0530 to 1215 on 11.960. To Australia and Northwest Pacific from 2115 to 0515 on 15.485 and 0515 to 1215 on 9.620. Four IRCs are required for a QSL reply. (Slawson, PA) Heard on 17.705 at 0400 in English with identification, newscast, and music. (Mackenzie, CA)

Nicaragua Voice of Nicaragua on 5.950 at 0423 in English with Latin music, propaganda, speech by junta leader Daniel Ortega, Central American news. Switched to Spanish at 0500 and signed off at 0503. In English from 0100 to 0200. (Wildman, ME) The 0400 to 0500 English segment heard better than earlier, 0100 segment.

Here's POP'COMM reporter Larry Rempala of Lisle, Illinois at his listening post.

Nigeria Radio Nigeria at Kaduna on 4.770 from 0447 to 0543 with disc jockey pop music show, news, political affairs programming, all in English. (Wildman, ME)

North Korea Radio Pyongyang on 9.977 and 9.745 in English at 1130 with a commentary on journalism. (Krzemien, IL)

Norway Radio Norway International's weekly Sunday-Monday English program is scheduled to Western North America at 0400 on 15.225, 15.175, and 9.590; at 1300 to Eastern North America on 17.840; to Central America and North America at 1400 on 17.840, 21.575, 21.730, 17.715, and 15.175; to Western North America at 1600 on 15.175; to North America generally at 2200 on 11.870; and to Eastern North America at 0000 on 9.610, 11.870, and 9.525. (Velleni, Italy)

Peru A number of goodies from Inca-land this month. Radio Vision, 5.360 heard from 0238 to 0255 at strong level in Spanish with everything from folklorico music to punk rock. (Crawford, FL) Radio Bagua, Bagua, 3.310 at 1052 sign on to 1112, other times caught signing on at 1055 and 1100, opening with short segment of violin music and full ID by man followed by Peruvian national anthem. (Lazarus, LA) Radio Satellite, 6.725 from 0420 to 0442 sign off, heard tentatively, uninterrupted Peruvian music, a few announcements, definite mention of "Cajamarca . . . Republica del Peru" at 0440 before brief flute interlude prior to national anthem. (Lazarus, LA) Radio Los Andes on 5.030 at 0950 with vocals, announcements, ads, theme from *Romeo and Juliet* on piano, ID, and mentions of Huamachuco. (Konen, WI) Radio Oriente, Yurimaguas, on 6.190 at 1038 with flute music, huaynos selections but interference from the BBC on 6.195 at 1055. (Konen, WI) Radio Rioja, Rioja, 5.045 at 0330 with lite music with violin, weak but in the clear. (Konen, WI)

Philippines The VOA relay with news and "Breakfast Show" at 0300 sign on on 17.745. (Mackenzie, CA) VOA Tinang relay at 1128 on 6.110 with features on new products, issues in the news. Fair level. (Paszkiewicz, WI)

Poland Radio Polonia on 15.120 in English at 0300 with news and commentary. (Krzemien, IL)

Portugal An unknown time station on 10.410, heard formerly on 5.402, at 2335 to 2347 on upper sideband with woman giving time every 10 seconds followed by two pips. Time given for zone GMT plus one. (Crawford, FL)

Saipan KYOI on 9.670 at 1741 in English and Japanese and IDs for "Super Rock Radio" along with pop music. On 15.190 at 0425 suffering from interference from Radio Moscow in Chinese. (Mackenzie, CA)

Senegal ORTS Dakar, 4.890 at 0539 sign on, inter-

val signal, announcement by woman, identification by man, news in French, later in vernaculars. (Konen, WI)

Sierra Leone Sierra Leone Broadcasting Corporation, 5.980 at 2300 with program of African music, man talking occasionally. May be the best time to hear them, without QRM from Voice of Free China. (Konen, WI)

Singapore BBC Far Eastern Relay on 17.715 at 2110 in an Asian language, long commentary by woman. (Mackenzie, CA)

Somalia Radio Hargeisa on 11.645 at poor level from 1220 to 1230 with music to sign off. Had been on 11.640. (Crawford, FL)

South Africa South African Broadcasting Corporation in Afrikaans on 4.880 at 0459, Glenn Miller music, man announcer, faded before 0530. (Konen, WI)

South Korea Radio Korea on 11.810 at 0405 to 0600 in Korean, pop music, English ID at 0500 and continued with English news, music, and DX news to 0600 sign off. (Mackenzie, CA)

Spain Radio Exterior de Espana on 11.880 in English at 0209. (Adams, MA)

Swaziland Radio Turuo, 4.980 from 0415 to 0440 with mix of Indian sitar and more generic pop music, man announcer in English. (Crawford, FL)

Sweden Radio Sweden International on 11.705 at 2300 with news, commentary, and program schedule. (Adams, MA)

Taiwan Voice of Free China at 2100 in Chinese on 17.800. (Mackenzie, CA) Broadcasting Corporation of China on 15.215 at 0410 in Chinese. (Mackenzie, CA)

Thailand Radio Thailand has English from 2230 to 0425, 0500 to 0600, and 1130 to 1230 on 11.905 and 9.655. (Stephens, AL)

Tunisia Radio TV Tunisienne on 7.225 at 0533 in Arabic with Arabic music. (Konen, WI)

Turkey The Voice of Turkey heard at 0405 on 15.220 in Turkish with news, followed by Turkish music. (Mackenzie, CA)

United Arab Emirates UAE Radio on 17.775 at 0300 in English with news, sports, and the "Wide World of Arabic Music." (Krzemien, IL) RCTV Dubai on 15.435 at 0330 in English with news to 0343, talk on the Koran to 0400, continued in Arabic, parallel to 17.775. (Mackenzie, CA)

United Nations United Nations Radio noted Fridays on 21.710, 15.120, 15.360 from 1830 to 2000 and from 2100 to 2200 on 15.120 and 17.730. (Stephens, AL) (VOA facilities, Editor)

USSR Radio Vilnius in English on 11.960 at 2209 with talk about the Lithuanian community in Chicago. (Paszkiewicz, WI) Radio Moscow's North American Service via Petropavlovsk heard on 12.050 at 0330 with a feature on work in the USSR. (credit misplaced)

Uruguay SODRE was heard in Spanish on 9.620 with news and commentary. (Krzemien, IL) Radio El Espectador on 11.835 from 0008 in Spanish and identifications. BBC sign on blocked them at 0030. (Konen, WI)

Vatican Vatican Radio heard at 0530 in Latin on 9.620 with ID and into a mass. (Mackenzie, CA) At 0050 to 0100 in English on 6.015. (Adams, MA)

Venezuela Radio Tachira from San Cristobal on 4.830 noted at 0214 with traditional and modern Latin vocals, occasional advertisements, and identifications. Severe interference from Radio Reloj in Costa Rica on 4.832. (Konen, WI)

