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POPULAR COMMUNICATIONS

SEPTEMBER 1984 $1.95
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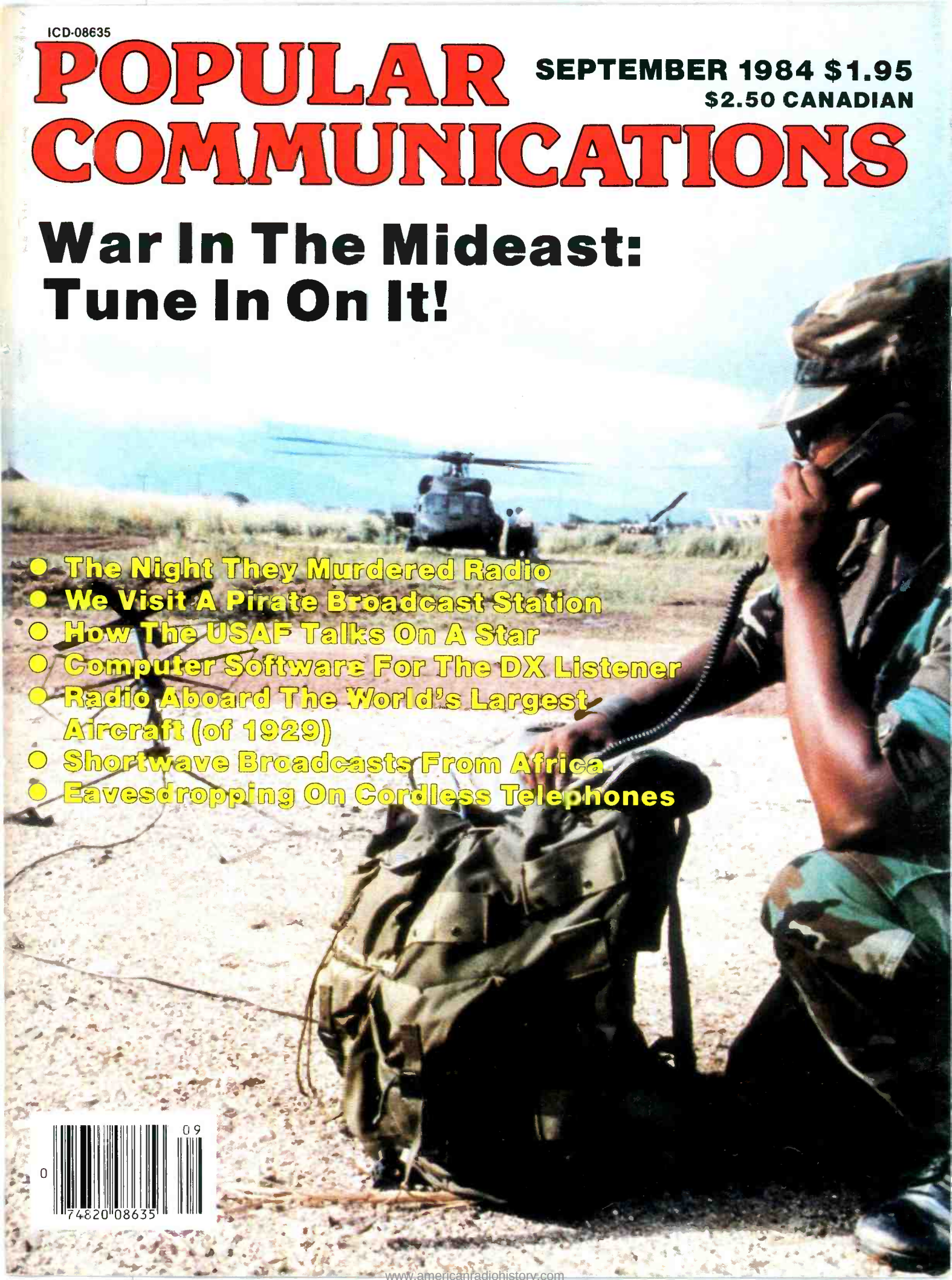
War In The Mideast: Tune In On It!



- The Night They Murdered Radio
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KENWOOD

...pacesetter in amateur radio

R-11 portable receiver

R-11

Kenwood's R-11 is the perfect "go anywhere" portable receiver. It covers the standard AM and FM Broadcast bands, plus nine additional short wave bands. The R-11's selectivity is greatly enhanced by the use of double-conversion on short wave frequencies above 5.95-MHz. High sensitivity coupled with a dual antenna system (telescopic and ferrite core) allow it to reach out and bring in those distant stations from all over the world.

Simplicity of operation is enhanced by a band-spread type tuning control. Electronic band switching, with LED band indicator, along with a tuning meter to indicate received signal strength, combine to provide you with superior listening capability. Safety Hold-Release switch prevents accidental station loss. Large front mounted speaker provides excellent sound quality. Tone switch adjusts for high, low and voice transmission.

Optional HS-7 micro-head phones allow for private listening pleasure.

All this along with a record output jack, external antenna terminal and a rugged and attractive carrying case make the R-11 portable receiver the perfect travel companion!

More information on the Kenwood receivers is available from authorized dealers of Trio-Kenwood Communications 1111 West Walnut Street, Compton, CA 90220.

CIRCLE 77 ON READER SERVICE CARD

R-2000 Top-of-the-line general coverage receiver • 150 kHz to 30 MHz • Ten memories • Dual 24-hr clock with timer • Scanning • 100-240 VAC (Opt. 13.8 VDC) • Opt. VHF (118-174 MHz converter).

R-1000 High performance receiver • 200 kHz–30 MHz • digital display/clock/timer • 3 IF filters • PLL UP conversion • noise blanker • RF step attenuator • 120-240 VAC (Optional 13.8 VDC).

R-600 General coverage receiver • 150 kHz–30 MHz • digital display • 2 IF filters • PLL UP conversion • noise blanker • RF attenuator • front speaker • 100-240 VAC (Optional 13.8 VDC).

SCANNER WORLD, USA

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

Special

The Regency D310

30 Channel Automatic/Programmable Scanner

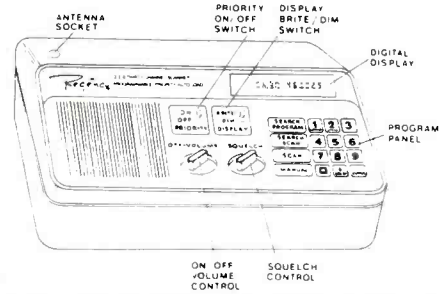
FEATURES

- ***30 Channels*** *For full coverage and easy selection.*
- ***No Crystals Required*** *Your choice of over 15,000 frequencies just by pushing a button.*
- ***6 Bands*** *Covers high and low VHF, UHF and UHF "T" plus two FM Ham Bands.*
- ***Search or Scan*** *Scan frequencies you have entered or search for exciting new frequencies.*
- ***Priority Control*** *Automatically overrides all other calls to listen to your favorite frequency.*
- ***Permanent Backup System*** *Memory requires no batteries. Capacitor saves frequencies entered up to one week during power outage or storage.*
- ***Dual Level Display*** *Selects brightness level of vacuum fluorescent digital display.*
- ***Channel Lockout*** *Skips channels not of current interest.*
- ***Scan Delay*** *Lets you set a delay so that replies to calls will be heard before scanning resumes.*
- ***Display Messages*** *Display flashes verbal messages to aid in programming.*
- ***External Speaker Jack*** *Standard connection allows use of external speaker.*
- ***AC or DC*** *Use at home or on the go. Both power cords included.*

Scanner World Price

$129.99

(plus 4.50 Shipping)



Suggested Factory List Price $259.95

The Regency D310 is a compact, programmable 30 channel, multi band, FM monitor receiver for use at home or on the road. It is double conversion, superheterodyne used to receive the narrow band FM communications in the amateur, public safety and business bands: 30-50, 144-174, and 440-512 MHz.

Sophisticated mircoprocess-controlled circuitry eliminates the need for crystals. Instead, the frequency for each channel is programmed through the numbered keyboard similar to the one used on a telephone. A "beep" acknowledges contact each time a key is touched. The D310 scans approximately 15 channels per second.

Any combination of two to thirty channels can be scanned automatically, or the unit can be set on manual for continuous monitoring of any one channel. In addition, the search function locates unknown frequencies within a band.

Other features include scan delay, priority and a bright/dim switch to control the brightness of the 9-digit Vacuum-Fluorescent display. The D310 can be operated on either 120VAC or 12VDC. One year warranty from Regency Electronics.

- ***Telescoping Antenna*** *Electronically optimized for all frequencies, included.*
- ***External Antenna Jack*** *Permits maximum reception range.*
- ***UL Listed/FCC Certified*** *Assurance of quality, American made design and manufacture.*

Optional Mobile Cigarette Lighter Plug (RGMPC. . . . 4.95)

REGENCY D310 *only*

$129.99

(plus 4.50 Shipping)

REGENCY D-310 30 Channel Digital	129.99(4.50)
REGENCY MA-506 Carry Case for HX-650 & H-604	12.99 (*)
REGENCY ACT-R-92AP Aircraft Crystal	119.99 (4.00)
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REGENCY R1050 AC 10 Chan. Programmable	116.99 (4.00)
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REGENCY Z-10 — 10 Channel Digital	146.99 (4.00)
REGENCY MX5000 All Band Scanner	369.99 (5.50)
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RCD Listen-In	38.99 (3.00)
REGENCY R106 AC/DC 10 Chan. HLU Crystal	96.99 (4.00)
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JIL SX-100 16 Channel Scanner	159.99 (4.00)
JIL SX-200 16 Channel Scanner	269.99 (4.00)
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BEARCAT BC-260 AC/DC Scanner	278.99 (4.00)
BEARCAT DX-1000 Shortwave Radio	499.99 (12.00)
BEARCAT 20/20 Digital Scanner	279.99 (4.00)
BEARCAT 220 Digital Scanner	249.99 (4.00)
BEARCAT 250 Digital Scanner	265.99 (4.00)
BEARCAT 100 Digital Hand-Held	284.99 (5.50)
BEARCAT 300 Digital Scanner	346.99 (5.50)
BEARCAT 201 Digital Scanner	194.99 (4.00)
BEARCAT 180 Digital Scanner	168.99 (4.00)
BEARCAT 210 XL Digital Scanner	224.99 (4.00)
BEARCAT 15 Crystal Scanner	126.99 (4.00)
REGENCY RH-250 High Band 2-way Radio	479.99 (5.50)
REGENCY Z100 watt High Band Amplifier	209.99 (4.00)
JIL SX-400 All Band DC Scanner	549.99 (12.00)

Uniden/President CB Radios - All Models in Stock

Fox & Whistler Radar Detectors - in Stock

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 with metal belt clip
- Set of 4 AAA Nickel Cadmium Batteries
- 6 Monitor Crystals (specify frequencies needed or wil will include certificates for unknown frequencies)
- Flexible Rubber Duckey Antenna
- AC Adapter & Charger

Scanner World Package Price

$109.99

(Plus $5.50 Shipping)

VISA MasterCard

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 4 weeks for bank clearance. Orders with cashiers checks or money orders shipped same day received. Prices, specifications and terms subject to change without prior notice. If items are out of stock we will backorder and notify you of delivery date. All shipments are F.O.B. ***Scanner World*** warehouse in Albany, NY. We are not responsible for typographical errors. All merchandise carries full manufacturers warranty. Bid Proposals and Purchase Orders accepted from Government agencies. Free full line catalogue available upon request. No minimum order. New York State Residents add 7% sales tax. Dealers send business letterhead for dealer wholesale information.

Shipping Charges

Add ($) per scanner, and $3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional $3.00 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, add $15.00 per scanner.

Scanner World, USA

10 New Scotland Ave, Albany, NY 12208

(518) 436-9606

CIRCLE 52 ON READER SERVICE CARD

NEW! uniden® Bearcat® Products

Communications Electronics,™ the world's largest distributor of radio scanners, is pleased to announce that *Bearcat* brand scanner radios have been acquired by Uniden Corporation of America. Because of this acquisition, Communications Electronics will now carry the complete line of Uniden *Bearcat* scanners, CB radios and Uniden *Bandit*™ radar detectors. To celebrate this acquisition, we have special pricing on the Uniden line of electronic products.

Bearcat® 300-E

List price $549.95/**CE price $339.00**

7-Band, 50 Channel • Service Search • No-crystal scanner • AM Aircraft and Public Service bands. • Priority Channel • AC/DC

Bands: 32-50, 118-136 AM, 144-174, 421-512 MHz.

The *Bearcat* 300 is the most advanced automatic scanning radio that has ever been offered to the public. The *Bearcat* 300 uses a bright green fluorescent digital display, so it's ideal for mobile applications. The *Bearcat* 300 now has these added features: Service Search, Display Intensity Control, Hold Search and Resume Search keys, Separate Band keys to permit lock-in/lock-out of any band for more efficient service search.

Bearcat® 20/20-E

List price $449.95/**CE price $269.00**

7-Band, 40 Channel • Crystalless • Searches AM Aircraft and Public Service bands • AC/DC Priority Channel • Direct Channel Access • Delay

Frequency range 32-50, 118-136 AM, 144-174, 420-512 MHz.

Find an easy chair. Turn on your *Bearcat* 20/20 and you're in an airplane cockpit. Listening to all the air-to-ground conversations. Maybe you'll pick up an exciting search and rescue mission on the Coast Guard channel. In a flash, you're back on the ground listening as news crews report a fast breaking story. Or hearing police and fire calls in your own neighborhood, in plenty of time so you can take precautions. You can even hear ham radio transmission, business phone calls and government intelligence agencies. Without leaving your easy chair. Because you've got a *Bearcat* 20/20 right beside it.

The *Bearcat* 20/20 monitors 40 frequencies from 7 bands, including aircraft. A two-position switch, located on the front panel, allows monitoring of 20 channels at a time.

Bearcat® 210XL-E

List price $349.95/**CE price $209.00**

6-Band, 18 Channel • Crystalless • AC/DC

Frequency range 32-50, 144-174, 421-512 MHz.

The *Bearcat* 210XL scanning radio is the second generation scanner that replaces the popular *Bearcat* 210 and 211. It has almost twice the scanning capacity of the *Bearcat* 210 with 18 channels plus dual scanning speeds and a bright green fluorescent display. Automatic search finds new frequencies. Features scan delay, single antenna, patented track tuning and more.

Bearcat® 260-E

List price $399.95/**CE price $249.00**

8-Band, 16 Channel • Priority • AC/DC

Frequency range 30-50, 138-174, 406-512 MHz.

Keep up with police and fire calls, ham radio operators and other transmission while you're on the road with a *Bearcat* 260 scanner. Designed with police and fire department cooperation, its unique, practical shape and special two-position mounting bracket makes hump mounted or under dash installation possible in any vehicle. The *Bearcat* 260 is so ruggedly built for mobile use that it meets military standard 810c, curve y for vibration rating. Incorporated in its rugged, all metal case is a specially positioned speaker delivering 3 watts of crisp, clear audio.

NEW! Bearcat® 201-E

List price $279.95/**CE price $179.00**

9-Band, 16 Channel • Crystalless • AC only Priority • Scan Delay • One Key Weather

Frequency range 30-50, 118-136 AM, 146-174, 420-512 MHz.

The *Bearcat* 201 performs any scanning function you could possibly want. With push button ease, you can program up to 16 channels for automatic monitoring. Push another button and search for new frequencies. There are no crystals to limit what you want to hear.

NEW! Bearcat® 180-E

List price $249.95/**CE price $149.00**

8-Band, 16 Channel • Priority • AC only

Frequency range: 30-50, 138-174, 406-512 MHz.

Police and fire calls. Ham radio transmissions. Business and government undercover operations. You can hear it all on a *Bearcat* 180 scanner radio. Imagine the thrill of hearing a major news event unfold even before the news organizations can report it. And the security of knowing what's happening in your neighborhood by hearing police and fire calls in time to take precautions. There's nothing like scanning to keep you in-the-know, and no better way to get scanner radio performance at a value price than with the *Bearcat* 180.

Bearcat® 100-E

The first no-crystal programmable handheld scanner.

List price $449.95/**CE price $234.00/*SPECIAL!***

8-Band, 16 Channel • Liquid Crystal Display Search • Limit • Hold • Lockout • AC/DC

Frequency range: 30-50, 138-174, 406-512 MHz.

The world's first no-crystal handheld scanner has compressed into a 3" x 7" x 1¼" case more scanning power than is found in many base or mobile scanners. The *Bearcat* 100 has a full 16 channels with frequency coverage that includes all public service bands (Low, High, UHF and "T" bands), the 2-Meter and 70 cm. Amateur bands, *plus* Military and Federal Government frequencies. It has chrome-plated keys for functions that are user controlled, such as lockout, manual and automatic scan. Even search is provided, both manual and automatic. Wow...what a scanner!

The *Bearcat* 100 produces audio power output of 300 milliwatts, is track-tuned and has selectivity of better than 50 dB down and sensitivity of 0.6 microvolts on VHF and 1.0 microvolts on UHF. Power consumption is kept extremely low by using a liquid crystal display and exclusive low power integrated circuits.

Included in our low CE price is a sturdy carrying case, earphone, battery charger/AC adapter, six AA ni-cad batteries and flexible antenna. The *Bearcat* 100 is in stock for quick shipment, so order your scanner today.

Bearcat® DX1000-E

List price $649.95/**CE price $489.00**

Frequency range 10 kHz to 30 MHz.

The *Bearcat* DX1000 shortwave radio makes tuning in London as easy as dialing a phone. It features PLL synthesized accuracy, two time zone 24-hour digital quartz clock and a built-in timer to wake you to your favorite shortwave station. It can be programmed to activate peripheral equipment like a tape recorder to record up to five different broadcasts, any frequency, any mode, while you are asleep or at work. It will receive AM, LSB, USB, CW and FM broadcasts.

There's never been an easier way to hear what the world has to say. With the *Bearcat* DX1000 shortwave receiver, you now have direct access to the world.

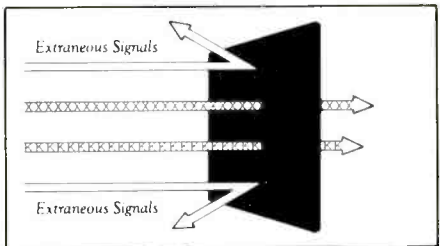
Uniden® PC22-E

List price $159.95/**CE price $99.00**

The *Uniden* PC22 is a 40 channel AM remote mobile CB radio. It's the answer for today's smaller cars which don't always provide adequate space for mounting. Since all the controls are on the microphone, you can stash the "guts" in the trunk. The microphone has up/down channel selector, digital display, TX/RX indicator and external speaker jack. Dimensions: 5¾" W x 7⅞" D x 1½" H. 13.8 VDC, positive or negative ground.

QUANTITY DISCOUNTS AVAILABLE

Order two scanners at the same time and deduct 1%, for three scanners deduct 2%, four scanners deduct 3%, five scanners deduct 4% and six or more scanners purchased at the same time earns you a 5% discount off our super low single unit price.



Both Bandit™ radar detectors feature E.D.I.T.,™ the Electronic Data Interference Terminator that edits-out false alarm signals.

Uniden® PC33-E

List price $59.95/**CE price $44.00**

The *Uniden* PC33 boasts a super-compact case and front-panel mike connector to fit comfortably in today's smaller cars. *Controls:* Power & Volume, Squelch; *Switches:* ANL. Other features of the PC33 include Graduated LED "S"/RF Meter, Digital channel indicator. Dimensions: 6" W x 6" D x 1⅞" H. ±13.8 VDC.

Uniden® PC55-E

List price $89.95/**CE price $59.00**

The full featured *Uniden* PC55 front-panel mike connector makes installation easier when space is a factor. It has ANL, PA-CB, Channel 9 and RF Gain switches. LED "S"/RF meter, TX lite, PA & external speaker jacks. Dimensions: 6" W x 6" D x 1⅞" H. ±13.8 VDC.

Bandit™ Radar Detectors

Now that everyone else has taken their best shot at radar detection, the Uniden Bandit™ has done them one better...with E.D.I.T.,™ the Electronic Data Interference Terminator that actually edits-out false alarm signals.

The Bandit 55, features a convenient brightness/dimmer control for comfortable day or night driving, plus a handy highway/city control for maximum flexibility wherever you drive. The Bandit 95 Remote, is a two-piece modular unit that lets you mount the long-range radar antenna behind the grill, out of view. The ultra-compact control unit can then be inconspicuously tucked under the dash or clipped to the visor. Order **Bandit 55-E** for $119.00 each or the **Bandit 95-E Remote** for $139.00 each.

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FB-W-E Frequency Directory for Western U.S.A. ... $12.00
BC-WA-E Bearcat Weather Alert™ ... $35.00
A60-E Magnet mount mobile antenna ... $35.00
A70-E Base station antenna ... $35.00

Add $3.00 shipping for all *accessories* ordered at the same time. Add $3.00 shipping per scanner antenna.

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To ***get the fastest delivery from CE*** of any product in this ad, send or phone your order directly to our Scanner Distribution Center.™ Michigan residents please add 4% sales tax or supply your tax I.D. number. Written purchase orders are accepted from approved government agencies and most well rated firms at a 10% surcharge for net 10 billing. All sales are subject to availability, acceptance and verification. 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. A $5.00 additional handling fee will be charged for all orders with a merchandise total under $50.00. Shipments are F.O.B. Ann Arbor, Michigan. No COD's. 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. Non-certified checks require bank clearance.

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CIRCLE 33 ON READER SERVICE CARD

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POPULAR COMMUNICATIONS

SEPTEMBER 1984 **VOL. 3, NO.1**


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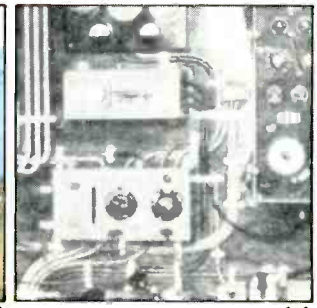
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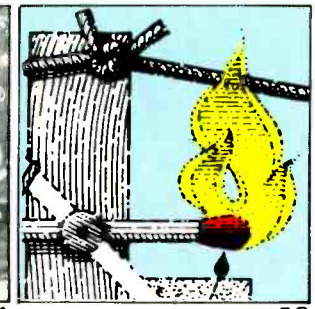
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FEATURES

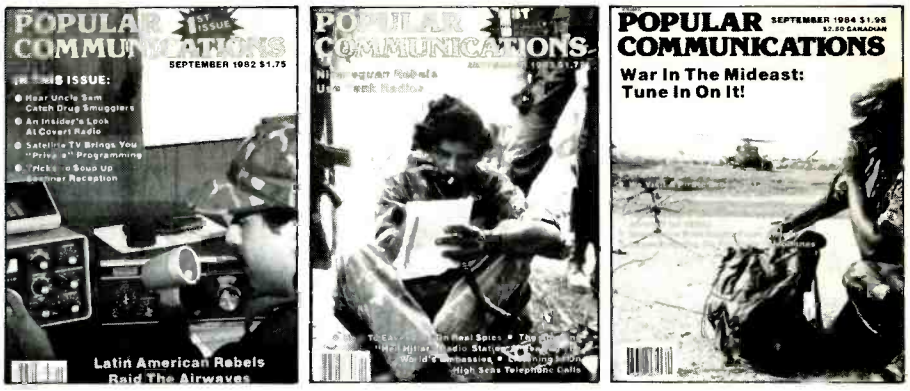
This month's cover: *Courtesy of the Department of Defense.*

DEPARTMENTS

BEAMING IN

AN EDITORIAL

BY TOM KNEITEL, K2AES



Starting Our Third Year

This issue marks the start of *POP'COMM*'s third year of publication and gives us an opportunity to look back over what we've accomplished as well as a chance to look forward to where we are heading. We have been lucky in so many ways that it's difficult to see just how well the timing was for a publication such as ours. I suppose you might say that it was an idea whose time had come, and we were there (on time) with the right concept and combination of talented authors, with the enthusiastic support of many areas of the monitoring industry and, of course, the support of the readers we had hoped would like the magazine.

After several years of publication, most magazines seldom look very much like their early issues. Ideas which seemed viable at first have been discarded and there are often major changes in the editorial approach and content. *POP'COMM* has added some topics that were requested by our readers, but most items we had incorporated into our early issues are still being covered.

In recent months, our publication's circulation has been expanded into Canada, into many chain and convenience stores in the United States, and subscriptions have been pouring in from throughout the world. It's been especially gratifying to read the very complementary letters that have also arrived at the offices here; in the many years I've been in the field of electronics publishing I can't recall any publication with which I've been associated that has received such encouragement from its readers.

There is little left to do at this point other than to thank each and every one of you who has written in your thoughts and suggestions, sent in stories and articles, contributed photos and station loggings to our columns—and to promise you that as *POP'COMM* enters its third year of publication we will continue to do our best to bring you an interesting and useful publication.

Specifics

In reviewing the reader mail and comments which have come in since we began publication in September of 1982, I think that it has been a pleasant surprise to find that those columns which we anticipated as being especially popular have more than surpassed our expectations—Communications Confidential, Scanner Scene, and Listening Post. We were also happy to note that the Pirates Den column (formerly Free Radio Focus) has been extremely popular, although a bit on the controversial side.

Readers did regularly request coverage of at least one monitoring area which we had not included in our initial concept of *POP'COMM*—the AM and FM broadcast stations. We recently added the Broadcast Topix column to tackle those stations.

On an overall basis, I would say that we have successfully met one of our early objectives—that being to focus attention on broadcast and communications monitoring and point out that it is a viable and vital independent pursuit of the highest calibre. For many years it had annoyed me to be constantly reminded that those who were monitors were generally considered to be pre-Novice Class Amateur Radio Operators who were biding their time until they could figure out how to become licensed hams. One alternative view was that of listeners being persons who had to settle for monitoring because they had already tried, failed, and given up on becoming ham operators. It may well be that there is a portion of the listening hobby which incorporates folks from these "camps," but I think, for the most part anyway, that monitoring is an end unto itself (notwithstanding an interest or lack of interest in ham radio, CB, or any other aspect of communications). Actually, it has been both interesting and gratifying to note that *POP'COMM* has sparked an interest in monitoring and scanners from many active hams who never before had any special motivation to tune their receivers on frequencies away from their favorite operating bands!

POP'COMM continues to grow in its coverage and also distribution and we have more than a few surprises up our sleeve for the future! PC

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NATIONS LEADING SHORTWAVE EQUIPMENT SUPPLIER

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- ***EEB*** offers more options and modifications to tailor your receiver to your needs.
- ***EEB***'s skilled technicians know the R71A inside and out; and offer many optional improvements.
- ***EEB*** doubles your warranty: 90 days ICOM/90 days ***EEB***, so you are covered a full 6 months!
- ***EEB*** is an authorized ICOM Service center. We take better care of you.

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- 32 Memories
- Memory Back-Up
- Scanning Frequencies & Memories
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- Wide Dynamic Range

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OPTIONS

CK-70	12 Volt DC Kit	$9.95
CR-64	High Stability Osc.	$56.00
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CIRCLE 27 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.

Information Galore

I'm an avid scanner enthusiast and have a keen interest in a wide assortment of radio services. What I'm lacking is a competant scanner frequency registry for my area, having been more than disappointed with the last few editions of *Police Call*.

Sam Martin, KOH8TA
Toledo, OH

We saw a really good scanner frequency directory covering northwest Ohio and southeast Michigan, 16 counties in all. It has scads of law enforcement, fire, industrial, and other various radio services of interest. This directory is published by Daryll Symington, N8EBR, Midwest Software Services, P.O. Box 399, Holland, OH 43528 and looks to be far more comprehensive and useful than a number of others we've seen. Check with the publisher regarding price and availability of the latest edition (enclose a self-addressed stamped envelope for reply). —Editor

A Matter Of Policy

What is *POP'COMM*'s policy relating to the use of the names of persons whose letters or articles you publish? Some folks would like to rather freely express their opinions on certain matters or else pass along some juicy frequency or station data but may hesitate because they don't wish to have their names made public. I have some frequency data to pass along but I hesitate because I'm not looking for publicity.

(name withheld by request)
Newport Beach, CA

It's always been our policy to avoid causing our readers unwanted attention from those whom it might not be appreciated. Letters and stories continually arrive here with the request that if they are published the sender be identified with a pseudonym or with no name at all. We always honor such requests, and even if the sender does not ask for such consideration we use our own judgment as to the amount of specific identification data we will run—although we do require a complete name and address for our own files. In any event, readers who might wish to write to us and avoid the possibilities of our printing their letters are asked to clearly mark their letters "Not for publication." Unless so marked, we generally regard all letters sent to us as being intended for possible publication. About the only letters that are usually ignored here are those which arrive unsigned or without any return address, or those which demand or dare us to print their contents. —Editor

Filling Us In

Several weeks ago I had dental work done and ever since then I've been hearing the Kansas City Mobile Telephone Operator and it's coming from somewhere inside my mouth. I hear the operator's voice, the numbers ringing, the people talking to one another. It goes on day and night and it's driving me up a wall. What can I do to get rid of these annoying telephone calls?

Everett Harrison
Kansas City, MO

Get an unlisted mouth. —Editor

Time For A QSL?

After I read *POP'COMM*'s great story on WWV I tuned to the station and began taking advantage of the various services it offers. Also, I sent for and received a WWV QSL card. While exploring the frequency adjacent to WWV, I also noted station RID just slightly higher in frequency than WWV. What and where is this station?

Jim Parisi
Spartanburg, TN

RID is a Russian standard time station located in Irkutsk, running 1 kW on 5004, 10004, and 15004 kHz. On their 15 MHz channel they operate the third and fourth Tuesday of each month from 0000 to 0800 GMT. It's very doubtful that you'll ever extract a QSL from RID, but if you want to take a shot at it the station is operated by The State Committee of Standards of The Council of Ministers of the USSR, 9 Leninsky Prospect, 117049 Moscow M-49, USSR. Try a prepared reply card—you might be the first to luck out with this one! —Editor

A Quack In The Voice?

I've got a definite problem with my receiver. My receiver is a good one and it's been in use for five years. It has developed a quirk which has driven me batty and nobody has been able to offer any reasonable solution. Voices sound scratchy and squawky on it, and music sounds raspy. That's the best way I can describe what it's doing. The circuits have been checked out and everything seems to be up to snuff. The funny thing is that when I use my headset the problem vanishes, but the rest of the time it's quack, quack, quack!

E.W. Wilkerson, Jr., KME1KR
Bar Harbor, ME

Looks like you've taken a sensible approach by having the circuits checked, but the clue to the problem most likely lies in the fact that the set works okay with the headset. My suspicion is that the speaker itself is your problem and since you didn't mention that it was checked out I would look therein. Service technicians often check out speakers by using a flashlight cell to see if the speaker makes a "pop," but this quickie-check isn't sufficient for your annoying problem. Try disconnecting your present speaker and hooking up another speaker. Many sets use a 4-ohm universal replacement speaker in the 4-inch size, but any similar speaker should be good enough for your purposes. If the sound clears up, then install a new speaker. Rip the cone out of the old one and give the frame to the kids to play with; it has a rather potent magnet in it. —Editor

Rumors Are Flying

Are you aware of the information (or rumors) circulating to the effect that there is a "numbers" transmission station located at the U.S. Army facility in Warrenton, Virginia? Have you data to confirm this?

(name withheld by request)
Annapolis, MD

A chap claiming to be the person who made this discovery called me on the 'phone last June and attempted to convince me of his triumph, and I understand he has made similar calls to several persons writing columns for DX clubs. He had little to say that was especially convincing, however my own sources indicate that he was actually close—but not quite directly on the nose. While the entrance to the Army facility is about as close as an unauthorized person can get to the numbers transmitter, the transmitter itself is not exactly located right at the Army facility in Warrenton, but it's nearby. —Editor

Tall Tale

I have always understood that all tall structures are required to have flashing red lights installed to warn aircraft. There is a broadcast tower in a local suburb which has no lights. Why?

Fred Klein
Chicago, IL

The rules for such warning lights are established by the FAA and they affect any tower, building, smokestak, or skeletal structure which is more than 200 feet in height. Not only must such structures be properly lit, but (in addition) skeletal structures (such as radio towers) must be painted with a distinctive pattern as an added safety precaution. Also, under certain conditions (depending upon the proximity of the structure to an airport), warning lights may be required on structures less than 200 feet tall. After a building permit is granted, the FAA will routinely conduct a study to see if a proposed structure will interfere with aircraft landing or takeoff patterns at any nearby airports. Some radio towers and other structures are designed to be slightly under 200 feet in height in the hope of avoiding these regulations; I'd guess that the tower you saw is less than 200 feet in height and not located near an airport. —Editor

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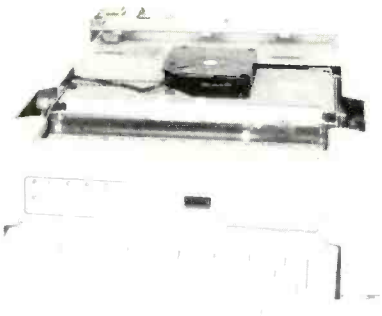

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CIRCLE 26 ON READER SERVICE CARD

Shortwave From The Persian Gulf War

Have You Heard? Half Of The Battle Is Via Broadcasting!

BY GERRY L. DEXTER

Take a moderate amount of modern weaponry, a hefty helping of religious fanaticism, stir well in oil and you have war in the Persian Gulf!

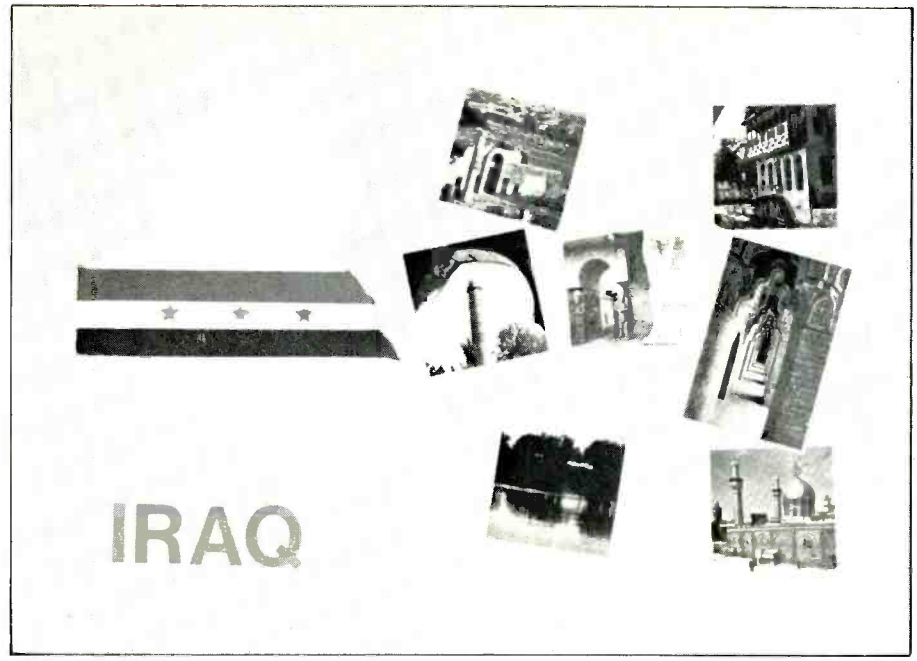
Although the Iran-Iraq conflict has been waxing and waning for nearly four years now, it took a decidedly dangerous detour late this spring when both countries began to attack oil tankers operating in the Persian Gulf. The gulf bottoms out at the Strait of Hormuz, the gateway through which shipping must pass to feed the west its supply of oil from this area.

Iran's Kharg Island oil terminal is the center of this attention, with Iraq attacking tankers at or headed for the island and Iran answering back with their own air attacks, threatening to close the Strait of Hormuz to all shipping if attempts to cripple Khomeini's ability to get his oil to market are successful. As this is written, Iraq is saying they'll soon have the necessary weapons to destroy the island's installations completely.

Iran fights the war virtually alone, backed only by Libya (surprise!) and Syria among the major area powers—and the Syrians seem to be having some second thoughts. Nearly everyone else, including the Soviet Union and the United States, leans to one degree or another to Iraq's side in the conflict. The gulf states dread the prospect of an Iranian victory, for it would mean the further spread of Khomeini's fundamentalist Shiite brand of Islam. The gulf states, run by Sunni Moslems, a more liberal sect, want no part of Khomeini's fire and brimstone.

Although Saudi Arabia and the other nations of the area are working as deftly as they can to find some sort of diplomatic approach that would at least halt the air war against the tankers, there seems little indication at present that the war itself will end anytime soon. Khomeini is determined to overthrow Iraqi president Saddam Hussein. As one expert put it, Khomeini wants Hussein's head on a platter. Next-door nations as well as the superpowers would probably consider it a considerable achievement just to keep the war

Baghdad's colorful folder QSL.



confined to ground campaigns between the two major players rather than allowing the conflict to spread to the point where it involves other countries in the region or, worse yet, the super powers themselves. Even so, area nations are building up their defenses as best they can and preparing "worst case" scenarios.

Shortwave listeners, of course, have an opportunity to tune in directly on who's saying what about whom in the gulf conflict. But following the propaganda and the battle reports from the area takes a little bit of doing if you live in North America. Radio stations of the gulf area are more difficult to hear with clarity than the biggies of Europe. It's not impossible by any means. But it's no snap either.

For one thing, there isn't a lot of English language programming coming out of the gulf. The North American audience isn't very high in the speaking order of broadcaster's attention. Much of the English which is aired comes on at inopportune times and frequencies, even those broadcasts which are supposedly directed at North America. It takes some careful tuning and even more careful listening in order to follow the action on your shortwave receiver.

Here's our *POP'COMM* survey of what's on from the gulf, and when and where to find it.

Iran

"War is ugly, but to be dominated by aliens is even uglier." That's the slogan on the QSL card being sent out by Iranian radio and it probably speaks as well as anything could of Khomeini's determination to have his victory over Hussein no matter what the cost. The Voice of the Islamic Republic of Iran (VOIRI) (the television version is "Vision of . . .") operates on a virtual non-stop basis on shortwave, but there's only one hour per day in English. That runs from 1930 to 2030 GMT on 9.022 and 11.930. 9.022 will occasionally vary to 9.023. The station also carries one hour segments in Spanish, Pashto, Urdu, Russian, Armenian, German, French, Turkish, and Bengali. The rest of the schedule is in Persian (Farsi). 15.084 (varying to 15.085) is listenable much of the day and evening, often with very good strength despite reports of jamming by Iran. Other Iranian frequencies are 3.775, 15.260, and 17.730.

VOIRI is in the process of expanding and upgrading their broadcasting facilities. This includes the introduction of a new "Prophet's Mission" shortwave transmitter, reportedly a 500 kilowatt job which was built to combat what Iran termed "evil propaganda" directed at Iran from the outside. In May, listeners began noting a new Iranian outlet on 4.990 and it may be that this is part of the new Iranian installation.

Even with the rise of Khomeini through the hostage crisis, despite the hatred manufactured toward the United States, the Voice of the Islamic Republic of Iran has remained an excellent verifier of reception reports.

Iraq

Radio Baghdad carries English beamed to Europe from 2130 to 2230 on 9.745, and it is often received in this country. For North America, English is aired at 0300 to 0400 on 21.585, far from being the best frequency choice at that hour. Other languages are Urdu, Hebrew (to Israel), Farsi (to Iran), in addition, of course, to Arabic.

Iraq's domestic "Voice of the Masses" service runs a 24-hour-a-day schedule on shortwave on various frequencies at different times. Check 3.367, 6.095, 7.180, 7.240, 7.215, 9.505, 9.520, 9.555, 9.570, 9.665, 9.745, 11.700, 11.790, 11.815, 13.700, 15.200, 15.400, and 21.585. These broadcasts are all Arabic. Frequencies tend to vary. Powers range anywhere from 50 to 500 kilowatts.

Baghdad's facilities also carry anti-Khomeini clandestine broadcasts including the "Free Voice of Iran" and "Radio Iran." "Free Voice" is on daily at 0300, with "Radio Iran" following an hour later; try 3.367, 7.180, 9.580, and 11.765. Again, these frequencies are quite variable and reception in the United States of these broadcasts is rare to non-existent. No English is carried on these broadcasts.

Iran has attacked some of the Iraqi radio and television installations as part of their war effort, but Iraqi broadcasting efforts have been fairly consistent despite finding themselves as military targets.

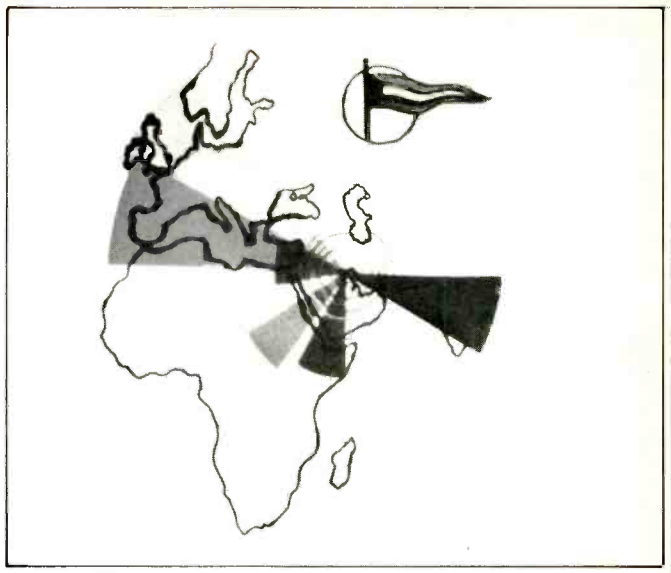
At one time, Baghdad said they were issuing QSL cards to commemorate the war, but cards received in response to reports didn't appear to be commemorating anything other than one's reception of the station.

Kuwait

Radio Kuwait, which started service 33 years ago using a single 500-watt transmitter, has grown to be something of a power broadcast voice in the gulf area. The station airs six services, although not all of them are carried on shortwave channels. Radio Kuwait has two, 500-kilowatt transmitters and is adding two more to go along with its four 250-kilowatt units which it has had in service for some time.

Radio Kuwait airs six hours of English each day in two broadcast segments. The first is from 0500 to 0800 on 15.345, with the second half of the schedule aired at 1800 to 2100 daily on 11.675. Radio Kuwait is well-known for its endless variety of musical fare including rock, disco, country-western, folk, Top Ten, jazz, and many others.

The domestic service from Radio Kuwait airs at 0225 through 2215 (later during Ramadan, the Muslim holy month); Check



Radio Kuwait also uses a folder QSL card.

one or more of the following frequencies: 9.750, 9.840, 9.880, 11.990, 15.110, 15.495, 17.650, 17.850, and 21.545.

In addition, Radio Kuwait broadcasts in Urdu and Farsi.

Oman

Radio Oman carries two hours of English each day at 0900 to 1100 on 9.735 and 11.890 with newscasts at 0900 and 1030. Other Omani frequencies are 9.510 and 9.655. Other than English, the rest of the schedule is in Arabic. Transmitter powers are mostly 100 kilowatts, although 11.890 is listed for just 50 kilowatts.

Although there is a BBC Relay station on Masirah Island off Oman's coast, this slave facility won't carry any programming of its own and will pay no more attention to the conflict in the area than does the BBC itself.

Qatar

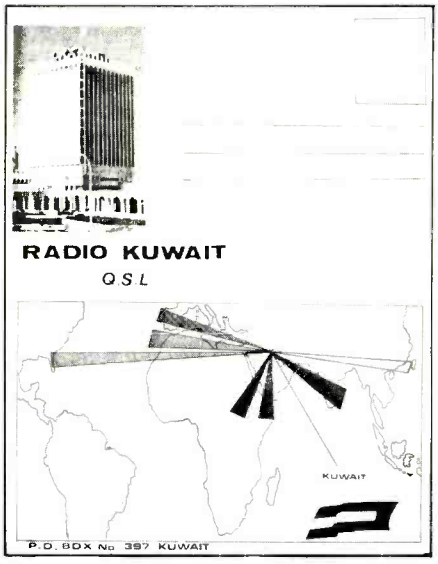
The Qatar Broadcasting Service has English programming, but it's only on local FM outlets. The shortwave, unfortunately, is Arabic only—don't ask us why. Listeners here are stuck with having to say "Yes, I can hear Qatar" and letting it go at that, unless you happen to speak the language.

Broadcasting runs from 0245 to 2130 on 9.570, 11.740, 11.885, 17.910, and 21.525. Not all of these frequencies will be in use at the same time. Their 23-note interval signal on a stringed instrument may help you identify the station. Transmitters are 250 kilowatts.

Saudi Arabia

The Broadcasting Service of the Kingdom of Saudi Arabia (BSKSA) offers external service programming in Farsi, Turkish, French, Indonesian, Bengali, Urdu, Turkmeni, Swahili, Somali, and Bombara, as well as in English and Arabic.

