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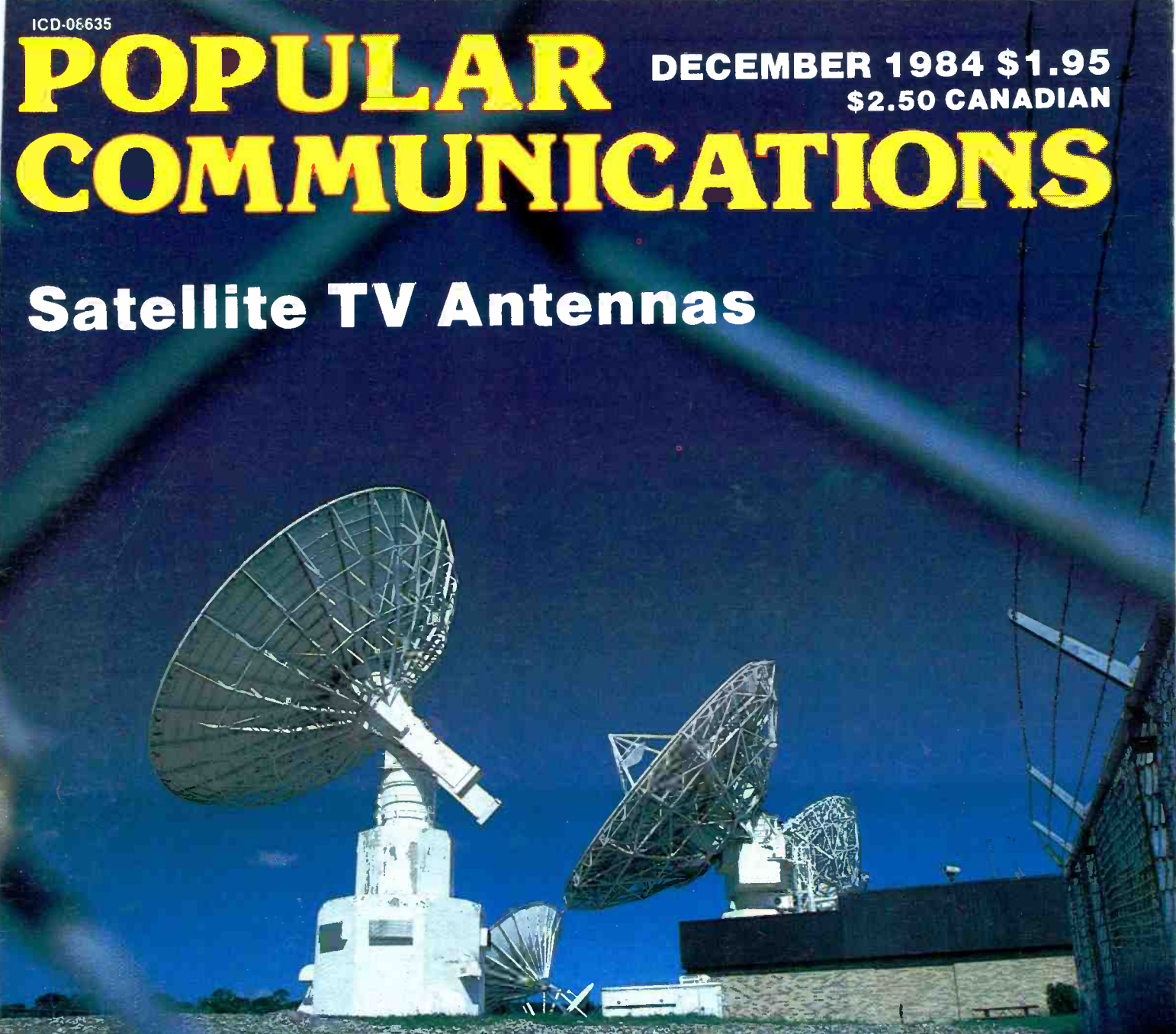
Satellite TV Antennas



- Portable Shortwave Receiver Roundup
- WUMS: Twenty Years Of Outlaw Broadcasting
- Tracking Down Mystery Radio Beacons
- Spy Radio Codes? Maybe Not So Tricky, After All!
- Taxi Radio— Overlooked And Underrated
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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).

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CIRCLE 31 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.

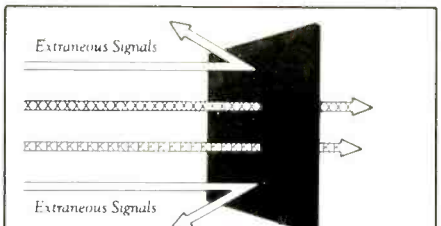
Uniden® PC22-E

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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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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CIRCLE 33 ON READER SERVICE CARD

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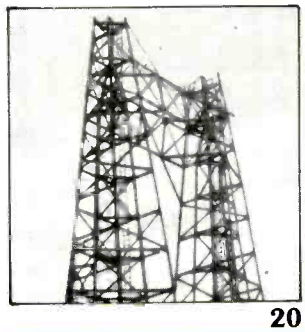
POPULAR COMMUNICATIONS

DECEMBER 1984 **VOL. 3, NO.4**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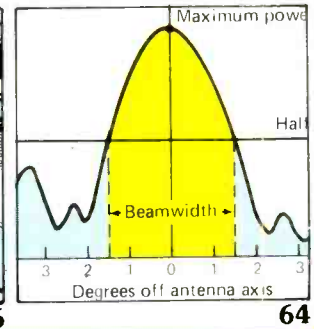

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FEATURES

This month's cover: *Photo by Larry Mulvehill, WB2ZPI. Taken atop Mt. Beacon in New York.*

DEPARTMENTS

ICOM 220MHz

IC-37A Mobile / IC-3AT Handheld

IC-37A

ICOM is proud to present modern mobile and handheld communications equipment for the 220MHz band.

The IC-37A is a full featured state-of-the-art mobile, measuring only 5½" wide by 1½" high.

25 Watts 25 watts of output power was previously unheard of in such a small package.

Selecting PL Tone

32 PL Frequencies The IC-37A comes complete with 32 PL frequencies installed. Each PL frequency is selected by turning the main tuning knob and may be stored into memory with other memory channel information for easy access. Channel numbers appear on the display which correspond to PL tones actually being generated.

Nine Memories The IC-37A has nine memories available to store receive frequency, transmit offset, offset direction and PL tone. Memories are backed up by a lithium backup battery which will store memories up to seven years.

Scanning The IC-37A scans the band or memories.

Priority Scan Priority may be either one of the dual VFO's or a memory channel.

Microphone Each IC-37A comes complete with the HM-23 microphone with a 16-button Touchtone® pad and up/down scanning buttons.

IC-3AT

The IC-3AT handheld covers 220-225MHz and features a 3 watt output. An undedicated switch is provided on the top panel for PL activation. The IC-3AT has a long reputation of durable and reliable service and comes with the widest selection of options available for any handheld on the market.

Handheld Accessories

The IC-3AT offers small size, multiple slide-on battery packs, various charging techniques and ease of portability... making it your best value for 220MHz.

Handheld Features Each ICOM handheld comes complete with a rechargeable NiCd battery, antenna, belt clip and wrist strap... All you need to get on 220MHz.

IC-3AT
220MHz Handheld
3 Watts

IC-37A
220MHz Mobile
25 Watts
Compact Size
Internal Speaker

Also Available: IC-27A and IC-27H 2 Meter Mobiles and the IC-47A 440MHz 25 Watt Mobile.

Other Handhelds Available Include: The IC-2AT, IC-02AT for 2 Meters: IC-4AT and IC-04AT for 440MHz.

ICOM
The World System

CIRCLE 77 ON READER SERVICE CARD

ICOM America, Inc., 2112-116th Ave NE, Bellevue, WA 98004 / 3331 Towerwood Drive, Suite 307, Dallas, TX 75234

All stated specifications are approximate and subject to change without notice or obligation. All ICOM radios significantly exceed FCC regulations limiting spurious emissions. 37A3AT584

BEAMING IN AN EDITORIAL

BY TOM KNEITEL, K2AES

Holiday Memories

When the holiday season comes around it often brings back memories of youth; perhaps an image of a particular gift or year which made a lasting impression, or an incident that remains in the mind as if it were a Norman Rockwell illustration on the cover of the *Saturday Evening Post*.

For me, the holidays invariably bring back the year that I first discovered "the catalog." I don't know exactly what year that was, but I suppose I was somewhere around 10 or 11 years old and had already observed the first flash of interest in radio. Somehow I got hold of a catalog from The Johnson Smith Co. of Detroit, Michigan.

I had already seen books about getting started in radio. They were good, but they never held the mystique offered by the Johnson Smith Co. catalog. It wasn't even a radio catalog. Most of it was dedicated to matters far removed from broadcasting or communications. In fact, the Johnson Smith Co. catalog was the ultimate repository for neckties that lit up in the dark and read "Oh You Kid" in luminous green letters, or where you could order a "Jumbo Surprise Package" for 10 cents. They had a dazzling jeweled cowboy belt buckle, books on mind reading, and hundreds of jokes, novelties, magic tricks, illusions, masks, shrunken heads, rings, decals, patches, trinkets, imitation diamond rings, and miniature cameras. It was a cornucopia designed to cause any kid to pick something from practically every single page. If the text didn't snag you, surely the spectacular illustrations of the delights offered would do the trick. But it was the radio gadgets that really did me in.

One page revealed a fantastic ancient-looking desk mike which promised to let you "Talk—Sing—Play Through Your Radio." The picture that went along with this showed the entire family seated in the parlor around a gigantic console receiver. Promising that it would permit me to "imitate Bob Hope or Bing Crosby" was more than I could easily ignore.

Next, they had a "Book of Radio Plans." It wasn't so much the plans themselves that got me glassy eyed, it was the illustration that went along with the ad for the book. This was a grotesque woodcut of a guy with a headset digging his paw into the gizzards of a breadboard-type receiver designed around large glass radio tubes. We are, of course, talking about the years of WWII, when such tubes really existed in receivers. Interestingly, in the late 1960's, I saw a Johnson Smith Co. catalog and they were still offering the book. I'd almost bet that it was the same edition being offered 25 years earlier with the same circuits calling for 2A7s, 80s, and maybe a 6K7 or two.

Some of the Johnson Smith catalog ads.

On the very next page they had plans for building radio controlled models. The picture showed a large wireless tower, an ocean liner, and a plane that looked like *The Spirit of St. Louis*. Each of these objects was radiating out large lightning bolts and sparks! Awesome! On the very page they had a crystal detector, cat whiskers, a 65 cent crystal radio, and an ICA lightning arrestor.

As in every catalog containing thousands of items, one single item had a very special lure. It was a receiver that was the culmination of all of my hopes, dreams, and fantasies. Every time I took the catalog out from under my pillow for its daily examination, it would fall open to the page upon which that object of desire was displayed.

No mere postage stamp-sized woodcut accompanied by a couple of sentences was adequate to describe my dream receiver. This was so formidable a piece of technology that it could be described in nothing less than half of an entire page. Not only that, it had an actual photograph of the set—and sitting next to the receiver was a kid wearing a headset. I pictured myself superimposed in this photo—arms raised in jubilation as I logged station after station across the nation. The receiver itself was called the "Philmore Crystal Radio Receiving Set," and it looked nothing at all like the other cheapie receivers in the catalog. This was a massive hunk of hardware and resembled a Mosler safe, with the big dial on the front.

"Loud, Clear and Selective," shouted the headline. "No Batteries! No Tubes! No Noise! No Distortion! No Expense to Maintain!" The text advised that "it is contained in a beautiful cabinet with a panel of modernistic design in four bright colors—gold, silver, green, and rose."

This was no piece of junk. Users were assured of being able to "hear messages broadcasted anywhere within 25 miles, or even up to 100 miles under favorable conditions." The heart of the device was described as the "tapped coil matched with a .00035 mfd. variable condenser." You just knew it had to be great because of all of those mfds.; I could hardly believe that so many could be squeezed into one condenser, no matter how variable. Amazingly, they had been able to produce such a marvel of engineering and sell it for only $9.95, including a complete antenna system (insulators and all).

On the other hand, $9.95 was—well, they might just as well have been asking 100 times that amount based upon my resources. My door-to-door *Liberty Magazine* route just wasn't going to generate that kind of cash. At that point I decided to augment my income by branching out with Miami Beach sales routes for Dr. Lynas' Hair Grower and Clover Leaf Ointment. No matter how hard I tried, it seemed that I'd never be able to put together $9.95 within any reasonable amount of time. With each passing day the receiver looked more beautiful and all the more unattainable. I began to hate that rotten kid in the photo of the radio; he no longer appeared to me to be happy about the stations he was hearing. He started looking as if he were leering and gloating because he had one of these receivers and I didn't, and probably never would.

As the holiday season approached, I took to leaving the catalog around the house where everybody could see the receiver. Maybe someone in the family would get this subtle hint. Finally, the Old Man asked if there was anything special I wanted as a gift. It was hard to believe that he was unaware of what I wanted, especially since I had managed to mention this receiver in virtually every conversation I'd had for weeks.

"Did you straighten up that mess in your room yet, Tommy?"

"Not yet. I'm still trying to figure out where to put my new Philmore Crystal Radio Receiving set when I get it!"

Since the Old Man actually asked what I wanted, I made certain that he'd have no further doubts. Proudly, I showed him the photo of the receiver. I even read him the lengthy description in the catalog. "*This* is what you want? You're not going to hear *anything* on this. I'll get you a *real* radio with glass bulbs and a horn, one that works on electricity."

(Continued on page 74)

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.

Favorably Compared

I've been an SWL since 1936. Have been reading your magazine since its inception and have not been disappointed with a single issue. I really look forward to each month's issue; in a way it reminds me of the old Gernsback publication *Short Wave Craft*. I wouldn't be surprised if *POP'COMM* has the same effect on the younger generation as *Short Wave Craft* had on me. Congratulations on a fine magazine.

Jack M. Janicke, K2JFJ
Butler, NJ

Thanks for the kind words, OM. We're flattered at being favorably compared with Gernsback's pioneering magazine, Short Wave Craft; *Hugo Gernsback was one of the first publishing pioneers to attempt to bring DXing into national view as a serious hobby through that magazine. It remains a true classic. —Editor*

Pick A Picture

In the October issue of *POP'COMM* you ran a great story entitled "Radio History via Picture Postcards." In the following issue you ran another story by the same author, Alice Brannigan. While there weren't any postcards, you did run a photo of the author. You're on the right track. Now let's have some additional photos of the author along with more of those postcards. By the way, Tom, I saw a photo of you on the back cover of the new *Confidential Frequency List*. If anybody ever suggests that you take up modeling, don't!

(name withheld by request)
Stone Mountain, GA

In this issue there are additional golden era radio postcards and, in another story, a photo of Alice Brannigan. As for myself, modeling has been suggested. The office therapist tells me that as soon as I finish my fingerpainting project I can begin modeling (with clay). —Editor

Mid-Range Antenna

The story you ran in the October issue on "Top Band" (1600 to 1800 kHz) monitoring provided me with the inspiration to listen in on those frequencies. My problem is that I'd like to put up a proper antenna but am limited because of space. How about some suggestions for limited space antennas on these mid-range frequencies lying between the broadcast band and shortwave.

Raoul Levesque
Lawrence, MA

For receiving purposes, a wire stretched out as long as you can get out your window should do a pretty good job. Don't forget that you don't have to keep a longwire receiving antenna straight—it can be zigzagged in limited-space areas. Here's another suggestion. A couple of years ago the old 2 MHz marine communications band was eclipsed by the VHF FM marine band. Some dealers in marine communications equipment have new/used 2 MHz antennas for shipboard use still in stock or in the warehouse and, at this point, you might be able to pick one up at a really good price. Last year a friend of mine asked a dealer in Washington about the price of a used antenna and the dealer gave it to him free, saying that it had been kicking around "for years" and he'd probably never be able to sell it. These antennas are long (about 15 feet), rigid metal poles with loading coils in the center and are intended for vertical mounting. Although designed for operation between 2.1 and 2.7 MHz, these antennas receive quite well between 1.6 and 3 MHz. —Editor

Futile Search

I am working on the restoration and SSB conversion of a piece of WWII military surplus communications equipment known as the ART-13 transmitter. Almost everybody I've spoken to tells me that I'll definitely need a copy of your *Surplus Conversion Manual* in order to get this conversion off the ground, except that even a major surplus dealer like Fair Radio Sales says they've long been out of copies of the book. Please advise where this book is sold. Help!

Paul DiFrancisco
St. Louis, MO

Paul, it looks like you and a lot of other folks have been searching for copies of that book. I receive several requests a month similar to yours and I've even seen a classified ad in another magazine from someone offering to pay a pretty high price for a copy. Unfortunately, the book has been out of print for a number of years and the only hope you have of finding one might be in used condition at a ham swap meet or flea market. That's where I picked up the only copy I have. There is little chance it will ever be reprinted even though it seems to have become the standard reference source to working on more than 100 vintage military transmitters and receivers. —Editor

Armchair Insurgents, Unite!

In many issues of *POP'COMM* you've run features relating to two-way communications and also clandestine broadcasts from rebel, guerrilla, and insurgent groups around the world. Frankly, this coverage has peaked my interest in such groups and their activities. It does appear that at least some of these groups are fighting for a noble cause. Is there a way one can sign up as a member of such a group and actually join in their activities?

(name withheld by request)
Worden, AR

They used to suggest joining the French Foreign Legion when someone decided that it might be exciting to lead a macho lifestyle. Today, it seems to me, that you could simply join the U.S. Marine Corps and they'd find something to satisfy your wanderlust and need for action. Foreign insurgent activities are best left to those directly involved in the political problems in the various nations and not to armchair soldiers looking for more of the action than they can get by monitoring the shortwave bands. You can, however, sponsor a real anti-Communist guerrilla fighter for $10 per month for four months. This offer is being made by the KPNLF (Khmer People's National Liberation Front), whose 12,000 troops are fighting Vietnamese occupation forces in Cambodia. This donation will buy one KPNLF fighter a pair of boots, two uniforms, a knapsack, a cotton scarf, two pairs of socks, and a hammock (the donation does not buy any weapons). The KPNLF is led by former Cambodian Prime Minister Son Sann and is one of three groups making up the UN-recognized Coalition Government of Democratic Kampuchea. In return, donors will receive a letter of thanks and a photo of the KPNLF fighter posing with the personal gear the donation has purchased. KPNLF asks potential sponsors to contact them at P.O. 22-25, Ramintra Post Office, Bangkok 10220, Thailand. The KPNLF is reported to be constructing a medium wave clandestine broadcasting station to be known as The Voice of The Kampuchean People. —Editor

Dornier Do. X

The story on the Dornier Do. X flying boat which ran in the September issue was superb. The same week my *POP'COMM* arrived in the mail I received a QSL card from station DFØDOX which is operated by the Dornier Radio Club in Friedrichshafen, West Germany. Your fascinating story on the famed 1929 flying boat makes my QSL from DFØDOX all the more valuable and meaningful to me. Thanks for stories like this in your magazine.

"Red" Morgan
Paris, TX

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POPCOMM

Portable Shortwave Receiver Roundup

They're Little, Lightweight, And Listeners Love 'Em!

BY KEN WICKLIFFE

Small, portable shortwave receivers have been coming up in the world lately. Once thought suitable only for casual listeners, portables are now frequently purchased by serious shortwavers as supplements to the home gear. And shortwave portables are perfect for those who want a simple, relatively inexpensive introduction to international listening.

But the same technology that has produced excellent small receivers has made the task of selecting one very difficult. Digital tuning, quartz-synthesis, memory station presets, and automatic scanning are only a few of the features that many radios offer. Any many buyers make the mistake of trying to find the "best" receiver. In the huge field of shortwave portables, there is no overall best. Viewed this way, buying a portable shortwave radio is a bit like buying a home computer—the one you select depends on your intended usage. The radio that's perfect for international DXing may be unsuited for radioteletype (RTTY) monitoring.

The first distinction to be made concerns size. Today's portables fall roughly into two groups: pocket and portable. Pocket models are a bit optimistically-named, as most are too bulky to fit into any but the largest pocket. Still, their small size, usually about the same as a small paperback book, makes them suitable for travel and listening on the go. Sony's ICF-2002 is a pocket portable, as is Sharp's FV-610.

Table 1: Shortwave Meter Bands

The band coverages of individual radios will differ slightly from these norms.

MegaHertz	Meter Band
2.3 - 2.495	120m
3.2 - 3.4	90m
3.9 - 4.0	75m
4.75 - 5.06	60m
5.95 - 6.2	49m
7.1 - 7.3	41m
9.5 - 9.775	31m
11.7 - 11.975	25m
15.1 - 15.45	19m
17.7 - 17.9	16m
21.45 - 21.75	13m
25.6 - 26.1	11m

Portable receivers, by contrast, come in a wider range of sizes and degrees of portability. Often, though, manufacturers define portable rather loosely as any receiver that has a handle and can be operated on batteries. Though determined listeners can, indeed, use a large "portable" in the field, a practical weight limit for true portables is about 5 kilograms (11 pounds). Radios much heavier than this may be a bit too inconvenient to carry about and will probably spend most of their time at home.

Though advanced features are available on both pocket and portable receivers, the larger portable models still have an edge, in most cases, in all-out reception ability. Most pocket receivers have shorter whip antennas than their portable counterparts, which limits signal capture. So the choice between pocket and portable is a trade-off. Pocket offers the greater convenience, while portables give slightly better reception.

Whether pocket or portable, one of the most important concerns on any receiver is the tuning system. The three main types available today are analog, digital, and quartz-digital.

Analog tuning systems are the oldest and most familiar to shortwave listeners. Analog tuning employs a conventional tuning dial and frequency scale, making the system similar in appearance to ordinary AM/FM portables. Advantages to analog are low cost, simple operation, and good band-scanning capabilities. The only pitfall to analog is its lack of preciseness—finding exactly what frequency you're at is often difficult.

A fairly recent variation on the analog theme is the "direct-readout" system. Briefly, this makes analog tuning more precise by letting the listener "recalibrate" the dial once a signal is tuned. Since direct-readout portables employ a very finely marked tuning dial, it's possible for a direct-readout radio to be nearly as accurate as a digital model. Direct-readout is not very common, however, and it takes some skill to use the system properly. Panasonic's RF-2200 is a direct-readout analog portable.

The Yaesu FRG-7700 is a full-coverage receiver.

A PLL synthesized circuit is a feature of the Realistic DX-400.

Digital tuning of the non-quartz variety is often added to receivers as a supplement to a conventional analog dial. This gives the listener analog's advantages while adding some of the exactness of digital. These digital systems are not always completely accurate, however, and some are difficult to tune accurately. On balance, however, digital receivers are valuable since they combine the virtues of analog and digital systems.

Quartz Digital is the most advanced tuning system, and most of the new portable and pocket receivers use it. With quartz-synthesized tuning, correct frequency readouts are assured since a quartz crystal inside the radio is used to generate the tuned frequency. Quartz systems are also advantageous because they can eliminate the conventional tuning dial, allowing convenient features like automatic scanning, direct frequency entry, etc. Listeners accustomed to a traditional tuning dial, however, can get a quartz receiver with a dial. Sony's ICF-2002 is a quartz-synthesized digital, as is Radio Shack's DX-400.

Conventional logic may suggest that more advanced listeners would benefit from the more advanced tuning systems, but this is only partially true. For instance, someone familiar with shortwave radios would have no problem using analog tuning successfully. A new listener, however, may find the analog system frustrating because of the difficulty the system presents when looking for individual signals. Conversely, seasoned shortwavers may dislike the absence of a tuning dial on a quartz radio, while a new listener may not mind this omission at all.

Aside from prior shortwave experience, the intended use of the receiver is important in selecting the correct tuning system. Quartz-synthesized tuning is quite helpful for finding specific international broadcasts, especially if the receiver allows the frequency to be entered through a keypad. To find the desired signal, the user has only to punch or dial in the correct numbers. But "direct-entry" can be a problem if the intended use includes listening to ham, RTTY, or other non-broadcast communications. These signals often occur on unpublished, often changing frequencies, so finding them with a direct-entry keypad would be frustrating.

Fortunately, then, it's possible to buy a receiver that incorporates "the best of both worlds" with respect to tuning. For example, some receivers have *both* direct-entry (via keypad) and a tuning dial to permit scanning for signals. And practically all simple digital models have both a conventional tuning scale to allow easy scanning and a digital display for preciseness. By combining these features carefully, manufacturers have developed a variety of different radios that can serve a wide range of needs.

A final consideration when looking at tuning is whether or not the receiver has a BFO (Beat Frequency Oscillator) switch. With BFO, it is possible to receive single-sideband signals clearly. Since most ham and "utility" voice mode communications are single-sideband, those who intend to listen to these signals should not consider a radio without BFO. The other side of the coin, of course, is that nearly all international broadcasts are in regular AM (no BFO needed), so those who intend to listen only to these signals needn't worry about the BFO feature.

After tuning, perhaps next in importance is band coverage. Generally speaking, the smaller the radio, the less likely it is to have complete shortwave band coverage. This is not usually a major disadvantage, though, since few shortwave broadcast listeners need a radio that will tune the whole shortwave spectrum from 1.6 to 30 MHz.

Most small portables are set up to tune the major international broadcasting bands. These are commonly referred to as the meter bands, and the most often used ones are 49m, 41m, 31m, 25m, 19m, 16m, and 13m. If the portable you are considering includes these seven meter bands, you can be reasonably certain that you'll have access to all of the major international broadcasting activities. That includes such signals as BBC, VOA, Radio Sweden, Radio Moscow, Radio Peking, etc. A radio with these bands will also be able to receive some ham and utility stations, provided it can receive

Table 2: Pocket-Sized Receivers

	Tuning System	AM	FM	LW	Shortwave Coverage
Kenwood					
R-11	Analog	X	X		13m, 16m, 19m, 22m, 25m, 31m, 41m, 49m, 60m, 75m, 90m, 120m
Panasonic					
RF-9	Analog	X	X		13m, 16m, 19m, 25m, 31m, 41m, 49m, 60m, 75m
RF-B50	Analog	X	X		13m, 16m, 19m, 25m, 31m, 41m, 49m, 60m, 75m, 90m, 120m
Sharp					
FV-310 GB	Analog	X	X		13m, 16m, 19m, 25m, 31m, 41m, 49m
FV-610 GB	Digital	X	X		13m, 16m, 19m, 25m, 31m, 41m, 49m
Sony					
ICR-4800	Analog	X			16m, 19m, 25m, 31m, 49m
ICF-7600A	Analog	X	X		13m, 16m, 19m, 25m, 31m, 41m, 49m
ICF-2002	Quartz Digital	X	X	X	Full (1.6 - 30 MHz)

The "X" marks under AM, FM, and LW (longwave) indicate that the radio does have that feature. The lack of an "X" means the feature is absent.

The Sony ICF-6800W is fully portable with its own whip antenna and offers a number of base station features.

The Kenwood R-1000 is transportable via its carrying handle.

Table 3: Portable Receivers

	Tuning System	AM	FM	LW	Shortwave Coverage
General Electric					
World Monitor	Digital	X	X		Full (3.5-31 MHz)
ICOM					
R-71A	Digital/Direct	X	X	X	Full(150 kHz-30 MHz)
Kenwood					
R-2000	Digital/Direct	X	X	X	Full (150 kHz-30 MHz)
R-1000	Digital	X		X	Full (200 kHz-30 MHz)
R-600	Digital	X		X	Full (150 kHz-30 MHz)
Panasonic					
RF-2200	Analog	X	X		Full (3.9-28 MHz)
RF-799	Quartz Digital	X	X	X	Full (1.6-30 MHz)
RF-3100	Quartz Digital	X	X		Full (1.6-30 MHz)
Radio Shack					
DX-360	Analog	X	X	X	13m, 16m, 19m, 25m, 31m, 41m, 49m, 60m
DX-400	Quartz Digital	X	X	X	Full (1.6-30 MHz)
Sony					
ICF-6500	Digital	X	X		Full (3.9-28 MHz)
ICF-6800	Quartz Digital	X	X		Full (1.6-30 MHz)
Uniden/Bearcat					
CR-2021	Quartz Digital	X	X	X	Full (1.6-30 MHz)
DX-1000	Quartz Digital	X	X	X	Full (1.6-30 MHz)
Yaesu					
FRG-7700	Digital	X	X	X	Full (150 kHz-30 MHz)

SSB. But the primary purpose of these bands is for high power, international broadcasting, and that's why small portables incorporate them.

If your taste is toward the more obscure signals, then consider a full coverage receiver. A true full-coverage model will tune all the way from 1.6 to 30 MHz, but many go from around 3 to 30 MHz, since there is limited activity between 1.6 and 3 MHz. Nearly all quartz-synthesized receivers offer full coverage, and may also include longwave. Though the whip antenna on a portable is unlikely to be very compatible with the very low frequencies of longwave, longwave capability is valuable if you intend to use the radio at home connected to an external antenna some of the time. So, full-coverage definitely offers the most flexibility, but it's also the most costly.

When selecting the bands you'll need and frequencies you want covered, it's important to be realistic about the radio's capabilities. Most small portables are intended to receive only fairly strong international broadcasts and, regardless of band coverage, they're unlikely to pull in obscure single-sideband signals. Listeners who want to DX for hard to receive signals need a full-sized receiver along with a good antenna.

The technological advancements that make quartz-synthesis and digital receivers possible also allow a wide variety of special features to be incorporated into radios. Many different trade names exist to describe these features, but these are the general functions and benefits of each type of feature:

Automatic Scanning is often found on quartz-synthesized radios as a substitute for a tuning dial. To use the scanning system, you just push a button and the radio scans up and down the dial, stopping for a few seconds at each signal. If you like what you hear, you can hit the stop button to hold the signal and stop the scanning. This feature is usually quite helpful, but many scanners require a fairly strong signal to be activated, so automatic scanning will miss some of the weaker but listenable signals.

Direct Entry is perhaps the biggest coup of the quartz receivers. With the system, the receiver has a keypad resembling that of a pushbutton telephone. To listen to a frequency, just punch it in. This is a very fast, convenient way to find desired broadcasts, but it makes scanning up and down the dial awkward unless manual scanning (or a tuning dial) is provided.

Manual Scanning, as mentioned, is a partner to the direct entry tuning system, since it allows you to go up or down the frequencies without punching in a new number each time you want to retune. To manually scan, hold down either of two buttons—one to scan up, and the other to scan down.

Clocks/Timers/Sleep Shutoffs have obvious benefits in terms of convenience, since they allow the receiver to be used as a clock radio. This is beneficial for travel. The sleep shutoff is helpful if you like to fall asleep to the radio, since it conserves batteries.

Memory Presets are another innovation of quartz digital. The system allows you to store in memories the frequencies you most often listen to for recall at the push of one button. This is obviously helpful if you like to listen to the broadcasts of certain countries, for instance, each day. Memories are also a convenient feature if the radio will often be used in the dark.

Tone Control, though a seemingly frivolous addition to a shortwave receiver, can increase listening enjoyment by allowing you to change the tone of the sound to suit room conditions, type of broadcast, etc. Separate bass and treble controls are offered on a few receivers, and these are even better than a simple tone control.

FM Band Coverage is a common feature on shortwave radios, but a few don't have it. It's helpful to have FM, since your shortwave may be the only radio you want to bring when traveling.

While shortwave listening is still largely a home-based hobby, today's portable and pocket-sized receivers are doing a lot to mobilize it and broaden its appeal. Most North Americans still think of radio in terms of the traditional AM and FM bands, but less expensive and more "user-friendly" shortwave equipment threatens the dominance of those two bands. Perhaps, one day, your local station will be competing with stations across the globe as well as those across town!

The ICOM R71A features keyboard entry, which permits precise frequency selection.

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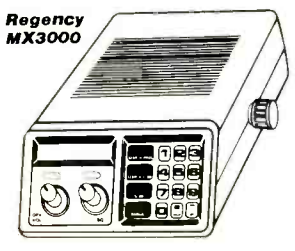

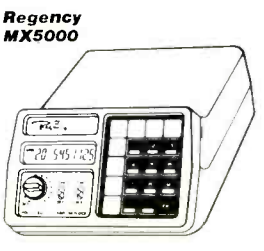

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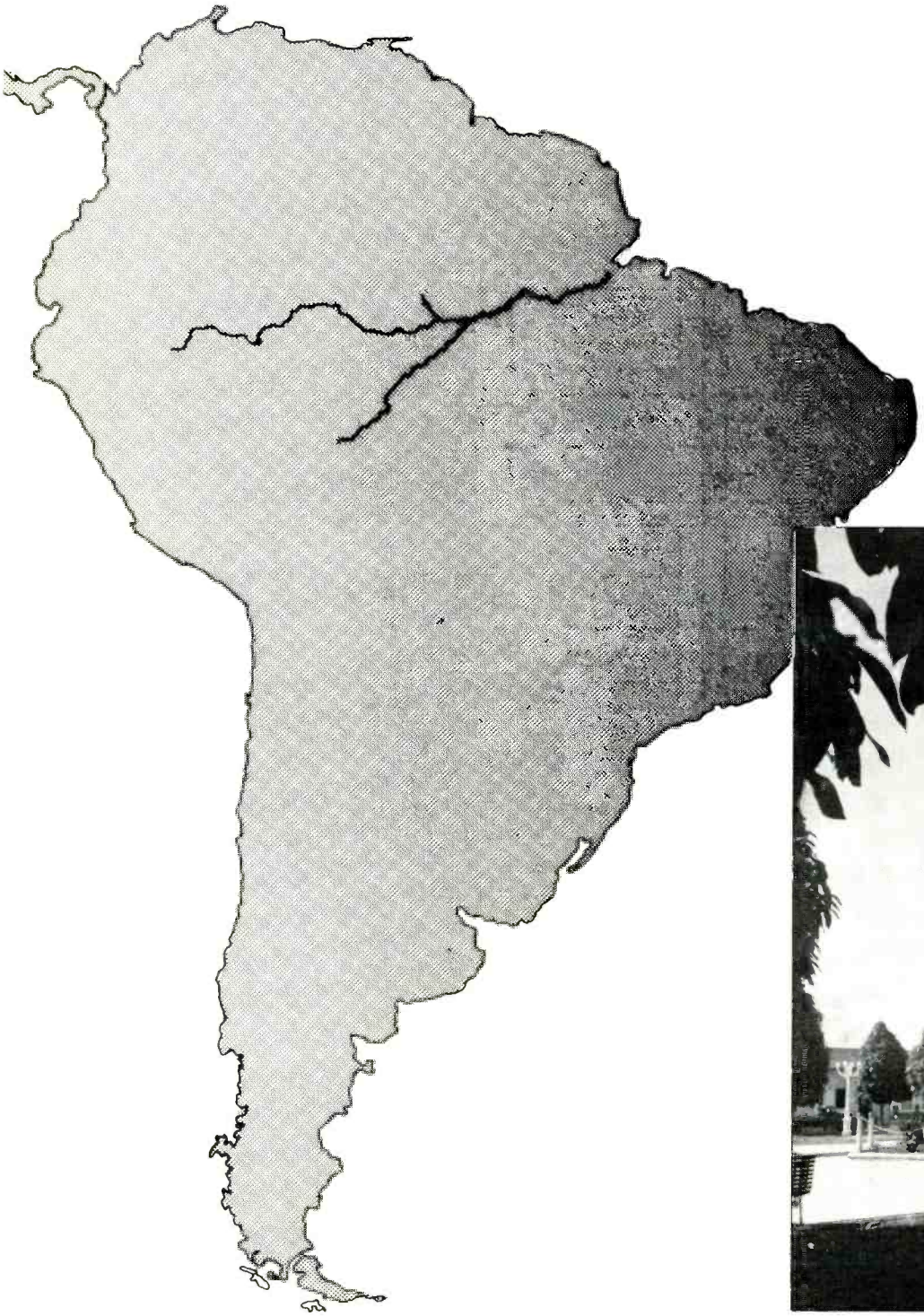


If there is a "Who's Who of the World's Waterways," the Amazon has to occupy a fistful of pages. This river of superlatives flows through some 4,000 miles of rapids, jungle, and mountains. It and its tributaries flow through six countries—Venezuela, Colombia, Ecuador, Peru, Bolivia and, of course, Brazil—all are touched, one way or another, by this giant river.

It begins, 17,000 feet high in the Peruvian Andes, as drops of melting snow, feeding a pool on Mount Huagra, about 130 miles south of the Inca capital of Cuzco. It ends, some 4,000 miles away, on the Atlantic Ocean coast of Brazil. You can catch it in your hand at its source. It takes three days on a ferry to cross its 200 mile wide mouth. It dispenses about one/fifth of all the fresh water discharged by all the rivers into all the seas of the world. That water flows past dozens of islands in the river's mouth, including one almost the size of Switzerland.

In between, there are some 50,000 miles of navigable waterways, 1,100 major tributaries feeding the Amazon's giant thirst.

The miniscule beginning on Mount Huagua feeds into a small stream the Indians call the Huaraco and tumbles its way down the mountain to join a slightly larger stream, the Toro, which in turn becomes the Santiago River.

The Santiago then becomes the Apurimac (Great Speaker), so named by the Indians

The Plaza de Armas in Iquitos, Peru.

because of the roar of its many rapids. On it travels, becoming the Ene, the Tambo, and the Ucayali and, finally, the Amazon.

A few adventurers have tried to tame the Amazon, at least by navigating it themselves. Some have lived to tell their tale. Many more have failed. Some have lost their lives in the effort. If not the heat, then the cold; if not the cold, then the rapids; if not the rapids, then the wildlife; if not the wildlife, then the jungle itself, or disease or exhaustion. The Amazon knows many tricks with which to waylay and defeat all but the most determined and well-prepared.

The armchair adventurer can read of such exploits. The armchair adventurer who is also a shortwave listener can take the trip with considerably more ease and decidedly less expense and danger. But the dial twiddler, too, will find following the Amazon's trail frought with frustration because many of the shortwave stations along the banks hide under interference, like some beast blending into the jungle foliage, unseen except by the most practiced of eyes.

The same challenge the Amazon presents to the real life traveler, it presents to the shortwave listener. In fact, one might very well travel the Amazon from source to mouth and do it much faster than the SWL could hear all the shortwave stations along the way.

So let's start at the source, or as near to it as we can, and follow this great river all the way. Get your shots, grab your mosquito netting and let's go.

Our first chance at an Amazon logging doesn't come until we are already battling the Apurimac rapids. It's at the small town of San Francisco in the province of Ayacucho in Peru. There's a relatively unknown station on the air here—Radio San Francisco, first heard by a monitor on Peru a few years ago on 3.910 and largely discounted by North American DXers at the time. The DXer was later proved correct. Radio San Francisco was one of the first bangs in what was later to become an explosion of new Peruvian outlets on the air. The station now operates on a variable frequency of 5.301 MegaHertz, running to around 0300 or 0330 GMT. Broadcasting, however, seems to be of a rather sporadic nature. Worse yet, the station's frequency is almost always QRM'd by a strong utility outlet. As far as we know it hasn't yet been heard in the U.S. If you can catch the utility off the air on an evening of exceptionally good conditions for Peruvian reception, it may yet be heard.