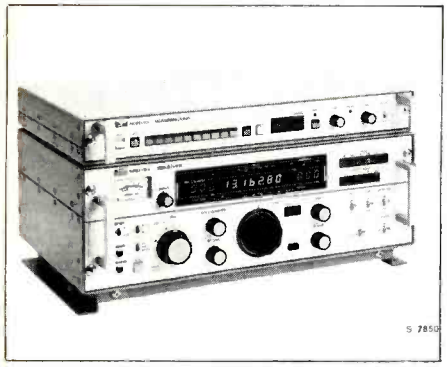
West Germany Deutsche Welle on 11.765 and 7.150 at 0510 in English with African news items, into French at 0515. (Konen, WI)

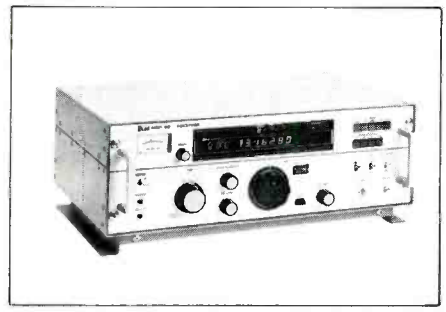
Many thanks to Roland L. Trombley Jr., Greenfield, Massachusetts; Robert E. Adams, Gardner, Massachusetts; Stewart Mackenzie, Huntington Beach, California; Sheryl Paszkiewicz, Manitowoc, Wisconsin; Mark Konen, Milwaukee, Wisconsin; John Stephens, Huntsville, Alabama; Lawrence Greenberg, Rockville Centre, New York; Giovanni Velleni, Trieste, Italy; Dennis Slawson, Sykesville, Pennsylvania; Rick Krzemien, Carol Stream, Illinois; James Wildman, Cape Elizabeth, Maine; Henry Lazarus, New Orleans, Louisana; George R. Neff, Niles, Ohio; and David Crawford, Oak Hill, Florida.

See you next month. Good listening!

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS





New Receivers

Universal Amateur Radio announced two new shortwave radios never before available to the retail customer in North America.

Through special arrangements with the Japan Radio Company, Universal Amateur Radio is offering two of JRC's finest commercial marine-grade receivers. Both units are presently in wide use by coastal stations worldwide and on board many new ocean-going vessels. These radios offer a degree of manufacturing excellence and performance never before available to the SWL community.

Japan Radio NRD-92 Communications Receiver

The NRD-92 is an up-conversion phase-locked digital frequency synthesized receiver covering 90.00 kHz to 29999.99 kHz in the CW, SSB, DSB (AM), FSK (RTTY), and FAX modes. Preset frequencies of 500 kHz and 2182 kHz are also provided. Bandwidth Filters of 6.0 kHz, 3.0 kHz, and .5 kHz are standard and can be used independent of mode. The radio will operate from 120 or 220 VAC or – 24 VDC.

Japan Radio NRD-93 Communications Receiver

The NRD-93 is an enhanced version of the NRD-92 offering additional capability. An additional mode position and filter is provided. Digitally displayed pass band tuning has been added as well as an analog frequency display scale. A 60 channel memory that stores frequency, mode, *and* bandwidth has also been incorporated into this receiver.

The NRD-92 and 93 are of plug-in-modular design throughout (exc. power supply). Both units include a speaker, AC power cable, BK cable (for BK signal, line output, and SP output), and a complete set of standard spare parts including every fixed resistor, and capacitor, all variable resistors and fuses, plus a spare antenna connector and BK relay.

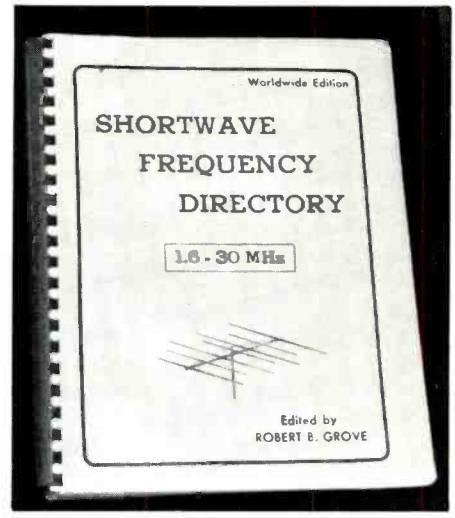
Options include a receiver cabinet, DC power cable, extension PC board, preset timer, filters, special spare parts (all semiconductors), and scanning unit. The matching scanning unit has a 300 channel capacity and is capable of preset reception, 9-group scanning reception, and sweep reception. There is also an optional remote control unit for the NDH-93 External Memory Option.

This equipment is available exclusively through Universal Amateur Radio. For more information, contact Universal Amateur Radio, 1280 Aida Dr., Reynoldsburg, OH 43068, or circle 112 on the reader service card.

Shortwave Frequency Directory

The Shortwave Frequency Directory is a comprehensive directory of frequencies and station operators in the 1.6 to 30 MHz communications spectrum with special emphasis upon U.S. Government operations. The large-format (8½" by 11"), 200 page directory includes some 5,000 listings, including USAF, USN, Coast Guard, Army, foreign military, emergency, embassies, Dept. of State, FCC, Dept. of the Interior, spy stations, ships, aircraft, overseas telephones, and more—done up in a spiral binding for desk-top convenience. This is a large and indispensable reference for any monitoring station and it comes with an updating supplement (no additional cost). This publication provides detailed breakdowns of SAC networks, Navy networks, Canadian military networks, mystery stations, NORAD, disaster networks, search and rescue units, Coast Guard, Cuban Air Force, USCG Aircraft roster, TAC, plus plenty of information on those elusive tactical military callsigns. This book, compiled by Bob Grove, contains far more information on federal communications below 30 MHz than Grove's earlier book, *Federal Frequency Directory*. If you're one of the many people who explores the mysteries of non-broadcast communications below 30 MHz, then you'll certainly want to have the *Shortwave Frequency Directory* at hand for instant reference while you're monitoring. This book (including the updater supplement) is $12.95 per copy plus $3 for First Class mailing. If 4th Class Book Rate mailing is desired, send $12.95 for the book and $1 for postage.

Order from CRB Research, P.O. Box 56, Commack, NY 11725.



Complete Portable Power Plant

The Hande-Pakage includes everything necessary for traveling "power equipped."

The power behind the KH1P is the KH1 Hande-Pak™ rechargeable battery. The KH1 packs 12 volts, 1.2 amps of energy, yet it only weighs one pound.

The Hande-Pak is vinyl-cased with a built-in receptacle, suitable for any "cigarette" plug (the most commonly used 12 volt connecting device). A charger is added to the Hande-Pakage allowing the battery to be recharged in 1-2 hours.