You can hear English programming from Riyadh from 1000 to 1300 and at 1700 to 2100 on 11.855 for both time segments.



Kuwait also sent this folder card.

The Holy Koran service airs in Arabic from 0500 to 1000 on 11.730, 15.335, 21.455, and 21.545; also from 1900 to 2100 on 7.250 and 11.685. Transmitter powers range from 50 to 350 kilowatts.

Saudi Arabia, the dominant force in the area, is a principal backer of Iraq and may be an especially good target for your monitoring efforts. 11.855 is often heard fairly well in the United States.

Syria

Syria isn't on the Persian Gulf, but the Syrians are an important factor in what happens along those shores just the same. One of shortwave's small mysteries is "What happened to Syria?" The Broadcasting Service of the Syrian Arab Republic hasn't been heard on the shortwave broadcast bands since about 1977, an odd situation when one considers Syria's role in Lebanon and the gulf. Whatever the reason, the eight year silence is apparently coming to an end, if it hasn't already. Syria is supposed to come back with a vengeance, 500 kilowatts' worth. The initial schedule is reportedly from 0300 to 0700 on 9.505, 0700 to 1500 on 15.215, and 1500 to 2400 back on 9.505. We've no idea at this point whether the broadcasts will include any English, although English (along with several other languages) used to be part of the shortwave offerings from Syria. Keep an ear on the above frequencies and you may be rewarded one of these days.

United Arab Emirates

UAE Radio and Television at Dubai has one of the more extensive English languages schedules out of the gulf area. Check from 0330 to 0400 on 9.595, 11.730, and 15.435; also at 1030 to 1100 on 17.795, 21.655, and 21.695; 1600 to 1700 on 11.955, 15.300, and 15.320; and, from 0500 to 0600 on 15.435 and 21.700. On the weekends, English programming will often run longer than the segments mentioned here.

RCTV's English programming consists of relays of their domestic service on FM. The station says this is due to a lack of studio space with which to produce English programming tailored for a shortwave audience. New studios are being built however, so eventually that will change. The mostly odd broadcasting hours from a North American audience's standpoint is also blamed on having to "take what comes when it comes" from the local FM service. RCTV Dubai recognizes the problem and we probably wouldn't be out of line to expect changes in the hours for English broadcasts once they've corrected these problems.

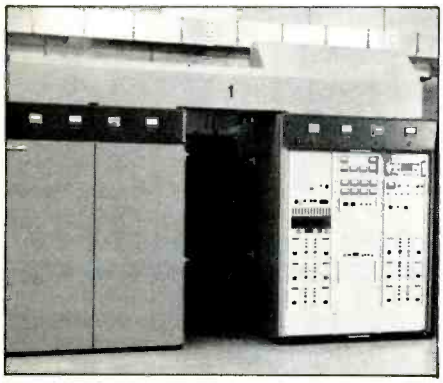
Other programming from RCTV Dubai is in Arabic, aired from 0230 to 2050 on one or more of the following frequencies: 11.955, 15.325, 17.775, 17.830, 21.655, and 21.700.

Three 300-kilowatt transmitters are located some miles out in the desert and a fourth transmitter is to be added. Transmitters are fully automated for use on any of the 22 fre-

This QSL from Syria represents an old logging. Though not on shortwave now, Syria is supposed to return. (Courtesy of Al Muick)

English Broadcasts from the Arabian Gulf

Time (GMT)	Station	Frequency
0300-0400	Iraq	21.585
0330-0400	UAE/Dubai	9.595, 11.730, 15.435
0500-0800	Kuwait	15.345
0500-0600	UAE/Dubai	15.435, 21.700
0800-1100	UAE/Abu Dhabi	9.695
0900-1100	Oman	9.735, 11.890
1000-1300	Saudi Arabia	11.855
1030-1100	UAE/Dubai	17.795, 21.655, 21.695
1600-1700	UAE/Dubai	11.955, 15.300, 15.320
1700-2100	Saudi Arabia	11.855
1800-2100	Kuwait	11.675
1930-2030	Iran	9.022, 11.930
2130-2230	Iraq	9.745



One of the high power transmitters of Radio Color Television Dubai in the United Arab Emirates.

quencies and can be pre-programmed for frequency, antenna arrangement, and transmission schedule.

The station is a very friendly one and welcomes reception reports.

Less often heard is the Voice of the United Arab Emirates from Abu Dhabi, which operates a single 250-kilowatt transmitter on 9.695. English is scheduled from 0800 to 1100, Arabic from 1600 to 2130.

Unfortunately, the pickin's are fairly slim from the Persian Gulf. But consistent tuning and careful listening should net you all of the stations and some interesting "copy" in the way of news reports and propaganda. It might not be a bad idea to have a tape recorder at the ready when tuning in to these broadcasts. It could prove beneficial in being able to replay the broadcasts for greater understanding. And, who knows? You might even capture an important announcement or news item.

The Iran-Iraq war has been going for almost four years now. Neither side seems willing to give an inch. Both seem determined to achieve victory. It seems a safe bet, therefore, that there is presently no end in sight and you'll have plenty of opportunities to tune in on the war in the gulf. PC

Where To Write To Gulf Broadcasters

Iran:
Voice of the Islamic Republic of Iran
International Affairs Department
P.O. Box 98-200
Tehran
Islamic Republic of Iran

Iraq:
Iraqi Broadcasting and TV Establishment
Radio Baghdad
Salihiya
Baghdad
Republic of Iraq

Kuwait:
Radio Kuwait
Kuwait Broadcasting Service
P.O. Box 397
Kuwait

Oman:
Radio Oman
Ministry of Information
P.O. Box 600
Muscat
Sultanate of Oman

Qatar:
Qatar Broadcasting Service
P.O. Box 3939
Doha
Qatar

Saudi Arabia:
Broadcasting Service of the
Kingdom of Saudi Arabia
Ministry of Information
Riyadah
Kingdom of Saudi Arabia

Syria:
Syrian Broadcasting and Television
Organization
Place des Ommayades
Damascus
Syrian Arab Republic

United Arab Emirates:
UAE Radio & TV
P.O. Box 1695
Dubai
United Arab Emirates

Voice of the United Arab Emirates
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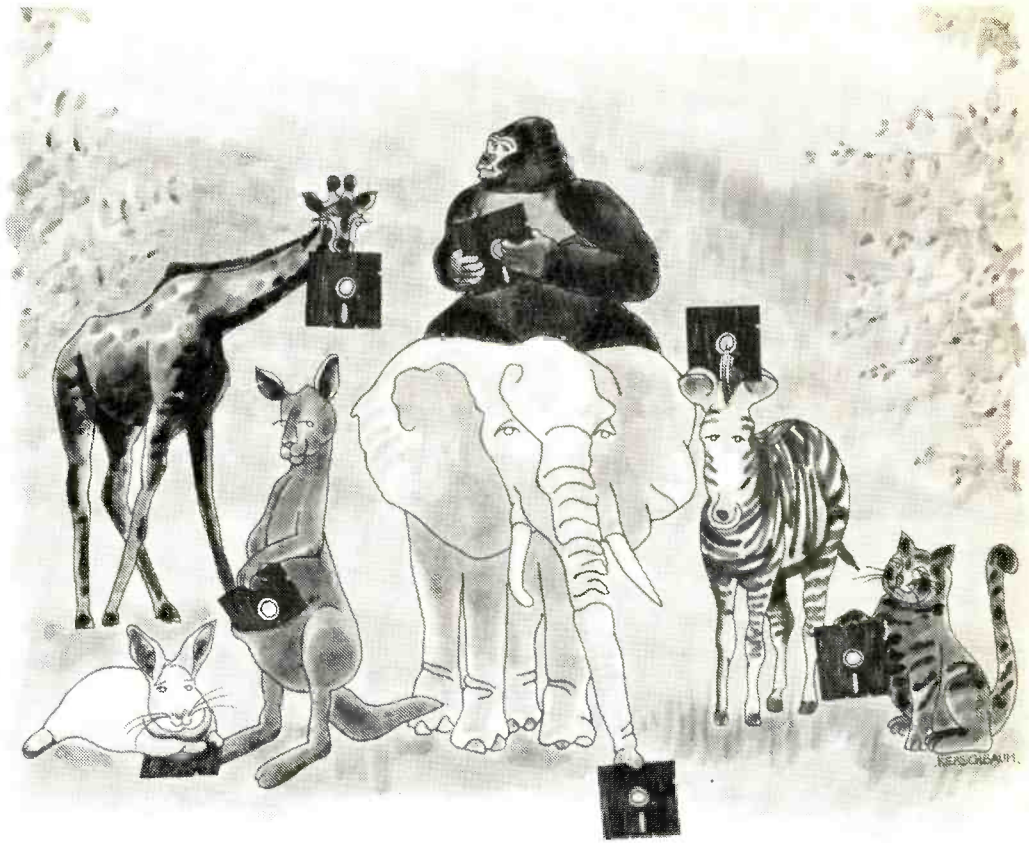

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8" SSSD Shugart Compatible, 32 Hard Sector	———	———	F31A-P	1.79	———	———	———	———
8" SSDD IBM Compatible (128 B/S, 26 Sectors)	———	———	F131-P	1.89	———	———	8SSDD-P	2.39
8" DSDD Soft Sector (Unformated)	———	———	F14A-P	2.09	———	———	8DSDD-P	2.89
8" DSDD Soft Sector (256 B/S, 26 Sectors)	———	———	F144-P	2.09	———	———	———	———
8" DSDD Soft Sector (512 B/S, 15 Sectors)	———	———	F145-P	2.09	———	———	———	———
8" DSDD Soft Sector (1024 B/S, 8 Sectors)	———	———	F147-P	2.09	———	———	8DSDD-1024-P	2.89
5¼" SSSD Soft Sector w/Hub Ring	6431-P	1.14	M11A-P	1.19	———	———	———	———
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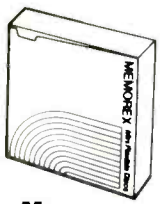

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2882D-P	1.59
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———	———
3481-P	1.59
———	———
———	———
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3491-P	2.19
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———	———
———	———
———	———
51401-P	1.59
———	———
524D2-P	1.99
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F2D-S-P	2.89
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———	———
F2D-S1024-P	2.89
———	———
———	———
———	———
M1D-S-P	1.59
———	———
———	———
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M2D-S-P	2.19
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FD2D-1024-P	2.89
———	———
———	———
———	———
M01D-P	1.59
———	———
———	———
———	———
M02D-P	2.19
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800839-P	3.14
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801187-P	1.94
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CIRCLE 63 ON READER SERVICE CARD

Radio Aboard Germany's Flying Miracle Of 1929

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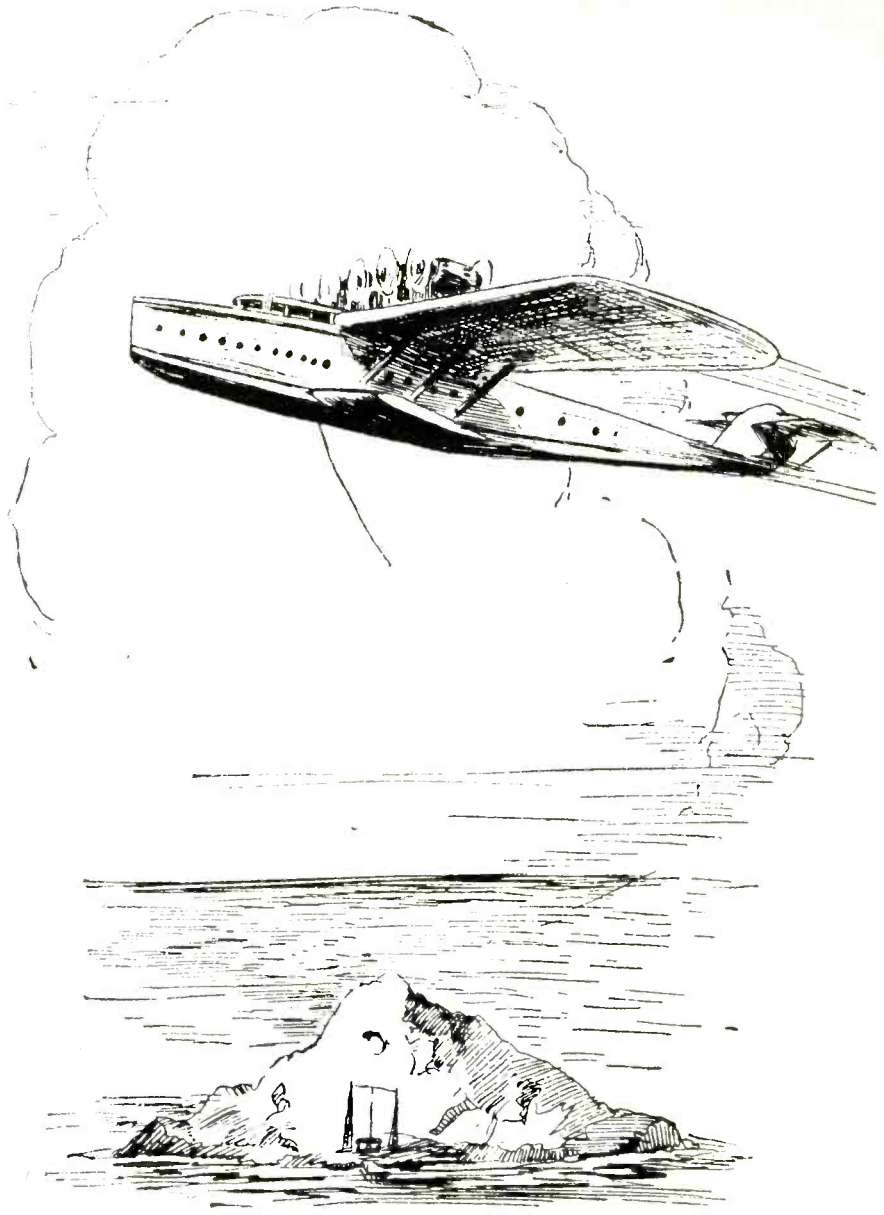
BY TOM KNEITEL, K2AES, EDITOR



Compared to today's Boeing 747 jumbo jet (196 foot wing span, 231 foot length, weighing in at 775,000 lbs.), the Dornier Do. X flying boat doesn't seem especially impressive. Only one Dornier Do. X was ever built; it had a wingspan of 157½ feet and weighed 123,459 lbs. A Boeing 747 carries 385 passengers, as compared to the total of 169 people (10 crew, 150 passengers, 9 stowaways) which the Dornier Do. X once carried. Nevertheless, when Germany built the Do. X in 1929, it was, by far, the largest aircraft ever built. It captured world headlines for several years and was considered as revolutionary a concept in air transportation as the supersonic *Concorde* was in the 1970's or as the Space Shuttle proposed to be for the 1980's and beyond. It was the forerunner of later (smaller) flying boats such as the PAA China Clipper and others of the 1930's which flew regularly scheduled flights throughout the world.

The Dornier Do. X was no speed demon—indeed it was not intended for rapid transit. It was designed to carry an average passenger load of 70 passengers on slow and luxurious trips to interesting and unusual places. The aircraft's hull contained three decks and included a lounge, sleeping quarters, a bar, writing and smoking rooms, a dining room, and a complete kitchen. The plane cruised at about 110 mph and generally flew at about 10,500 feet altitude; a typical flight might well take months. In fact, it took ten months to go from Europe to New York (via South America) on one of its flights in 1931. During the period of 1930 to 1932, the Do. X made a number of highly publicized prestige flights across the Atlantic. The Do. X was powered by no less than twelve back-to-back 550 hp. engines (later replaced by twelve 615 hp. engines). Nothing quite like it has ever been previously conceived and it was heralded as the engineering marvel of its time.

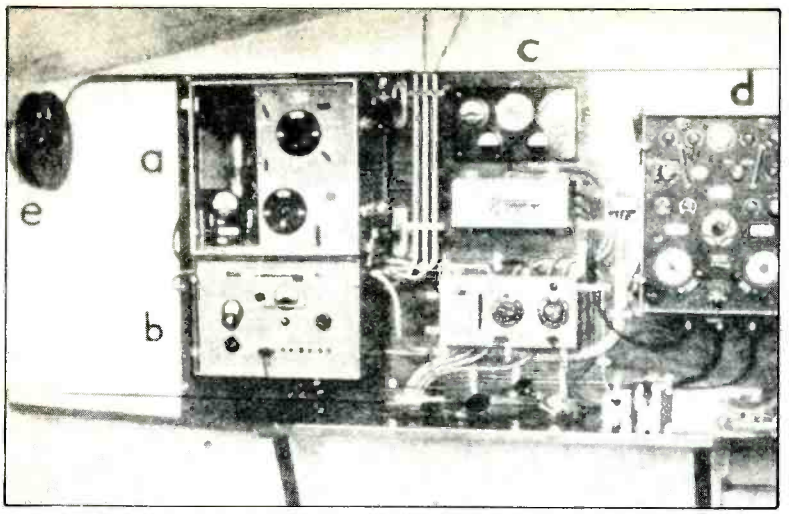
Dornier Do. X Communications

The communications equipment aboard the giant flying ship was designed to meet the challenge of serving the needs of the craft. They had more electronics loaded aboard the Do. X than any other aircraft in the world. This made it possible for them to remain in contact with both its take-off place and also its destination, as well as with ships at sea along its route.

All of the equipment (except for the radio compass) was made by Lorenz and was located on the upper deck. Along the upper surface of the wing and extending back were antennas, while from the hull a trailing wire antenna could be extended. In addition, a direction finding loop antenna was located in the bow of the hull.

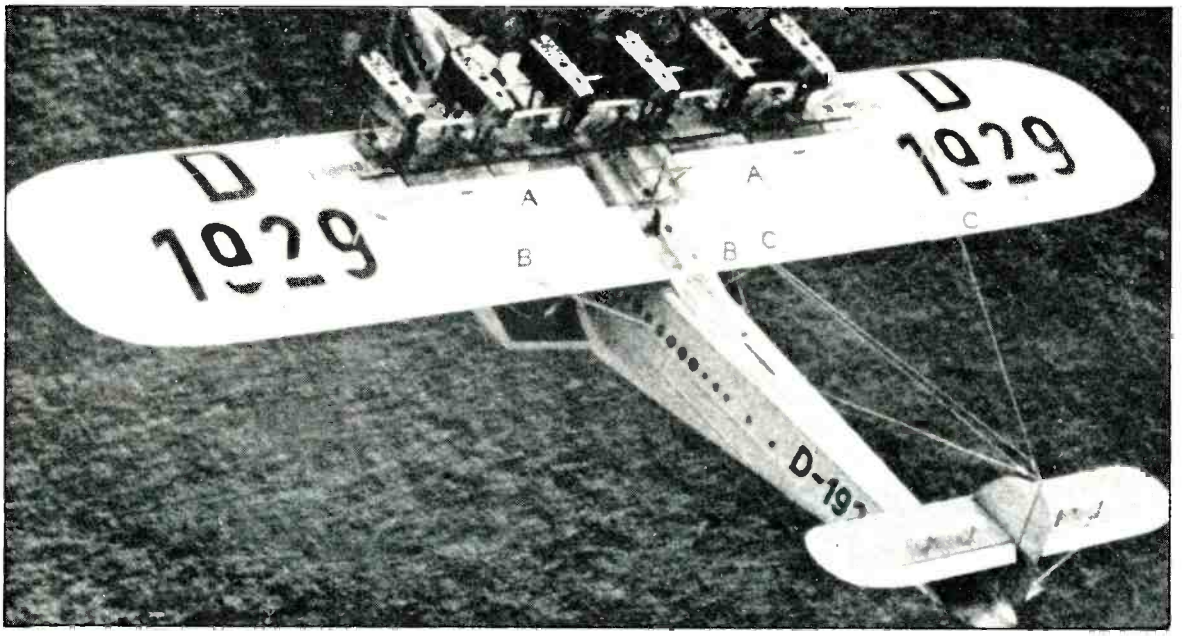
The Dornier Do. X carried a wind-driven and an engine-driven generator, a battery, and two dynamotors to power its electronics.

The equipment installation scheme was carefully worked out so that most of the elec-



The radio shack aboard the Dornier Do. X. "A" shows the low frequency transmitter; "B" the shortwave transmitter; "C" the control panel and meters; "D" a receiver; and "E" the reel for the trailing antenna.

The Do. X antenna system. A dipole ("A") was used for shortwave operations. For low frequency operations, one or both sections of the two V-shaped antennas ("B" and "C") were used.



tronics were accessible within the restricted area of the radio shack, which was a small compartment located about midship just aft of the pilot's compartment and adjacent to the captain and navigator. The radio compass loop antenna was located so that passengers seated in the lounge might don headphones and listen to broadcast programs. Passengers were also welcome to send and receive private messages via the flying boat's communications facilities, and weather reports which the craft's radio operator copied were posted for the passengers' information. The fact was that the entire radio situation aboard the Dornier Do. X was virtually identical to that aboard a luxury ocean liner, and the Do. X was just that, an ocean air-liner deluxe. It was the ultimate way of giving one's wealthy friends who took ocean liners a taste of one-upmanship.

The antenna system was rather unique. The hull of the craft, being all metal, served as an excellent counterpoise. Besides the radio compass loop and the trailing antenna (which was extended after takeoff), there were the two fixed antennas. One of the fixed antennas was a dipole which utilized a hollow mast installed amidships. This was an 8-foot mast which permitted the antenna to pass straight through the wing from the radio shack to the mast top where it divided and went out towards each wing tip to 3-foot stub masts, mounted so as to give a flat top span along the wing of 50 ft. The dipole was guyed to the wings to minimize vibration. This antenna was used for both transmitting and receiving.

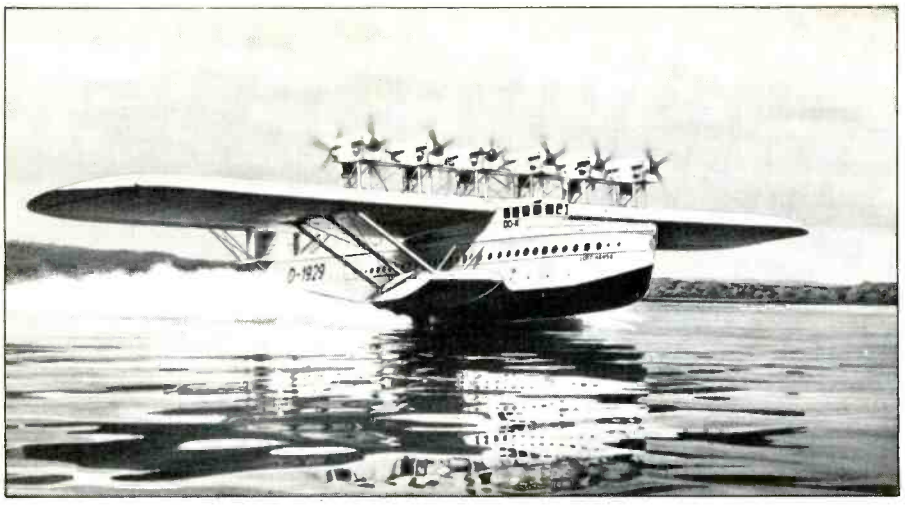
The other fixed antenna was a doublet type made in two open V sections. These were formed by stringing antenna wire from each stub mast to the tail and back to the dipole mast. The stub masts on top of the wings supported and insulated this wire from the wing surfaces, while a regular strain insulator was used for the ends attached to the vertical stabilizer aft. One section of this antenna was used for transmitting and receiving on 500 kHz. Both sections switched together had an effective length of about 200 ft., and that arrangement was used for communications on frequencies below 500 kHz.

The Low Frequency Antenna

The trailing antenna was reeled out by hand from a spool that was counterbalanced to facilitate quick rewinding in case of a sudden landing. A lead weight attached to the end of the antenna caused it to trail aft as well as down. The length of the antenna could be varied according to the frequency used, but it could be reeled out to 450 feet before the spool locked and that length was sufficient for communications on frequencies as low as about 130 kHz.

Two transmitters were in use. The low frequency transmitter covered 130 to 545 kHz and could send out CW, 'phone or modulated CW. Magnetic modulation was employed for 'phone and modulated CW. This transmitter was used for communications with ships at sea and was the more heavily used of the transmitters. It ran 120 watts.

The shortwave transmitter could operate between 4 and 12 MHz. This was a MOPA (master oscillator, power-amplifier) type, crystal controlled. Its input was 30 watts (antenna output 5 watts). There was one German type RE-134 tube used as an oscillator and two used as amplifiers. These were tubes which required 4 volts for their heaters and 250 volts for their plates. While this appears to have been a transmitter of somewhat limited potential, it did have both 'phone and CW capabilities and was used



for communications up to 4,500 miles while the craft was transmitting from the water.

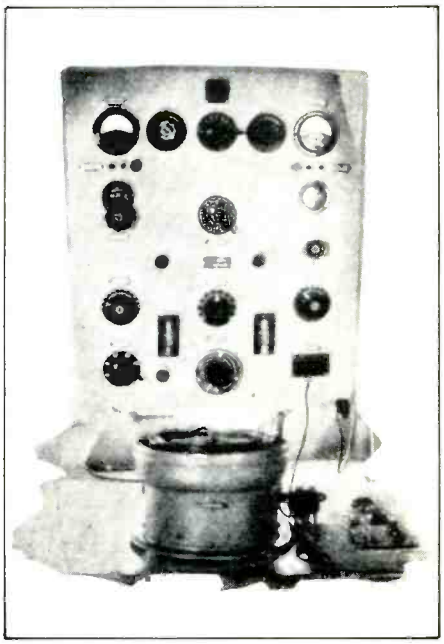
The low frequency receiver was a 7-tube superhet, while the shortwave receiver used 4 tubes. The radio-compass receiver employed four RF stages, detector and three audio stages, all resistance coupled. In all, the Dornier Do. X's receivers could span 100 kHz through 14 MHz.

Operations

Communications aboard the Do. X were contracted out to a German company known as Debeg, which provided similar services of virtually all German commercial aircraft. A Debeg employee, Henry F. Kiel, was the operator on the Do. X, and although he had never been aboard any aircraft before his assignment here, he had been a Debeg operator aboard German ships for four years. He stuck pretty close to the maritime CW frequencies for most of his communications and generally avoided 'phone operations because of language problems (German was the only language spoken by Kiel and the other officers and crew members).

Marvel that it was, the Dornier Do. X ultimately was little more than a curiosity which was not commercially feasible for large scale or long term operations. Eventually other mighty flying boats were built—the Martin M-130, Boeing 314, Supermarine Sea Eagle, Supermarine Walrus, and all of the rest, including the massive Martin Mars as well as Howard Hughes' famous Hercules (the *Spruce Goose*) with its 320 ft. wingspan. But the Dornier Do. X led the way; it was an original, *the* original giant flying boat. Its communications installation was as newsworthy as was the flying boat itself. **PC**

The Dornier Do. X's radio compass.



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POP'COMM *Visits:*

"Radio Krypton," British Shortwave Pirate Broadcaster

It's Been Broadcasting For Five Years!

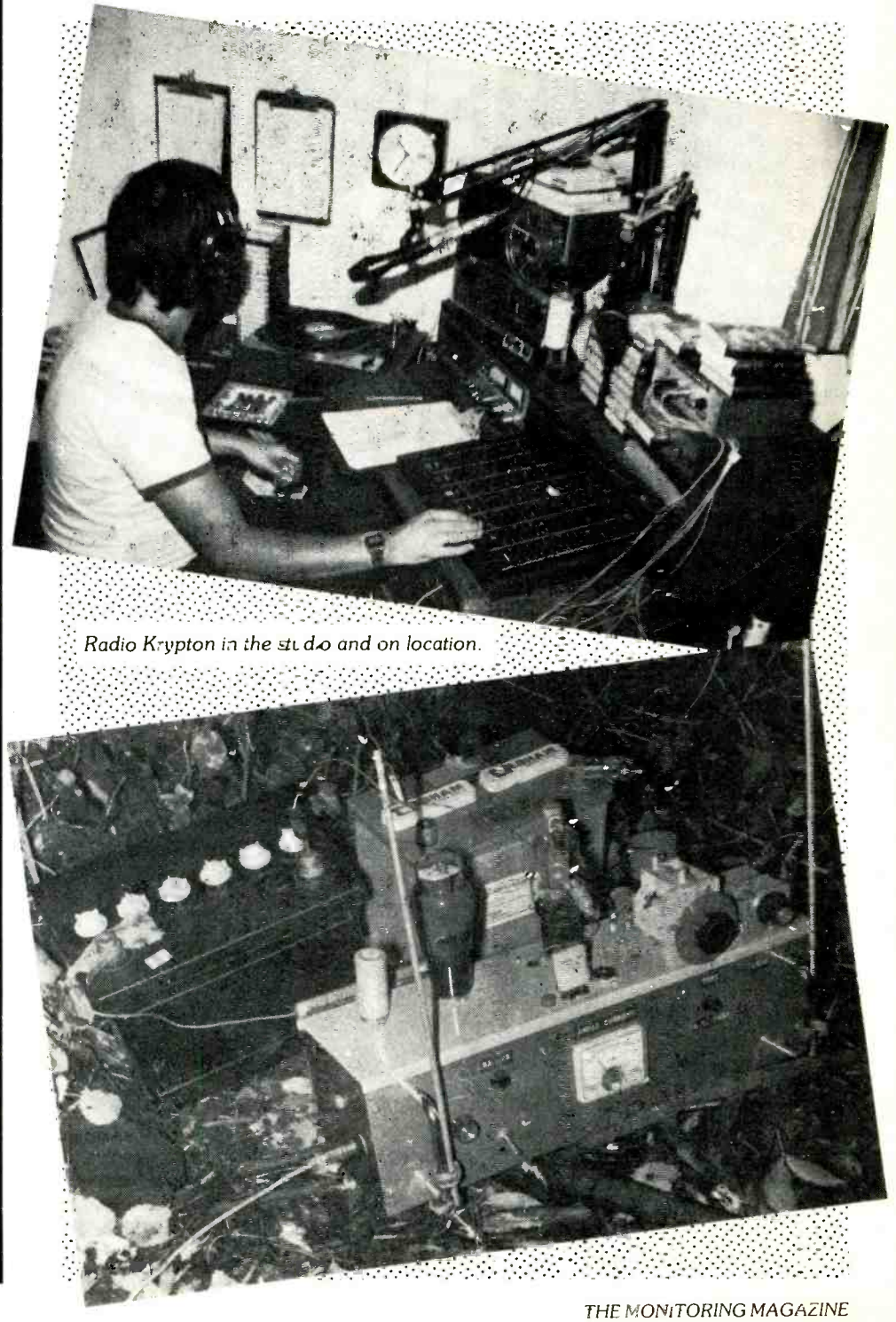
BY AUSTEN FOX

Radio Krypton, located in the United Kingdom, has been a long-time fixture on the shortwave bands. You probably have not heard the station, so here's a look at its inner workings. The station usually operates behind firmly locked doors, but we have been able to pry open those doors so that you can get a closer look. We have, just in case you were wondering, changed the names and location to respect the privacy of those involved.

Beginnings

Radio Krypton is mainly the work of three people—Dave (in charge of production and engineering), Kevin (the station's original DJ), and Jimmy (a DJ who joined the staff after the station commenced operation). Mike Skaer presents an additional Top 40 program each month and Clare and Sue also fill in with programs from time to time and also comprise the "jingles" department. They also get to participate in the annual wild Christmas program.

Radio Krypton first began broadcasting on March 18, 1979, in the 40 meter shortwave band. Original broadcasts were 90 minutes in length and were presented by Kevin Kent. It didn't take long for the station's operators to realize that the fre-



Radio Krypton in the studio and on location.

quency they had selected was too close to other stations for comfort and within a month they had moved to 6225 kHz, occupying that frequency for several years. Presently the station operates on 6265 kHz and 7318 kHz. As with many other pirates, Radio Krypton operates on Sundays and is usually on the air from 1100 to 1300 GMT.

The station plays a selection of contemporary music with some golden oldies added in for good measure. Although the sounds are very middle of the road, there are also some more ambitious programs—such as the serialization of the Motown story and Rock & Roll of the 20th Century, which was presented a while back. The programs are done in an informal style. A 1981 Christmas presentation (most probably a first) was a radio pantomime of Cinderella Boots. Even if this was not an actual first, it certainly reached a new high (or low) in broadcast comedy. While programs are always entertaining and (hopefully) enjoyable, the staff tries to maintain a professional approach. Most especially, they refrain from playing music that could be considered provocative, such as "Catch Us If You Can." They also take great pains to avoid being controversial or political, as they feel that it would guarantee massive efforts to shut the station down. This discretion has enabled them to operate for more than five years without any real problems.

Although the programs are transmitted on Sunday, they are taped on Thursday. The studio is prepared and set up, the play list and a rough script is already prepared, and a list of "thou shalt nots" is posted in front of the DJ. The clock is set to 11 a.m. to allow the accurate time checks, and the jingles are readied. Keeping in mind such mottos as "Don't open your mouth until your brain knows what to say," Kevin Kent launches into his one hour show. The program is taped straight through without any pauses. For special events and special programs, the station may actually remain on the air for as long as four hours. When Kevin's program is over, Jimmy's show is taped.

Radio Krypton sends out an information sheet and QSL to correspondents and QSL'ers.

The Studio

The studio, although located in a bedroom, is not only comprehensive but also well organized. Some smaller local radio stations would be envious! The record library is extensive and takes up any space not occupied by electronics hardware.

The station ID's are given every 15 minutes, as well as the address, and the amount of incoming mail is quite large. Listeners who supply correct reception reports receive a QSL card. Most of the mail received is from European DXers.

On the Sunday of transmission, the transmitter, batteries, and cassette player are taken out to a certain location and the antenna is erected. The equipment is located discretely and the program recording is started at exactly 11 a.m. (1100 GMT). Dave and whomever accompanies him to the transmitting site moves off some distance in order to monitor the transmission. Dragging the transmitter to a remote site each week is a nuisance, but not as painful as the loss of the transmitting equipment and a large fine.

Radio Krypton uses a 15-watt tube-type transmitter. They do have a 100-watt transmitter which could be used, but it is used only rarely as 15-watts gives them sufficient coverage to reach the audience in the U.K. and much of Europe. The transmitting equipment is home built.

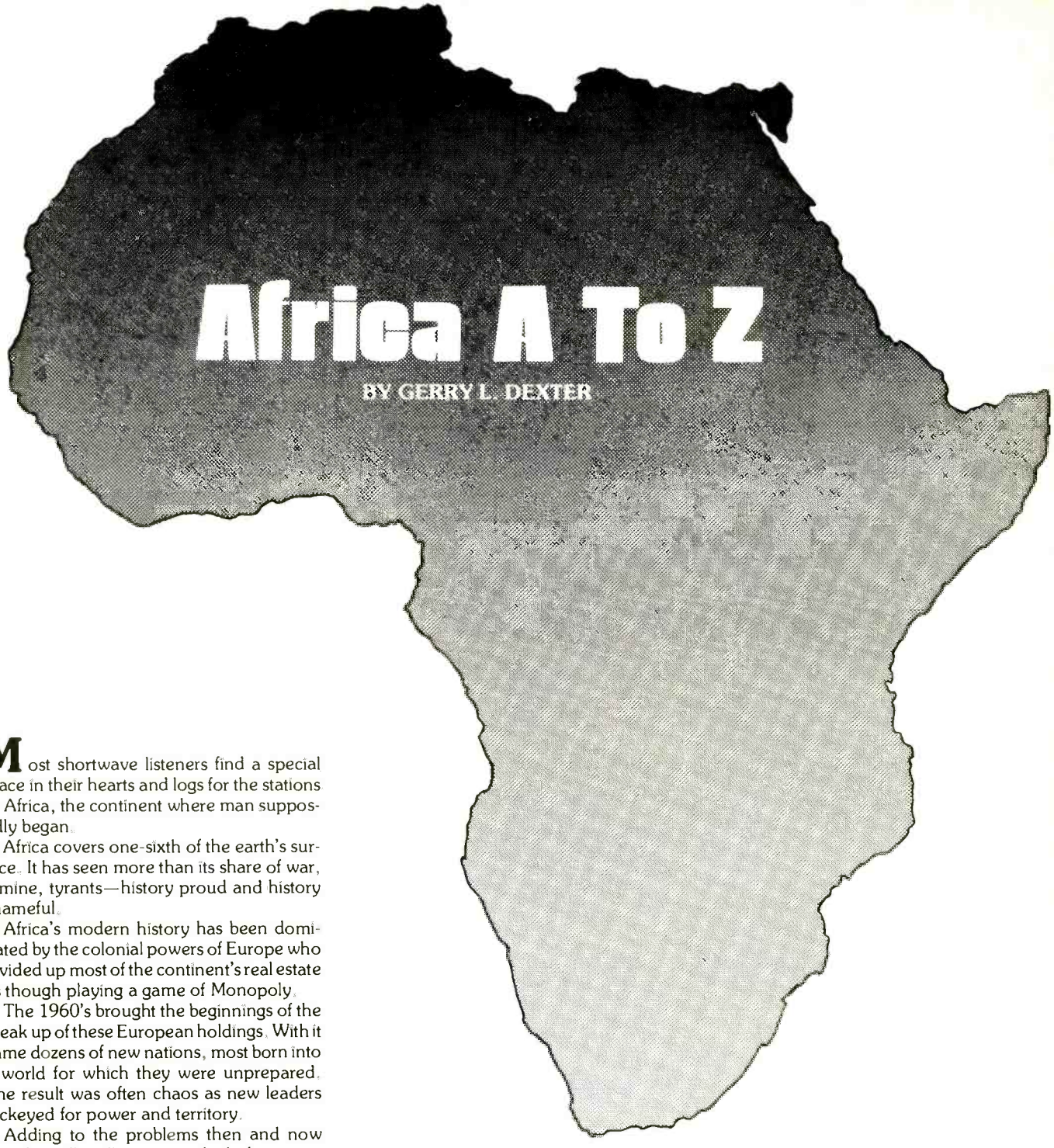
The station is entirely financed by the staff and no commercials are accepted. There is obviously no financial gain from its operation. Quite to the contrary; the station operates at a financial loss, but the staff does it for the satisfaction of providing programs to their audience. That makes it all worthwhile.

The fact that they receive lots of mail from regular listeners confirms to the station's staff that their efforts are appreciated. Although reports of Radio Krypton's activities do appear in American publications (there was one in the June '84 *POP'COMM*), there is little chance of the station being heard in North America due to its low power and combination of frequency and schedule. Well, if you are ever lucky enough to hear Radio Krypton, there's a QSL card waiting for you!

Studio Equipment: Two Goldring GL-75 turntables fitted with Stanton 500 broadcast series cartridges. AKG 2-202 and D-24E microphones. Allen and Heath 6-channel stereo production mixer. Technics RS-631 cassette deck (with Dolby). SONY TC-266 open reel tape deck.

Transmitters: *No. 1:* Tube construction, crystal controlled, 15 watts. Uses an ECC-81/12AT7 audio preamp; 6L6 audio power amp; 807 crystal oscillator and power amplifier. *No. 2:* Solid state construction, 3 to 100 watts output, crystal controlled. Semiconductors: 2N3819 FET oscillator, TBA 810 IC; BFY-52 amplifier, VN-67 AF VMOS driver, two SD-1452 high lower linear amplifiers.

Antenna: Horizontal half-wave dipole with toroid transformer. At about 50 ft. above ground level, fed with coaxial cable. PC



Africa A To Z

BY GERRY L. DEXTER

Most shortwave listeners find a special place in their hearts and logs for the stations of Africa, the continent where man supposedly began.

Africa covers one-sixth of the earth's surface. It has seen more than its share of war, famine, tyrants—history proud and history shameful.

Africa's modern history has been dominated by the colonial powers of Europe who divided up most of the continent's real estate as though playing a game of Monopoly.

The 1960's brought the beginnings of the break up of these European holdings. With it came dozens of new nations, most born into a world for which they were unprepared. The result was often chaos as new leaders jockeyed for power and territory.

Adding to the problems then and now was the willy-nilly way in which these new nations were created, carved out of colonial holdings with no regard to tribal loyalties and such. The results left many ancient African nations as part of two or more countries. Much of the modern conflict across the continent can be traced back to desires for unity and independence of African peoples divided by artificially-created borders.

For the shortwave listener Africa offers dozens of targets ranging from the simple to the simply impossible. Much of the continent's broadcasting was developed or created with the help of the former colonial powers. The colonials ran two famous African stations. Radio Brazzaville in the French Congo served as the voice of the Free French during World War II. OTC, The International Goodwill Station at Leopoldville in the Belgian Congo (now Kinshasha in Zaire) served the same purpose for the Belgians.

Except for the large international broadcasters, most African stations are best heard on the 90 and 60 meter tropical bands. Most of African broadcasting is government owned. There are relatively few private broadcasting concerns.

From the standpoint of QSLing, African broadcasters vary from the excellent verification practices of Radio RSA in South Africa to the "no way" attitude of Radio Botswana. Most occupy a position somewhere between these two extremes.

It is safe to say that no one can claim to have logged every station on the African continent. With time, perseverance, and effort you can log all of the active countries, however. Beyond that, a few more years of work may bring you to within a handful of having heard everything there is to hear on the African continent and its associated islands.

Our *POP'COMM* guide is designed to help you in your pursuit and assist you in adding as many African stations and countries to your logbook as possible.

So, let's get to work. All times are GMT.

Algeria: Radiodiffusion-Television Algerienne (RTA) or Radio Algiers has English beamed to Europe at 2000. Frequencies are often quite variable. Check 9.509, 9.640, 9.685, 15.215, and 17.745. Other frequencies include 6.160, 7.245, 11.715, and 15.160. Spanish, French, and Arabic are other main languages used. Good times to try for Radio Algiers are late afternoons and early evenings local time.

People's Republic of Angola: Radio Nacional de Angola recently began 24-hour-a-day operations. Several frequencies are used, but 9.535, 9.660, and 11.955 are the ones most often reported. Most programming is in Portuguese, but English is scheduled at 1130 to 1200 and 2230 to 2300 on weekdays.

Angola has a number of regional and provincial stations which are more difficult targets. These include Emissor Provincial Huila on 3.970; Emissor Regional Luanda Norte on 4.770; Emissor Regional do Cuando-Cubango on 4.780; Emissor Regional Uige on variable 4.848; Emissor Regional Zaire on 4.885; Emissor Regional Bie on 4.896; Emissor Regional Malanje on 4.941; Emissor Regional Cabinda on 4.970; Emissor Provincial Namibe on 5.014; Emissor Regional Benguela on 5.041, 6.152, and 7.250; Emissor Provincial Moxico on 5.192; Emissor Provincial Luanda Sul on 6.113; Emissor Regional Lobito on 7.172.

Frequencies tend to be variable and operations sporadic. Huila, Zaire, Cabinda, Namibe, Benguela, and Moxico are the most frequently heard, but even they are relatively rare. Sign on for regional outlets is most often around 0500.

Ascension Island: The BBC Atlantic Relay Station is easily heard and uses a fairly large selection of frequencies. Two of the most reliable are 11.750 and 15.260. Various language programs are relayed over this facility, including programming to Africa and Latin America as well as the World Service in English. Station identifications for Ascension are given at sign on and sign off.

Benin: Office de Radiodiffusion et de Television du Benin (ORTB) from Contonou is best heard on 4.870 from its 0400 sign on. In addition, a regional station operates from Parakou on 5.025 (best heard) and 7.190, also from sign on at 0400. Programs are primarily in French.

Republic of Botswana: Radio Botswana uses English and local languages and is a fairly regular performer at sign on around 0357 with its famous "farm animals" interval signal. Recent upgrading of facilities to 50 kilowatts has made Botswana an easier catch. Check 4.848 and 7.295. To the dismay of everyone, Radio Botswana has a very firm "no QSLs under any circumstances" policy and seems to take pride in being the "only" station in the world which will not verify reports. (If they only knew!) The DX world hopes things will one day change.

Republic of Burundi: One of the tougher Africans to hear is La Voix de Revolution from Bujumbura. Broadcasts are mostly in French and vernaculars and it takes exceptional conditions to bring in their 25 kilowatt signal on 3.300. Sign on is at 0300 daily. The station's other frequency, 6.140, is even less frequently logged.

Radio Brazzaville was in French Equatorial Africa when this 1955 card was issued.