The next port of call is Pucallpa, on the Ucayali River. It's a rough-hewn town of some 60,000 and growing thanks to sawmills, oil refining, paper manufacturing, and timber. It can be considered a boomtown in fact, but probably not someplace you'd want to linger for very long.

There are two shortwave stations in Pucallpa, and neither of them are easy catches. OAX8Q, Radio Pucallpa, has been heard occasionally on 6.155 variable with its 1,000 watts (although verifications from the station indicate the actual power is half that). The station has been on the air for nearly 25 years. Programming relies on tropical music. Check for it around its 1000 sign on.

Higher up on the dial is Radio Sideral on 9.755. OAX8W, which has periods of inactivity, also uses the slogan "Radio Programas." Sign on is just prior to 1000 GMT and sign off usually occurs at 0400.

From Pucallpa we take the steamer up the Ucayali to Iquitos, a jungle city on the Amazon's west bank. Iquitos is the world's furthest inland port, accessible only by river or air. In the early 1900's, Iquitos was the center of Peruvian rubber production. Those were days of high living—high fashion, imported French champagne, great balls, and other gala events. Rubber barons made instant fortunes and wasted no time or effort to spend them. Iquitos today is a hodgepodge of internationalities. It serves as a financial center for the Peruvian Amazon area, is a base for oil exploration, supplies tropical fish for aquariums, squirrel monkeys for medical research, and helps stock the world's zoos.

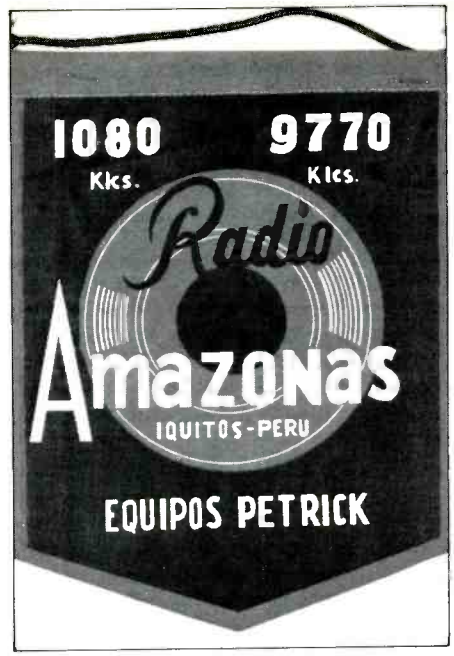
There are several shortwavers operating from Iquitos. One of the easiest to log is Radio Atlantida on 4.790. This 5 kilowatt outlet has long used this channel and can often be very well received. Watch out for Sistema Radioemisora Atalaya in Ecuador which is active on the same frequency at times. Atlantida operates until 0500 and signs on at 0900. On Sundays the schedule starts an hour later and ends an hour earlier. If Atalaya is absent, Atlantida should be clearly heard.

Higher up on the challenge chart is La Voz de la Selva on 4.825, which has undergone a couple of switch-back name changes over the years. Sign on is at 1000, sign off 0500. Power is listed at 10 kilowatts but, if that's true, the station doesn't do as well as it should. The station's reputation for replying to listener's reception reports is something less than wonderful.

The frequency 5.050 is one you may have to spend a lot of time on in order to hear Radio Loreto. It will show up for a few days or few weeks and then simply disappear for months or years. At present, it's been some time since there were many logs of this station. OAX8E is supposed to use 1 kilowatt.

To assuage frustration of trying for Radio Loreto, you can move up 10 kiloHertz and have a go at Radio Amazonas on 5.060. This one operates a less-often heard outlet on 9.770 as well. Sign of time is highly variable, like hours. It may be anywhere from 0230 to as late as 0500. The stations plays a lot of music from Colombia and Venezuela. You may also find the transmitter drifting up to 5.062 or even 5.063.

Another Iquitos outlet that's fairly easy to hear is Radio Eco, OAX8V, on the "out of band" frequency of 5.112 MHz. Radio Eco's 1 kilowatt transmitter is scheduled to run until 0600. Use of 5.112 may be the result of a transmitter fault or the crystal they use may have been as close as they could get to their assigned frequency of 5.010.



Radio Amazonas at Iquitos is more often heard on 5.060 variable.

The Peruvian government network of Radio Nacional stations supposedly has a couple of outlets at Iquitos, but they have not been active for some years. Frequencies are 6.028 and 9.610 in case you want to check.

Our excursion has to take us past Colombia's only populated encounter with the Amazon, at Leticia, for unfortunately there is no shortwave target here and it's still a thousand miles to Manaus. At least we are practically in Brazil.

Brazil's port of entry along the Amazon is Benjamin Constant, right across the river from Leticia. That crossing is a two hour trip by this point. There's an easily heard Radio Nacional outlet here—Radio Nacional de Tabatinga on 4.815 using 10 kilowatts. One has to take a ferry from Leticia or Tabatinga even to get to the city. The Radio Nacional station is one of several the Brazilian government has spotted around the country. It is not a good verifier, claiming a lack of staff available to answer reports. Try local evenings or early mornings, local time, around 0900 GMT.

At Tefe, center of the Brazil Nut Industry, unusual orchids and a hub of the area's fishing industry, one can shoot for Radio Educadora Rural, ZYF271, listed for 3.385 but seldom reported. There's no current schedule information but the sign off may be very early, something like 0100 GMT.

Another Educadora Rural is found at Coari, further down the river. Although listed for 5.035, it was last reported still using its longtime frequency of 2.490, although a move to the 60 meter band channel is probably planned. Wait for a good 120 meter band opening and then try it around local sunset.

Historic Manaus was the center of Brazil's great rubber boom back in the early 1900's. Well known for its great opera house (the

Amazon Log

2.340	Radiodifussora Itacoatiara, Itacoatiara
2.400	Radio Educadora Sao Jose, Macapa
2.490	Radio Educadora Rural, Coari
3.335	Radio Liberal, Belem
3.385	Radio Educadora Rural, Tefe
4.765	Radio Educadora Rural, Santarem
4.790	Radio Atlantida, Iquitos
4.805	Radiodifussora Amazonas, Manaus
4.815	Radio Nacional Tabatinga, Benjamin Constant
4.825	La Voz de la Selva, Iquitos
4.845	Radio Nacional, Manaus
4.885	Radio Clube do Para, Belem
4.915	Radio Nacional, Macapa
4.935	Radio Jornal, Manaus*
4.955	Radio Marajoara, Belem*
4.965	Radio Alvorada, Parintins
5.045	Radio Cultura do Para, Para
5.050	Radio Loreto, Iquitos
5.060v	Radio Amazonas, Iquitos
5.112	Radio Eco, Iquitos
5.301v	Radio San Francisco, San Francisco
6.155v	Radio Pucallpa, Pucallpa
9.695	Radio Rio Mar, Manaus
9.755	Radio Sideral, Iquitos
9.770	Radio Amazonas, Iquitos

* = status in doubt

A decal from Radio Alvorada de Parintins, 4.965 MHz.

Teatro Amazonas), which was built in 1910 at a cost of $2 million, international stars were brought in at fabulous salaries to perform for the rubber barons. The Manaus customs house and lighthouse were originally English but were dismantled, shipped to Manaus, and then rebuilt. The Manaus docks float so they can move up and down as the Amazon rises and falls over a 40-foot span through the seasons.

So wealthy were the men who made fortunes in rubber that they shipped their laundry to London rather than do it themselves. It was not to last, however. An infiltrator made off with seeds of rubber trees, planted them in Asia, and soon the price of rubber collapsed. The golden age of Manaus ended, practically overnight.

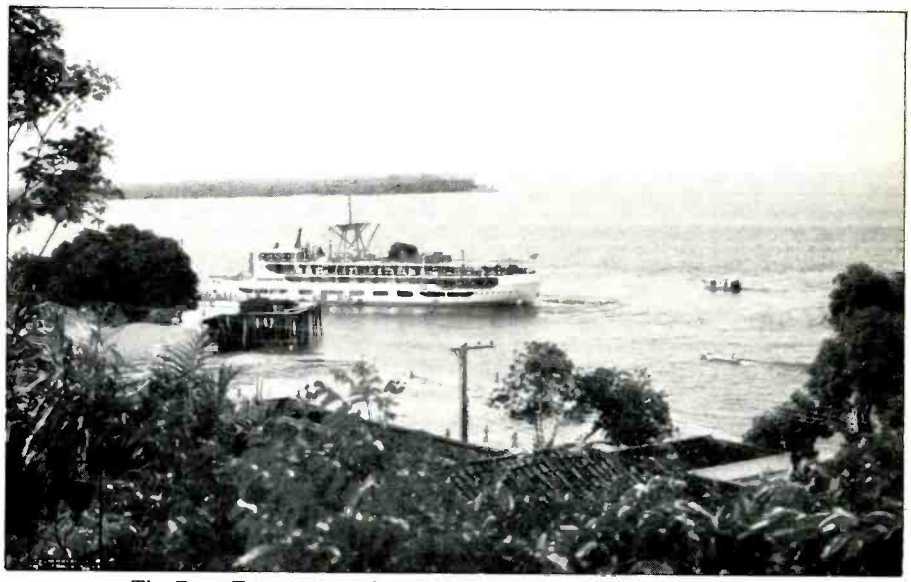
In 1967, Manaus was made a free port and has again risen to achieve some of its former splendor. The great opera house has been restored to its former elegance.

Manaus claims several stations on shortwave. Try 4.805 for Radiodifusoras Amazonas. Their 5 kilowatt transmitter operates daily until 0300 and can occasionally be heard despite or instead of the usual interference from utilities on this channel.

There's another Radio Nacional outlet in Manaus, on 4.845, listed at a whopping 250 kilowatts. It puts in a usually reliable signal evenings and early mornings.

The frequency 4.895 is occupied by Radio Bare. Try the listed 0830 sign on time. Sign off is early, around 0130. Early mornings U.S. time will probably present the best opportunity to hear this one.

Frequency 4.935 is a Brazilian junkyard. There have been a half-dozen or so stations announced as being active on this frequency or variously reported here in recent years, including a Radio Jornal in Manaus. If the station really does exist it has not been heard, at least as far as we know.



The River Tapajos joins the Amazon River at Santarem, Brazil.

One of the few higher frequency Amazon outlets is Radio Rio Mar on 9.695. Sign off occurs in the afternoon, U.S. time, so early mornings will provide the best chance at bagging this one, especially right around 0900 sign on. "Rio Mar," incidentally, was the name given to the Amazon by Francisco de Orellana, one of the Spanish conquistadors who sighted the river in 1592 and was one of the first Europeans to explore it. The name, which means "River Sea," never seemed to catch on.

Further down the river is Itacoatiara, home of a small and seldom heard station, Radiodifusora Itacoatiara, operating with 1 kilowatt on another of those tough 120 meter band channels—2.340 MHz. The schedule runs from 1000 to 0100 and you'll need good 120 meter band conditions to hear this one. Order up an ionospheric storm.

Next stop—Parintins, and the occasionally reported Radio Alvorada de Parintins with 5 kilowatts on 4.965. Parintins is on the Amazon's south shore, just before the river leaves Amazonas State to swing north into Para State. Again, this is likely to be an early morning tune since evening sign off comes at 0100. Try sign on at 0900.

On now to Santarem, a city that was settled by Confederate veterans of the American Civil War and where Confederate flags still whip in the breeze. Santarem is experiencing a boom now, thanks to the discovery of gold. Radio Emissora Rural at Santarem was once a pretty easy catch with its 10 kilowatts on 4.765. If you tune the tropical bands much at all you'll know why it's not so easily heard today. The Cuban "Mayak" station blasts away for much of the time on this frequency. Still, try for the 0700 sign on;

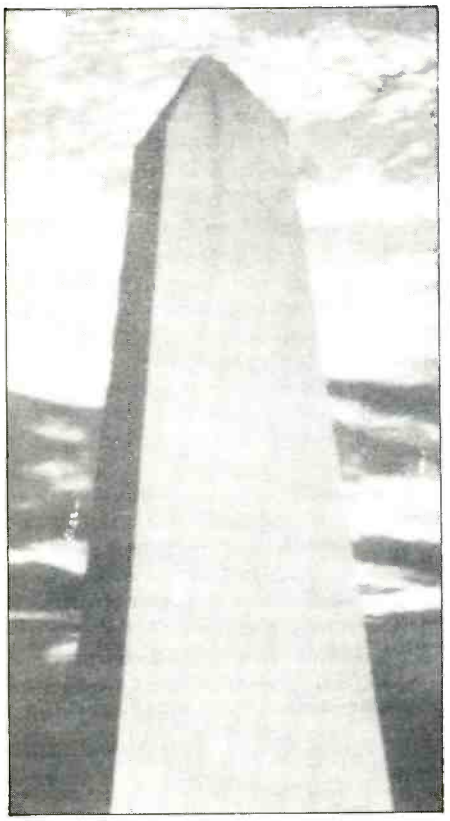
A view of the Amazon near Macapa.

you might catch it during a Mayak silent period. Broadcasts run until 0400 daily. With some concentrated listening it may be possible to hear Emissora Rural underneath the Cuban if Brazilian conditions are good.

Finally, we arrive at the mouth of the Amazon with the city of Macapa along the north channel and Belem on the southern channel.

Macapa, the capital of Amapa State (an area as large as France), sits right on the equator and is a center for agriculture, gold, and manganese. There's more than one water buffalo to be seen, too.

Macapa offers up Radio Educadora Sao Jose on 2.400, operating from 0830 to 0200. Again, with a 120 meter band frequency, unusual conditions are required, along with careful tuning before you can bag this one.



The equator runs through Macapa and is marked by this obelisk.

Radio Bare, from Belem, issued this small pennant several years ago.

More easily heard is another Radio Nacional outlet, this one on 4.915 using 10 kilowatts. Check evenings or early mornings around 0900.

Belem, largest city on the Amazon, is a great, modern metropolis exporting rubber, Brazil Nuts, jute, rice, hardwood, and such. It's a three day trip on the ferry across the channel to Macapa—that's how big that little trickle of snow in the Andes has become!

Shortwave from Belem includes the seldom reported Radio Liberal (buried as it often is under utility interference on 3.335 MHz). Its 5 kilowatts are seldom sufficient to punch through the noise, but with lots of persistence, it can be heard. It's supposedly a 24-hour-a-day operation.

Radio Clube do Para on 4.885 is occasionally logged at its 0800 sign on or up to 0300 sign off, especially when the Colombian, Ondas del Meta, is absent.

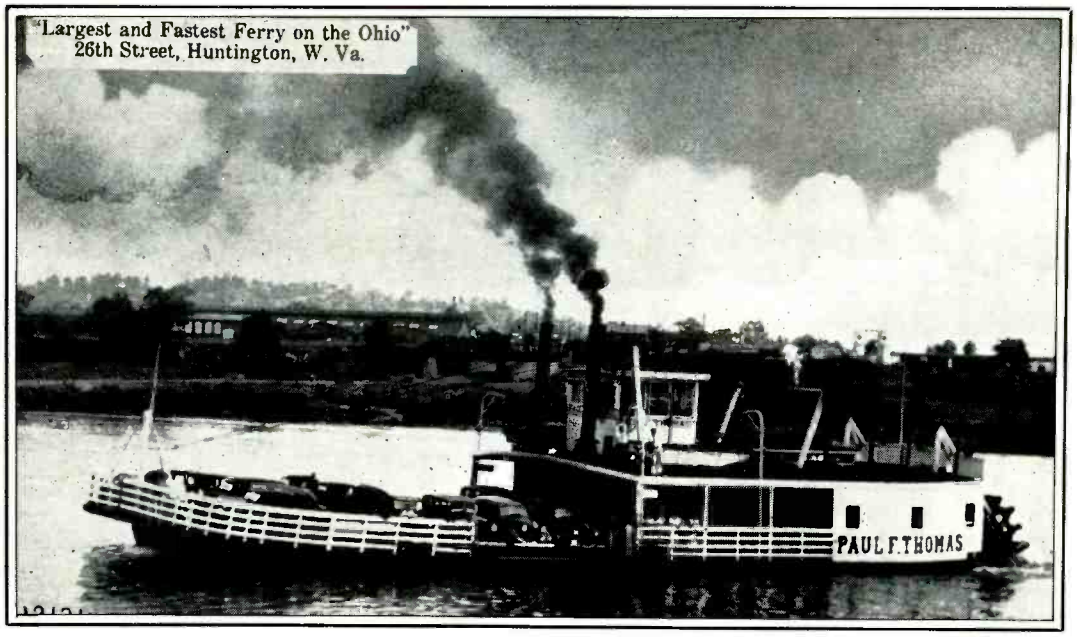
Radio Marajoara on 4.955 has become something of a mystery. It was once well and often heard but may now be inactive or have moved to another channel. There are Brazilian outlets on this frequency—more than one—but reception is seldom good enough to discover which one is dominant. Perhaps it is Radio Marajoara after all. If it is active, the schedule is likely to be 0900 to 0300.

Radio Cultural do Para on 5.045 is heard often with 10 kilowatts from 0700 to 0300. There's another Brazilian on this frequency, so take care with your identification.

We've made over 4,000 miles since Mount Huagra. We've been through areas of the densest jungle in all the world—an area bigger than a lot of countries, yet an area that contains some of the world's least populated lands.

The rush to develop the Amazon has been underway for some years however. New industries, huge plantations, grandiose projects, the clearing of vast amounts of forest area (which scientists worry about because of the loss of oxygen it may mean to the world's atmosphere), all are adding people and enterprise to the Amazon region.

As the area is opened up to development, more targets for the shortwave listener are likely to be put on the air. In the mean time, even the most experienced of DXers has plenty to occupy his attention as he attempts to explore this mighty river via the high frequency bands. PC



The Paul F. Thomas *was an Ohio River ferry boat which was the site of the WUMS transmitter during floods.*

WUMS: The Unknown Mysterious Station

On The Air For More Than 20 Years, Nobody Could Get WUMS To Shut Down!

BY TOM KNEITEL, K2AES, EDITOR

You've probably never heard of Proctorville, Ohio, a tiny community of about 975 souls located on the banks of the Ohio River at the southernmost point of Ohio. It's just across the river from Huntington, West Virginia. If you're driving along State Route 8 and you reach the intersection of State Route 775, look around for Proctorville—it's there, somewhere. There's no plaque there to indicate that it's the home of the world's very first pirate broadcaster, WUMS, despite the fact that WUMS was about as bold and brassy an outlaw as ever took to the airwaves. For decades, federal files in Washington literally bulged with paperwork relating to futile efforts to get its owner, David F. Thomas, to shut down the station.

The Ohio River, it should be observed, is famous as an inland shipping route. It may be equally well known for its long record of seasonal floods which have caused extensive hardship for area residents over the years.

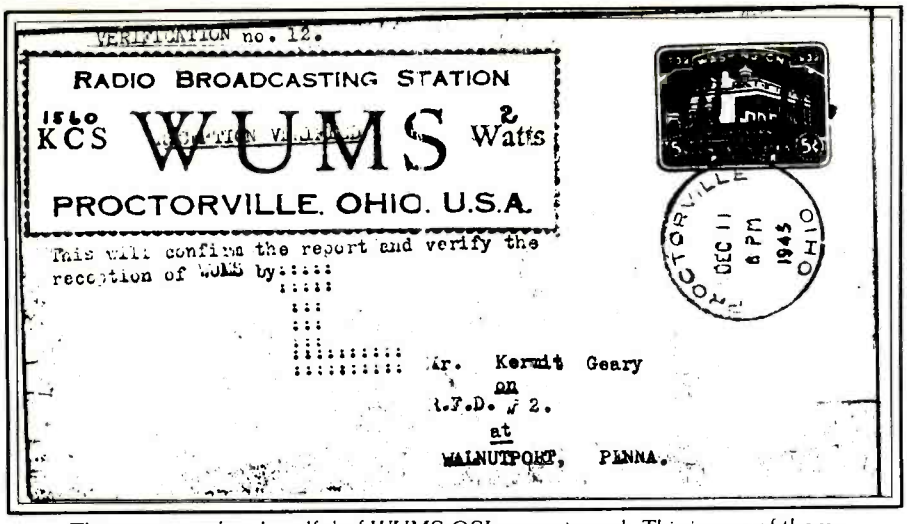
The father of Dave Thomas, Capt. Paul F. Thomas, was known as the best ferryman on the Ohio River, and he operated a thriving ferry business between Proctorville and Huntington for many years. His three ferries, the *Champion No. 3, Oweva*, and *Paul F. Thomas,* were regular fixtures along the river. Floods, of course, disrupted the regular service of the ferries, and when the water level rose so high that the roads were blocked, the boats would move up and down the river picking up food, milk, medical supplies, and other necessary items for Huntington, as well as deliver items from Huntington to other communities.

It was during 1925 that Capt. Thomas's 16-year-old son, Dave, came up with the idea of utilizing radio during the floods. His station, using the self-assigned call letters WUMS, first took to the air 16 November 1925 transmitting flood information, music, news, and advice to area residents about where and when the boats would be docking with the emergency supplies. In fact, Dave installed WUMS right on one of the boats!

The station ran only a few watts and provided a very definite community service during perilous times when there were relatively few other broadcasters on the air, and Dave really got a feeling for operating the station. He claimed the callsign stood for "We're Unknown Mysterious Station" (many years later this was reported as "We're Unlicensed Marine Station").

The station's exact location and the identity of its operator remained a secret for a few years, although from time to time there were references made to the fact that the government might have, at one point, issued Dave Thomas an operating permit of some sort to allow him to provide his radio services during floods. Correspondence from Dave Thomas in later years, and his operational secrecy in the early years of WUMS, makes it hard to believe that there ever was an authorization given to WUMS, even for emergency purposes.

This isn't to say that Dave Thomas preferred that WUMS be an outlaw station. In-


VERIFICATION no. 12.

RADIO BROADCASTING STATION

1560 KCS WUMS 2 Watts

PROCTORVILLE, OHIO, U.S.A.

This will confirm the report and verify the reception of WUMS by:::::

Mr. Kermit Geary

on

R.F.D. # 2.

at

WALNUTPORT, PENNA.

PROCTORVILLE DEC 11 4 PM 1945 OHIO

There were only a handful of WUMS QSLs ever issued. This is one of them.

David F. Thomas, who kept WUMS on the air over the decades.

As late as 1959, the state of Ohio was issuing broadcaster's license plates to WUMS.

deed not. It's just that the government kept refusing to issue him a broadcasting license. He never could understand why they wouldn't license WUMS when it was obviously providing a vital service to his community. Of course, the fact that he couldn't agree with, or even understand, the government's thinking didn't stop him from operating the station to provide what he felt was a vital service.

By 1931, despite several run-ins with the government about the continuing operation of WUMS, Dave decided to dub his station "World's Best Known Outlaw Station." By that time he seemed to be wearing the title "outlaw" as some sort of merit badge, for he had been able to keep WUMS on the air for a full six years, far longer than the dozens of other broadcasting pirates that had been silenced. Fact was that WUMS, by 1931, had even outlived a number of fully licensed but unsuccessful broadcast stations. And, of course, WUMS had "come out of the closet" and was no longer being operated as a secret station. Not only did the government know where it was and who operated the station, they could read about it in many radio publications of the day inasmuch as Dave Thomas's little station was becoming quite famous.

One of the factors that made WUMS better known was the increase in its scope of operation. During times of flood, WUMS operated on 2004 kHz (self-assigned), but Dave had come to enjoy broadcasting so much that he opened up broadcasts on yet another frequency when there were no floods! Now WUMS could also be heard on 1560 kHz with anywhere from ½ to 3¼ watts.

These new broadcasts originated from area churches, schools, and theatres. Thomas would set up a portable transmitter and present local talent. This isn't what made him really famous, however. It was the special DX broadcasts and frequency test checks which WUMS had embarked upon (running 2 watts on voice and 5 to 10 watts on CW) for the benefit of hobbyists from coast to coast. In 1963, Thomas wrote to me and recalled, "WUMS was like walking on the tracks of a railroad; be doing emergency work and in a few days be on for a DX test as far off the track as one could get. One day be semi-legal and the next time illegal." As you can see, despite the lack of a transmitting license, Dave Thomas insisted upon considering his flood transmissions to be, at least, "semi-legal." It was this argument which he repeatedly used to defend himself every time they came around to give him a hard time.

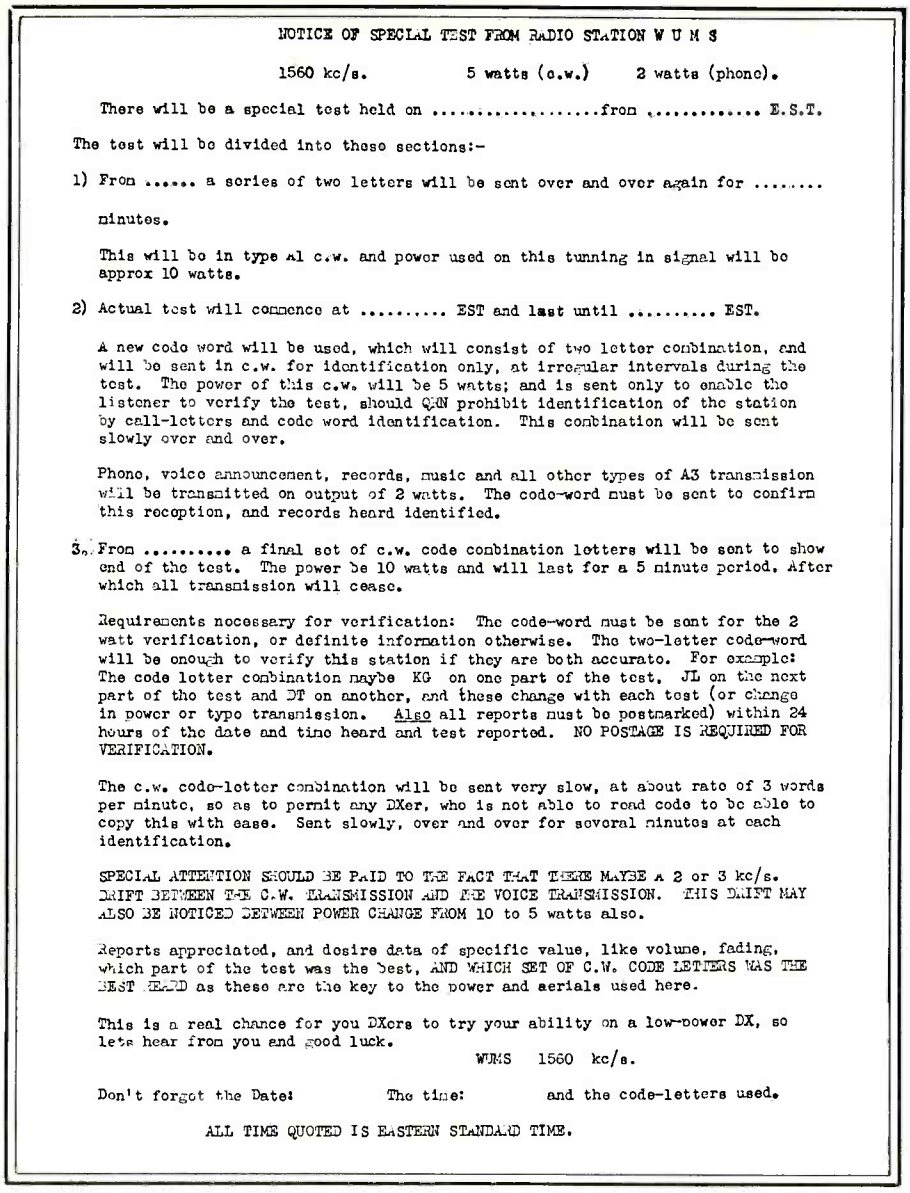
Thomas claimed, in his 1963 letter, "It was these DX programs that always kept us in trouble. Regardless of the marine broadcasts (which never caused us much trouble) . . . these DX tests were the real trouble between the FCC and WUMS for they were not connected with the special work WUMS was doing so they could not be declared legal. Even with the FCC monitoring station across the river in Huntington we kept on with our monthly frequency checks and the DX programs. These DX programs were put on without telling them about it; they'd have to stay awake to pick us up."

Actually, it was probably the DX programs and also the QSLs that were the problem. Dave Thomas was a very active DX listener and had received more than 2500 QSLs from 123 countries (65 countries on the broadcast band). He knew the appeal and attraction of a QSL from a rare low-power station, and WUMS fit those criteria. It was then that he decided to commence offering QSLs from WUMS, establishing what still remains as perhaps the most stringent QSLing policies ever instituted by a broadcaster, legal or illegal, anywhere in the world. It made WUMS an instant sensation within the DX community, somewhat of an "ultimate DX catch," and a real challenge to listeners.

For starters, one had to know when his special DX tests were going to take place. That meant it helped to get on his mailing list to receive the notices he mailed out. While clubs were on his list, not all of them printed the information, and some who did couldn't get it into print fast enough.

Next, the listener had to try to actually hear WUMS; not an easy stunt considering its low power—although it did use a very efficient long wire antenna system. Each special DX broadcast featured regular program material plus the transmission of two letters of the alphabet in CW. These letters were changed for each special DX broadcast, and sometimes even within individual broadcasts. The DXer had to copy these letters as well as all other program material and then get the reception report into the mail within 24 hours. No mail-drop addresses were used; a letter sent to *Radio Station WUMS, Proctorville, Ohio*, would promptly be delivered by the Proctorville post office.

When Thomas received a report, he would go over it word by word, line by line. Unless it was 100% accurate, down to the very last minute detail, no prized WUMS verification would be issued. Although, over the years, many hundreds of reception reports were received at WUMS, only 30 actual QSLs were ever issued! What's worse, those who sent in reception reports that couldn't make it past Thomas's close scrutiny were sent a special non-QSL acknowledging the report but refusing to verify the reception. Although these non-QSLs, today, are themselves prized DX memorabilia, those who received them in the mail were often extremely put out about the situation. It is said that, in 1931, one DXer got a non-QSL and was so angry that he complained about WUMS to the Federal Radio Commission. The FRC was already fully aware of the station and was no more pleased with its operation in 1931 than they had been for the



NOTICE OF SPECIAL TEST FROM RADIO STATION W U M S

1560 kc/s. 5 watts (c.w.) 2 watts (phone).

There will be a special test held on .....from ..... E.S.T.

The test will be divided into these sections:-

1) From ..... a series of two letters will be sent over and over again for .....

minutes.

This will be in type A1 c.w. and power used on this tunning in signal will be approx 10 watts.

2) Actual test will commence at ..... EST and last until ..... EST.

A new code word will be used, which will consist of two letter combination, and will be sent in c.w. for identification only, at irregular intervals during the test. The power of this c.w. will be 5 watts; and is sent only to enable the listener to verify the test, should QRN prohibit identification of the station by call-letters and code word identification. This combination will be sent slowly over and over.

Phone, voice announcement, records, music and all other types of A3 transmission will be transmitted on output of 2 watts. The code-word must be sent to confirm this reception, and records heard identified.

3. From ..... a final set of c.w. code combination letters will be sent to show end of the test. The power be 10 watts and will last for a 5 minute period. After which all transmission will cease.

Requirements necessary for verification: The code-word must be sent for the 2 watt verification, or definite information otherwise. The two-letter code-word will be enough to verify this station if they are both accurate. For example: The code letter combination maybe KG on one part of the test, JL on the next part of the test and DT on another, and these change with each test (or change in power or type transmission. Also all reports must be postmarked) within 24 hours of the date and time heard and test reported. NO POSTAGE IS REQUIRED FOR VERIFICATION.

The c.w. code-letter combination will be sent very slow, at about rate of 3 words per minute, so as to permit any DXer, who is not able to read code to be able to copy this with ease. Sent slowly, over and over for several minutes at each identification.

SPECIAL ATTENTION SHOULD BE PAID TO THE FACT THAT THERE MAYBE A 2 or 3 kc/s. DRIFT BETWEEN THE C.W. TRANSMISSION AND THE VOICE TRANSMISSION. THIS DRIFT MAY ALSO BE NOTICED BETWEEN POWER CHANGE FROM 10 to 5 watts also.

Reports appreciated, and desire data of specific value, like volume, fading, which part of the test was the best, AND WHICH SET OF C.W. CODE LETTERS WAS THE BEST HEARD as these are the key to the power and aerials used here.

This is a real chance for you DXers to try your ability on a low-power DX, so lets hear from you and good luck.

WUMS 1560 kc/s.

Don't forgot the Date: The time: and the code-letters used.

ALL TIME QUOTED IS EASTERN STANDARD TIME.

If you were on the WUMS mailing list, you would have gotten a notice in the mail telling you when to listen.

previous six years. Still, several arrests (and subsequent acquittals) had been wholly ineffective in silencing WUMS as Thomas insisted that the station's services were vital during times of Ohio River flooding.

Nevertheless, in 1937, Thomas announced that WUMS would henceforth be utilized only for flood work and that the DX broadcasts had ended for good. This would have been an accurate statement only if Thomas had commenced to consider the former 1560 kHz DX tests to have somehow become connected to flood uses. Despite the announcement, broadcasting of one sort or another (virtually identical to the earlier special DX tests) continued on 1560 kHz. Of course, during actual flood conditions, operations shifted to 2004 kHz.

It was during a 1939 flood that two hams heard WUMS on 2004 kHz and thought it was a fellow Amateur Radio Operator who had drifted out of the 160 meter ham band. They decided to chat with WUMS. That caused the Dept. of Justice to embark upon a major flap with Dave Thomas. A suit was filed in Federal Court in Cincinnati against Thomas for operating an unlicensed amateur station. Thomas sniffed—they were mistaken, he wasn't operating an unlicensed ham station; he was operating an unlicensed *broadcasting* station, he claimed. Somehow that curious revelation was sufficient to cause the entire federal case to unravel.

The feds did not seem inclined to go away quietly. They kept writing Dave Thomas a continuing string of nasty letters and threats. Thomas continued to request and even demand that they issue him a license if they didn't want him on the air illegally. It was a real Mexican standoff.

After one of his many license application rejections, on 18 March 1942, Thomas wrote to the FCC saying that he was sorry that they had again bounced his license application, commenting, "One of the first rules of the Commission is that radio is to be used for safety of life and property, and a few more things which should/would grant a permit to anyone who is working emergency times for no personal gain and has saved thousands of dollars for others during past floods.

"I have been turned down many times by you, but it makes no difference to me—for when I was turned down before I ran just the same as an outlaw and I will do the same if the occasion demands it.

"I have always tried to play ball with you on the square and seek this permission so that I could operate in a legal way. I do not want to operate as an outlaw station, but when . . . floods are raging over the Ohio Valley this station *will* come on the air.

"I'm sorry that your action is going to cause me to operate as an outlaw but when communication with the outside world ends . . . word must be sent from this town. This station will take to the air.

"I wish you would reconsider your action, for there is no reason to stir up trouble, perhaps go to court again, you bringing charges against me in Federal Court in Cincinnati, having your men in Huntington assigned to check on me and waste of time and money while I am rendering a public service.

"I've asked for nothing impossible for you to grant and I've asked for nothing personal except to serve the people of this locality..

"Please grant this . . . permit so that I will not have to break the laws, for with the U.S. at war it is a bad thing to break the laws of the country . . ."

"I'll use the call WUMS, power 10 watts, and I'll tell the FCC in town here about it (should I have to operate without a license) as well as the FBI so they can see the service I render. So it's up to you now if I operate legal or illegal during the floods."

These comments, of course, were based upon Thomas's continuing contention that his DX test broadcasts had ceased in 1937. As you can see from Thomas's letter to the FCC, however, he was quite adamant about remaining on the air even without their sanction. And remain on the air he did.

By 1948, Thomas felt that he had racked up a sufficient amount of life experience to sit down and set some of his innermost feelings to paper. Thomas, who had majored in religion at Marshall College and Ohio Wesleyan, then issued his philosophical concepts in a privately printed 128-page volume he called *Mytheology* (which he said was to be pronounced "my theology"). The book, which delved deep into metaphysics and the meaning of life, was not intended for sale to the public. It was given out only to a few select personal friends and members of his family. To say the very least, *Mytheology* was a rather obtuse treatise which took virtually all of the world's major religions to task for a variety of reasons probably best understood by the author himself alone, although it did express the author's own personal deep religious faith and the fact that he had found peace with the world.

Unfortunately, 1948 was not to be a year in which the world gave Dave Thomas much peace. That was the year in which Thomas

This will acknowledge your communication of (Last Week / Last month)

We are glad to send you this card but sorry to say we CANNOT VERIFY your reception due to ☐ Report too vague to check with station log. ☐ Lack of specific details on material heard and insufficent information submitted. ☐ Station not on air at time reported. ☐ Material submitted was not transmitted from this station.

The Transmitters of W U M S are as follows:-

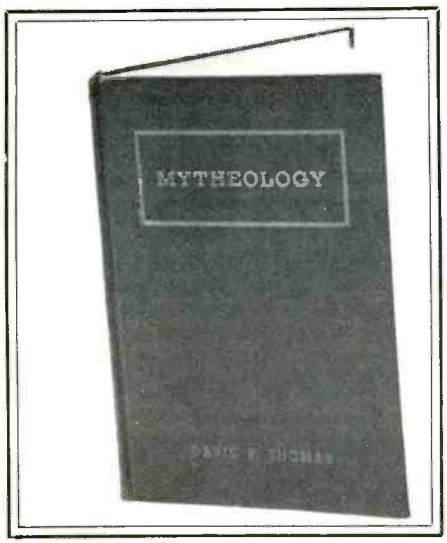
No.1 2004 & 1560 kc's ½ - 3¼ watts A-3 fixed
No.2 100 to 3000 kc's 75 - 125 watts A1, A2, A3 variable
No.3 1750 to 60,000 kc's 20 - 30 watts A1, A2 ,A3 variable
No.4 2¼ to 13 meters 14 watts A3 variable
No.5 100 to 300 meters 75 watts Type B variable

WUMS started Broadcasting 10 P.M. EST, November 16th, 1925. The call stood for "We're Unknown Mysterious Station", as the station worked as outlaw and it's location remained a secret for several years. Located 1931 our slogan became "Worlds Oldest Known Outlaw Station". Since 1937 we use this equipment only for Ohio River Flood Broadcasting; or any special or temporary emergency work which may occur at irregular times. WE HAVE NO REGULAR SCHEDULE OF OPERATION.

Reports always welcome as we consider WUMS A REAL DX STATION and a DX catch extraordinary for the DX'ers and for this reason we are a friend to the DX'ing Fraternity

RADIO WUMS

A rare look at one of the non-QSLs.