The R37 DC Voltage Converter completes the Hande-Pakage. This item converts 12 volts DC into either 3, 6, 9, or 12 volts, saving both money and energy, since unneeded power is not wasted. In addition, the R37 comes equipped with a multiple adaptor plug, so it fits just about all radios with external power jacks.

This compact, complete package is extremely economical compared with "throw-away" batteries, which can only be used for a limited amount of time and then quickly run out of power. The KH1 can be used for a variety of purposes. It can be recharged hundreds of times and will also save the user over $100 on the average.

From recreational activities to scanner use and computing, the KH1P Hande-Pakage is suitable for you to take along. Contact KAPCO, Inc., 1270 Jarvis Avenue, Elk Grove Village, IL 60007.

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY MARK LONG, WA4LXC

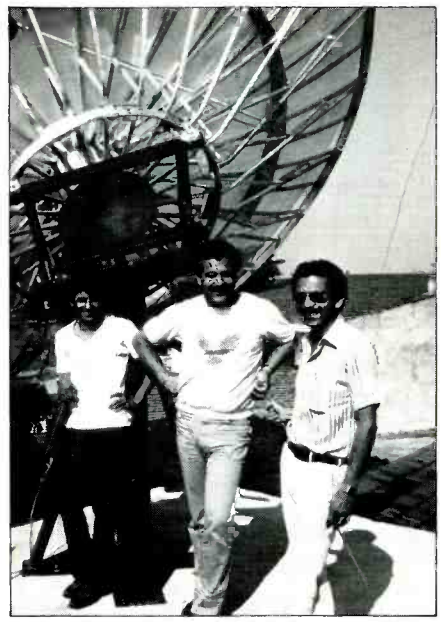
Satellite TV In South America

The deadline for this month's column found me in the middle of South America, 18 degrees below the equator. A company in Bolivia was very interested in the possibility of supplying satellite television systems to people throughout the region. The Telesat company of Miami, Florida supplied the Bolivian entrepreneurs with a 5 meter aperture antenna, international satellite earth station receiver, and 70 degree LNA. I was asked to accompany Telesat's technician, Terrell McClintock, to Bolivia to assist with the installation.

Bolivia just happens to be one of the most isolated areas in South America. More than two hundred years ago, Bolivia lost its Pacific Ocean territory to Chile in a debilitating war. Today, Bolivia is a landlocked nation with little manufacturing capabilities. Oil, minerals, and cattle are the main resources of this third world country. Existing television services are minimal, with most of the country limited to viewing one or two channels of Spanish language programming.

An evening flight to Santa Cruz de la Sierra, Bolivia from the Miami international airport delivered us without event to a location far below the equator. While this location is beyond the reach of our North American domestic satellites, we knew from previous experiences that there are numerous international satellites that can be intercepted within the region. (See *POP'COMM* series "DXing the International Satellites," February, March, and April 1983 issues.) Some of the INTELSAT birds carry the programs from a number of Central and South American countries. This would give the Bolivians several channels of Spanish-language television for their viewing enjoyment.

Upon our arrival we spoke with several Bolivian people about the program services which we knew would be available. At first, we were surprised by the amount of skepticism expressed about receiving satellite TV at this location! Then we learned the reason behind the skepticism. A year before, a Bolivian gentleman had gone to the United States and purchased a complete home earth station package which he promptly took back with him to Bolivia. Following the manufacturer's instructions precisely, he assembled the system and began looking for the birds. Unfortunately, he never found a single satellite signal. The problem was that the American assembly instructions required that the antenna be pointed south. This is fine for locations north of the equator, but in South America this aligned the gentleman's antenna toward the empty skies over Antarctica, leaving this early would-be satellite TV pioneer without a single satellite to view. We assured the local Bolivians that, with the proper antenna orientation, we would succeed in delivering satellite television into their living room.



Bolivian satellite entrepreneur Roberto Richards (center) and company with 5 meter Odom antenna.

Shortly after arrival, we began assembling the Odom 5 meter antenna. This antenna is made from a radar wire mesh that slips into grooves in the sides of the parabolically-curved support struts. One especially nice feature of this antenna is the placement of a hole through the center of the antenna hub. This allows you to stand at the back of the antenna and look directly into the mouth of the feedhorn and LNA. By sighting this hole, you can precisely adjust the LNA mount assembly so that the feedhorn and LNA sit exactly at the center of the dish's focal point.

The receiver used was the Avcom 3R with a ½ transponder filter and threshold peaking circuitry which helps to extend the reception capabilities of the unit when intercepting the relatively weak signals of the INTELSAT birds. To achieve the lowest system noise temperature possible, a 70 degree LNA was used. The Odom antenna was equipped with an MTI computerized antenna positioner with motorized actuator.

Within a few hours of our arrival we had the antenna assembled. After connecting the various cables and connectors, we settled down to the serious business of sweeping the skies in search of the birds. We were almost immediately rewarded with reception of satellite TV from Venezuela. At the time, the Pan American games were being held in Caracas, Venezuela and we treated our Bolivian hosts to a smorgasbord of sporting events via the INTELSAT bird at 27.5 degrees west longitude. Everyone there was very excited. It was the first reception of TV via satellite by a home earth station ever to occur in the area and one of the first South American installations this far south of the equator.

Rede Globo TV INTELSAT IVA-F4. 21.5° west longitude.

Venezolana de Television INTELSAT V, 27.5° west longitude.

On the following day we returned to the installation to align the antenna so that the polar mount would accurately track through all of the available satellites. It was then that we discovered that the correction factor from magnetic to true north supplied by the local Bolivian airport was off by more than 10 degrees. This affected our calculations considerably, making reception of the INTELSAT bird at 1 degree west more difficult because of local obstructions along the eastern horizon. Our Bolivian host then suggested another location: a flat rooftop three stories up! In order to move the 16 foot antenna we would have to transverse many obstacles in the neighboring yard. "No problema," said Roberto. He arranged for about 15 Bolivians to assist in the relocation of the antenna which came off without a hitch. In little more than an hour's time we had relocated the system and were rewarding the local participants with reception of baseball from the Pan American games. With the polar mount axis of the antenna properly aligned, we were able to view the following selection of programming. While our reception took place in the center of South America,

HAM RADIO LICENSES SIMPLE TO GET UNDER NEW FCC RULES

FCC GOING PUBLIC WITH ALL AMATEUR RADIO TEST QUESTIONS

BY GORDON WEST, WB6NOA

How Would You Like Ham Call Letters in 9 Weeks?

Are you one of the thousands of hobby radio enthusiasts who wanted a ham radio ticket, but were stymied by the code and heavy technical tests? If so, there is good news from the Federal Communications Commission. The FCC is now going public with all test questions and will be allowing amateur radio volunteers to administer the examinations.

The FCC Notice of Proposed Rulemaking NPR Docket 83-27 outlines a volunteer examiner program where local hams will take over the responsibility of giving ham radio tests. Public Law 97-259 amended the Communications Act of 1934, and that allowed the FCC to accept the voluntary services of licensed radio amateurs in preparing and administering the Amateur Radio Service exams.