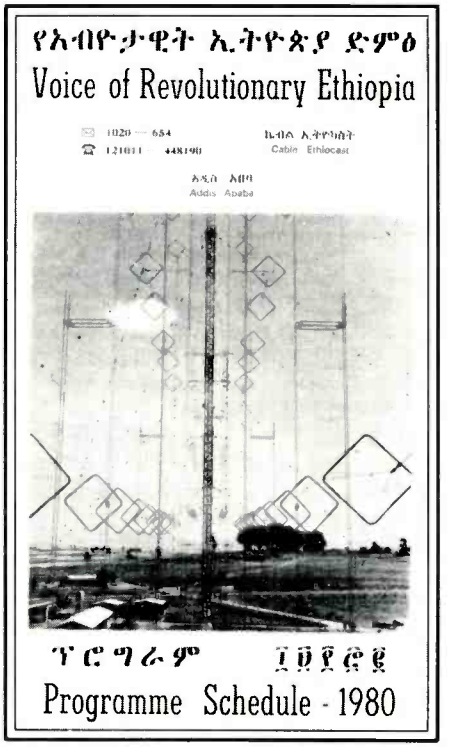
United Republic of Cameroon: Radiodiffusion Nationale du Cameroun operates a number of regional outlets in addition to their main station at Yaounde. Sign on is at 0430 for all of the outlets and an English segment is carried around 0500. Yaounde on 4.850 and Douala or Garoua on 4.795 and 5.010 respectively are your best bets with all three using 100 kilowatt transmitters. Other regionals are Buea on 3.970, Bafoussam on 4.000, and Bertoua on 4.750. Buea uses 8 kilowatts, the other two operate with 20 kilowatts. Frequencies in the 49 and 41 meter bands are also used but the 60 meter outlets provide more consistent reception.

Canary Islands: A relay station is operated here by Radio Exterior de Espana in Madrid. REE programming on 11.815 and 15.365 comes via the Canary Island site. Afternoons and evenings should provide reception of this outlet. Reception reports should be directed to the Spanish radio in Madrid.

Republic of Cape Verde: There are two pretty tough ones waiting to be snared by determined DXers. Emissora Oficial da Republic de Cabo Verde uses just 500 watts on 7.155 from 0700 to 0945. The station is at Praia on Sao Tiago Island.

Radio Voz de Sao Vicente from Mindelo has ten kilowatts on 3.931. Try during the winter months just an hour or two before their 0000 sign off. Most programming on both stations is in Portuguese.

Central African Republic: Radiodiffusion Television Centrafricaine (RTC) at Bangui has a 100-kilowatt transmitter operating on 5.035. Programs are mostly in French. Try from 0430 sign on or just prior to the 2300 sign off hour.



A 1980 program schedule from the Voice of Revolutionary Ethiopia showing part of the antenna complex.

Chad: Radiodiffusion National Tchadienne (RNT) returned to the air from N'djamena in the spring of 1984 using 100 kilowatts on its old frequency of 4.904.5. Check for it around 0450 when sign on procedures get underway.

A second station, Radio Moundou (in the town of that name), came on the air a year or so ago using a variable 5.288 and only 2.5 kilowatts—at times probably lower than that. Sign on is at 0500 but expect to have to make a number of attempts before you log the station. Both stations broadcast in French.

Federal Islamic Republic of the Comoros: Radio Comoro is a real challenge. Loggings of this one are quite rare in the United States, but you can check for an 0300 sign on on 3.331 (just above the Canadian time station CHU which is part of the problem). It is occasionally reported on 7.260 in the early morning. Broadcasts are in Comorian and sign on is at 0530. Power is only 4 kilowatts.

People's Republic of the Congo: Radiodiffusion Television Congolaise (RTC) from Brazzaville offers itself as a possibility during the 1700 to 0100 time frame on 9.715 or 15.190. Broadcasts are in French, Portuguese, English and local languages. A regional station at Pointe Noire is audible occasionally on 4.843 from sign on at 0445.

Republic of Djibouti: Radiodiffusion Television de Djibouti (also called Jibouti) is another station that was silent for a time and recently returned. A 20 kilowatt transmitter operates on 4.780 from 0300 sign on. Expect difficulty with La Voz de Carabobo from Venezuela if it is active. If you can get a combination of reasonably good African conditions and a silent Venezuelan, chances are you'll bag this one. Programs are in French, Arabic, Somali, and Afar.

Arab Republic of Egypt: Radio Cairo is a regular in the United States with its English broadcasts to North America from 0200 to 0330 on 9.475 and 12.000. Readability, however, usually doesn't match signal strength.

Democratic Republic of Equatorial Guinea: The former two distinct stations in this country now operate under one name —Radio Nacional de Guinea Equatorial. At Bata there is a 100 kilowatt transmitter on 4.926 or 5.005 (sometimes one, sometimes the other). Bata is scheduled from 0430 to 0630 and 1000 to 2200. Malabo on 6.250 with 10 kilowatts is heard more frequently than Bata, with sign on at 0500. Programs are in Spanish and local languages. Both stations have begun to verify reports again (however vague the reply) after many years of ignoring reception reports.

Ethiopia: The Voice of Revolutionary Ethiopia (VORE) has 100 kilowatt transmitters at Gedja on 7.110, 7.165, 9.560, and 9.595. Check from 1200 to 1800 on 9.595. Actually the transmitter runs past 1800, carrying various African liberation or "clandestine" programs. Try also for the national service signing on at 0330 on 7.110 or 7.160 in local languages. It may take rather careful tuning to hear this one, especially during the 0330 broadcast. Verifications can tend to be sporadic.

Republic of Gabon: Radiodiffusion Television Gabonaise (RTG) operates two stations on shortwave. The main station at Libreville uses 100 kilowatts on 4.777 and 7.270, both carrying the national network in French and vernaculars from 0430 sign on. There is also an outlet at Franceville which is a more difficult catch. Check 4.830 at 0430 sign on for this 20 kilowatt outlet, although you'll likely have strong interference from Radio Reloj in Costa Rica on 4.832.

A newer outlet is the well-known Africa Number One which gave away a sports car in a kick off promotion when it first went on the air. This commercial station has transmitters of 500 kilowatts at Moyabi and also carries the programming of Radio France International and Radio Japan. Swiss Radio International recently conducted tests using the station as a relay as well. Two or three religious groups also air programs from these transmitters. Try 11.815, 11.940, 15.200, 15.435, or 17.750 from 0600 to 1700. Or try 4.810 from 0500 sign on.

Ghana: The Ghana Broadcasting Corporation (GBC) uses 3.366, 4.915, 5.960, and 7.295. Your best bet is probably 4.915. Listen for sign on around 0545 to 0600. Programs are in English and vernaculars. There are two networks, GBC-1 and the commercial, English-only service, GBC-2.

Republic of Guinea: Radiodiffusion Nationale at Conakry is heard fairly often with their 18 kilowatt transmitter signing on at 0600 on 4.910 nominal but more likely to be 4.911. Try during daytimes up to 0100 on 15.310 for the 80 kilowatt outlet. There's another of the same power on 9.650. Programs are in French and vernaculars.

Republic of Guinea - Bissau: Radiodifusao Nacional is another toughie and it's occasionally inactive to boot. Your best shot is at 0600 sign on on a variable 5.041. Power is 5 kilowatts and programs are in Portuguese.

Ivory Coast: Radiodiffusion Television Ivoirienne (RTI) can be frequently heard via their 20 kilowatt transmitter on 4.940 or 7.215 from 0600 sign on in French. The foreign service in English is scheduled from 1745 to 1945 on 11.920 with 100 kilowatts. As for QSLs, you may get lucky and receive a reply on your first try or, like many, it may take you years of trying to get their verification card.

Kenya: The Voice of Kenya is most often heard via their listed 100 kilowatt outlet on 4.915 around 0300 sign on. The 10 kilowatt transmitter carrying the general service in English is less often heard on 4.934 at 0300 sign on and, at this writing, may be inactive. Kenya is supposed to be upgrading their facilities so perhaps that will mean better reception in the future.

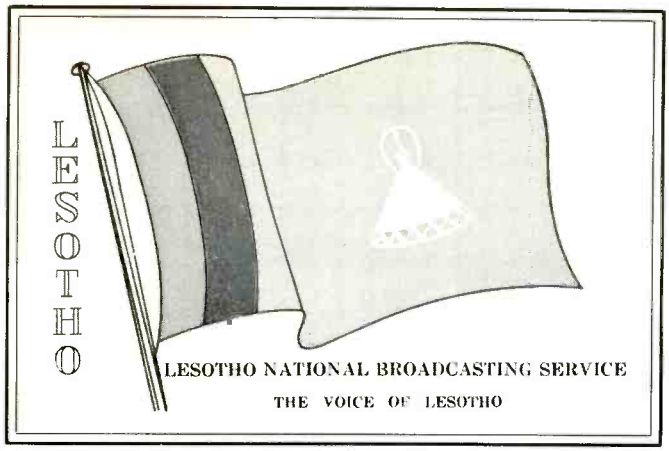
Lesotho: The Lesotho National Broadcasting Service, also known as Radio Lesotho, is heard fairly well on 4.800 assuming a clear channel. Sign on is at 0400 and programs are in English and vernaculars. As an alternate, try 3.336, although there are few reports of reception on this frequency and it may be that it's not currently active.

A second possibility from Lesotho is the BBC Lesotho relay which receives its feed from the BBC Ascension Relay. Indeed, Lesotho even relays the Ascension announcements! Lesotho uses 6.190, 9.515, and 11.830 with 100 kilowatts, beaming BBC broadcasts to Africa.

Republic of Liberia: The Liberian

May We Recommend

The Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057. Here's a club for those rugged enthusiasts interested in knowing what's happening below 540 kHz! Their monthly publication, *The Lowdown*, not only covers listings of stations operating between 10 and 540 kHz, but also has interesting coverage of the 1750 Meter (no license) low power communications band as conducted by Ken Cornell (W2IMB—well known "lowfer" authority. Membership includes mailing of the publication by First Class Mail and costs $10 per year (anywhere in the world). When writing to the above, please mention that you saw it in POP'COMM!



Radio Lesotho's flag card which has appeared in various styles over the years.

ELWA, Monrovia, Liberia used this "drummer" card for a number of years. (Courtesy: Harold Frodge)

Broadcasting System (LBS), using ELBC as a call, can be heard fairly often on 3.255 using 25 kilowatts from sign on in English at 0600.

The Sudan Interior Mission operates EWLA on 4.765, lair of the Cubam Mayak outlet, from 0600, using 10 kilowatts. 50 kilowatt outlets are on 9.550, 11.830, 11.850, 11.870, 11.930, and 11.940 in Arabic, English, and several vernacular languages throughout much of the local daytime period in the U.S.

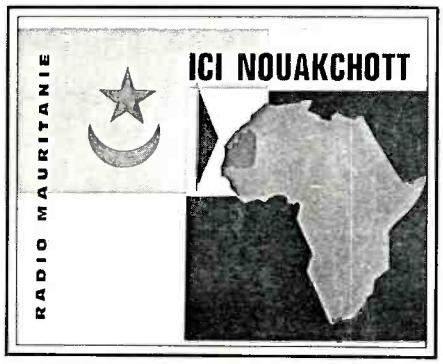
In addition, The Voice of America has a relay station at Monrovia using some 35 frequencies on all bands from 49 meters on up. Several 250 kilowatt and 50 kw. transmitters are in use here. Look for VOA broadcasts in African languages or in English to Africa and wait for a site identification. That's about all we can do in the way of a tip since the schedule and list of frequencies are so extensive and so variable.

Libyan Arab Jamahiriya: Libyan Jamahiriya Broadcasting or Radio Jamahiriya is widely heard in the U.S with its English language harangues to North America on 11.815 variable from 2130 to 2300. The Voice of the Arab Homeland (same operation, different title) runs from 1745 to 0400 on 6.185, 15.415, 15.450, and 17.930 (occasionally 17.940 instead) in Arabic. 15.450 has also been used for a new "Voice of Africa" service in English, heard from around 1900, but this name was apparently in use only briefly. Perhaps Khadafy didn't realize it's been used before.

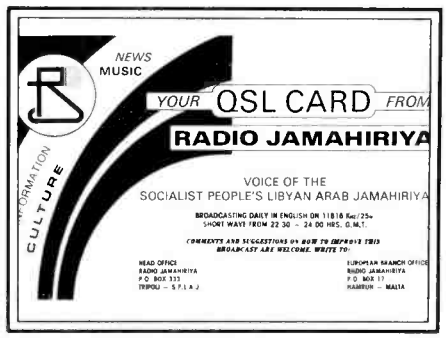
Democratic Republic of Madagascar: Radio Madagascar isn't heard too often. Try 3.386 from 0300 to 0500 or 9.690 from 0500 to 1500. English, French, and vernaculars are in use.

A better target is the Radio Netherlands Relay Station at Volonondry with its 300 kilowatt transmitters. Frequencies include 6.030, 7.285, 9.540, 9.715, 11.735, 11.740, 15.560, 15.570, 21.480, 21.640, 21.685, and 25.970. This installation is used for transmissions to Europe, the Middle East, Africa, Asia, and Australia/New Zealand.

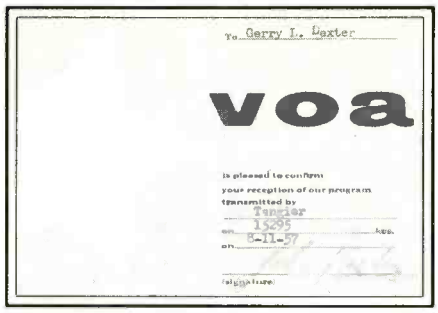
Malawi: The Malawi Broadcasting Corporation (MBC) has had a somewhat intermittent existence of late. Keep an ear on



Radio Mauritanie's attractive QSL card. (Courtesy: Al Muick)



Radio Jamahiriya QSL. Replies are more likely if you write to the Malta address. (Courtesy: John R. Tow)



An ancient QSL confirms reception of the VOA relay station at Tangier.

3.380 from 0253 when they're scheduled to start transmissions. When they are, active signals are usually at least of fair strength.

Mali: Radiodiffusion National du Mali (RNM) from Bamako is most often heard on its 4.838 channel around 0600 sign on. Programming is largely in French.

Islamic Republic of Mauritania: Radiodiffusion National de la Republique Islamique de Mauritanie (RNRIM) is fairly often heard at its 0600 sign on on 4.845; also prior to its 0000 sign off time on the same frequency. Programming is almost entirely in French.

Morocco: Radiodiffusion Television Morocaine (RTM) uses 15.330, 15.335, and 15.590 with 50 and 100 kilowatts, relaying service programming. Check 15.590 from 1000 to 0100, 15.335 from 1000 to 2000, and 15.330 from 1600 to 2000.

Radio Mediterranee International, a government-operated commercial station (known in verbal shorthand as "Medi-1") can occasionally be heard to sign off around 0800 on 15.250 and 17.700.

Another thirty or so frequencies are used by the Voice of America relay station at Tangier. Schedules are always changing, so it's difficult to say when and where to listen. Relay station identifications are given only at sign on and sign off. Look for VOA programming directed to Africa and stay with the broadcast until sign off.

People's Republic of Mozambique: Radio Mozambique from Maputo uses 3.210, 4.865, 6.115, 7.240, 9.620, 11.820, and 15.295 from 0255 sign on straight through to a variable 2210 sign off time. Frequencies, too, are variable. 3.210 offers a good chance for reception if conditions are good.

The regional station at Beira can sometimes be heard on 3.280, 3.370, or 9.635 from 0255. The other regional outlets at Nampula, Pemba, and Quellimane are very low power and rarely, if ever, heard in the United States.

Niger: Office de Radiodiffusion Television du Niger (ORTN) at Niamey gives best reception on 5.020 from 0530 sign on in French. But this one is far from being a frequent visitor, so consistant checking is necessary. Good African reception conditions will be required.

Federal Republic of Nigeria: The Voice of Nigeria is a fairly steady performer on 15.120 from 1000 to 1200 beamed to North America, then continuing past 1200 to other areas in other languages. Other frequencies to check are 17.800 and 11.770. From 0500 sign on try 7.255, which is usually well heard with English for the first hour.

There are a number of Nigerian regional outlets to try, either from 0500 sign on or just before 2300 sign off. Powers are generally 10 and 50 kilowatts. Kaduna on 3.396, 4.770, and 6.090; Owerri on 4.755; Jos on 5.965; Enugu on 4.932 and 6.025; Ibadan on 6.050; Maiduguri on 6.100; Calabar on 6.145; Sokoto on 6.195; and Illorin on 7.145. With a little effort all of these can be heard.

Republic of Rwanda: Radiodiffusion de la Republique Rwandaise (RRR) uses 3.300 and 6.055 with 5 and 50 kilowatts respectively. Reception of this one is quite rate, but check between 0300 and 0600.

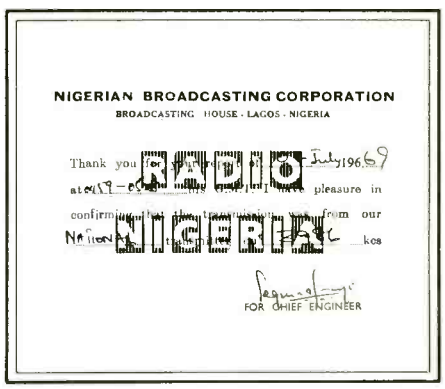
The Voice of Germany's Kigali relay station uses 7.225, 9.565, 9.610, 9.735, 11.705, 11.785, 11.965, 15.410, 17.800, 17.860, 21.540, and 21.600 and gives local identifications at sign on and sign off. Power is 250 kilowatts.

Sao Tome E Principe: Radio Nacional de Sao Tome was off shortwave for a considerable period but is back now. Check for the home service on variable 4.807 from 0530 sign on. Transmissions run until 2300, giving an opportunity near sign off during the shorter daylight months. Power is 10 kilowatts and programs are all in Portuguese.

Senegal: Office de Radiodiffusion Television du Senegal (ORTS) from Dakar is an easy log when it's on. Operation has tended to be a bit sporadic lately. Check 4.890 for an 0600 sign on or the same frequency as late as 0100 sign off.

Seychelles: The Far East Broadcasting Association (FEBA) has one of its several stations here. The station is on in a variety of languages to various African and Asian targets. Frequencies include 7.275, 7.510, 9.515, 9.535, 9.600, 9.765, 11.760, 11.780, 11.800, 11.845, 11.855, 11.865, 11.895, 15.200, 15.320, 15.325, 15.405, 15.410, 15.430, and 17.875. Your best bet may be English to South Asia at 1500 to 1600 on 15.325 and 11.895.

Sierra Leone: The Sierra Leone Broadcasting Service (SLBS) has a 250 kilowatt transmitter at Waterloo near Freetown. Check for sign on at 0600 or prior to sign off at 0000.



Nigerian Radio provides a number of targets.

Democratic Republic of Somalia: Radio Mogadishu was heard fairly widely at its 0300 sign on on 6.790. More recently the frequency has been 7.200 where it's not as well received. Radio Hargeisa, located in the former Italian Somaliland, uses 7.120 from 1000 to 1230 and 1500 to 1800. It's a toughie. Occasionally the station is reported on variable 11.640 and is a more likely log there if it turns up. Still, it's a very difficult catch.

South Africa: Radio RSA, The Voice of South Africa, is an easy one with prime time English to North America at 0200 to 0300 on 5.980, 9.615, and 11.730, with English carried to other areas at other times.

The South African Broadcasting Corporation (SABC) carries a number of services for the domestic audience. The Afrikaans Service is positioned on 3.320, 3.965, and 4.880 (partial), 9.560, and 11.885. Best bets are at 0350 sign on on 3.320 or 0550 sign on on 4.880. Radio Five, a commercial service, is carried on 3.250 from 0300 daily. Also check for the English Service on 4.835 around 0400.

The Transkei Republic, considered by most DXers to still be a part of South Africa, offers Capital Radio from Umtata on 3.930, 7.150, and 9.765. The former frequency is the most often heard from 0300 sign on. Programming is in English.

Southwest Africa Namibia: The Southwest Africa Broadcasting Corporation (SWABC) uses 3.270, 3.295, 4.965, 6.185, and 7.190. Check around 0300 to 0515 sign off for the first three channels, the latter two from 0515 sign on. The lower frequencies seem to be the easiest to hear.

Democratic Republic of The Sudan: The National Broadcasting Corporation Radio Service from Omdurman is occasionally heard with its 20 kilowatt outlet on 5.039 from 0400 sign on in Arabic.

Swaziland: Swaziland Commercial Radio (SCR) can best be heard on 3.223 and 4.980 from 0500 sign on. This station has several services including Radio SR, the Afrikaans service, and Radio Turo, the Indian service.

Trans World Radio at Manzini uses a number of frequencies for broadcasts in English, French, German, Mandarin, Portuguese, and several African tongues. Again, like a number of the other stations, the lower frequencies seem to be the most profitable hunting ground. Try 3.200, 3.240, 3.275, 3.335, 4.760, and 4.790 from sign on at 0300.

Tanzania: Radio Tanzania is best heard via its national service on 5.050 and 9.684 from 0300 sign on; also in its external service on 9.747 from 0330 to 0430 and 1530 to 1915.

Togo: Radiodiffusion Television Togolaise, La Voix de la Nouvelle Marche, is a fairly regular performer with a 100 kilowatt transmitter on 5.047, opening at 0530 in French and vernaculars. Also try the Kara regional station with 10 kilowatts on 3.222, also at 0530 sign on.

Tristan Da Cunha: Tristan Radio has been logged any number of times—in the dreams of DXers! Otherwise, only once-in-a-lifetime conditions will bring this one in. The station uses a microscopic 40 watts on 3.290 and is scheduled Sundays, Wednesdays, and Fridays from 1900 to 2205.

Radio RSA at Johannesburg, South Africa, is an excellent verifier.

Tunisia: Radiodiffusion Television Tunisienne (RTT) recently began an external service beamed to Europe in Arabic at 1900 to 2100 on 11.745; also try late afternoons around 2200 on 7.225 to 2300 sign off, and from 0430 sign on.

Republic of Uganda: Radio Uganda at Soroti on 5.027 is an on again, off again affair. When it's on, look for sign on at 0300 in English, with broadcasts also in French, Swahili, and vernaculars. The external service, also temperamental in nature, is listed for 6.030, 9.515, 9.685, 9.730, 15.250, and 15.325—with the latter most frequently reported (when it's on at all).

Upper Volta: Radiodiffusion Television Voltaique (RTV) at Ouagadougou uses 4.815 in French and local languages from sign on at 0530. During winter months try around 2200 on this frequency as well.

Republic of Zaire: La Voix du Zaire from Kinshasha operates on 7.255, 9.710, 11.720, 15.245, and 15.350, 24-hours-a-day. But the station is often inactive for long periods. Zairian regionals include Bukavu on 4.839, with just 4 kilowatts, but nonetheless it is occasionally heard at 0400 sign on. The other regionals—Mbandaka on 5.995, Bandundu on 7.103, and Lubumbashi on 7.205—are rarely heard in the U.S. and may or may not be active at any given time.

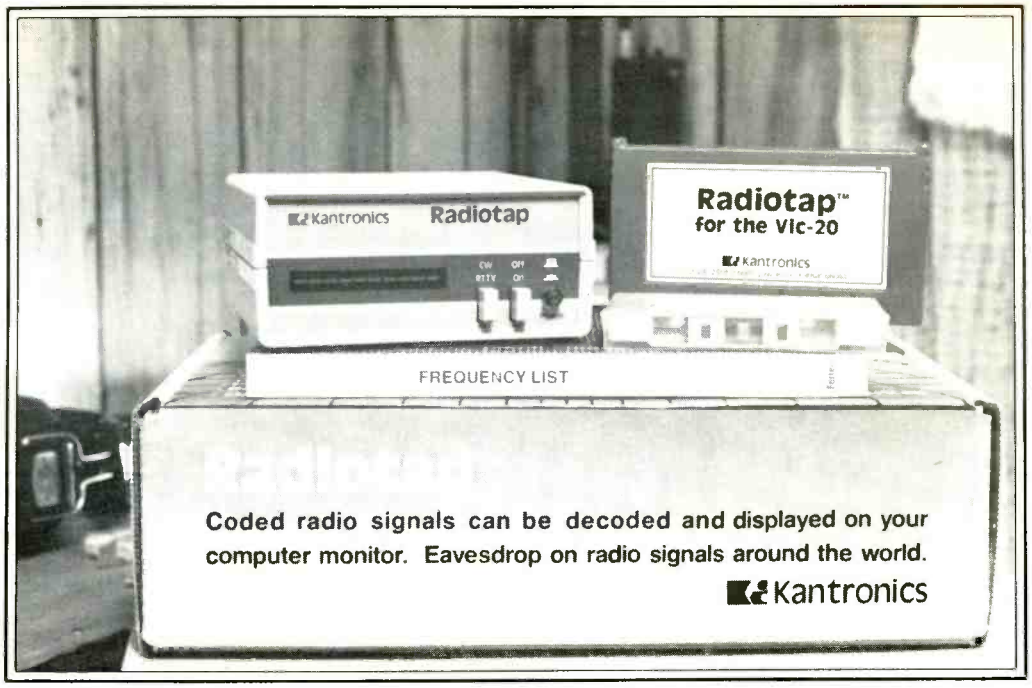
Republic of Zambia: The Zambian Broadcasting Service (ZBS) from Lusaka is most reliably logged on 4.911 from 0355 sign on. It's easily identified by the call of the fish eagle, used as an interval signal.

Zanzibar: Although a part of Tanzania, DXers don't necessarily look at it that way and many consider Zanzibar a separate entity. Radio Tanzania-Zanzibar (RTZ) is a tough log. Try for it at sign on at 0330 on 3.339. Long a non-verifier, it has improved its QSLing policy in recent years. Still, you have to hear it first. Reports go to Zanzibar rather than Dar es Salaam. A 60 kilowatt transmitter is being installed with Chinese assistance and that may improve reception of this one.

Zimbabwe: The Zimbabwe Broadcasting Corporation (ZBC) runs four radio services at various times, using English and local languages. Best bets are 3.306 for Radio Two in English and local languages and 3.396 for Radio One in English. Sign on is at 0325.

And that's Africa, A to Z! Some are easy, some will defy all your efforts. Most can be had with a little concentrated effort.

We've done our part. Now, how about starting on *your* African safari? **PC**

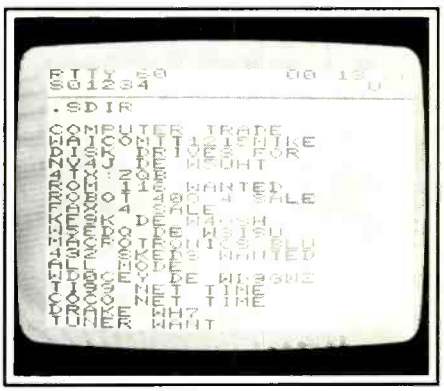


The RADIOTAP package comes with everything you need except the receiver. Pictured here is the terminal unit, the software cartridge, an audio cassette, and the Confidential Frequency List.

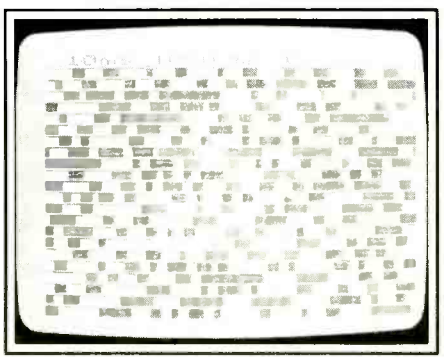
"RADIOTAP"

Computer Software For The DX Listener

BY JIM GRUBBS, K9EI



RADIOTAP at work. This picture was taken off of the computer screen and illustrates a 60 wpm RTTY signal being decoded. This particular transmission was from an amateur radio message storage operation and shows a directory of messages on the MSO.



A special feature of RADIOTAP is the "scope" function. This picture represents an incoming RTTY signal. By positioning two cursors (not easily visible in this photograph) at the beginning and end of a single data bit, the number in the upper middle of the screen will allow you to calculate the speed of transmission.

If you are a utility ("ute") monitoring fan, you already know of the many fascinating signals that exist on the shortwave bands. While tuning through the uncharted shortwave spectrum, you've no doubt heard numerous transmissions that sound something like high speed code but were not intelligible. Many of these signals are radioteletype transmissions, or RTTY for short.

In the days when my monitoring efforts began, the only way to decode these transmissions involved using big, bulky mechanical teleprinters. Most of them were war surplus and looked something like an electric typewriter gone wild. In addition, a special signal converter called a terminal unit was needed to take the audio tones coming from the receiver and convert them to a current loop to operate the teleprinter.

Besides the inherent mechanical difficulty of whirring gears, the biggest drawback of having a teleprinter in your listening post was the clattering noise. Several times I had the chance to obtain an old model 15 Teletype Corporation unit and had the project vetoed by dear old mom. Besides not liking the noise, she always wanted to know if it "came with a power supply." My conversions of other surplus gear had necessitated building a power supply or converter.

Fortunately, this is the age of computers—QUIET computers! With a modest investment, your home computer can be used to decode not only RTTY signals but Morse code and ASCII signals as well.

The Commodore VIC-20 and C-64 have made home computing available at a very modest price. The VIC in particular is beginning to show up on the used market for $50 and under. Virtually *any* home computer can be used, but let's concentrate on a commercially available package for the Commodore machines called RADIOTAP.

RADIOTAP is a comprehensive software and hardware package from Kantronics. It is designed especially for the SWL and even comes with a copy of *The Confidential Frequency List* and an audio cassette to aid the newcomer to this type of monitoring in properly tuning the signals.

Your computer, when used for normal data communications, has three elements. The first is the computer itself. Secondly, you need a terminal program to turn the computer into a terminal-like device. Finally you need a modem—another piece of hardware that interfaces your computer to the phone line.

The same elements are present in a radio connection. You still use your computer as a terminal, but the software needed is more complex. The terminal unit replaces the modem. In practice a terminal unit (or TU as it is abbreviated) is very similar to a modem.

The terminal unit in the RADIOTAP package is quite small. Operation of the unit is very simple and straightforward. The only connections necessary are a cable to the audio output of your SWL receiver and a cable from the TU to the joystick part on your computer.

There are two switches on the front of the unit. One is an on/off switch, and the other is marked CW/RTTY. The second switch sets the internal bandpass filters in the TU for either a narrow band width for use in decoding Morse code (CW) signals, or a wider range for use in receiving RTTY and ASCII signals. This switch also moves the center frequency of the filters from about 750 Hertz for CW to about 2200 Hertz for RTTY.

Proper tuning is accomplished with the aid of the LED bar graph on the unit. You are instructed to tune the signal until the maximum number of LEDs are lit. This will usually be all of them. Tuning signals, particularly teletype signals, takes some practice.

The circuitry used in the RADIOTAP terminal unit works as advertised, though it doesn't have the immunity to interference and fading signals that more expensive units have. For most beginner applications it works quite well.

The software included with RADIOTAP does a superb job for the SWL. As provided, it will decode Morse code up to 99 words per minute, radioteletype at all common speeds, and ASCII transmissions up to 300 baud.

The RADIOTAP software includes several unique features not available in other packages. From the function menu, you can select the "scope" function. This feature turns your computer into a simple storage oscilloscope! It is often difficult to determine by ear what speed or baud rate the transmitting station is using. By selecting the scope option, the signal is sampled and a frame of the signal is displayed on your computer screen. By calculating the length of the bits within the signal, it is possible to determine the speed of transmission. RADIOTAP lets you set two cursors and figures the timing interval for you.

Not all RTTY and ASCII signals are sent in the normal fashion. Some stations use one or more simple encryption techniques.

One method involves inverting one or more bits of the data. Normally a "mark" tone indicates a zero to your computer while a "space" tone indicates a one. Each character in an RTTY signal, for example, consists of five data bits and a start and stop bit. The signal can be scrambled by inverting one or more bits, thus reversing the expected mark and space tones. The RADIOTAP software allows you to experiment with bit inversion combinations to break this type of encoding.

Another trick used is to change the order of the bits, exchanging bit 2 with bit 5 for example. The software will also allow you to experiment with this type of encryption. The nice part is that it takes very little effort on your part—the computer does it all. The catch, of course, is that there are thousands of combinations, so your chances of breaking a particular type of coding are not high.

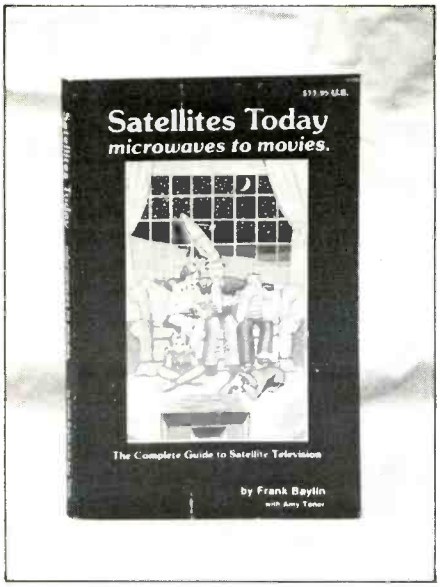
Overall, the RADIOTAP package for the Commodore VIC-20 and C-64 deserves high marks. It is priced at $200 retail and, yes mom, it even comes with a power supply! At this time, Kantronics doesn't have software available in the RADIOTAP format for any other machines. They do sell a wide range of software aimed at the amateur radio operator for a variety of machines, as do other manufacturers. The RADIOTAP package is unique in that it is the only one specifically designed and marketed to the SWL/computer hobbyist.

The combination of computer technology and SWLing opens up many possibilities. RADIOTAP is just one of them!

For more information, contact Kantronics at 1202 East 23rd St., Lawrence, KS 66044.

PC

Books You'll Like



Satellites Today, Microwaves To Movies

Satellites Today, Microwaves to Movies, is the title of a new 163-page book authored by Frank Baylin, with Amy Toner. Baylin's interesting book is intended to give the reader a non-technical survey on the latest innovations in home satellite TV, covering the satellites themselves and what they're broadcasting, along with programming, legal questions, earth stations, and even careers in this exciting new field of communications. This book is heavily illustrated with photos and diagrams and it's written in an easy-to-read non-technical style for the average consumer who has been boggled by much of the high-tech material that has been previously published. Baylin explains noise, interference, antennas, receivers, and just about everything else you'd ever want to know about home satellite TV reception. We liked the nice technical glossary at the rear of the book which goes a long way towards making it look a lot less perplexing than it might have looked originally. This book is $11.95 from ConSol Network Inc., 1905 Mariposa, Boulder, CO 80302.

Ham Master Tapes

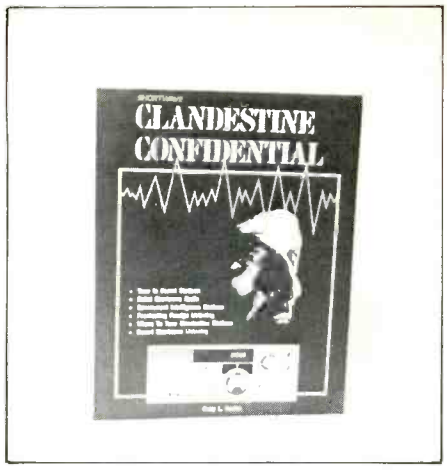
Ham Master Tapes aren't books at all but we felt that this book page in *POP'COMM* would be the best place to tell you all about them. These are three 2-hour videocassettes (available in VHS or Beta formats) that were prepared by Larry Horne, N2NY. These tapes provide you with a wealth of theory and foundation which will be a boon to any person seeking a Novice, Technician, or General Class ham ticket from the FCC. They are in full color and contain plenty of graphics, demonstrations, and data. A few of the dozens of topics covered include modulation types, antennas, feedlines, power limitation information, equipment operation, signal propagation, operating courtesy and rules, circuits, repeaters, test equipment, ham satellites, and lots more. These are professionally prepared and offered by an active ham who has had more than 30 years experience in teaching people how to become licensed hams. The nice thing about these comprehensive tapes is that you can return them as often as you want to review any specific topic about which you might be fuzzy. We've screened these tapes and feel that they are a very clever approach to getting someone on the right path to exploring yet another worthwhile aspect of communications—ham radio. The set of three tapes costs $199.95 (specify Beta or VHS when ordering) and are available from Ham Master Tapes, 136 East 31st St., New York, NY 10016. The course includes the new 200 question FCC syllabus put into use this past year. All in all, it is a good way to get into hamming.

Clandestine Confidential

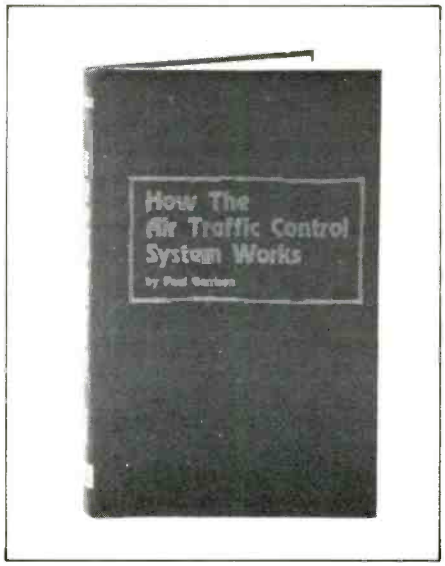
Universal Electronics has just brought out one of the most fascinating communications books to come along in quite a while—it's called *Clandestine Confidential* and it is by *POP'COMM*'s own Gerry Dexter. Dexter's book is a complete nation-by-nation guide to the eerie and mysterious world of shortwave intrigue—underground and undercover secret broadcasters classified as "clandestines." These stations are far more plentiful than you might have thought and are usually operated by various rebels, guerrillas, freedom fighters, and others seeking to irritate or dump assorted governments around the world from Afghanistan to Zimbabwe and everything between. The book is packed with photos of the stations, copies of letters from the stations, QSLs, posters, frequencies, schedules, mailing addresses, QSLing information; really everything one could want to know about the intricacies of this weird aspect of broadcasting.

The book also contains several lengthy stories of clandestines which have made their mark on DXing history, such as Radio Euzkadi, Radio Sandino, the Falklands radio war, Radio Liberation (Vietnam), and the notorious CIA station known as Radio Swan (a/k/a Radio Americas) which Dexter notes ended its seven year broadcasting career shortly after Tom Kneitel published a probing expose of the internal operations of the station. Dexter adds a chapter on special DXing techniques to use when seeking out the clandestine broadcasters on your receiver.

Here's a book which truly captures the dazzling and unusual world of "black propaganda," threats, boasts, lies, innuendos, and provocative statements to be found by tuning in the clandestine broadcasters.



Clandestine Confidential is $8.95 per copy plus $1.75 shipping/handling to the U.S. and Canada. Other countries, $8.95 plus $3 postage worldwide. Universal Electronics' address is 4555 Groves Rd., Suite 3, Columbus, OH 43232.

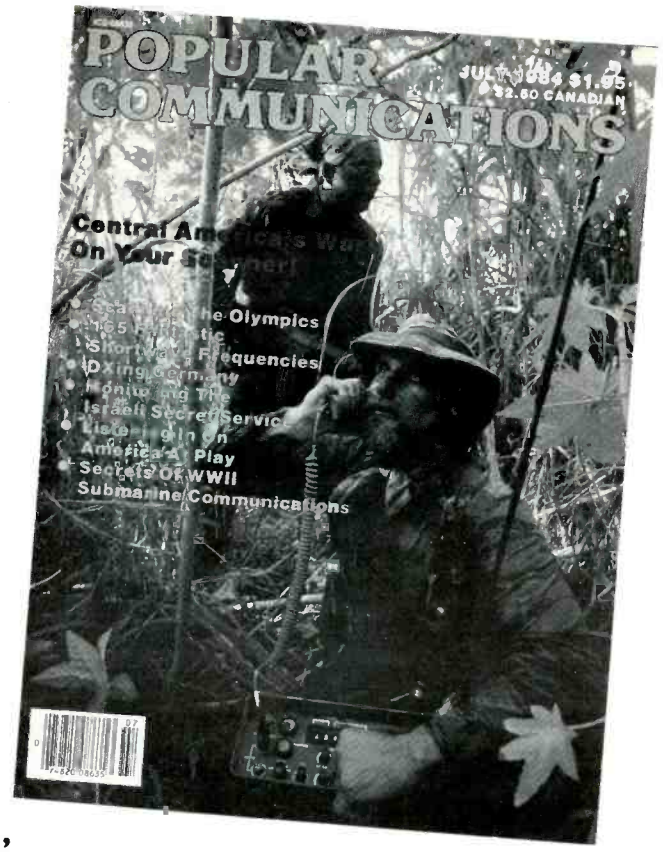


How The Air Traffic Control System Works

For the many scanner and HF monitoring enthusiasts who are interested in monitoring the aeronautical frequencies, we highly recommend a 190-page (hardcover) book entitled *How The Air Traffic Control System Works*, by Paul Garrison. This well-written book explains in great detail the operations and communications relating to control towers, air route traffic control centers, flight service stations, automatic terminal information service (ATIS) transmissions, and other topics of interest. A complete chapter is devoted to avionics and the equipment used at ground stations and in aircrafts. There are plenty of photos and charts, as well as information on communications data as it appears on flight charts. It is an all-around book of understanding what they're talking about on the aeronautical band frequencies, and well worth having. This book is $8.95, plus $1 shipping/handling to the U.S. and Canada from CRB Research, P.O. Box 56, Commack, NY 11725. PC

. . . . from the publishers of CQ

You be the judge...



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A poster relating to the Surinam political struggles.

"Radio Free Surinam" Born In Blood

The Night They Murdered Radio

BY DON JENSEN

The flames, unchecked, leaped high into the velvet black tropical night.

ABC-Radio and RADIKA, two of Paramaribo's main radio stations, were on fire. Elsewhere in the city burned a newspaper office and the headquarters of Surinam's largest labor union.

City firefighters stood by their hoses in frustration. Armed military police held them back from the flames as the stations burned to the ground.

A Surinamese radio ham was tuned to the VHF police frequency that night. He heard something that puzzled him greatly.

"In the name of the commander," the woman dispatcher ordered, "the fire must not be put out!"

Later, the incriminating tape he'd had the presence of mind to record would be broadcast on newscasts in Holland.

Free and independent radio died that night in Surinam. But it was only the beginning. Democracy was not far behind.

Less than 24 hours later, on the night of Dec. 8-9, 1982, the bodies of 15 men, the political elite of Surinam's business, labor, and professional communities, and key members of the local news media, were sprawled, bullet-ridden, on the brick courtyard of nearby Ft. Zeelandia.

Among the dead were ABC-Radio's owner and the young country's former minister of culture, Andre Kamperveen, and his chief newscaster, Frank Wijngaarde.

Into hiding went Mrs. Chitra Radhakishun, director of the Hindustani language radio, RADIKA.

To polyglot Surinam, the former Dutch colony on the northeastern "shoulder" of South America, it was the Night of the Assassinations, and with it came broadcasting censorship—suddenly, brutally.

Once there were five free and lively broadcasters on FM, medium, and shortwave in Paramaribo, plus another in the regional town of Nieuw Nickerie. Today there is only one, the official government outlet, hewing faithfully to the revolutionary line of the military regime of Lt. Col. Desi Bouterse.

Outside Surinam's borders, however, there's another voice on the air sporadically these days. It's Radio Frie Sranan—Free Surinam—operated by exiles transmitting anti-Bouterse programs on shortwave.

For Surinam, the murders and the death of democracy came as a jolting shock! It has been called a United Nations in miniature, a wildly improbable mix of racial and ethnic groups which, somehow, worked. Its diverse peoples managed to live together in peace and tranquility.

Surinam became a Dutch colony in 1667, in a swap that gave the British undisputed title to Manhattan Island. The Netherlands established a successful, but labor-intensive, plantation economy in its tropical outpost.

That required cheap field labor, so the Dutch sponsored wave after wave of immigration to aid in working on the estates. First came black slaves from Africa. After slavery was abolished in the middle of the 19th Century, thousands of hired laborers were imported from India. Today, their descendants —black Creoles and Hindustanis—comprise the two largest ethnic groups.

The next wave of immigration, about 1890, brought Javanese workers from the Dutch East Indies, now Indonesia. The Javanese are the third largest ethnic bloc.

There are also the native Amerindians, plus those who trace their origins to Dutch, Chinese, Lebanese, and Portuguese and Spanish Jewish settlers.

Solid and efficient Dutch colonial administrators had things running smoothly when, after 30 years of steps toward independence, Surinam set out on its own in 1975.

But for the 350,000 Surinamers, the tidy past broke down. Though democracy remained, cronyism and corruption stagnated the economy.

On Feb. 25, 1980, 16 young (ranging in age from 23 to 34) Surinamese Army sergeants and corporals staged a coup. Armed with three shotguns, 16 knives, and a few packages of firecrackers, they took over the country almost without resistance.

The eldest of the non-coms, 34-year-old Desi Bouterse, began his rise to power.

The sergeant's coup stemmed from petty military frustrations and once they had power, the military men seemed baffled about what to do with it.