Mytheology *wasn't easy to understand, but neither was its author.*

locked horns with some members of a DX club over some matter which, at this point, remains obscure. Club members retaliated by letting the FCC know when the next WUMS DX test was to take place and the feds were there waiting. *Bingo!* They caught WUMS and before long Thomas was convicted in Federal District Court at Portsmouth, Ohio for operating an unlicensed broadcasting station. Thomas appealed. One version of the story alleges that he produced the special flood transmitting permit he had supposedly been issued many years earlier and somehow managed to, again, slip through the government's clutches with the well-worn river flooding excuse. In any event, his appeal created such a clamor in the courtroom that he narrowly missed being charged with contempt of court. Yet, Thomas *did* wriggle out of the illegal broadcasting conviction. At that point, however, he had undoubtedly come to the conclusion that WUMS had surely run its ball of string out about as far as it would stretch. While not totally dead, WUMS henceforth operated only infrequently and with considerable caution. Even so, more than 10 years after the 1948 incident, the state of Ohio was still issuing special broadcast station license plates reading "Radio WUMS" to Dave Thomas for his car—probably the only pirate station call letters to ever be issued on a license plate.

In 1966, Dave Thomas pulled up stakes in Proctorville and relocated to Tampa, Florida. He then turned his attention to eclipse expeditions around the world, acting as expedition leader.

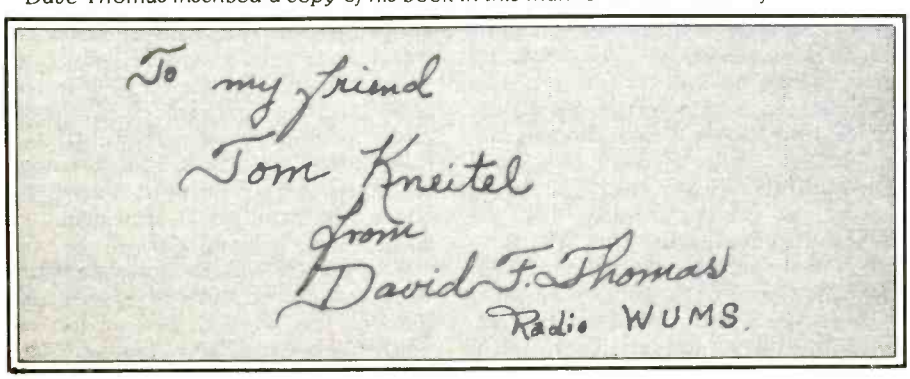
In a letter I received from Dave Thomas in late 1980, he said, "WUMS is still around but seldom on the air. Last time WUMS was on the air was on an eclipse expedition. In the many years during which WUMS operated from Proctorville I received many reception reports, however I had established very strict qualifications for those who would receive QSLs. Many false reports were received from those who never heard WUMS but wanted a QSL."

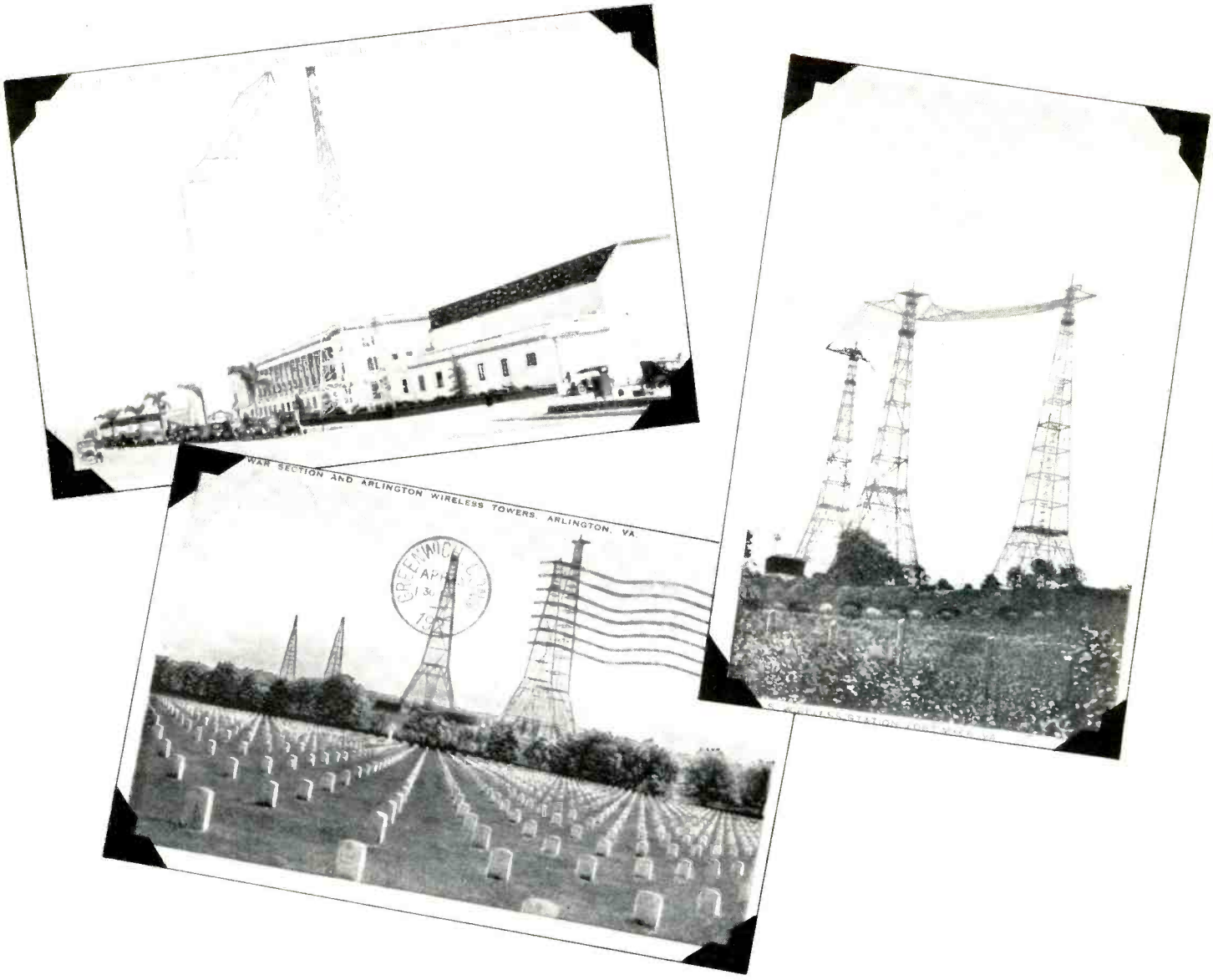
Thomas told me that "the equipment used at WUMS was . . . given to the Ohio Historical Society, however when they moved to their new museum WUMS was 'lost.' There has been considerable fuss over the matter, they show it as 'misplaced when moved,' but the curator thinks it was stolen. The Smithsonian has asked me for the rest of my old time equipment, and also for my complete QSL files. I'm over 70 now and am going to have to start trying to find a place to give these things a new home."

Several readers were kind enough to send me copies of a short piece mentioning WUMS and Dave Thomas which appeared in the April 21 (1984) edition of *The Waterways Journal*, a newspaper devoted to shipping on inland waterways. Those who sent copies of the story asked me if I had ever heard of WUMS and knew any more about the station than had appeared in the newspaper clipping.

Sure, I've heard of WUMS—I've not only got a non-QSL from the station, but a lot of memories of its owner/operator, the feisty outlaw broadcaster who just wouldn't quit no matter how hard they pushed him. If there is ever an honor roll of unforgettable characters who have been involved in radio, David F. Thomas will surely be somewhere near the top of that list. PC

Dave Thomas inscribed a copy of his book in this manner to the author of this article.





More Radio History — Via Postcards!

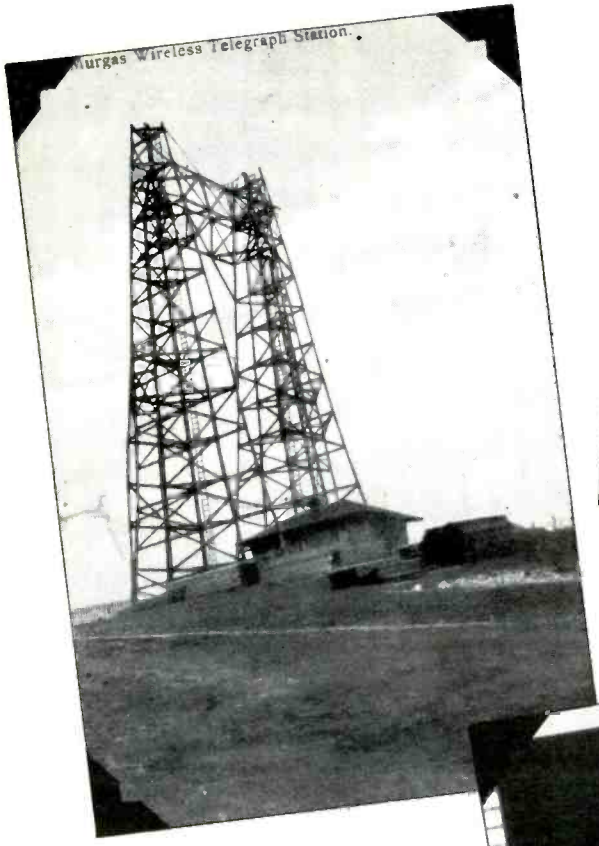
You Asked For More, So Here They Are!

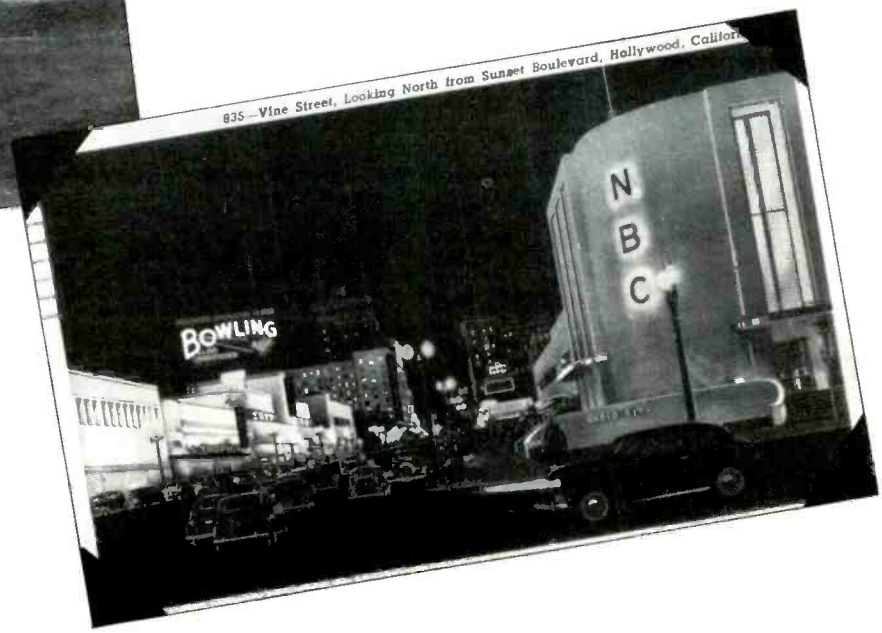
BY ALICE BRANNIGAN

In the October *POP'COMM* I offered readers a view of some long-forgotten radio history by means of old picture postcards I've collected. At that time I mentioned that space permitted showing only a couple of cards in that issue. As soon as that issue went on sale, the magazine began receiving cards and letters asking for additional glimpses into radio's glittering past via means of these historic postcards. Okay, you asked for more, so here they are.

The first one that I found after digging into the file was a view of Warner Brothers motion picture studio at 6425 Hollywood Boulevard in Hollywood, California. As you can see, two giant radio towers dominate the scene on this undated card. The radio towers were used by radio station KFWB, which the reverse of the postcard describes as "the only studio owned radio broadcasting station in the world." I checked KFWB in old records and found that in 1930 it was on 950 kHz with 1 kW. This station, which went on the air in 1925, was listed in 1946 records on 980 kHz with 5 kW from 5833 Fernwood Ave., Los Angeles (transmitter at Baldwin Hills, Culver City), although the view shown on the postcard is certainly from the 1925-30 era. The station, to the present time, remains on 980 kHz with 5 kW.

Next, a scene to please those "ute" listeners who wrote in to say that they were being ignored. This undated card shows "The United States Naval Radio Station at Radio,





Virginia, situated at the southwestern end of Ft. Myer." Although the card doesn't specify the callsign, this is how station NAA looked at some point in the dim past. The card goes on to describe the station as having been built by the Navy's Bureau of Steam Engineering and running 100 kW. One tower is 600 feet high (150 ft. square at the base), two towers are 450 ft. high (120 ft. square at the base) located "at angles of an isosceles triangle, large tower at the apex base of triangle 350 ft. between centers of towers." The card goes on to note that the station "cost about $250,000."

Another postcard, showing the three giant NAA naval radio towers (along with two smaller towers not shown in the other view) is also available. This card, which unfortunately has a postmark across the scene, looks to have been made up at a later time than the other card. Shown from a viewpoint within the Arlington National Cemetery (which is adjacent to Ft. Myer, Virginia), the card is dated 1927.

And now, digging back even further into the past, here is a card from a station which looks to be from the very earliest days of wireless, based upon the appearance of the antenna system. The only description on the card itself is "Father Murgas Wireless Telegraph Station," without any additional information as to its location or function. Apparently Father Murgas' station enjoyed sufficient popularity at some point in time to warrant the printing of full color postcards, but I have been unable to locate any reference to this station in the usual sources. Although the card was printed in Germany, it was made up for an American distributor. Does anybody out there in readerland know anything about this station?

Next, a view of the well-known pioneer broadcaster WGY, in Schenectady, New York, as it looked in 1947. This station was first placed on the air in 1922 by General Electric, running 1 kW on 790 kHz. By 1930 it had stepped up its power to 50 kW. When broadcasters shifted their frequencies in the years before WWII, WGY moved to 810 kHz. The station still uses 810 kHz and can be heard over a large part of the nation every night. Great programming too.

And finally this month, a vignette of "Hollywood's Radio City," on Vine Street, looking north from Sunset Boulevard. This is how it looked more than 40 years ago in 1943. At the right of the scene is the west coast headquarters of the NBC radio network, which was still considered to be a new building when the photo was taken.

Next month some additional AM broadcasters and also a rare view of a very early wireless long-forgotten telegraph station. PC

Taxi Radio: "Fare" Game For Scanners

Emergencies, Celebrities, X-Rated Stuff, And More! Listen Here!

BY HENRY SPENCER, KCA6RM

Transit and transportation communications have long been favorites of communications monitoring enthusiasts; aero, maritime, railroad systems have carved a niche for themselves, and deservedly so. Even truckers and municipal bus lines have their own group of followers. Interestingly, one set of participants in transportation has long had its own set of followers—a relatively small clique of scanner owners devoted to the Taxicab Radio Service, a communications service which has generally been overlooked.

Maybe it's that a lot of listeners don't realize that there's some really interesting traffic taking place on these frequencies from time to time. Not always, mind you; but then, even on police and fire frequencies there's quite a bit of routine dispatching taking place and each and every transmission isn't a hair-raiser. On taxi frequencies, it's quite similar. In many areas, taxis belong to volunteer reporting programs used in conjunction with law enforcement agencies. These programs call for taxi drivers to radio in street crime incidents to their dispatchers, and also to report fires or suspicious persons and vehicles; very often such reports appear quite some time before they turn up on police and other public safety frequencies. Taxis are also used for emergency blood transport between hospitals and to transport accident victims to hospitals during emergency situations.

Notwithstanding these uses, the routine traffic between drivers and dispatchers can be both salty and amusing, especially when discussing some of the passengers ("fares") who have just gotten out of

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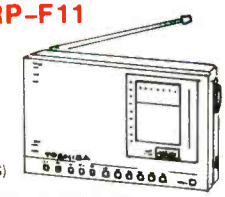

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(More details 1984 WRTVH, page 585)

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CIRCLE 20 ON READER SERVICE CARD

the cab. You'll hear gripes about small tippers, descriptions of some of the oddball stunts pulled off by passengers while in transit, reports of fare arguments, etc. Last summer I monitored a vivid description of three passengers who changed from street clothing into bathing suits while on the way from a train station to a beach! While big city metro taxi frequencies seem to have a larger percentage of grisly communications, there's still plenty of freaky correspondence on suburban and even rural taxi company frequencies.

One communication that I recall as being especially memorable was the request for a cab to be sent to the home of one of my neighbors. The cab driver was told that "a very angry lady wants to be driven around to all of the local taverns so she can try and find her husband." The missing husband, it might be noted, was a rather sanctimonious guidance counselor at a local high school. It's little things like that which somehow give you some additional insight into your own community.

Then there was the time a well-known celebrity got into a cab for a ride from the airport to a charity dinner he was emceeing. After he got out of the cab, the driver gave a full and complete description of the X-rated antics which transpired between the celebrity and his traveling companion during the 45 minute ride; the dispatcher was hysterical with laughter, and so was I! Every time I see this guy on TV (which is every week), I think about the incident.

The majority of taxi communications take place in the VHF high band and the UHF band on frequencies set aside for these communications. There are also low power "offset" frequencies which may be assigned, as well as special UHF "T" band channels available in some major metro areas.

The original 152 MHz band taxi frequencies are in heavy use. While some taxi companies operate in a simplex mode (base and mobile units sharing the same frequency), others operate in a semi-duplex mode (base stations on 152 or 452 MHz frequencies and mobiles operating on paired 157 or 457 MHz frequencies). Moreover, some taxi frequencies are assignable only to companies located in cities having certain population limitations.

The accompanying frequency information outlines the haunts of most of the nation's taxi companies. It should be noted that some taxi companies are licensed on regular Business Radio Service frequencies and these are not dealt with here.

If you've never before listened on these frequencies, why not give them a try? While some large city taxi fleets are comprised of hundreds of vehicles, and some rural companies may have anywhere from one to four cabs, they all can provide their own unique listening fare to be found nowhere else on a scanner. PC

Regular Taxicab Radio Frequencies

Base or Mobile	Alternate Mobile Freq.	Remarks
152.27 MHz	157.53 MHz	
152.285	157.545	Areas of 50,000+ population
152.30	157.56	Areas of 50,000+ population
152.315	157.575	Areas of 50,000+ population
152.33	157.59	
152.345	157.605	Areas of 50,000+ population
152.36	157.62	Areas of 50,000+ population
152.375	157.635	Areas of 50,000+ population
152.39	157.65	
152.405	157.665	Areas of 50,000+ population
152.42	157.68	Areas of 50,000+ population
152.435	157.695	Areas of 50,000+ population
152.45	157.71	
152.465	157.725	50+ miles from cities of 600,000+ population
452.05	457.05	
452.10	457.10	Areas of 200,000+ population
452.15	457.15	
452.20	457.20	Areas of 200,000+ population
452.225	457.225	Areas of 200,000+ population
452.25	457.25	Areas of 200,000+ population
452.275	457.275	Areas of 200,000+ population
452.30	457.30	
452.35	457.35	Areas of 200,000+ population
452.40	457.40	Areas of 200,000+ population
452.45	457.45	Areas of 200,000+ population
452.50	457.50	

Note: Base stations operate on the 152 and 452 MHz frequencies. In some systems, the mobile units operate on the same frequency as their associated base station, although they may (instead) be licensed for operation on the paired 157 or 457 MHz frequencies shown in the middle column.

"Offset" Taxi Frequencies

452.0625	452.3125
452.0875	452.3375
452.1125	452.3625
452.1375	452.3875
452.1625	452.4125
452.1875	452.4375
452.2125	452.4625
452.2375	452.4875
452.2625	452.5125
452.2825	

Note: Additional "offset" taxi frequencies are situated exactly 5 MHz above the frequencies listed (457.0625, 457.0875, etc.). "Offset" frequency stations all use low power and therefore have limited signal coverage. Antennas are limited to heights lower than allowed on regular frequencies. These frequencies are therefore primarily used within localized areas or neighborhoods rather than by city-wide services.

UHF-T Band Taxi Frequencies

Boston, MA	472.3625 to 472.4375 MHz
	475.3625 to 475.4375
Los Angeles, CA	472.9875 & 475.9875
	508.9125 & 511.9125
New York, NY	472.3625 & 475.3625
	472.4375 & 475.4375
	472.6375 to 472.6625
	475.6375 to 475.6625
	472.7375 & 475.7375
	472.6875 & 475.6875
	478.3625 & 481.5125
	478.6625 & 481.6625
Washington, DC	496.3625 & 499.3625
	496.3975 & 499.3875

Note: These frequencies are available for use only in the majo cities indicated. Where frequencies are shown spanning an upper/lower frequency limit (Boston and New York), frequencies between these limits are assigned with 25 kHz spacing between.

High Frequency Single-Letter Beacons (SLBs)

Part 1: The K- and U-Beacons The Search Goes On

BY WILLIAM I. ORR, W6SAI

For many years shortwave listeners and radio hams have been bemused and confused by a number of innocent-sounding radio signals—high frequency (hf) "beacons" that appear and disappear from time to time. These signals are easily identified as they merely send a continuous carrier signal, interrupted by a single Morse code letter every few seconds. Typically, many beacons send either the letter "K" or "U." Looking backwards into the past, these beacons were first logged in the early "seventies" and they have been on the air (in one form or another) on various frequencies since then.

No one seems to know (and those who know won't tell) the source or purpose of these mysterious transmissions. Where do they originate? To whom are they directed? What information do they convey? Why are there so many of them? Why do they jump about in frequency? Good questions, and ones not easily answered.

The single-letter beacons (SLBs) have been heard worldwide and reception reports of these signals have appeared from time to time in *Popular Communications* and elsewhere. At one time a great effort was made to log and identify all beacon signals heard over a period of years. The results were summarized by SPEEDX. The final count of logged SLBs totalled over 180!

Separating The Wheat From The Chaff

The beacon signals had been only a minor curiosity to me until one of them was found in an amateur band on a frequency I planned to use for an early morning schedule. The beacon completely jammed the frequency during the night hours until, after sunrise, it faded into the background noise.

None of the amateurs operating on the frequency (3980 kHz) had any idea of the source of the beacon signal, but they all complained about it. My interest in this signal, and beacon signals in general, was aroused and I decided to monitor these unusual transmissions that signed no call letters and apparently provided no recognizable information to the casual listener. However, keeping track of 180 signals, as reported by SPEEDX, would be too great a task for a part-time observer.

Table 1

The K-beacons: total = 21

(2844) kHz	11154.5-11155.5
(3979)	12149.5-12150.5
4004.5-4005.5	14476.5-14477.5
(4523)	14966.5-14967.5
7905.5-7906.5	(16316)
(7954)	(18016)
8143.5-8144.5	18347.5-18348.5
8157.5-8158.5	(22310)
(8974)	(22748)
9042.5-9043.5	(28965)
10570.5-10571.5	

( ) = exact frequency span not logged

The U-beacons: total = 14

(3637.5) kHz	9056.5-9057.5
(4448.5)	10215.5-10216.5
(6246.5)	12184-12185.5
(7395)	12327.5-12328.5
7568.5-7569.5	(13339)
(8077.5)	15654.5-15655.5
(8136.5)	
(8670.5)	

( ) = exact frequency span not logged

The first step was to enlist the help of a colleague on the east coast so that beacon observations could be made in widely separate locations in New England and California. The observations were simple but time consuming. Each morning and evening a sweep of the HF spectrum from 2 to 30 MHz was made by each observer and audible beacon signals were logged, noting the identifying Morse code letter, signal strength, frequency, and time of reception.

It was immediately apparent that many of the 180 beacons in the SPEEDX list were nonexistent, either off the air or too weak to be heard during the listening periods. Many of the SPEEDX listings, too, were duplicates caused by inaccurate calibration of the various observer's receivers. Other signals, such as an idling radioteletype marker, were mistaken as a true beacon signal. At the end of the search period, the quantity of observed beacon signals in Spring-Summer 1984, was drastically reduced as compared to the older SPEEDX list.

Getting Down To Business

The beacon signals appeared to fall into three distinct classifications: the K-beacons, the U-beacons, and the "cluster" beacons. (The latter will be discussed next month.)

To conserve time and effort, signals not conforming to these classifications were ignored for the time being.

Once the SLB classifications were established, additional part-time listening posts were manned by volunteer SWLs in such faraway spots as Finland, England, Alaska, Hawaii, and Japan. The observers examined the new "up-to-date" beacon frequency list and searched for beacons that had slipped through the net. A summary of the K-and U-beacons is given in Table 1.

The investigation is ongoing, but some aspects of the HF beacon signals have come to light and are the subject of this article.

Defining The Beacons: The K- and U-Signals

The beacons are identified by the Morse code letter, or identifier, that each one transmits every few seconds. The K- and U- beacons transmit the identifier by frequency-shift keying (radioteletype mode). That is, the beacon transmits a steady carrier, broken every few seconds with an identifying Morse code letter having an up-frequency shift. One beacon family transmits the identifier "K." A representation of this signal is shown in Figure 1. When the beacon is properly tuned in, the letter is heard very clearly. Reception is accomplished by using the receiver beat-frequency oscillator (BFO) on the upper-sideband mode, and tuning from a low frequency up to zero-beat with the carrier signal.

It is possible to tune the frequency-shift signal "backwards," and the listener can be fooled into thinking the Morse letter "K" is really "I" or "U," but such is not the case.

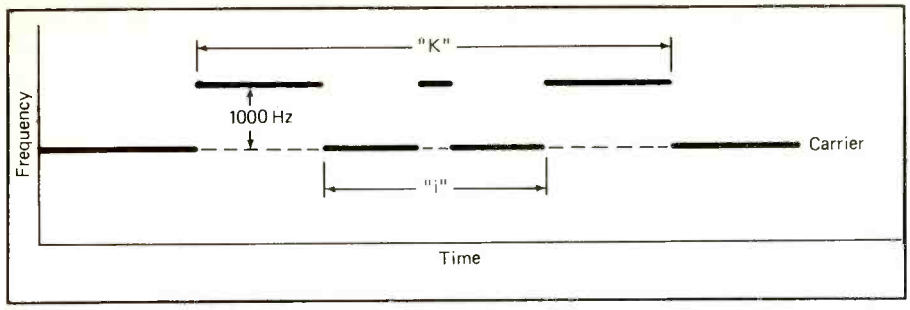


Figure 1. *Representation of frequency shift of K-beacon. Shift is up-frequency, 100 Hz. If shift is tuned incorrectly, the letter "i" can be mistaken for the Morse code letter "k."*

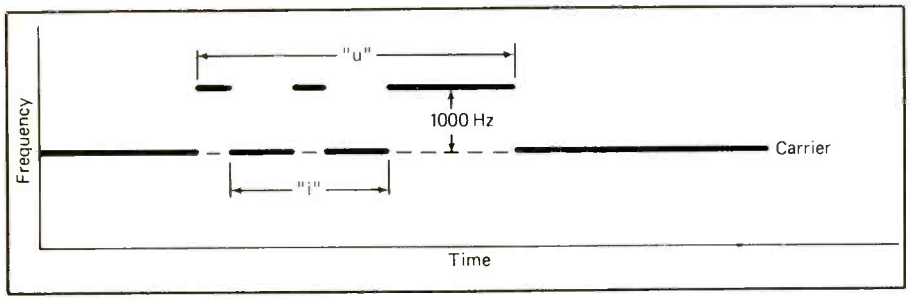


Figure 2. *Representation of frequency shift of U-beacon. Shift is up-frequency, 100 Hz. If shift is tuned incorrectly, the letter "o" can be mistaken for the Morse code letter "u."*

The Frequency-Shift Clue

It was noted that the frequency shift on these beacons for the letter-identifier is 1000 Hz, commonly employed by the USSR and other Eastern Bloc countries. This shift is not used by the U.S. or other Western European countries. This observation confirms the belief that the beacons are Soviet in origin.

A second family of SLBs also has the Eastern European 1000 Hz identifier frequency shift and is keyed with the Morse code letter "U," as tabulated in Figure 2. Again, it is possible to misread the keying and think the beacon is keyed with the letter "I." Not so.

Finally, the repetition rate of the K- and U-beacons varies slightly, but is approximately the same for both families.

Early reports suggested that the beacons were located worldwide, perhaps in Soviet embassies or Soviet-bloc countries around the world. As a matter of fact, a few years ago a loud beacon with a W-identifier was traced to Cuba, but this signal subsequently went off the air.

A Location Clue

Continued listening to the K- and U-beacons with several receivers at once indicated that all beacons using the same identification letter are keyed by the same keyer, suggesting that all beacons in a particular letter-family are at the same approximate transmitting location. The puzzle was to determine the locations of the two families of beacons.

Beacon Harmonics

Some listener reports seemed to have logged beacons on their harmonic frequencies. This turned out to be incorrect. The listener was not hearing a second harmonic signal, but an actual separate transmission on approximately twice the frequency of a similar-type beacon! This was easily proved, because if a second harmonic signal had been received, the frequency shift of the keyed identifier letter on the harmonic signal would be twice the shift on the fundamental signal; that is, 2000 Hz instead of 1000 Hz. No such abnormal shift was ever noted.

Beacon Frequency Shift

The K-beacon on approximately 9043 kHz was monitored for a period of time. Sequence of operation of this beacon (and that of U-beacons) is very complex and passes unnoticed by the casual observer. Initially, the beacon frequency was logged as 9042.50 kHz, but several times at unlogged intervals the beacon abruptly shifted frequency. One such shift was to 9043.00 kHz and another shift was to 9043.30 kHz. Frequency shifts as small as 50 Hz have been noted.

One closely monitored frequency shift on the 9 MHz K-beacon was logged during August, 1984. The initial beacon frequency was 9042.420 kHz. A second signal, identical to the first, came on a frequency of 9042.470 kHz, a difference of 50 Hz. Over a period of time, the second signal seemed to come on and off the air, sometimes duplicating the original signal. It was a very complex mix, as represented in Figure 3. This complex signal lasted for about an hour.

At another time, a second signal, 50 Hz away from the original signal, came on the air. After a period of about 10 seconds, during which both signals were observed, the first signal went off the air.

It is surmised that both the K- and U-beacons can shift frequency in increments of 50 Hz over a band about 1 kHz wide. This provides 20 possible "channels" for each existing beacon.

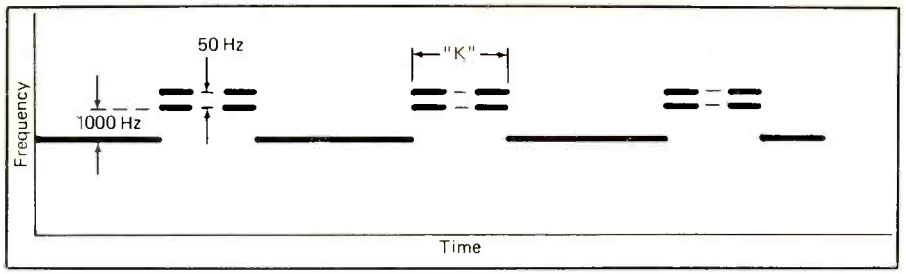


Figure 3. *Complex keying pattern occasionally observed on K-beacon for periods of up to one hour around 1600 GMT. There is no proof that the second signal is at the same location as the first.*

Frequency-hopping was also observed on the U-beacon, as well as the K-beacon, but time has not allowed a complete investigation of this phenomenon.

In any event, frequency stability of the beacons is excellent and is undoubtedly controlled by a synthesizer, as repeated frequency checks on the 9042 kHz beacon indicate the frequency tolerance of the received signal is at least as good as that of the frequency-sythesized receiver used in the observations.

Subcarrier Information

What is the purpose of the 50 Hz shift in the K-letter? Sometimes only a portion of the letter shows up on the shift, as shown in the illustration.

A possible similar technique exists using a subcarrier for transmission of digital information on an AM (amplitude modulated) signal, as discussed in the June, 1984 issue of *Broadcast-Management Engineering* magazine. The article says, in part, "the technique calls for transmitting subaudible (less than 80 Hz) digital signals, which are superimposed on the broadcast signal using small-angle synchronous phase modulation. The subaudible signals do not interfere with the AM program . . . .

"To produce a digital '1,' the carrier is advanced and delayed by 30 degrees. The absence of phase modulation in the appropriate time slot indicates a digital '0.' The phase-modulated signal is transmitted at 80 bps (bits-per-second)." (Note: I understand this system is used by KNX at 1070 in Los Angeles.

In a manner such as this it is possible for the SLB signal to be keyed, or shifted, to continually send digital information by subaudible phase modulation during selected time periods. The 50 Hz-difference signal is not on at all times, and when it is present, it takes a very special receiver to identify the sequence of events.

The Beacon "Messages"

Continual observation leads to the proposal that the Morse letter-identifiers are automatically produced, possibly by a device coded to the frequency shift system of the beacon. The normal rate of identification is about 3 seconds carrier time on and one second shift to the identifying letter. The time periods vary a bit, but it is not known if this has any significance. Occasional silent periods have been noticed during which keying stopped, leaving only the carrier on the air. And when a beacon was caught coming on the air, a steady carrier was heard for a period of time as though the operator was keying up a computer.

Of great interest is the fact that the K- and U-beacons occasionally send a coded message in frequency-shift Morse code. SPEEDX has listed a number of these messages, each of which is repeated from three to fifteen times. All messages have the same general text pattern, such as this sample of a K-beacon message:

KKK 89580 KK 48261 81564 76781 96747

Sometimes several days go by without a message, followed by one or more messages in a day. Logging messages is a tedious task as many listening hours have to be expended before a message comes along. No attempt has been made to decode the messages, but SPEEDX observers assume that the KKK is a message preamble and the first five-digit group of numbers before the KK could be a routing code.

The format resembles a standard weather code, employed by many HF marine stations, but this is discounted because if the code changes in each message represented weather conditions, they would not change that fast.

A "Radio Lighthouse"?

The suggestion has been made that the SLBs perform as a "radio lighthouse," providing a line of direction from the beacon to the receiver. Radio direction finding equipment on a boat, for example, could determine a bearing to the beacon.

This idea is discounted because of the beacon frequencies involved. Up to about 1200 miles from an SLB, it is possible to make a direction finding bearing, but even at that distance the bearing indication fluctuates with the condition of the ionosphere, preventing an accurate reading from being taken. Deviations as much as 40 degrees from the Great Circle path have been noted on long-distance, high frequency direction finding attempts. Better techniques exist for determining position at sea, such as LORAN-C, and equivalent systems.

It is possible, however, for the SLB to provide tracking and acquisition data for a satellite passing overhead in the vicinity of a ship. The occasional encrypted message, plus the unusual 50 Hz frequency shifts of the beacons, could provide time and equatorial crossing data for a satellite. Or, the data could mean something else . . .

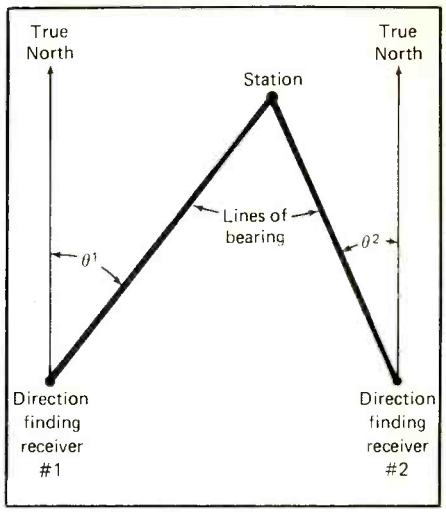


Figure 4. *Two "lines of bearing" determine a "fix" on the station. Angles of bearings (0^1 and 0^2) from true north determine station location.*

Where Are The Beacons Located?

General agreement among observers indicates that all K-beacons are northwest of the continental United States and all U-beacons are northeast. These conclusions were reached by comparing the times the beacons were heard against land-based, readily identifiable CW utility (marine) signals near the SLB frequencies, and that were located in the general world areas under consideration. Specifically, coastal maritime CW traffic stations in the Orient and Europe were used as propagation reference sources.

Continued observation showed that the propagation path of the beacon signals was unusual when compared to the utility stations. The beacons did not fade out and in during the same time-frame as noticed on the utility stations. Checking the sunrise fade-out and sunset fade-in times led to the conclusion that the beacons (although weaker than the utility stations) are located further north than the utility stations chosen for the experiment. The conclusion is that the SLBs are located in areas having unusual patterns of daylight and darkness. This points to the Arctic regions of the USSR as the most probable location of the K- and U-beacons.

DFing The Beacon Signals

A series of DF (direction finding) experiments was run on the loudest beacon signals. It was found that long-distance direction finding on an ionospheric-reflected signal is an inexact science! Azimuthal angles of signal arrival can change as much as 30 degrees in a few moments during disturbed ionospheric conditions. In addition, the polarization of the received signal can change from horizontal to elliptical to vertical mode. This makes a simple loop antenna

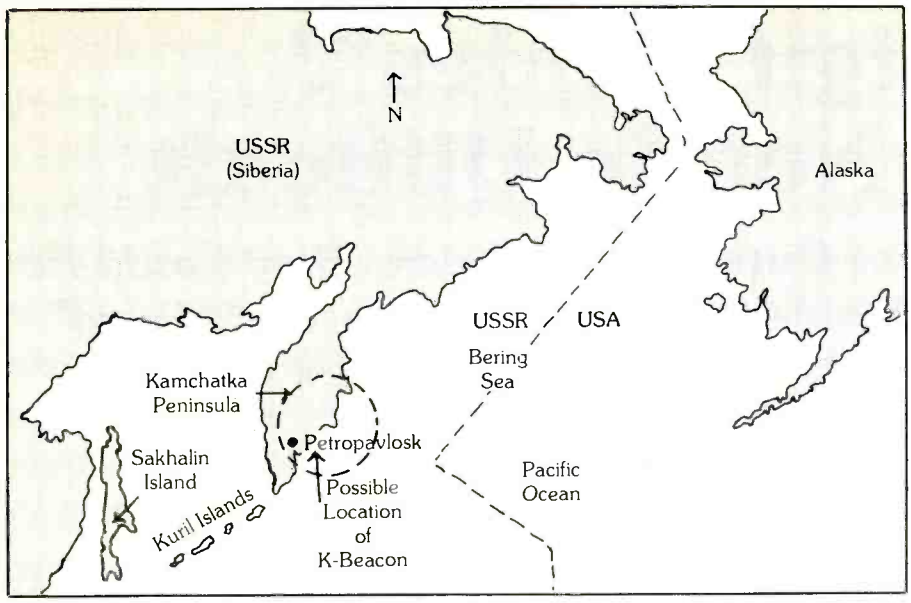


Figure 5. *Possible location of K-beacon is Kamchatka Peninsula on the Bering Sea.*

worthless for direction finding. An Adcock antenna array will do a better job than the loop, and a construction article on such an antenna is in the works. In any event, it is possible to get an approximate line of bearing of a single beacon signal using observations made over a long period of time. A back-up cross-bearing from a widely separate location will indicate the approximate location of the signal (Figure 4).

Location Of The K-Family Of Beacons

Repeated monitoring and DF readings suggest that the K-beacons are all located at one point in the Northern Pacific area. It has been suggested that the beacons are in the Soviet city of Kharbarovsk, on the Amur River in Siberia. More recent observations discount this suggestion and point to a location on the coast, much farther north: at or near Petropavlovsk on the Kamchatka Peninsula (Figure 5). This location provides ideal propagation for full Pacific Ocean coverage of the K-beacon family, and also provides good over-water coverage of the Arctic Ocean immediately north and west of the peninsula.