No longer will exam questions be kept secret. Right now you can receive all of the 200 test questions for the amateur radio beginner license test, the Novice License. Similar to aircraft FAA exam procedures, publishing companies and Radio School, Inc., have developed multiple-choice-type answers for these questions, as well as a key giving the correct answer for every question. This allows the beginner student to know exactly what is required to pass the 20-question FCC Novice test.

The FCC will soon publish all the questions for the amateur radio Technician, Advanced, and Extra Class theory tests, too.

BUT WHAT ABOUT THE CODE? The Morse Code requirements still stand for any amateur radio license. For the beginner regular classroom instruction, Radio School offers a complete home-study Novice license course. In about 30 days after receiving the complete course, you should be prepared to have a local ham Novice license, you must send and receive international Morse Code at 5 words per minute. This is slow enough that many students learn the code at this speed within 30 days. The code test is administered by a neighbor volunteer examiner ham, relieving the applicant of the pressure of an FCC-administered code test. You can take the code test in a relaxed atmosphere in your home, or at the volunteer examiner's ham shack.

Once you pass the 5 word-per-minute code test, you won't need to take the code test over again to obtain the coveted Technician, voice-class license. The Technician class license lets you operate voice through the satellites, repeaters on 2 meters, plus skip propagation on 6 meters. The Technician license only requires a 50-question multiple-choice exam to be passed. Then, with the Technician license, it's only a 13 word-per-minute code test to get your worldwide, voice class, General license.

A company called "Radio School" let's you get into ham radio the easy way. If you don't have time for regular classroom instruction, Radio School offers a complete home-study Novice license course. In about 30 days after receiving the complete course, you should be prepared to have a local ham volunteer give you the code and theory test, and pass with flying colors. It takes about four weeks for your call signs to arrive in your mailbox after you pass the test and your volunteer ham examiner sends in the FCC forms.

"Dual stereo voice and code tracks allow the tapes to play in the car, play on regular mono equipment, or at home on a stereo..."

Here is what the course consists of:

- 4-set stereo code cassette long play tapes
- 2-set stereo question and answer theory tapes
- 2 4-set vinyl cassette carrying cases
- 1 fully illustrated Novice class Q&A license manual
- FCC published 200 Novice test questions
- Typical Novice class multiple choice exam

Everything for you and your volunteer ham examiner to pass the Novice license test.

- 5 wpm code test tape for your volunteer examiner
- FCC Form 610 for you and the volunteer examiner
- Examination answer sheet for your 20-question theory test
- Detailed instructions, for you, on how to find a local volunteer amateur radio examiner

Also included are detailed instructions to the volunteer examiner on how to conduct the actual test, plus his test questions and code test tape.

As you can see, everything is here for both you and your ham volunteer examiner. Courses are also available for all of the other grades of ham licenses, too.

You may order the Radio School beginner course by mail or telephone. Then, as soon as it arrives, try it out in the privacy of your home and car, and see how easy it is to learn the code and understand the easy beginner theory questions. After that, if you aren't 100 percent satisfied with your instructional material, simply send it back and Radio School will see to it that you get a complete refund with no questions asked!

Just fill out the coupon below and send it to Radio School with your personal check. Your order will be sent out the very next day.

I will look forward to hearing you on the air very soon. You are going to like this beginner course I have designed and recorded in stereo, just for you!

NO-RISK ORDER COUPON POP COMM

(Please fill in and mail today.)

TO: GORDON WEST
RADIO SCHOOL, INC.
2414 College Drive
Costa Mesa, CA 92626

Phone Inquiries
(714) 549-5000
Mon-Fri 9am-4pm
Calif. Time

DEAR GORDON:

Yes, I want my ham license. I want to try your Novice course. I am enclosing my personal check or money order for $60.00 plus $4.00 for postage and handling. (Total $64.00) I understand I must be 100% satisfied, or that within 30 days I may return the course and receive a complete refund with no questions asked. Calif. res. add $3.60 sales tax.

NAME_____

ADDRESS_____

CITY_____STATE_____ZIP_____

P.S.: Check here if you are already a ham and want more info on our other upgrading courses, plus free test tapes to qualified volunteer examiners. ☐

most of these services can be obtained throughout the continent.

INTELSAT IV F1
53 Degrees West Longitude

The Mexican lease services on this bird are transmitted via a spot beam centered on Central America. Consequently, these signals are very weak at locations well within South America. The following transponders can be enjoyably viewed in Bolivia only with a very large antenna, at least 30 feet in diameter. Estimated EIRP (effective isotropic radiated power) is approximately 17 dBW.

1	3720 GHz	XEW-TV Mexico City Channel 2
5	3805 GHz	TRM, Telecommunicaciones de la Republica de Mexicana
13	3965 GHz	XETV's selection of U.S. network programs
14	3980 GHz	XHDF-TV, Mexico City's channel 13

During the Pan American games, we also noticed that the Mexicans were using transponder 24 (4175 GHz) for television transmissions from the Pan American games. Unlike the other transponders onboard this bird which are on a spot beam, this transponder was sent via a global beam antenna. This made the service watchable in Bolivia with the 5 meter aperture earth station, with an estimated EIRP of 25 dBW there.

INTELSAT V-F2
34.5 Degrees West Longitude

Transponders 22, 23, and 24 are active at various times of the day, carrying international news feeds, sports events, and sporadic entertainment programs. EIRPs vary depending on who is originating the uplink and whether a full or half transponder format is in use. This results in EIRPs in the 17 to 27 dBW range. Since these transmissions are only made via a global beam antenna which is the weakest in signal strength of the various antennas available from the V series birds, we were quite pleasantly surprised to find that many of the feeds were at or above threshold. This made the video quality quite good when the transponders were operated full throttle. Many sporting events were seen here including soccer games from South America, professional baseball and football games from the U.S., and various competitions from the Pan American games in Caracas.

INTELSAT V-F4
27.5 Degrees West Longitude

1	3725 GHz	Cadena 1, TV from Bogota, Colombia
3	3765 GHz	RTP-TV, Channel 7 Lima, Peru
5	3870 GHz	Venezolana de Television, Caracas, Venezuela
24	4177 GHz	Argentina Television Color, Buenos Aires

Colombia's TV service is in the half transponder format with an estimated EIRP of 26 dBW in Bolivia. Audio is specially encoded via SCPC or single channel per carrier techniques, rendering it unavailable from your standard earth station receiver. Peruvian satellite TV has an estimated EIRP in Bolivia of 29 dBW. This service is transmitted in the full transponder format with audio SCPC encoded. Venezuelan TV from Caracas has an estimated EIRP of 30 dBW in Bolivia. It is transmitted via a full transponder with the audio on a standard subcarrier. Good reception of Venezuela's audio requires a wide/narrow audio bandwidth switch on the receiver, with the control in the narrow position. Argentina's TV service is also transmitted via this bird with an EIRP in Bolivia of 27.5 dBW. ATC is transmitted in the full transponder mode, with a standard audio subcarrier used.