A few ideologues among them began a leftward tug on the group. The civilian government they had formed was shunted aside. Close ties were established with the revolutionary regime of the late Maurice Bishop, prime minister of the island nation of Grenada, and through it, with Cuba.

Paramaribo had a healthy commercial broadcasting industry at the time.

There was Radio Paramaribo, which programmed primarily in Dutch and Sranan Tongo, a local dialect. It operated on medium wave and FM until shut down after the dictatorship was established.

ABC-Radio also was mainly a Dutch-speaking station, though like the other medium wave outlets, it also aired Hindustani, Javanese, and Sranan Tongo programs. Kamperveen's station tended to speak for the more conservative elements in the society.

RADIKA, also on medium wave, broadcast especially to the Asian audience that spoke Hindustani, as did the small outlying station, Radio Rani in Nieuw Nickerie.

The other commercial radio outlet in Paramaribo was Radio Apintie, which reached local audiences via medium wave and FM, with programs in the four main languages, plus Chinese, but especially in Dutch.

Radio Apintie was also known to shortwave listeners for its transmissions on 5005 kHz. It would survive until late 1983.

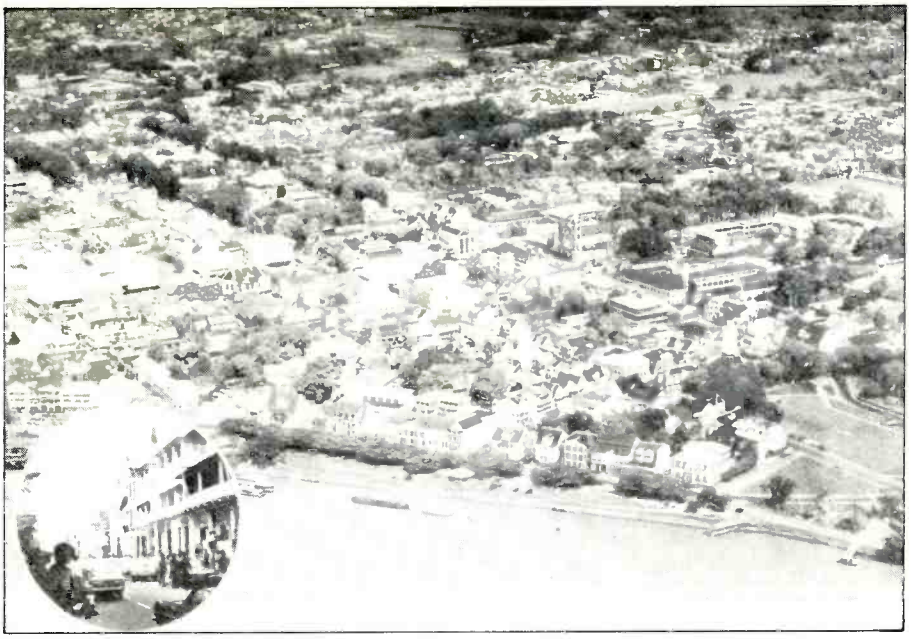
Finally, there was the government station, S.R.S., on medium wave, FM and on 4850 kHz, shortwave.

Originally it had been called, in Dutch, Stichting Radio Omroep Suriname, the Surinam broadcasting station. But after the revolution, while S.R.S. remained the same, it stood for Stem van de Revolutie Suriname, the revolutionary voice.

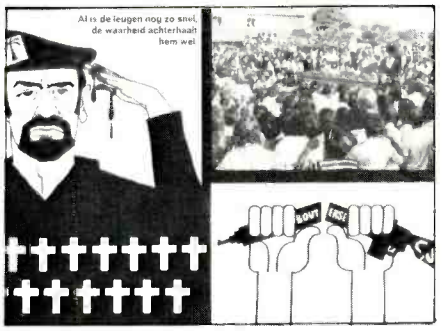
As the government became more radical, the Surinamese grew progressively more concerned. A conservative group within the Army, including Sgt. Wilfred Hawker, once one of the original 16 revolutionaries, staged an attempted coup in March 1982. It narrowly failed and Hawker was executed.

Tensions increased. Business leaders, intellectuals from the university and others spoke out openly against a feared out-and-out dictatorship. The national labor organization, Mother Union, provided the opposition's main strength.

Bouterse, self-promoted to lieutenant colonel, was accutely embarrassed in October 1982 when his guest, Grenada's Bishop, was virtually snubbed during a state visit. Only 1,500 persons turned out for a rally in Bishop's honor. At the same moment, across town, 15,000 cheered union leader



Paramaribo, the capital of Surinam.



Here is a QSL card from the freedom fighters of Surinam.

Cyrill Daal, who called for immediate free elections.

Kamperveen's ABC-Radio aired Daal's speech until Army troops intervened.

Weeks passed and things got worse. Finally, according to one of the original revolutionaries who later split with his military "blood brothers" and died mysteriously, Bouterse decided to take decisive action against his opposition, "once and for all!"

Despite the warning signs, the opposition still had a fundamental faith in constitutional safeguards. It was a fatal mistake, for the "commander" had decided to destroy their leadership and the media.

Early on the evening of Dec. 7, Daal and Kamperveen still thought they could talk out differences with Bouterse, but he refused to meet with them. They went home.

Not long afterward, the radio stations were set ablaze. RADIKA's Mrs. Radhakishun angrily went to the police station to report the arson by the soldiers. Fortuntely she soon recognized the extreme danger, went into hiding and survived.

About 1 a.m. the following morning, two autos, filled with Army commandos, drove up to Kamperveen's home on Schneiders Howardstraat. One blocked the rear entrance, the other pulled up in front of the house and five men, armed with submachine guns, got out.

Kamperveen's dogs raised such a racket that their owner appeared on his balcony to see what was happening. The commando leader demanded he accompany them to see Bouterse. When he refused, the troops tossed grenades through the windows. The explosions set the house on fire.

A shocked Kamperveen surrendered.

At Ft. Zeelandia, it was later reported, Kamperveen and others among the 15 regime opponents similarly arrested that night, were beaten and threatened with death. In time, he confessed to planning an anti-revolutionary coup. In the made-up and coerced statements, the U.S. and the Netherlands were strongly implicated. Those confessions were broadcast on state radio and TV the next morning.

During that day, it is alleged, Bouterse and his "council of blood," reached the decision to kill all the prisoners. It would be claimed that the men were shot down while attempting to escape.

That night, one by one, the prisoners were called before the tribunal and informed of their fate.

An insider witness said that Kamperveen "was a pitiful sight," protesting his loyalty and promising to put his radio station at the service of the revolution.

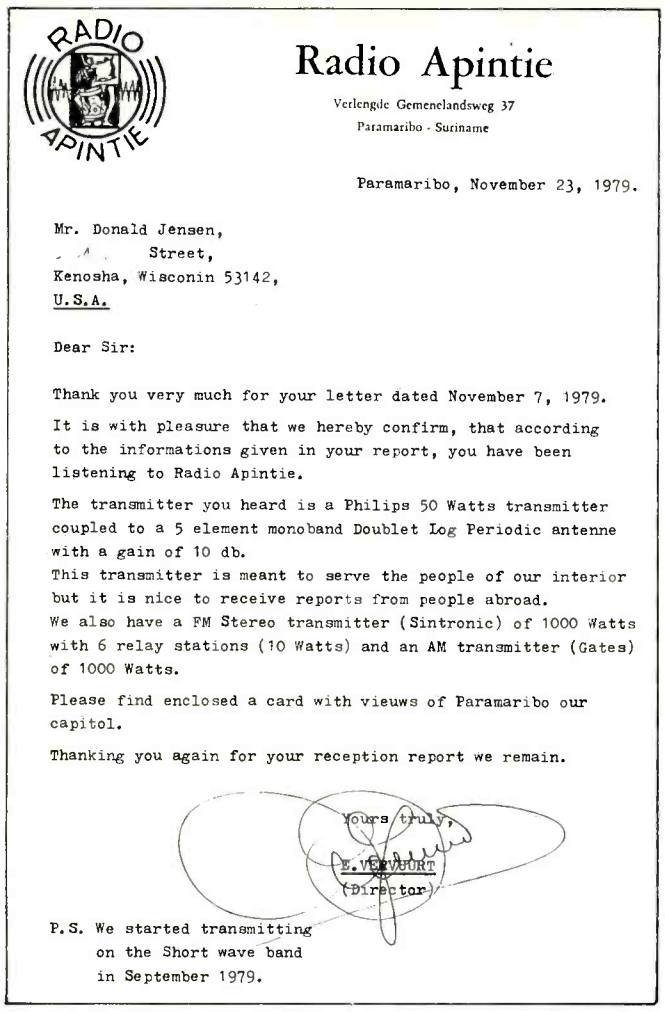
Bouterse, reportedly, was unmoved.

Individually, it is alleged, the prisoners were brutally tortured, savagely beaten and, finally, shot.

In Paramaribo, there is only one medium faster than radio broadcasting, Mofokoranti, mouth-news in the local dialect —rumor. The shocking word spread throughout the city of 150,000 quickly.

Bouterse had been right. The assassinations instantly ended open opposition. Terror gripped Surinamers.

The claim that the victims had been shot while escaping was branded a lie by an in-



Radio Apintie

Verlengde Gemenelandsweg 37
Paramaribo - Suriname

Paramaribo, November 23, 1979.

Mr. Donald Jensen,
[illegible] Street,
Kenosha, Wisconin 53142,
U.S.A.

Dear Sir:

Thank you very much for your letter dated November 7, 1979.

It is with pleasure that we hereby confirm, that according to the informations given in your report, you have been listening to Radio Apintie.

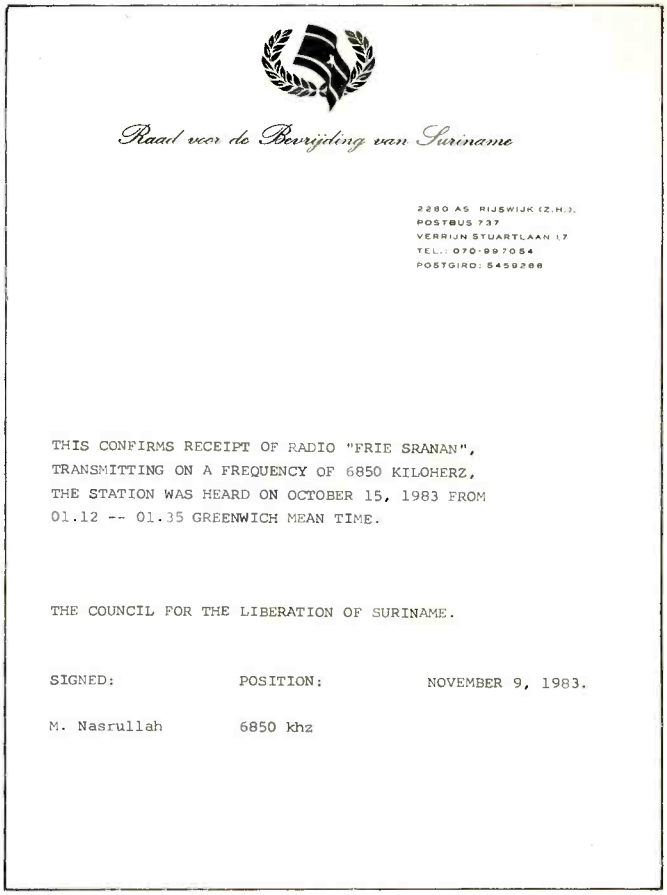
The transmitter you heard is a Philips 50 Watts transmitter coupled to a 5 element monoband Doublet Log Periodic antenne with a gain of 10 db.
This transmitter is meant to serve the people of our interior but it is nice to receive reports from people abroad.
We also have a FM Stereo transmitter (Sintronic) of 1000 Watts with 6 relay stations (10 Watts) and an AM transmitter (Gates) of 1000 Watts.

Please find enclosed a card with vieuws of Paramaribo our capitol.

Thanking you again for your reception report we remain.

Yours truly,
E. [illegible]FURT
(Director)

P.S. We started transmitting on the Short wave band in September 1979.



Raad voor de Bevrijding van Suriname

2280 AS RIJSWIJK (Z.H.).
POSTBUS 737
VERRIJN STUARTLAAN 17
TEL.: 070-997054
POSTGIRO: 5459268

THIS CONFIRMS RECEIPT OF RADIO "FRIE SRANAN",
TRANSMITTING ON A FREQUENCY OF 6850 KILOHERZ,
THE STATION WAS HEARD ON OCTOBER 15, 1983 FROM
01.12 -- 01.35 GREENWICH MEAN TIME.

THE COUNCIL FOR THE LIBERATION OF SURINAME.

SIGNED: POSITION: NOVEMBER 9, 1983.

M. Nasrullah 6850 khz

vestigating panel of Dutch jurists who questioned persons who had seen the bodies at the morgue.

Soon the U.S., Belgium, Venezuela, and the Netherlands suspended development aid programs to what they considered an outlaw regime. The world press and, in the following months, various human rights organizations condemned the barbarism.

Just over a month later, in January 1983, exiled Surinamese leaders met in Holland to form a Council for the Liberation of Suriname, a seven-man board headed by a former president of the country, Henk R. Chin A Sen.

Recognizing the importance of communications, one of the seven, Mohammed S. Nasrullah, former manager of the Telecommunications Co. of Surinam (TELESUR), was named to head a "Radio Department."

The Council's stated aim is to unite resistance to the Bouterse government and promote the re-establishment of a democratic, constitutional state "by all legal and legitimate means."

But in the summer of 1983, the exile council had other means in mind.

Dutch internal security agents reportedly uncovered a plan in which some 300 mercenaries and Surinam refugees were to have flown from Florida to Paramaribo to launch an attack on the military dictatorship. They were to be joined by Surinamese recruited in Holland, who would enter the homeland from neighboring French Guiana. The scheduled July 1 coup attempt never came off.

Almost immediately afterward, though, the Council set up a clandestine shortwave program called Radio Frie Sranan—Free Surinam in the local Sranan Tongo dialect. The abbreviated broadcasts in the major national languages, including Dutch and Hindustani, sporadically have been heard on 6850 kHz from about 0100 until anywhere between 0115 and 0135 hours GMT/UTC.

The Council, whose headquarters are at Verrijn Stuartlaan 17 in the Dutch town of Rijswijk, says it records its programs at studios in The Hague. The programs are rather low key compared with the fiery diatribes aired by other clandestine radios.

Nasrullah has refused, not surprisingly, to reveal the location of the transmitter, which supposedly runs 15 to 20 kilowatts of power. Sources not connected with the Council say the location is Venezuela.

By early 1984, Radio Frie Sranan's broadcasts were off the air and Nasrullah said that the Council was trying to raise money for further programming and, he hoped, a more powerful transmitter.

Apparently the Council had some success in its fund raising, since Radio Frie Sranan appeared back on 6850 kHz in April on a sporadic basis.

Meanwhile, back in Paramaribo, there was yet another fire that destroyed the station. This time, though, it was anti-Bouterse forces supposedly responsible for the Oct. 26, 1983 firebombing of the transmitter building of the government's S.R.S.

Sources within the country say a young man named Gobardhan was arrested and jailed for the firebombing, but no more is known of his fate.

S.R.S.'s surviving FM transmitter was supplemented by a transmitter appropriated from TELESUR, and the station returned to medium wave on 600 kHz. There are also rumors that a surviving Radio ABC transmitter on 1030 kHz was confiscated by the government as well.

Finally, the Bouterse government took over the only other shortwave broadcasting transmitter in the country, that of Radio Apintie.

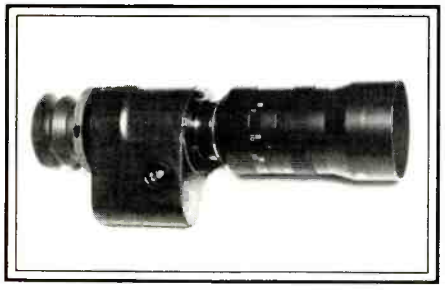
And that's where today—on Apintie's former shortwave frequency of 5005 kHz—foreign listeners can hear the programming of S.R.S. during early morning and evening transmissions.

Rumors abound throughout Surinam and the world. The government, according to one tale, will shortly install a 100 kilowatt transmitter and has even registered for international shortwave frequencies. According to another, two of the local stations, Radio Apintie and Radio Paramaribo, would be permitted to return to the air by summer.

But in a country where radio was murdered, don't believe it until you hear it with your own ears! PC

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



The infrared viewer used with the JVR 500.

Electronic Kidnap Recovery

To meet the threat of kidnapping, CCS has developed a specialized electronic kidnap recovery system. The JVR 500 consists of a tiny transmitter so small it can be carried at all times by anyone vulnerable to attack. The JVR is constantly emitting a signal...the naked eye can't see it, but with a special infrared viewer the signal becomes visible in any light, in any weather.

With this infrared viewer, security can easily and quickly scan a crowd. A victim can be followed or located without the kidnapper's knowledge. Even vehicles or cargo of value can be kept under constant surveillance.

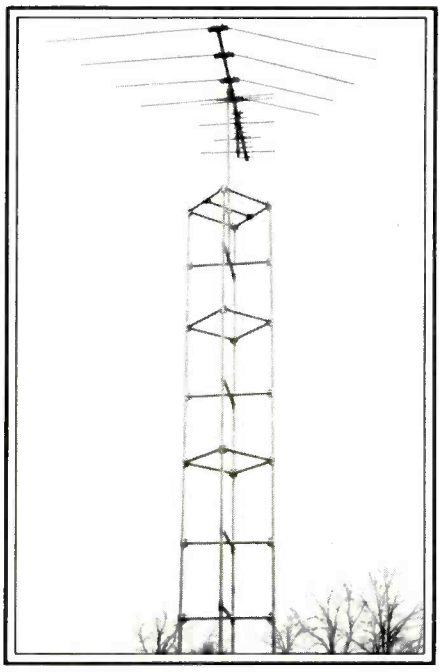
CCS predicts that this extraordinary kidnap recovery system will be used by executives, politicians, and others in high visibility, high risk positions.

For more information contact CCS Communication Control Inc., 633 Third Avenue, New York, NY 10017 or circle number 102 on the reader service card.

Rigid Antenna Tower

Any do-it-yourselfer can build a sturdy, professional looking tower for a scanner TV, CB, or ham radio antenna out of common ¾-inch electrical conduit and plated steel clamps, which carry the trade name FrameMaker Clamps. When tower cross sections are constructed at 20 to 30-inch intervals, material costs are approximately $7.00 to $10.00 per running foot.

The only tools needed are a hacksaw (or tube cutter) to cut the conduit and a couple of wrenches. Conduit sections are simply placed into the openings of the clamps and the plated nuts and bolts are tightened, locking the clamp jaws securely around the conduit. To avoid the pitfalls of "one-clamp-does-all" designs, several kinds of FrameMaker clamps are made; 4-way fixed and adjustable, 3-way 'T', and 2-way adjustable and parallel. No locking collars or set screws are needed to prevent slippage. Unlike towers whose joints are welded or brazed, a tower made with FrameMaker clamps can easily be taken down, and the clamps and conduit can be used to build other projects.



A free project idea brochure is available from Bullseye Products, Dept. DU, 28506 Hayes, Roseville, MI 48066, or circle number 105 on the reader service card.

High-Security Portable Telephone Scrambler

The new TS104 portable telephone scrambler offers 8-digit keyboard-programmable codes for 100,000,000 code combinations. An additional built-in customer code is optional.

The TS104 is powered by 110 to 240 VAC, 12 VDC, and internal rechargeable batteries, and can therefore not only be used worldwide, but also in a car or boat.

The time segment rearrangement and reversal scrambling method offers very high security.

The connection to the telephone is made by means of an integral acoustical coupler and handset.

The scrambler's dimensions are 9.6″ × 7.6″ × 1.5″ and its weight is 3.3 lbs.

For more information contact Viking International, PO Box 632, Newhall, CA 91322, or circle number 106 on the reader service card.

RT-1200 Receive Terminal

DGM Electronics, Inc. has introduced the RT-1200 Receive Terminal. The RT-1200 will copy Baudot, ASCII, and Morse codes and display the text on a video monitor. A built-in high performance demodulator will copy 170, 425, and 850 Hz shift RTTY signals using either the high or low tone pairs. This allows you to copy those commercial RTTY stations. An on-screen tuning indicator allows accurate tuning of incoming signals while the on-screen status line displays the selected mode and speed along with the demodulator status. A Morse code speed readout is also included.

The RT-1200 has three selectable display formats. These are selected using a front panel pushbutton. The first format is 24 lines of 72 characters per line which contains 2 pages. The second is an easy to read 24 lines of 36 characters per line with 4 pages. The third is 16 lines of 36 characters per line containing 6 pages. The display can also be viewed in reverse video by front panel selection. The different pages are also selected by a front panel pushbutton.

It has AUTOSTART operation which can be used to turn on a cassette motor to record messages automatically. The AUTOSTART also enables data output to the printer output. A serial ASCII printer or Baudot printer can be connected for hard copy print out.

The RT-1200 has a built-in audio monitor and speaker to monitor incoming signals. A built-in 120 VAC power supply is also included. The RT-1200 is housed in an attractive RF proof aluminum enclosure and is manufactured in the U.S.A.

For more information contact DGM Electronics, Inc., 787 Briar Lane, Beloit, WI 53511, or circle number 107 on the reader service card. PC

SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Powerful Stuff

Of prime importance to all persons seeking to provide power for emergency or survival communications systems is the ability to have adequate power on hand to keep those systems operating in the absence of public power sources. Remembering the severe weather of last spring, and what with this being the start of the hurricane season, we thought it might be timely to take a look at some of the ways you might power your receiver, scanner, transmitter, or other electronics equipment.

First, let's start off with a question on communications power from Duane of Newcombe, Kentucky, who asks if we can discuss the ability to provide operational power for battery-operated military surplus equipment. The military designations for the batteries required for some of the more popular military equipment includes:

Battery	Used For
BA-37	BC-611, BC-536
BA-38	BC-611, SCR-536, SCR-625
BA-270/U	AN/PRC-6
BA-279/U	AN/PRC-8, -9, -10
BA-386/PRC-25	AN/PRC-25, -74
BA-386/PRC-77	AN/PRC-77
BA-399/U	AN/PRT-4

Some surplus dealers can supply these and other military batteries and it's wise to check with companies such as Meshna, Western Wireless, Baytronics, Fair Radio Sales, and Michael Murphy to see if they carry what you're seeking. There are also battery adapter units that will permit the use of standard Burgess, Eveready, and other "civilian" types with military radios. One manufacturer is TNM Enterprises, P.O. Box 2331, Anaheim, CA 92804.

Charlie Redfeather of Oregon asks for some information on the use of solar power for base station communications equipment normally operated in a remote area where public power is not available. The best way to approach this situation, Charlie, is to run the equipment from heavy-duty 12-volt storage batteries (the kind designed for use in trucks and industrial vehicles), then use solar electric modules to trickle-charge the batteries. Arco Solar (21011 Warner Center Lane, Woodland Hills, CA 91356) is a leading producer of solar electric modules which are intended for this purpose and for use in conjunction with powering boats or RV equipment, fence chargers, lights, or other electricity users.

Typical Arco modules which would be suitable for powering communications gear include the recently announced M82 and M85 modules from Arco.

The M82 is lightweight, compact, ruggedly constructed, and easily installed. Weighing only 1 lb. 10 oz. and measuring about 11″ × 14″ (and only ¼″ thick), the M82 is well-suited where space is restricted and mounting options are limited. It is made of 35 single-crystal silicon solar cells encapsulated between layers of special plastics, bonded to a strong metal backing, and framed with a sturdy neoprene gasket. Strict quality controls assure long-lasting dependability and permit Arco to offer a 1-year limited warranty. With a typical voltage of 15.9 volts, the M82 can help maintain the charge in a 12-volt battery.

The M85 features portability and power flexibility in a single package. It consists of five interconnected photovoltaic modules that fold together for easy carrying in a canvas pouch. The unit weighs only 3 lbs. and measures only 5″ × 9″ when stowed. When unfolded, the M85 measures about 9″ × 33″. Nominally rates at 10.8 watts at peak power, the M85 uses 70 single-crystal silicon solar cells that can produce electricity in as little as 10% of noon sun. For 12-volt charging, the M85 is rated at 16.8 volts and 640 milliamps. When used with a 24-volt battery, the unit's rating is 33.6 volts and 320 milliamps.

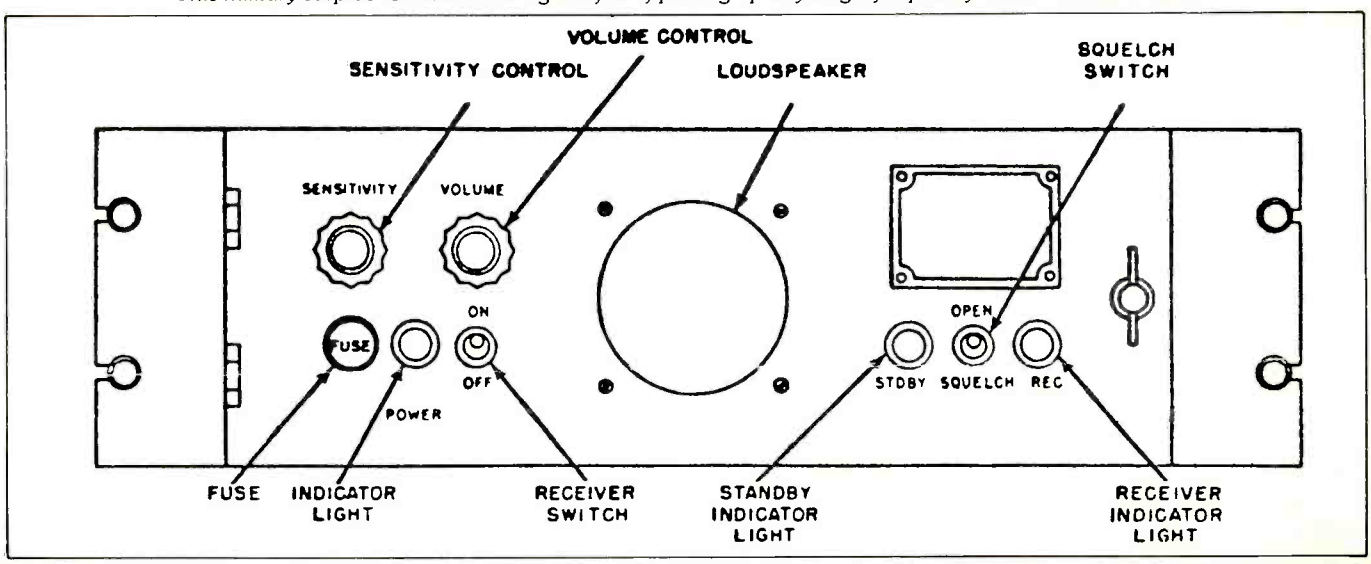
Arco produces a large assortment of solar panels for many different applications and they are sold at many dealers across the nation. A great solar power equipment catalog is available for $2 (refundable) from Current Alternatives, P.O. Box 166-P, Northfield, VT 05663. A catalog of Arco solar products is available for $1 from Springhouse Energy Systems, Inc., Room 418, Washington Trust Bldg., Washington, PA 15301.

A question came in that our readers might wish to try to answer. Gary P. Cain, W8MFL, 1428 Marigold Way, South Bend, IN 46616, has a radio transceiver which he'd like someone to identify. The mystery set is apparently a synthesized version of the military AN/PRC-64 and covers 2 to 10 MHz. The set was manufactured by Delco and bears their ID "Delco 1600," although the label carrying the military designation is missing. Delco doesn't seem to know anything about such a transceiver, unfortunately. Gary feels that this radio almost certainly has a designation in the PRC series. If you have any information, contact Gary.

Radiation detection, and what one might do about it on a personal level, is a question posed by Alfred Weiner of Colorado.

Well, Al, there are quite a few radiation

This military surplus receiver does a good job of picking up any single frequency in the VHF aero band.



Arco Solar's M-85 portable solar electric charging unit. The only thing this won't charge is a pair of socks at Sears.

Arco Solar's M-82 photovoltaic module.

Gary Cain isn't able to figure out what this transmitter is. Can you help him?

The Visi-Rad is an inexpensive way of checking for harmful radiation.

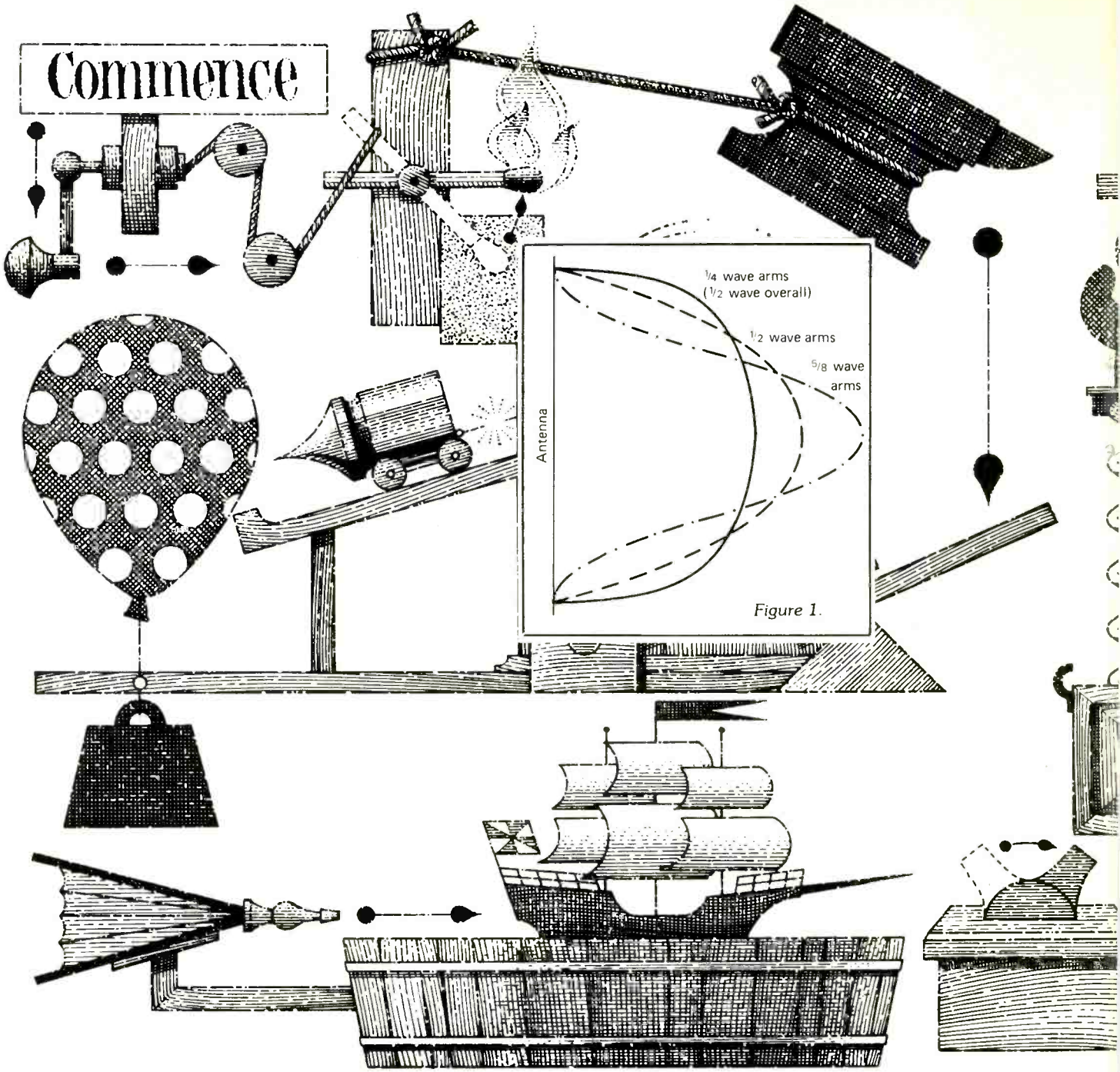
detection units available these days. One that we saw which was particularly well designed and produced is the VisiRad H-1 dose rate meter, employing a new technique to measure nuclear radiation. It utilizes a component which emits light when irradiated, glowing brighter as radiation increases. The user makes an objective visual comparison between this component and a calibrated light source, and reads any dosage rate at the light source adjustment knob. It's the first low-cost dose rate meter ever developed which covers the measurement range needed for high radiation nuclear emergencies—up to 1,000 Roentgens per hour. The H-1 sells for less than $95. It's manufactured by VisiRad Corporation, 7131 Owensmouth Ave., Suite 115-D, Canoga Park, CA 91303.

An inquiry from someone identifying himself (or herself, as the case may be) only as "Spinner" of Sand Springs, Oklahoma asks for information on the applications of a military surplus transceiver called the AN/PRC-88. Well, I don't assume you mean the AN/PRC-88/GY, which is a West German unit that is essentially a solid-state version of the AN/PRC-77. More than likely you are referring to the U.S. designator AN/PRC-88. If so, there really isn't any actual piece of equipment bearing such a designation. The AN/PRC-88 was a special designation used to indicate the combined use of two pieces of equipment, the PRT-4 transmitter and the PRR-9 receiver. As such, these two pieces of equipment go together like franks and beans and have many applications for the person interested in highly portable short-range communications. These units are crystal controlled and operate on two channels between 47 and 57 MHz. The PRR-9 receiver is designed to be helmet-mounted. Both units are available on the surplus market, although the PRR-9 is somewhat more difficult to locate today than the PRT-4.

A question came to the column from Mark Wormrath of Tennessee. Mark's question probably should have been directed to *POP'COMM*'s Editor, Tom Kneitel, since it makes reference to something TK had mentioned in a recent reader mail column. However, I'll do the honors myself because I happen to know the answer. Mark wants to know more about the private communications systems used by the families of the national police and national guard officers in El Salvador—the systems used to communicate with their relatives in the combat areas. Essentially the systems they use center around the JPC/Azden PCS-4000 transceiver used in conjuction with a linear amplifier. This is a 2-meter band FM ham rig which can operate (via synthesizer) anywhere between 142 and 150 MHz. For some reason, the transceiver is a universal favorite with the families who want to have these communications with their relatives who are in the jungles fighting. The number of homes sprouting 2-meter ham antennas in Sal Salvador is truly amazing! The troops themselves use hand-held transceivers. The hilly terrain gives those who have good locations a reasonably good shot at reliable communications. But even though the majority of these people can get through only once in a while, they continue to dutifully monitor their designated frequency around the clock. None of this is licensed or sanctioned, but the government doesn't seem to care. El Salvador is a relatively small country and this is probably one of the few instances when anything like this has ever taken place.

Many readers have continually written asking about the availability of an organization which is oriented towards the survivalist communicator. The one major national organization is the SSB Network, P.O. Box 908, Smithtown, NY 11787. This group, which began in 1964 and has tens of thousands of members, is primarily directed towards 27 MHz SSB operations, however all of those people interested in survival communications are welcomed. The one-time registration fee is $8 (there are no annual dues) and you are given a membership card and certificate, a copy of the group's publication, SSB Net Notes, and you're also assigned an individual on-the-air identification code/membership number. If you want more information, send the group a #10 (long) envelope, self-addressed and stamped.

For those who are interested in monitoring one favorite VHF aero band (116 to 140 MHz) channel, here's an approach worthy of your consideration. It's a single channel tube-type crystal controlled monitor receiver with a built-in speaker. The supplier sets it for any frequency you specify and for the input power voltage you desire (117/230 VAC, 50-60 Hz). These were originally made for use in control towers so they're rugged and reliable. You might wish to use one to monitor your own local control tower or Unicom frequency, or set it on 121.5 MHz, the aero emergency channel. These receivers are $75 each (less antenna) from N.E. Litsche, P.O. Box 191, Canandiagua, NY 14424. PC



An Antenna? Build It!

Here's An Antenna That's Easy To Construct—And It Works!

BY DAVID T. HARDY

The most important component of any shortwave listener's equipment, apart from the receiver itself, is the antenna employed. The antenna not only functions to pull in signals for the receiver, it can also increase the strength of those signals, pulling them above the receiver's noise floor, and can (to a certain extent) screen out interfering noise and transmissions.

I was recently faced with the altogether agreeable prospect of a substantial upgrading in receivers, from a non-digital portable to an R-2000, and needed an antenna worthy of the Kenwood. Fortunately, I decided to install the new antenna before acquiring the new set. I say fortunately because changing from a longwire to the antenna design I hit upon completely transformed the non-digital portable, as well as proving worthy of the R-2000!

The antenna itself is simply described; it was a 78 foot dipole, of insulated wire, linked at the center by 450-ohm "ladder wire" feeding an antenna tuner and a home-brew 2 MHz high-pass filter. Describing the reasoning behind this choice will take a bit more time.

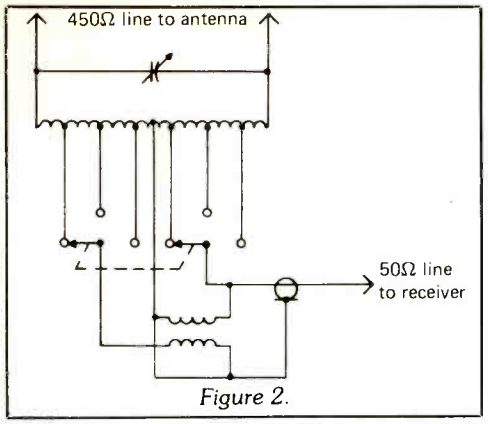


Figure 2.

Figure 3.

I had three objectives: (1) to construct an antenna which would resonate at as many frequencies as possible so as to strengthen incoming signals at those frequencies; (2) to achieve low-loss transmission from the antenna to the receiver; and (3) to screen out interference from local broadcast-band AM stations.

Resonance is vital because an antenna will in effect, increase the power of signals at the frequency for which it is resonant. The effect is analogous to the manner in which a tuning fork will begin vibrating if another, tuned to the same frequency, is struck and placed next to it. In the case of an antenna, this strengthens signals of the resonant frequency, lifting them above signals of random frequency (noise) and increasing the strength of the signal fed into the transmission line and ultimately into the receiver. An antenna is resonant in relation to a radio signal if one of its arms is equal to ¼, ½, ⅝, or ¾ of a wavelength of that signal. Additionally, all odd multiples of ¼ wavelength will be resonant. Since a dipole is essentially two antenna arms placed center-to-center, its overall length would be double these figures. Somewhat complicating this is the fact that wavelengths of signals are expressed in terms of the wavelength in "free space," which has no resistance; a copper wire has resistance, which acts to shorten the effective wavelength of a signal being received on it, so that a 7.5 MHz signal whose "free space" ¼ wavelength would be 10 meters will in fact resonate on a copper wire about 9.4 meters long, or a dipole with overall length of 18.8 meters. The general rule for computing overall length of a wire dipole with two quarter-wave arms (the basic dipole) is Length (in feet) = 468 ÷ Frequency.

Trying to make an antenna resonate on a number of different bands involves some calculation. Hams have it relatively easy, as their major bands have wavelengths of 10, 15, 20, and 40 meters. SWLs, on the other hand, must contend with odd wavelengths such as 19, 25, 31, 41, 49, and 60 meters.

After much plotting and calculation, I settled upon a dipole with two 39 foot arms for an overall length of 78 feet. This would give me a simple dipole resonating at 6 MHz (middle of the 49 meter band), a dipole with two half-wave arms (a "double zepp") at 12 MHz (top of the 25 meter band), one with ⅝ wave arms (an "extended double zepp") at 15 MHz (bottom of the 20 meter band), and two ¾ wave arms at 18 MHz (top of the 16 meter band). This covered all the bands on which I do much listening, except 31 meters. Moreover, 78 feet of line would fit within my yard and would be convenient to purchase (allowing for length lost wrapping around insulators, it would work out to a nice round 80 feet).

Solving the resonance problem also resolved the need for directional characteristics. I needed an antenna with increased reception in two directions—northeast, to take in the "great circle route" from Europe, and southwest, to take in Australia and Southeast Asia. The dipole is generally bidirectional, at right angles to the antenna itself, and thus could meet these requirements. In fact, up to ¾ wave, the dipole becomes more directional as the frequency is increased in relation to the antenna's length (see Figure 1).

With directionality comes increased gain for signals at right angles to the antenna and thus within the center if its receiving "lobe": for an antenna with ⅝ wave arms, this can amount to several decibels. Unfortunately, at ¾ wave, the lobes split into a cloverleaf pattern, with maximum reception not at right angles to the antenna, but in four lobes each about 45 degrees from the antenna. Three out of four is not bad; at 49, 25, and 19 meters I would have a directional antenna aimed precisely at the points I desired; at 16 meters I would have a directional antenna aimed at four random points, but which would still take in Africa and northern Asia with sizeable gain and other points at a reduced gain.

Having reached a suitable compromise on the directionality of the antenna, I had a sizeable problem with ensuring low-loss transmission from it to the receiver. Low losses normally require a low standing wave ratio (SWR), which requires ensuring a good match in impedances between receiver, transmission line, and antenna. The problem is that standard coaxial transmission line is 50 or 75 ohms impedance, while antenna impedances vary radically with length in terms of wavelengths. A ¼-wave antenna has a characteristic impedance of about 75 ohms, as does a ¾ wave antenna and indeed

all antenna lengths which are odd multiples of ¼-wave. On the other hand, ⅝-wave antennas have higher impedance, while ½ wave antennas have impedances which can exceed 5000 ohms. A feedline that matches one impedance will be a sizeable mismatch with regard to the other; in the case of coaxial feedlines, the mismatch with ½ and ⅝-wave antennas would be such as to cause very high losses indeed. Thus, the antenna might function well at 6 MHz and at 18 MHz, but would experience serious losses at 12 and 15 MHz.

The solution is found in "ladder wire," whose characteristic impedance is 450-600 ohms (depending upon spacing of the wires), and which is extremely tolerant of high SWR (Even at high SWR, its losses are usually less than small-diameter coaxial cable at 1:1.) Ladder line lacks certain advantages of coaxial cable—most notably, its impedance can be disturbed by the proximity of metal objects, whereas coax can be run without regard to metal siding, reinforcing bars, conduit, etc; but tolerance of high SWR made it essential for a multi-band antenna such as this one.

The use of ladder wire did pose two problems. The first was that our house has metal casement windows. Drilling a hole through the glass with a proper carbide drill was one way to keep the ladder wire away from metal, but a bit of investigation showed another, easier way. I simply cut two one-foot pieces of ordinary coax cable, soldered the inner conductor to the ladder wire, ignored the outer conductor, and used this segment to pass through the casement. With the outer conductors not connected, the normal impedance of the coax can be ignored for this short a stretch, and the influence of the metal casements can be ignored. The other problem was that matching the impedance of the antenna-feedline combination to the receiver was going to be no easy task. With ladder line, the impedance (and its component values) varies from place to place on the line, generally reproducing itself at half-wave intervals. But since the length of a half-wave is different at 6, 12, 15, and 18 MHz, impedance matching would be complex. This complex task can be resolved with ease by fixing an antenna tuner to the end of the feedline and using that to match the antenna-feedline combination to a short piece of coax feeding the receiver. A suitable antenna tuner can be bought for about $50 (make sure it's one for balanced feedlines such as ladder-wire), but I decided to make one for a fraction of this price. The schematic for the tuner is shown in Figure 2.

I assembled the tuner in a plastic box; rather than using a coax plug as an outlet (which would have required a separate coax "patch cord"), I simply spliced in a surplus piece of coax with attached plug. The coil was one obtained from a "miscellaneous parts" bin for a dollar; it is seven inches long by an inch in diameter. Location of taps on it were selected by trial and error; by tuning stations at various frequencies and noting if the signal was improved by moving the taps. In this case, all taps were located near the center, along the first two turns. The capacitor was a 365 mfd. variable, obtained from my junk box; it likewise was calibrated by trial and error. Calibration was not difficult; rotating the capacitor from minimum to maximum settings can make a 20-db difference in signal strength. The windings on the ferrite core are essential to making the conversion from balanced (ladder wire) to unbalanced (coax feed). They are formed quite simply by taking two 4-foot pieces of enameled magnet wire, twisting them tightly together, then wrapping 20 turns on an Arnidon FT-61 ferrite core. (I suspect other cores would function as well, as long as they were suited to shortwave frequencies; I twisted the wings to 5 turns per inch in a few minutes by placing one end of the wires in a vise, balling the other end into a mass that could be grasped in the chuck of a variable-speed drill, and operating the drill at very low speed.) The tuner operates by alternately increasing inductance (by routing the signal through the coil, which is equivalent to lengthening the antenna) or increasing capacitance (by bridging the signal with a capacitor, which is the equivalent of shortening the antenna), to bring the antenna-feedline combination into resonance and proper impedance.