Location Of The U-Family Of Beacons

Preliminary monitoring of the U-beacons indicate a northern European location. Propagation of these signals to the western U.S. is erratic, suggesting a path through the auroral area surrounding the North Pole, a notorious disrupter of HF communications.

The azimuthal angle of arrival of the U-beacon signals turned out to be more variable than that of the K-beacons. Observations outside the continental U.S., in locations where the propagation path is less affected by magnetic disturbances, suggest that the U-family of beacons is situated in the northern USSR, possibly between Murmansk and Amderma as shown in Figure 5. This or a nearby location would service the northern Arctic Ocean areas from Spitzbergen on the west to Tiksi Bay on the northeastern Siberian coast.

A Beacon Roundup

Still to be determined is the real purpose of the beacons. A maritime solution is probable. The beacons are on coastal land, some of them transmit in the maritime HF bands, and rumor has it that the beacons serve the Soviet naval forces. Is the mere presence of the beacons the message? Do they transmit military data, or satellite backup information? Or perhaps they are used in a manner as yet undetermined. Only time will tell.

The writer would appreciate additional reception reports on the K- and U-beacons. Any additions to the frequency list would be welcome. Address all letters care of *Popular Communications* magazine.

The next article will discuss the *very* mysterious "cluster beacons," which show up in closely-knit signal groups in the HF spectrum.

PC

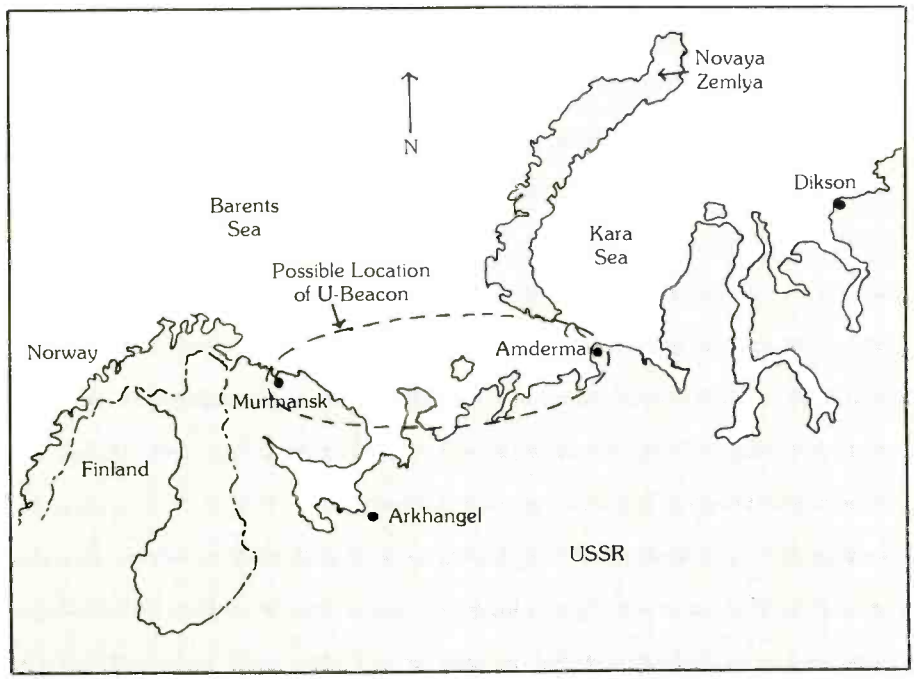


Figure 6. *Possible area of location of U-beacon lies between Murmansk and Amderma on the Barents Sea. My guess is that it is Murmansk!*

5-Digit "Codes"? Maybe Not So Difficult

Although Difficult For Outsiders To Break, They Could Be Simple Enough For Insiders To Decipher "In Their Head" Without One-Time Pads Or Other Aids! Here's How!

BY ALICE BRANNIGAN

Monkey spit started me on the road to being fascinated by secret messages. Really, it did. Once, I was in a certain rather expensive store (the owners called it a "shoppe," a sure clue to the fact that everything costs a lot) and was browsing through their wares. Everything on sale was tagged with a sticker which contained, instead of easily understood prices, a set of cryptic letters such as PSET, MKIIE and NEO. When I asked the clerk for prices of some of the items on sale, he checked the tags and very quickly rattled off prices—$87.50, $149.95, $250. Obviously the tags on the fellow's antiques were intended to remind the owner of the price he was asking rather than inform the customer. This way, I suppose, he could vary the price according to whatever he thought the traffic would bear.

Intrigued by this secret code, I jotted down the letters from the tags on a few dozen items he had for sale and also noted the prices he had quoted me for specific pieces. When I got home and began to sort out the information I had gathered, I quickly noticed that the letters on the coded price tags were contained within a group of ten, e-i-k-m-n-o-p-s-t-y. Moreover, when I began matching his price quotes to these letters, it became apparent that each of these letters had been assigned a number equivalent between 0 and 9. When I rearranged the letters into ascending order, the letters spelled out *monkey spit*. This chap had coded his prices in such a way that only he could read what they were, and by memorizing the simple phrase monkey spit, he had instant access to this information without resorting to code books or going back into his office and checking a ledger. He could also ask any price he wanted for an item (if the prospective customer looked especially prosperous), or he could quickly decide how much he could drop his price if someone wanted to bargain.

The next day I dropped by his shop and started going through his wares, saying things like "This vase isn't worth $249.50," and "You can't be serious asking $89.95 for this picture frame." He was dumbfounded. His code had been cracked. I closed my encounter by telling him that I was the world's foremost expert on "antique monkey spit."

As things turned out, I came out ahead. First of all, I never forgot this fellow and his monkey spit. I've actually used that same method for recording frequencies and transmission schedules on certain occasions. Moreover, the concept of being able to put information into cryptic form which can be immediately retrieved without complex charts, tables, papers, and books has subsequently intrigued me.

I'm the first to admit that the antique dealer's convenient security trick didn't stay very secure once it was put under some analysis, but he found that it was suitable and had been using it "safely" for more than 15 years (he told me). This proved what I call "Brannigan's first law of message security": No code or cipher need be any more complex than the motivation or ability of a potential codebreaker to decode or decipher the text.

In tuning the shortwave bands over the past few years, I have noted the continuing presence of messages being sent in enciphered 5-digit groups, along with the immense interest these messages have generated within the realm of shortwave monitors. It does seem that such messages have come from several (or many) different sources and may well serve several (or many) widely divergent purposes from things as exotic as espionage and smuggling to those as mundane as banking and general commerce. Frankly, we must keep this in mind when trying to get an objective overview of such texts. I say this because it isn't too difficult to take the easy (and more exciting) view that these are all espionage messages, that they are all using the same method of encipherment, and that the method of encipherment is highly complex. Let's not get carried away with the notion that putting messages into the form of units of 5 digits (or letters) is, in itself, especially new or unusual; this has long been a very popular group length for enciphered texts. Fact is that although it may well appear that all of the 5-digit groups going out over the shortwave bands are related to one another in their method of encryption, more than likely they range from highly complex to grossly simple, all depending upon who is sending the messages, the purpose of the messages, who is going to receive them, and the nature of the messages and the need to maintain security.

Here's the author asking if you can figure out this message.

Perhaps those messages relating to espionage, military or diplomatic, or smuggling matters are in a 5-digit group format so highly complex that it would be virtually impossible for outsiders to comprehend their texts. On the other hand, most likely there are other 5-digit messages being sent for non-critical purposes where there is more of a de-

A	=	1	N	=	14
B	=	2	O	=	15
C	=	3	P	=	16
D	=	4	Q	=	17
E	=	5	R	=	18
F	=	6	S	=	19
G	=	7	T	=	20
H	=	8	U	=	21
I	=	9	V	=	22
J	=	10	W	=	23
K	=	11	X	=	24
L	=	12	Y	=	25
M	=	13	Z	=	26

Table 1: *Standard numeric equivalents for the letters of the alphabet.*

sire for privacy than a need for maximum message security. Externally, in their 5-digit group formats, all of these messages would (on the surface, at least) appear virtually identical.

A Simple Method

Let's see just how simple one of these messages might well be. It could be so basic that even the man from "Ye Olde Monkey Spit Shoppe" could read it "cold," without any delay, straight from his headset as it came off the shortwave bands. Here comes the message now:

40719 12475 23614 52524 85519 79888
32619 47816 61913 72835 27914 81320

A rather humdrum message, to be sure, advising him to "send shipment." Here's how uncomplicated this code can be.

First, let's assign each letter of the alphabet a number. Nothing fancy, 1 to 26 for A to Z, in order. The letter A equals number 1, B equals 2, C equals 3, and so on. These numbers become the last one or two digits in each of our twelve 5-digit cipher groups, a separate 5-digit group for each plaintext letter in our message. See Table 2.

Next, we note that while letters from A to I are represented by a single digit, those from J to Z require two digits, with J to S having a 1 as the first digit, and T to Z having a 2 as the first digit. This provides us with information on establishing the first digit in our 5-unit group. This first digit is the key to that particular group, advising whether to use the last digit alone when deciphering into plaintext, or if you are to use the final 2 digits. If an odd number is used in the first position, that means to regard only the final digit and disregard all others. If an even number is in the first position, that means to utilize the final two digits when converting back into plaintext. See Table 3.

You then have all of the first and fifth positions filled, and at least some of the fourth position filled. From there on, in all other positions are arbitrarily assigned random digits. These are "nulls," that is, numerals of no significance used to fill out the pattern and to make it more difficult for a cryptanalyst to discover the plaintext. See Table 4, which contains the final message received by our antique dealer friend. If he has spent a couple of hours in memorizing the numerical equivalents of the alphabet, he can immediately recognize the plaintext letters as they are transmitted. Numbers in the text would be spelled out in full.

Inasmuch as the numerals 1 and 2 can show up as nulls as well as significant digits in the fourth position, it adds some deliberate confusion to the cipher. Furthermore, since repeated letters (either adjacent to one another or within the same word or message) will have only 1 or 2 digits the same, they are not immediately apparent.

Even an espionage agent using such a code would not need any special training in cryptanalysis and would not require the maintenance of any incriminating one-time pads or other crypto materials laying about.

A Touch of Complexity

Without too much effort, this very simple cipher can be made somewhat more complex. For instance, the numerical equivalents to the letters of the alphabet could be randomized so that instead of A being assigned the numeral 1, B equalling 2, etc., A could be 24, B might be 18, and so on. Every sixth-digit group could be a null.

The digit 0 could be placed in the third po-

1	2	3	4	5
			1	9
				5
			1	4
				4
			1	9
				8
				9
			1	6
			1	3
				5
			1	4
			2	0

Table 2: *The numerical equivalents of the alphabet in positions 4 and 5.*

1	2	3	4	5
4			1	9
1				5
2			1	4
5				4
8			1	9
7				8
3				9
4			1	6
6			1	3
7				5
2			1	4
8			2	0

Table 3: *The key numbers (odd/even) advise whether to acknowledge only position 5 or positions 4 and 5.*

1	2	3	4	5
4	0	7	1	9
1	2	4	7	5
2	3	6	1	4
5	2	5	1	4
8	5	5	1	9
7	9	8	8	8
3	2	6	1	9
4	7	8	1	6
6	1	9	1	3
7	2	8	3	5
2	7	9	1	4
8	1	3	2	0

Table 4: *The completed cipher, including random nulls placed in positions 2 and 3 (and in some cases, position 4).*

sition to indicate a repeat letter (thus 87220 41015 could spell out the word "too").

The entire 5-digit group could be structured so that the key digit could be in any other position rather than the first position. The digits normally assigned to positions 4 and 5 could be shifted to any other two positions, or the entire 5-digit group could be sent in reverse (87220 would become 02278).

If the cipher was to be varied from one message or transmission to another, the first 5-digit group sent could contain all of the information required to determine the format, such as reversed, every sixth (or tenth, or whatever) group sent is a null, or any other deviations from the orignal format.

Certainly, efforts to unravel the original cipher or its more complex variants would eventually produce results by those who had the motivation, time, and knowledge to devote to the task, but it would be quite difficult. Furthermore, one would have to realize that the ciphered message was actually fairly simple rather than one (virtually identical in appearance) that was a highly complicated computer generated cipher, or one requiring one-time pads or other deciphering aids.

I don't offer this information to suggest that the cipher described here is actually in use by any of the many persons or organizations presently blanketing the shortwave bands with long strings of numbers. I am merely pointing out that at least some of these transmissions (depending upon their source/purpose) could actually be quite simple while still defying conversion to plaintext. This system could also be worked-up in a 4-digit format.

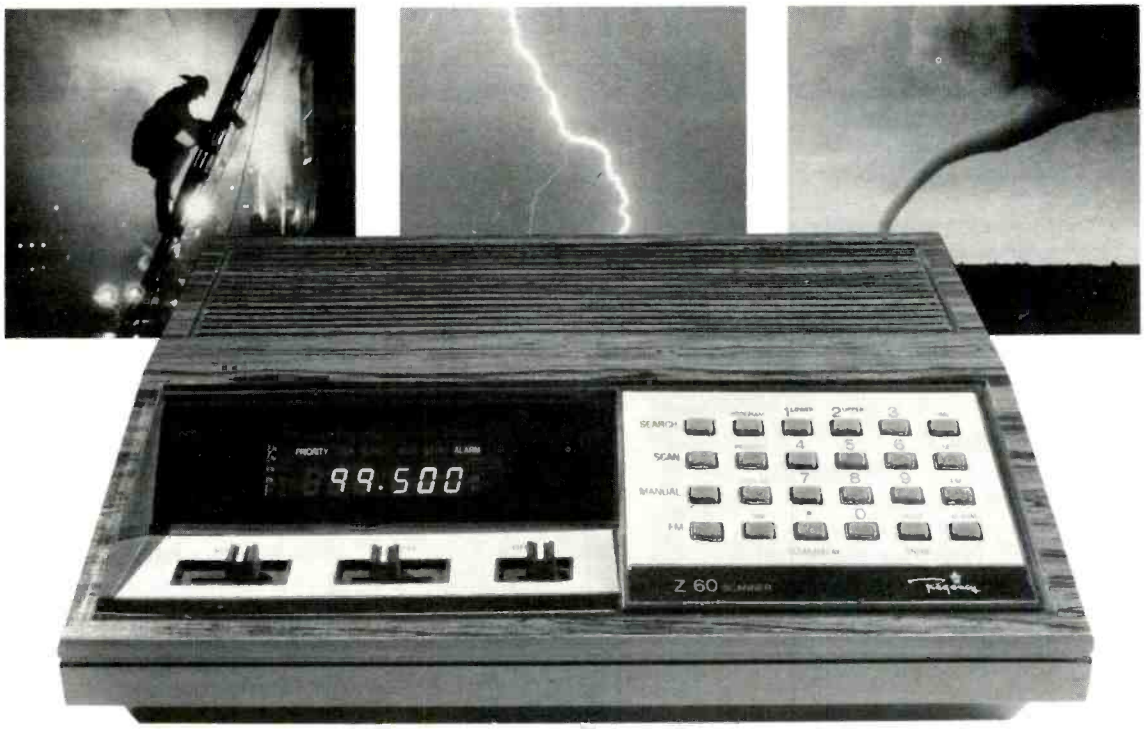
You may, depending upon your needs, wish to make use of the information here for your own purposes. If you want to pick a cipher other than monkey spit, then select any easy-to-remember 10-letter word or expression having no duplicated letters. Then assign each letter a number from 0 through 9. Sample expressions you might use are KING HEARTS, DOG BISCUIT, FLYING SHOE, WASHINGTON, or even DUMB CYPHER if you want to be unique—or pick any other suitable one. Cyphers are good for frequencies, schedules, appointments, telephone numbers, combinations to safes, etc., but only if you want to conceal the information from those who aren't going to try especially hard to find out your data. And, whatever you do, don't be obliging as the hapless antique dealer who unwittingly furnished the necessary key to unlocking his hidden messages.

As for the other alphabetic code described here, it has as many applications as it has variations by anybody with a little imagination and creativity. Wouldn't it be funny if the very next "spy numbers" message you copied off the shortwave could be "cracked" with it, without resorting to letter-frequency tables, lists of pattern or common words, or any of the other devices used by codebreakers—especially since such aids aren't going to be easily applied with this cipher.

For those wishing to get involved more deeply in either understanding or utilizing codes/ciphers, the author suggests joining the American Cryptogram Association, c/o Eugene Rogot, 9504 Forest Rd., Bethesda, MD 20014 (write to the ACA for current membership information). The ACA puts out a really fascinating magazine and all members adopt their own individual code name used when communicating with one another or writing for the group's publication. My own code name is—well, you can call me plain Alice Brannigan; I'm really just a *nice gal in a barn.* PC

Regency Scanners

bring you all the action... as it happens!



Regency Scanners bring you the local news . . . as it happens. From bank hold-ups to three alarm fires. It's on-the-scene action. While it's happening, from where it's happening . . . in your neighborhood.

You can even listen to weather reports, business and marine radio calls. Plus radio telephone conversations that offer more real life intrigue than most soap operas. And with some models, there's even more.

The Z family

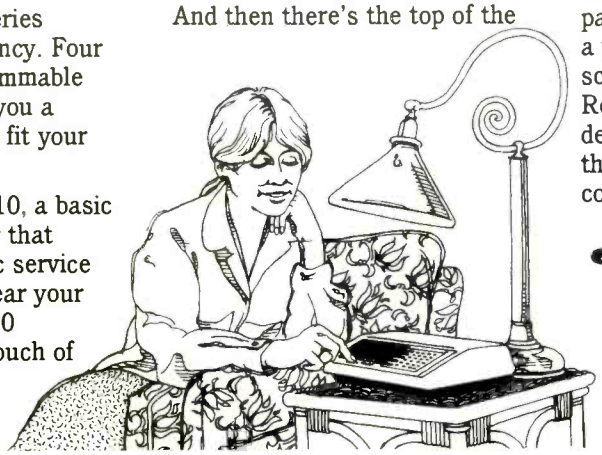
Introducing the Z series scanners from Regency. Four exciting new programmable scanners that offer you a variety of options to fit your personal needs.

First, there's the Z 10, a basic ten channel scanner that covers the six public service bands. It lets you hear your choice of over 15,000 frequencies at the touch of a finger. Or, if you prefer, locate new, active frequencies using the search function.

If you like the Z 10 but need more channels, step up to the Z 30. It gives you all the same features with a thirty channel memory and, surprise, a programmable alarm clock that stays on even when the power switch is turned off.

For the guy who wants to tune into the aircraft and tower transmissions, we've got the Z 45. It's got the same coverage as the Z 30 with the addition of the aircraft band with forty-five total channels.

And then there's the top of the line Z 60. It covers all the public service bands plus aircraft and FM radio broadcasts with sixty total channels.



Common to all the Regency Z scanners is a contemporary simulated wood grain cabinet and a bright, easy-to-read vacuum fluorescent display with prompting messages. They even come preprogrammed with frequencies so you can scan "right out of the box".

Backed by Regency

Regency stands behind the Z family with a full one year parts and labor warranty. And a tradition of building great scanners. So stop in your Regency dealer today for a demonstration, or write us at the address below for a full line color brochure.

Regency®
ELECTRONICS, INC.
7707 Records Street
Indianapolis, IN 46226-9989

CIRCLE 115 ON READER SERVICE CARD

ON THE LINE

BY GORDON WEST, WB6NOA

NEW AND EXCITING TELEPHONE TECHNOLOGY

"We Tried It!"

You can't believe everything you read these days. When it comes to modern electronic gadgets, the advertisements may say one thing, but the product may be something entirely different.

Here in California where I put together the "On the Line" column, we routinely test and try out these telephone gadgets and accessories to make sure they really live up to the expectations printed in the ads. I think you'll find some of our tests interesting.

This Month's Winner

An absolutely astonishing telephone plug-in handset is offered by Buscom, 490 Gianni Street, Santa Clara, California 95050 (408/988-5200). I saw this replacement handset offered by Dak Industries in their latest catalogue (1-800-DAK-0800). They call this handset the "Office Imposter." That's a silly name for a real business-type product.

The handset looks like any regular telephone handset, except it has a miniature key pad at the mouthpiece. You simply unplug your old handset and plug in the new Buscom unit using your existing curly cord. You have now added a powerful computer to your home or office telephone.

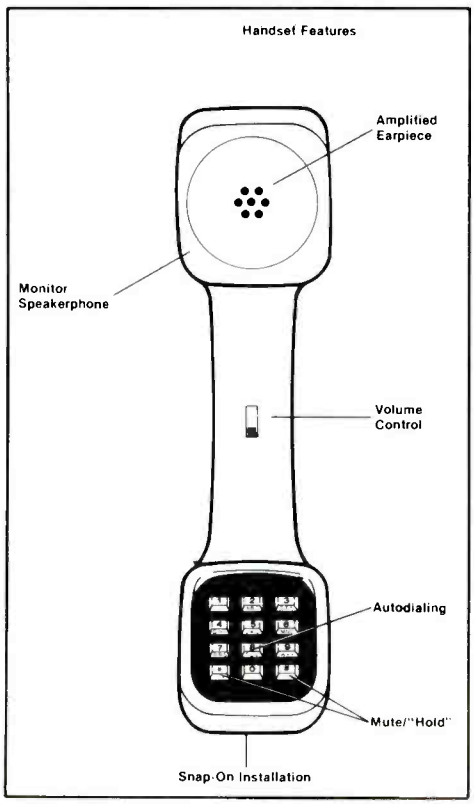
The first thing you will notice is that you have a loud handset, with the volume adjustable. If you are hard of hearing, or if there are a lot of background noises, simply turn the volume up—and it's loud!

Now take a look at the miniature key pad at the mouthpiece. It's a tiny computer that will memorize up to (count 'em) 80 phone numbers! Once you get the hang of it, you can easily store these numbers into any 1- or 2-button positions. You can even stack those extra long distance numbers that have multiple access codes—even to include the customary wait for the extra dial tone. Amazing as it may seem, everything is stored inside the handset with a 3-year backup battery built in and included in the unit as shipped.

Of course, if you just want to manually dial a number, you can push the tiny buttons on the handset instead of the regular phone apparatus. If the number is busy, you can redial it with the single push of a button.

Another great feature I liked about this product was the secret mute button. As the telephone caller is talking to you, you can silently block out your own voice so they won't hear anything at the other end. It's sort of like a "hold" feature.

In our tests, it only took me about a half hour to get the hang of how to store memorized numbers. (That's not bad for my diminished brain power.) It took me all of 5 seconds to connect, and both the talking audio and the received audio was clear as a bell.



The Buscom 80 Number Dialer phone.

You must get used to the somewhat tinny sound of the earphones—because it is run through a volume amplifier, it doesn't have quite the mellow sound of a regular telephone handset. However, you can even turn the volume all the way up and leave the unit on your desk and use it as a speaker phone.

For $89, it beats the heck out of conventional, bulky, 20-number memory dialers and has four times the capacity!

Glass Antennas

Lots of letters about whether or not those new "on the glass" antennas work for mobile phone systems. We tried them, and they do! Avanti Corporation developed the "on the glass" antenna years ago for the CB and ham community. Eventually they sold the "on the glass" antenna system to the Antenna Specialist Company, 12435 Euclid Avenue, Cleveland, Ohio 44106. Now sold through A.S. Dealers, a wide variety of glass antennas are available. Whether you plan to use it for your new cellular telephone, or simply for a CB antenna, ham antenna, or a scanner monitor antenna, the antennas are a snap to install. Double-sticky tape holds the tiny black box onto the inside of your windshield.

Super sticky tape and silicon seal hold the antenna base and the whip on the outside of the window. It takes about 15 minutes to set up the antenna on your automobile (or for that matter on the plate glass window of your home). Fine tuning of an adjustment screw allows the antenna to be perfectly matched to compensate for different thicknesses of glass. This capacity match is not a compromise—the signal instantly jumps between the two plates and you have a permanent antenna system that can be easily removed when you sell your car. Look Ma, no holes!

Speak To Me Baby

More and more telephone dialers and answering machines are going speech-synthesized. We had an opportunity to review the actual operation of the Technico (1328 Broadway, New York, NY 10001) Model SS-600 telephone with built-in speech synthesizer. The synthesizer reproduces voices with electronic components instead of recording the voices on tape. You can leave an outgoing message on this phone, synthesized, and hook it up to your own tape recorder to handle incoming messages. It's a great way to hide your identity; they'll never tell by your voice (unless you are a transistor). The same company also offers a 255-memory phone dialer. Instead of trying to remember that Aunt Lucy has been plugged into slot 207, you simply type in her name on the soft-touch alphabetic key pad and the phone will automatically bring her up on the line. We watched this in operation, and it indeed works. My problem is I have a hard time memorizing names.

New Phones

I am still trying out several models of 46/49 MHz cordless phones. Yes, the range goes further than the older sets because reception is quieter. Mike Santana with Fannon (15300 San Fernando Mission Boulevard, Mission Hills, California 91345) got me set up with their new FCT-246 cordless phone. The clarity beats the heck out of their older units. Calls came through loud and clear, and we were no longer annoyed by false ringing in the middle of the night.

Again, I implore that you not give in to any super-low-price advertisement for older frequency cordless phone setups. Spend a few more bucks and get a new 46/49 MHz unit that will make the advertised range.

The Federal Communications Commission is still studying the proposal by General Electric for a long-range UHF cordless telephone car telephone system called PRCS.

The Technico model SS-600 Telephone with Speech Synthesizer.

G.E. is presently testing this system in New York, and we had the privilege of talking over this experimental system in Las Vegas, Nevada. You simply hook up the transponder to your regular telephone. Now take a drive and place and receive phone calls through your own home system up to 5 miles away. If your home is on a hill, you might expect 20 miles.

If you wish to place and receive phone calls further than the 5-mile range, you can go on a community repeater that will extend the coverage. Everything goes through your home phone—no middle man.

As planned, the PRCS system will operate in the 900 MHz band and will have 133 channels for repeater and simplex communications. Modulation will use FM, and bandwidth will be a whopping 30 kHz for maximum intelligibility. Ten watts of power is proposed. If the FCC should give this system a green light, chances are you could get on the air with a long distance cordless phone set up for about $800.

That sure beats the heck out of the $3,000 cellular telephone service, if you only travel within 5 miles of your own home. However, if you are really serious about placing and receiving phone calls in your car throughout your community, a cellular telephone system is the only way to go. Expect prices for next year to drop below $2,000 for a complete cellular system. Monthly cellular rates, however, could go as high as $100!

Lots of new inventions when it comes to the telephone. A survey by AT&T indicates that if you work at home, your telephone is the most important asset for your home operation. I can buy that—I work at home, and without the phone, these articles would never get done.

My final thought for this month is to try out any piece of telephone equipment you are thinking of giving as a gift this holiday season. Most telephone sellers have the equipment hooked up for trial demonstration. Unless your phone "feels good," it's not going to please you every time you pick it up. Listen to the quality of both the talking and listening sounds. Check the warranty in case it should die prematurely. Keep all of your receipts, and take advantage of some of the finest in modern technology—smart phones.

TUNE IN TO A FASCINATING WORLD OF RADIO LISTENING

What makes shortwave reception different from ordinary broadcast reception? The type of broadcast stations that you are most familiar with transmit their signals using so called "ground waves." Shortwave radio, on the other hand, makes use of the ionosphere to reflect signals 125 to 150 miles above the earth. Acting in a mirror-like fashion the ionosphere enables shortwave signals to travel great distances. This effect allows shortwave listeners to hear a fascinating mixture of cultural information, music, and news from all parts of the globe.

Modern SW receivers are as easy to use as regular AM-FM radios and signal reception can be downright outstanding; especially at night, and in the winter months. Today, shirt-pocket models are available that pull in signals quite admirably, and make very excellent travelling companions.

Because of modern technology, it isn't necessary to spend a lot to enjoy this hobby. Very good performance can be had for $60 to $250. Antennas, accessory items, and publications all can add to your enjoyment at moderate prices as well. Another key factor to keeping within your budjet is to *ASK QUESTIONS!*

Shortwave listening clubs exist around the country and they tend to enhance the social aspect of SWL'ing through get-togethers and rapid exchange of current information, (often over the phone while something exciting is being monitored by one or more club members).

ANTENNAS ARE IMPORTANT...

RANDOM LENGTH WIRE

PORTABLE WHIP

DIPOLE

3 BASIC TYPES OF ANTENNAS

Random Length Wire: This is the simplest type of antenna for receiving. In general, the longer the wire, the stronger the received signals. For indoor use, 15 to 20 feet of wire will serve as an antenna. Outdoors, experimenting with various lengths will produce maximum reception for certain bands. When a given length of wire produces maximum reception, you have a "tuned antenna."

Portable Indoor: When you live in an apartment building, or have limited outdoor space, indoor antennas might be considered. Some types are "passive" and some are "active." Active antennas gather the available signal through a metal rod and electronically amplify it before feeding it to the receiver itself.

Tuned Dipole: Another type of outdoor antenna takes full advantage of being tuned to a given set of shortwave bands. In general, reception is greatest at right angles to the antenna and poorest at the ends.

GLOSSARY OF SHORTWAVE TERMS

AM Amplitude Modulation. The type of voice transmission used by most international broadcast stations.

Broadcast station A radio station that provides news and music for public entertainment and information.

CW Continuous wave. A type of radio transmission used to send information via morse code.

DXer A more serious SWL who is typically also interested in non broadcast stations.

LW Long wave. The band of frequencies found below the broadcast band. Usually not much there for the typical SWL.

MW Medium wave. The band of frequencies where your local AM stations are heard.

PLL Phase lock loop. The latest in receiver design to assure stability & accuracy of reception.

RTTY Radio Teletype. A type of data transmission requiring special decoding.

Selectivity The ability of a receiver to focus in on a signal while rejecting others.

Sensitivity The ability of a receiver to hear weak signals.

SSB Single side band. A type of voice transmission used mainly by hams, military and non broadcast stations.

SW Short wave. Simply the frequencies that exist between .5 and 30 MHz.

SWL Short wave listener. Someone who listens to international broadcasts.

HERE ARE SOME INTERESTING FACTS ABOUT SW LISTENING!

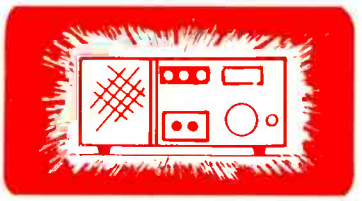
- English is the most popular language on the shortwave bands. It is sent out on more than 1000 frequencies.
- Broadcasters in nearly 40 countries on all continents (except Antarctica) beam English Language broadcasts to North America.
- More than 4450 frequencies are used in 148 languages.
- 20,000 hours of programming is broadcast worldwide *each week!*
- Over 18,000,000 SW sets have been sold in the USA in the last 10 years.

DEPEND ON SPECTRONICS FOR ALL YOUR RADIO NEEDS

THINGS YOU CAN HEAR

- **International News** BBC is regarded as one of the world's most objective news sources. Radio Moscow on the other hand, well...
- **Music** The fidelity isn't so great, but it's still enjoyable.
- **Sports** You can still hear the World Series and Super Bowl even if you are out of the country.
- **Religion** Many inspirational broadcasts can be heard daily.
- **Governments** Embassies, Military, Intelligence, Space Flights, and plenty more.
- **Third World Guerilla Forces** The good guys and the bad guys all use radio to appeal to the population.
- **Pirates** The radio kind, that is. An ever -growing activity is illegal broadcasters having fun on the air waves while Uncle Sam runs ragged trying to shut them down.
- **Smugglers** Radio communications plays an important part in the illegal activities of drug smugglers.

SELECTING A RECEIVER...



Without getting too technical, here are some features that modern SW receivers have that were unheard of only a few short years ago:

Compact Size: Gone forever are the old tube type receivers that were the size of a small refrigerator! Today, you can tune in the world with shirt pocket models. Typical desk top units are similar in size to FM stereo receivers.

Digital Readouts: No more guesswork. The exact frequency is always displayed in large, easy to read numerals. Only the smallest shirt pocket models lack digital displays, and that will also change one day soon.

PLL: Phase Lock Loop electronic circuitry insures absolute no-drift performance. Re-tuning the receiver every few minutes is a thing of the past.

Scanning: Now your receiver can scan through thousands of frequencies automatically. The spies and smugglers can't hide on the airwaves as well these days.

Memories: Instant access to preprogrammed frequencies is commonplace today. When you find something interesting, plug it in a memory bank and come back to it any time you wish.

Modern receiver technology has literally put the world at your fingertips. A benefit of this is that you don't have to be an expert to pick a good receiver. We offer you receivers specifically chosen for performance and value. Choosing your first receiver need not be traumatic if you keep a few simple points in mind.

First, determine your type of listening. Will you be listening to foreign news and music for relaxation and enjoyment, or will you be spending hours searching for the weak ones and specialty stations?

Second, consider what fits your budget. Typically when you pay more money you get improved selectivity, stability and creature comforts. A $500 receiver doesn't hear twice as much as one for $250.

Once you have narrowed your choices and are ready to take the plunge, give us a call. We will put our years of radio experience to work for you.

SCANNER WORLD, USA

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

Special

The Regency D310

30 Channel Automatic/Programmable Scanner

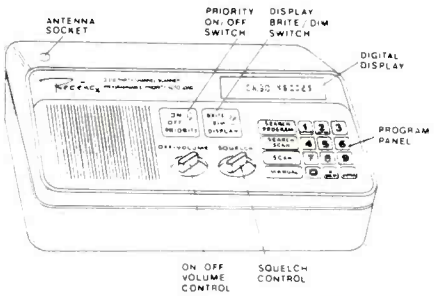
FEATURES

- ***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)
REGENCY POLARIS MT-5500XL Marine	214.99 (5.50)
REGENCY R1050 AC 10 Chan. Programmable	116.99 (4.00)
REGENCY C403 AC 4 Channel Crystal HLU	66.99 (4.00)
REGENCY Z-30 — 30 Channel Digital	172.99 (4.00)
REGENCY Z-10 — 10 Channel Digital	146.99 (4.00)
REGENCY MX5000 All Band Scanner	369.99 (5.50)
REGENCY D100 10 Channel Ditigal	138.99 (4.00)
REGENCY MX3000 30 Channel Digital	186.99 (4.00)
RCD Listen-In	38.99 (3.00)
REGENCY R106 AC/DC 10 Chan. HLU Crystal	96.99 (4.00)
REGENCY D810 AC 50 Chan. HLU & Air Digit.	249.99 (4.00)
JIL SX-100 16 Channel Scanner	159.99 (4.00)
JIL SX-200 16 Channel Scanner	269.99 (4.00)
RUSSELL Digi-10 Russcan Hi/Lo Handheld	114.99 (3.00)
FANON M8HLU 8 Chan. Mini Mobile Crystal	99.99 (4.00)
FANON PSK-1 AC adapter for M8HLU	12.99 (*)
FANON SlimLine 6 HLU Handheld Crystal Scanner	103.99 (4.00)
FANON CHB-6 Charter/AC Adpater for Slim 6	12.99 (*)
FANON CAT-6 Carrying Case with Belt Clip	11.99 (*)
FANON AUC-3 Autolighter Adapter/Charger	12.99 (*)
FANON SCMA-6 Mobile Adapter/Charger/Amplifier for Slim Line 6 HLU	38.99 (3.00)
FANON PSK-6 Base Power Supply for SCMA-6	14.99 (*)
BEARCAT* 350 AC/DC 50 Channel	394.99 (5.50)
BEARCAT* 5 HLU AC Crystal Scanner	94.99 (4.00)
BEARCAT* FIVE-SIX Pocket Scanner	126.99 (4.00)
BEARCAT* SP-55 Carry Case for BC5/6	12.99 (*)
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)

CIRCLE 52 ON READER SERVICE CARD

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

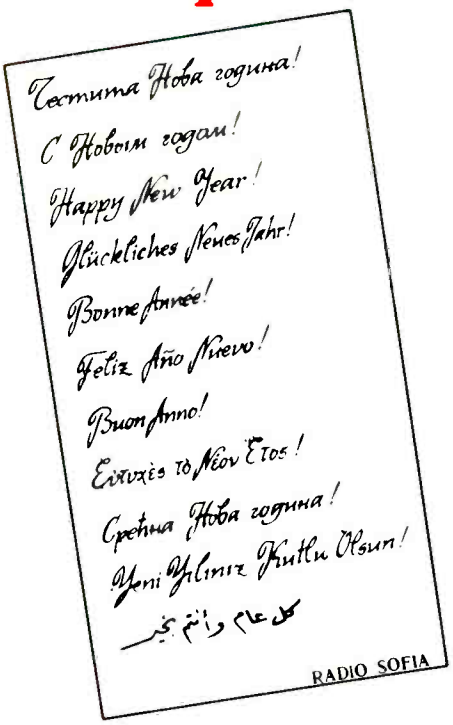
Add ($) per scanner, and $3.00* for all accessories ordered at same time. C.O.D. shipments will be charged an additional $3.00 per package. Full insurance is included in shipping charges. All orders are shipped by United Parcel Service. Shipping charges are for continental USA only. Outside of continental USA, add $15.00 per scanner.

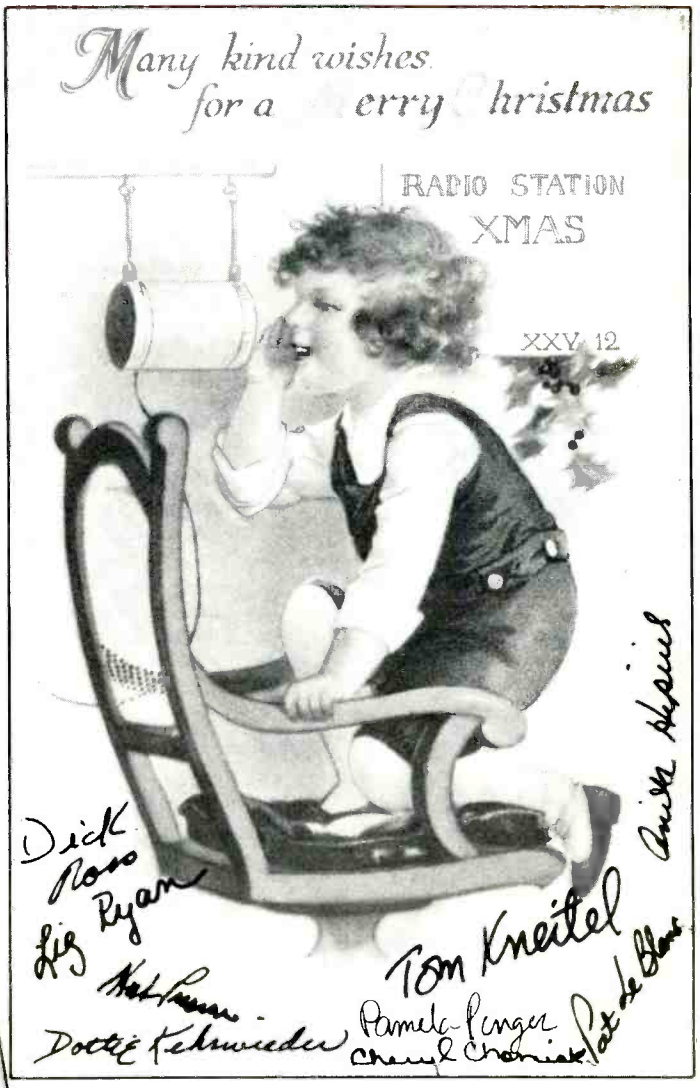
Scanner World, USA

10 New Scotland Ave, Albany, NY 12208

(518) 436-9606

Happy Holidays from the Staff of Popular Communications





Wij wensen U prettige Kerstdagen en een voorspoedig Nieuwjaar
With our best wishes for a Merry Christmas and a Happy New Year
Feliz Navidad y Próspero Año Nuevo
Nous vous souhaitons un joyeux Noël et une bonne année
كل عام وانتم بخير
Selamat Hari Natal dan Selamat Tahun Baru
Nossos votos de Boas Festas e feliz Ano Novo
Nos ta deseabo bon Pascu y bon Anja Nobo
Switi Kresneti nanga boen Njoen Jari

RN **Radio Nederland Wereldomroep**

Santa's Little Helpers

The new Sony ICF-2002 is here! From one of America's largest Sony SWL dealers.