AFRTS from INTELSAT IV F8, 1° west longitude.

Argentina Television Color, INTELSAT V, 27.5° west longitude.

INTELSAT V-F3
24.5 Degrees West Longitude

Transponders 22, 23, and 24 carry a variety of international news and sports feeds in either the full or half transponder format. On the night we were to leave Bolivia, we were asked to take a spin through the satellite belt in search for the South American Cup soccer game between Brazil and Argentina. The game was not available via Brazilian TV and soccer fans in Santa Cruz expected it to be the game of the year. We found the game on the INTELSAT bird at 24.5 degrees west. It was completely above threshold with the color in the American NTSC standard. Had I not seen it myself, I would not have believed that a 5 meter earth station could provide a perfect picture from a global beam transmission. But since this was a new V series satellite, it appears that it has considerably more transmitting power than the INTELSAT IV and IVA series satellites which preceeded it. We had to leave in the early moments of the game, but we later learned that the final score was 1 to 0, with Argentina the winner. Our Bolivian friends had ended up setting up their television sets outside next to one of the main avenues in town. More than three thousand Bolivians descended on the scene that night, viewing the game and totally disrupting local traffic along the highway.

INTELSAT IVA-F4
21.5 Degrees West Longitude

1	3725 GHz	Bandeirantes TV, Sao Paulo, Brazil
5	3805 GHz	Rede Globo TV, Rio de Janeiro, Brazil
11	3925 GHz	Rede Globo TV

All three channels of Brazilian television available from this satellite are transmitted via a hemispheric beam in the full transponder format with the audio contained on a standard audio subcarrier frequency. Both Bandeirantes and Rede Globo have an estimated EIRP in Bolivia of 31 dBW, making them the strongest satellite signals available in the region. Transponder 11 (which is sent via a global beam) is much weaker, with an estimated EIRP of 23 dBW.

INTELSAT V-F5
18.5 Degrees West Longitude

Transponders 22, 23, and 24 are used for video transmissions of international news feeds and sporting events.

GORIZONT 7
14 Degrees West Longitude

Both transponders 6 and 9 are active on this satellite. Transponder 6 is the strongest of the two, with occasional video transmissions from the Soviet Union in the full transponder format. Estimated EIRP is 28 dBW. Transponder 9 is also active, but much weaker when received in Bolivia. Estimated


Relocation at a 5 meter satellite earth station is no problem with a crew this large!

RTP-TV from Lima, Peru. INTELSAT V, 27.5° west longitude.

EIRP is 22 dBW with a selection from around Eastern Europe and Cuba. Gorizont is allowed to wander in a figure eight orbit that is centered on the equator. Consequently, the satellite antenna must be adjusted in elevation to receive the satellite when it is appreciably above or below the equator.

Symphonie 1 & 2
11.5 Degrees West Longitude

Symphonie only transmits signals into the western hemisphere on an occasional basis, using transponder 14. These feeds consist of news and sports coverage from the French TF-1 television network.

INTELSAT IV-F8
1 Degree West Longitude

This is the furthest satellite to the east which can be viewed from Bolivia. Transponder 1 and 2 are occupied by ABC news London and CBS LSAT Europe. This pair of half transponder transmissions relay news and sporting events from Europe to the United States. EIRP in Bolivia is around 17 dBW. Transponder 16 and 18 are used for occasional video feeds from Europe or Africa. We viewed television from Morocco and other countries in Africa during our visit. Transponder 24 carries the full time service of the Armed Forces Radio Television Service (AFRTS). AFRTS supplies news and sports video programming to American military personnel located at overseas military installations. (See September, 1983 *POP'COMM*). AFRTS is transmitted via a global beam in the full transponder format. Estimated EIRP in Bolivia is 23 dBW.

As Terrell and I flew back to Miami following the successful completion of our installation, we both felt that South America was a fertile territory for satellite earth stations. With as many as eighteen available channels, international satellite TV services provided an exciting mix of international programming, which was very attractive when compared to the available local television services. Little did I know how soon I would be returning to the land below the equator.

If you would like to learn more about satellite television, *The World of Satellite Television* by Mark Long and Jeffrey Keating is available from Solar Electronics International, 156 Drakes Lane, Summertown, Tennessee 38483. Price is $10.00 plus $1.00 for shipping and handling.

Beaming In (from page 4)

how many were seeking news and entertainment.

Between the years 1960 and about 1970, manufacturers who were once major equipment suppliers to the shortwave listening consumer seemed to fade away from this market one-by-one—Hallicrafters, Hammarlund, National Radio, Gonset, RME. During the past few years, however, there has been an amazingly brisk influx of exceptionally fine receiving equipment directed at shortwave listeners from companies such as ICOM, Panasonic, G.E., Grundig, McKay-Dymek, Kenwood, Drake, Yaesu, Electra, Sony, Japan Radio Corporation, Collins, and others. And they're doing well in this market. There are also many multi-band broadcast receivers now in the hands of the public in addition to those that are actually communications receivers. Even taking into account that there are far more receivers around that are capable of picking up shortwave broadcasts than there were in 1975, one cannot help but wonder how many people hereabouts normally forego an evening of TV to turn on a receiver to sit back and listen to the programming on those bands.

As far back as 1971, in an editorial in *Popular Electronics*, Perry Ferrell observed that some "international broadcasters are phasing out programs aimed at North America simply because listeners appear to be more interested in QSLs and frequency changes than in program content." It appears that this reported action on the part of SW broadcasters may have had ample justification. How many people do you personally know who actually spend any amount of time regularly listening to the programming on these frequencies, as opposed to brief hobby-type listening?

If the North American audience response was ever evaluated by American TV network standards, there wouldn't be a single English language broadcast beamed to North America! *Star Trek* and *The Paper Chase* each had a far larger audience than all of the combined English language broadcasts beamed to North America, and they were both unceremoniously dumped from the networks for having too small a following. It's a fate which has befallen scores of TV programs, be they "good" or "bad."

Let's explore this more graphically. Even if, for instance, there were presently 200,000 regular non-DX-hobby listeners in North America who dutifully tuned-in on international shortwave broadcasts beamed here in English, it is still hardly representative of the general public. Moreover, once those 200,000 listeners were divided up between Radio Moscow, Radio Sweden, BBC, Kol Yisrael, Deutsche Welle, and others that would make the size of the average audience receiving their programs about 5,000 listeners each. My 200,000 figure is probably far too generous. Contrast this with contemporary methods to evaluate the interest of an American audience.