The explanation has been a bit complex, but the result is simple. An 78 foot dipole, ladder-wire feedline, and an antenna tuning unit will leave you with one excellent multi-band antenna! For the sake of reception, be sure to get the antenna as high as possible. Use insulated wire if going through trees or foliage (I had no choice), and if you must use trees to anchor the ends, remember that they can easily sway ten or more feet in a high wind. Leave plenty of slack, or use a weight-on-pulley system to put "give" into your system, and don't count on solder to hold the center connection together—it won't for very long. Instead, bare plenty of wire at the center, twist it tight after passing through the center insulator, wrap the ladder wire tightly around the twisted portion, then flow on the solder and tape. If this seems overly cautious, one view of the center of your 80 ft. dipole holding up several pounds of ladder wire and bouncing around in a stiff wind will suggest I am being quite conservative! For the same reason, use a strong nylon line to guy the wire. I used a "wrist rocket" slingshot to loft a heavy fishing sinker over likely limbs. The sinker towed fishing line, which in turn carried the nylon line, which carried the wire; no end insulators were necessary with the nylon line. I still needed a 20-foot pole to help lift the midpoint before the line could be pulled into position. It goes without saying that for safety's sake you should avoid power lines like the plague and use a good lightning ground—preferably a grounding block linked to a heavy aluminum line running *straight* to the grounding rod or two; a multi-kilovolt charge which has leaped through thousands of feet of air to find your antenna is in no mood to follow sharp turns when earth is

only another few feet away, and a lightning bolt following the feedline into your shack is one quick way to win your wager with the life insurance company.

Assembly of the antenna, feedline, and tuning unit took a good part of the day and about $35; lifting it into place took another morning. The efforts were well worth it, though, when I hooked the result up to my non-digital portable. Programs that had come in poorly with the built-in whip and only somewhat better with a 50 ft. longwire blasted in to the point of overload. Stations that had previously been inaudible were easily copied.

In fact, the signal-gathering abilities of the antenna were *too* good. There are some 24 broadcasts-band AM stations in my metropolitan area, some with antennas only one or two miles away. Images of these stations appeared, especially in the region of 12 MHz, and even my long-awaited Kenwood suffered from them. But I had waited too long for this antenna-receiver combination to be frustrated by two dozen pestiferous broadcast stations.

Speedy consultation of several electronics handbooks suggested that a band-stop filter, which would filter out and "dump" to ground signals within the broadcast band, would keep those signals away from the receiver's front end and thus end the appearance of their images. But the charts for a band-stop filter seemed a bit complex for a first effort. Since I did almost no listening at frequencies below the broadcast band, a high-pass filter which would pass all frequencies higher than broadcast band would be adequate and much simpler to build. A high-pass filter with cut-off point at about 2 MHz would nicely slice off the 525-1605 kHz band while not interfering with shortwave listening; moreover, a nice round cut-off point like 2 MHz would involve values which were easily computed from available charts. The indicated values for capacitors (440 and 337 picofarads) moreover closely approached those of some readily available parts (330 and 470 pf), so I used the latter values instead. The schematic for the filter as I finally constructed it is shown in Figure 3.

The coils are wound on toroid cores; the number of turns necessary to achieve the required inductance can be determined from charts usually available with the cores. (I used Amidon type E cores, outside diameter .68". For these, 24 turns of the enameled wire supplied with the cores gave 5.5 mh inductance, which was close enough. Make sure the cores you choose are suitable for shortwave frequencies—these were suited to anything below 30 MHz.) The capacitors were mica; less expensive ones might have worked, but were not tried. I mounted the entire assembly in a metal box, which was grounded; the coils were mounted at right angles to minimize coupling. The entire cost was about ten dollars.

A filter of this type can, of course, be given a detailed test with the appropriate equipment, but I would rather spend the money on the receiver than on a grid-dip oscillator. I gave it a rough shakedown by tuning the broadcast band stations it was intended to filter out. It worked like a charm; stations which had "pegged the needle" before were now barely audible; others, not in my immediate region, were entirely gone. A check of the shortwave bands showed that the images were likewise gone. A check of shortwave stations on the 41 meter band (the lowest frequency I normally use) showed no difference with filter in or filter out; Radio Papua New Guinea, at 4.890, likewise came in clearly. Whatever its technical attributes, the filter did what it was intended to—and at minimal cost.

The work consumed in creating and testing the antenna system was considerable, but it was well worth it. I ended with an antenna which brought in signals my previous long-wire had missed, and overloaded with some that had previously been barely adequate (I now have good use for the R-2000's variable attenuator!). The entire system was created at a cost of under forty dollars. PC

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

BY DARREN LENO, WDØEWJ

TVQ and the Federal Communications Commission are trying to locate the pranksters who interrupted a pay-TV service in Milwaukee, Wisconsin with an unauthorized announcement.

At least three times this year subscribers watching TVQ's Home Box Office signal were treated to a special message from "the president of TVQ."

The messages, which appeared during prime time viewing hours, stated that TVQ was sorry for prosecuting individuals who use their own microwave receiving dishes to "pirate" the HBO signal and avoid paying the monthly subscription fee. The bearded man in the message claimed that it is now alright to do so. But according to Drew Sheckler, TVQ's general manager, it is *not* alright to do so.

Mr. Sheckler and the Federal Communications Commission are investigating the incident. They have an idea how the pirate interrupted TVQ's signal, but declined to be specific. George Sklom, assistant engineer-in-charge of the FCC's Chicago field office, says his office is investigating the matter.

George Sklom's office was responsible for the recent "bust" of the shortwave pirate, Radio Free Insanity. He also closed Jolly Roger Radio of Bloomington, Indiana in 1980.

Thanks to Terry O'Laughlin of Wisconsin for forwarding this information, which appeared recently in the *Milwaukee Journal*.

Richard Persinger of Michigan chases pirates with his 1948 Zenith transoceanic and Yaesu FRG-7 receivers.

Pirate Bandscan

KMA: John Norfolk in Oklahoma heard this station operating on 7410 kHz between 0053 and 0122 GMT. An announcer calling himself Dr. "Y" said, "set up your own pirate station . . . impress your friends . . . be heard around the world . . . for free information and our QSL card, write KMA." Their address is PO Box 3192, Joliet, IL 60434. Rick Cunningham of Texas recently received a QSL card from this address, so we know it's good. Ken Evans of South Carolina heard KMA on 7408 kHz from 0150 to 0202 GMT. He heard Dr. "Y" casually mention that he lives on Saturn, and would "return to earth in 6 or 7 bleams."

KPRC: Frank Decker of New York heard Pirate Radio Central on 1616 kHz with a parallel frequency of 6275 kHz after 0300 GMT. The station was accepting phone calls from listeners. Their address for QSLs is PO Box 542, Exeter, NH 03833.

KQRP: John Norfolk of Oklahoma, Jeff Zell of Illinois, and Randy Noak of Indiana caught KQRP on 7425 kHz after 0130 GMT. The DJ was Dr. "X," who claimed a power output of 50 watts. Jim Lonsdale of Arizona and Michelle Shute of Florida heard KQRP on 7373 kHz with a parallel frequency of 6233 kHz at 0207 GMT. Reception reports should be sent to PO Box 982, Battle Creek, MI 49016.

KQSB: This pirate continues to be widely heard on 15050 kHz, usually after 2300 GMT, according to John T. Arthur in Hawaii. Joe Wosik of Illinois reports hearing DJs Frank Furter and Uncle Al on 7415 kHz from 0113 to 0140 GMT.

Munchkin Radio: This unique pirate was on 7525 kHz when Joe Farley of Illinois heard them after 0125 GMT. Munchkin Radio is a difficult station to hear, largely because their transmissions are so short and sporadic. If your receiver dial happens by chance to land on this station, you can try for a QSL through PO Box 982, Battle Creek, MI 49016.

Radio Bag: Grant Lochmiller of Iowa heard Radio Bag on 7415 kHz. They were broadcasting rather early on this frequency, from 2000 to 2030 GMT.

Radio Clandestine: This was heard on 7355 kHz from 0342 to 0352 GMT. Richard White of Ohio, Loren Thompson of Illinois, and Randy Noak of Indiana each described the programming as very humorous. Sheryl Paszkiewicz of Wisconsin heard RC on 9675 kHz at 1500 GMT with DJ R.F. Burns. Reception reports for this station should be sent with return postage to PO Box 982, Battle Creek, MI 49016.

Radio Espirito: This pirate was noted on 7425 kHz from 0315 to 0400 by Fred Roberts of Ohio. Fred described the "Gregorian Chant" music Radio Espirito programs as "thoroughly boring."

Voice Of Communism: After reading the Pirates Den for several months, Randy Noak of Indiana finally heard his first pirate. This station was transmitting on 7410 kHz from 0309 to 0334 GMT.

Voice Of Democracy: This profession-

Radio Los Angeles broadcasts on 26580 kHz on weekend afternoons.

Dick Tracy has been adopted as a mascot for Radio (A).

al sounding pirate was logged by Michelle Shute of Florida on 7372 kHz after 0432 GMT. A phone number was announced with a Washington, DC, area code, and they played easy listening music.

Voice Of Laryngitis: George Zeller of Ohio heard the VOL on 7414 kHz from 0058 to 0112 GMT. A comedy sketch was presented in which "Jed Edgar Heaver" and the FCC were chasing pirate operators with their machine guns. George says the program was very well produced, and compares the quality to Radio Clandestine.

The Crystal Ship: We haven't heard much from this pirate lately. They had been experiencing problems with their transmitter. But Bill Houghtaling of Illinois managed to hear them on 7414 kHz after 0400 GMT. Reports can be sent to TCS, c/o PO Box 245, Moorhead, MN 56560.

New Pirates

KHAM was heard on 7427 kHz after 2257 GMT by Fred Roberts as they relayed WLS, a legal radio station in Chicago.

The Pirate Broadcasting Network (PBN) was heard on 7375 kHz after 0300 GMT by Artie Bigley of Texas. PBN was relaying European pirate stations.

Radio Free Sound Wave operates on 7425 kHz USB. Artie Bigley of Texas caught this pirate after 0100 GMT. They claim to be transmitting from the southern United States with 350 watts and said reception reports should go to radio clubs, including A*C*E and MVDXC.

Randy Jackson of Oregon heard Radio Frankenstein on 7410 kHz from 0430 to 0500 GMT. Rock music by Linda Ronstadt and Hart was played.

Radio High Frontiers Int'l. was heard on 7430 kHz after 0600 GMT playing new wave rock music. Tracy Wood of Oregon heard them mention that they would verify reports which appeared in A*C*E's club bulletin.

Artie Bigely of Texas managed to track down Radio Int'l Northstar during an apparent test transmission on 7400 kHz after 0500 GMT. This is not the same Radio Northstar that was closed by FCC officials last year.

Kirk Baxter heard Radio Wagner on 7426 kHz after 0400 GMT. This station seems to be fond of opera music, which is very unique as pirates go.

WCBR was saying hello to George Sklom of the FCC's Chicago field office when Paul Walkendorf tuned in. Paul heard the station on 7426 kHz after 1950 GMT.

WPRI was heard on 7540 kHz after 0430 GMT by Fred Roberts. The DJ's, Jake and Elwood (the Blues Brothers?), were the hosts for the evening. However, by 0439 GMT a lady, possibly someone's mother, was heard asking "What's going on here?!"

"Oh, we're just doing some recording," someone replied. This was followed by giggles and laughter.

WPRI encouraged listeners to send reception reports to *POP'COMM* and A*C*E. A*C*E would probably be your best bet. Although they can't forward your mail, they'll mention your name and address in their bulletin, which hopefully the WPRI receives.

listener's guide:

TANGERINE RADIO

Box 5074 Hilo HI 94720 We QSL promptly.
Please enclose extra postage with all correspondence.

PROGRAMMING

Tangerine Radio is a low-power shortwave station broadcasting rock music, news and commentary. The station provides an alternative to the worn-out songs and authoritarian propaganda heard on most radio stations. In addition to the usual shows hosted by DJ Raunchy Rick, TR hopes to relay programs from pirate radio stations, and to provide a free-access time slot for anyone who cares to contribute humor or commentary.

TUNING

7415-7435 / 14485 / 21495

Look for Tangerine Radio on or near the above channels.

Most likely transmission times
(Summer of 1984)

GMT	EDT
Sat 0100	Fri 9:00pm
Sat 1130	Sat 7:30am
Sun 2000	Sun 4:00pm
Mon 0300	Sun 11:00pm
Tue 2300	Wed 7:00pm

Also 0330 on the night of the full moon.

TR tech data: 50W AM or 100W PEP on USB into ½L Hertz on 41m, 1L wire on 19m, helix or quad on 13m.

If you're new to free radio listening, remember that these are low-power, sporadic broadcasts. Use the best receiver you can afford, and an antenna as large and as high as possible. Be patient and persistent. The frequencies used by most shortwave pirates are: 6200-6300, 6900-7000, 7350-7450, and 14450-15100 KHz. Also check 1610-1640 KHz on AM and 88-92 MHz on FM. Keep your ears peeled!

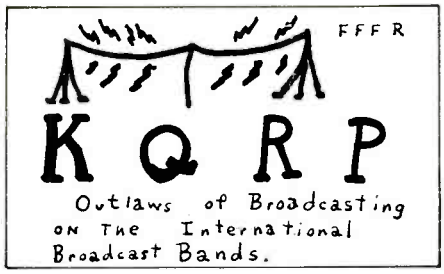
Feedback

Steve Anderson of California writes to say, "In your April column, you mentioned KFAT on 1560 kHz. People in southern California cannot receive KFAT because of KPMC, a 10,000 watt legal broadcaster in Bakersfield that broadcasts on this frequency. Also, do you know anything about an FM pirate that operated in Los Angeles on 95.1 MHz FM back in January?"

Thanks for your letter, Steve. Since 1560 kHz is occupied in your area, you might listen for KFAT in the shortwave band on 7433 kHz, usually weekend evenings. As for your question about the FM pirate, perhaps one of our readers knows something about it and will write in.

Geoff Butler of California wrote to say he finally heard his first pirate station, XPRS on 1090 kHz, and wonders how he can get a QSL.

Well Geoff, getting a QSL shouldn't be too difficult. I'm quite sure what you heard was XEPRS, 1090 kHz in Mexico. If you still want a QSL, you can probably obtain one by writing XEPRS, Rosarito, Baja California, Mexico. Keep listening though, Geoff! I get letters every week from excited readers who have just logged their first pirate station. Your turn is coming soon.



Richard Persinger received this hand drawn QSL from KQRP. The "FFFR" in the upper right corner means "Fight For Free Radio."

Remember, most pirates operate Friday and Saturday evenings. Keep a close watch on the frequencies mentioned here.

I'm indebted to the people who sent in their contributions for this month's column. Hopefully by next month, some of those loggings will be yours.

Special thanks to the fine members of the Association of Clandestine radio Enthusiasts (A*C*E) for all their help.

Your letters, loggings, kind (or unkind) comments, and copies of your pirate QSLs and pennants are appreciated. Please send all correspondence for this column to "The Pirates Den, c/o Popular Communications, 76 N. Broadway, Hicksville, NY 11801. I hope I'll be hearing from you. PC

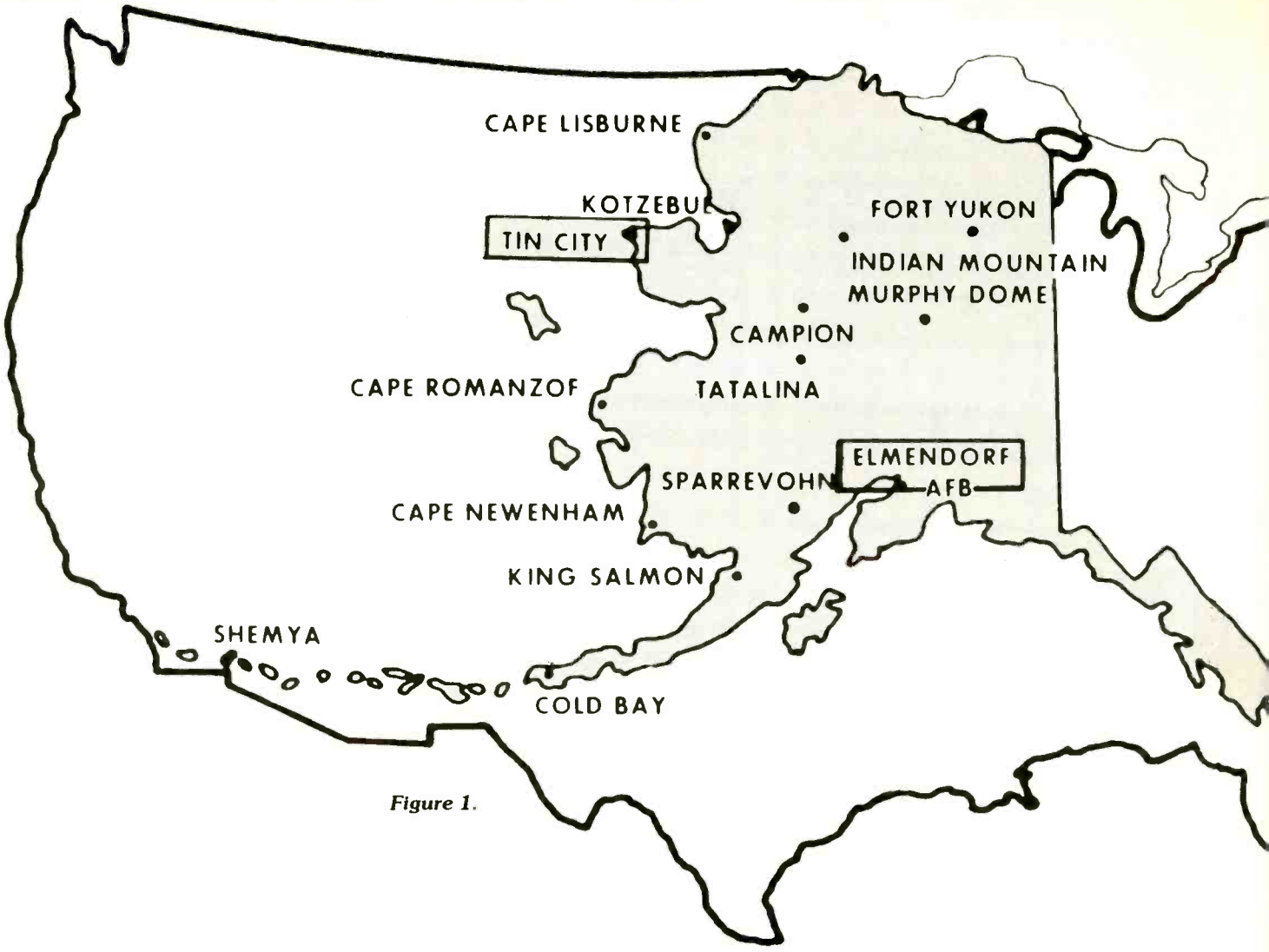


Figure 1.

How The USAF Talks On A Star!

Meteor Burst Link Supports Radar In Alaska

BY COLONEL PHILLIP K. HEACOCK, USAF
AND FRANK D. PRICE, METEOR DATA, INC.

Brigadier General Billy Mitchell, whose name is often associated with Alaska, told Congress in 1935, "I believe in the future he who holds Alaska will hold the world, and I think it is the most important strategic place in the world." For the most part, General Mitchell's statement was a logical extension of his strongly held beliefs regarding the importance and value of air power in war. Indeed, aside from some critically important intelligence gathering missions, the military's primary reason for existence in Alaska is related to a refinement of this theory. For more than three decades, lonely and desolate aircraft control and warning (AC&W) radar sites, scattered throughout this immense state, have trained their high power energy out over the northernmost reaches of our continent and contiguous seas.

It is important to remember the substantial size of Alaska. It is one-fifth the size of the continental United States and, if superimposed over the U.S., would stretch from coast to coast (See Figure 1). Why is this important? Because of the sheer distance involved. When the factors of remote mountainous terrain and temperature extremes are added, communications challenges start to become clear.

In years past, distances were always a communicator's nemesis—that is, until tropospheric scatter came along and the problem began to ease a bit. Then came satellites and the nemesis fell away. No longer did the military communications planner need to concern himself with distances and controlling terrain between sites.

Alaska's evolution has clearly been typical, then. It all began in May of 1900 when Con-

The meteor burst antenna configuration at Anchorage, Alaska. (U.S. Air Force photo by TSgt. Al Miller)

gress appropriated the astronomical sum of $450,500 to build the Washington-Alaska Military Cable and Telegraph System (sometimes affectionately called WAMCATS). Using technology of the day, land-line (open-wire) telegraph and submarine cable systems were combined to link Alaskan military garrisons with Washington, DC and the rest of the world.

Things didn't stop there. With the advent of wireless radio, new opportunities were opened which had not been imagined in 1900. Telegraph land lines hung on for awhile, but they soon were replaced by the "new fangled" radio business. Radio totally changed in the years prior to WWII when spark radio telegraph gave way to high frequency radio using vacuum tube technology, and Congress officially renamed the WAMCATS Alaska Communications Systems (ACS).

The threat of war brought fortifications, more people, and advances in technology to ACS and the vital Territory of Alaska. An open wire pole line was built through Canada along the Alaska Highway reaching Tok Junction, Fairbanks, and Anchorage. Between 1940 and 1944, ACS grew to a force of 2,000 men as radio and open wire lines spread across the state. The early 1950's brought construction of the aircraft control and warning radar system which required an extensive long-line communications network. To fill this function, the Department of Defense initiated the White Alice Communications System in 1955.

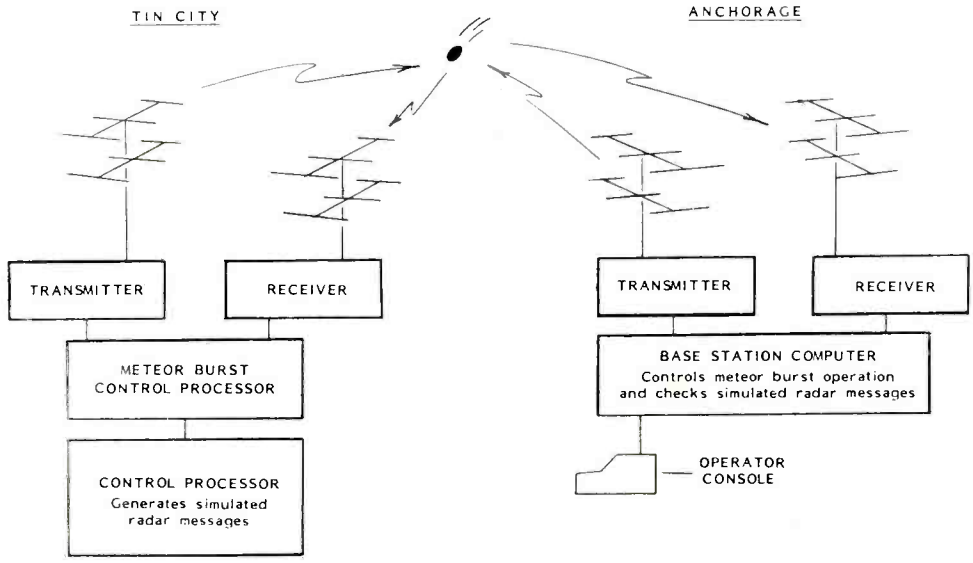
White Alice provided the long-haul communications to and from the remote aircraft control and warning (AC&W) radar sites. The network used a mix of tropo-scatter and microwave radio to serve the remote, sparsely populated areas of Alaska. The system, as could be expected, presented difficult problems of huge distances, high costs, 24-hour manning, mountainous terrain, and extremely harsh climate. As satellite technology developed, the tropo-scatter ultimately became too expensive to maintain.

Faced with these substantial costs and the desire to transfer this responsibility to industry—a normal job for a public utility, certainly not a logical one for the Air Force—the Government negotiated a contract to sell the White Alice system to ALASCOM (then a subsidiary of RCA). One of the stipulations of this contract was that ALASCOM would install satellite terminals at each of the 13 AC&W sites. Satellite communications has proven to be a better answer and has been the final evolutionary step in Alaska's military communications history.

Although the system has been quite reliable, and certainly less costly, it is not a panacea due to its single-threaded aspects. There's only one link into each AC&W site. This has never been a desirable situation, but recent events have caused the situation to become untenable. Up until late September, 1983, there had always been Air Force weapons controllers at each of the AC&W sites who could perform the air defense mission on an autonomous basis should that be necessary. With the activation of the Regional Operations Control Center (ROCC) at Elmendorf AFB (located near Anchorage), this is no longer possible. All of the surveillance, identification, and intercept functions are now done centrally in this new facility. This, of course, intensifies the long standing requirement for an alternate communications system to move radar track data between the AC&W sites and the Elmendorf ROCC. Given the remoteness of all the AC&W sites, and the extreme distances involved, the options for solving this problem were limited. An alternative satellite system, using the Defense Satellite Communications Systems (DSCS), was expensive, plus the availability of terminals would have meant too long a wait. Meteor burst communications technology, which has been in use for relatively low data rate applications in Alaska, seemed like a logical candidate.

Consequently, Alaskan Air Command (AAC), through DECCO, contracted with Meteor Data, Inc. (an Alaska based corporation) for testing of the concept. Meteor Data believed that by providing enough power and antenna gain, a meteor burst system could utilize a sufficiently large number of the weaker meteor-created radio paths and could successfully transfer the USAF's radar target data from the remote AC&W radars to the ROCC at Elmendorf AFB. The meteor burst system could replace a failed satellite circuit and the controllers at the ROCC would

Figure 2: *Block diagram for communications test using simulated radar data.*



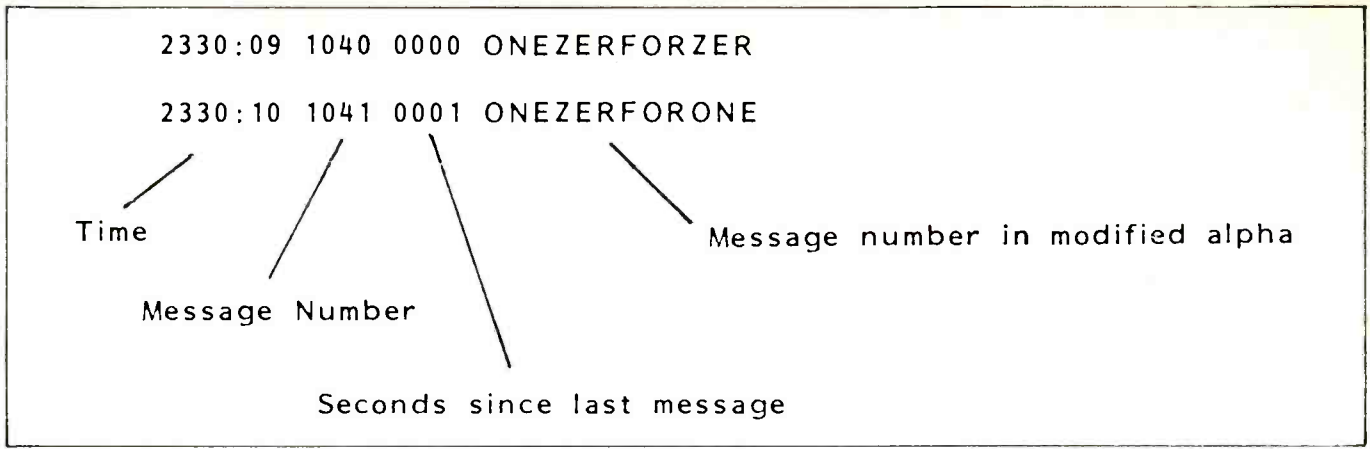
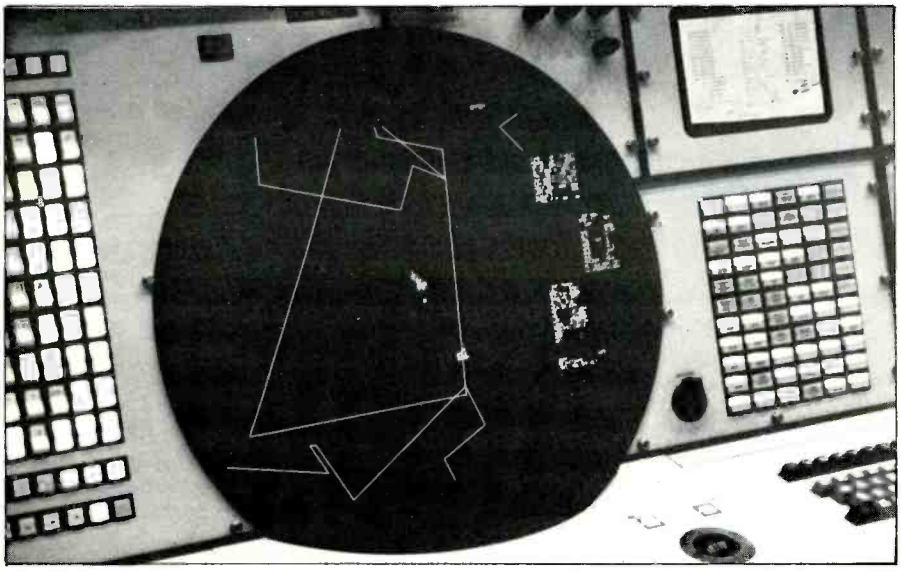


Figure 3: *Test messages simulating radar data in length and frequency.*



Test aircraft locations and vectors are displayed on a console at the Elmendorf Region Operations Control Center. During the first operations test of meteor burst, a communications aircraft controlling medium, aircraft were directed to an intercept in the skies over remote Alaska. (U.S. Air Force photo by TSgt. Bill Forster)

then at least be able to observe the remote northern radar presentations in real time.

The Air Force had a further need, however. How would controllers communicate with interceptor aircraft and direct their pilots toward intruders? Normally a satellite circuit carries the controller's voice signals to radio outlets which are collocated with the remote radars. The nature of the proposed high-powered meteor burst communications system would not support carrying ordinary voice in real time. As the needed vocabulary to vector the interceptors is relatively small, a short sequence of code could be transferred by meteor burst communications to the remote radar facilities. This code could then be interpreted at the remote location and via voice synthesization techniques broadcast directions by ground to air radio to the interceptors.

Under Air Force sponsorship, Meteor Data proposed a two-phase test. The first phase would prove out the meteor burst medium and the capability of the equipment to carry data at an adequate rate for real time radar data display. The second phase would be a live test to include not only the meteor burst communications link and the radar equipment, but a controller at the ROCC, and actual aircraft for a true simulation of an intercept. This phase would provide assurance that the meteor burst concept could perform in harmony with the people and machinery of the radar defense system.

The Tin City, Alaska AC&W radar was chosen as the remote test site. In January 1983, after installation of antenna arrays, radio equipment, and a controlling computer, hourly testing of the meteor burst communications system began.

Figure 2 shows the system arrangement. At Tin City and at Anchorage, pairs of antenna arrays, for receiving and transmitting, were aimed at an area of common sky visible from both locations. The Anchorage base station transmitted "probe" signals toward Tin City for periods of ten minutes each hour. During the short times that ionized trails in the upper atmosphere created radio paths, the controlling computer at Tin City recognized the received probe signals and responded by returning a test message to the Anchorage base station. Transmissions took place at 4000 baud.

Each test message from Tin City consisted of a short packet of 128 information bits. As shown in Figure 3, each message carried an identifying sequential number and a count of the number of seconds the message had waited for transmission. By observing the distribution of waiting times found in the sequences of received test messages, the channel capacities of the meteor burst medium were assessed for various transmitter powers and times of day. The controlling computer at Tin City generated the text field of the message—an English representation of the message number—which was used to confirm the accuracy of the received test messages. Transmitted messages were enveloped within additional sychronizing bits and a 9-bit cylic redundancy code (CRC). The CRC not only enabled the base and remote stations to distinguish valid messages from noise, but virtually assured the accuracy of the received messages. The Tin City equipment required an acknowledgment from the base station before sending a new message.

As designed, the test system could not attain thruput greater than 5 test messages per second because of the time required by the computers to complete various housekeeping tasks. The test results, however, clearly indicated that the Air Force objective of remotely displaying tracks of ten or more aircraft in a timely manner was quite feasible.

On December 1, 1983, specialists from the 1931st Communications Group and Meteor Data met at the Elmendorf ROCC to conduct the second phase of the test. Instead of transferring test messages, as in the first-phase, the meteor burst communications systems now carried live remote radar target information which was being displayed at the ROCC. The RF power at the Anchorage base station was set to 10 kilowatts, and at Tin City, to 5 kilowatts.

A voice synthesizer has been added to the Tin City facility. Through a keyboard, the controller at the ROCC could enter a sequence such as "80/154/10," and within seconds an interceptor pilot would hear in clear English, "direction eight zero, range one five four, altitude one zero, repeat . . ."

On that morning, two T-33 aircraft of the Alaskan Air Command's 5021st Tactical Operations Squadron were flown to within the 200-mile range of Tin City's FPS-93 radar.

Controllers and pilots practiced vectoring the aircraft by using the synthesized voice communications feature. The military test aircraft and several incidental civil aircraft were tracked using the meteor burst communications system. For comparison, satellite supported radar and telecommunications were available at an adjacent console. To those observing the practice session, it was clear that with the synthesized voice communications and radar tracking over the meteor burst circuit, a pilot and controller could work with nearly the same agility as with the standard satellite circuit.

At approximately 1300 hours, a live intercept began. The "intruder" aircraft was located approximately 100 miles east southeast of Tin City and was flying a course of approximately 260 degrees at 210 knots at 26,000 feet. The "defender" was approximately 100 miles to the south, south southeast of the AC&W radar. Only the "defender" could hear the synthesized voice commands of the controller. Following calculations performed by weapons controllers, instructions were entered via keyboard at the ROCC which a few seconds later, using the voice synthesizer, were transmitted over the ground to air transmitter to the "defender" aircraft. At the ROCC display console the defender aircraft could be seen changing course direction in response to the instructions. After several more vectoring commands the targets merged and the defender reported visual contact with the target aircraft over the normal communications channel, and thus was credited with a successful intercept.

Without satellite communications, aircraft were tracked and controlled with sufficient accuracy to achieve the defense mission, and the area of single thread communications was at an end.

Innovation has always been commonplace to pioneers of Alaska. It is an expected norm in "the last frontier." The meteor burst test was not all that atypical under this setting perhaps. It was quite unusual, however, for this test to be conducted by an "operational" command as opposed to one of the more traditional development commands. The overwhelming success of this history-making test has paved the way for an expanded operational application of this economical transmission medium. Meteor burst is not a new technology, but the Alaskan application, with its higher powers and increased thruput, was a first-ever accomplishment.

Work is underway now to lease a meteor burst system connecting the ROCC at Elmendorf with all thirteen radar sites. The inherent characteristics of meteor burst offer some distinct advantages over the existing single threaded and vulnerable satellite system for radar track data. Alaskan Air Command is hopeful of exploiting these advantages in the near future. PC

Meteor Burst Communications

Meteor burst communications relies upon trails of ions left by the billions of meteors daily entering the upper atmosphere. The ion trails reflect or reradiate VHF radio signals up to 2000 kilometers, well beyond the normal line-of sight radio horizon. These trails which appear in the common sky between sending and receiving stations are transient and occur randomly. Unlike ordinary radio or satellite communications channels, which experience a fixed propagation delay in passing data from end-to-end, the meteor burst channel introduces a randomly varying waiting time before a packet of data can be passed.

Smaller meteors and their weaker, short-lived ionic events, occur more frequently than those of greater magnitude. By applying greater amounts of radiated power in a meteor burst system, greater numbers of meteor events become usable, and thus, the mean waiting times between communication periods are reduced.

Some advantages of meteor burst communications are: relative immunity to jamming, low probability of enemy intercept, and minimal disturbance by the ionospheric effects of nuclear detonations. In addition, the costs of establishing and maintaining meteor burst systems are modest compared with satellite or troposcatter systems.

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Listening Post notes with deep sorrow and regret the passing of Perry Ferrell of Gilfer Associates over the Easter weekend. We had a long association dating back many years. Perry did a tremendous amount of good for the listening hobby and he will be sorely missed. His wife, Jeanne, will continue to operate Gilfer. Our sympathies go to Jeanne and the family.

Another of the South African "homelands" is scheduled to go on shortwave. The government/commercial Radio Thohoyandou in Sibasa plans to add a shortwave to their current medium wave and FM outlets. Venda, like Transkei which also has shortwave, was established by the South African government some years ago. Most country lists haven't yet recognized Transkei as a separately countable country and we suspect the same will hold true with Venda. Don't start looking for Radio Thohoyandou right away though. Although no time table is known, we suspect the start-up date for the shortwave outlet is some distance away.

Welcome back to The Voice of the Maldives, which had been off the air on shortwave for a couple of years while technical changes and new studios were being added. This station has always ranked in the top ten toughest countries to hear in the United States. In that respect, things haven't changed much. Although the station is using a new antenna configuration which should help some, it's still a mean trick to catch this one. When the dead of winter rolls around again you can try 4.754 variable around 0030 or 0130 or at 1230 sign on. You might get lucky. We'd certainly like to have that kind of luck here.

Although the regional service of Radio Uganda has operated fairly consistently on 5.027, the international service has lived a more disjointed existence, coming and going like an over-anxious waiter. It's back again, although it could well have disappeared by the time you read this; check 15.325 around 0300. Transmissions in this latest emergence appear to be a bit spotty and there seems to be no definite operating schedule set as yet.

Equatorial Guinea is another country which has just instituted an international service (El Servicio Internacional de Radio Guinea Equatorial) from transmitters at Bata. It's being heard to 2130 sign off on 7.998. A frequency of 15.110 has also been announced, but there are no reports of its being heard there yet. Programming is in both English and Spanish. Addresses for letters and reception reports are announced as P.O. Box 851, Malabo or P.O. Box 441, Bata. That's all quite a turnaround from the days when neither station in Equatorial Guinea would verify a reception report.

"Keep In Touch—Radio Sweden" T-shirt.

Bye-bye Belize? Radio Belize has disappeared from 3.285 where they've been a regular performer in the mornings and evenings for many years. We seem to recall hearing or reading somewhere that the station planned to drop shortwave and it looks like they may have gone and done it. With Guatemala's continuing designs on Belize, one would think the Belize government would see shortwave as something to maintain at the very least, if not upgrade. If you'd like to express your feelings you can write to the station at P.O. Box 89, Belize City, Belize.

The quasi-pirate Radio Dublin in Ireland is seeking your help. They'd like to go legit and are looking for letters in support of granting them a license. You can help them out by addressing your letter to Mr. Jim Mitchell, Minister for Posts and Telegraphs, Leinster House, Dublin 2, Ireland.

You can turn yourself into a walking advertisement for shortwave radio and for Radio Sweden at the same time by wearing a "Keep in Touch—Radio Sweden" T-shirt. The station still has a supply of these left. You can get one by sending 15 International Reply Coupons with your name and address to Radio Sweden International, S-105 10, Stockholm, Sweden; specify extra small, small, medium, large, extra large, or extra, extra large. Radio Sweden, by the way, has dropped their old interval signal. The new one is fairly long.

Those puzzled over what receiver to buy will be interested in knowing that the seventh edition of the "Radio Netherlands Media Network Receiver Shopping List" is out. The pamphlet provides a rundown of all the major makes and models with specifications. It's available free from Media Network, Radio Netherlands, P.O. Box 222, 1200 JG Hilversu, The Netherlands.

Good luck, Clayton, and thank you! Clayton Howard, who has been the host of the

Clayton and Helen Howard, popular hosts of HCJB's DX Party Line, are retiring after some 43 years of service.

DX Party Line program on HCJB in Quito, Ecuador, retired in July. Clayton joined HCJB in 1941, giving some 43 years of service to HCJB. He was born in Canton, China where his father was a teacher. Clayton received a degree in physics and later did graduate work in that field. He married his wife, Helen (who was also heard on DX Party Line), in 1942 in Ecuador. Since so many of their friends and relatives were, quite naturally, unable to go to Ecuador to attend a wedding, the ceremony was broadcast over HCJB so those at home could be there via shortwave radio. Clayton is also responsible for the ANDEX club, which is operated by HCJB and the DX Party Line Show. The Howards have three children and ten grandchildren. They expect to retire to Florida in September. Clayton's position as HCJB's Communications Director has been assumed by Roger Stubbe, who has often hosted DXPL while the Howards were on leave. Roger's new duties won't allow him time to spend behind the Party Line mike, however. Clayton says there's a new man on the way who has background in DX-ing and ham radio and he'll probably be the

new host. Like many DXers, we've had the pleasant experience of meeting Clayton and Helen on two or three occasions. We wish them both the very best and extend our thanks for a job well done!

Mailbag

Let's dip into the mailbag. Daniel Tomasevich of Cicero, Illinois says that he and a friend are trying to organize a DX club since they haven't found any clubs in the area close enough to attend meetings. Actually, there is a nearby club, Daniel—The Chicago Area DX Club. Contact their president, Michael Nikolich, at 2137 West Farwell Avenue, Chicago, IL 60645. CADX publishes a monthly bulletin and holds a number of meetings and social events throughout the year. You don't have to live in Chicago to join—anyone within 150 miles is welcome.

Dale Aderhold of Reading, Pennsylvania is having problems receiving Radio Japan and NSB. Listening to these two stations was one of the reasons he got into shortwave to begin with. NSB, Dale, is a little difficult to hear with good readability; try early mornings, from before local sunrise, on 3.925, 3.945, 6.055, or 9.595. Radio Japan, as an international broadcaster, tends to change their frequency and time line-ups. The most recent information we have suggests your best bets may be from 0000 to 0100 on 17.825 and 15.300 and from 0145 to 0245 on 21.640, 21.610, 17.825, and 15.195. It might be a good idea to write to Radio Japan and get on the mailbag list for their program schedules. The address is NHK, 2-2-1 Jinnan, Shibuya-ku, Tokyo. Radio Japan has plans for major expansion of their programming and technical facilities, so reception should improve down the line. The use of the Moyabi, Gabon transmitter as a relay has already helped.

Joey Garcia, WB4TMP, in Key West, Florida notes that he's returning to shortwave listening after a lapse of 24 years! He notes that receivers with digital readout are the biggest change he's noted. Joey is using an ICF-6500W by Sony and a 35-foot longwire.

Pat McDonough of Pittsburgh, Pennsylvania needs the address of Radio Cairo. Okay, here it is—P.O. Box 1186, Cairo, Arab Republic of Egypt. Replies from this station tend to blow hot and cold, so you have may to write to them more than once.

A. Semel of Staten Island, NY with his FRG-7 and other equipment.

One of the shack photos featured this month is that of A. Semel of Staten Island, New York who got into shortwave via the citizen's band route back in 1959. He uses a Yaesu FRG-4, Yaesu transceiver, and three different scanners.

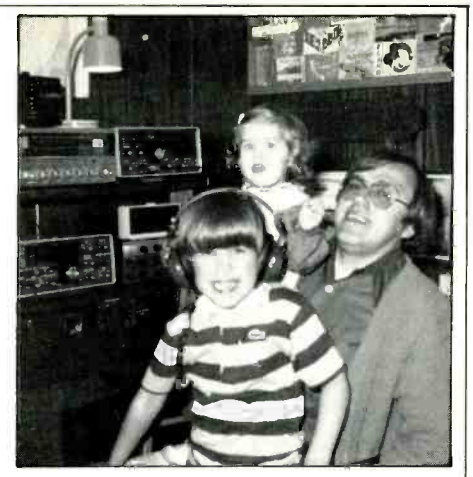
Another featured photo comes from Mike Witkowski of Stevens Point, Wisconsin. Mike is one of the top ham band DXers in the United States and he also operates the SWL section of the ARRL QSL Bureau through which ham-band listeners can receive QSLs from hams. Mike also publishes "The Ham Band DX'er," a monthly newsletter for DX listeners which covers ham band activity. To get in on the bureau service or for information on the newsletter, send an SASE to Mike at 4206 Nebel Street, Stevens Point, WI 54481.

The monitor card of Mike Slaughter of Chillicothe, Ohio is one he designed himself and a nice-looking one it is, too. Mike uses a Realistic DX-300 as well as several military surplus receivers.

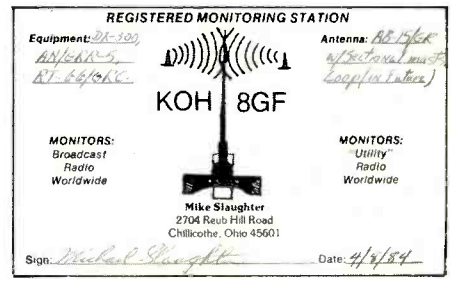
Another DX-300 user is Tony Orelik of East Pittsburgh, Pennsylvania who has been tuning shortwave for about five years now. Your logs look fine, Tony. Keep 'em coming!