Reg. $249.95
INTRODUCTORY SPECIAL
$214.95
Plus $3.00 UPS

AVAILABLE NOW!

MAKE WAY FOR THE NEW LEADER IN SW!

After selling over 1,000 ICF-2001's we didn't think Sony could top this performer, but they did!

FEATURES

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

SPECIFICATIONS

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

SUPER CLOSEOUT!

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

SONY ICF-6500W

This May Be Your Last Chance!

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

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

PANASONIC RF3100

$269.95
+ $6.00 UPS

- **PLL Synthesized • Digital Display**
- **.5-30MHz+AM/FM • Wide/narrow filters**

★★½ Our most popular table model SWL receiver. Selective & sensitive. About all the casual SWL will ever need. Built-in, or external antenna capability. Stable for dabbling in SSB. Easy to use, even for big fingers. Recommended for those who don't want to spend big $$ but want a decent receiver.

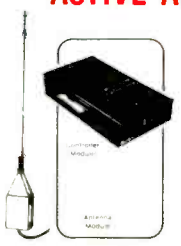
NEW! PANASONIC RFB600

ONLY
$424.95
+ $7.00 UPS
List Price $599.95

- **Digital Display • Wide/narrow Filters**
- **PLL • Dual Voltage • Sounds Great**

★★★ All the convenience features of the more expensive units plus a pleasant surprise...performance. It is fast becoming our most popular mid-price receiver. Ideal for all types of listening needs.

SONY AN1 ACTIVE ANTENNA



- 100KHZ-30MHz
- Remote 59 inch Telescoping Whip
- Battery or Optional AC Powered

$74.95
+ $3.00 UPS

When you're stuck in an apartment with no other choice, this may just be the answer. The unique design offers numerous mounting & hook up options. You will be surprised how well it works.

POCKET PORTABLES

RFB50

$124.95
+ $3.00 UPS

- $4^{7}/_{16}$Hx$7^{1}/_{4}$Wx$1^{5}/_{16}$"D
- AM, FM+8 SW bands
- Dual selectivity

PANASONIC RF9

$84.95
+ $3.00 UPS

- AM/FM+75,49,31,25, 19,16,13mtr SW
- $2^{7}/_{8}$Hx$5^{3}/_{8}$x$1^{1}/_{8}$"D
- Only 7.1 ounces

FREE!

With any radio purchased from this ad, you will also receive a FREE copy of White's Radio Log!

SONY ICF6800W

SALE PRICE
$529.95
+ $8.00 UPS
$ List

- **Digital Display • Wide/narrow Filters**
- **PLL • Dual Voltage • Sounds Great**

★★★ This long time favorite is ideal for listening to your favorite SWL broadcast station. Selective enough to remove most annoying interference and it has excellent audio for taping your favorite news or music program.

FAMOUS "EAVESDROPPER" SWL RECEIVING ANTENNA

ONLY
$54.95
+ $3.00 UPS

- Automatic bandswitching
- Completely weatherproof
- 60,49,41,31,25,19,16,13 & 11mtrs.
- Complete, no assembly needed

All the world's shortwave broadcast bands are yours with the Eavesdropper All-Band antenna! Individually tuned traps make the Eavesdropper work like seven separate antennas, each tuned to a different international broadcast band. Its 100 foot, 72 ohm balanced feedline provides an exact match to the antenna on every band. Completely assembled, and ready to install with 50 ft. of 450 lb. test nylon rope. Overall length: 42' 10". Wire: #14 copper. Bandswitching: Automatic, impedance to rcvr: 50-75 ohms balanced.

SPECTRONICS, INC
1009 GARFIELD STREET, OAK PARK, IL 60304
(312) 848-6777

MasterCard VISA

CIRCLE 63 ON READER SERVICE CARD

SURVIVAL

BY R.L. SLATTERY

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Scanning For Survival

If there were ever a device which seemed to be devised with emergency use and survival applications in mind, then it's probably the VHF scanning receiver. The scanner gives its user the opportunity to quickly check out the action on multiple (4 to 50 or more) different frequencies—police, fire, federal, aero, maritime, county, state, EMT, transportation, and all others of interest.

Since scanners come in base/mobile and even hand-held models, there's hardly an application they can't fill. Moreover, the current breed of scanners are mostly of the programmable persuasion, and that means you don't have to shell out anywhere from $2.95 to $8.95 for a plug-in crystal for each frequency you want to monitor.

Those seriously interested in monitoring during wide-area emergency situations (such as forest fires, earthquakes, severe weather, etc.) have easily determined the wisdom in being able to listen in on the conversations of law enforcement and fire agencies. Unfortunately, these same people frequently overlook the potentials in monitoring forestry and environmental agencies, highway maintenance agencies, fish and game wardens, National Guard frequencies, bridges and tunnels, power utilities, port and harbor operations, search and rescue groups, and even civil defense operations. This is a reminder that, in times of trouble, a vast number of frequencies come into play. Unless you realize this and are fully prepared to monitor all of the known emergency-situation frequencies in your area, you're going to be getting only a small fraction of the available information input you require to know what's *really* going on.

Scanners are currently being produced by Electra (Bearcat), J.I.L., Regency, Radio Shack (Realistic), and Fox. Surely within the extensive model lines offered by these suppliers there is a scanner that will meet your needs and your budget.

A book called *The National Directory of Survival Radio Frequencies* covers virtually all of the emergency frequencies (5,000 in all) used throughout the 50 states, offering listings between 179 kHz and 470 MHz. This includes the hard-to-find forestry conservation, park, fish and game, and highway maintenance channels assigned to each state, as well as state police, fire, CD, and many other agencies. This book is only $6.95 (plus $1 postage) from CRB Research, P.O. Box 56, Commack, NY 11725.

Protect Yourself From Radiation

Radiation can't be seen, heard, smelled, or felt—but it's deadly. Without scientific measuring equipment, there is no way to know if your home, school, business, or plant site may be exposing you to dangerous levels of radiation.

Mountain West Alarm is proud to announce Monitor 4—a reliable, compact, and inexpensive radiation-measuring instrument that makes the old-fashioned geiger counters obsolete. It does everything those heavy and costly devices of the past could do, yet it fits in a shirt pocket and operates on a 9-volt transistor battery for 2000 hours of protection. Alpha, beta, gamma, and X-radiation are accurately measured in milliRoentgens per hour (mR/hr). Three selectable range settings allow the scale to read radiation intensities of 0-.5 mR/hr, 0-5 mR/hr, or 0-50 mR/hr.

Catastrophic sources of radiation such as nuclear accident or attack are well-known, but what about minor sources like pottery, smoke detectors, building materials, timers, watch dials, and the chemicals used in hospitals and laboratories? Depending on your location and altitude, everyday background radiation can be expected to produce 5 to 25 counts per minute, which is a fraction of the level established by the government as "safe" for U.S. nuclear workers. The Monitor 4 is so sensitive, however, that even this "safe" level will cause a pronounced change in the beeper and a dramatic rise in the meter pointer.

A state-of-the-art measuring instrument, the Monitor 4 is reliable enough to be used in research, education, and industry, and convenient enough for personal protection in laboratories, schools, businesses, and homes.

Monitor 4 comes with full instructions for measuring each type of radiation.

For more information, call or write: Mountain West Alarm, 4215 N. 16 St., PO Box 10780, Phoenix, Arizona 85064-0780.

Preferred Frequencies

In this month's mailbag we have an inquiry from Harry, SSB-677-B, of Cayuse, Oregon, who asks if there are any special CB channels that have been set aside or are suggested for use by survivalists. There aren't any FCC-designated channels, Harry, but the trend has been for AM operations by survival groups (and individuals) to take place on Channel 7 (27.035 MHz). SSB operations (which look to be your own personal mode of preference, based upon your SSB Network ID) relating to survival are most often encountered on Channel 36 (27.365 MHz LSB). There's really nothing stopping an operator from using any established channel between 26.965 and 27.405 MHz, however the two frequencies noted above are where you're most likely to encounter others sharing your own interests—just like Channel 19 (27.195 MHz) has long been unofficially used as the channel where in-transit vehicles operate or Channel 14 which has traditionally been occupied by youngsters. Likewise, maritime users sometimes flock to Channel 13 (27.115 MHz).

In any event, try not to use SSB on any frequency between 26.965 and 27.295 MHz (except Channel 16, 27.165 MHz), nor AM between 27.305 and 27.405 MHz. AM and SSB don't mix well on the same frequency and it is only by voluntary cooperation and mutual respect for the integrity of the two transmission modes that maximum communications can be realized. Unfortunately, the FCC has never wished to establish official separation of these two transmission modes within CB, despite repeated requests by the operators for rules to be set up.

It might be of interest to AM and SSB operators to try to work out plans for local or regional operational drills on Channel 7 (AM) and Channel 36 (LSB). In an emergency situation, such operational facilities could be of significant benefit. Monitor these channels for such operations, and if you hear other survivalists on the air, then join in the conversation. Or, if you don't hear any of the desired communications, pop onto the channel and ask if anybody's around! PC

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

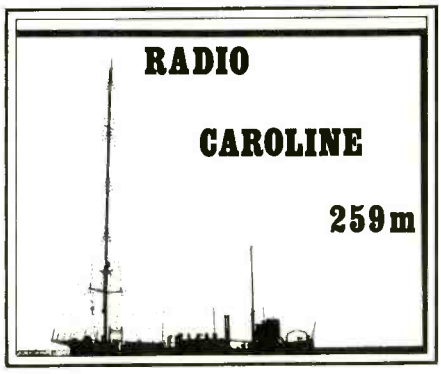
BY DARREN LENO, WDØEWJ

An Egg Harbor, New Jersey man was indicted this past summer by a federal grand jury and charged with fraud. James G. Ryan, financial director for Simor Establishment, was charged with defrauding people who had invested in Radio Caroline, an unlicensed pirate broadcasting ship.

Back in 1981, Simor Establishment, the owner of Radio Caroline, began looking for American investors to help convert a vessel into a radio ship. Federal investigators got into the act the following year when investors began complaining that they had only received $100,000 of their principal investment, rather than the $1 million personally guaranteed by Ryan, and no percentage of Radio Caroline's profits as promised them.

The indictment also accuses Ryan of using $60,000 of the investor's money for his own use, and not informing the investors that $330,000 originally planned for Radio Caroline had been returned to his control.

If convicted of the charge, Ryan faces a maximum penalty of 60 years in prison and a $39,000 fine.



Radio Caroline is mixed up in an investment scandal that has cost backers hundreds of thousands of dollars.

was closed by FCC officials, but another which hopes to "fill the void" left when the original was forced off the air. There were two DJs with north eastern accents that played rock music and comedy skits.

Samurai Radio: Keith Hill of New York tuned into this pirate on 7375 kHz after 2350 GMT. Music by Rod Stewart was being played. Reception reports can go to PO Box 982, Battle Creek, MI 49016.

Spectrum World Broadcasting: Was broadcasting on 6272 kHz and 7710 kHz in parallel when Nolan Stephany of New York heard them after 0500 GMT. Although reception was weak, Nolan managed to hear some dialogue on Americans in WWII, maybe a documentary.

Voice of Bob: This station is one of the more interesting pirates to come along in quite awhile. The name is certainly original.

In Ohio, George Zeller tuned into the Voice of Bob on 7427 kHz after 0100 GMT. The program began with music from the 1960's, and then went into a lengthy testimonial about "Bob," a man gifted with mystic sales ability. Reports to to PO Box 5074, Hilo, HI 96720.

Voice of Laryngitis: Fred Roberts of Ohio noted the VOL on 7410 kHz after 0300. John Santosuosso heard them on 15050 kHz after 2300 GMT. The program-

Pirate Bandscan

KLS: Gary Criteser of Michigan noted KLS on 6915 kHz after 0300 GMT with a good signal. He thought he heard a DJ mention that this was the "Key Largo Show."

KLS has also been heard operating on 7440 kHz.

KMA: Doctor Why, the host of a recent KMA broadcast on 7405 kHz after 0200 was heard identifying his station as "KMA . . . on your shortwave dial from a transmitter on a Space Invaders game in Peoria." Nolan Stephany of New York reports that Dr. Why claimed this was KMA's last broadcast because the transmitter had to be sold to pay his phone bill.

KPRC: Jon Morrison heard KPRC on 7433 kHz after 0320 GMT. KPRC is also frequently heard on 1616 kHz, and on 91.5 MHz FM in New York City. Andy Bohn of Ohio heard KPRC after 0400 GMT.

KQRP: Michael Moore of Texas heard KQRP on 7441 kHz after 0513 GMT. The station was broadcasting the radio play "1984."

Radio Jupiter: a/k/a the Minority Association, this pirate was noted by John Santosuosso of Florida on 7430 kHz after 0500 GMT. In the June, 1984 issue of *POP'COMM* (p. 67), we reported in this column that "public notice" stickers advertising this station had begun to appear in Philadelphia. They asked reception reports be sent to PO Box 42678, Philadelphia, PA 19101.

Radio Free Insanity: Not long ago, I received a phone call from Radio Free Insanity alerting me to their broadcast on 7430 kHz after 0400. This is not the original RFI that

To: Darren Leno 117-37th Ave. South Moorhead, MN. 56560

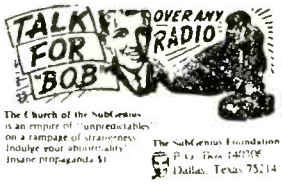
This will Confirm Reception of THE SECRET MOUNTAIN LABORATORY,LTD.

On the following Date and Time; June 17, 1984 from 05:29 to 05:38* UTC 7432 khz

THE SECRET MOUNTAIN LABORATORY is a shortwave relay station and is currently rebroadcasting the following free radio stations:

KFAT, 'the FAT one, a medium wave station;

THE VOICE OF BOB,



The Church of the SubGenius is an empire of "unpredictables" on a rampage of stupendous indulge your absurdicality" insane propaganda $1

The SubGenius Foundation P.O. Box 140306 Dallas, Texas 75214

And others.....

Thank you for your report. We hope you can tune in again to our next broadcast. Too bad we can't tell you when it will be. Oh Well!

73fr from

THE SECRET MOUNTAIN LABORATORY,LTD.

ming consisted of the clever and well done comedy skits that has made this pirate so popular.

Voice of To-morrow: In Washington, Iowa, Tom Eicher received the VOT on 15.040 MHz from 1515 to 1555 GMT. Tom commented that the programming was of a racist nature. The program ended with a wolf's cry. The address announced on the air was PO Box 20039, Ferndale, MI 48220.

WBST: This pirate was heard on 7426 kHz after 0400 GMT by Michael Moore. Their slogan is "WBST brings out the beast in me."

WBBH: "From the Courtland School of Music in New Jersey, this is your station for the arts, WBBH." Arthur Pym of Washington, DC heard this pirate on 4860 kHz after 0000 GMT.

WKRU-SW: This pirate was operating on 6953 kHz after 0220 GMT when Robert Horvitz of Rhode Island tuned in. He heard an announcement that was repeated several times: "WKRU-SW operates on a frequency of 6825 kHz. WKRU is a member of the R.K.K. radio network." Robert then checked 6825 kHz, but heard nothing. No address was given.

WTVI: George Zeller noticed a suspicious carrier intermittently on 6980. He kept watch on this frequency, and at 0033 GMT, he heard this announcement: "Stand by—WTVI coming on frequency." This was followed by a number count, but no serious programming was heard.

Euro-Pirates

Podney Sixe in Cornwall, England writes to fill us in on what's happening overseas.

Station 41 recently made a return to the airwaves on 7375 kHz from 0800 to 1100 GMT, with DJs Rick Devlin and Mark Evans. Their address is 7 Chantry Ave., Hartford, Northwich Cheshire, England CW8 1LZ.

WABC Leicester is a new pirate that has made two broadcasts so far on 6240 kHz. Programs so far have featured tapes of old offshore pirates, including Radio Veronica and Radio Mi Amigo.

WVLR, the Voice of the Lone Ranger, was noted on 7330 kHz until 1000 GMT with a U.S. accented DJ named Hank, who played country and western music. They claimed to be broadcasting from a ship called the MV "Trigger" in the Bay of Biscay, on their way to the North Sea where they would begin testing on 981 kHz and shortwave prior to commencing 24-hour broadcasts. I am inclined to believe this was an interesting hoax.

The U.S. based pirate, Radio USA, was heard on 7320 kHz from 1030 to 1100 GMT. They were relayed by the English pirate, Radio Apollo Int'l.

Radio Rabbithole made a broadcast live from (you guessed it) a rabbit hole in the heart of Birmingham on 7315 kHz after 1100 GMT.

There are currently three West German based free radio stations providing very good signals in England: Radio Batida on 7320 kHz, Radio Big Brother on 6225 kHz, and Radio 101 on 7445 kHz.

FM Pirates

Listeners near the New York City area should tune carefully for the following semi-active FM pirate broadcasters:

KPRC	91.5 MHz	0400 GMT
Music Radio 92	91.5 MHz	0230 GMT
Stereo Nine	91.95 MHz	0445 GMT
WHOT	91.5 MHz	evenings
WTNT	91.9 MHz	0200 GMT

Keep a close watch on 91 MHz for these and other pirate broadcasters. NYC FM pirates are, overall, quite professional sounding. If you're not familiar with your FM dial, these pirates could be easily mistaken for legitimate radio stations.

This list was compiled from loggings by Al Spremo and Mike Pollock of New York.

In Conclusion

If you're lucky enough to live in Minnesota, you are eligible to join the Minnesota DX Club. MDXC is a friendly organization providing fraternity between DXers in that state. For more information, send an SASE to MDXC, Dept. PC, 5212 Drew Ave. So., Minneapolis, MN 55410.

Anyone seeking more information on the various shortwave clubs operating in North America today should send 25 cents and an SASE to ANARC Club List, 1500 Bunbury Drive, Whittier, CA 90601.

Back Scatter is a newsletter published by the Over-The-Horizon (OTH) Radar Committee, who investigate and report news and developments on OTH radar. Most SWLs are familiar with OTH radar in the form of the "Russian Woodpecker." Back Scatter is published periodically, and may be obtained by sending an SASE and a 30 cent stamp (or coin for as many issues as you would like to receive) to Robert Horvitz, Dept. PC, 54 East Manning St., Providence, RI 02906.

Radio listeners interested in receiving the latest news on pirate, clandestine, and spy number transmissions should write the Association of Clandestine radio Enthusiasts. It is well worth your while to check this organization, now in their third year of operation. Send an SASE for information, or $1.00 for a sample of their newsletter to A*C*E, Dept. PC-11, Moorhead, MN 56560.

Thanks to all who participated in this month's column. Please send your pirate loggings, QSL reprints, etc., to the Pirates Den, c/o Popular Communications, 76 N. Broadway, Hicksville, NY 11801.

Remember, most pirates operate on weekend evenings. Pay close attention to frequencies mentioned above, particularly 7425 kHz, then report back to us what you've been hearing. Happy listening! PC

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

Asheville's Radar Guns Flunk Tests

Seven of the Asheville, North Carolina Police Department's nine speed device models flunked tests conducted for the Law Enforcement Standard Laboratory of the National Bureau of Standards. But local police officials say the failing grades will have little effect on the department until new models are put in use.

"We don't do that much radar detection," Chief Fred Hensley said. "We needed some new equipment anyway."

The National Bureau of Standards lab approved 24 models, two of which Asheville police use. The other seven have been permanently assigned to an equipment room inside police headquarters and the department will order four approved units.

The regulation upgrading radar performance specifications was recently adopted by the state Criminal Justice Standards Division on a recommendation by the National Highway Traffic Safety Administration. State legislation requires that the federal speed detection program serve as a minimum for North Carolina's own.

The regulation, effective August 1, 1984, rendered 13 models obsolete, according to Justus C. Rudisill Jr., director of the state Criminal Justice Education and Training Standards Commission. Just how much this will cost local departments has not been determined, but the commission recognized "that there will be a number of pieces of equipment that will be taken out of active service," Rudisill said.

Many of the speed devices nixed by the regulation were given to local agencies several years ago as a result of the Governor's Highway Safety Program, Rudisill said, indicating that some of those departments won't actually lose money because of the change.

Man Loses First Round Against Radar

Paul Lutus, of Sunny Valley, Oregon, is a recognized expert in fields like electronics and computers—and, more recently, police radar. He was in Jackson County District Court recently fighting another round in his four-year crusade against the microwave-emitting speed-calculating devices.

On his last flight, he complained about possible health hazards with the radar equipment. This time he focused on the effectiveness of the devices.

Unfortunately, even though Lutus testified that radar is inaccurate and easily affected by outside interference, District Judge Ray White pronounced Lutus guilty of going 45 mph in a 30 mph zone.

"The question was, whether radar is right more often than it is wrong," White said afterwards. "And I believe an unbiased expert would tell you that it is right more often."

In 1980, Lutus launched a campaign against the use of radar, insisting that police radar units emit microwaves at levels that far exceed those allowed by the federal government in microwave ovens.

Since then, the world-renowned computer programmer says he has studied radar rather extensively.

Judge White, in finding Lutus guilty of the offense, said he went by testimony about what the officer saw, combined with the radar reading—not just what the radar unit said. He didn't consider radar to be on trial.

Lutus, who was represented by Grants Pass lawyer Richard Lane, said after the trial that he didn't think justice was "all that hot" in Jackson County. He fought the ticket because municipalities are relying more and more on revenues from traffic offenders.

Also, "The police are getting complacent about the use of radar because no one ever challenges it," Lutus said.

Golden Gate Bridge Directors Want Radar To Stop Speeders

The Golden Gate Bridge board of directors voted to ask the Highway Patrol to use radar to catch speeders on the bridge.

San Francisco director Quentin Kopp, who proposed the radar watch, said a reduction in the speed limit from 50 mph to 45 mph last fall produced a significant drop in the number of accidents on the bridge—but it was still not good enough.

"There are still many motorists who do not comply with the 45 mph speed limit," he said. He said he thought that the use of radar would have an effect, but that the CHP would not act unless the bridge district made a request.

CHP spokesman Michael O'Brien stated, however, that the Highway Patrol was not sure radar would work on the bridge and would not act until it could make a study of the matter.

"Radar works by reflecting impulses off metal, and we are not sure it would work on a bridge that has steel railings," O'Brien further commented.

If the radar system is found to be practical, the bridge district would pay for installation, which is expected to cost $10,000.

Car Is Great Witness

The defendent told the judge she was innocent of speeding—her car wouldn't go that fast! So Metropolitan Judge Burt Cosgrove in Albuquerque, New Mexico decided to see for himself. Cosgrove and several police officers escorted Kristi Miller, who was cited for traveling 70 mph in a 40 mph zone, to the interstate to test-drive her car.

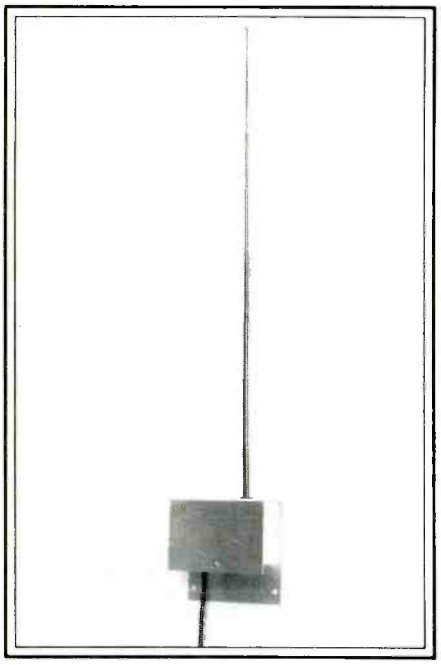
The vehicle succumbed to radiator trouble before officers could even clock it on radar. Cosgrove dismissed the citation.

"She told me that car couldn't go that fast," the judge said. "She didn't say it couldn't go at all." **PC**

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

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



Hamtronics® Outdoor Scanner Antenna

Hamtronics, Inc., has announced a new antenna for scanner and monitor buffs, a compact "Power Antenna" that can be installed easily on the side of a house, outside a window, in an attic, etc. without any special mast or brackets.

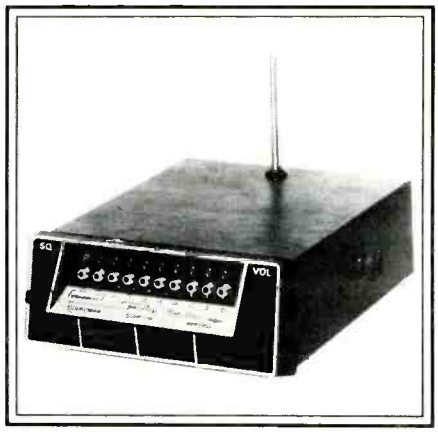
The ACT-1 Power Antenna is a broadband whip antenna with a low-noise preamplifier in its base. Although it is much smaller than a full size outdoor antenna, being only 25 inches tall, the ACT-1 provides good coverage of distant signals. It often outperforms much larger antennas because of the active booster amplifier. Weak signals become clearer, and you can hear distant signals which you didn't even know were on the air before. The built-in preamp has a gain of up to 15 dB, which is the equivalent of making a signal 30 times as strong!

A low-noise microwave transistor in the preamp provides excellent results from 30 MHz right up through the new 800 MHz band; and it covers low-band, high-band, and UHF. Up until now, it was hard to find a good outdoor antenna for the 800 MHz band. The problem? Large losses in the coax cable cancels any good derived from having a high antenna. The ACT-1 solves this problem by amplifying the weak signal from the antenna before the coax cable run can degrade the signal. There is even a considerable benefit from this effect on UHF and VHF reception. In this regard, the ACT-1 can easily outperform an outdoor antenna with a separate preamp at the radio.

Getting an antenna out away from electrical noises in the house and up in the air gives far better results than a radio-mounted whip antenna. With the simple installation required for an ACT-1 antenna and the fact that it is shipped fully assembled, anyone can enjoy a good outdoor or attic antenna!

The ACT-1 Power Antenna is mounted to any flat vertical surface with four wood screws. The 50-foot cable plugs directly into the "antenna" and "12V" jacks on the rear of most scanner radios. If your particular scanner doesn't have a 12V terminal, a simple 12Vdc plug-in adapter is available.

Best of all, the price of the ACT-1 Power Antenna is only $79 plus $3 for shipping and handling. For more information, call 716-392-9430. For a complete catalog, including all of the communications equipment made by Hamtronics, Inc. send $1 to 65-F Moul Road, Hilton, NY 14468-9535. (For overseas mailing, send $2 or 4 IRC's.)



9-Channel Aircraft Band Scanner

Regency Electronics now offers a highly sensitive U.S.-made aircraft band monitor that scans up to nine crystal-controlled channels and operates at home or in a 12 VDC car, airplane, boat, or other vehicle. The Regency Model R-92AP is available for $149.95 at participating Regency Electronics dealers.

The Regency R-92AP can be used to monitor local airport, plane-to-tower, and in-flight aircraft communications. It scans from two to nine channels automatically at a rate of approximately 15 channels per second; channels may also be stepped manually. And it features dual-conversion superheterodyne circuitry to maintain high sensitivity over the entire 118-136 MHz VHF aircraft band.

When its priority feature is selected, channel one is sampled for activity approximately once each second, overriding any other active channel. Green indicator lights (red for channel one) show at a glance which channel is being monitored.

Each channel has an on/off (lockout) switch that allows the user to omit it from the scan, when desired. An adjustable squelch control eliminates background noise on inactive or unreadably weak channels while scanning. Its audio amplifier delivers an ample 2 watts of output power to its built-in speaker; an external speaker jack is also provided. An external antenna jack may be used for longer-range or mobile operation (Regency's Model MA-5 coupling harness, not included, permits the use of a standard auto radio antenna with the scanner).

The Regency R-92AP operates from 117 VAC or 12 VDC. It comes with AC and DC power cords, a telescoping antenna and mobile mounting bracket.

For additional information, contact Regency Electronics, Inc., 7707 Records St., Indianapolis, IN 46226-9989; (317) 545-4281, or circle number 107 on the reader service card.

New Power Supply Division

Electrolert, Inc. is introducing a new line of power supply products. This new line includes four surge/spike protectors which put an end to harmful power surges and spikes before they put an end to your electrical or electronic equipment. Voltage surges (also known as transients, spikes, and glitches) are capable of causing extreme damage or even total destruction to electrical systems left unprotected.

Two new multiple outlet extenders have also been added to the power supply line for organizing and providing electrical power outlets for the home, office, or workshop.

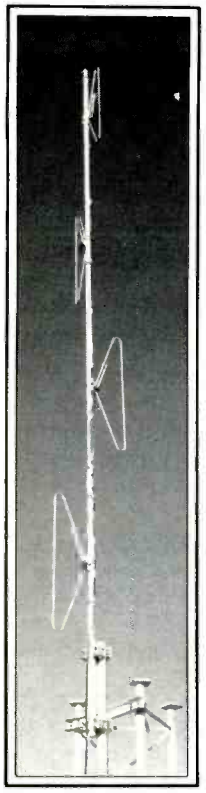
A brief summary of Electrolert's power supply division include:

- **Model PS200**—Electrolert Master AC Control console protects against spike/surge damage by filtering both the hot line and neutral line. In addition, the filter is also bi-directional, dissipating both incoming and outgoing spikes. The console provides both master and individual control and includes 8 plug-in "U" ground outlets.
- **Model PS210**—Electrolert Power Surge Multiple Outlet Extender protects against power spikes and surges. It includes 4 plug-in "U" ground outlets and a circuit breaker with reset.
- **Model PS220**—Electrolert Power Surge Multiple Outlet Extender is a wall unit with voltage surge protection. Includes 2 "U" ground outlets and plugs into any 120 volt outlet (normal household current).
- **Model PS230**—Electrolert Multiple Outlet Extender: 6 plug organizes power for electrical and electronic equipment. Contains a resettable circuit breaker and 6 ft. heavy duty cord. On/off switch with pilot light.

•**Model PS240**—Electrolert Multiple Outlet Extender: 4 plug converts one electrical outlet into 4. On/off switch with pilot light and 6 ft. heavy duty cord. Circuit breaker with reset.

•**Model PS260**—Electrolert Power Surge Protector: 6 plug protects against power surges, includes 6 plug-in "U" ground outlets, circuit breaker with reset and 6 ft. heavy duty ground power cord.

For further information, contact Electrolert, Inc., 4949 S. 25A, Tipp City, OH 45371, or circle number 106 on the reader service card.



The 135-175 MHz VHF two-way antennas *The 406-512 MHz*

Line Of Two-Way Base Station Antennas

Anixter Mark, a division of Anixter Communications, has introduced a new line of UPS shippable two-way base station antennas for the 135-175 MHz VHF and the 406-512 MHz UHF bands.

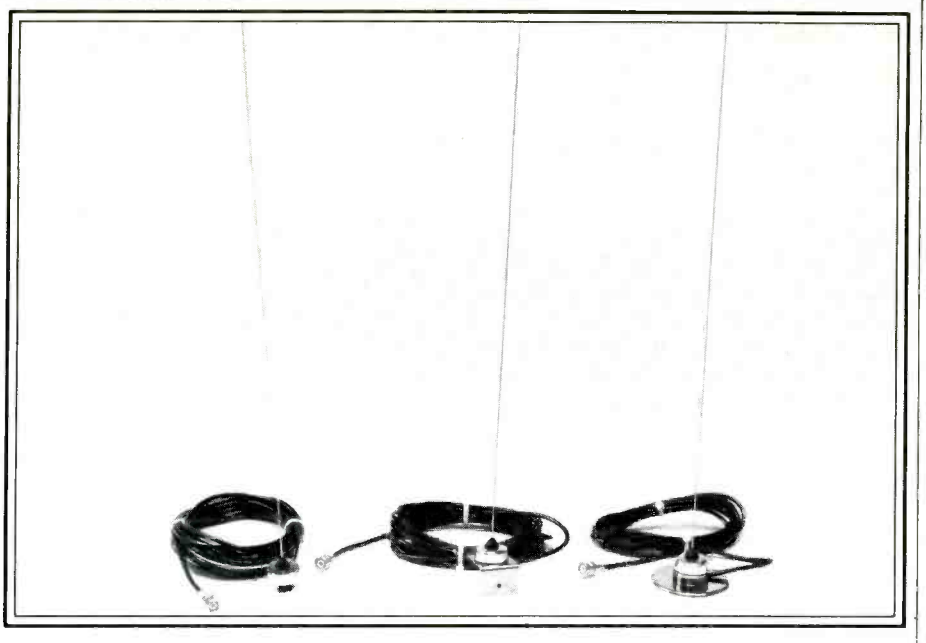
These new base station antennas are rugged yet lightweight enough in construction to be suitable for mounting to the top or side of a tower.

The VHF antenna has a gain of 6.0 dBd omnidirectional, 9.0 dBd with elliptical pattern with a 20 MHz bandwidth.

The UHF Antenna features a gain of 9.2 dBd omnidirectional and 10.4 dBd elliptical with a 30 MHz bandwidth.

Both antennas feature individually gamma matched array and corporate feed harnesses, assuring equal in-phase power distribution to all radiating elements.

For further information please write Anixter Mark, 2180 S. Wolf Road, Des Plaines, IL 60018, or circle number 101 on the reader service card.



Antennas Available For TR-720

Communications Specialists of Orange, California, has anounced a new line of aviation antennas for use with their TR-720 Hand-held Airband Transceivers. All are professional quarter-wave antennas supplied with 17 feet of coax cable terminated in a BNC connector for direct connection to the TR-720.

The CS-31 is a magnet mount antenna for temporary auto rooftop mounting. The price is $38.95 each.

Also available is a CS-33 which can be permanently mounted on an auto rootop. This one sells for $29.95 each.

The CS-34 is supplied with an angle mount which can be adapted to ultralight aircraft. This antenna is priced at $32.95.

All three antennas, when installed on a suitable ground plane, are claimed to increase the TR-720's range to a point where it is on a par with most panel mounted avionics. For more information and literature, please contact: Communications Specialists, 426 West Taft Avenue, Orange, California 92665, or circle number 109 on the reader service card.

Synthesized Tuning In A Seven-Band Scanning Radio

Heath Company, the world's leading manufacturer of high-technology electronic kits, has introduced the only kit-build scanner to cover aircraft, marine, and public service bands, all in one unit. The GR-740 40-Channel Scanning Radio covers all seven UHF/VHF radio bands, scans 40 user-selected frequencies, and provides direct access to any frequency in the seven bands.

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SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Not too long ago, I decided to go out and buy crystals for an old crystal-type scanner to keep tabs on the local activity without having to tie up one of my programmable scanners. After choosing all the police, fire, and rescue channels, I still had an available slot and picked the county road department. The winters where I live can get pretty fierce because it's a rural area, and it's always good to know which roads have been drifted shut by mounds of blowing snow. Keeping an ear on the county road crews kept me up to date.

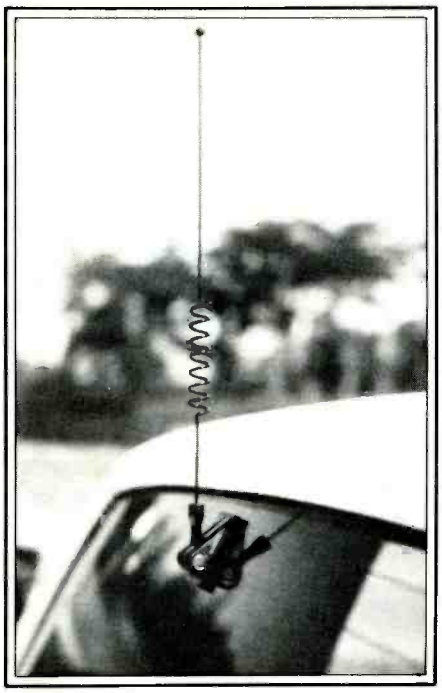
However, during the rest of the year, I found out that I locked out the county road crews much of the time because they would be out fixing bridges or putting up new stop signs—hardly much excitement.

But summer storms can create much havoc as well, and tuning in the road crews after a nasty thunderstorm can be interesting. The highway workers usually are out clearing fallen trees from major routes and even watching water start to rise in streams where there are bridges. So I find myself listening to the road crews more than just in the winter.

Winter, however, is probably the most popular time to listen to road and highway workers as they attempt to clear all of those frozen flakes. In many areas of the country, road crew dispatchers often broadcast the latest weather forecasts to crews out on the highway so that they know whether or not they'll be plowing the snow twice. In many instances, highway departments will use private weather forecasters such as AccuWeather, instead of or to supplement National Weather Service reports. By tuning in to these frequencies, you also can be kept up to date on the latest weather conditions.

Sometimes it can be amusing to listen to road crews, too. When Mrs. So-and-so calls to complain her mailbox has just been plowed under nine feet of snow, chances have it the snow plow operator will have an amusing comment or two.

Because of the unique nature of communications needed by highway workers, the Federal Communications Commission has allocated dozens of frequencies to the Highway Maintenance Radio Service. On these channels, you'll hear municipal, county, and state road crews, in addition to toll road crews. On some toll roads, state police or highway patrol units may also use the highway crews' channels for coordination or even routine dispatching. Some highway maintenance channels are allocated exclusively for state use only, some are for mobile use only (such as repeater input frequencies), and others are shared with other radio services such as public safety. The following is a list of frequencies allocated for highway and road crews:



This "On-Glass" antenna made by Antenna Specialists is used by cellular mobile telephone users in the 800-900 MHz band.