Thicke of the Night was syndicated on 120 TV stations in early September. In its New York Metropolitan showing the first week it reached an average of 11% of the local viewing audience—231,000 households—and *Broadcast Week* observed that it "fell flat on its bottom . . ."

That same week, *We Got It Made*, a new sitcom on NBC, reached 34% of the households in New York, Chicago, and Los Angeles. That rating made the poll takers happy, and why not? In the New York market alone, that translates into 714,000 households. Try those numbers on for size against the figures relating to the potential impact of English language shortwave broadcasts beamed to all of North America.

It would be easy to conclude that there is little point to continue sending any English language broadcasts in our general direction. Not so. It would be a far better approach to try to cultivate and build a North American audience for this programming. But, of course, the failure of these programs to gain an audience here is an old story.

Potential audiences have to be made aware that the international programming is there to be heard. Years ago there were major newspapers (such as *The New York Times)* that carried international broadcast schedules. These days, the general media ignores such programming information. To the majority of persons in the general public, shortwave radio implies getting a Ham ticket, learning CW, or both. Most people haven't the foggiest notion of what it's all about, what equipment is needed, where/how to listen, or anything else connected with such listening. It appears distant, vaguely complicated, and possibly expensive. ANARC and several other hobby groups have attempted to change this situation but (as Ferrell observed in his 1971 editorial), one of the problems has been that, "a lack of positive direction, along with pettiness, fragmentation, and a variety of minor annoyances plague this worthwhile hobby." This is still true and, of course, a lack of funds to accomplish this educational feat is also a problem.

Another problem lies with the broadcasters themselves. The North American audience is different than someone listening to international broadcasts from a remote hut in the Andes Mountains, in the Fiji Islands, or from an apartment in Prague. North American audiences are spoon fed their news and entertainment programming as a result of clever and slick promotional campaigns engineered by media professionals who seem to know the right kind of glitter to use on the public hereabouts. Constant polling of the audiences helps these program packagers to know the directions to head in which to capture and hold an audience. It's highly competitive. While a person can read several magazines on the same topic per month, they can only tackle one single radio or TV program at a time. If an audience is to be captured from 9 to 10 p.m. on a Tuesday night, the programming package has to be the one single program which catches their interest. While some of the programming on the international shortwave bands is excellent, the majority of state-sponsored programming is either far too political or otherwise deadly boring to vie for the attentions of these audiences. There has been no significant research done by overseas broadcasters to learn the kind of programming which might be of interest to the rather unique tastes of the North American public. North American audiences would probably love some of the BBC's comedy shows, if only they knew that they were as funny as Monty Python—but, unfortunately, they don't know about those programs. North American audiences also like rock music and would probably like to hear more of the local groups from various nations than programs on how alfalfa and soybeans are cultivated using modern implements. American station WRNO has the right idea—plenty of music!

It would be great to see North American audiences remember that in pre-TV days there was ample reason to spend many hours listening in on the shortwave voices of the world. The way it looks now, far too much of this programming is grossly underutilized. What with so much in the way of news taking place in the Middle East, Central America, and the Caribbean, you'd think that would be a sufficient "hook" to snag the North American audience; enough reasons for newspapers to run the frequencies to monitor. Despite all of the media talk of "Radio Free Grenada" last October, nobody ever told the public RFG's frequencies!

Readers are invited to offer comments on the various ways overseas broadcasters can increase their impact upon North American audiences.

COMMUNICATIONS SHOP

Advertising Rates: Non-commercial ads are 30 cents per word including abbreviations and addresses, minimum charge $6.00 per issue. Ads from firms offering commercial products or services are $1.00 per word, minimum charge $20.00 per issue. Leading key words set in all caps at no additional charge. All classified ads must be prepaid in full at time of insertion; a 5% discount is offered for prepaid 6 time insertions. All ads must be typewritten double spaced.

Approval: All ad copy is subject to Publisher's approval and may be modified to eliminate references to equipment and practices which are either illegal or otherwise not within the spirit or coverage scope of the magazine.

Closing Date: The 10th day in the third month preceding date of publication. Because the advertisers and equipment contained in Communications Shop have not been investigated, the Publisher of Popular Communications cannot vouch for the merchandise listed therein. Direct all correspondence and ad copy to: PC Communications Shop, 76 N. Broadway, Hicksville, NY 11801.

WORLD'S MOST UNUSUAL Communications Books! A large selection of outstanding titles covering scanners, "confidential" frequency registries, bugging, wiretapping, electronic surveillance, covert communications, espionage, monitoring, and more! New titles being added constantly! Ask for our large new FREE catalog. CRB Research, Box 56-PC, Commack, NY 11725.

US NAVAL RESEARCH creates computer program that pinpoints when frequencies are open. Free details. Good product. Base (2) Systems, 2534 Nebraska, Saginaw, MI 48601.

SATELLITE TV SPECIAL. TERRIFIC PICTURE QUALITY! DEXCEL/GOULD 100° SYSTEM with 2-year factory warranty, stereo capability, 9′ spun aluminum dish, polar mount, Polarotor I/control, 125′ cable and line, instructions. Compare at $1795.00. Order free price list today. VIDEOSAT, INC. 1-602-445-0383 P.O. Box 449, Prescott, AZ 86302.

SCANNER OPERATORS! Are you registered? Be assigned your own personal monitoring ID letters inscribed on beautiful 2-color bordered certificate. Thousands already registered! Only $5, ppd. from CRB Research, Box 56PC, Commack, NY 11725.

"ELECTRONIC BONANZA" Regency MX-3000 $219.95, HX-1000, HX-3000, MX-7000, CALL!!! BC-100 $288.49, BC-300 $359.49, Sony 2002 $249.95, Icom-R70 $639.95, R-1000 $409.95, R-2000 $499.95, R-600 $344.95, FRG-7700 $429.95, frequency directories, antennas, Panasonic RF-799, RF-B300, RF-B600, much, much more. Free UPS shipping to 48 states. Picture catalog $1.00 (REFUNDABLE). Galaxy Electronics, Box-1202, Akron, Ohio 44309 (216-376-2402) 9-5 EST.

CB RADIO MODIFICATIONS! Increase channels, range, privacy. Conversion hardware, books, plans, kits, repairs. Catalog $2. CBCI, Box 31500PC, Phoenix, AZ 85046.

WANTED: CASH PAID FOR USED SPEED RADAR EQUIPMENT. Write or call: Brian R. Esterman, P.O. Box 8141, Northfield, IL 60093, (312) 251-8901.

SIDEBAND OPERATORS! Join the oldest/largest network of 27 MHz SSB operators. Now more than 100,000 strong! Send self-addressed stamped long (#10) envelope for FREE details and application (no obligation). SSB Network, P.O. Box 908, Smithtown, NY 11787.

POLICE CODE UNSCRAMBLERS, lets you hear the coded messages of Police, Fire, and Medical channels; other scanner accessories. Satisfaction guaranteed; DNE, Inc. Rt. 7, Box 257B, Hot Springs, AR 71901 (501-623-6027).