Awards and certificates collecting are the bag of Gary L. Cooper in Boise, Idaho. Gary has a Drake R4B and has logged over 100 countries on shortwave broadcast. He's also interested in RTTY reception and is working toward getting his Novice license.

Summertime, to many, often means the DX doldrums. 'Taint necessarily so! There are often some fairly quiet, static-free nights in the summertime, and even when that's not the case, there are always new things happening on the bands—and plenty of interesting things to tune for during the daytime. Hang in there and let us know what kind of results you have. We are always interested in your loggings (with time, frequency, and program details), your comments, questions, photographs of you and your equipment, good quality, high-contrast copies of your more interesting verifications, as well as anything else you'd care to talk about. So let's hear from you next month and be sure to check in as often as you can.



One of the ham band listening's kingpins, Mike Witowski, with children Trent and Stacy (the youngest). Mike lacks only three countries on the ham bands to have heard 'em all!



Michael Slaughter of Chillicothe, OH designed his monitor's card.

Listening Reports

Here's what's on. All times are GMT.

Australia ABC Brisbane heard on 4.920 with its domestic service from 1105 to 1140. (Hickerson, AR)

Radio Australia on 17.795 at 0303 with news in English and on 9.580 at 1401 with news and music. (Orelik, PA)

Austria Austrian Radio noted at 0135 with news on 5.945, again at 0330 with "Daily Report From Austria" on 9.770 and another date at 0331 on 5.945 with "Profile on Austria." (Orelik, PA)

Albania Radio Tirana on 6.300 at 0331 with news and commentary, local culture program, and music. Heavy QRM. (Tomasevich, IL) Do you mean 7.300? Or possibly 6.200? (Editor) 7.300 in English with "Internal Report" at 0353. (Orelik, PA) 9.375 at 1700 with man reading news, modern and folk music. (Keenan, CA)

Algeria Radio Algiers, in English at 2002 on 17.745 but faded out after about 15 minutes. (Shute, FL) From 2000 to 2020 with strong signal in English. (Hill, NY) 2000 to 2031 with English news and "Musicbox" program, into Spanish at 2030. (Fravel, WV)

Antigua BBC Relay on 6.175 at 0022 with "News About Britain." (Fravel, WV)

Belgium BRT heard at 0030 on 9.925 with "Brussels Calling." (Miller, GA) On 11.620 at 0109 in English. (Orelik, PA)

Bolivia Radio Riberalta on approximately 4.699 with poor strength at 2239, Latin music. (Quaglieri, NY)

Radio Abaroa, fair at 2358 on approximately 4.720. (Quaglieri, NY)

Radio Illimani on 4.945 with flute music, fair at 0952. (Quaglieri, NY)

Brazil Radio Emissora Rural at Santarem noted at 0238 on 4.765 with a variety of music, Portuguese announcements. (Fravel, WV)

Radiobras on 15.280 at 0247 with news, station identification, and sign off at 0300. (Tomasevich, IL)

Bulgaria Radio Sofia heard on 9.700 at 2230, with commentary on the world's intelligence agencies. Beamed to North America. (Pastrick, PA) At 0000 with news, etc. (Miller, GA) At 1932 in English with international news. On 11.860 at 0438 in English with a report on Bulgarian history and on 12.860 at 0445 in English. (Orelik, PA)

Cameroon Radio Bafoussam, 4.000 with fair signals at 0446, drums and chanting. (Quaglieri, NY)

Radio Yaounde, 9.745 at 2100 to 2124, opening with interval signal. (Hill, NY)

Canada CKZU at Vancouver on 6.160 with CBC programming heard around 0815. (Quaglieri, NY)

CKFX, 6.080, also Vancouver (and only 10 watts! Editor), also noted around 0815. (Quaglieri, NY)

Radio Canada International in English to Africa on 15.325 with news at 2135. (Garcia, FL) On 11.955 at 1546 with a report on Yukon Indians. On 15.325 at 0943 with mailbag and "SWL Digest." (Orelik, PA)

Cape Verde Voz do Sao Vicente, heard on 3.931.3 at 2328 to 0001 sign off in Portuguese. Heavy ham interference. Heard about three times in one week but not currently. (Hickerson, AR) Requires earlier sunset than now. Probably no shots at this one again until mid to late fall. (Editor)

Chad Radiodiffusion Nationale Tchadienne heard on 4.904.3 at 0530 to 0555 in French. Can be heard earlier. (Hickerson, AR)

China Radio Beijing, 15.385 at 0200 to 0230 with news and commentary, music and features. (Quinn, MA) On 11.820 at 1115 to 1130 in English with commentary and music. (Garcia, FL) 9.820 at 1208 with world and domestic news, sports, identification and "Across The Land." (Tomasevich, IL)

Clandestine Voice of the Sudanese People, via Libya, on 17.940 in Arabic with music and announcements from 1602 to 1628. (Fravel, WV)

Costa Rica Radio Reloj, San Jose, at 0433 with identification, time check, music, male announcer on 4.832. (Shute, FL)

Cuba Radio Havana noted in English at 0230 on 11.930 beamed to North America. (Pastrick, PA) On 11.760 in English at 0333. (Orelik, PA)

Czechoslovakia Radio Prague heard in English on 5.930 with news at 0100, international and local news at 0300, music at 0328. (Orelik, PA)

East Germany Radio Berlin International, 9.620 at 0306 to 0314 in English with announcements about programs, times, frequencies, and RBI DX Club address. (Fravel, WV)

Ecuador HCJB on 15.295 at 2130 with music. (Pastrick, PA) On 15.155 with news at 0400 in English. (Orelik, PA) 11.910 at 0530 with Latin American news and "Passport" program. (Pastrick, PA)

Egypt Radio Cairo at 0745 on 9.495 in Arabic. Man announcer and music. (Keenan, CA)

France Radio France International with news in English at 0328 on 7.125. "Paris Calling Africa" heard at 1615 on 15.315. (Orelik, PA)

French Guyana Radio France International via is Cayenne relay on 15.180 at 0106 with French news from correspondents, identification at 0115. (Paszkiewicz, WI)

RFO Cayenne heard well at 0900 sign on, on both 5.055 and 6.170. (Quaglieri, NY)

Great Britain BBC at 0739 with talk on satellite communications, 21.470. "Mailbag" noted at 2315 on 9.590. (Orelik, PA) Service to the Falklands on 15.390 at 2130 to 2135 with story about hospital fire. (Garcia, FL)

Greece The Voice of Greece logged on 9.865 at 0130 to 0140 with news to sign off at 0140. (Hill, NY) On 7.315 at 0200 sign on with flutes and sheep bells interval signal followed by national anthem. (Shute, FL)

Honduras HRVC, La Voz Evangelica found at 0431 in English on 4.820 with religious talk. Interference from 4.825. (Shute, FL)

Hungary Radio Budapest, 5.930 at 0200 in English with local and international news. (Orelik, PA) On 12.000 at 2140 to 2200 with good signal until Radio Moscow sign on. (Hickerson, AR)

Iceland Icelandic State Broadcasting Service tentatively heard on 13.797 at 1906 in unknown language, possibly Icelandic, man and woman alternating in talk. (Shute, FL)

India All India Radio, Delhi, on 11.620 at 2300 sign on with interval signal and opening in unknown language. Good strength. (Hickerson, AR)

Iraq Radio Baghdad heard on 9.610 at 2135 with instrumental music, identification in English (Paszkiewicz, WI)

Israel Kol Israel noted at 0227 on 11.655 with local news and music. (Tomasevich, IL) On 9.815 at 0111 with interview; at 0117 on 11.655 with special interest program; and on 12.025 at 0501 with English news to 0515 when into an unidentified language. (Fravel, WV)

Ireland Radio Dublin found on 6.910 at 0322 in English with pop and folk music, identification announcements. (Paszkiewicz, WI)

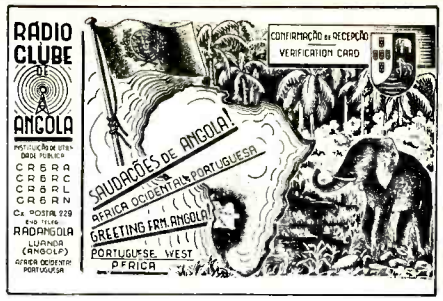
Japan Radio Japan at 0305 in English on 17.755. News, press comment, talk about Japanese transportation, sturgeon breeding, time check, and Asian news. (Paszkiewicz, WI) At 0300 with news and report on Japan and at 2307 with news. Also on 17.825 at 0200 with news. (Orelik, PA) On 21.550 at 1530 to 1545 to Europe via Moyabi, Gabon, in English. (Hickerson, AR)

Kiribati Radio Kiribati on new 14.802 from 1733 to 1810 in English with island music. Weak signal. (Hickerson, AR)

Kuwait Radio Kuwait, 9.840 at 0245 to 0300 in Arabic, chanting and discussion between two men. (Brumm, IL) On 11.675 at 1800 to 1845 with rock, then news. (Tomasevich, IL)

Lebanon The Voice of Lebanon found most nights with fair to good signals around 0415 to 0510 on 6.550. (Hickerson, AR)

The Voice of Hope, on 6.215, heard well at 0011, asking for letters to Box 77, Matulla, Israel. (Quaglieri, NY)



Al Quaglieri supplies this look at one of those great old QSL cards from Angola.

Lesotho Radio Lesotho heard with music program and local language talk at 0402 to 0421 on 4.800. (Fravel, WV)

Libya Voice of Africa noted on 15.450 at 1905 sign on until 2012 sign off with English to Africa. (Hickerson, AR) At 1911 giving address in Tripoli, readings from the "Green Book." (Shute, FL) Yes, it's the same station as Radio Jamahiriyah but a different service. Apparently the name "Voice of Africa" was short-lived. (Editor)

Luxembourg Radio Luxembourg at 0154 with pop music, man announcer, identification leading to sign off. Severe interference dominates their 6.090 frequency. (Shute, FL)

Netherlands Radio Netherlands with its African service on 9.715 at 2035, in English. (Orelik, PA)

Netherlands Antilles Trans World Radio, Bonaire on 15.275 with "Morning Sounds" program, birthday greetings, news and religious program. (Tomasevich, IL)

New Zealand Radio New Zealand, 11.960 and 9.520 at 1100 to 1216 sign off. Jazz programs. (Hill, NY) On 15.485 with good signals at 0453. (Shute, FL)

Nicaragua La Voz de Nicaragua on 6.015 at 1143 in Spanish with news and anti-American programming. (Garcia, FL) On 6.100 at 0430 with woman announcer in English. (Pastrick, PA) Used 6.100 for about a month and then switched to 6.015-6.017 variable. (Editor)

Nigeria The Voice of Nigeria heard in English from 1020 to 1040 on 15.120. (Hill, NY)

North Korea Radio Pyongyang, 9.360 at 1630 with some beautiful folk music. (Keenan, CA)

Norway Radio Norway International logged on 9.565 at 0520 to 0530 in English on a Sunday, into Norwegian at 0530. Good Signals. (Rempala, IL) On 21.730 at 1730 in Norwegian with pop music, news, and identification at 1745 sign off. (Tomasevich, IL)

Paraguay Radio Nacional, Asuncion, on 9.735 in Spanish with sign on at 1000. (Hill, NY)

Poland Radio Polonia, 9.525 at 1600 to 1630 in English with news, local news, weather. (Rempala, IL)

Portugal Radio Portugal on 6.060 with international news in English at 0303, and news at 0311 in English on 11.925. (Orelik, PA)

Qatar Qatar Broadcasting Service, 17.910 at 1423 to 1440 in Arabic, discussion program and music. (Fravel, WV)

Roumania Radio Bucharest, 0209 in English with a newscast on 11.810. (Orelik, PA)

Saipan KFBS heard at 1500 sign on to 1530 with test announcements in English and Chinese, poor to fair. (Hickerson, AR) ON 15.125 weak at 2302 with test broadcasts, repeated, multi-lingual announcements and requests for reports. (Quaglieri, NY)

Sao Tome Radio Nacional de Sao Tome e Principe, 4.806.9 heard from 0531 sign on and also to 2302 sign off at fair level. (Hickerson, AR)

Sierre Leone Sierra Leone Broadcasting Service at Freetown noted at 0607 to 0636 on 5.980 with country music program in English. (Fravel, WV)

South Africa South African Broadcasting Corporation's Radio Orion service heard on 4.835 at 0415 to 0435, weak, with local programming. (Rempala, IL)

Radio RSA on 25.790 at 1300 to 1556 in English to the Middle East, United Kingdom and Ireland, Central and East Africa. Strong. (Hill, NY) On 11.730 at 0200 with "Africa Today" and news beamed to North America. (Pastrick, PA)

South Korea Radio Korea at 1416 on 15.575 with news, commentary, and "Korean Music for Music Lovers," "Favorite Pastimes," and "Going to the Movies." (Tomasevich, IL) On 15.575 at 0200 with news in English. (Orelik, PA)

Spain Radio Exterior de Espana on 11.880 at 0135 in English with news, weather, music, international news. (Orelik, PA) New address: P.O. Box 156 202, Madrid 24, Spain. (Editor)

Swaziland Trans World Radio with religious music program at 0642 to 0651 on 9.730. (Fravel, WV)

Sweden Radio Sweden International at 2300 in English on 11.710. (Miller, GA) On 9.696 at 2325 noted with sign off. (Pastrick, PA)

Switzerland Swiss Radio International on 15.305 at 2145 to 2215, English to Africa and South America, news and commentary on the "Dateline" programs. (Pastrick, PA) 11.715 at 0430 with news in English. (Orelik, PA)

Tahiti Radio Tahiti heard at 0412 with good signal strength on 15.170. (Shute, FL)

Taiwan The Voice of Free China on 11.740 at 0215 with political commentary and music. Via WYFR, Florida. 11.985, also via Florida, in Chinese at 0417. (Shute, FL) 11.740 at 0237 with report on China's technology. (Orelik, PA)

Tanzania Radio Tanzania at Zanzibar very weak on 3.339 with African music, female announcer at 0404. (Quaglieri, NY)

Unidentified "Voice of Liberation" on 15.027 at 0330, identification as "This is the Voice of Liberation from . . ." and into unknown language at 0330. (Shute, FL) Perhaps a pirate? (Editor)

United Arab Emirates UAE Radio, Dubai, 15.320 from 1634 to 1643 with world news, local weather, station identification and into Arabic. (Tomasevich, IL)

United States Voice of America, 6.040 at 0700, via Wooferston, England relay. (Pastrick, PA) 6.130 at 0143 in English with a report on South America. Also on 5.995 at 0519 in English with report on Africa. (Orelik, PA)

Organization of American States, La Voz de la OAS, via VOA facilities on 15.160 at 0025 to 0030 sign off, programming in Spanish. (Fravel, NY)

WRNO New Orleans, with rock at 2135 on 15.420. (Pastrick, PA)

Uruguay Radio El Espectador, Montevideo, on 11.835 is being heard now and then around 2300. (Quaglieri, NY)

USSR Radio Moscow on 11.840 at 1552 in English and on 9.610 at 2207 with international news. (Orelik, PA) Also on 9.740 at 2215 to North America with "Newsreel" program. (Pastrick, PA)

Radio Kiev (via USSR transmitters, Editor) on 9.685 at 2345 with Radio Kiev DX Program, commentary. English to North America. (Pastrick, PA)

Radio Vilnius (again via USSR transmitters, Editor) on 9.685 at 2200 to 2228 with news and commentary to North America. (Pastrick, PA)

Venezuela YVTO time station, Caracas, on 6.100 under Deutsche Welle with a good signal around 0245. (Hickerson, AR)

Radio Capital, Caracus, 4.850 at 0218 in Spanish with U.S. pops. (Fravel, WV)

Radio Occidente at Merida, on 3.225 at 0329 with music and Spanish talk. (Fravel, WV)

Radio Mara, Maracaibo, 3.275 at 0131 with music and announcer in Spanish. (Fravel, WV)

West Germany Deutsche Welle, The Voice of Germany on 5.960 at 0500 with "Microphone on Europe." (Miller, GA) 0100 with English news on 9.565. 0505 with international news on 11.705. (Orelik, PA)

Radio Liberty, Lampertheim, 3.985 at 0210 to 0230 in Estonian, according to *World Radio TV Handbook* listing. (Fravel, NY)

That's the story. Our appreciation to: Michelle Shute, Pensacola, FL; Peter C. Quinn, Jr., Chelmsford, MA; Joey Garcia, Key West, FL; Al Quaglieri, Albany, NY; Tony Orelik, East Pittsburgh, PA; Daniel Tomasevich, Cicero, IL; Sheryl Paszkiewicz, Manitowoc, WI; Gary Hickerson, Ft. Smith, AR; Larry R. Fravel, Clarksburg, WV; Keith Hill, Pine City, NY; Robert Pastrick, Baden, PA; John Miller, Thomasville, GA; Larry Rempala, Lisle, IL; David Keenan, Northridge, CA; and Jerry Brumm, Chicago, IL.

Hope you'll check in with us again next month. Til then, good listening! **PC**

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

Cordless Eavesdropping

If you own and operate cordless telephone equipment, keep in mind that your conversations are anything but private. In a recent court case, the judge allowed tape recordings of a cordless telephone conversation to be used as evidence in a drug case. Evidently, an unsuspecting cordless telephone user was dealing in illegal drugs and didn't realize that his communications were being intercepted by a curious neighbor. What he thought was a private conversation was actually going out all over the neighborhood to every scanner listener for miles around! As to the actual legality of someone intercepting a cordless telephone call and recording it, that is still a debated question. Nonetheless, be aware that a cordless call is anything but secure, and is quite *possibly* not "protected" by Section 605 of The Communications Act of 1934.

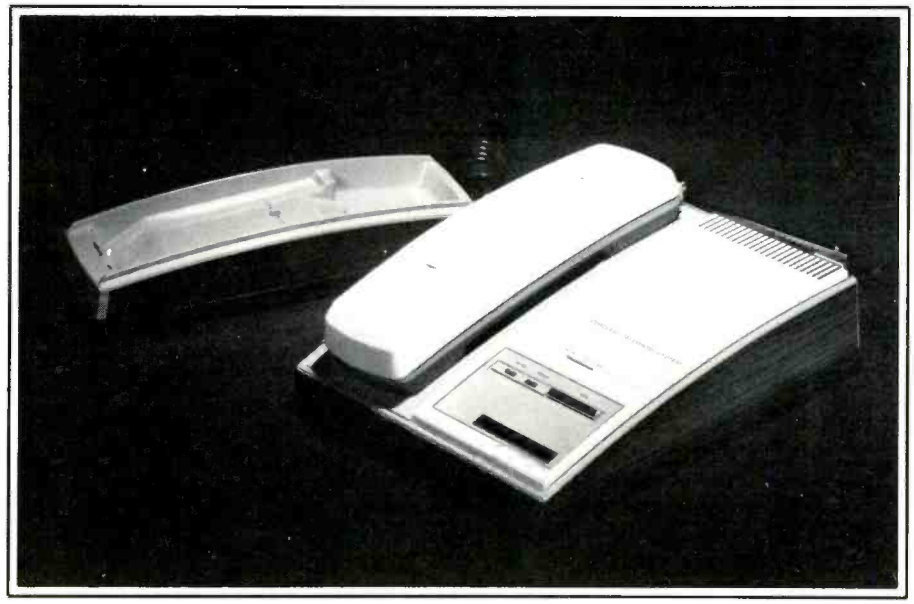
It's relatively easy to monitor cordless telephone conversations; all you need is a shortwave receiver or a scanner radio, and you are all set to tune in. You might want to try out your scanner and shortwave set to see how many cordless telephone calls you can pick up in your own neighborhood.

A shortwave receiver is necessary for picking up the base transponder side of the cordless telephone conversation. The output frequencies for the base transponders are fed into the AC power lines, giving extremely good reception up to a couple of blocks away. Here are the frequencies to tune in to with your shortwave set in the standard AM mode or FM mode (if available on your receiver): 1.705, 1.735, 1.765, 1.795, and 1.825 MHz.

These frequencies are also shared by other "carrier current" devices, such as intercoms and local paging systems. Besides hearing the base transponder cordless phone calls, you should also be able to pick up some other interesting signals just above the AM broadcast band.

Your shortwave antenna system for maximum reception to this band should consist of a long wire elevated approximately two stories high and running the length of your house. The longer the wire, the greater the reception at 1700 kHz. It may take some fine-tuning with your band spread knob to pull out each individual conversation. With less selective receivers—such as inexpensive, battery-operated, shortwave sets—simply tuning to frequencies around 1.7 MHz should lead to interesting discoveries!

The ultimate range of the carrier current transmissions should be approximately one block from the transmitting station, although many monitors report reception over several miles! The advantage of a small, handheld, shortwave receiver is that it allows you to walk around the block and hear many different phone calls!



The G.E. "Voyager" cordless phone promises a 1,000 foot range.

The handset of the cordless telephone device operates in the 49 MHz region, utilizing narrow band FM. Since your shortwave receiver won't cover frequencies above 30 MHz, it will be necessary to employ the use of a scanner radio to pick up the handset side of the conversation. The following frequencies may be programmed into your scanner to pick up the present cordless telephone conversations: 49.830, 49.845, 49.860, 49.875, and 49.890 MHz.

The range of the handset will be hardly over a couple of houses away. A good outside VHF low-band or 6 meter band ham antenna will be necessary to pick up any handsets more than this distance. Since the cordless phone handsets are limited to a maximum output power not to exceed 10,000 microvolts per meter at 3 meters, we are dealing with extremely low signal levels. Also, if the user of the cordless handset does not have his telescopic whip fully extended, the range will even be less. This will require some careful listening and some unknown cooperation from the user of the cordless handset.

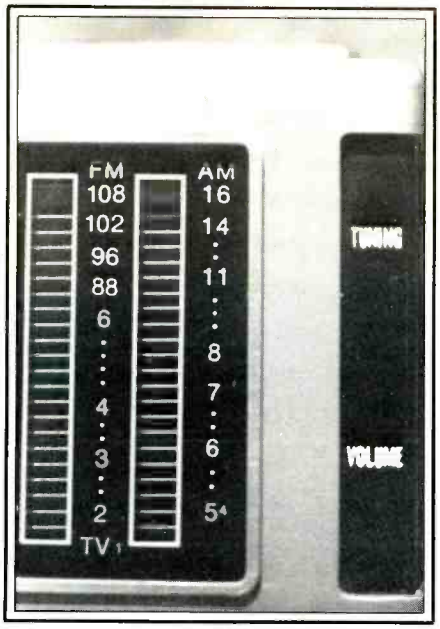
Some handsets also retransmit out the base side of the conversation—and if this is the case, you will hear both sides of the telephone call. However, some handsets have more sophisticated circuitry that masks the calling side of the conversation from being retransmitted out on the cordless side. This means you will only hear one side of the conversation on 49 MHz. Many of the 1700 kHz band pedestals also carry both sides of the conversation.

One major manufacturer made a series of cordless telephones that operate exclusively at 49 MHz; they're "49/49" MHz cordless phones. These devices use two frequencies out of the five in the 49 MHz band. If you and your scanner are agile enough, you should be able to switch back and forth between the two 49 MHz channels to hear both sides of the conversation. The range of these units is slightly greater than that of conventional cordless handsets, so you might be able to pick up someone up to a block away.

Cordless telephone users who have extended their range by using outside antennas will give much greater signal levels for eavesdropping. Their antennas will look similar to low-band, ground-plane antennas.

New Frequencies

New cordless telephone sets manufactured after October, 1984, operate on frequency pairs in both the 46 MHz and 49 MHz bands. Since these two frequencies are independent of the AC power lines, chances are most cordless telephone users will employ outside antennas for greater range. This means that reception of these two frequency bands will be a great deal easier—especially the base transponder on the 46 MHz band. The following frequencies

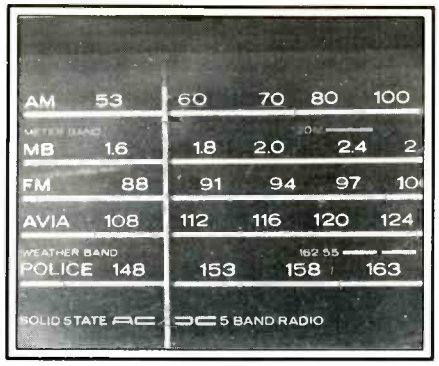


Tune the high frequency end of the AM broadcast band.

are assigned to base transponders and should provide you with a minimum of two blocks of range if an outside antenna is employed:

46.61 MHz	46.77 MHz
46.63 MHz	46.83 MHz
46.67 MHz	46.87 MHz
46.71 MHz	46.93 MHz
46.73 MHz	46.97 MHz

These base transponder frequencies will spring to life in October as more and more of the newer cordless telephone sets begin utilizing these ten interim channels. The Federal Communications Commission has allocated these frequencies on a temporary basis to help relieve the present congestion on cordless telephone frequencies.



Somewhere between 1.6 and 1.8 MHz is where to hear phone calls.

Most of the new cordless base transponders will repeat out both the handset as well as the telephone line side of the conversation on the base frequencies—which means that you will hear both sides of the conversation with equal volume and clarity. A good outside, 50 MHz, low-band antenna will help pull in these frequencies loud and clear.

The associated handset channels for the newer cordless telephones will be transmitting on the following frequencies:

49.670 MHz	49.830 MHz
49.845 MHz	49.890 MHz
49.860 MHz	49.930 MHz
49.770 MHz	49.990 MHz
49.875 MHz	49.970 MHz

Since few handsets will ever employ an outside, permanent-type antenna, chances are the range to these portable handsets will be dramatically less than the range to a base transponder with an outside antenna. Nonetheless, you should be able to pick up the handset side of the conversation fairly well.

Keep It Confidential

There is still great debate as to whether or not cordless telephone conversations are indeed protected by Section 605 of The Communications Act that classifies certain radio transmissions as "secret." It would be your best bet not to divulge to anyone what you hear on your shortwave receiver or scanner set. Since cordless telephone calls are intended to be private, keep them that way by not telling anyone what you hear. This makes good sense; remember, someone might be listening in to your conversation, too, and I am sure that you wouldn't want to hear about it from a neighbor.

Part 15 Devices

Cordless telephones fall under the Part 15 category as defined by the Federal Communications Commission rules and regulations. To better understand cordless telephone regulations, here's an excerpt of the rules:

15.117—A low power communication device may be operated on one or more frequencies without any type of modulation provided it complies with certain frequency and power output requirements.

Frequency tolerance of the carrier will be greater than ± .01 percent.

Emission type will be confined within a 20 kHz band centered on the carrier frequencies.

The emission of RF energy on the carrier frequency shall not exceed 10,000 microvolts per meter measured at 3 meters distant. (This is why they don't go very far!)

The out-of-band emissions, including harmonics, shall not exceed 500 microvolts per meter measured at 3 meters.

The device shall, with the exception of the microphone, be completely self-contained with the antenna permanently attached to the enclosure containing the device (probably making the addition of an external antenna to base transponders illegal).

Home Brew

If you decide to build your own Part 15 telephone device, you are allowed to build up to 5 units, but you are not allowed to sell them unless they have been approved by the Federal Communications Commission.

Ultimately, cordless telephones will switch to the 900 MHz band—but that is still *many* years away. For at least the next ten years, there will be *plenty* of activity on the 46 MHz and 49 MHz band. You will find that activity at the 1.7 MHz band will taper off because ultimately these frequencies will turn into commercial broadcasting channels.

Remember, what you hear on your scanner or shortwave set should be kept in confidence. Cordless channels are private, so don't tell a friend! On the other hand, why not see what your neighbors are saying. Hey, maybe they're talking about *you*! PC

BROADCAST TOPIX

BY MARK J. MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

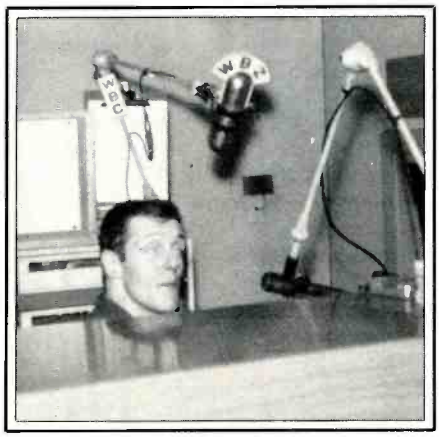
I want to spend a few minutes talking to those who might not be aware of Broadcast Band DXing. Here are some pointers to get you started. First, every DXer has his own special way of working and you will be no exception. Take advice from those you talk to and from what you read and then find out what is right for you. The ideas I'll give you now will be augmented over the next few months with comments sent in by readers, and together we'll all learn a new way or two of doing what's been done since the early part of the century—listening to the Broadcast Band!

The best place to start is with a receiver (radio) that enables you to tell to what frequency you are tuned. If you already have a receiver with a digital dial, you're a giant step ahead. Most DXers have not had digital readouts due to the fact that they have only been out a few years. The majority of DXing over the years has been done on analog (slide rule) type dials with S-38's, SW54's, S-20R's, HQ-129's, NC-125's, DX120's and countless other Atwater Kents and portable radios. The big brothers to these are Hallicrafter's SX-62 and SX-28; National HRO's; and Hammarlund Super Pros.

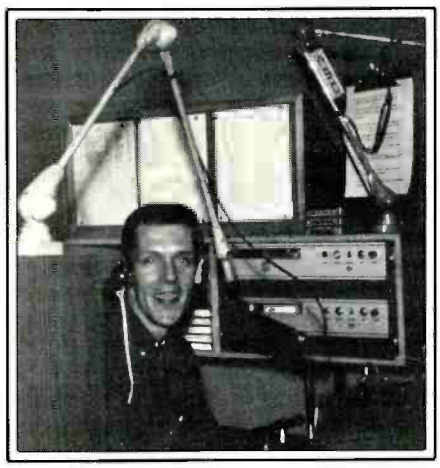
If you can't afford a digital readout-type receiver, any of the above mentioned "old timers" will get you started in fine style for small bucks. The old Hallicrafter SX-62 was designed with the SWL in mind. The SX-62 had a large slide rule dial and tuned from 540 kHz to 109 MHz with reception on AM, FM, and CW. Many of the above mentioned receivers and others are available from used equipment dealers such as those you see advertising in the back of *POP'COMM* and *CQ*. Also, check the want ads, as well as the pages of *CQ* and *QST*, for hamfests being held in your area, as they always have old receivers for sale below $100. Don't go much over that because you can get a digital portable of very good quality for a few bucks more. Watch that you don't buy a "ham band only" receiver at a hamfest because of a "good" price. If possible, try it out before you buy; otherwise save your dollars until you can purchase a newer model that suits your fancy. Please don't ask me for specific recommendations. There have been several reviews in *POP'COMM* and *CQ* over the past year.

Now that we have a receiver, let's get started. If the radio has a built-in antenna, fine; if not, run a wire around your "radio room" (now called a shack), and fasten it to your bed springs or drop it out of a window. You don't need much to get started, but I'd use insulated wire to keep it from touching objects you don't want it to (that creates static). Twenty to thirty feet will get things started.

Next, devise a logging system to suit yourself. The simplest system would be to underscore the station in the guide book (a must have). A more sophisticated system would be a separate log book with columns for the call letters, location, date, signal report, program content, and QSL information. Work out what is best for you.



One of the WBZ studios with O'Hara at the controls in 1965. Trivia: Who was WBC? Answer next month.



O'Hara was the air name for Paul Bicknell in 1965 on WBZ. Paul is now at WBAL (1090) from midnight to 5 a.m. (T-Sa).

The first loggings can be a scan of the dial from 540 to 1600 kHz during the day. Use the guide book to help identify the stations and make sure that you hear a definite identification on each station. This should include call letters from station promotional announcements or ID's. Commercial announcements, weather forecasts, and some news stories can be misleading as to the station's actual location, so be careful with this type of "station ID." Some of the stations you may already be familiar with. I still keep a record of stations I've heard that are no longer on the air which are referred to as "silent." A television station that has gone off the air is said to be "dark."

Log each station you hear as you move up the dial one channel at a time. There is no reason to be concerned with weak stations or channels where you hear several stations on the first "sweep" of the dial. These can be searched out later. Bear in mind it could take up to 10 to 15 minutes or more on some stations that do not give frequent ID's. You might want to come back to these later. Talk shows can be a problem if the host does not mention the call letters often. Some stations will tip their hand with a telephone number containing their call letters. For example, the talk show telephone at WBAL is 481-WBAL (9225) and for long distance add the area code (301). This not only tells you the station, but by looking up the area code in the phone book, you can find that 301 is the area code for Maryland (in case you don't have a guide book). Also during a newscast you might hear "WBAL news time is ----" or "This has been WBAL news, Mark Weaver reporting." Listen for the time checks, too. Station logos are given in many different ways. A station may use a dial position which only tells you what you already know . . . where you're tuned, almost. They may only give call letters once an hour. Don't wait around; come back about 56 or 57 minutes after the hour. This is especially popular on the FM band. All hour you'll hear "98 Rock" or "Q 105" which tells you nothing if you're not familiar with the station.

If you don't have a digital dial, here are some ways to determine what frequency the dial is set for: Learn the frequencies of some stations that you can easily recognize and pick stations at various spots along the dial. When an unknown frequency is found and you can't figure out what it is, slowly move the dial toward the closest known station, counting the channels as you go. Each channel is 10 kHz apart (North America). This method is more effective at night because there may be some blank channels in the daytime. You should learn the dial very quickly and become an expert knowing each station and its frequency up and down the dial. This system can also be used in reverse, counting the stations from a known one, keeping track of where you are on the dial at any given time.

The first night or two of DXing can be spent logging the local stations and nearby cities and the clear channel 50 kw stations with signals into your area. A station logged during the daytime and again at night I don't count as two stations, but I do note having heard the station both day and night.

The log builds quickly the first few nights and months, and a new one will pop up all the time. When you reach 600-700 stations, it's going to take some new strategies —a better antenna, maybe a loop antenna, a better receiver, or maybe a vacation!

Next month we'll mention a few more ways to help BCB DXing.

Listening In

In the latter part of April I snagged one I've been after for years. With other interests, including children and home owning, I don't always get equal time for BCB DXing. Anyway, the west coast has eluded my best efforts of logging. Even 640 kHz always seems to have Cuba running "S9." Coming home from work at 4 a.m. one Monday with my digital tuned to 640, I was hearing the usual Cuban, plus, I thought, two other stations. Home is only 3 or 4 minutes from work, so I quickly set up one of my loops with my R-70 and tuned the null of the loop to Cuba. I listened to WHLO in Akron for almost an hour before the propagation finally shifted just enough for me to clearly hear "KFI, Los Angeles." I mention this to point out the challenge and frustration of DXing the Broadcast Band. One reason this has been such a challenge to me is that my home is just about the geographic center of Baltimore on a city lot with houses on both sides that I can almost "reach out and touch" (without a telephone). By the way, cordless telephone listening is excellent here! So I say, it can be done if you persevere.

WBZ in Boston always has a strong signal all up and down the east coast. Send me your reports on 'BZ this month (1030 kHz). We'll do a station more to the west next month.

With the coming of fall we may have chances for some DX when the cool mornings warm rapidly. This causes the atmosphere to form a "duct" which carries the FM signals greater distances than usual.

Here are a couple of ways to take advantage of this VHF "duct." (These ideas will help you catch some DX on the FM band.) First, using a low band scanner radio, locate a few stations that are quite active but well beyond your normal listening range and in different directions. An active station might be a police station of a metropolitan area, or a paging system or community repeater. This will take time to organize, but when it is worked out and set up the scanner will just sit there quietly scanning away until the atmosphere provides a path for distant signals. Then the stations you hear will tell you from which direction the ducting is occurring. Generally, but not always, the FM openings will occur in the same manner. When you start hearing the low band stations, it will usually be only a matter of time before the FM band will open up. The time lapse from low band to FM band could be a few minutes to an hour or so. The possibility exists that the FM band will not open just because the low band is active. Sometimes the Maximum Usable Frequency (MUF) will not go beyond the low band.

Remember that the low band is 30 to 50 MHz. Do not use the high band, which is 150 to 175 MHz. (This is above the FM band, so it would not work to give early warning of a band opening on the FM band.) For distant signal reception the usable frequencies go from lower to higher. The lower frequencies will provide DX, first increasing to the higher frequencies and then stopping at some point. This point becomes the MUF.

Lacking a low band scanner, a TV set or one of the "TV sound" radios may be used to accomplish a similar "early warning system." The TV sound radio would be the most economical way for DX warning. These radios tune the VHF TV band, so you can listen to the sound from TV stations. Tune the set to a TV station 200 to 300 miles from where you live that is broadcasting on a channel between 2 and 6. Channels 2, 3, or 4 would give a greater time lapse, whereas channels 5 and 6 would give a shorter but more accurate warning of an impending "band opening." The high channels (7-13) cannot be used for the reason mentioned before (Channel 7 starts at 175 MHz).

There is one other "TV early warning" system you can use if you live beyond the primary coverage (about 40-50 miles) of a low band (Ch. 2-6) TV station. If, when observing one of these stations, you notice horizontal lines that shouldn't be there, it could be a distant station "skipping in." This could indicate an upcoming "DX duct" for the FM band, just as hearing a station on your TV sound radio would tell you there was DX on the horizon.

Learn the format and "sound" of your local FM stations because when the "band opens," the signals are apt to be strong. After all, you don't want to spend time listening to a local and thinking it is a DX station.

To show you how strong a signal can be, let me tell you about some DX I caught several years ago quite by accident. My home was about 75 miles north of Washington, DC and I listened to a station there most of the time. One summer afternoon my radio

This Hallicrafters ad is from the 1954 ARRL Handbook. No lack of frequencies to tune on this baby.

Updates

City, State	Call	KW	ANT	FREQ
Riverbank, CA	new	50/1	DA-2	770
Orlando, FL	WWKA	98	1341′	92.3
Tallahassee, FL	WGLF	100	674′	104.1
Atlanta, GA	WRMM	100	1032′	99.7
Detroit, MI	WQRS-FM	16	784′	105.1
St. Louis, MO	KSLH	100	503′	91.5
Soldotna, AK	new	10/10	-	1140
Oro Valley, AZ	KVOI	10/1	DA-2	700
Rockingham, NC	WLWL	5/0	-	770
Memphis, TN	new	10/0	-	1030
Portland, ME	WMGX	50	467′	93.1
Grand Rapids, MI	WGRD-FM	30	590′	97.9
Oklahoma City, OK	KATT	100	1188′	100.5
Diboli, TX	KIPR-FM	100	522′	9.5
Bluefield, VA	WBDY-FM	.22	1122′	106.3

Call Letter Changes

City, State	Old Call	New Call
Folsom, CA	new	KHWY (AM)
College, AK	new	KSUA (FM)
Bradenton, FL	new	WJIS
Marathon, FL	new	WPLC
Nampa, ID	KXTC	KNPA (AM)
Whitefish, MT	KTXX	KSKR
Orangeburg, SC	WTND	WKSD
San Antonio, TX	KVAR	KXET
Hurricane, WV	WZTQ	WVKV
Castle Rock, CO	KRKY	KADX (FM)
Caldwell, ID	KQZQ	KLCI
Elmwood Park, IL	WXFM	WAGO
Marshfield, MO	KOSC-FM	KTOZ
Helena, MT	KPEF	KMXT-FM
Refugio, TX	KYOT	KPRT
Milwaukee, WI	WLPX	WBTT
Laramie, WY	KIOZ	KRQU

Abbreviations:
KW - power in kilowatts; for AM day/night
ANT - (′) sign shows antenna feet for FM
DA = directional antenna
D = daytime
1 = same pattern and power day and night
2 = different power or pattern day from night
- = nondirectional antenna or not known
FREQ - shown in kiloHertz for AM, megaHertz for FM

suddenly changed stations. To make a long story short, this DX station came in so strong it pulled the AFC of my Fisher over one channel. The station was in Miami, Florida, over 1500 miles away! The receiver flipped back and forth several times before Miami finally faded.

Comments From Readers?

Should you be wondering where the reader comments have been, please hold on for another couple of months. This column is being written in May for the September issue. I haven't forgotten you, but since the first column was in July, there is a time lag until the readers begin to respond in print, which I trust you are doing! I want to know about what you're hearing and what your likes and dislikes are. Do you have any good pictures or other interesting material to show? Send it along with an SASE for return to you. Tell me about your DXing as well.

FCC News

The FCC has said "no," to low power FM stations other than translators. Moody Bible Institute of Chicago had requested using FM translators of up to 10 watts for rebroadcasting satellite and microwave feeds. The FCC said they have too much to consider right now and maybe they'll think about it in a few years.

The FCC has approved increased modulation for stations using SCA subcarriers. Except for stations within 100 miles of Mexico, SCA stations may modulate up to 110% (this is due to the fact that we do not have an agreement with Mexico yet). This means that these stations can deviate their carriers to 82.5 kHz rather than the present 75 kHz. This should not affect the FM DXer.

There should now be more power for class III stations—but not much, although it should make for a little better DXing for the BCB DXer. The FCC earlier granted post-sunset power to a lot of stations, but the amount of power was so small that most stations would be wasting their time and energy to operate with 2 watts or 20 watts. A few stations were granted up to 500 watts. The FCC has said that the others may now use at least 100 watts until 6 p.m. (This is for daytime stations on regional channels.) The Commission will also increase some of the class II stations. With 100 watts, DXing will become a little more sane than trying to hear a daytimer when he reduces power from 5,000 watts to 6 watts.

Out of space for another month. I'd like to hear from you. My address is P.O. Box 5624, Baltimore, MD 21210-0624. PC

Other receivers of the early 50's.

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

Traffic Week Highlights Strict Enforcing Of Rules In Saudi Arabia

Police will resort to stricter implementation of traffic rules with the commencement of "Traffic Week." Every offense, however small, carries both a jail term and fine, according to Capt. Abdullah Saleh Ragaban, director of traffic.

The drivers found stopping their vehicles on the zebra lines at the traffic signals face at least a 24-hour custody plus fine. The zebra lines must be respected as they are meant for pedestrians, he added.

All cars and other vehicles with dents and damages will be halted and a warning given for their repair within a reasonable time. Such offenders will be issued "tickets" and a declaration taken that they will carry out the necessary repairs within the stipulated period. If they are caught again without the repairs having been undertaken, they will be severely penalized, Capt. Ragaban warned.

He said an average of 1,000 traffic violations are detected and at least 150 offenders jailed daily.

Jumping the red signal entails a minimum jail term of 15 days plus fine, while non-possession of a valid driver's license results in a stay of at least 10 days in jail in addition to a fine.

Capt. Ragaban said his department, with the help of radar, has been apprehending an average of 50 drivers daily for disregarding speed limits.

Three cheers for the freedoms we enjoy!

Maryland Speeding Tickets Increase

Nearly 15 percent more speeding tickets were issued by state troopers on Maryland highways in 1983 than in 1982, according to the State Police Field Operations Bureau. In 1983, tickets were issued charging 130,400 drivers with exceeding the 55 mph speed limit posted on Maryland highways, while 113,500 tickets were issued the year before.

Col. W.T. Travers, Jr., state police superintendent, has directed the Field Operations Bureau to increase the number of patrols on roads which have been speeding problem areas. The state police Special Traffic Enforcement Unit has begun monitoring interstate highways in six counties.

Michigan Task Force Will Appeal Radar Rule

Radar speed traps will remain an issue in the state of Michigan. The state's radar task force recently voted to support an appeal of a court decision that set standards for the use of radar speedmeter evidence.

Radar experts had initially insisted the Michigan Court of Appeals decision—won by activist Zolton Ferency—posed no great problems for law enforcement.

Max Pinkney, chairman of the task force, maintains that position but says that some portions of the ruling need to be clarified.

Gratiot County Prosecutor Mark Gates has vowed to appeal the ruling, which threw out a speeding ticket issued to Ferency.

In the Ferency decision, the court set forth mandatory standards for weighing radar speedmeter evidence in future cases. The standards are: that the officer using the device must have adequate training and experience, the device must be in proper working condition, road conditions must leave a minimum possibility of distortion, and the speed of the patrol vehicle must be adequately verified. The court also said that the speedmeter must be retested at the end of the officer's shift, the subject vehicle must be in the operational area of the radar beam, and the unit must be certified for use by a qualified agency.

Ferency's ticket was thrown out because the speedometer of the patrol car was not independently calibrated and because Ferency's car was not in the radar beam at the time his speed was tested.

Police In Small Texas Suburbs Say Diligence Helps Save Lives And Fill City Coffers

Wilmer, Texas police Capt. R.E. James says that every time he hears the warning "Watch out for the cops" blaring over his CB radio, it reminds him that he has one of the safest highways running through his town.