Low band: 33.02, 33.06, 33.10, 45.68, 45.72, 45.76, 45.80, 45.84, 47.02 (state), 47.04 (state), 47.06 (state), 47.08 (state), 47.10 (state), 47.12 (state), 47.14 (state), 47.16 (state), 47.18 (state), 47.20 (state), 47.22 (state), 47.24 (state), 47.26 (state), 47.28 (state), 47.30 (state), 47.32 (state), 47.34 (state), 47.36 (state), 47.38 (state), 47.40 (state).

High band: 150.995, 151.010, 151.025, 151.040, 151.055, 151.070, 151.085, 151.100, 151.115, 151.130, 156.045 (mobile), 156.060 (mobile), 156.075 (mobile), 156.105, 156.120, 156.135, 156.165, 156.180, 156.195, 156.225, 156.240, 158.985 (mobile), 159.000 (mobile), 159.015 (mobile), 159.045 (mobile), 159.060 (mobile), 159.075 (mobile), 159.105, 159.120, 159.135, 159.165, 159.180, 159.195.

In many instances, road crews will operate on Local Government Radio Service frequencies in many municipalities. The following local government channels also might be used by highway crews.

Low band: 37.10, 37.18, 37.26, 39.06 (2 watts), 39.10, 39.18, 39.50, 39.58, 39.82, 39.90, 39.98, 45.08, 45.12, 45.16, 45.20, 45.24, 45.28, 45.32, 45.36, 45.40, 45.44, 45.48, 45.52, 45.56, 45.60, 45.64, 46.52, 46.54, 46.56, 46.58.

High band: 153.740 (mobile), 153.755 (mobile), 153.785 (mobile), 153.800 (mobile), 153.815 (mobile), 153.845 (mobile), 153.860 (mobile), 153.875 (mobile), 153.905 (mobile), 153.920 (mobile), 153.935 (mobile), 153.965 (mobile), 153.980 (mobile), 153.995 (mobile), 154.025, 154.040, 154.055, 154.085, 154.100, 154.115, 154.965, 154.980, 154.995, 155.025, 155.040, 155.055, 155.085, 155.100, 155.115, 155.145, 155.715, 155.745, 155.760, 155.775, 155.805, 155.820, 155.835, 155.865, 155.880, 155.895, 155.925, 155.940, 155.955, 155.985 (mobile), 156.000 (mobile), 156.015 (mobile), 158.745, 158.760, 158.775, 158.805, 158.820, 158.835, 158.865 (mobile), 158.880 (mobile), 158.895 (mobile), 158.925 (mobile), 158.940 (mobile), 158.955 (mobile).

UHF: 453.225, 453.275, 453.325, 453.375, 453.425, 453.475, 453.525, 453.575, 453.625, 453.675, 453.725, 453.775, 453.825, 453.875, 453.925, 453.975. (Inputs are 5 MHz higher.)

In addition, the following frequencies are available to both the Highway Maintenance and Local Government radio services on a shared basis with police, fire, and forestry conservation users.

UHF: 453.050, 453.100, 453.150, 453.200, 453.250, 453.300, 453.350, 453.400, 453.450, 453.500, 453.550, 453.600, 453.650, 453.700, 453.750, 453.800, 453.850, 453.900, 453.950. (Inputs are 5 MHz higher.)

T-band: If UHF T-band frequencies are allocated for your area, highway crews can use frequencies on a shared basis with police, fire, local government, and forestry conservation users.

L.A. Update

The Communications Center of Anaheim, California, advises that the Los Angeles County Sheriff's Office has reshuffled its frequencies. The current assignments are as follows:

Industry	39.94 base, 39.46 mobile
Lakewood	39.82 base, 39.34 mobile
Norwalk and Pico Rivera	39.88 base, 39.42 mobile
East Los Angeles	39.76 base, 39.30 mobile
Carson	39.20 base, 39.66 mobile
Firestone and Lynwood	39.44 base, 39.78 mobile
Lennox and Marina Del Rey	39.14 base, 39.84 mobile
Lomita and West Hollywood	39.02 base, 39.74 mobile
Catalina	39.68 base and mobile
San Dimas	39.28 base, 39.62 mobile

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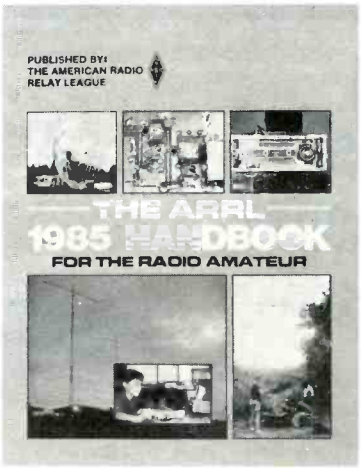

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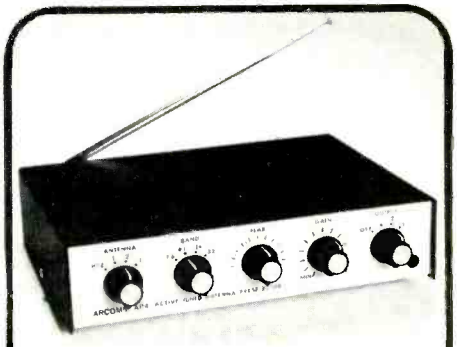

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North tactical "Nora"	39.40
East tactical "Edward"	39.72
West tactical "William"	39.32
Car-to-car "Charlie"	39.48
Air "Henry"	39.48
Mountain rescue "Mary"	39.52
Administrative "Adam"	39.36
Jail security "John"	39.38

During the winter months, the L.A. Sheriff's Office frequencies can be heard in many areas of the United States via skip for up to several hours a day. These listings will help you identify what channels you are hearing.

Caught By Radio

Further to last month's feature on police monitoring:

In Orlando, Florida, an alert newspaper photographer helped nab a robbery suspect as the man sat in a barbershop getting a shave.

Gordon Williamson, a photographer with the *Orlando Sentinel*, was listening to his scanner when he heard police dispatched to a bank robbery. As Williamson headed to the scene, he spotted a man—stripped down to a swimsuit—who fitted the description he heard on his scanner. The man was riding a bicycle away from the bank.

The photographer fired off a few frames with his camera as the man sped away. Unaware he was being followed by Williamson, the man parked his bike and walked in for the shave. Williamson immediately radioed his city desk and asked the newspaper to call the police.

A police sergeant arrived at the scene and walked into the barbershop with his revolver pointed at the suspect, who had most of his beard shaved off.

The suspect, who was charged with robbery and grand theft, surrendered peacefully and the money was recovered on the back of the bicycle, police said.

Williamson's news photo chief, Richard Wells, told The Associated Press that the photographer keeps good track of what police in the area are doing. "That's what he does best," Wells said. "He loves listening to the scanner and understands what they are saying. The best thing from all of this is that he got a great picture."

Metro Hams

If you like listening to amateur radio operators in the metropolitan New York area, one New Jersey ham has compiled a comprehensive listing of 2-meter repeaters in the 144-148 MHz band in New York City, Long Island, northern and central New Jersey, southwestern Connecticut, and immediate areas of New York state.

The directory can be purchased in two forms: by frequency sort or by location sort. The frequency sort lists the input and output frequencies, town and state, and callsign. The comprehensive location sort listing details town and state, input and output frequencies, callsign, club sponsor, and special notes such as links, subaudible tones and nets that are conducted on the repeater.

The cost is $1.00 for either directory, or $1.50 for both. Enclose a self-addressed stamped envelope with your order to: Jeffrey Gornstein, KD2BE, 35 Green Hill Road, Springfield, NJ 07081.

Lockups

Tom Cheney, N2EOW, of Watertown, New York, writes in to say he is hearing lots of activity on 453.400 MHz, which is used by the Watertown Correctional Facility in New York. Tom reports this is a repeater frequency and wonders whether this is a standard frequency or band used by correctional facilities.

Well, In New York state, correctional facilities use 453.400 MHz on a primary basis and some also use 453.775 MHz on a secondary basis. However, the frequencies used from state to state vary. Some states use the same frequencies statewide; others don't coordinate the use of frequencies. Prisons can turn up on low band, high band, UHF, or even T-band. Some may be licensed just for mobiles because all they use is portable units. Keep your ears open and you'll find them on the air, although some correctional facilities run low power rigs intended only for coverage in and around the prison itself.

Your Turn

We'd like to hear from you here at *POP'COMM*. What frequencies are you listening to this winter? How do you like that new scanner you got for Christmas? What questions do you have about scanner listening? And while you're at it, send along a photograph of your listening post or antenna farm. Write to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801. PC

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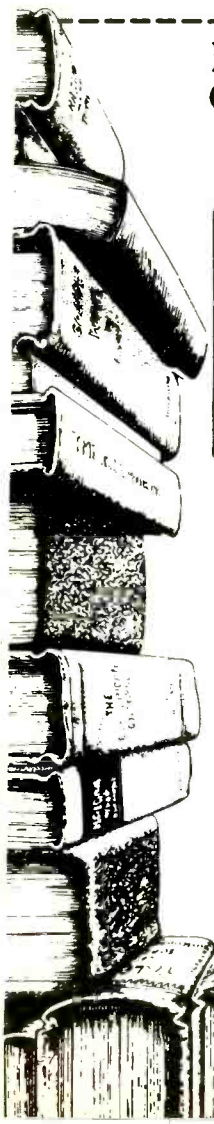

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LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

An exercise in the advantages of being in power: The opposition to the government of Surinam can barely scrape together enough guilders to put its Radio Free Surinam clandestine station on the air now and then. The government of Surinam, with its hands on the nation's treasury, has, in contrast, opened up an unusual broadcasting service. Special programming, prepared by the Surinam Information Service, is being beamed daily to the Netherlands, Surinam's former "mother country." The broadcast will be transmitted by the Surinam Post Telephone and Telegraph Administration to Brazil. From Brazil, one of the 250 kilowatt Radio Bras transmitters will beam the broadcasters to the Netherlands. Programs are scheduled daily at 1800, Saturdays and Sundays at 1430 on 17.555. Here in the Listening Post we were unable to hear the first day's scheduled transmission in mid-August, so perhaps things didn't get going by the target date.

New stations come on the air from Peru on an almost weekly basis it seems. That's not the case in neighboring Ecuador, where new shortwave voices appear only very occasionally. This is one of those times. A new Ecuadorian station, Radio La Voz de Upano in Macas in the south central part of the country, showed up in mid-August. It's on the air until 0030 sign off (and apparently until 0200 on Saturdays) on 5.040. The station takes its name from the Upano River. There's no known address yet, but Macas is not a large town—so a report sent without a street address or apartado number may well reach them anyway.

Goodbye Upper Volta, hello Bourkina Fasso. That's the new name for this country, and the Ougadougou government station has become Radiodiffusion-Television Bourkina. The station can occasionally be heard on 4.815 from sign on at 0530. Programming is in French and local languages.

Thrice as nice. HCJB 's "DX Party Line" recently announced plans to expand the program to three times a week, each show different from the other two. We don't know when this will occur, but we expect the new addition to the be in mid-week at the usual 0230 hour. Meanwhile, Media Network on Radio Netherlands will continue to air reruns of past features through the end of October while the program is reorganized. A five minute media news report continues to be carried at the beginning of each show. Check 6.165 or 9.590 Fridays GMT at 0250 for the Bonaire Relay of Media Network.

Shortwave stereo? That's the intention of H. Dickson Norman of Opelika, Alabama. The call letters to be used are said to be "NDXE" (meaning "in Dixie") and the station will carry commercial advertising, lots of locally-produced programming and a lot of sports, much of it with an Alabama flavor. The station will be owned by World Service Broadcasting Incorporated and the grand plan is to eventually use several transmitters. A January target date has been set for the first broadcasts, but if this project is like most, we'll wager it'll be sometime past January before it's on the air. Now you have a good excuse to give your wife when she asks why you need a second receiver—"To hear NDXE in stereo, of course!"

Bobby Raymer of Cookeville, Tennessee has his equipment surrounded by attractive QSL cards.

Let's mention the availability of the 12th edition of the popular "Tropical Bands Survey" from the Danish Shortwave Clubs International. A 28-page booklet, it lists all of the stations active between 2.000 and 5.900 MHz. Send nine International Reply Coupons to DSWCI, Tavleager 31, DK-2670, Greve Strand, Denmark.

Mailbag

Elton Manzonie of Athens, Georgia says he's "just come on board as a shortwave listener" and uses a military surplus R-174 receiver and a longwire antenna. Elton hopes to get his ham license soon. Welcome Elton, and good luck on getting your call. But we hope you won't give up the monitoring side of things once you get on the air. We have a number of hams who are also Listening Post reporters.

Another new listener is Paul McGinnis of Huntington Beach, California (home of the American Shortwave Listener's Club, incidentally). Paul, like a couple of other reporters, includes a computer print out of his loggings. Welcome to you, too, Paul.

We have a number of shack photos again this month. One of them is from Harry H. Abery, Jr., of Hartford, Connecticut whose equipment includes scanners, a transceiver, two-way FM, recording facilities, and a computer!

Bobby Raymer of Cookeville, Tennessee has an all-band monitoring interest and would like to correspond by tape with anyone of like mind. He'd also like to make contact with other DXers in Tennessee for the purpose of starting up an area club. Bobby's address is Route 11, Box 139, Cookeville, TN 38501. Take note Bobby, we had two others from your state this month.

Andrew Crowell uses an old National HRO-60 with a 110-foot longwire strung around the patio of his apartment. Andrew is looking forward to a move to a farm shortly where he can grow a "bumper crop" of antennas. He'd like to hear from others who are using an HRO-60. Write Andy at 721 Devon Lane, Nashville, TN 37211.

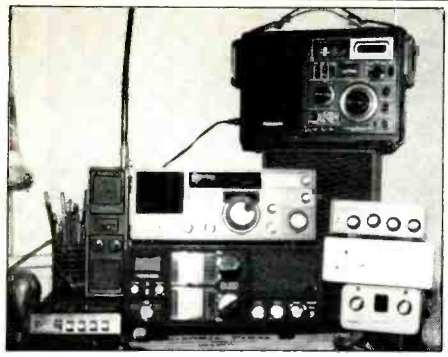
We knew it! Somebody came up with a source for Spanish language lessons on shortwave after we said we didn't think there were any. Mike Westphal of Alden, New York says Spanish Foreign Radio carries such a program between 0000 and 0200. Mike didn't note which day or days this was on and we'd suspect the program is probably just a fifteen minute segment within that 0000-0200 period.

Ken Cobb of Portland, Maine has been an SWL for about four years and is a member of the North American Shortwave Association, which Ken says he can highly recommend. We can underline that, Ken. It's also the only major North American club dealing exclusively with shortwave broadcast listening and DXing. If you'd like a sample copy of their monthly bulletin "Frendx," send a dollar with your request to: NASWA, 45 Wildflower Road, Levittown, PA 19052.

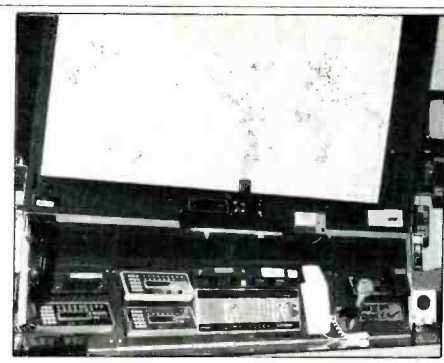
Another photo comes from Mark Abramowitz of Crowley, Texas which, in addition to a wall full of QSLs and various scanners and CB equipment, includes a Kenwood R-2000.

Stanley Mayo of Portland, Maine has been around listening and DXing for many

Mark Abramowitz of Crowley, Texas operates from this shack, equipped to monitor a wide range of modes and frequencies.



Michael Westphal in Alden, New York has three receivers with associated equipment and all of it going strong.



Harry H. Abery, Jr. of Hartford, Connecticut qualifies for the "super shack" award with this impressive line-up.

years, just recently becoming active again. Stan checks in to say he'll be inactive for awhile while he moves to another location in Portland.

Larry Fravel of Clarksburg, West Virginia is also moving, but only his shack—from the basement to an upstairs room. Let's have a photo after you're settled in, Larry.

John Friberg, Jr. of Concord, New Hampshire wants to know whether amateur operators or shortwave stations were the first to use QSL cards. We've never seen a definitive answer to that question. In truth, it may have been AM broadcast band stations or even shipboard stations which were the first to QSL. It's something like arguing about which was really the first AM station in the U.S. We'd be interested in an answer if anyone has any historical information.

John also wants to know the best times and frequencies to hear Radio Free Europe/Radio Liberty and also the most easily understood identifications. That's a tough one, John. Three Radio Liberty frequencies, 9.520, 11.885, and 15.340 are in use around the clock, so you might check those at appropriate propagational times. Radio Liberty's Russian language ID is "Goverit Radio Svoboda" and is fairly easy to copy. Radio Free Europe is on the air from 0300 to 0000 on a wide number of frequencies. You might check 15.115 and 21.745, which carry programs in Bulgarian with the ID "Tuk e Radio Syobdna Evropa." Those frequencies aren't continuously active throughout the day, however.

Listening Reports

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

Alaska KNLS heard at 0700 on 11.850 with its Big Band program in English. (Shute, FL)

Albania Radio Tirana on 7.065 noted at 0300 to 0400 with woman announcer and rapid delivery of news. (McDonough, PA)

Algeria Radio Algers, ending news in English at 2013 on 17.745, into "This week in Algiers and Africa." ID as "The international service of Radio Algiers." Lots of U.S. pop/rock. Into possible Spanish at 2030. (Alpert, NY) Schedule announced in English at 2030 and into Spanish. (Rutowski, NY)

Argentina RAE with English to Asia and the Pacific at 1134 on 11.710, news, talk about relations with Great Britain and the Malvinas. (Pastrick, PA) At 0232 with Latin music, interference from 11.715. (Shute, FL) At 0410 with music and cultural programming, gave address, into Spanish at 0430. (Patton, TN)

Armenia Radio Yerevan heard 0240-0300 on 17.860 with Mideast instrumental music, then news/commentary in English and "Voice of Yerevan, Armenia" ID. (Brumm, IL)

Australia ABC Brisbane at 1105 with domestic service and 1930 era show tunes. (Hickerson, AR)

Radio Australia on 5.995 in English at 1140, pop music, Olympics news. (Gray, MI) At 1025 in neo-Melanesian, interval signal, identification. (Crowell, TN) Top 40 countdown at 0910. (Rutowski, NY) 9.580 at 1140 with rock, Olympics news, ID. (Gray, MI) English to North America and Pacific at 1130, rock. (Pastrick, PA) 9.610 at 1130 with comedy show. (Gray, MI) 15.395 at 0500 with news and talk about National Aborigine Week. (McGinnis, CA) 21.720 at 0345, English news and pop music. Also 9.625 at 1100 in English is well heard. (McDonough, PA)

Austria ORF in German on 5.945 at 0232. Strong but bad fade. (Crowell, TN) At 0254-0300 with music and announcements. (Fravel, WV) 11.655 at 0430, also 15.165. (Patton, TN)

Belgium BRT on 15.590 at 1831-1834 woman announcer in English with football news. (Fravel, WV) In English at 0030 on 9.925, 11.620, and 5.910 with news and "Tour of Belgium." (Westphal, NY)

Belize Radio Belize noted on 3.285 in English at 0155. ID as "This is Radio Belize, the voice of the newly independent . . ." (Gray, MI)

Bolivia Radio Nueva America, La Paz, poorly at 0151 with ID at 0204, all Spanish on 4.797. (Shute, FL)

Brazil Radio Bras on 15.290 at 0235 with music, commentary on the Brazilian post office. (Gray, MI) I'd have a few comments on that myself! (Editor)

Radio Brazil Central on 4.985 at 2335 in Portuguese with identification. (Hill, NY)

Radio Universo, Curitiba at 1010 in Portuguese on 9.545. (Shute, FL)

Bulgaria Radio Sofia in English at 0400 on 11.720 with newscast. (McDonough, PA)

Canada CFRX, Toronto, 6.070 at 2338-2042 with pro football. (Fravel, WV) At 0820 with easy listening music and announcements. (Crowell, TN)

Time station CHU, 14.670 with time tones, English and French IDs every minute. (Manzonie, CA)

Radio Canada International on 17.875 in English with "SWL Digest" at 1955. (Shute, FL)

Cape Verde Islands Voz do Sao Vincente on 3.931.3 at 2328 to 0001 sign off. Woman with news in Portuguese, music. Heavy interference from ham operators. (Hickerson, AR)

Chad Radiodiffusion National Tchadienne on 4.904.5 at 0455 sign on in French. Balafon interval signal, national anthem, kid's chorus, identification, frequency announcement, talk, African vocals, news. (Paszkiewicz, WI) At 0530 with French, African music, vernaculars, singing, and ID. (Hickerson, AR) Heard at 0530 all French with disc jockey and African folk music. (Krzemien, IL)

China Fujian Front Station noted on 5.770 at 1015 with music, long talk by woman announcer. Weak. (Crowell, TN)

Radio Beijing on 15.520 at 0310 in English with commentary by woman. (Gray, MI) Woman with recipe for barbecued fish, parallel to 15.385. (Alpert, NY)

Clandestines Radio Farabundo Marti on variable 7.000 at 0102, Spanish with many IDs. Frequency wanders. (Hickerson, AR)

Radio 15 de Septiembre was heard at 0515 on 6.215. (Westphal, NY)

La Voz del CID's Radio Camilo Cienfuegos heard on 10.042 at 2154, anti-Castro comedy skit, professional sounding. Interim IDs included "Radio Camino Sin Fuego" (probably Camilo Cienfuegos—Editor) and "Radio Vencenti." (Boehm, TX)

Colombia Radio Super de Cali, 6.120 at 0900 in Spanish with ID at 0905. (Hill, NY)

Radio Sutatenza, Bogota on 5.095 at 0250 in Spanish with ID 0257 and sign off at 0300. (Hill, NY)

Radio Guatapuri, Valdupar heard at 0135 in Spanish on 4.815 with music, IDs. (Shute, FL)

Comoro Islands Radio Comoro on 3.330.9 from sign on at 0300, local music and talks. Irregularly heard. (Hickerson, AR)

Cook Islands Radio Cook Islands on 11.760 with local news in English, then national and world news in Maori followed by U.S. pops. (Krzemien, IL)

Costa Rica Radio Reloj ticking away on 4.832 at 0730 with news, into music. (Crowell, TN) Hope it doesn't go "off." (Editor)

Cuba Radio Havana Cuba ending French and into English at 0330 on 11.760, announcing parallel 11.930 and 15.300. Schedule for Caribbean and Americas, as announced: 0100-0450 on 11.930, 0100-0600 on 15.300, 0330-0600 on 11.760. (Alpert, NY)

Cyprus BBC Relay on 7.135 at 0220-0230 in English to South Asia and Iran. (Hill, NY)

Czechoslovakia Radio Prague in Czech on 11.990 at 0025 with interval signal, ID and news. (Crowell, TN) Also heard on 7.345 at 0339 with world news in English. (McDonough, PA)

Denmark Radio Denmark with news on 15.165 at 1900. (Patton, TN) Presume this was in Danish. (Editor)

East Germany Radio Berlin International good at 0200-0245 to Africa. Fair at 0230 on 9.560 for west coast. North American service reception has been poor lately. (Westphal, NY) 17.770 at 1300 with English to Southeast Asia. (Fravel, WV)

Ecuador Radio Zaracay, Santo Domingo de los Colorados on 3.395 at 1005 with Andean music and announcements. (Crowell, TN)

Time station HD2IOA heard well on 3.810 around 0500-0900. Operated by Instituto Oceanographic de la Armada." (Westphal, NY)

HCJB with "Musical Mailbag" on 9.745 at 0600. (McGinnis, CA) On 15.155 with "Passport" at 0100. (Manzonie, GA)

Egypt Radio Cairo with Islamic program in English at 0200 on 9.745. (Patton, TN) At 0220 with talk about Egypt's efforts to end the gulf war. (Gray, MI)

El Salvador Radio El Salvador heard on 5.992 at 2330. (Krzemien, IL)

Falkland Islands FIBS on 2.380 at 0320-0430, weak, not nightly. Pop and country, English-speaking disc jockey, mentions of Falklands. (Hickerson, AR)

Finland Radio Finland on 15.400 at 0325 with ID by woman at 0326, heavy interference. (Gray, MI)

France English from 0415-0430 and 0445-0500, all news and switching into French on 9.790, service for Africa. (Westphal, NY) 17.620 at 1600 in English with "Paris Calling Africa" and 15.315 at 1600. (Gray, MI) 9.795 English 0415-0430 with news and sports, alternating with French every 15 minutes. (McDonough, PA)

Gabon Africa No. One on 4.810 at 0555 in French. ID at 0600. Also in French with African music 2220-2250. (Hill, NY) At 0607 in French. (Shute, FL)

Ghana Ghana Broadcasting Corporation on 4.915 at 0604 in English, with newscast. (Hill, NY)

Greece Voice of Greece at 9.420 at 0345-0350 in English with world news and voting results. Into Greek at 0315. (McDonough, PA) 0320 with Greek music, decaying after 0340. (Gray, MI) 15.635 at 1232-1249, musical program in Greek. (Fravel, WV)

VOA Relay at Kavala on 7.205 in English to South Asia. Ham QRM. (Hill, NY)

Guinea-Bissau Radio Nacional on 5.475.2 at 0612 variable sign on. Portuguese, ID, and vocal music. (Hickerson, AR)

Guyana GBC at Georgetown on 5.950 at 0826-0900 with English—news, sports, music. (Pastrick, PA)

Haiti 4VEH in Creole on 4.940 at 1015. Folk songs, woman announcer. Strong. (Crowell, TN)

Honduras HRVC, La Voz Evangelica on 4.820 at 0435 in English with religious program. (Crowell, TN)

Hungary Radio Budapest in unidentified language on 9.835 at 0230. (Shute, FL)

India All India Radio, Delhi, from 2300 sign on with interval signal, sitar music on 11.620 (Hickerson, AR)

Here's Ken Cobb's shack in Portland, Maine.

Indonesia Radio Republik Indonesia at Biak, Irian Jaya heard at 1020 on 5.451 with Indonesian music and news at 1030. Very faint. (Crowell, TN)

Iraq Radio Baghdad on 13.700 at 1650. New 22 meter band frequency. Arabic with ID, clock chime at 1700. (Hickerson, AR)

Ireland Radio Dublin International heard on 6.910 at 0848 relaying World Music Radio. Weak but readable. (Crowell, TN) At 0225-0259 with pop program in English, weak. (Fravel, WV)

Israel Kol Israel on 9.009 with all-night election coverage in English to 0430 sign off. (Alpert, NY) 11.655 at 0003-0010 with news in English, Israeli popular music. On 15.615 at 1818-1823 in Hebrew. (Fravel, WV)

Italy RAI on 17.780 at 1701-1703 with news in Italian. (Fravel, WV)

Ivory Coast Abidjan in French at 0615 on 7.215, lots of music. (Westphal, NY) At 0614 in French, with music. (Shute, FL)

Japan Radio Japan with English to North America at 1100 on 9.505. World news. (Pastrick, PA) News at 0020 in English on 17.810. (credit misplaced)

Kiribati Radio Kiribati in English on new 9.825 at 0530 with U.S. pops. BBC News, ID at 0600. (Krzemien, IL) 14.802 upper sideband at 1733 but heard better late at night. Pop music, English ID, island music. (Hickerson, AR)

Kuwait Radio Kuwait on 15.495 at 1837-1841 with Arabic music. (Fravel, WV) On 11.675 at 1902 with world news and pop music. (Rutowski, NY)

Lebanon Radio Voice of Lebanon on 6.550 at 0415 in Arabic with news, some orchestral music, and an ID. (Hickerson, AR)

Lesotho BBC Relay station on 6.190 at 0400 with beginning of world news but lost to WRNO splash from 6.185. (Paszkiewciz, WI)

Liberia VOA relay, Monrovia on 16.500 at 1826-1830, commentary and news. (Fravel, WV) At 1610 with news items. (Gray, MI)

Libya Voice of the Arab Homeland Service on 3.200 at 0355-0432 sign off in Arabic. (Hickerson, AR)

Voice of Africa Service on 15.450 from 1905 sign on, (time varies) in Arabic. (Hickerson, AR)

Radio Jamahiriyah, 11.816 at 2230 with cultural program. (Patton, TN)

Luxembourg Radio Luxembourg, 6.090 at 0057-0119 with pop music in English, heavy interference from Deutsche Welle on 6.085. (Fravel, WV) At 2306 with pop music, music quiz. (Rutowski, NY) 15.350 heard at 1848- 1853 with musical variety program in French. (Fravel, WV)

Madagascar Radio Netherlands relay on 9.715 at 2030 to 2100 with "Happy Station." (Hill, NY)

Malta IBRA Radio via Radio Mediterran on 9.590 at 2030-2115. Radio Med ID at 2030 and into IBRA programming. (Hill, NY) Radio Mediterran on 6.110 at 2232 in English with ID, music, rather poor in QRN. (Paszkiewicz, WI)

Mariana Islands KYOI Saipan with English and Japanese on 11.900 at 1200. (Pastrick, PA)

KFBS on 15.110 at 1500 sign on, test broadcast in English and Chinese. (Hickerson, AR)

Monaco Trans World Radio Monte Carlo on 6.210 at 0340 sign on with interval signal, German ID, religious program. (Hickerson, AR) 9.495 at 0800 with "This is the Way To Life." (Rutowski, NY)

Netherlands Radio Netherlands on 9.895 in Dutch with music and interviews. (Manzonie, GA)

Netherlands Antilles Radio Netherlands, Bonaire relay on 6.020 at 2330 in Spanish. (Fravel, WV) 6.165 at 0530 with news and "Newsline." (McGinnis, CA) At 0240-0245 with news in English. (Fravel, WV) 9.590 at 0228, QRM from Moscow. (Shute, FL)

Trans World Radio, Bonaire with English to North and Central America at 1115 on 11.815. "Morning Sound" program. (Pastrick, PA) 9.535 with "The Fellowship Hour" at 0400. (McDonough, PA)

New Zealand Radio New Zealand on 15.485 at 0330 with pop music. (Gray, MI)

Nicaragua La Voz de Nicaragua now on announced 6.015 but sometimes varies up to 6.018. Good in English 0400-0500. (Westphal, NY) At 0358 in English, into news at 0400. Strong. (Crowell, TN) At 0400 on 6.000 with English news. (Manzonie, GA) On 6.014.7 with music and "Mailbag." (Alpert, NY) Commentary on National Day of Students at 0408. (Gray, MI) 0427-0500 anti-American talks, usually lots of interference. (credit misplaced)

Radio Sandino clear at 0600 in Spanish on 6.200. (Westphal, NY)

Nigeria Voice of Nigeria at 0539 on 7.255, parallel with 15.120. (Shute, FL) At 0550 with world news to 0600 when English ID. (Rutowski, NY)

North Korea Radio Pyongyang with English to North America at 1107 on 9.745, relations with Mozambique. (Pastrick, PA) 1120 with commentary. (Gray, MI) 9.977 at 1125 with talk on socialist's revolution. (Gray, MI)

Peru Radio Atlantida on 4.790 at 0915-0925 in Spanish with Peruvian ballads and talks. (Hill, NY)

Poland Radio Polonia at 0332 in English on 7.145, headlines and ID as the "North American Service of Radio Polonia in Warsaw." Best frequency in this time period. (Alpert, NY)

Portugal Radio Portugal, 6.060 at 0315 with talk about small town around Lisbon. 11.925 at 0315 in parallel. (Gray, MI) 0300-0330 in English. (McDonough, PA) 6.075 in English at 0533 with local news. (Shute, FL) 11.770 at 0300 with news and music. (Patton, TN)

Romania Radio Bucharest on 9.690 at 2100 in English with news, talk about miners. (Paszkiewicz, WI)

Rwanda Deutsche Welle relay heard on 17.800 at 1231, with news and "Sunday Commentary" in English. (Fravel, WV)

Seychelles FEBA on 15.200 at 0402 sign on with interval signal, news by woman, talk by man and woman. Very weak. (Paszkiewicz, WI)

Solomon Islands Solomon Islands Broadcasting Corporation on 5.020 at 1150 with popular and island music, ID at 1154. (Gray, MI)

South Africa Radio Five, 3.250 at 0345 in English with various types of music. Into possible Afrikaans. (Paskiewicz, WI) At 0500 in English with music and commercials. (Westphal, NY)

SABC on 4.880 at 0500 in Afrikaans. Also at 0351 sign on with interval signal. (Hill, NY)

Radio RSA on 5.980 at 0205 with news items in English. (Gray, MI) 6.010 in English to North America. News at 0250, program preview, sign off announcement and interval signal 0256. (Alpert, NY)

Southwest Africa/Namibia Radio Southwest Africa Broadcasting Corporation on 3.295 at 0323 with varied music and fair signal. 3.270 is QRM'd by radioteletype. (Paszkiewicz, WI)

South Korea Radio Korea on 15.575 at 1430 with "Good Neighbor" program in English. (Patton, TN) Better reception lately, 1400-1500 on 15.575, news, commentaries on North-South relations. (Westphal, NY)

Spain Radio Exterior Espana on 17.660 at 1739, discussion program in Spanish. (Fravel, WV) 11.880 with world news in English at 0000. (McDonough, PA) 0120 news and commentary. (Gray, MI) 9.630 at 0015-0020 economic news in English. (Fravel, WV)

Sweden Radio Sweden International, 6.965 at 0230, parallel to 11.705, commentary on cable TV. (Gray, MI)

Switzerland Swiss Radio International on 15.570 at 2300 in Portuguese with interval signal, ID, news. Poor and severe interference. (Crowell, TN)

Syria Syrian Broadcasting and Television Organization on 12.085 with Arabic news, ID at 1940. Heard daily. (Hickerson, AR) 2003 in Arabic. (Fravel, WV)

Taiwan Broadcasting Corporation of China on 3.230 at 0620 with woman in Chinese, commentaries. (Westphal, NY) Don't think so at this hour unless your time quotes are local time. (Editor)

Voice of Free China, via WYRF on 5.985 at 0505, "World of Science." (McGinnis, CA)

Tanzania Radio Tanzania from 1900-1920 on 9.749 with news in English and long instrumental tunes. (Krzemien, IL)

Togo RTV Togolaise on 5.047 in French at 0612. (Shute, FL) At 0615 in French with music, poor to fair. (Westphal, NY)

Joseph P. Sepulvado of Nekoosa, Wisconsin forwards this QSL he received from Lithuanian Radio.

RTVT at Kara site on 3.222 weak in French at 0540. (Westphal, NY)

Turkey Voice of Turkey with an hour's English at 0300-0400 on 11.755. News and commentary. (Westphal, NY)

Uganda Radio Uganda on 15.325 at 0310. Strong when on but not regular. Native chants, drums, woman in English. (Hickerson, AR) 5.027 at 0400 with man announcer giving news of Africa. (Westphal, NY)

Unidentifieds 15.040 man in Arabic at 0542. (Shute, AL) Likely the clandestine Voice of the Libyan People. (Editor)

4.905 in French from 0500 anthem. (Shute, FL) Undoubtedly Chad on 4.904.5 (Editor)

United Arab Emirates UAE Radio Dubai on 15.435 ending English news at 0340, parallel and equal in strength to 17.775. (Alpert, NY) 15.435 at 0335 with world news, "Listener's Mailbag." (Rutowski, NY) 15.300 in English at 1625 with news items. (Gray, MI) 0330-0355 with English news, press review. (McDonough, PA)

United States Armed Forces Radio TV Service, 21.570 at 0154 to 0209 with baseball. (Brumm, IL) 6.030 to Central and South America at 1050 with talk on ice skating. (Pastrick, PA) 11.780 here and 11.790 with Dan Rather commentary at 0343. (Alpert, NY)

KGEI with Spanish at 2200 on 15.280. (Patton, TN)

VOA Feeder in lower sideband on 7.445 at 0537, parallel 5.995 and others. (Alpert, NY)

WRNO at 0400 with rock on 6.185. Also 7.355 at 0128. (McGinnis, CA) With Radio Earth at 0400 on 6.185. (Manzonie, GA) 7.355 with "Special Delivery" letters show. (Shute, FL)

USSR Radio Moscow North American Service at 0350 with talk. Mixing with Radio Norway on 15.180. (Alpert, NY)

African Service on 15.520 at 2000 sign on in English, parallel to 15.510. (Alpert, NY) 11.700 at 1036. (Pastrick, PA)

English in World Service on 15.320, parallel to 15.125 and 15.375 at 0700. (Alpert, NY)

Vanuatu Radio Vanuatu, Port Vila, 7.260 in English at 0800 with world news, U.S. Pops. (Krzemien, IL)

Venezuela Radio Capital, Caracas on 4.850 at 0320 in Spanish with South American rock. (Hill, NY)

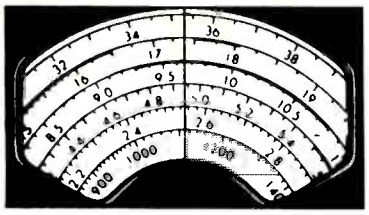
Vietnam Voice of Vietnam on 9.840 at 1115 in Spanish. Off at 1128, on again at 1130 with interval signal and fade out shortly after. Very weak. (Crowell, TN)

West Germany Sudwestfunk at Baden-Baden on 7.265 at 0345 with American pop music, woman in German, time pips, ID at 0400 and news. (Hickerson, AR)

Yugoslavia Radio Yugoslavia on 9.620 at 2117 in English with news, music to 2130 when into French. (Paszkiewicz, WI)

Our thanks to the following: David Patton, Signal Mountain, TN; Andrew Crowell, Nashville, TN; Pat McDonough, Pittsburgh, PA; Keith Hill, Pine City, NY; Jerry Brumm, Chicago, IL; Gary Hickerson, Ft. Smith, AR; Elton Manzonie, Athens, GA; Rick Krzemien, Carol Stream, IL; Michelle Shute, Pensacola, FL; J. Speed Gray, Grand Rapids, MI; Robert Pastrick, Baden, PA; Dennis Rutowski, FPO, NY; Jim Boehm, San Antonio, TX; Sheryl Paszkiewicz, Manitowoc, WI; David R. Alpert, New York, NY; Larry R. Fravel, Clarksburg, WV; Michael R. Westphal, Alden, NY; Paul McGinnis, Huntington Beach, CA.

We'll be looking for a letter from *you* soon. Loggings, good, high contrast copies of QSLs, schedules, questions, clippings, comments and what-have-you are always welcome. Til next time—good listening! PC



COMMUNICATIONS CONFIDENTIAL

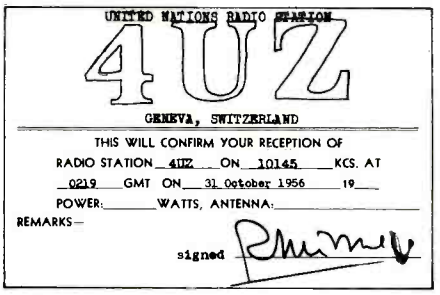
BY RON RICKETTS, WA5VFA

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

This month has been very exciting here at *POP'COMM*. It appears that we now have a real *Chinese* numbers station transmitting routinely between 8400 and 8405 kHz every weekday from about 1430 to 1500. Not only do we get 4-digit numbers in what seems to be Mandarin, but the sign off is usually accompanied by Chinese music. The Mandarin dialect is used primarily by the rulers of the People's Republic of China and the Republic of China. This station has not been received at my location in Texas due to some mowing of the antenna farm, but our readers on the West Coast will certainly have better luck with it, especially now that winter is here. I would like to hear fom some of our Chinese-speaking readers concerning the content of these broadcasts. Robert Schaeffer of California was kind enough to send some excellent tape recordings of these transmissions, and we at *POP'COMM* are grateful to him.