RTTY FDM DEMODULATORS. Frederick 1202R, four models available: used, new, $50-$350. Call/write for full specifications. Electrovalue Industrial Inc., Box 376-PC, Morris Plains, NJ 07950. 201/267-1117.

MILITARY RADIO SET TYPE AN/PRC-47, 2 to 12 MHz, 10,000 channels, 20 or 100 watts output, operates on 24 VDC portable, base, or vehicular. Complete in original military shipping container with all accessories, checked, ready to use $400.00. For more details on this and other current military equipment, S.A.S.E. and $1 to Michael P. Murphy, 11621 Valle Vista Rd., Lakeside, CA 92040 (619) 561-2726.

POLICE ★ FIRE PATCHES, BADGES—all 50 states, discount scanners, crystals $2.94. Two stamps for free catalog. Dever Communications, P.O. Box 277, Hot Springs, AR 71901.

ARE YOU INTERESTED in English transmissions on shortwave? If yes, then the International Listening Guide is for you!! For information send 50¢ to I.L.G., P.O. BOX 3434, Littleton, CO 80161, USA.

DO YOU WANT INFORMATION on shortwave listening, shortwave clubs, shortwave DXing? For information send 50¢ to Shortwave, P.O. Box 3434, Littleton, CO 80161, USA.

WANTED, MILITARY SURPLUS RADIOS. We need Collins 618T, ARC-72, ARC-94, ARC-102, RT-712/ARC-105, ARC-114, ARC-115, ARC-116, RT-823/ARC-131, OR FM-622, RT-857/ARC-134 or Wilcox 807A, ARC-159, RT-1167 or RT-1168/ARC-164, RT-859/APX-72, APN-171, Collins antenna couplers type 490T-1, 490T-3, 490T-9, CU-1658A/ARC, CU-1669/GRC, 490B-1, 690D-1, CU-1239/ARC-105. Top dollar paid or trade for new amateur or SWL gear. Write or phone Bill Slep, 704-524-7519, Slep Electronics Company, Highway 441, Otto, NC 28763.

SURVIVAL! Tom Kneitel's new *National Directory of Survival Radio Frequencies!* Unique book reveals the 5,000 most required radio frequencies 179 kHz to 470 MHz. State police, forestry, CD, highway maintenance, fish/game disaster, EMS, military, flood control, Indian Reservations, Air/Army National Guard, fed/state prisons, ports/harbors/bridges, clear channel broadcasters, severe weather, and lots more. National & state-by-state listings. An absolute must for every Survivalist and concerned citizen. A concise/handy key to knowing what's going on around you during a disaster or crisis, or for listening right now to hear what's taking place behind the scenes. Only $7.95 by First Class Mail from CRB Research, P.O. Box 56, Commack, NY 11725.

CAN YOU: Trace anyone, anywhere, get unlisted telephone numbers, beat the lie detector and PSE, tail or ditch a tail, run driver's license, property, credit and personal record checks, open virtually any lock or safe in a few seconds? Do you know what device listens thru almost any wall, what exotic surveillance gear works and where to buy it at a savings of 30-500%, how to alter common objects into electronic surveillance gear, the 11 undetectable bugs, what (CIA) chemical lets you read thru envelopes, how to buy super cheap night vision devices, what countermeasures work and those that don't; how to defeat bug detectors, worldwide sources for exotic gear? One NBC reporter calls it "the most dangerous book ever published." *How To Get Anything On Anybody.* $29.95+ $4.00 handling. TOLL FREE 1-800-345-8112, in PA call 1-800-662-2444, or write: AW, Box 623, Holmes, PA 19043.

THE BOOTLEGGERS BIBLE. $12.95 and other CB Radio Books, Kits, Modifications. Catalog $1.00 refundable! APS, POB 263PC, Newport, RI 02840 (401) 846-5627.

NEW! JERROLD AND OAK CABLE CONVERTERS. Decoders. Catalog $1.00 Refundable With Purchase. APS, POB 263PC, Newport, RI 02840 (401) 846-5627.

RTTY RADIOTELETYPE FREQUENCY LISTS

2000 WORLDWIDE RADIOTELETYPE STATIONS by FREQUENCY... press, air, military, government, diplomatic, all utilities with calls, times, plus other information 3 to 30 MHZ. $12 POSTPAID

World Press Services Frequencies & Manual. All press services, frequencies and transmission times. BOOK with 3 LISTS...$8 ppd.

UNIVERSAL ELECTRONICS
4555 Groves Rd. (Suite 3), Columbus, OH 43227

CIRCLE 45 ON READER SERVICE CARD

SCANNER OWNERS eliminate the dead air between transmissions with easily constructed controller that connects between scanner and recorder. Plans $5. JFJ Projects, PO Box 152, Natrona Heights, PA 15065.

WESTERN WIRELESS Inc. (415) 372-8805 Military Surplus specialties. Phone for catalog. Radios and accessories available. Electronic equipment of various types. Technician specializes in repair. (415) 372-8805.

MILITARY RADIO AND COMMUNICATIONS. Surplus Unlimited. Western Wireless Inc. (415) 372-8805. Send $3.00 for catalog. 4840 Tahoe Circle, Martinez, California 94553.

WESTERN WIRELESS INC. (415) 372-8805 Surplus Unlimited - VRC, GRC, PRC, TRC, MRC, Surveillance - PPS, GSQ, Night Vision PVS, PAS. Phone for catalog.

"RAIL-SCAN" by Tom Kneitel. New scanner frequency directory! Largest & most comprehensive railroad industry communications directory ever! 4,200 frequencies, 863 major RR's, short lines, narrow gauge, government, miniature, movie, museum, scenic, industrial traction, mass transit lines, private car owners, RR police, car/locomotive builders & service companies, regulatory agencies, accident/emergency channels, RR addresses, trackage data, lots more. Only $7.95 (add $1 for 1st Class Mail). Order now or ask for free info. CRB Research, Box 56-PC, Commack, NY 11725.

CRYPTO PRGMS FOR COMMODORE-64 $49.95. Code & decode, codebreaking, high-speed machine lang. Disk only. Kalt & Associates, 3420 Telstar Circle, Anchorage, AK 99503.