Catching traffic violators also has proven to be lucrative.

Wilmer and at least four other small suburbs—Cockrell Hill, Ferris, Glenn Heights, and Melissa—rely heavily on radar guns to fill their city coffers, budget figures show.

While 12 other cities that border on major highways plan to take in no more than 6 percent of their revenue through municipal court fines this year, those five cities project that they will raise 23 percent to 57 percent of their city funds through fines.

Although the larger cities project taking in a much larger dollar amount in court fines, that revenue plays a small part in those cities' budgets. In all but one of the five smaller cities, municipal court fines account for more revenue than property taxes.

And, according to the Texas Judicial Council, about 80 percent of all municipal court fines are the result of traffic violations.

Of the five cities that depend heavily on municipal court fines, all but Cockrell Hill border on major highways:

- Wilmer, a town of 3,000 along I-45 south of Dallas, plans to take in $360,000 in municipal court fines to make up 47 percent of its $759,770 budget.
- Melissa, with a population of 600 residents and situated along U.S. Highway 75 in Collin County, expects to make up 57 percent of its $271,782 budget.
- Ferris, an Ellis County town of 2,300 people south of Wilmer on I-45, plans to take in $240,000 in fines to make up 36 percent of its $660,151 budget.
- Glenn Heights, a town of 1,500 people on I-35E, expects to take in $72,290 in fines to make up 23 percent of its $318,641 budget.
- Cockrell Hill, a town of 3,250, has no major highway running through the town but still plans to collect $170,000 in municipal court fines to make up 29 percent of its $586,834 budget.

In comparison, Arlington projects it will take in $2.6 million in municipal court fines, but that will represent only 5.8 percent of its expected revenue of $44.3 million. In other cities, municipal court fines make up as little as 2.1 percent of annual revenues.

The diligent police activity in the five smaller suburbs is designed to slow speeders and save lives, officials of the towns said. But some officials said the money from traffic tickets is needed to cover costs beyond the means of bedroom-community tax bases.

Lost Tuning Fork May Cost New Jersey Thousands

Waterford Township officials are singing the blues over a misplaced tuning fork that could cost them thousands of dollars in fines against motorists charged with speeding.

The tuning fork, required for calibration of police radar equipment, was lost last October, and the local judge is now questioning the validity of speeding cases dating back to October 29, 1981.

Recently Judge Angelo DiCamillo dismissed an October 1983 speeding charge against a woman because police did not use the tuning fork to set radar equipment used to clock her speed.

At that time, DiCamillo told township Prosecutor Nicholas F. Trabosh that the court will decide this month if about 200 cases dating from October 1981 to Jan. 11 were legitimate violations of the speed limit.

Pennsylvania Superior Court Approves ESP

Local as well as state police officers may legally use the TK 100 Excessive Speed Preventer because it is free of the distortion problems of radar devices, State Superior Court says. The court recently ruled that the machine, which measures a vehicle's speed

over a six-foot distance, is an electrical rather than electronic device, such as radar, and this is permitted under state law for use by municipal police.

A spokesperson for the State Department of Transportation estimated several hundred of the devices have come into use in the past several years.

The ruling stemmed from a case in East Pennsboro in which Guy DePasquale was cited for speeding. His vehicle was clocked on a TK 100, or ESP, as traveling at 36 mph in a 25 mph zone. DePasquale appealed his conviction in Cumberland County Court, contending state law bars all but state police from using such devices.

But Superior Court agreed with a lower court that the state Vehicle Code prohibits the use of only electronic devices by municipal police, and said the ESP is electrical, not electronic.

In using the device, police place two sensor tapes six feet apart on a roadway. When the wheels of a vehicle cross the tapes, two signals are electrically transmitted to a computing unit that determines the car's speed based on the time elapsed between the two points.

Although the computation of that speed is performed electronically, the appeals court said the actual measurement of a vehicle's speed is performed electrically.

It noted the reason state law limits the use of radar to state police is because such devices contain "inherent dangers of inaccuracy if not carefully used."

Because of the problems with radar, state law prohibits speeding convictions based on evidence obtained by radar unless the vehicle was traveling at least 6 mph above the speed limit.

Superior Court said "the potential for inaccuracy inherent in electronic measuring devices is not present in the TK 100" and its measurements cannot be distorted by the surrounding environment. It also ruled municipalities do not have to establish ordinances to use the machines and have no obligation to post signs or otherwise inform motorists of their use.

Enforcing Speed Limits In Vermont

Republican gubernatorial hopeful John Easton said recently that the federal government should leave Vermont alone in enforcing highway speed limits. "I don't think Washington, D.C., should be running the Vermont State Police," the attorney general told a gathering of Republicans.

Federal authorities are dictating the number of tickets and arrests for speeders and are thus taking away Vermont law enforcement options, Easton said.

State police have stepped up their traffic surveillance recently, since spot checks in the last three months of 1983 showed that almost half of Vermont drivers were speeding. That record throws almost $2 million in federal highway aid into jeopardy, unless the state can reduce that average.

Easton said it was fair for the federal government to attach "broad, reasonable guidelines," but Washington is going too far. He said speed limits were generally left up to state discretion.

If the federal government is going to cut back on its funding of certain programs to states, regulations should also be reduced, Easton said, citing several other examples of federal regulations.

"If they're going to take away our money, they should at least remove some strings," he said.

Letter To The Editor Defending Radar Detection Devices

The following letter recently appeared in the Kentucky *Post* in Covington, Kentucky.

To the editor of *The Post*:

I cannot allow Thomas Martin's letter (Feb. 25) regarding an article in *The Post* about radar detectors to go unchallenged.

Mr. Martin's argument is that *The Post* was irresponsible for not pointing out that "radar-detection devices are nothing more than tools for violating the law." This logic, if applied, would preclude *The Post* from doing articles about CB radios and scanners, and allowing hardware stores to advertise (they sell tools that criminals might use).

I disagree specifically with his beliefs that detectors are wrong to use. Mr. Martin is reacting to a reaction. Detectors became popular when our all-knowing and all-doing federal government sought to impose the 55 mph speed limit on the populace. Not that the limit was a bad idea if applied selectively and reasonably, but it wasn't.

Drivers learned that a police officer with a radar machine was sometimes downright abusive. Not all machines performed with the accuracy we were led to believe they had. Not all officers fully knew how to operate the machines, and many simply set up the machines on the safest parts of highways where the easiest violations could be detected.

Mr. Martin may never have received a speeding citation. If not, he cannot perhaps understand what this can do to your pocketbook, time, and insurance rates. These are priced to pay if we are indeed guilty. But, if you aren't, what defense do you have? To argue agains a radar reading is a lost cause for most of us.

I can't and don't equate a radar detector with unsafe drivers. Only recently in the post-Nadar era of highway safety has America discovered that many, no, a majority of traffic accidents and deaths result from drinking drivers.

Finally, I would like to remind Mr. Martin that years ago in Cincinnati one could tune to several AM radio stations and get a radar update on where the Cincinnati police were operating. Also, years ago, the law required that a sign be posted warning motorists of a stationary radar device ahead.

Times and technology have changed. We should follow the law. However, I see no need to complain if one uses a defensive device against a not-so-perfect technology, working with a less-than-perfect justice system, trying to enforce far-from-perfect traffic laws.

Name withheld

PC

Janice Lee is the Editor of Monday, A.M., the newsletter of Electrolert, Inc.

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

BY JOSEPH JESSON

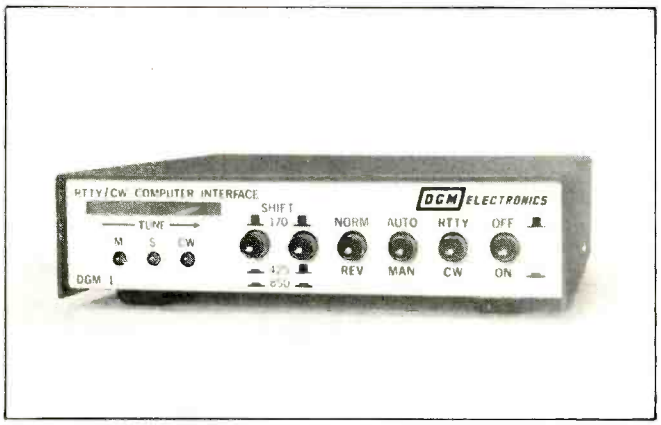


Figure 1: *The DGM-1 RTTY/CW Computer Interface.*

DE GYU DE GYU
QSY JGHF TO NRPR
QSY JGHF TO NRPR

MUL DEGYU MUL DE GYU

QLH QLH NRDJ PGLF
QLH QLH NRDJ PGLF

QSX QSX JGRO NRGS ZGN ZGN BOTH BOTH
QSX QSX JGRO NRGS ZGN ZGN BOTH BOTH

Figure 2.

Hardly a month goes by without a new RTTY demodulator or terminal unit (TU) that appears on the hobbyist market. Overall, this is a positive development for the RTTY buff due to the large number of excellent low cost demodulators. On the other hand, such a large number of demodulators also means a confusing potpourri of choices available.

We find two different technologies in the under $200 category—phase locked loops (PLL) and active filter demodulators. What are the advantages and disadvantages of each? The phase locked loop "tracks" the frequency shift (audio) and converts this frequency change into ones and zeros, a relatively simple design using modem integrated circuits like the XR2211. This PLL has an excellent signal-to-noise ability—the "digging out" of weak RTTY signals from broadband noise.

However, this PLL tends to be easily confused by powerful adjacent interfering signals such as CW. The PLL tries to lock on the stronger interfering signal. Solutions to these problems include adding a quality bandpass (allowing only the RTTY signal of intersect to pass) in front of the PLL or to have two PLL's, one for the work tone and one for the space tone. It is important to keep the adjacent interfering signal 3 db less (1/2 power) than the RTTY signal of intersect. The popular MFJ unit uses a bandpass filter with a PLL RTTY detector. The bandpass filter, however, is only used in the 170 Hz shift mode.

Keep in mind that quality bandpass filters are expensive. For example, if MFJ chose separate bandpass filters for 170, 425, and 850 Hz shift, the unit would cost several times more than it is currently priced and most of the interfering RTTY and CW signals may be found on the ham bands where 170 Hz shift is commonly used.

Active filter demodulators use two sharp filters—one for work and one (selected) for space tones. If designed properly, this scheme works very well.

It has been proven in the 1960's that a *matched* pair of filters is optimum for RTTY frequency shift keying demodulator. Most demodulators over $200 use this technique due to the reason we mentioned earlier, that filters are expensive and tricky to manufacture. This may change as digital bandpass filters become commonplace.

DGM Electronics, 787 Briar Lane, Beloit, Wisconsin 53511 has introduced a new low-cost (introductory price of $149) RTTY/CW demodulator. The DGM-1 computer interface (shown in Figure 1), uses both work and space tones. The demodulator section is preceded by a three-stage bandpass filter to minimize effects of adjacent signals. An additional three-stage post detection filter helps to remove any fast noise pulses that get through the detector. A function generator provides an audio frequency shift keyed signal to your transmitter if you are a ham. Shift selections include 170, 425, and 850 Hz shift. This may be a limitation if you would like to receive nonstandard shifts commonly used in some RTTY press transmissions.

Good *variable* shift demodulators are even more expensive than fixed shift units. The DGM-1 demodulator offers a dedicated 800 Hz CW filter and provides both positive and negative CW keyed outputs. A standard 5 pin I/O connector for TTL level interfacing resides on the rear panel. Since this is only a demodulator and does not include a computer or display, an external microcomputer is required. Also, RTTY software for the microcomputer (many quality software terminal packages can be found) must be purchased. All of these requirements add to the total RTTY system cost but allow total flexibility.

It seems as if most of the under $200 demodulators use the LED bargraph tuning indicator rather than the more expensive meter. Scope outputs will allow a "cross" display for optimum tuning. The scope is an option which may be added at any time as long as the scope (x-y) output receptacle is provided on the RTTY demodulator.

Flesher Corporation (P.O. Box 976, Topeka, KS 66601) offers two RTTY demodulators under $200—models TU1200 and TU170A. The TU-1200 is offered as a kit for $99.95 and allows data rates to 1200 baud(!). This top end baud rate is certainly unreliable on shortwave but usable at VHF and UHF frequencies. Optimal post detection filters are designed for specific baud rates. For example, a post detection filter designed for 45 baud will not be effective at 1200 baud and vice versa. The TU-170A is set up as a single shift RTTY unit that uses plug-in filter boards to select individual shifts and is priced at $189.95 in kit form.

Advanced Electronic Applications, Inc., P.O. Box C-2160, Lynnwood, WA 98036 introduced their CP-1 Computer patch demodulator. It is claimed that the LED tuning bar indicator is useful to within 10 Hz accuracy. The CP-1 offers a fixed 170 Hz shift and variable shift capability for the unique shifts. A price of $199.95 makes this demodulator attractive indeed considering the variable shift feature. Variable shift tuning will move the space filter from 2225 Hz to 3125 Hz (100 Hz to 1000 Hz shift).

It is a nontrivial task to design a variable shift demodulator since the filter bandwidth usually changes by varying the center frequency. AEA accomplishes tunable shift without changing the bandwidth by using a precision gauged potentiometer to track multiple filters. The top end (greater than $1000) demodulators, such as the Frederick units, use an audio mixer to convert all variable audio input signals to a fixed center frequency. This is the same technique as

used in Superheterodyne receivers, but instead of RF conversions to an intermediate frequency, audio frequency is used throughout. Along with the CP-1, AEA is marketing companion software trademarked SWLTEXT™. We will review this software package as soon as we get our hands on it.

Other software that would be compatible with all of the above demodulators can also be purchased from Kinetic Designs, 1187 Dunbar Ct., Orange Park, FL 32073. This software package works with either the VIC-20 or Commodore 64.

W. Palmberger writes from Germany to ask if our readers have any ideas as to the mysterious RTTY signals found on the following frequencies and times:

Frequency	Shift	Time
7942.0 kHz	850 Hz	1905 Z
4963.0 kHz	850 Hz	2113 Z
4898.0 kHz	850 Hz	2234 Z
16785.0 kHz	850 Hz	0928 Z
16310.0 kHz	850 Hz	1930 Z
17475.0 kHz	850 Hz	1622 Z

"The quick brown fox jumped over the lazy dogs back" and "QBF" test message was logged on the above frequencies.

The British Navy in Gibraltar was logged at 6865.0 kHz, 2357 UTC, 850 Hz shift 50 baud. Also found at 13943.0 kHz, 1520 UTC, 850 Hz shift 50 baud (see Figure 2).

A test message was logged on 8157.0 kHz, 1948 UTC, 425 Hz 50 baud belonging to the RAF, Cyprus. PC

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY JEFFREY KEATING, WB4KDH

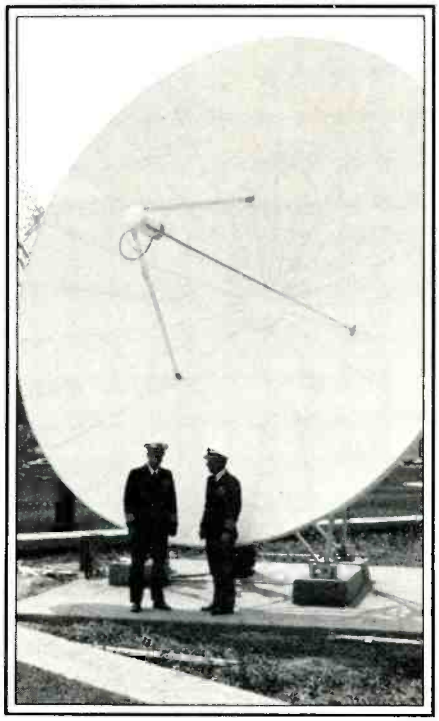
Satellites: A New Tool For Education

Over two dozen U.S. domestic satellite transponders are now either fully or partially devoted to news, weather, information, or educational programming. A lot can also be learned from watching the international satellites. Mark Long, U.S. Bureau Chief for *Satellite Orbit International**, recently installed a 20-foot earth station for the U.S. Naval Academy in Annapolis. We asked Mark about this installation and to share with us some of his thoughts about the educational uses of the satellites.

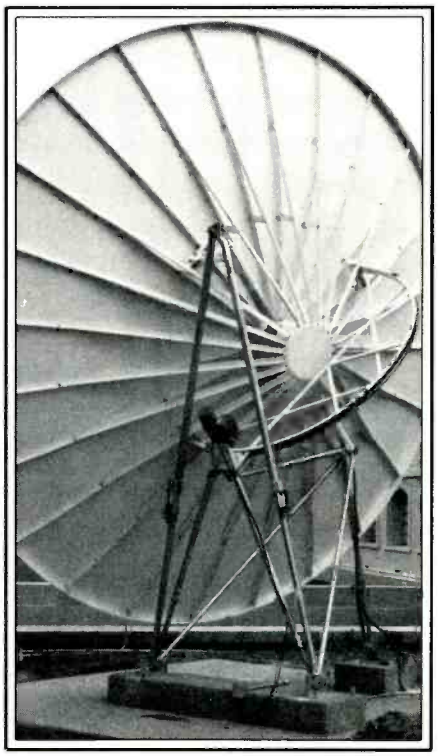
Popular Communications: Can you tell us how students are benefiting from the use of satellites today and how the Naval Academy intends to use their satellite receiving equipment to enhance their curriculum?

Mark Long: There is a high tech revolution happening in the classroom today and it's because of a new wave of communication technology becoming available to the student. We have people using computers who a few years ago were not into a high tech field at all. So we have students making use of software, creating software, learning about the machines and using a whole array of equipment that gives them access to information services—ways to do research for example. With a modem connected to a telephone line, you can access information from around the world. I really feel that this is just the tip of the iceberg. In this country, people are looking for ways to use high tech to speed up the education process, and satellite TV allows an excellent opportunity to expand a student's awareness of the world, putting them in touch with different cultures, different types of people, and different ways of thinking. It brings into the classroom an immediacy of experience. They're not looking at old newsreel tapes, magazine articles months or years old, or listening to language tapes ordered months or years previously. I think it is a really excellent tool for the student, and the Naval Academy was also thinking about how they could use the technology and how that would affect their students.

*The *Satellite Orbit International* magazine details the international satellite services available for viewing in North, Central, and South America as well as the Pacific Ocean region, including the areas of Australia, the Pacific Islands, and the Far East. Included in this monthly publication are hour-by-hour television program listings for 26 international satellite services. It is available from CommTek Publishing Company, P.O. Box 1048, Hailey, Idaho 83333, (208) 788-4936.



Two Naval officers in front of their 20-foot dish gives perspective to its size.



From this view behind the dish, you can see the tripod polar mount and motorized horizon-to-horizon tracking system.

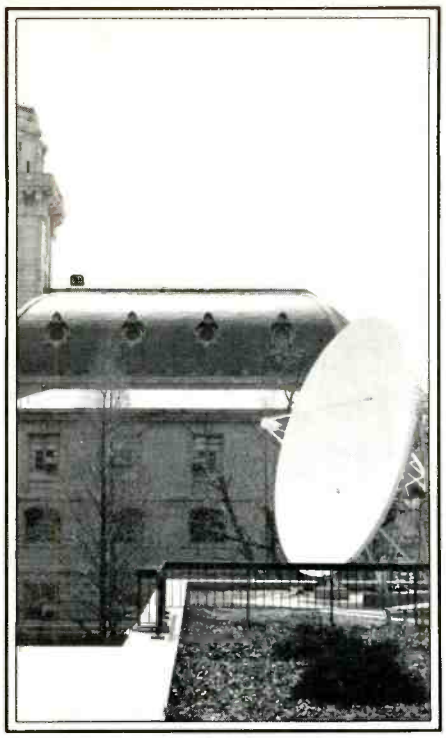
The academy now has the capability of taping in multi-standards any programming coming in from Europe, Central America, or most of the South American stations, and they can then edit these videos to produce an individual series of tapes which would be part of a course. For example: Language students might look at the evening news from Venezuela for say a week and get an idea of how different news events are discussed and get a feel for the langauge. Political science students might look at the same series of tapes and try to obtain a feeling for how people in that country view different world events. This really gives these students an opportunity to step into the shoes of other people in other places.

PC: Can this 20-foot antenna track from horizon to horizon?

Long: Yes, the system can track from Satcom 1R all the way over to the Atlantic Gorizont and the Symphony satellites, so that's quite a range. I believe there are more than 30 satellites that they can actually receive. Seventeen countries now have regular feeds of programming. They are also able to view international news service feeds coming in from all over the planet, thus gaining access to all the information that's available to the major networks. This is an advantage because it allows them to see the news before it's packaged for delivery on the evening newscasts. They get to see the raw information coming in.

PC: How do you find the programming from less developed countries?

Long: Some of it is quite accomplished. You'll see some very good programming out of Brazil, for example, and Venezuela has a very good TV station (Channel 8) in Caracas with very good news coverage. You'll find events on satellite like the Contadora Group—the meeting of the members of the Central and South American states that are working together. They had a meeting to talk about Cuba, for one thing, and to recommend a policy that would be implemented by people of that region and what they would recommend to the U.S. They wanted to have a certain viewpoint that was expressed to the U.S., but on the regular news there was hardly any coverage of that while it was going on. Yet that was a very important event in Central America. We should have access to these different countries. There's only so much time in a half-hour broadcast and if it's covering national news and foreign affairs, there just isn't time



The U.S. Naval Academy's new 20-foot earth station makes a prominent stand on campus. Maury Hall in the background.

to really give you the same sort of feeling for what's going on.

PC: How are other educational facilities using satellite technology?
Long: There's an organization called Satellite Communication for Learning Association (SCOLA), which is a group of educators who are promoting a project that would bring channels of international television into a domestic satellite for redistribution to classrooms in the U.S. This would allow them to access programming and disseminate it in a way that would be relatively inexpensive. In other words, people wouldn't have to have a 20-foot dish like the Naval Academy to get programming from Eastern Europe or South America. Now a 10-foot dish would have access to the programming and it could be retransmitted in NTSC color format so that any American TV set would have full color reception of these international broadcasts.

SCOLA recently held the Satellite Conference for School and Campus, attended by representatives from over 100 colleges and universities from around the U.S. and Canada. They came to learn about the satellite technology and how their educational institutions can benefit from its use. So this is really a new development, yet it's something that could become fairly commonplace, similar to how the use of the computer has grown in the classroom.

Other countries are going to be doing this. Mexico is already doing it. It has implemented an educational channel with down links around Mexico. They have over 160 receiving stations at small communities and educational facilities. They plan (with their new Morellas satellite) to use the 12 GHz package (the high frequency K band portion of the satellite) for down linking into classrooms around the country with a whole variety of educational programs using dishes three to four feet in diameter.

PC: But for now, don't we need a fairly large dish in the U.S. to receive international programming?
Long: If you want to watch international satellites, most of the channels require large antennas. If someone is seriously interested in watching some of this programming, I think they could give it a go with a highly efficient 12-foot dish. It ought to give access to programming from South America, the Soviet Union, and Eastern Europe.

PC: From anywhere in the United States?
Long: No, from the eastern seaboard. If you'd like to spin your 12-foot dish around and point it over the Hudson Bay, you can access Russian transmissions from Molniya anywhere in North America.

PC: What do people out in the middle of the country get? Mexico?
Long: Yes, there are four channels of television from Mexico and they are quite strong in the southern part of the U.S. A 12-16 foot antenna would do a good job. There has been a lot of change going on in earth station technology within the last few months; the availability of relatively low noise temperature LNA's at prices that are unbelievable is really changing the situation. When you can buy a 60 degree LNA off the shelf and replace your 120 degree, that's quite an improvement you can make in the operation of your system. When you go from 120 degrees to 60 degrees, you're talking about 2 db. That's like adding 2½ feet to your antenna.

Another improvement in the situation is the newer satellites that are coming on line, including the Intelsat 5 and (later this year) Intelsat 5A satellites, with much more powerful beam patterns than some of these older satellites currently in use. That should raise some of the signal levels by perhaps a db or two. Again, it's like adding another foot or two to your antenna, except it's not happening to your *antenna*, it's happening in other places in your system. This is good, because when you stop to think about it, the antenna is the most expensive part of the system, especially if it is a large antenna.

PC: What got you interested in satellites?
Long: I wasn't too interested in them at first. When I heard about the Bob Cooper shows and people watching HBO I thought, so what? Do I really care? I was very much interested in amateur radio and communicating with people in other countries and doing projects that directly link people in one part of the globe with another. I thought that was really worthwhile and useful to do. The satellite thing seemed like a toy at the time. Then I started to realize that the world gets its information through satellites—that we can watch Ted Koppel talk with someone in Jordan on the other side of the world, or see people on the *Today* show talk with Moammar Khadafy. This would not be possible except through the satellite expressway which is up there trucking along with the information goods of the world. I realized to have access to that before it gets processed and selected is actually a really powerful tool to have. So, considering what's happening in the world today and how it's constructed, satellites are really the focal point of the communications grid. It may not always be this way, however. Twenty years from now there may be grant fiber optic networks. Perhaps there'll be some new communication modes discovered that will allow us to communicate more economically—ways that we can't see now. But I think for the era in which we live, the satellite is at the focal point for the communications of the world.

PC

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

In most areas of the nation, summertime means aditional recreational boating activity on lakes, streams, and rivers. And with more people on the water, there is additional radio traffic on the VHF marine radio channels going on.

At one time, marine radio meant long-distance shortwave radio circuits to contact ships at sea. However, the propagational characteristics of high-frequency systems below 30 MHz did not lend themselves to short-range use, such as many boaters needed. Thus, a VHF marine radio service was created in the 156-157 MHz band and channels are dedicated to specific uses. Thus, a ship can communicate with a tug and a vessel heading upstream can contact the drawbridge to raise its deck. Because of the many dedicated channels in the VHF marine radio service, you can pick and choose what interests you most.

In some metropolitan areas, you might even hear police using marine radio frequencies—if they have good reason to be doing so. In New York City, for instance, Harbor Division units operate on 156.850 MHz and Marine Police and Staten Island Ferry police operate on 156.950 MHz. In the Philadelphia area, you'll hear the Delaware River Port Authority using 156.700 MHz for port operations.

In areas where there is a lot of recreational boating, you may hear someone on the shore with a walkie-talkie call their boat out on the lake to tell them to come in for dinner, for instance. In areas where there is commercial fishing, you'll hear fishermen communicating with each other about good and bad places for catches.

Some other types of communications you may hear include distress calls from boats and ships, warnings to vessels in dangerous areas or during impending storms, environmental and oceanographic agencies at work, marine telephone calls, and of course, the Coast Guard.

The U.S. Coast Guard monitors some channels to assist boaters and ships and also has some channels reserved for its own use during routine activities and search and rescue operations. For instance, the Coast Guard keeps an ear tuned to 156.800, marine channel 16, which is used for calling and distress calls. Almost all vessels monitor this frequency and switch to another channel if they are called. If there is a severe weather warning to be issued, the Coast Guard will make the announcement on this frequency that the broadcast can be heard on another channel. Also, if there is a telephone call for a boat, the marine operator will call the ship on the calling channel and tell them which marine telephone channel to switch to.

The Coast Guard also will keep an ear tuned to 156.300, which is Marine Channel 6 and is used for ships to contact other ships; 156.600, which is Marine Channel 12 and is used for port operations; and 156.700, which is Marine Channel 14 and also is used for port operations.

Frequencies used by the Coast Guard on an exclusive basis include 157.050, Channel 21; 157.075, Channel 81 and used for oil spill cleanups; 157.100, Channel 22 and used to broadcast information to boaters; 157.125, Channel 82; 157.150, Channel 23; and 157.175, Channel 83 and used by the Coast Guard Auxiliary.

If listening to marine telephone calls is your bag, you'll have to determine what channels are in use in your area, as each area has its own pair of frequencies. There are nine pairs of frequencies, with ships transmitting on the 157 MHz channels and the coast stations relaying the telephone calls through repeaters on the upper end of the 161 MHz band. You'll want to tune in to the coast stations to hear both sides of the conversation. Ship stations are unable to talk and receive at the same time on marine telephone systems, however, so the ship operator has to release the microphone button to hear the party on the other end of the line. The marine telephone frequencies, with their input frequencies for ships in parentheses, are:

161.800, Channel 24 (157.200)
161.850, Channel 25 (157.250)
161.900, Channel 26 (157.300)
161.950, Channel 27 (157.350)
162.000, Channel 28 (157.400)
161.825, Channel 84 (157.225)
161.875, Channel 85 (157.275)
161.925, Channel 86 (157.325)
161.975, Channel 87 (157.375)

Commercial channels, reserved for marine-related businesses, include the following frequencies: 156.350, Channel 7; 156.400, Channel 8, ship-to-ship only; 156.450, Channel 9; 156.500, Channel 10; 156.550, Channel 11; 156.900, Channel 18; 156.950, Channel 19; 156.375, Channel 67, ship-to-ship only; 156.875, Channel 77, ship-to-ship only; 156.975, Channel 79; 157.025, Channel 80; and 157.425, Channel 88, ship-to-ship only.

Non-commercial channels, which would be used by recreational boaters, for instance, include the following assignments: 156.425, Channel 68; 156.475, Channel 69, ship-to-shore only; 156.525, Channel 70, ship-to-ship only; 156.575, Channel 71, ship-to-shore only; 156.625, Channel 72, ship-to-ship only; 156.925, Channel 78, ship-to-shore only.

Port operations channels, which generally are used by port authorities in major ports, can be heard on the following frequencies: 156.600, Channel 12; 156.700, Channel 14; 161.600, Channel 20 (ships on 157.000); 156.275, Channel 65; 156.325, Channel 66; 156.675, Channel 73; 156.725, Channel 74.

Other specific assignments include: 156.650, Channel 13, navigational; 156.750, Channel 15, environmental and hydrographic; 156.850, Channel 17, state government use.

Most marine radios also are equipped to receive weather broadcasts from the National Weather Service on 162.400, 162.475, and 162.550. Some new weather channels that may come into use soon are: 162.425, 162.450, 162.500, and 162.525. Some of the newer frequencies may be used for low-power relays of more powerful weather stations to extend the coverage area of the transmitters.

One also should not forget to check routine business band channels for marine-related activity. Frequencies in the 151 and 154 MHz business bands often are used by marine businesses. Also, terminals and stevedores can be heard operating on the 461-465 MHz business band using either repeater or simplex-split frequency operation.

And all this does not go without saying that illegal activity can be heard on the VHF marine band. Synthesized, fully channelized marine radios can be purchased at relatively low prices by almost anyone. Because of this, you may hear almost anything on these channels from illegal business use to criminal activity. Some boaters also have gone as far as to install VHF marine radios in their cars so they can make telephone calls from their cars while they are driving down the road. That's illegal and some folks do get caught.

As the summer winds down, chances are that your scanner went along for a vacation with you. If you visited an amusement park, a national park, or just a ballpark, you probably did some eavesdropping. There's radio communications in use almost everywhere you go. We'd like to hear about what new frequencies you found while on vacation this summer. There's a good chance someone else may be looking for the information. And as usual, we also like to publish code lists and unit designator lists. If you have any photographs of your listening post, your antenna system, a dispatch console, or a repeater site, send them along also to: Chuck Gysi, N2DUP, Scanner Scene, *Popular Communications*, 76 North Broadway, Hicksville, New York 11801. PC

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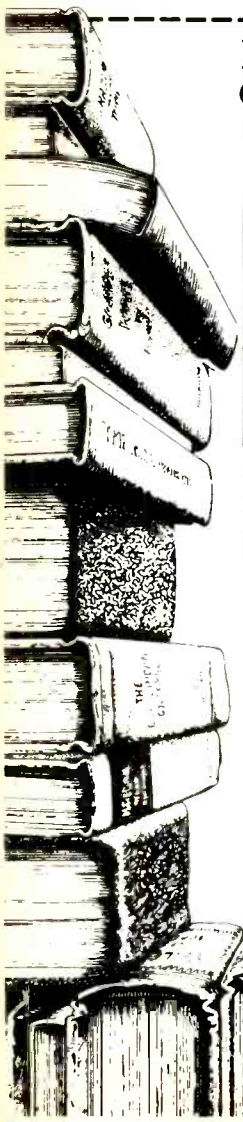

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CIRCLE 54 ON READER SERVICE CARD

EQUIPMENT REVIEW:

The JRC Model NRD-515

BY KEN FARVER & JOSEPH JESSON

One is immediately struck by the rugged, quality appearance of the NRD-515 receiver. This should be no surprise since the NRD-515 comes from a family of receivers from a company with a long history of manufacturing superb commercial marine equipment. The frequency range of the NRD-515 extends from 100 kHz to 30 MHz continuously using 100 Hz optically counted steps. Modes of operation include AM, USB, LSB, SW, and RTTY. Four independently switched selectivity positions are available from the front panel—6 kHz, 2.4 kHz, .6 kHz (optional), and AUX. The 6 kHz position selects a ceramic filter (center frequency of last IF is 455 kHz) while the 2.4 kHz position selects a 2.4 kHz KUKUSI multipole mechanical filter with a shape factor (60 dB/6 dB) specified at better than 3 dB but empirically measured at 1.9 dB—typical of the better mechanical filters.

The dimensions (excluding projections) are 340 (width) × 140 (height) × 300 (depth) mm. The weight is about 7.5 Kg.

The front panel is attractively styled and the controls are well laid out and easy to use.

Japan Radio Company's very impressive NRD-515

The rear panel includes:

AC connector for connection to the power cord.

TX connector for use with the JRC transmitter.

Monitor control for adjusting the monitor level when combined with the companion transmitter.

Memory input for connection of the memory unit.

E terminal for providing a ground to the receiver.

ANT connector for connection of an antenna 50 to 75Ω, unbalanced.

Line out jack for connection of the AF output to be recorded.

IF out jack.

SP jack for external 4 ohm speaker.

Record jack for constant output in the use of recording (this output can be adjusted from the line adjust control while the AF gain has no effect).

Voltage Selector Switch for setting the radio to the proper line voltage.

The front panel controls are:

MHz control for setting the MHz digit: A band designated with the MHz control is indicated on the LED display and scale on the panel with 30 equidistant divisions.

Tune dial: Several rotations of tune dial cover the entire frequency band continuously in steps of 100 Hz without switching the MHz control. Full rotation of the tune dial covers 10 kHz. If the tune dial is rotated in excess of the MegaHertz, the MHz digit of the LED display will change automatically. Now the MHz control will be showing the wrong MHz which can quickly be corrected by a turn of the MHz dial. The manual changing of the MHz dial is preferred over automatic.

LED display: Displays frequency down to 100 Hz. Battery backup is provided for memory when power is removed.

Phone jack: For connection of the headphone. Insertion of the plug disconnects the speaker.

BFO and BC Tune: For adjusting the best CW tone, with the mode switch set to CW. For tuning the preselector in the range of 600 to 1599.9 kHz.

Lock pushbutton: This "lock" effectively disconnects the digital VFO counter to prevent accidental brushes against the frequency knob.

AF control: Enabled with the AF switch. For fine tuning the frequency. In excess of ± 2 kHz. LED display will not change.

AF gain: For adjusting the audio gain of the receiver.

PBT control: For tuning the passband of the IF.

RF gain control: For adjusting the IF gain of the receiver.

AGC switch: For switching on and off and to control the time constant—OFF, FAST, and SLOW are provided.

Mode switch: For controlling the receive mode—RTTY, LSB, USB, and AM are provided.

Bandwidth switch: For switching the bandwidth of the IF filter. Both 6 kHz and 2.4 kHz are provided while the 0.6 kHz and AUX filters are optional.

ATT switch: For switching in either 10 or 20 dB of attenuation.

Power switch: For switching on and off the power supply.

Monitor switch: For monitoring the signal of the combined transmitter when provided.

NB switch: For switching on and off the noise blanker. The factory set threshold control is located inside of the receiver.

VFO switch: For selecting internal or external VFO when in operation with the combined transmitter.

Up-Down switch: For automatic and quick changes of the tuning frequency.

S meter: For indication of the intensity of the received signal. Set the RF gain control to maximum and the AGC switch to either FAST or SLOW.

Circuit Description

A simplified block diagram is shown in Figure 1. The receiver is dual conversion with the first IF at 70.455 MHz. The second IF is at 455 kHz.

The incoming signal passes through the switchable 10-20 dB attenuator, 35 MHz low pass filter, 1.6 MHz high pass filter, BC band preselector and one of six filters. The 1.6 MHz high pass filter and six filters are

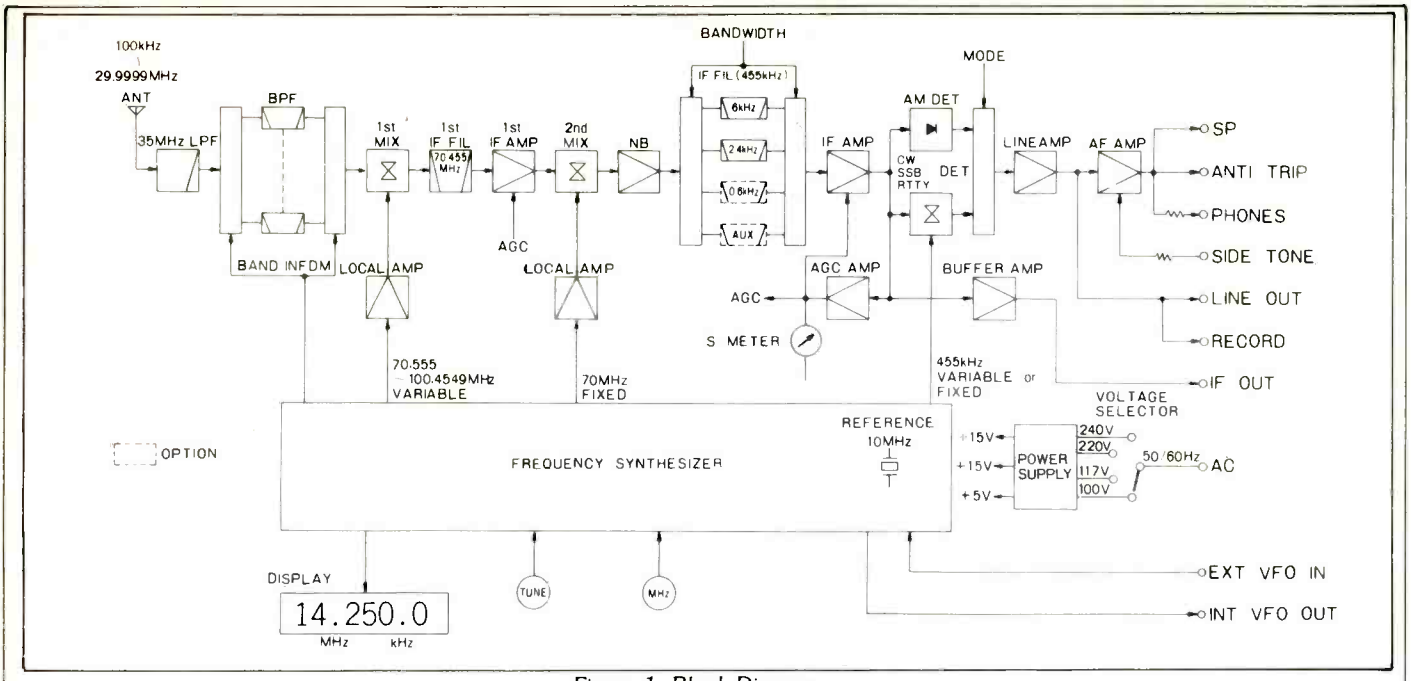


Figure 1: Block Diagram.

selected automatically depending in the operating frequency. After filtering the signal passes through the balanced mixer, first local amplifier, crystal filter at 70.455 MHz, first IF amplifier, second mixer, second local amplifier, second IF amplifier of 455 kHz and the noise blanker circuit.

The signal of 455 kHz is passed through the chosen 455 kHz IF filter and amplifier to the detector circuit. The AF signal from the detector is fed to a switching circuit of IF AGC and RF AGC. The AF signal from the detector is amplified and fed to the line output and speaker.

The synthesizer unit consists of a reference signal generator with a reference frequency of 10 MHz. Frequency dividers provide 500 kHz for Loop 1 and 1 kHz for the digital VFO. The VCXO of the VFO circuitry generates 19 MHz and a filter circuit picks out 38 MHz and applies it to the mixer. The 38 MHz mixes with the output of VCO (24.55 to 34.55 MHz) to provide an output of 13.45 to 3.45 MHz. After amplification, the output is fed to a variable frequency divider. Its output and reference frequency of 1 kHz are applied to the phase detector for detecting the frequency and phase difference to control the VCO.

The second local oscillator oscillates at 70 MHz and is amplified. This output is fed to the second mixer and VFO.

The VFO mixer circuit mixes the 70 MHz and 5 MHz to produce 65 MHz. When passed through the band pass filter and amplifier, this signal is mixed with the output of the VFO to produce an output of 67.455 to 68.455 MHz. This output is fed to Loop 1.

In the Loop 1 circuit, both signals of 67.455 to 68.455 MHz from the VFO mixer, and 70.455 to 100.455 MHz from Loop 1 VCO A-1 are applied to the balanced mixer to produce an output of 3 to 32 MHz.

This 3 to 32 MHz signal is amplified to produce first local frequency signal. The output signal from the mixer is passed through the 35 MHz low pass filter, amplified and divided. This output is supplied to a variable frequency divider. This output of 500 kHz and the 500 kHz reference from the synthesizer are detected to control the Loop 1 VCO.

Measurement Technique

All measurements were provided from the author's equipment. Differences may appear between models.

Noise floor with reference to 1 mv. SSB standard bandwidth of 2.4 kHz provides a minimum discernible signal 3 dB out of the noise floor of:

14 MHz -132 dBm

Oscillator Sideband Noise. Measured by connecting a signal generator of 14040 kHz and tuning the receiver away from the generator. The level noted was the signal required for a 3 dB increase in the noise floor.

3 kHz	– 62 dBm
5 kHz	– 49 dBm
10 kHz	– 36 dBm
15 kHz	– 33 dBm
25 kHz	– 31 dBm
30 kHz	– 30 dBm
40 kHz	– 27 dBm
50 kHz	– 27 dBm
75 kHz	– 22 dBm
100 kHz	– 26 dBm
200 kHz	– 26 dBm

Third Order Intermodulation. The measurements were made using generators at 14040 kHz and 14060 kHz. A reference signal of 1μv (– 107 dBm) was provided. This reference was set on the VTVM at the audio output of the receiver. The signal was then increased until the 3rd order products equaled 1μv (the same reference on the VTVM). This level was – 31 dBm. Calculations for third order intercept then show + 7 dBm. This is at 20 kHz spacing.

The Intermodulation Dynamic Range can then be calculated as follows:

2/3 Intercept - (– Noise Floor)

2/3 (+ 7) = (– 132) = 92.66 dB dynamic range for 20 kHz spacing at standard SSB bandwidth.

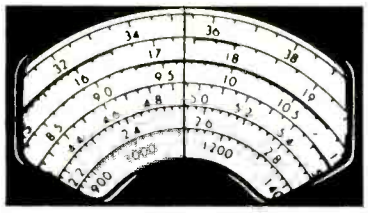
S meter linearity. Levels required per S unit.

S1	– 102 dBm
S3	– 98 dBm
S4	– 96 dBm
S5	– 95 dBm
S6	– 94 dBm
S7	– 93 dBm
S8	– 89 dBm
S9	– 82 dBm
+ 20	– 58 dBm
+ 40	– 22 dBm
+ 60	– 5 dBm

Blocking. A desired signal of – 110 dBm was applied at 14060 kHz while the 14040 kHz generator output was increased. Blocking was noise limited and never showed a 1 dB drop, but the reference signal increased by 1 dB at the audio output at the level of – 28 dBm. This was also at SSB bandwidth. AGC on or off made no difference.

The JRC NRD-515 is a fine performer with low phase noise. Noise floor is very good with, of course, an improvement at CW bandwidths with the optional filters.

The radio really shows its own in weak signal RTTY reception with the proper shift provided for the correct digital frequency readout. In fact, injection control for RTTY, USB, and LSB can be independently adjusted by the separate internal frequency potentiometers. The overall mechanical integrity is exceptional and fiberglass (G-10 style) PC boards are used throughout. Last, but not least, is the ability to interface the NRD-515 with a computer by the BCD interconnect brought out through the back. Complete frequency control from 100 kHz to 30 MHz by this BCD port allows many opportunities for future expansion. PC



COMMUNICATIONS CONFIDENTIAL

BY RON RICKETTS, WA5VFA

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

This month I received an interesting and informative letter from Jon Morrison of Lubec, Maine with information concerning "split" number transmissions. There has been a general decline in these transmissions and Jon has listed both frequencies and modes of transmission.