It seems that there are more and more of our readers becoming interested in the LF and VLF bands. Robert Margolis of Illinois, a generous contributor, has included a large number of these interesting stations in this month's loggings. There is quite a variety of stations below the broadcast band. The majority of these are radiolocation beacons for aircraft and ships. Besides giving a fixed radio bearing, many of these stations transmit weather info in AM or CW. If you are interested in monitoring these transmissions, you will find that they are heard best at night. Listeners living in coastal areas will hear a large number of weather transmissions as well as the more common aero beacons.

The aero navigation beacons are heard on 200 to 285 and 325 to 415 kHz. The majority of these consist of a repeated 2 or 3 character call in modulated CW, repeated over and over. These transmissions are easily heard in either AM or CW mode on your receiver. The call for an aero navigation beacon is usually a contraction of the location of the airport, although this is not always the case. The CW is transmitted so slowly that it is usually easy to copy. In urban areas, you will also hear continuous broadcasts of aviation weather, barometric pressure, temperature, and visibility. You may also hear a continuous transmission which repeats a warning of some hazard to pilots of nearby aircraft. For example, a low-powered transmitter near my home bellows, in a pronounced southern accent: "CAUTION! Cedar Hill antenna farm, 2350 sea level, centered 17 nautical miles south-southwest Love Field."


UNITED NATIONS RADIO STATION

4UZ

GENEVA, SWITZERLAND

THIS WILL CONFIRM YOUR RECEPTION OF

RADIO STATION 4UZ ON 10145 KCS. AT

0219 GMT ON 31 October 1956 19

POWER: WATTS, ANTENNA:

REMARKS—

signed

A QSL from United Nations station 4UZ in Geneva. (Courtesy Tom Kneitel)

I am particularly fond of this little station. I have heard this gentleman's voice and message, without change, for many years. It never identifies, so it's probably run by the FAA. The most amusing thing about it was several years ago when, in a fit of frustration, the tape machine doubled its speed and for two glorious days spewed its message in the manner of an enraged chipmunk. You may judge the relative importance of this station in that it went on in this manner for two days before it was repaired. Maybe their maintenance people also maintain the 5-digit Spanish numbers stations and Radio Cairo!

The coastal stations operate in a similar manner as the aero beacons. You will hear fixed coastal stations at 160 to 200 kHz and 285 to 325 kHz. These stations mostly send in CW, including weather information and advisories. If you are interested in LW two-way communications, I suggest you listen from 415 to 490 kHz. Here will be found traffic and weather information being passed around, mostly in CW, though I have heard encrypted RTTY here at times. A special frequency, 500 kHz, has been set aside for ships in distress. This frequency is monitored on a regular basis by both ships at sea and the Coast Guard. Although there are other frequencies, notably 2182 kHz, that are used more frequently, many craft use this as a primary emergency frequency.

Along the same line, Tom Adams of Wisconsin made reference to several loggings in the past of a "scratching" sound in the vicinity of 90 kHz that was not identified. Tom indicated that it was probably LORAN-C, a radionavigation system used by ships for accurate positioning. These signals are difficult to zero-beat, hence the possible error in the frequency. LORAN-C is centered at 100 kHz, with a total bandwidth of 20 kHz. There are stations located all over the northern hemisphere operating in a synchronized mode. By making delicate phase measurements, an aircraft or ship can position itself accurately. These stations are extremely powerful, output being rated in the megawatts. If your receiver is capable, tune down to the vicinity of 100 kHz. You can usually hear these stations from anywhere in the country. Thanks for the information, Tom.

Is AME3 Playing Jekyll And Hyde?

Several readers have recently sent letters indicating the apparent change of call of the mysterious AME3. In recent months, AME3 has been sending tests in both CW and RTTY, and making endless calls to UMA7 and other stations with a Soviet prefix. I made the statement earlier that it is possible that AME3 is not Spanish in origin but perhaps some Soviet spy vessel. It has appeared that, no sooner did this become public, AME3 pulled a disappearing act and resurfaced as 33AME; a thin disguise, *indeed*. In the last month, another changed has apparently taken place. The same type of transmissions are appearing on the same frequencies giving the call of 72JKL. Robert Margolis of Illinois writes telling of his logging of this station on RTTY. He has logged the same test slip on both 17139 and 22470, which reads:

72JKL 2/4/6/8/17/22 QR RG 12 RG RYRYRYRYRY
72JKL 2/4/6/8/17/22 QW RG 12 RG SGSGSGSGSG

The controversy over AME3/33AME/72JKL seems about equally divided. One side contends that this is, indeed, a genuine Spanish Naval station that, for unknown reasons, wants to disguise its true identity. One individual, name withheld, insists strongly that this station was identifying itself as EBA before its incarnation as AME3. I see that EBA, Madrid Naval Radio, is assigned 22472, but this is the only frequency that I find to be close to those in use by AME3/33AME/72JKL. But even of this is the case, why were virtually all calls made by AME3 (et al) to stations with a Soviet prefix? The changing of a callsign on a routine basis would only serve to call more attention to the sender. If this is the case, why would they use the same frequencies and test slips? Others indicate that this is probably some thinly concealed Soviet activity.

Perhaps the most bizarre opinion of all seems to come from the clandestine monitoring organization known as the "Shanachie Identification Group." In the latest of the letters sent to *POP'COMM*, HF operator Banshee 5 advises us that the calls from AME3 to UMA7 consist of ". . . Press working geographic to the British colony of

Belize." I do not really think this is so. I have never monitored anything remotely resembling press or weather activity in any of these transmissions. At present, there is no sure way to resolve this dilemma without some additional information being revealed. If any of our readers can provide enlightenment, or even have a theory that fits the evidence, drop a note to Communications Confidential.

Mistaken Identity . . . Revisited

In the September issue, we related the tale of an amateur radio operator who made contact with Coast Guard Station NMN on RTTY. He was told, in no uncertain terms, to get off the frequency immediately. In his letter to me, the operator of the station was concerned that he would be in considerable trouble with the FCC, Coast Guard, and maybe even Santa Claus. Well, he did get a response from the Coast Guard, but not exactly what he was expecting. Instead of being arrested or strung up to the yardarm he got—are you ready?—*an apology*.

In a letter dated 3 May, 1984, the Commanding Officer of the communications section stated that he was incorrect in ordering the amateur station off the frequency.

"My operators have been instructed that we share 10138 kHz with amateur operators, with no priority being given to the Coast Guard. In the future, we will observe accepted circuit procedures in sharing this frequency with you and other stations. Please accept my apology for any inconvenience we may have caused you."

Before everyone runs out to try to work a military or commercial station on the new shared access amateur bands, let me remind you of one small detail. Since this is a new area and a new problem, the Coast Guard was quite gentlemanly in their handling of this matter. But if some misguided individual decides to call CQ for 30 minutes or so on top of the Coast Guard, which might be conducting a search and rescue operation, then a different situation applies. Here, an amateur is "willfully interfering" with a station that is going about its lawful business. The Communications Act of 1934 is quite explicit in the penalties for willful interference, especially when life or property is involved. And additionally, there is no provision in the law, except for specifically approved events, for an amateur station to engage in communication with a station licensed for another radio service. Thanks to our correspondent for his interesting and informative letter and Coast Guard "QSL."

Space Shuttle Launch Support Frequencies

Ken Eichman of Ohio sent a letter detailing his monitoring activities during the two recently aborted space shuttle launches. The aborted launches provided Ken with an excellent opportunity to determine the frequencies of the various support groups and their activities during a mission. The list of players is followed by their activities in chronological order, as shown in Table 1. Thanks, Ken, for sharing these frequencies with the readers of *POP'COMM*.

From The Mailbag

Mike Miller, KA9DFI, of Illinois would like to start an amateur radio net to chat about shortwave listening. This could be a useful and informative activity both for the participants and also those non-amateur listeners who "read the mail." In fact, I'll bet that the net control might even QSL those listeners who send a report and SASE. And Mike, when you get it set up, send your net schedule to us and we'll put it in the column. Any of our ham readers who would like to participate in the net are invited to contact Mike at 5215 Maplehill Drive, McHenry, IL 60050.

Each month the quantity and quality of the loggings submitted seems to grow. If you have never sent your loggings to us because you think they might not be good enough, then put your mind at ease. In fact, the very first hint I had concerning the Chinese numbers activity came from an anonymous young lady on the west coast who had never submitted anything before. So I urge each and every reader to write to me and tell me what you have heard. Be sure to include the essential information required in a good logging: frequency, mode, time, content, and call if available. I will assuredly share this information with the rest of our readers. If you wish to remain anonymous, I will honor your request. Send your loggings to Ron Ricketts, Communications Confidential, Box 795, Bedford, TX 76021. Now let's get to this month's listening reports.

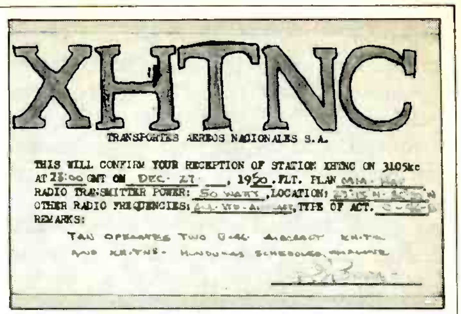
Listening Reports:

61.5: WBR70, Miami, FL with weather on RTTY, 150/100R, at 0623. (Robert Margolis, IL)
194: TUK, Nantucket, MA CW beacon at 0253. (Robert Margolis, IL)
255: CFH, Halifax, Nova Scotia, Canada Military with traffic in CW at 0701. (Robert Margolis, IL)
256: KLC, Galveston, TX with CQ/QSX marker in CW at 0655. (Robert Margolis, IL)
257.5: WLO, Mobile, AL with CW weather broadcast at 0615. (Robert Margolis, IL)
268: CKN, Vancouver, BC with weather broadcast in CW at 0552. (Robert Margolis, IL)
274: KFS, San Francisco, CA with CQ/QSX marker in CW at 0610. (Robert Margolis, IL)
285: VCS, Halifax, Nova Scotia Coast Guard Radio with VVV/CQ marker in CW heard at 0532. (Robert Margolis, IL)

Cape Radio: AFE71, Patrick AFB, Florida
DOD Cape: Possibly a go-between station coordinating the military and civilian unit's operations. Normally activated 24 hours prior to launch.
Bravo One Charlie (B1C): controller for surveillance/rescue helicopters
Five Zero One (501): unidentified
India Eight Hotel (I8H): unidentified
Liberty Star, Freedom: booster recovery ships
Patrick Vessel 1925: sonic boom control ship, civilian manned
Peapod 01, Peapod 02: surveillance aircraft of unidentified type
Bravo Hotel 36 (BH36): probably rescue helicopter
Bravo Hotel 36 (BH38): probably rescue helicopter
Agar 22: EC135 tracking aircraft

Frequency	Date/Time	
10780	25/1247	Patrick vessel 1925 reports to Cape Radio that they are on station, but due to first launch abort, are preparing to return to port. They are instructed to stand by.
5810	25/1300	DOD Cape informs Patrick Vessel 1925 that the launch has been delayed 24 hours.
5350	25/1319	AGAR 22 calls Cape Radio, requests a link with "mother." A patch is set up with "Orion Control," with whom AGAR 22 coordinates his return to base.
	25/1327	DOD Cape asks Patrick Vessel 1925 if they desire the F-4 aircraft to make another pass for calibration purposes.
5810	25/1328	Liberty Star and Freedom make radio check with Cape Radio.
5810	26/1045	"501" asks about surveillance aircraft. He is informed they will be "Peapod 02" and two helicopters, and that "Peapod 01" is unavailable for this mission.
10780	26/1149	"I8H" is told by Cape Radio to meet on circuit 12.
7461	26/1238	Cape Radio informs AGAR 22 "five minutes to launch."
5350	26/1240	"BH36" and "BH38" make radio check with "BIC."
5350, 7461	26/1242	Countdown to launch started at 60 seconds. Second launch aborted at 4 seconds.
5350	26/1244	"BH38" asks "B1C" the nature of the delay.
5350	25/1254	"BH36" and "BH38" are told by "B1C" to return to base.
7461	26/1305	AGAR 22 requests a frequency change (QSY). Cape Radio advises to QSY to 12160.
12160	26/1310	Orion Control informs AGAR 22 that they are relieved from their patrol at this time.
5350	26/1313	"B1C" reports to "BH36" and "BH38" that the mission is officially scrubbed, and that he will coordinate with Miami Center on the re-opening of downrange airspace.
12160	26/1323	Orion Control reports he is closing the net. AGAR 22 gives ETA of 1500 to Wright-Patterson AFB and requests Cape Radio to QSY to 10780 for routine ops.
10780	26/1330	Patrick Vessel 1925 requests Cape Radio to relay to "their office" to monitor "2713 upper."
10780	26/1437	AGAR 22 secures communications with Cape Radio.

294: WNU31, Slidell, LA with CQ/QSX marker in CW at 0549. (Robert Margolis, IL)
310: WNU41, Slidell, LA with CQ/QSX marker in CW at 0539. (Robert Margolis, IL)
335: LUK, Cincinatti, OH CW beacon at 0237. (Robert Margolis, IL)
346: NMN, Coast Guard, Portsmouth, VA with CW weather broadcast at 0635. (Robert Margolis, IL)
356: KPH, San Francisco with VVV/QSW marker in CW at 0706. (Robert Margolis, IL)
400: Coast Guard Cutter SWEETGUM working NMA, Coast Guard, Miami in SSB heard at 0712. (Robert Margolis, IL)
417: WSL, Amagansett, NY with traffic list in CW at 0358. (Robert Margolis, IL)
437: CFH, Halifax, Nova Scotia, Canada Military with CQ marker and hydrolant summary in CW at 0210. (Robert Margolis, IL)
4308: 4-digit Spanish numbers station with female announcer at 0300. (Robert Margolis, IL)
4589: FUE, French Navy, Brest, France with V marker in CW at 0430. (Raymond Rocker, MS)
4602: BADGER 157 of the Civil Air Patrol's Wisconsin Wing heading network traffic in SSB at 0006 and RED ROBIN 363 of the Michigan Wing heading the network at 0103. (Robert Margolis, IL)
4780: WGY912 sending 5-digit groups in slow CW at 0009. (Cameron Bailey, PA) WGY912 is the FEMA facility at Mt. Weather. (Editor)
5080: Female announcer with 5-digit Spanish groups in AM at 0103. (Thad Adamaszek, OH)
5092: 5-digit Spanish numbers station heard with female announcer at 1300. Simulcast with 6840. (Robert Margolis, IL)
5640: Female announcer with "Sierra Yankee November 2" over and over in English in AM at 0210. (Thad Adamaszek, OH)
5692: NOH, Coast Guard Air Station, Chicago, calling Coast Guard 1459 in SSB at 0107. (Robert Margolis, IL)
5810: Female announcer with 4-digit Spanish numbers in AM at 0127. Parallel transmission on 6800 kHz. (Thad Adamaszek, OH)
5866: "2 QUEBEC" radio check to "4 INDIA" in SSB at 0512. (Robert Margolis, IL)
6100: YVTO, Caracas, Venezuela standard frequency and time station at 0519. (Robert Margolis, IL)
6655: Female announcer speaking 5-digit groups in Spanish at 0103. Loud hum on signal, "final" three times and off at 0107. (Thad Adamaszek, OH) Female with young voice with 5-digit Spanish groups in AM at 0103. (Thad Adamaszek, OH)
6698: 4WX with coded message of letters and numbers for about 20 seconds. Also longer message 15 minutes later to SKYKING, which was relayed by RODNEY on 6762 about 7 minutes later. Also same message heard on 11268 about 25 minutes later from station 4LH. (George Delap, NY) These are tactical relays of SAC. (Editor)
6723: Q9V, G4G, and W7M making radio checks in USB at 0105. (Cameron Bailey, PA)
6800: Female in AM with "4-8-3" three times, 0-1 over and over, 10 beeps, "Grupo 82" and then 4-digit numbers, all in Spanish. Began at 0100 and parallel transmission at 9075. (Thad Adamaszek, OH)
6840: Female announcer at 0230 in AM with "3791-8367-7771-5?38" repeated in Spanish over and over. Considerable noise and QRM. (Thad Adamaszek, OH) Female in AM with "2932-3136-8417-4552" over and over in Spanish at 0230. Heavy QRM from Daventry. (Thad Adamaszek, OH). "UADT DE46 BBU4" sent repeatedly in CW at 0336. On another day, at 0333," AUNV, B4ND 4VDU UNEA DTTV" was repeated in CW. (Robert Margolis, IL) Unusual SS/4D numbers activity. First incident was the usual female voice repeating the numbers "3142 1583 8487 6523" over and over at 0235. On another night, an SS/4D numbers station came on with a distinctly different voice, otherwise normal, heard at 0600. (Raymond Rocker, MS)
6841: "BVETNDTEADNN" repeated in slow CW from 0334 to 0338 (Robert Margolis, IL)
6860: 5-digit CW groups at 0120 with all digits cut except 4 and 6. (Raymond Rocker, MS)
6923: 5-digit Spanish numbers station with male announcer at 0237. Similar to 6933, with same man, another woman. (Robert Margolis, IL)
6933: 5-digit Spanish numbers station with male announcer in SSB at 0210. Numbers were dictated to a woman, who requested repeats. (Robert Margolis, IL)
6976: Unidentified station with CW traffic in French at 0341. (Robert Margolis, IL)
6997: "VV DE OST3/32 OST42" tape marker in CW at 0251. Transmission from Oostende, Belgium. (Don Schimmel, VA)
7315: "IDR3" with very strong signals in CW at 0105. "VVV VVV VVV IDR3 IDR3 IDR3." Irregular gaps between groups. (Burt Knight, NH) IDR3 is Rome Naval Radio, Rome, Italy. (Editor)
7337: Five letter groups in CW at 1240; probably Russian as IM, AA, OE, and OT characters used. (Don Schimmel, VA)
7404: Female calling "Papa November" in USB at 0032. Then female announcer with 5-digit German numbers sent in USB at 0035. This was not machine generated; she would pause to catch her breath. (Cameron Bailey, PA) 5-digit German numbers station in SSB with female announcer at 0630. Opened with "Papa November" and musical tones. Several broadcasts were made, one only five groups long. Furthermore, some of the messages were of the 3/2 pattern, while others were normal. (Raymond Rocker, MS)
7408: Five letter groups in CW at 1224 with no ID given. (Don Schimmel, VA)
7410: 5-digit numbers station with female announcer in unknown language, possibly Russian, at 0400. (Raymond Rocker, MS)
7425: CW test tape, "QRA DE KWS78," Athens, Greece, US Embasssy, at 0245. (Don Schimmel, VA)
7445: Female announcer repeating "Kilo Papa Oscar 2" over and over in English at 0155. Mode was SSB or AM with very bad modulation. (Thad Adamaszek, OH) Thad, it was probably AM with upper sideband only. These type of transmissions are more easily understood in SSB mode. (Editor)
7461: AGAR 22, ORION Control and Cape Radio preparing for Space Shuttle *Discovery* until aborted. Received more accurate info from these communications than from television reports. (Cameron Bailey, PA) Nothing new about that. (Editor)
7540: "Q27A DE 0AZBO P AR" repeated in CW at 0507. At 0515 the station abruptly went into a string of random numbers. (Raymond Rocker, MS)
7667: "XE4," in an unknown location, sending repetitive CW marker at 0650. "VVV VVV VVV DE XE4 XE4 XE4 125/189/066." (Raymond Rocker, MS)
7788: Five letter groups in CW at 1225. Probably Soviet at IM, OE, OT, and AA were the characters used. (Don Schimmel, VA)
8070: FDY, French Air Force, Orleans, France with V marker in CW at 0530. (Raymond Rocker, MS)
8403: Female announcer reading numbers in Chinese, dialect unknown, at 0023. (G. J. Harris, Philippines) More confirmation that we now have a Chinese numbers station to wonder about. (Editor)
8439: "VVV DE VCS" marker in CW at 2300. (Cameron Bailey, PA)
8441: "78EAL DE 72JKL 13RRG" repeating CW marker at 0257. (Raymond Rocker, MS)
8505: XSG, Shanghai, PRC, with QSX and ID tape in CW at 0020. (G. J. Harris, Philippines)
8567: DZR, Manila Radio, Philippines with QSX and ID tape in CW at 0015. (G. J. Harris, Philippines)
8694: 4XO, Haifa, Israel, with CQ/QSX marker in CW at 0130. (Robert Margolis, IL)
8700: YUR, Rijeka, Yugoslavia with VVV/QSX marker in CW at 0118. (Robert Margolis, IL)
8753: WTEG-NOAA vessel Mt. Mitchell working KVH-Atlantic Maritime Center, Norfolk, VA in SSB at 1906 and WTEQ-NOAA Pierce calling same at 1921. (Robert Margolis, IL)
8809: FFL41, St. Lys Radio, France with voice marker and musical signal in French heard at 0502. (Raymond Rocker, MS)
8830: Live broadcast by Spanish-speaking male with phonetics in 3/2 format in SSB at 0256. Used "Mexico" for "M" and "Quito" for "Q," the rest being the usual phonetics. (Robert Margolis, IL)
8984: NOT, Coast Guard Air Station, Traverse City, working CG2130 in SSB at 1510. (Robert Margolis, IL)
8993: BLUE SKY working McDill AFB in SSB at 0549. (Robert Margolis, IL)
9040: 5-digit German numbers station with female announcer at 0400. Opened with 5 minutes of "Uniform Bravo" and musical tones. Signal was very strong and it is unlikely that the transmitter is located in East Germany. (Raymond Rocker, MS)
9050: 5-digit German numbers station with female announcer at 0308. Was not on SSB as is usual for this type of station. (Robert Margolis, IL)
9074: "Footsteps" sound, like that heard preceding SS/4D numbers transmissions, heard at 0528. At 0530, the "footsteps" ended but the carrier remained. At 0538, a repeating "N" beacon came on, apparently from the same transmitter. (Raymond Rocker, MS) Good logging, Raymond. This is an interesting correlation between the numbers and beacon transmission. (Editor)


XHTNC
TRANSPORTES AEREOS NACIONALES S.A.
THIS WILL CONFIRM YOUR RECEPTION OF STATION XHTNC ON 3105kc
AT 23:00 GMT ON DEC. 27, 1950. FLT. PLAN
RADIO TRANSMITTER POWER: LOCATION:
OTHER RADIO FREQUENCIES: TYPE OF ACT.
REMARKS:

An unusual aircraft station callsign was XHTNC, a C-46D aircraft, monitored in 1950 by Tom Kneitel. This transport plane was of Honduran registry.

9075: Female announcer with Spanish 4-digit groups, "Grupo 120," standard format, heard at 0002. (Thad Adamaszek, OH)
9110: 5-digit Spanish numbers station with female announcer at 1334. (Robert Margolis, IL)
9120: "CACTUS" calling "CARNATION" in SSB at 1938. (Robert Margolis, IL)
9140: "0A" working "K90A" in CW from 1648 to 1700. Traffic consisted of 6-digit numeric groups, each transmission being repeated every two minutes. (J. E. Gregory, Australia)
9222: 4-digit Spanish numbers station with female announcer at 0400. (Robert Margolis, IL)
9223: Zero-digits Spanish numbers station with female announcer at 0100. The woman repeated "545" for ten minutes without the usual counting from uno to cero, then went off the air. (Robert Margolis, IL) Well, it could be that their budget was cut. But have you ever seen a woman with nothing to say? (Editor)
9265: Female announcer speaking 5-digit groups in German at 0206. (Thad Adamaszek, OH) 5-digit German numbers station with female announcer on AM at 0207. Each group was repeated twice in a row and the entire transmission was repeated a second time. (Robert Margolis, IL)
9435: Female announcer with 4-digit groups in English at 0223. "End" at 0225 followed by short RTTY burst and then off the air. (Thad Adamaszek, OH)
9450: German female announcer with 5-digit groups in AM heard at 0209. Heavy QRM from VOA. (Thad Adamaszek, OH)
9958: "4447 4704 8797" repeated in Spanish by the 4-digit numbers station voice at 0234. At 0237, a single "Grupo 04" was sent, then back to the repeated numbers. Transmission ended at 0240. Apparently trouble at the numbers studio. (Raymond Rocker, MS) It is interesting that most of the numbers stations seem to be continually plagued by minor technical problems. Not only that, but when transmissions are "live," they are usually non-professional sounding. It makes you wonder! (Editor)
10210: "0A" working "79H" in CW from 1642 to 1711. Traffic consisted of eight 6-digit numeric groups, each transmission being repeated every two minutes. (J. E. Gregory, Australia) "0A" calling "75," "87," "43," "87," beginning at 1622. (J. E. Gregory, Australia) A considerable amount of activity on this and other frequencies by "0A." None of my sources list this call so I would assume it is either tactical or spurious. Do any of you readers know what it is? (Editor)
10511: CW beacon "C" at 0531 going into "5HSQXDEIK" at 0534. (Robert Margolis, IL)
11182: "EUREKA" calling "APPALACHIA" in SSB at 0107. (Robert Margolis, IL)
11243: "TEAMWORK" working "STAMPEDE" and "DWELLER" working "QUOTATION" in SSB at 0010. (Robert Margolis, IL)
11528: 4-digit CW groups of cut numbers using ABDENTUV46 at 0420. (Raymond Rocker, MS)
11532: Female in AM with 4-digit Spanish groups, "Grupo 173," standard format at 0100. (Thad Adamaszek, OH) 4-digit Spanish numbers station with female announcer at 2000. (Robert Margolis, IL)
12781: 9MG, Bayan Lepas Radio, Pinang, Malaysia

with V marker and ID in CW heard at 0050. (G. J. Harris, Philippines)

12855: UBF2, Odessa Radio USSR, calling 4LT3 in CW at 0000. (Robert Margolis, IL)

12912: UHK, Batumi Naval Radio, USSR, with traffic in Russian in CW at 2316. (Robert Margolis, IL)

12939: SPE61, Szczecin Naval Radio, Poland, with VVV/QSX marker in CW at 2304. (Robert Margolis, IL)

12940: Varna Naval Radio, Bulgaria with "DE LZW LZW" marker in CW at 2256. (Robert Margolis, IL)

12996: ANSA news in Italian sent in CW at 2220 by IAR33, Rome Naval Radio, Italy. (Robert Margolis, IL)

13051: CW test tape at 1947, "CQ DE WPD." Transmitter located in Florida. (Don Schimmel, VA)

13178: WLO, Mobile, AL with male reading traffic list in SSB at 0130. (Robert Margolis, IL)

13181: NOVEMBER 5 WHISKEY with Skyking broadcast on SSB at 1521. (Robert Margolis, IL)

13241: English announcer, possibly Navy or Coast Guard, passing traffic in USB at 2015. Mentioned Yeoman, Captain, and similar terms. (Don Schimmel, VA)

13249: YUB2, unknown location, sending CW marker at 1840. "VVV QRA DE YUB2 YUB2 YUB2." (Raymond Rocker, MS)

13279: Spanish announcer is USB at 0200 with phonetic trigraphs followed by 4-digit groups. (Don Schimmel, VA)

13280: Five letter groups in CW at 2045. No ID given. (Don Schimmel, VA)

13297: Five figure groups in CW at 1233 with zero cut as T. (Don Schimmel, VA)

13303: Five character groups with cut numbers heard in CW at 1320. Digits sent as AU34567DNT. (Don Schimmel, VA)

13330: 5-digit cut CW groups at 1226. Digits sent as AU345 67DNT. (Don Schimmel, VA)

13350: "Sierra" messages in CW at 2335 using letters ADEGIMNRTUW in long strings. "Sierra" prefixed each message. (Robert Margolis, IL)

13364: Five letter CW groups at 1305. Probably Soviet as IM, OE, OT, and AA characters are used. (Don Schimmel, VA)

13372: "LUB" working "BOR" in hand-sent CW at 2225. Five figure groups sent and received with zero cut as T. (Don Schimmel, VA)

13384: Four figure CW groups sent by hand in CW with no ID at 1953. Zero was cut as T. (Don Schimmel, VA)

13385: CW test tape, "386 386 386 1" repeated at 2104. (Don Schimmel, VA)

13393: "NDO," unknown location, with RTTY RY's, 425/66R and a four-group, 5-digit message at 1710. (Robert Margolis, IL)

13394: "0A" calling "64," "27," and "38" in CW at 1635. Traffic consisted of 6-digit groups. (J. E. Gregory, Australia)

13402: CW test tape, "QRA DE E2P" followed by five letter groups at 2116. (Don Schimmel, VA)

13425: "234 234 234 1" in CW repeatedly. Then into five figure groups with zero cut as T, at 2110. (Don Schimmel, VA)

13427: 5-digit messages from an unknown station in RTTY, 425/66N, at 2315. This was followed by messages in a partially unidentifiable language and then into CW with traffic in alphanumerics with punctuation. (Robert Margolis, IL)

13513: "43" and "94" being called by "0A" in CW at 1606. (J. E. Gregory, Australia)

13554: Five letter groups in CW at 0227. May be Soviet since IM, OE, and other Cyrillic characters used. (Don Schimmel, VA)

13616: SPH, Gydnia, Poland with Polish traffic in CW to ship SPTZ at 1911. (Robert Margolis, IL)

13654: National Weather Service, Honolulu, Hawaii with weather reports in CW heard at 1314. (Don Schimmel, VA)

13676: Five-alphanumeric groups with punctuation marks in CW at 1918. (Robert Margolis, IL) Five-character groups in CW consisting of letters, numbers, and punctuation randomly mixed together at 1756. (Raymond Rocker, MS)

13857: 5-digit Spanish numbers station with female announcer in SSB at 1539. (Robert Margolis, IL)

14407: "V V V K38 K38 K38" repeating CW marker heard at 0230. At 0235, the station sent "SK SK"2 and left the air. Very strong signal; sounded like the "VK30" that was on 6102 kHz. (Raymond Rocker, MS)

14423: "574 574 574 QTC 1 ABT 69" in CW at 2353. This was followed by five character groups, ending at 2358 with a "QRU QRU SK." (Robert Margolis, IL)

14430: 5-digit English numbers station with male announcer at 0430. Began with "374" repeated for five minutes, with very weak signal. (Raymond Rocker, MS)

14434: FJY4, Martin de Vivies, St. Paul and Amsterdam Islands with weather via RTTY, 850/66R, at 0320. (Robert Margolis, IL)

15075: Beacon "U" at 0250. (Robert Margolis, IL)

15156: "WAR" with some frequency shift. "VVV VVV VVV DE WAR WAR WAR." Sent at 0125 in CW at approximately 20 wpm. (Burt Knight, NH) This is the Army MARS HQ near Washington, DC.

15780: WQB35, Firestone Tire and Rubber Co., Akron, OH with SITOR traffic at 1430 to ELE15, U.S.-Liberia Rubber Corp., Harbel, Liberia. (Robert Margolis, IL)

15810: 5-digit Spanish numbers station with female announcer at 1400. The same woman was on 11532 kHz at the same time with a different group of numbers. (Robert Margolis, IL)

16451: Female announcer with 4-digit Spanish groups, regular format, at 2200. "Attencion 737." (Gordon Hubbard, AZ)

16923: OFJ, Helsinki, Finland with CQ marker and traffic list in CW at 1347. (Robert Margolis, IL)

16970: 9VG, Singapore Radio, Singapore with CQ and QSX tape in CW at 0043. (G. J. Harris, Philippines)

16974: "DE GKD" marker in CW at 2255. (Cameron Bailey, PA)

16983: "VVV DE NMR" marker in CW at 2253. (Cameron Bailey, PA)

17008: TAH, Istanbul, Turkey with QSX/CQ marker in CW at 0030. (Robert Margolis, IL)

17017: Beacon "D" heard at 0040 in CW. (Robert Margolis, IL)

17043: JCU, Chosi, Japan with CQ/QSX marker in CW at 2235. (Robert Margolis, IL)

17095: "DE SVA" marker in CW at 2239. (Cameron Bailey, PA)

17113: "DE GKB3" marker in CW at 2250. (Cameron Bailey, PA)

17143: "CQ DE DAN" marker at 2242 in CW. (Cameron Bailey, PA)

17146: 4XO, Haifa Radio, Israel with CQ and QSX marker at 1445. (G. J. Harris, Philippines)

17173: "DE WLO" marker in CW at 2243. (Cameron Bailey, PA)

17188: "DE SVD" marker in CW at 2248. (Cameron Bailey, PA)

21752: "BB 6VENE4" repeated in CW heard at 1628. No ID given. (Raymond Rocker, MS) Nice "mystery" catch, Ray!

22376: ZLO, Irirangi Naval Radio, New Zealand with DE/QSX marker in CW at 0128. (Robert Margolis, IL)

22431: WNU36, Slidell, LA, with weather broadcast in CW at 1647. (Robert Margolis, IL)

22464: FUM, Papeete, Tahiti, with V marker and ID in CW at 0035. (G. J. Harris, Philippines)

22470: "72JKL," location unknown, with RY and SG test slip in RTTY, 850/100R at 0048. Transmission ceased at 0053. (Robert Margolis, IL) Keep an ear on this one. This station transmits in the identical format of AME3 and 33AME. The evidence is coming in that these are all the same station(s). (Editor)

22476: HLG, Seoul Radio, Korea, with CQ tape in CW at 0038. (G. J. Harris, Philippines)

22533: ZLB2, Awarua, New Zealand with CQ/QTC marker in CW at 0155. (Robert Margolis, IL)

27772: Paging system, possibly FM and off frequency. "Dr. Jacobs, please call Mrs. Smolen." Tones, continuous carrier and no ID given. Station somewhere in midwest. (Burt Knight, NH)

27782: RAF ground to air transmissions, asking that CBers leave the frequency and stop interfering with government business at 1720. (Burt Knight, NH) And good luck on that! (Editor) PC

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY FRANK BAYLIN

Satellite Television Antennas

Antennas for receiving satellite broadcasts are so simple in concept that hundreds of large to small manufacturers are now selling these products to the homesat market. Yet many antennas on the market are far from achieving the stringent design characteristics to ensure adequate performance. The industry is now moving in the direction of establishing procedures to test these dishes. In the future, these will serve to weed out quality products from those which are poorly designed or manufactured.

The quality of an antenna is defined by how well it concentrates the signal intercepted from a targeted satellite into the feedhorn and by how well it ignores noise and unwanted signals. But this is only half the story since feedhorn design determines how well the message reflected from the antenna is captured.

The parabola is the underlying form of most "dishes" on the market today. It has the characteristic of reflecting signals entering parallel to its axis to one common point, the focal point. This concentration of signal is measured by a term called the gain. Gains of more than 10,000 are typical for 10-foot diameter dishes. However, all dishes are not perfect, so surface irregularities will cause some signals to be reflected away from the focal point and some undesired signals to be detected. The table below (Table 1) shows that even small imperfections can cause much signal to be lost.

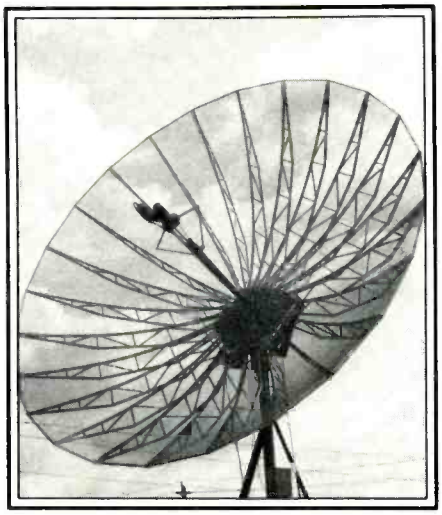
Table 1

Average Surface Distortion (inches)	Loss of Gain (%)
0.01	2
0.05	17
0.10	44

Dishes made from many different types of materials such as fiberglass, wood, metal screening, spun aluminum, or steel can range in quality from excellent to very poor. If a very thin metal mesh is used, flying objects such as hail or stones can severely damage the surface. If allowances for material expansion are not included in the design, a once excellent antenna can rapidly deteriorate. Wood and other substances can warp if not properly treated.

The simplest way to weed out a poor quality dish is to either visually inspect or run your hand over its surface. If it has noticeable ripples or waves, chances are excellent its performance will be poor.

A second measure of the quality of a dish is the beamwidth. An excellent antenna should have severe tunnel vision; any off-axis signals or noise should pass by unobserved. In reality, the microwave energy detected by a dish is spread over a region of the sky measuring typically 1 or 2 degrees. A



The wire mesh SUPER TENNA from Hero Communications.

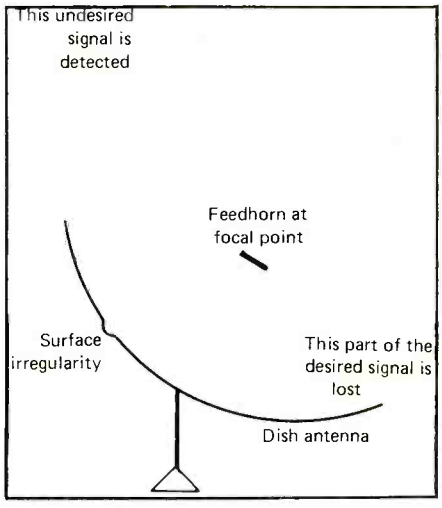


Figure 1: The accuracy of an antenna surface is a factor in the home satellite system performance.

dish having an irregular surface, as shown in Figure 1, will see more than it should and subsequently have a larger beamwidth. Figure 2 shows one definition of the beamwidth, that measured between the two "half power" points.

In practice, antenna beamwidth is a function both of the antenna and feedhorn. The feedhorn occupies some 6 to 8 inches at the antenna focus and as a result will intercept some microwave energy from slightly off-targeted regions of space. Thus, even if the antenna were perfect, an antenna would have a measureable beamwidth.