ARMY FIELD RADIOS: genuine G.I. mainstays from Korea to Nam. PRC-10 Backpack Radio with Accessories, tunes 38-55 MHz FM: $39.50 apiece, $77.50/pair, good condition. CPRC-26 Canadian Portable Field Radio, tunes 42-54 MHz FM, 6 channels, with battery box, antenna, crystal: $22.50 apiece, $42.50/pair good condition. R-174 Receiver, tunes 1.5-18 MHz AM-CW-SSB military, shortwave, ham, aircraft frequencies: $47.50 mint, $27.50 good condition. R-108 Field/Vehicular Receiver, 20-28 MHz FM: $27.50 mint. VRC-7 Field/Vehicular Radio Set, includes RT-70 Transceiver, AM-65 Audio Amplifier, PP-282 Power Supply, antenna, vehicle mount, accessories, mint in original cartons: $137.50. ARC-27 Guard Receiver, single channel 220-250 MHz aircraft receiver: $12.50 mint. 45 Day Replacement Guarantee. Add $9.50 shipping-handling. $5 apiece postpaid items: Field Radio Techniques Manual; M-29 Microphone; H-113 Earphones. Baytronics, Dept. PC, Box 591, Sandusky, OH 44870.

CMJ-IF

MULTI-FUNCTION PLUG-IN CARTRIDGE

FOR

TRS 80C & TDP 100 COMPUTERS

PROVIDES

* TEXT TO SPEECH *

AN EXTENDER • 2 PARALLEL PORTS • 2 COUNTER/TIMERS
• 1 SERIAL COMM. LINE • SPEECH SYNTHESIS
• 4 OR 8K EPROM/ROM SPACE
• INTERFACE FOR *CMJ-TU *(CW, RTTY, SSTV, FAX) •

MAGNUM DISTRIBUTORS INC.

1000 S. DIXIE HWY. W. #3
POMPANO BEACH, FLORIDA 33060
TLX. 514365 305-785-2002

CIRCLE 116 ON READER SERVICE CARD

AD INDEX

Popular Communications magazine is a monthly consumer publication devoted to the user and prospective user of VHF Scanners, Short Wave Receivers, RTTY Receiving Equipment, Radar Detectors, Satellite TV, Sophisticated Telephone Devices and other related products. Our readers are intelligent, curious and eager to explore new ideas and products. To reach this dynamic audience with your advertising message, contact either Herb Pressman, or Arnold Sposato, at (516) 681-2922.

The Bearcat® DX1000 makes tuning in London as easy as dialing a phone.

Direct access keyboard tuning brings a new level of simplicity to shortwave radio. With the *Bearcat® DX 1000,* dialing in the BBC in London is as easy as dialing a telephone. And you can switch from the BBC to Peruvian Huayno music from Radio Andina instantly. Without bandswitching.

Featuring the innovative microprocessor digital technology made famous by *Bearcat* scanner radios, the *DX 1000* covers 10 kHz to 30 MHz continuously, with PLL synthesized accuracy. But as easy as it is to tune, it has all the features even the most sophisticated "DXer" could want. 10 memory channels let you store favorite stations for instant recall—or for faster "band-scanning" during key openings.

The digital display measures frequencies to 1 kHz, or at the touch of a button, doubles as a two time zone, 24-hour digital quartz clock. A built-in timer wakes you to your favorite shortwave station. Or, it can be programmed to activate peripheral equipment like a tape recorder to record up to ten different broadcasts—any frequency, any mode—while you are asleep or at work.

The *DX 1000* also includes independent selectivity selection to help you separate high-powered stations on adjacent frequencies. Plus a noise blanking system that stops Russian pulse radar interference.

There's never been an easier way to hear what the world has to say. With the *Bearcat DX 1000* shortwave radio, you have direct access to the world.

For the name of your nearest retailer dial toll-free... 1-800-SCANNER.

Frequency Range: 10 kHz to 30 MHz continuously. **Tuning:** Direct keyboard entry, selectable 3 or 24 kHz per revolution knob tuning, or manual step tuning in selectable 1-99 kHz steps. **Sensitivity:** 1.0 μV AM, 0.5 μV CW/SSB/FM, 1.6-30 MHz. **Image and IF Rejection:** 70 dB or more. **Memory:** 10 frequency capacity. **Frequency Stability:** Better than 100 Hz after warm-up. **Modes:** AM/LSB/USB/CW/FM. **AGC:** Selectable Fast/Slow release times. **Filter Bandwidths:** 2.7 kHz, 6 kHz and 12 kHz. **Filter Selection Independent of Mode.**

CIRCLE 24 ON READER SERVICE CARD

Bearcat® DX 1000
shortwave radio.

Direct Access To The World.

Electra

Electra Company
Division of Masco Corp. of Indiana

300 East County Line Road
Cumberland, Indiana 46229

NEW!

ICOM IC-745

A New Transceiver Worth Celebrating!

9 HAM BANDS! **GENERAL COVERAGE RECEIVER!** **16 MEMORIES!** **SCANNING!** **PASSBAND TUNING!** **VARIABLE NB & AGC!**

What's the celebration about? The IC-745 . . . a new all ham band HF transceiver with SSB, AM, CW, RTTY and an FM option . . plus, a 100KHz — 30MHz general coverage receiver.

And . . . the IC-745 has a combination of features found on no other transceiver at such an incredibly low price.

Compare these exceptional features:

- 100KHz — 30mHz Receiver
- 16 Memories
- Full function Metering with a built in SWR Bridge
- IF Shift and Pass Band Tuning
- 10Hz / 100Hz / 1KHz Tuning Rates with 1MHz band steps
- Optional Internal AC Power Supply
- Adjustable Noise Blanker (width and level)
- Continuously Adjustable AGC with an OFF position
- Receiver Preamp
- 100% Transmit Duty Cycle

Other Standard Features:

- 100 Watt Output Transmitter with exceptionally low IMD
- VOX
- Speech Compressor
- Tunable Notch Filter
- RIT and XIT
- All Mode Squelch
- Scanning
- ICOM System Compatibility

Optional Accessories:

- IC-PS15 External Power Supply
- IC-PS35 Internal Power Supply for the ultimate in Portability
- IC-2KL Linear Amplifier
- IC-SP3 External Speaker
- IC-MB12 Mobile Mounting Bracket
- IC-AT100 Antenna Tuner (100W)
- IC-AT500 Antenna Tuner (500W)
- IC-HP1 Headphones
- IC-EX241 Marker Module
- IC-EX242 FM Module
- IC-EX243 Electronic Keyer
- IC-FL52A 500Hz 455KHz CW Filter
- IC-FL45 500Hz 9MHz CW Filter
- IC-FL54 270Hz 9MHz CW Filter
- IC-FL53A 250Hz 455MHz CW Filter
- IC-FL44A 2.1KHz 455KHz SSB Filter
- IC-SM6 Desk Mic
- IC-HM12 Hand Mic

The IC-745 is the only transceiver today that has such features standard . . . the number of options and accessories available . . . and such a low price.

ICOM is ...*Simply the Best* in quality built ham equipment today. See the IC-745 at your local authorized ICOM dealer or contact ICOM for more information.

CIRCLE 57 ON READER SERVICE CARD

ICOM

The World System

ICOM America, Inc., 2112-116th Ave NE, Bellevue, WA 98004 **(206)454-8155** / 3331 Towerwood Drive, Suite 307, Dallas, TX 75234 **(214)620-2780**