German language transmissions of the 3/2 variety begin on the hour and have a 10 minute start of 3 numbers repeated 3 times followed by a count from 1 to 9 plus 0. At 10 minutes there are some pips and then "gruppen ##" and into the groups. The announcer is generally female. Frequencies of the German split numbers include: 4022, 4058, 4415, 4770, 4990, 5225, 5440, 5750, 5950. Parallel transmissions noted are on 4022//4058; 4770//4990; 5440//4990; or 4770 or 5750.

English language transmissions have a female announcer reading split number groups. Transmissions begin on the hour and have a 10 minute start exactly the same as the German transmissions. Frequencies include 5330, 6875, and 14603, which is Sunday only. The 5330 and 6875 transmissions are usually in parallel.

Spanish language transmissions begin in the same manner as the others and appear to be the same station (or announcer) as the 4 and 3 digit transmissions. Split transmissions are rare and have been noted only a few times. Frequencies include 5812, 8417, 9074, 11532-3, 13452, 13808, and 16450. Thank you, Jon, for sharing this information with the readers of *POP'COMM*.

The Saga Of WGY912

Recently, many readers have reported hearing transmissions consisting of 5 letter code groups in CW and signing "SK DE WGY912 SK." A letter received from Harold S. Eisley, Saint Mary's City, Maryland sheds some light on these mysterious transmissions. He reports that they may be heard daily on 4780 kHz beginning at 0030 and continuing until 1230. The messages themselves begin on the hour and consist of six 5-letter groups repeated in slow CW over a 15 minute period. The messages are retransmitted at 15, 30, and 45 minutes past the hour. Each message period begins with "SK DE WGY912 SK" and ends with "AR SK."

The block of 'WGY9--" calls are allocated to FEMA, the Federal Emergency Management Agency, a governmental agency empowered to take responsibilities for preparation for major civil emergencies brought on by natural disaster or war. Harold also mentions that WGY912 is extremely strong at his location and exhibits characteristics of ground wave propagation. He also states that he has heard similar transmissions on 3380 kHz from WGY908 but they were considerably weaker, so transmitter sites appear to be different. Thank you for your letter, Harold.

This story takes a more bizarre turn, though. I received another letter on the same subject from an individual who wished to have his name withheld. This person was also curious as to why a federal agency would send hours of leisurely code, so he called the agency's office in Olney, Maryland (301-926-5110) and was connected to the radio officer. When questioned about the location of WGY912, the radio officer replied, "I'm glad you asked me that question, but I'm afraid I can't tell you anything about that particular station."

The radio officer was then asked to confirm that WGY912 was indeed one of FEMA's stations. The radio officer replied that it was but that he could not tell him any more about it. He also asked the caller if he was a ham or an SWL. When told the caller was a ham, they exchanged callsigns and ended the conversation. When checked, the call given by the radio officer was not listed and *appeared* to be fictitious. The entire tone of the conversation was "mind your own business."

It would appear that the activities of WGY912 are definitely out of the norm for a federal agency supposedly chartered for disaster coordination and relief. Not so! The following is extracted from a federal organization manual describing the charter of FEMA.

". . . In addition, Federal functions relating to earthquake hazards reduction, dam safety, weather-related emergency readiness plans, natural and nuclear disaster warning systems, *and the consequences of terrorist incidents* will also be transferred to the Agency."

The italics are mine but serve to indicate the relatively broad base of authority given to FEMA. My thanks to Harold Eisley and *Name Withheld* for their letters. I would certainly like to hear from any of our readers with similar experiences they would like to share.

SAC Transmissions Jammed

Jon D. Andreason of New Jersey writes to tell us of a most unusual "Skyking" broadcast. These transmissions are general calls to all SAC stations and aircrews, giving them instructions and possible changes in their orders. Each transmission consists of authentication codes and perhaps a burst of RTTY or data. On 6 April, 11245 USB at 2045, Jon monitored a "Skyking" broadcast that was being interfered with (jammed) by someone playing rock music. The music would start just after the USAF operators began transmitting. Over a period of 45 minutes, transmissions were interfered with on a seemingly random basis; one transmission would be okay, then the next one would receive interference. All during this time, the AF operators were having considerable difficulty copying each other.

On a similar note, K.G. Lindsay of Canada writes that he was monitoring 6761 kHz on 5 April at about 0300 and was startled to hear Led Zeppelin music being played. This was made more interesting by the fact that this is the SAC *Quebec* frequency. This continued until about 0400, at which time Rush music was played. The music transmissions were of short duration—15 to 30 seconds—and were extremely loud. This continued until about 0500. During this entire time, the usual "foxtrot" broadcasts and routine traffic were being transmitted. Each time an AF transmission began, so would the music.

There are several possible explanations for this, but none of them make any real sense. The most likely is that some malicious and demented prankster has access to transmitting equipment that is tunable to these frequencies. If this is the case, my only comment is that if he is caught, the penalties will probably be extremely severe. This is not along the line of being a WFAT-type pirate; this endangers national security. I would like to hear from anyone who might have ideas on the source of these transmissions.

A Case Of Mistaken Identity

Amateur radio operators recently had some band privileges allocated to them. One of the new bands is the 30 meter band located from 10100 to 10150 kHz. This band is not exclusively for amateurs; in fact, amateur use is secondary here. This group of frequencies is also used for worldwide fixed station use. I received a letter from an amateur in Boynton Beach, Florida who described a case of mistaken identity. In this little story, I will refer to him as WA4XYZ.

"He was monitoring NMN (USCG-Portsmouth, Virginia) on RTTY. NMN had been passing traffic with NRUO on 10138 kHz and took a break. Since the stations were operating within an amateur band,

WA4XYZ decided to give NMN a call on RTTY. NMN came back giving a good signal report and requesting a repeat of the ham's callsign. NMN must have initially thought that WA4XYZ was some kind of military station because he said he had traffic for him up the band. WA4XYZ explained that he was not military, but an amateur station operating in the new 30 meter band, and proceeded to give a description of the weather and asked for NMN's location. There was a long delay before NMN returned, presumably from contacting his supervisor. NMN replied that WA4XYZ was in communication with a U.S. Military station and that he should get off the frequency without delay. NMN also indicated that they were going to contact the FCC immediately. WA4XYZ, believing discretion to be the better part of valor, departed the frequency forthwith. Later, WA4XYZ contacted a friend who was an FCC field engineer and described what had taken place. He was advised that U.S. amateurs have the band on a secondary basis, with land and fixed stations having primary usage. It was illegal to willfully communicate with any non-amateur station on that band except for FCC sanctioned exceptions such as Armed Forces Day."

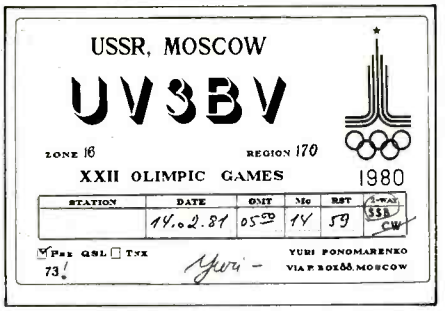
This situation is bound to happen again, so for some interesting listening, try the new 30 meter ham band. By the way, if you get a QSL, I would like to see it. And thanks, WA4XYZ, for writing to Communications Confidential.

From The Mailbag

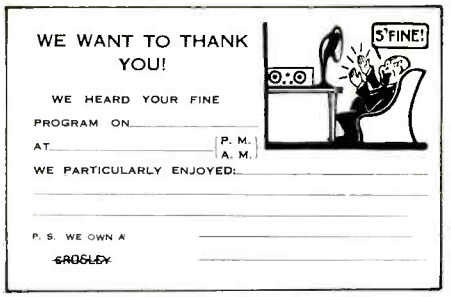
An anonymous reader sent a copy of an article from the April 5th issue of *New Scientist* entitled "How Cheltenham Entered America's Back Yard." In it, the current doings of GCHQ, the British equivalent of the NSA, are described, including location of monitoring stations. GCHQ has six listening stations in Britain: at Bude in Cornwall, Culm Head in Somerset, Irton Moor near Scarbrough in North Yorkshire, Cheadle in Staffordshire, Hawklaw in Fife, and Brora in Sutherland. Cheltenham is the heart of SIGINT (signals intelligence) with more than 7,000 people employed at the center. GCHQ's most famous employee, Geoffrey Prime, was convicted in 1982 of spying for the Soviet Union. He was discovered with a shortwave radio and 5-digit "one time pads" that were used to decipher messages from "numbers stations" in East Germany.

The messages from Prime's contacts were first put into the form of numbers with the help of a code book. These numbers were then added to the numbers on the page of the one-time pad. The sum is then transmitted from the numbers station and received on an inexpensive shortwave radio. Prime would take the numbers and subtract them from the numbers on the page of the one-time pad. He would then translate the resulting numbers into the message using his code book. The page from the one-time pad would be destroyed. This technique is virtually unbreakable.

Kenneth Muggli of Washington writes wondering if there is a computer bulletin board for the SWL. Yes, Kenneth, there is a very good one sponsored by Universal Amateur Radio, 1280 Aida Drive, Reynoldsburg, OH 43068. This BBS is open to anyone having an interest in shortwave listening or utility monitoring. I have been using this BBS for some time and enjoy it immensely. For information on accessing the system, write to Fred Osterman at the above address. He will be glad to give you the details.



A QSL from the days when the Russians liked the Olympics—1980.



These two card forms were printed by the Crosley Radio Company to be used by owners of their radios for sending reception reports and also for promoting radio broadcasting. They date from 1925 and were supplied to us by Marc A. Mugmon, M.D., N3DBS. They were given to Dr. Mugmon by one of his patients who held the callsign 3RC back in 1916.

Bob Roehrig of Illinois writes to tell us of the results of his direction finding efforts on several of the numbers stations. He states that on April 2 and 3, he took measurements on the stations operating on the frequencies of 4670, 6802, and 9074, with all nulls lying on an East-West line. His loop consists of a one meter diameter loop made of copper tubing with a single conductor inside of it. The copper tube serves as an electrostatic shield. This loop is tuned to resonance with a single 365 pf variable capacitor, giving a tuning range of 4.3 to 15 MHz. Thanks for the info, Bob, and stay in touch. I would certainly like to hear from anyone who has been using direction finding equipment. I am compiling this information and will publish it when enough information has been acquired.

I received a very interesting note from Alfredo Polanco of Panama regarding his interest in numbers stations. He gave a very helpful hint for those of you who copy numbers transmissions looking for clues. In copying them by hand by the hour, it's easy to make a mistake. Alfredo enclosed a sample of his simple technique for copying numbers transmissions. He uses an adding machine. As each number is heard, it is punched into the keys and entered but never totalled. This gives a strip with a single column of 4 or 5 digit numbers. The resulting strip is easy to store and seldom has errors. Thanks, Alfredo.

As you have probably noticed, Harry Helms has stepped down as monthly Communications Confidential columnist. Have no fear, he will still be contributing articles and features to *POP'COMM* on a regular basis. Harry has done a great job here and will certainly be a tough act to follow. I have been an active SWL and Amateur for 17 years. My special interests fall into general *utilities* monitoring, RTTY, and numbers stations. Send your loggings, letters, photos, copies of QSL's, and questions directly to me—Ron Ricketts, WA5VFA, Box 795, Bedford, TX 76021. Now let's get to this month's loggings.

Listening Reports

194: "TUK" Nantucket, MA CW beacon at 2300. (George Primavera, NJ)
205: Man reading weather statistics 0645. All information heard was for Texas, Mississippi, Louisiana, Alabama, and Oklahoma. (P.N. Davis, IL)
262: "JSO" repeated in CW at 0649. (P.N. Davis, IL) This is an RDF Aero marker from Jackson, MS. (Editor)
320: "TY" repeated in CW at 0653. (P.N. Davis, IL)
363: "RNB" Millville, NJ CW beacon at 0100 (Rainbow Field airport). (George Primavera, NJ)
364: Aviation weather broadcasts from Dallas-Fort Worth Airport at 0658. (P.N. Davis, IL)
388: "NXX" Willow Grove, PA CW beacon at 2300 (Willow Grove N.A.S.) (George Primavera, NJ)
396: "ZBB" Bimini, Bahamas CW beacon at 2300. (George Primavera, NJ)
402: "IBG" repeated in CW at 1827. (P.N. Davis, IL)
414: CW beacon heard at 1430 repeating O-G-Y (Tom Lewandowski, NY)
1613: Pip repeated every 4 seconds. RTTY came on at 0416 followed by a sound like tape flapping. Signal faded out around 0430. (Mark Johnson, ID) There is a good possibility that this might be one of the "SPOT" navigation transmissions. See last month's column. (Editor)
1634: Beacon repeating "BBH." Very weak. (Mark Johnson, ID) Where's it from? (Editor)
3090: 5-digit Spanish numbers with female announcer at 0240. (Harold Ort, NY)
3333: CHU, time signals in English at 1000 from Quebec, Canada. (David Keenan, CA)

3400: 3/2 digit German numbers in AM with female announcer at 0615. (Bruce Saville, NY)
3435: 0130 in CW, "DE GYA QSX 2 4 6." Whitehall (London) Naval Radio England. (Don Schimmel, VA)
3485: New York aviation weather broadcasts to major Eastern cities including Bermuda and Freeport, in SSB at 0351. (Thomas N. Cerf, IL)
4025: 5-digit Spanish numbers in AM spoken by female announcer at 0301. (Thad Adamaszek, OH)
4052: 5-digit Spanish numbers spoken by female announcer at 0400. Very poor audio quality. (Editor)
4094: "VVV DE TBO/2" in CW at 0305 by Izmir Naval Radio, Turkey. (Don Schimmel, VA)
4100: 5-digit Spanish numbers in AM with female announcer at 0201. (Thad Adamaszek, OH)
4150: Foxtrot broadcast followed by various callsigns such as "Newcombe," "Echo," and "Golf" requesting a new coordination frequency for "Tango Sierra" to gain access to the net, in SSB at 0355. (Thomas N. Cerf, IL)
4220: CW marker "DE LZW" at 0312. Varna Radio, Bulgaria. P.T. traffic. (Don Schimmel, VA) Interesting catch, Don! (Editor)
4241: CW marker at 0155, "DE 4XX VVV" from Haifa Naval Radio, Israel. (Don Schimmel, VA)
4251: CW marker, "DE GKC" at 157 from Portishead Radio, England. (Don Schimmel, VA)
4263: 5-figure CW groups, no calls. All numbers sent in normal fashion. Pause after every ten groups. At 0151. (Don Schimmel, VA)
4284: "VVV CQ DE VCS QSX 4 AND 8 MHZ" in CW at 331. Halifax CG Radio, NS, Canada. (Don Schimmel, VA)
4413: WLO in Mobile, AL working high seas phone patch traffic in USB at 0518. (Rodney Grussling, KS)
4640: Male reciting numbers in Spanish with overmodulated and distorted AM signal at 0551. Announcer speaks very rapidly. (Thad Adamaszek, OH) This chap, sometimes called "The Babbler," is quite amusing. He may be heard most weeknights from 0200 GMT on, transmitting intermittently. Also heard in parallel on 3646. (Editor)
4670: Female announcer repeating "5-4-5" over and over in Spanish at 0300. (Thad Adamaszek, OH) Female announcer repeating "Oscar Lima Bravo 2" 0348 to 0350. (Harold Ort, NY)
5004: Loud "buzzsaw" type noise, very strong, covering 4997 to 5011 kHz but strongest at 5004. Completely wiped out WWV. Heard at 0015. (George Osier, NY) George, I heard something similar during most of last winter. It centered two or three kHz above WWV at 5, 10, and 15 MHz. It seemed strongest on 15 MHz and would usually disappear by 0200. I never located the source. Do any readers have an idea? (Editor)
5036: "Mike, Mike" running radio check with "Niner Mike" asking him to run test tones and then RTTY. Transmission began at 2225 and went to RTTY at 2229. (George Osier, NY)
5305: N58, V1J31, and G8B tactical military stations heard at 0500 USB having problem with RTTY portion of their transmissions. (Tom Lewandowski, NY)
5597: USAF aircraft "Whip-42" calling NY Aeradio; position report at 0450. (Tom Lewandowski, NY)
5810: 5-digit AM Spanish numbers with young sounding female announcer at 0331. Began transmission with "attencion 5 3 6 - 0 5" repeated over and over. (Thad Adamaszek, OH)
5865: Military traffic in USB, *Kilo* (net control) various times. (David Keenan, CA)
5985: 4-digit Spanish number station with female announcer at 1004. (Joseph Lemak Jr., NY)
6030: AFRTS affiliate information at 0635. Man announcing the times and sources for coverage of the upcoming baseball games, Presidential speech and Space Shuttle launch. (P.N. Davis, IL)
6100: YVTO Time signal station, Caracas, Venezuela at 0649. (P.N. Davis, IL) This station QSL's. (Editor)
6230: 5-digit numbers in Spanish spoken by female announcer at 0504. (Rodney Grussling, KS)
6386: CW marker HKC sending "DE HKC" in CW from Buenaventura, Columbia at 0613. (Rodney Grussling, KS)
6388: FUF, Fort de France, Martinique, V marker in CW at 0615. (Rodney Grussling, KS)
6462: FUM, Papeete, Tahiti, V marker in CW at 0620. (Rodney Grussling, KS)
6577: New York en-route communications in SSB requesting weather and final instructions to destination, 0125. SELCAL numbers and codes stated by aircraft followed by two tones and the end of transmission. (Thomas N. Cerf, IL) New York and San Juan Radio (P.R.) handling air traffic, using SELCAL. Eastern, United, and other airlines heard 0200. (J. Bedient, WI) New York and Gander Radio VOLMET, 0150. (J. Bedient, WI)
6604: Gander, Newfoundland VOLMET VFG in USB at 0055. (Rodney Grussling, KS)
6683: *Air Force One* working Andrews AFB in SSB at 0125. Transmissions consisted of tests with satellite comm links. (Thomas N. Cerf, IL)
6730: On USB Andrews AFB/USAF aircraft "Birdnest" went to RTTY 100 wpm encrypted at 0445. (Tom Lewandowski, NY)
6760: USAF (SAC)—several stations went to scrambled speech (Motorola DVP type) at 0430. This frequency known as Alfa-Kilo. (Tom Lewandowski, NY)
6793: At 0440 4GF worked 0HZ on USB. Probably military transmissions. (Tom Lewandowski, NY)
6791: Female repeating "Charlie India Oscar 2" in USB at 0018. (George Osier, NY) Good story on these stations in the July '84 *POP'COMM*! (Editor)
6800: 4-digit Spanish groups in AM spoken by female announcer noted at various times and dates. (Thad Adamaszek, OH) If any readers have never yet heard a numbers station, this frequency is an excellent choice since it is quite busy. Try it any weekday evening from 0100 GMT on, especially on the hour and half-hour. (Editor)
6806: "D" and "P" repeated continually with data bursts every few seconds at 0200. (George Primavera, NJ) Interesting report, George. Have you noticed the increasing incidences of "data" transmissions on 6600-6900 kHz? Do any readers know what they are? (Editor)
6840: 5-digit groups in AM spoken by female anouncer with young voice at 0331. Eventually buried in SSB and slow CW (cut numbers?). (Thad Adamaszek, OH) This particular frequency is one of my favorites. Various types of numbers transmissions appear here regularly, including those in CW and MCW. A good place to monitor, as several really bizarre transmissions have been noted here. (Editor)
6890: 5-digit Spanish numbers in AM with young sounding female announcer at 0500. (Thad Adamaszek, OH)
6989: CW marker, "BLA DE TAN." Callups, no traffic at 2246. (Don Schimmel, VA)
6990: 5-digit AM numbers with female announcer at 0801. (Thad Adamaszek, OH)
6995: No calls, 5-figure groups in CW at 1351. Sends "BT" at various intervals. (Don Schimmel, VA)
7025: 5-digit Spanish numbers in AM with female speaker on various dates at 0300 GMT. (Thad Adamaszek, OH)
7360: Foxtrot 7 Sierra/Romeo 8 Bravo testing equipment at 1440. (Joel McClure, MI) Possibly USN, Joel. (Editor)
7404: 5-digit German numbers in AM, usual format at 0004 spoken by female announcer. (George Osier, NY)
7420: 4-digit Spanish number station with female announcer at 0921. (Joseph Lemak, Jr., NY)
7440: 5-digit Spanish numbers in AM with female announcer at 0804. (Thad Adamaszek, OH) 4-digit Spanish numbers station with female announcer at 0803. (Joseph Lemak, Jr., NY) These two loggings are several weeks apart. It is generally believed that the 4-digit transmissions emanate from separate facilities and sources than the 5-digit transmissions—Havana and Washington, for instance. Perhaps one of the employees of the transmitting sites could clear this up, he said laughingly! How about it? (Editor)
7525: 5-digit Spanish numbers in AM spoken by female announcer at 0300 on various dates. (Thad Adamaszek, OH)
7770: Female announcer saying "This is an audio test . . . 1 2 3 . . . 9 8 7 . . . 1" repeated about eight times followed by a male voice saying "This is a test of government equipment." At times the lady sounded like she was going to laugh in a self-conscious way. At 0205 and 0105 on various dates. The announcers spoke in English. (J.C. Halbrooks, CT) Very interesting, J.C. Was this a taped message or did it sound live? Let's keep an ear peeled here. (Editor)
7785: 5-digit Spanish numbers in AM. Announcer was female with lively singsong delivery at 0231. (Thad Adamaszek, OH) Good catch, Thad. Is this announcer different from the normal "young sounding female"? (Editor)
7846: Almost nightly activity, 5-digit Spanish language, female anouncer. Always the same station, strong signal, crummy audio. Generally heard on even quarter hour from 0630-0730 (J. Bedient, WI)
8185: 4-digit Spanish number station with female announcer at 0811. (Joseph Lemak, Jr., NY)
8478: TIM Limon Radio, Costa Rica calling CQ in CW, 0253. (P.N. Davis, IL)
8498: SAG4 Goteborg Radio, Sweden calling CQ in CW, 0249. (P.N. Davis, IL)
8573: HKC Buenaventura Radio, Columbia VVV Marker in CW at 0654. (P.N. Davis, IL)
8597: CTH55 Horta Naval Radio, Azores VVV Marker in CW, 0229. Not a normal frequency for CTH55. (P.N. Davis, IL)
8625: CW Marker, "VVV DE FUM" 0516 (J. Bedient, WI) See 6462 kHz listing. (Editor)
8652: OST42 Oostende Radio, Belgium VVV Marker in CW, 0705. (P.N. Davis, IL)
8656: IAR38 Rome P.T. Radio, Italy VVV Marker in CW, 0701. (P.N. Davis, IL)
8694: PJC Curacao (Willemstad) Radio, Curacao calling CQ in CW, 0211. Also 4XO, Haifa Radio, Israel calling CQ in CW, 0215. (P.N. Davis, IL)
8654: CW Marker, "DE PCH4 2 12 AS," 0504. Scheviningen Radio, Ijmuiden, Holland. (J. Bedient, WI)
8682: CW Marker, "CQ DE EAD/2/3/EDZ2/4 QSX 8MC/S AR K." 0455. Aranuez Radio, Aranuez, Spain. (J. Bedient, WI)
8694: CW Marker, "CQ DE 4XO QSX 22 C K," 0445. Haifa Radio, Haifa, Israel. (J. Bedient, WI). CW Marker, CQ DE PJC QSX 8 MHZ K," 0544. Curacao Radio, Curacao. (J. Bedient, WI)
8741: WOO "Ocean Gate Radio" female voice transmitting weather and wind reports for "South of 35 North," in SSB at 0200. (Thomas N. Cerf, IL)
8646: CW Marker, "VVV DE LPD44/86 at 0508." General Pacheco Radio, Argentina. (J. Bedient, WI)
8778: US Navy—"Overwork" broadcasts, tactical callsigns W0K/P5G/X4B/K0W/F5D at 0400. (Tom Lewandowski, NY)
8784: HEB18 Bern Maritime Radio, Switzerland. Male operator handling ship to shore phone calls in English SSB at 0133. (P.N. Davis, IL)
8828: Anchorage VOLMET, 0255. Honolulu VOLMET, 0300. San Francisco VOLMET, 0305. (J. Bedient, WI) Honolulu Radio with weather info in USB. ID at 1330. (Harold Ort, NY)
8855: Belem, Brazil Aero working aircraft at 0249. English in USB. (Harold Ort, NY)
8894: Algiers Radio, air traffic control over Northwest Africa, using SELCAL, 0330 and other times. (J. Bedient, WI)
8903: Aircraft calling Accra (Ghana) Radio, 0408, Brazzaville (Congo) Radio, working air traffic over Southwestern Africa in French language, 0433. (J. Bedient, WI)
8919: San Juan Radio SELCAL tones and SSB traffic air-to-ground conveying flight information, locations, destinations, civil call signs, and general salutations at 1945. (Thomas N. Cerf, IL)
9027: Foxtrot Broadcast ending with "Calloway out," SSB at 0118. (Thomas N. Cerf, IL)
9050: Female with strong accent and abrupt delivery sending 5-digit groups in English at 0100. (Thad Adamaszek, OH)
9074: SSB 4-digit Spanish language numbers, female announcer, 0231, "fin" at 0245. (J. Bedient, WI) This frequency sometimes transmits in DSB, suppressed carrier or carrier with upper sideband only. Never seems to be any pattern to this. (Editor)
9075: 4-digit Spanish numbers in AM with female announcer at 0333. Did not repeat message. (Thad Adamaszek, OH)
9265: 5-digit AM German numbers with female announcer. Began with double beeps and entire transmission was repeated. Heard various times and dates. (Thad Adamaszek, OH)
9450: Fluting sounds in AM followed by female reciting 5-digit groups in German at 0200. Sequence repeated twice with brisk delivery. Announcer has good German conversational delivery. (Thad Adamaszek, OH)
9972: 5-digit German groups recited by female with heavy accent and brisk delivery at 0201. Entire message repeated twice. (Thad Adamaszek, OH) Is this the husky sounding female who appears on 7405 that some call "deep voice," Thad? (Editor)
10038: Scrambled SSB at 0223. (Daryl E. Duckworth, CO) Probably military aircraft. (Editor)
10049: New York Radio aviation weather and terminal forecast for various cities along the East coast in SSB at 2118. (Thomas N. Cerf, IL)
10110: Male in AM with flat, monotone voice with 5-digit Spanish numbers, each group being repeated at 0340. (Thad Adamaszek, OH) The recent upsurge of number transmissions in the 10100-10500 kHz range may be at-

tributed to the availability of ham transceivers with the new WARC bands installed. Readily available equipment makes for easier spying, so they say! (Editor)

10178: 5-digit English numbers in USB spoken by female announcer at 0606. (Rodney Grussling, KS)

10420: Female with young voice in AM with 5-digit Spanish groups at 0330. (Thad Adamaszek, OH)

10437: No calls. 5-letter groups in CW at 2236. Probably Soviet because of use of distinctive IM AA OE OT characters. (Don Schimmel, VA)

10646: "O" beacon at 0205, believe this used to be "K." (Daryl E. Duckworth, CO)

10730: Male in SSB saying phonetics in groups of 3 at 0211. Then at 0213 two-way transmission with female. (Thad Adamaszek, OH) Good catch, Thad. 3-digit phonetic transmissions are very uncommon. (Editor)

10740: German 5-digit groups in USB by female announcer at 0513. She sounded curiously happy this broadcast! (Daryl E. Duckworth, CO) Maybe she has a new boyfriend? (Editor)

10822: 5-digit English numbers in USB spoken by female announcer at 0546. (Rodney Grussling, KS)

11155: "K" beacon at 0506. (Daryl E. Duckworth, CO) What the heck are these beacons, anyway? (Editor)

11180: Andrews AFB working SAM 24130 and "South Sea" for radio checks and phone patches in SSB at 0400. (Thomas N. Cerf, IL)

11182: Scott AFB/SAM-975 VIP flight with phone patches at 0100. (Tom Lewandowski, NY)

11226: Foxtrot broadcast with Andrews AFB radio check with SAM 31683 in SSB at 0230. (Thomas N. Cerf, IL)

11242: "Erskine" and "Retaliate" with communications test in USB at 0209. "Parasite" called by "Retaliate" in USB at 0211. (Harold Ort, NY) Sounds like military traffic to us! (Editor)

11532: 4-digit AM Spanish numbers with female announcer at 2102. (Thad Adamaszek, OH) This station also transmits simultaneously on 9072 later in the evening. (Editor)

12000: Unidentified time signals at 0649. Maybe VNG Australia? Used pips for seconds 1 through 54, clock ticks for 55 to 58, skipped second 59, tone at 0, and double pip at seconds 1 and 2. (Mark Shepherd, TX)

12235: 5-digit Spanish numbers read by female at 1807. Ended at 1814 with "Final, Final." At 1818, a short burst of unidentified code. (P.N. Davis, IL)

12829: XFM Manzanilla Radio, Mexico calling CQ in CW at 0059. (P.N. Davis, IL)

12910: UAT Moscow Radio, USSR transmitting "DE UAT UAT" marker in CW, 0054. (P.N. Davis, IL) Nice catch! (Editor)

12975: IQX Trieste P.T. Radio, Italy VVV Marker in CW, 0047. (P.N. Davis, IL)

12978: ICB Genoa P.T. Radio, Italy VVV Marker in CW, 0045. (P.N. Davis, IL)

13100: CW marker "CQ DE TIM" at 2157. Limon Radio, Costa Rica. (Don Schimmel, VA)

13115: Weather forecast read by man in SSB at 1623. Spoke frequently about "Gulf Stream Location" as well as location of "Warm Eddies" and "Cold Eddies." At 1629 an ID of "US Coast Guard NMN out."

13116: Coded traffic in SSB at 0430 passed between "Whiskey Oscar Mike," Alpha Whiskey," and "Oscar November Delta Alpha." (Thomas N. Cerf, IL)

13185: Man reading weather conditions in SSB at 1505. National Weather Service, San Francisco. (P.N. Davis, IL)

13255: No calls, Spanish military traffic in CW at 1806. (Don Schimmel, VA)

13264: Shannon, Ireland VOLMET with weather info in English, USB at 1323. (Harold Ort, NY)

13270: Gander, Newfoundland VOLMET VFG in USB at 0553. (Rodney Grussling, KS)

13281: CW marker, "VVV DE FUF" in CW at 2346. Fort de France NAVRAD, Martinique. (Don Schimmel, VA)

13350: Spanish Cuban official press items in CW at 2336. (Don Schimmel, VA)

13375: Male voice with announcements in English and German on USB. Transmission for circuit adjustments. Station located in GDR. (Don Schimmel, VA)

13410: Dakar NAVRAD, Senegal "V" marker in CW at 2345. (Tom Lewandowski, NY)

13425: 5-digit AM Spanish numbers with young sounding female announcer at 2135. (Thad Adamaszek, OH)

13434: CW marker "CQ DE CLQ QSX 6300/12624 KHZ" at 2342 from Havana, Cuba. (Don Schimmel, VA)

13485: 5-digit Spanish numbers in AM spoken by female with young voice at 0208. (Thad Adamaszek, OH)

13980: BLA working TAN. Callup followed by Spanish chatter at 0028. Very sloppy since one operator simply can't send with *bug*. (Don Schimmel, VA) A *bug* is a mechanical keying device that allows the user, if experienced, to send very rapid CW. It does, however, require considerable experience to insure that the code is even copyable. (Editor)

14314: Traffic net in Hawaii in English at 0600. Sounded like military phone patch. (David Keenan, CA)

14440: German female reading 5 figure groups in USB at 1342. Very pronounced echo to signal. (Don Schimmel, VA)

14686: Anti-drug smuggling ground station "Atlas" with aircraft "Swordfish-2" in USB at 2315. (Tom Lewandowski, NY) One reader reports that Atlas has its transmitters in Iowa and southern California. Any confirmation on this data? (Editor)

15000: LOL1, Argentine Naval time station. Heard at 2230 with CW ID every fourth minute, voice ID every 5 minutes with heavy interference from WWV. (George Osier, NY) Good job, George. Usually WWV covers all the other time standards except during the silent period every hour. (Editor)

15041: USAF-"Micron"/"Abram-08" in comm for quite some time. Possibly the Cruise missile test over Canada in USB at 1715. (Tom Lewandowski, NY)

16005: CW marker "VVV IDR6" at 1433. Rome Naval Radio, Italy. (Don Schimmel, VA)

16425: SSB 5-digit Spanish station, female announcer. Deep fading. From 1833 to "finale" at 1839. (J. Bedient, WI)

17975: "Skyking" coded traffic in USB at 0128. (Rodney Grussling, KS)

18666: SSB aircraft communications looking for drug smugglers at various at 1600. (Tom Lewandowski, NY) Interesting traffic here, similar to 14686 kHz. (Editor)

19013: PWZ33 Radio de Janeiro Naval, Brazil testing RY and SG in RTTY 850/66N, 0125. (P.N. Davis, IL)

22362: CW Marker, HEB, Radio Suisse, Berne at 1925. Traffic list at 1900 and 2030. (J. Bedient, WI)

22472: NMO COMSTA Honolulu, Hawaii weather broadcast in CW, 0124. (P.N. Davis, IL)

22516: DAN, Norddeich Radio, GFR, "V" marker in CW at 1700. (Tom Lewandowski, NY)

PC

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Syracuse, New York, Ham Gives Up Licenses And Pays $600 Fine

Edward L. Johnson, WA2JHU, of Syracuse, New York, paid a $600 Federal Communications Commission fine and agreed to turn in his ham licenses for a four month period.

Johnson was caught violating FCC Rules by Captain David A. Stevenson of the Onondaga County, New York, Sheriff's Department. Captain Stevenson investigated complaints from hams supplying radiocommunications at the 1983 Empire Games in Syracuse about severe interference. During the investigation Captain Stevenson tracked Johnson down electronically and caught him violating FCC Rule 97.84 (failure to identify) and FCC Rule 97.113 which prohibits hams from "broadcasting" (transmitting to whoever is listening instead of to particular stations).

Propose To Amend Parts 81 And 83 In The Maritime Radio Service

The Commission is seeking comments on its proposal to amend Part 81 of its rules concerning the identification of narrowband direct-printing (NB-DP) transmissions by Public High Seas Telegraphy Coast stations and its proposal to amend Part 83 to prohibit calling the Coast Guard for radio checks on the distress frequency, 156.8 MHz, a/k/a Channel 16.

The FCC proposed to allow public high seas telegraphy coast stations to identify using an A1 emission (telegraphy using on/off keying) on the "mark" frequency in lieu of an F1 emission (telegraphy using frequency shift keying) prior to a NB-DP transmission, provided that such use does not cause harmful interference to other stations.

The Coast Guard asked the FCC to prohibit boaters from calling it for radio checks on the VHF distress and calling frequency, because such calls cause congestion, and in some cases, cause interference to distress guards and distress communications. While it proposed to prohibit radio checks on 156.8 MHz, the Commission said the proposed new rules make exceptions for testing during installation of equipment or correcting deficiencies in the station's radiotelephone equipment.

Certain Aviation Rules Modified

The Commission modified the Aviation Services transmitter frequency tolerances of Part 87 of the rules to conform to the Final Acts of the World Administrative Radio Conference, Geneva, 1979 (WARC 79). The Final Acts of WARC 79 became effective internationally on January 1, 1982, for administrations that had ratified the treaty. The U.S. ratified it on September 6, 1983.

There are three noteworthy changes:

- WARC 79 allocated the band 136.0 to 137.0 MHz to the Aeronautical Mobile Service. Since this allocation is adjacent to a prior Aeronautical Mobile Service allocation, the FCC moved the band edge from 136 MHz to 137 MHz;
- The listing of the frequency tolerance for radionavigation stations was corrected to be compatible with equipment authorized for use by the FAA;
- The table of frequency tolerances indicating a certain frequency tolerance for "Land stations" in the band 960-1215 MHz was corrected to specify "Radionavigation stations" instead of "Land stations."

Maritime Rules Updated And Clarified

The Commission deleted an unnecessary rule in Part 81 regarding marine utility stations and clarified four rules in Part 83 concerning ship stations on large oceangoing ships.

Marine utility stations are portable, low power devices which are operated in the VHF band. They may be used either on land or aboard ships. They provide for the flexible short range communications needs of various segments of the maritime community such as harbor pilots.

When this class of station was established, the Commission required applicants to submit the antenna information and show how they coordinated with other stations. These requirements are similar to those for coast stations licensed under Part 81. However, because marine utility stations are portable and low power VHF radios with self-contained antennas, interference potential is minimal. Therefore, this requirement has been deleted.

The Commission also: discontinued the practice of reassigning the same radio callsign to documented ships, with the exception of radiotelegraph ships and ships with survival craft stations; stressed that instruments and meters used to provide a visual indication of both radiotelegraph system operations do not violate the requirement of electrical separation of main and reserve installations; clarified that a second frequency must be included in the transmitter for the purpose of emergency testing of the radiotelephone alarm system; permitted additional "off" switch to be located on the bridge of ships operating under a general exemption from the radiotelegraph requirements under which the only location for the off switch for the distress alarm was the radio room.

Commission Adopts Fourth Notice Of Inquiry On International Conference For Communication Satellites

The Commission adopted the fourth in a series of notices to develop policies and proposals for an upcoming international conference on communication satellites. The first session of the Conference known as WARC-ORB-85 will be convened in August 1985. It will consider the international arrangements by which nations obtain recognition and protection of the communication satellites that operate from an orbit in space that is located 22,500 miles above the earth, the so-called geostationary-satellite orbit (GSO). This potentially treaty-making conference is being held by the Geneva-based organization of 159 countries, the International Telecommunications Union (ITU).

The first two notices issued by the Commission dealt very broadly with the subject of the Conference. The third began to narrow the focus by explicitly establishing a few basic positions concerning the scope of the WARC-ORB-85 based on the recently agreed agenda. Since the issuance of that notice, a number of important developments have occurred. These include the filing of comments by several parties who generally supported the positions, the receipt of a First Report from the Space WARC public advisory committee, and the holding of several important international meetings and conferences.

The *Fourth Notice* narrowed the FCC's focus on specific radio services and frequency bands even further. The Commission found that only the heavily used Fixed-Satellite Service bands at 3700-4200 MHz and 5925-6425 MHz were appropriate for consideration by the Conference. The primary purpose of the *Notice*, however, was to address the central conference issue—what kind of international arrangements will allow each country to satisfy its satellite communication needs as they arise without impeding new technological and operational developments.

In addressing the subject, the Commission described a conceptual framework that could serve as a basis for international discussion of the ITU arrangements at issue. It noted that although the precise means of accomplishing the required work may differ, the general process by which nations obtain recognition and protection of satellite networks invariably requires three phases. These arrangements are described by the Commission as the "ITU arrangements for the identification, harmonization and implementation of satellite systems."

The FCC felt that such a framework would allow Conference participants great free-

dom of choice and not polarize or skew the discussions. Additionally the framework promotes a pragmatic dialogue on the complex and difficult factors that must be balanced in devising the ITU arrangements for satellite use. The three phases are:

- Proposed satellite networks are identified and announced by administrations in some agreed fashion.
- Harmonization occurs through the application of threshold criteria for identifying potential interference among networks, followed by a process of resolving any incompatibilities discovered.
- Near the time a satellite network is brought into use, the network assignment is notified to the International Frequency Registration Board whose review provides the basis for network recognition and protection.

The framework described above was used by the Commission to discuss each of the different mechanisms to accomplish the identification, harmonization, and implementation of satellite systems through the ITU. The Commission explicitly stated those options that on the basis of experience or policy present significant difficulties, as well as those which could be further pursued. Not only were preferences stated, but the underlying bases were given.

The Commission solicited comment on the three most critical WARC-ORB-85 issues:

(1) What should be the nature of the international protection afforded upon completion of the implementation phase, including the time period such protection is effective?

(2) What additional principles and criteria should be considered for detecting and resolving conflicts among satellite networks?

(3) Whether any new institutional mechanisms should be used to accomplish harmonization of satellite networks and when should those mechanisms be invoked?

The FCC indicated that the key to a productive international dialogue and satisfactory international agreements lies in maintaining a sensitivity to the concerns of all countries while recognizing the great technical and operational diversity and dynamics of the Fixed-Satellite Service.

Inquiry To Prepare For 1986 RARC

The FCC has begun an inquiry looking toward developing United States proposals for the International Telecommunications Union Region 2 Administrative Radio Conference (RARC) to plan broadcasting in the 1605-1705 kHz band in the Western Hemisphere.

At the first session, scheduled for 1986, technical criteria and planning method or methods will be developed for submission to the second session in 1988, where the plan for broadcasting use of the 1605-1705 kHz spectrum will be developed.

The conference is a result of the 1979 World Administrative Radio Conference (WARC 79) which allocated the 1605-1705 kHz band to broadcasting in the Western Hemisphere based, in part, on the U.S. proposals to that conference. The allocation permits a number of radio services to continue to operate on a primary basis until such time as decided by the Regional broadcasting planning conference. The allocation would allow some of these services to continue operation after that date, but in a lesser category of use, i.e., permitted or secondary.

The Commission said that to develop the recommended U.S. proposals for the first session of the 1605-1705 kHz RARC, several issues must be explored further regarding broadcasting in this new band, particularly since the operational environment and technical situations are different from those in the lower AM broadcasting band.

It said it needed to examine, in a band not having existing broadcasting operations, such parameters as protection ratios, class and bandwidth of emission, calculation of field strengths and curves to be used, and power limitations.

Other items to be examined include definitions, frequency tolerance, time of operation, and whether or not the new plan should attempt to give priority to the resolution of incompatibilities still outstanding in the 535-1605 kHz broadcasting band.

Specifically, the Commission asked for comments on:

- Updating the list of requirements as developed for the Rio conference taking into account recent Commission actions;
- Maximum power to be used and whether other powers should be permitted either in steps or on a sliding scale;
- Whether to model protection requirements on Class III stations on regional channels or Class IV stations on local channels, which have limited power and higher interference limits;
- Possible field strength curves for groundwave propagation in the 1605-1705 kHz band as well as skywave propagation aspects;
- How to bring new service about since existing AM receivers do not cover the new band;
- Establishment of an industry advisory committee.

Partial Relaxation Of 18 GHz Band Suspension

The Commission suspended the filing of applications for all frequencies between 17,700 MHz and 19,700 MHz (18 GHz band) because it was considering petitions to adopt a new channel plan for the 18 GHz band (Public Notice dated April 5, 1984, 49 Fed. Reg. 14,579). They announced that no additional applications would be accepted for the band until further notice, except for timely filed applications which were mutually exclusive with applications filed on or before April 5.

Several petitions seeking limited relief from the suspension have been filed with the Commission. These petitions ask for a limited modification of the suspension order to permit the Commission to continue accepting and processing applications for the point-to-point channels in the 18 GHz band. Petitioners note that there are existing point-to-point systems in this band and that 18 GHz point-to-point links represent an essential element in numerous communications systems which need to be implemented expeditiously.

The FCC has considered the petitions and agrees that a partial lifting of the band is appropriate and necessary. They recognized the public interest in allowing these licensees to expand or modify these systems when it approved the Ericsson waiver (Order [FCC 83-576] in Gen. Docket No. 79-188, released December 6, 1983). Accordingly, the suspensions will be relaxed to the extent of permitting the acceptance for filing and processing of applications for the point-to-point channels in the 18 GHz band. All such grants will be on a secondary non-interference basis to systems which may be approved pursuant to the revised channel plan under consideration for the 18 GHz band.

The suspension continues in effect for applications proposing to establish Digital Termination Systems on either a common carrier or private radio basis.

800 MHz Licensees In Detroit And Cleveland

The FCC decided to hold a lottery to select from among 82 competing applicants the licensees for Specialized Mobile Radio (SMR) 800 MHz channels in the Detroit, Michigan, and Cleveland, Ohio, areas. The Detroit and Cleveland areas were consolidated into one proceeding because spacing rules preclude co-channel grants at proposed transmitter sites which are within 70 miles of each other.

On December 15, 1983, the Commission initiated an expedited paper hearing proceeding to select licensees from among 92 competing applicants for these areas. The FCC indicated that applicants would be assigned two comparative points if they were expanding an existing, loaded, trunked system, one comparative point if they proposed to operate a new trunked system, and no comparative points if they proposed to operate a conventional system.

Of the 92 applications received, 10 were dismissed and the remaining 82 all proposed to operate new, trunked systems. (There are no existing trunked systems in Detroit or Cleveland because the channels were unavailable until now due to negotiations with Canada as to sharing the 800 MHz channels along the border. Therefore the remaining 82 applicants are tied with one point each.)

The Commission said a lottery notice would be issued shortly providing the date and procedures for the lottery. PC

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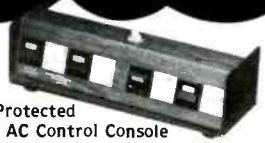

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