Both the gain and beamwidth vary with antenna diameter. Gain increases with antenna diameter because the larger the antenna, the more energy from any chosen satellite is "seen." In fact, a maximum gain

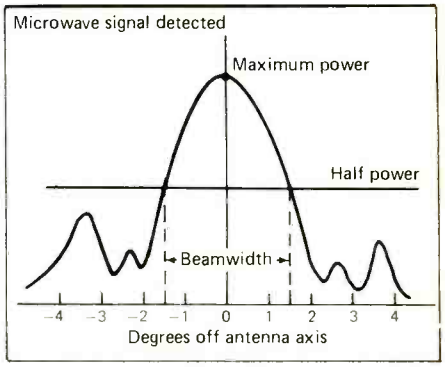
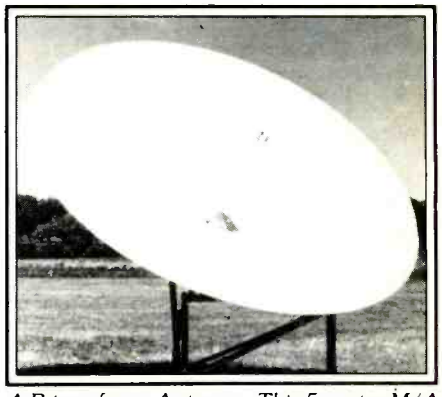


Figure 2



A Prime-focus Antenna. This 5-meter M/A COM antenna is molded from fiberglass. (Courtesy M/A COM, Inc.)

can be calculated for any antenna diameter. Antenna beamwidth decreases as antenna diameter increases. So if a dish is too small, the beamwidth may be large enough to detect the wrong satellite located maybe three or four degrees off the line to the targeted satellite. Therefore, increasing antenna diameter can substantially improve television reception because beamwidth decreases while gain increases.

The third parameter which serves to define the quality of an antenna/feedhorn combination is the noise temperature. Noise or any other undesired microwaves can be picked up from energy emitted from the warm ground, from nearby electrical equipment, or from signals coming from other satellites or earth based communication systems. In general, the more narrow the beamwidth, the lower the antenna noise temperature.

Noise is strongly affected by the match between the feedhorn and the dish. All feedhorns have a particular illumination pattern; that is, they see signals coming from a predetermined area of space. If the feedhorn sees only the central portion of a dish, gain will be reduced. If it sees beyond its boundaries, excess ground noise, called spillover, will be detected.

A much talked about parameter related to

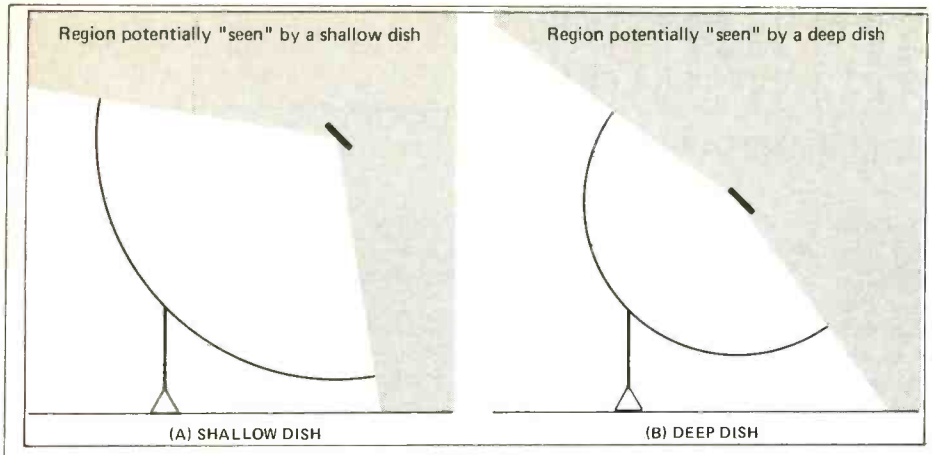


Figure 3

dish/feedhorn quality is the focal length to antenna diameter ratio, the f/d ratio. A system with a very low f/d such as 0.25, a deep dish, will see much less of the surrounding terrain than a shallow dish with an f/d of 0.40. This is demonstrated in Figure 3.

An antenna manufacturer should understand how antenna size and design interact to determine the important parameters of gain, beamwidth, and noise temperature. But many don't or do not pay adequate attention to these measures of quality. Many in the satellite television industry, including the national industry representative, SPACE, are now pushing to establish standards and independent testing organizations. Until these procedures are in place, the consumer should always try to ascertain the source of any published antenna specifications. In the past, some nationally placed advertisements have made impossible claims such as antenna gains which are not theoretically feasible for the given dish diameter. Hopefully, by the time this column is printed, the satellite television industry will be well on its way to properly policing itself and protecting the consumer.

If you would like to learn more about satellite television, *Satellites Today, The Complete Guide to Satellite Television* by Frank Baylin is available from ConSol Network, 1905 Mariposa, Suite B, Boulder, CO 80302 for $9.95 plus $1.00 for postage and handling. PC

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Controlling Interference Potential Of Computers And Similar Electronic Equipment Quantities

The FCC proposed an exemption to the existing rules governing the interference potential of computers and similar electronic equipment for large, essentially one-of-a-kind equipment or large multi-system equipment built in quantities of ten or less.

Electronics Associates, Inc., asked for exemptions for equipment built in quantities of less than 300.

The Commission found this number to be too high but noted that ten might not be correct either. It asked for comments on the appropriate number of large special purpose equipment to exempt and the definition of the equipment to be exempted.

Operator Convicted Of Unlicensed Operation And Jamming

Harold Claypoole of San Diego has been placed on three years probation by the U.S. District Court for the Southern District of California on conditions that he cease violating radio regulations and not speak over the air on any radio equipment without prior approval of the FCC.

This recent action brings to a close the illegal and disruptive jamming by this San Diego radio operator who at one time held a valid amateur radio license N6BII, but had it revoked in 1979 following a history of deliberate and malicious interference dating back to 1961.

The FCC's San Diego Office, responding to more than fifty complaints from amateurs concerning Claypoole's unlicensed operation, put together a strong case resulting in the February 15, 1984 execution of a search warrant at Claypoole's address in San Diego. U.S. Marshals seized the radio equipment and criminal prosecution ensued.

While the FCC normally handles amateur interference problems by way of administrative procedures involving violation notices and fines, it became necessary to take the firm action applied in this case to silence the continued disruptive operations following the repeated warnings of the Commission and area amateurs.

Seizure Of Over $140,000 In Illegal Radio Equipment

On August 9, U.S. Marshals, assisted by agents from the District Office of the Federal Communications Commission at Norfolk, Virginia, conducted a search and seizure of over $140,000 worth of illegal radio equipment intended for use in the Citizens Band (CB) Radio Service. The equipment was seized from D&D, Inc., in Shelby, North Carolina.

J. J. Freeman, FCC Engineer-in-Charge of the Norfolk District, said the investigation was launched on the basis of several tips from confidential sources that led to an undercover investigation by his staff.

The seized equipment included numerous linear amplifiers, components, and subassemblies which were being manufactured in Shelby and distributed to retailers in several states.

According to Freeman, such devices are not authorized for use in the CB service and can cause interference to all kinds of home electronic entertainment equipment, aircraft communications, and even pacemakers used by heart patients. He added that finding the source and shutting down such operations is the most effective way to deal with this type of criminal activity.

D&D, Inc., and possibly others, face criminal charges for violation of the Communications Act of 1934, and could be fined up to $10,000 and sentenced to one year in prison for the manufacture and sale of external linear amplifiers.

The investigation and criminal prosecution is being conducted with the assistance and cooperation of Charles Brewer, U.S. Attorney for the Western District of North Carolina.

Modifies Spectrum Utilization Policy Bands Between 947 MHz And 40 GHz

On reconsideration, the Commission clarified its action taken in the First Report and Order in Docket 82-334 (FCC 83-392, released September 30, 1983), and the Second Report and Order in Docket 79-188 (FCC 83-393, released September 30, 1983) with respect to the 18 GHz channeling plan and technical standards and reaccommodation provisions for displaced 12 GHz private microwave licensees.

In the Second Report and Order, the FCC established an allocation in a segment of the 18 GHz band (specifically, 18.36-19.04 GHz) for use by private and common carrier Digital Termination Systems (DTS) and by private, common carrier, and broadcast auxiliary point-to-point operations. It also reallocated 10.55-10.68 GHz, previously allocated exclusively for common carrier DTS, for use by private DTS and by the private operational-fixed service for point-to-point operations.

The First Report and Order provided spectrum in the 13 GHz (12.7-13.15 GHz) and 6 GHz (6525-6875 MHz) bands for the reaccommodation of existing 12 GHz (12.2-12.7 GHz) private fixed service users who must vacate that band in order to permit the implementation of the broadcasting-satellite service at 12 GHz. It also completed the allocation of the remaining segments of the 18 GHz band (17.7-19.7 GHz) for private, common carrier, broadcast auxiliary, and cable operations.

The Commission received several petitions for reconsideration of the two proceedings. Since the issues raised in several petitions in both dockets were interrelated, the FCC addressed all issues in a single order. The four general categories are: Digital Termination Systems; 18 GHz Band Allocation Plan; 18 MHz Technical Standards; and 12 GHz Reaccommodation Procedure.

The FCC affirmed its previous action to allow private DTS operations on the four 10.6 GHz channels previously allocated to common carrier systems.

The channeling plan for the 18 GHz band is to be used to support terrestrial fixed point-to-point and point-to-multipoint operations; the band is also co-equally shared with the fixed-satellite service. The FCC modified the channeling to support contiguous spectrum for cable television operation and to have a uniform transmit/receive separation for the narrow band channels. However, a requested 120 MHz transmit/receive separation is not provided for in this revised channeling plan. The current waiver to market equipment not complying with the channeling plan is extended for two years from the release of the text of this item.

With regard to the technical standards adopted for the 18 GHz band, the Commission postponed the implementation of the 1.0 bps/Hz spectrum efficiency standard until December 1, 1988. Therefore, manufacturers will not be required to redesign existing equipment in order to meet the 0.6 bps/Hz interim efficiency standard.

The FCC affirmed its decision to make available spectrum at 13 and 6 GHz to reaccommodate the 12 GHz licensees who are being displaced by DBS.

FCC Eliminates Developmental Classification Of 13.2-13.25 GHz Band

The Commission amended Section 94.61(b) of its rules to eliminate the developmental classification of the 13.2 to 13.25 GHz band for private licensees in the Operational-Fixed Microwave Service and Section 94.81 to exempt low power portable transmitters used in this band from the requirement of type acceptance or notification.

The development provision for use of the

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13.2-13.25 GHz band was originally intended to encourage development of radio equipment to be used in this band, and to increase use of this spectrum. This spectrum is used on a primary (non-developmental) basis by the Television Auxiliary Broadcast Service (Part 74), the Local Television Transmission Service (Part 21) and the Point-to-Point Microwave Service (Part 21).

The FCC said the present state of microwave radio technology and the regular authorizations in other services in this band have made the developmental restriction on private use inappropriate.

Operation Of Marine Radar Transponders And Radio Beacons For Offshore Exploration And Radiolocation

In response to a request by Radar Devices, Incorporated (RDI), Mar-phonics, and Novatech Designs Limited, the Commission has begun an inquiry concerning the operation of marine radar transponders and radio beacons for offshore exploration and radiolocation.

In 1981, RDI was granted a license to test an offshore oil exploration radar system. In offshore oil exploration, a vessel tows a long seismic streamer which is used to make sounding measurements of the ocean bottom. A radar reflector is attached to the end of the streamer so that the vessel can establish the exact location of the streamer. However, it is often impossible to distinguish signals returned from the radar reflector from those returned from the ocean surface.

To remedy the problem, RDI developed a radar transponder to replace the radar reflector. The RDI system consists of a radar interrogation transceiver, a transponder, a VHF transmitter, and a VHF receiver. The VHF link is used to command the transponder "on" and fine tune it to the radar frequency. The radar used in the RDI system operates in the 9300-9500 MHz band and consists of FCC type accepted equipment. The VHF transmitter also consists of FCC type accepted equipment and operates on 173.25 MHz with a maximum power output of 2.5 watts. The transponder consists of RDI developed equipment which is not type accepted by the FCC and operates in the 9300-9500 MHz band with an output power of 300 milliwatts and a maximum of 4 watts effective radiated power.

Mar-phonics requested that the Commission allocate 10 land mobile frequencies for use of a radio beacon for commercial fishing and oceanographic purposes. The Mar-phonics device would operate in the 151-174 MHz bands, and would be attached to a floating platform to transmit fishing information to commercial fishing vessels.

The Novatech radio beacon, certified by Canada, operates on 150.8 MHz and 150.9 MHz. It is used to mark the location of schools of fish, offshore platforms, and work sites; to track the movement of ocean currents, tides, oil spills, and ice; and to facilitate search and rescue operations.

Since the use of the RDI transponder in the 9300-9500 MHz band could cause interference to other radionavigation operations, the Commission is seeking comments on its proposal that these operations be used in the 9280-9320 MHz band. Similarly, to prevent interference to land mobile radio users, the FCC proposed that the RDI VHF transmitters and the radio beacons might use the frequencies of 156.450, 156.475, 156.500, 156.525, 156.850, and 156.875 MHz, instead.

The Commission is seeking comments on the need for these devices and the appropriate frequencies, technical and administrative requirements to be operated under Part 83 (Marine ship services) rules.

Deletion Of Special Mobile Radio System Channels Affirmed

The Commission denied Motek Engineering, licensee of Specialized Mobile Radio System (SMRS) Station WZZ-545, San Jose, California, reinstatement of its 20 channel authorization for WZZ-545; and affirmed its staff action which deleted 15 channels from Motek's SMRS trunked facility, at San Jose.

The Private Radio Bureau reclaimed 15 channels from Motek for reassignment to applicants in San Francisco on the grounds that Motek had failed to meet the express loading conditions of its authorization (Motek had only 281, ½ of the minimum 350 mobiles required by Rule 90.366(d)) even with a five month extension. It subsequently denied Motek's petition for reconsideration.

In denying Motek's review, they said there was no evidence that the Bureau underestimated the actual number of mobiles Motek had in operation. Additionally the Commission said it rejected Motek's claim that the Bureau failed to consider the "captive nature" of its relationship with its equipment manufacturer which impeded Motek's ability to meet the loading requirements. The FCC asserted that Motek's relationship with its supplier was an independent business judgment and may not be used to exempt it from the loading requirements of the Commission rules.

Disagreeing with Motek's assertion that recovery of 15 of its channels lacked fundamental fairness, the FCC pointed out that Motek ordered equipment for additional channels in early 1983 in disregard of Rule 90.366(d) which requires that a licensee demonstrate 70% loading of the initial 5 channel stage prior to construction of the next stage. They also noted that Motek's practice of heavily loading its system with 20 channel mobile users despite the Bureau's determination that it was only entitled to a 5 channel system was questionable.

The FCC stated that it agreed with the staff ruling and added that the deleted channels should be routinely reassigned by the Bureau.

Battery Packs Used In Emergency Locator Transmitters

The Commission upheld a staff action deleting a restrictive note found on replacement battery packs for seven emergency locator transmitter (ELT) models manufactured by Emergency Beacon Corporation (EBC) of New Rochelle, NY. (ELTs are battery-powered devices which transmit a signal to aid rescuers in locating survivors of a downed aircraft or survival craft.)

In 1982, EBC asked the Commission to make all of its type-acceptance grants for ELTs subject to the condition that they be used with factory-approved battery packs. EBC argued that battery packs of other manufacturers could make its ELTs operate outside FCC specifications. In response, the FCC staff added a note stating the ELTs would be type accepted only when used with battery packs approved by EBC.

Less than a year later, the staff removed the note after several competing battery pack manufacturers had objected. Subsequently, as a result of tests by the FCC's Laboratory, it was concluded that the note was not justified under FCC rules, and it was removed. EBC has asked for stay and review of the staff's action, as well as reinstatement of the note.

The Commission pointed out that, in the past, it has not treated batteries as a critical circuit element in type-accepted transmitters, since they are available from many suppliers and the transmitter manufacturer usually has no control over their installation.

It added that if a transmitter were found to be so vulnerable to off-frequency operation or other noncomplying operation upon the mere replacement of one battery with another one, then the Commission would question the suitability of the transmitter for type acceptance.

Interconnection Of PLMRS With Public Switched Phone Network Above And Below 800 MHz Band

The FCC has taken three separate actions concerning Part 90 of its rules as it pertains to the interconnection of private land mobile radio stations (PLMRS) with the public switched telephone network (PSTN) above and below the 800 MHz band.

First, it began a rulemaking proposing elimination of geographic and other restrictions imposed on the interconnection of PLMRS with the PSTN below 800 MHz, in conformance with interconnection rules adopted previously.

Second, it denied a joint petition by Communications Sales and Services, Inc., South Texas Radio Service, Inc., Auto Page, Inc., and Louis Systems, Inc., and a separate petition by Telecator Network of America for reconsideration of the previous ruling amending the rules governing interconnection above 800 MHz.

Finally, the Commission proposed to eliminate certain restrictions below 800 MHz to allow private licensees and users to obtain telephone service from an authorized carrier, individually or jointly on a non-profit cooperative basis or on a shared non-resale basis through ordering agents, in conformance with the rules adopted to govern such arrangements above 800 MHz.

In addressing the PLMRS interconnection rules, the FCC elected to consider systems operating below 800 MHz first, and to treat the interconnection of 800 MHz systems later.

The first phase resulted in adoption of a First Report and Order containing rules prohibiting interconnection within 75 miles of 25 of the nation's largest urban areas in five services—Automobile Emergency, Business, Special Emergency, Special Industrial, and Taxicab Radio Services; special provisions governing use of internal systems of communication in connection with the operation of private land mobile stations and the use of dial-up circuits for transmitter control; and special requirements pertaining to the methods of interconnection, such as monitoring by the control operator and time limitations on interconnected communications.

In May 1982, the FCC adopted a Second Report and Order eliminating many of the restrictions imposed in the first. In the second order they concluded that eligibles in the private services should be able to use state-of-the-art equipment and system design. It removed interim restrictions at 800 MHz which limited interconnection to a licensee's premises and prohibited common point interconnection by a group of licensees. No geographic or time limitations were imposed on systems operating above 800 MHz.

The Commission has now proposed revising the interconnection rules for the bands below 800 MHz to conform them to the rules adopted to govern agents in arranging for telephone service as long as the service is obtained on a non-profit, non-resale basis. PC

BROADCAST TOPIX

BY MARK J. MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Happy Holidays to each of you. May the season be most meaningful to you and your family.

Did you catch the Hallicrafter SX-62 in the shack of Cherie Martin and Charles Guest on page 60 of August *POP'COMM*? This was one of the receivers I mentioned in my September column.

This month I have computerized the monthly updates and call changes. If you are interested in the program, drop me a letter with an SASE for more information. It is set up for the Commodore 64 with or without a printer. I also have a program for the TI-99/4A. Both are on tape or paper.

Scott Hood reports that there was some very good FM DX during May. On the 24th he logged 12 stations between central and south Florida. On the 14th and 15th he logged WKZW in Peoria, Illinois, and last November he heard WQUE in New Orleans. Scott is looking for an FM/TV DX club near him. Reach him at 7 Auburn Road, Beverly, MA 01915. Good DX Scott —keep it up!

The answer to last month's trivia question: The most powerful station in the U.S. according to my research is WOOD-FM in Grand Rapids, Michigan. They operate with 265 kW ERP at 810 feet above average terrain on 105.7 MHz.

Network Radio

According to Statistical Research Inc.'s RADAR-29 report, 145 million people listen to network radio each week. Two of the ABC's networks (Entertainment and Information) were one and two, NBC was third, RKO 1 was fourth, and CBS fifth. There were 15 radio networks ranked in the RADAR report which also showed Paul Harvey's morning commentary on ABC the top rated radio show with an average of 5.11 million listeners per broadcast. Of the 15 listed networks, only 5 showed listener gains. This is attributed to the fact that most of the networks have lost affiliates due to stations dropping the nets rather than installing satellite receiving equipment to continue the network programming. Also contributing to the loss of listeners of the old line networks is the continued erosion of the AM radio audience, while the newer networks were picking up FM stations.

Speaking of networks via satellite, I received many comments about the August column. Here is additional information on how the networks use the satellites. First, monitoring of the network's birds is going to be difficult or expensive. The units used by ABC, CBS, NBC, and RKO cost the stations between $10,000 and $20,000, depending on the station's needs and situation. They have 20 channels and each channel can be used to transmit: one 15 kHz audio channel; two 7.5 kHz audio channels; 12 voice cue or data channels; one 7.5 kHz audio channel; and six voice cue or data channels. Each network has its own plan. The average noise level of these audio channels is −60 dB with .3% distortion. Excellent, in other words. Then all of the above mentioned channels are combined into a single digital signal for transmission through the satellite.

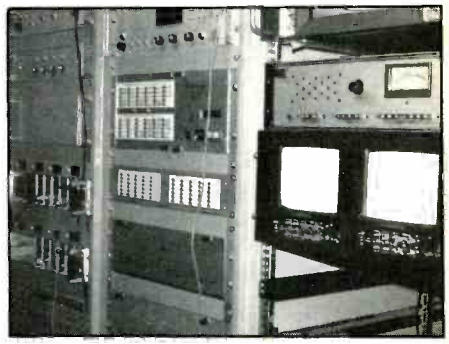
Satellite receiver installation. Left rack from bottom: Bottom two items used to pick up music for transmission on SCA. Next two panels receive CNN video and audio. Next three items used with UPI. Right rack from bottom: First item is receiver typical of ABC, CBS, NBC & RKO. Next items are the decoders for audio/data. Each strip has two channels. Jack field connects receiver to other parts at station. Tape recorders used for taping from satellites. (Courtesy of WBAL, Manucy photo)

UPI does basically the same thing, except they have many more channels combining for the single high speed signal through the satellite. I think they have about 400 channels available.

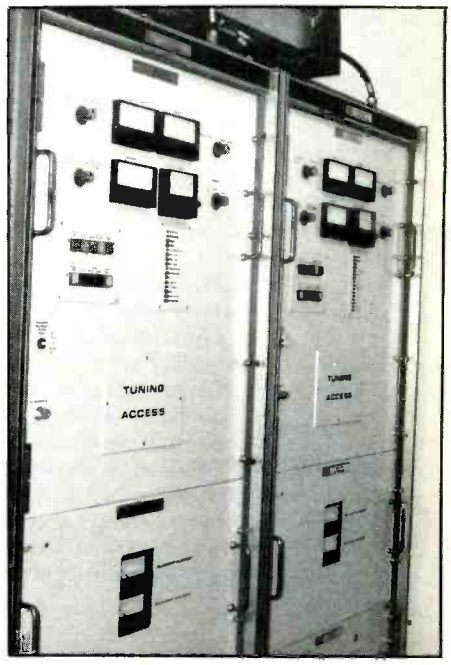
All of the satellite signals are in the 3.7 to 4.2 GHz region. That's GigaHertz—3.7 million MHz! Most stations use 10-foot dishes (3 meter) and the aiming has to be within 1/4 of one degree of the satellite signal to be useable. So the total cost to the station for everything can be $7,000 to $30,000 for each earth receiver.

Traffic Reports

There is another new type of monitoring available to listeners in New York, Philadelphia, Detroit, Los Angeles, and soon in Wilmington, Delaware. According to a report in *Broadcast Week*, the European car radio manufacturer Blaupunkt is operating a traffic reporting system via subcarriers (SCA) of selected FM stations. The California system will involve seven stations from Malibu to San Diego, each broadcasting four traffic reports per hour. The Wilmington experiment involves broadcasting emergency information concerning nuclear generators located in the area. The radios cost just under $600. We'll try to get more information about this.



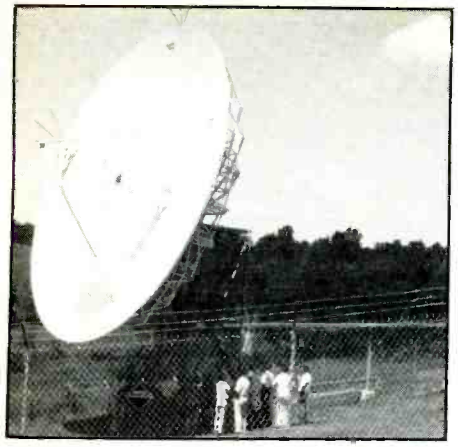
WJZ, Baltimore, receiving equipment (dual) for satellite programs (TV).



WJZ transmitting (uplink-dual backup) equipment. WJZ, which is owned by Westinghouse, transmits uplink for KYW in Philadelphia also.

FCC News

The FCC has dropped the seven station rule allowing the 7-7-7 rule to be increased to 12-12-12. Station owners were only allowed to own 7 AM, 7 FM, and 7 TV sta-



WJZ 10 meter (33') uplink/downlink dish. Building housing equipment shown on right. The video signal is microwaved to and from the downtown Baltimore studios of WJZ. This is called an "earth station."

tions. This has been increased to 12 each. More on that later.

Class IV stations waiting for their power increase at night to 1 kilowatt are still waiting. As of August, the papers with Mexico had not been signed. I noticed, however, that some Class IV stations have started to apply, via the formal application route, for 1,000 watts at night. This would seem an exercise in futility since the FCC will no doubt give blanket approval to all Class IV's when the time comes. This means that one night all Class IV's will be 250 watts and the next night all will be 1,000 watts!

The FCC has ordered WSBW-FM to forfeit $2,000 for willful and repeated violation of Section 503(b)(1)-(A). This involves building and operating an unauthorized station facility in variance to the construction permit. KQYN (FM) was notified of apparent liability for forfeiture of $300 for failing to make required proof of performance measurements each year.

Although we haven't talked about TV here, I do want to tell you that a broadcasting first was made on July 26, 1984. WNBC-TV became the first station to broadcast a network TV program with stereo sound. The broadcast was *The Tonight Show*. If you're a cable subscriber, be aware that even with a new stereo sound TV, the converter box supplier by the cable company will not pass the stereo sound. If you buy a stereo sound TV be sure it is capable of receiving the cable channels (without the converter). This is why MTV uses the FM band from the cable to your FM receiver to get stereo sound.

By the way, stereo sound converters will probably be available but will not be as easy to connect as the FM units were in the 60's. The TV manufacturers have not provided the multiplex jacks for TVs as did the FM manufacturers 25 years ago. Also, some TV sets are not isolated from ground and present a shock hazard if hooked to other gear. A word to the wise . . .

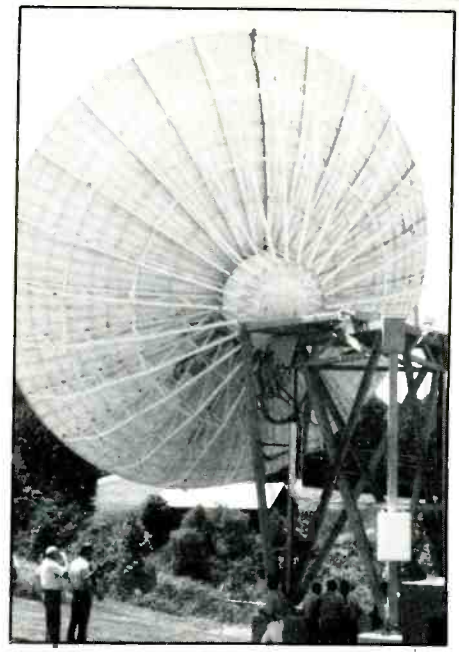
Speaking of TV, the FCC has said that DBS (Direct Broadcast Satellite) is here to stay. The NAB had taken the FCC to court to block DBS, claiming that since it was a "non local" service, the Congress, not the FCC, should have the say. The FCC shall be the sayer! The FCC wants DBS to be free in nature just as Broadcast TV.

Remotes

Long distance remotes are not new. In the 70's, WBAL in Baltimore did a series of talk show remotes from England with Alan Christian. This past June, WWDB-FM in Philadelphia did a talk show remote from the Magic Kingdom at Walt Disney World to help celebrate Donald Duck's 50th birthday. Susan Bray and Ira Homer were the hosts.

Radio

My favorite subject! According to a newsletter, *Tomorrow*, since radio started in the early 20's, it has always been marked by drastic changes. A few points: it changed from network to local type programming; then TV came in swinging, and radio survived with the help of the transistor radio, which made it portable. Now the day of the satellite is upon us, making TV and VTR's even more commonplace in the home. But all of this does not stop radio. There are almost 500 million radio receivers in America listening to the 8,000+ stations. New licenses are being issued as fast as the FCC allots the frequencies. Almost 1,000 additional stations are in the various stages of being



Rear of WJZ dish . . . the people near the structure will give you an idea of the size. Auxiliary generator on the right.

on the air, with many more applying for power increases.

The funny thing today is that TV and cable, with all of the "video music," seem to be helping radio. Once the audience has "seen" the music, they turn to radio to enjoy what they saw, again!

I received a nice letter from Frank Coryell of Ohio. Frank made my day when I read his letter. He explains DXing in the best terms yet: "DXing (especially MW) is for me what fishing and hunting is to many others—therefore my hideaway should be a location where reception is an optimum!" This is what he tells his wife as he, like me, sits for hours turning the knob on that silly box! Where is the best DX location? I'm still looking myself, Frank. How are the Carolina and Virginia coasts . . . I was a little disappointed on my visit there. What do other readers suggest?

According to Rod O'Connor, Alaska is not the best for MW DXing. The last week in July did have some good DX to the lower 48. He picked up WBBM, WWL, and WBZ. Beantown is his hometown, some 5,000

Call Letter Changes

Location	Old	New
AM Stations		
Helotes, TX	new	KXAM
Sebring, FL	WSEB	WITS
Whitefish, MT	KTXX	KSKR
Moses Lake, WA	KSEM	KBSN
Deland, FL	WDLF	WYND
Visalia, CA	KONG	KNDE
Oakdale, LA	KREH	KICR
Medina, TX	KBUS	KYCX
Anoka, MN	KTWN	KGBB
Minneapolis, MN	KTCR	KTCJ

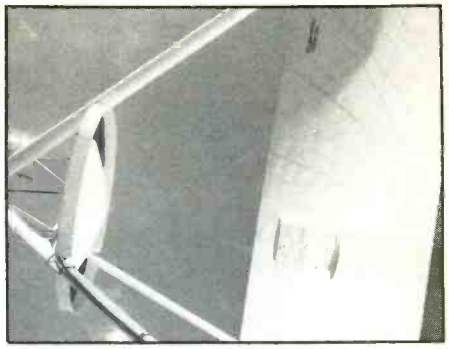
FM Stations		
Lahaina, HI	new	KPOA
Sebring, FL	WSKP-FM	WCAC
Breckenridge, CO	KLGT	KSMT
Visalia, CA	KONG-FM	KNTN
Oakdale, LA	KGBM-FM	KICR-FM
Medina, TX	KYCX	KYCX-FM
Minneapolis, MN	KTCR-FM	KTCZ-FM

Station Updates

Call	Location	Freq	Pwr	Ant
AM Stations				
	No AM			
FM Stations				
KKBE	Sheridan, AR	102.3	3	300′
KTTZ	Oracle, AZ	103.1	.58	610′
KXGO	Arcata, CA	93.1	100	N/C
KOTR	Cambria, CA	94.3	N/C	328′
KGBA	El Centro, CA	100.1	3	300′
KRTH	Los Angeles, CA	101.1	54	N/C
KCPP	Rosamond, CA	105.5	3	300′
WRUF-FM	Gainesville, FL	103.7	N/C	768′
WKKZ	Dublin, GA	92.7	1.8	400′
WXMG	South Bend, IN	103.9	N/C	328′
WKJN	Hammond, IN	103.3	N/C	1003′
KEXL	Norfolk, NE	106.7	N/C	1025′
WJLK-FM	Asbury Park, NJ	94.3	N/C	328′
WPLJ	New York, NY	95.5	6.3	1331′
WEVD	New York, NY	97.9	7.76	N/C
WEBN	Cincinnati, OH	97.9	16.6	N/C
KYTT-FM	Coos Bay, OR	98.7	25	522′
KCCC	Eugene, OR	89.7	86	N/C
KWWM	Stephenville, TX	105.7	100	800′
KTYE	Tye, TX	99.3	.708	625′
KATS	Yakima, WA	94.5	10.7	820′
WZEE	Madison, WI	104.1	9.42	N/C

Abbreviations

D = Daytime
N = Nighttime
DA = Directional Antenna
DA1 = Same Pattern Day & Night
N/C = No Change
DA2 = Different Pattern/Power Day/Night
O = Omni Antenna Day and/or Night



Close up of "feed"... signal comes from the tube, is reflected from the small convex plate to the concave surface of the 33′ dish and into space. Most stations with receive only equipment use a 3 meter (10′) dish.

Here's a low power broadcaster to challenge you. The station is designed to be heard only along the Robert Moses Causeway at the entrance to Captree State Park in New York. The station, which has no callsign, provides information on available parking. Unlike Travelers Information Stations, which operate on 530 kHz or 1610 kHz, this is a real oddball and operates on 640 kHz! Thanks to Tony Earll for this photo and information.

miles from Kodiak. Rod was so excited about hearing 'BZ he called the talk show to tell them. Otherwise, radio around Kodiak seems to be slow.

We are sad to report KOA talk show host Alan Berg was shot to death June 18 as he returned home. Although he frequently had death threats from callers, there is still a question as to whether the killer could have been an angered caller.

As a result of the shooting, several other "fist fight" style talk hosts were considering protection of varying degrees. KOA offered police protection to the rest of their staff. Steve Kane of WNWS in Miami, Florida, was considering the purchase of a gun.

In early June, a man shot the sales manager of WJTM-TV in Winston-Salem, North Carolina, claiming local TV stations were spying on him.

Well, rather than end with such a sour note, let me tell you of some of the topics I plan to talk about in the months ahead. Receiver selectivity—what is it and why is it important to the BCL/SWL; FCC allotting more stations on the clear channels; the new FM frequencies; Monday morning DXing and how to DX, Part 2. My computer is also putting together a TIS list. Send me any info you might have.

The best topics are the ones that are suggested by you. If you have any questions you think I might be able to answer, just write them on paper and send them along with an SASE. I'll send an answer back as quickly as I can. I will talk about types of equipment, but please don't ask for recommendations of specific equipment brands. I have not tested each one and it is not fair to the manufacturers or to me. A lot of your questions will also be answered in the column since they will be of interest to others as well.

One last note of thanks to Kenneth Cummings, Chief Engineer of KTCZ/KTCJ, for sending a correction on our call letter changes. That was one of the changes I thought was in error from the notices, but was not sure. Thanks again, Ken.

That's about all the time we have for the show this month, except to say, tell me how you receive WOWO (1190) in Ft. Wayne. A postcard to me will do. Write to me at P.O. Box 5624, Baltimore, MD 21210. PC

AEA Announces: SWL-TEXT™

MORSE, BAUDOT RTTY, ASCII RTTY and AMTOR RTTY MODES Receive Only Software with Automated Features developed especially for the SWL Enthusiast.

MAIN MENU SCREEN

```
                                hh:mm:ss

SWL-TEXT™
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SELECT:
 M. MORSE
 A. ASCII
 R. RTTY
 L. AMTOR ARQ
 F. AMTOR FEC
 C. COMMANDS
 O. OPTIONS
 T. TIMING ANALYSIS
```

TIMING ANALYSIS SCREEN

```
                                hh:mm:ss
TIMING ANALYSIS
SAMPLING DATA
I:0000000  T:1234567
(NOISE)  (POSSIBLY)
147 WPM   110 BAUD
ASCII
INVERTED

T. TIMING AGAIN
A. ALT. TIMING
B. BIT TEST
U. USE DATA
```

COMMAND MENU SCREEN

```
                                hh:mm:ss

L. LOAD BUFFER
B. BROWSE BUFFER
E. EDIT BUFFER
S. SAVE BUFFER
T. SET TIME
C. SET COLOR
```

Just Look At Some Of These Features:

- * CW receive speeds from 5 to 99 wpm, auto speed track and lock.
- * 7 bit ASCII speeds from 45 to 300 bauds, preset and user set speeds.
- * 5 bit Baudot speeds from 60 to 132 wpm, preset and user set speeds.
- * TOR, ARQ MODE L. Allows reception of ARQ transmissions.
- * TOR, FEC MODE B. Allows reception of FEC Broadcasts.
- * Selects COMMAND MENU.
- * Selects OPTIONS MENU.
- * Selects TIMING ANALYSIS ROUTINE, AUTOMATICALLY DETERMINES RTTY SPEEDS.
- + Complete split-screen display with status information.
- + Allows RUSSIAN RTTY Reception.
- + Allows RUSSIAN and JAPANESE MORSE reception.

- * AUTOMATICALLY DETERMINES RTTY SPEEDS.
- * Indicates reception of data for BIT TEST.
- * Indicates bit inversion and transposition patterns from BIT TEST.
- * Indicates signal problems or non-standard data.
- * Speed of RTTY data in words per minute and bauds.
- * Indicates type of RTTY data, either ASCII or BAUDOT.
- * Indicates that the signal is NORMAL or INVERTED.

- * Allows the Timing Routine to be repeated.
- * Allows the use of an Alternative Timing Routine.
- * Samples data to determine bit inversion and transposition pattern.
- * Allows usage of Timing Analysis data with a single keystroke.
- + Complete Printer Control.
- + Complete Buffer Control.
- + CW SPEED LOCK for enhanced copy in noisy conditions.

- * 24 hour clock, displays time in hours, minutes and seconds.

- * Allows loading buffer from either DISK or CASSETTE storage.
- * Allows viewing of buffer in text format, no control characters.
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- * Allows you to save buffer data to DISK or CASSETTE storage.
- * Allows setting the time of day clock.
- * Choose among any of 16 colors for each, Character, Screen & Border.

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Beaming In *(from page 5)*

A *real* radio? What did he think the Philmore was? Couldn't he see the look of sheer ecstasy on the face of the kid in the picture? This was *the* radio, the *only* radio. I told him that kids all over the world were using Philmores, even lots of guys in my school had them. To suggest a substitute seemed to me as if maybe he had some ulterior motive for attempting to steer me away from this receiver. Did he think it was going to be so powerful that it might bring in stations which were saying things I wasn't supposed to hear? He just didn't understand the way it was when you really wanted something and nothing else would do. I spent the next weeks going over in my mind how I was going to react when I was given some junky electric radio that I had specifically said I didn't want.

When it came time for me to unwrap the gift, I was running through all of the many comments I had rehearsed for use upon the occasion of first viewing the unwanted receiver which was to be thrust upon me. I had to be subtle enough to convey my disappointment, yet not so ungracious that I'd be spending the rest of the day trying to pry the set and its components from the side of my head. I was thinking along the lines of "This is a swell set, my friend Eddie got electrocuted by one only last week." My fears were for naught. When the gift was unwrapped, the box contained the set of my dreams. It was, without any doubt whatsoever, even more beautiful than I had hoped it would be.

True, it was somewhat smaller than it had appeared in the photo. Actually, it was the size of a box of wooden kitchen matches. But, after all, it had no bulky tubes to take up a lot of space. Stringing up the antenna, I set out on my exploration of the mysteries of the airwaves. One day's listening brought in all sorts of stations—WKAT, WQAM, WIOD, and WGBS, according to my logbook. What did he mean about not being able to hear anything on this set? It was hotter than a firecracker!

The Old Man was not overly impressed, pointing out that WKAT was located only a few blocks from our house. The other stations, he noted, were all within a few miles. He again offered to get me "a real radio." *This* was a real radio, and *more*—it was *everything*!

Even when the family would all gather around the big Scott broadcast console receiver in the living room to hear Jack Benny, Lum & Abner, and Gang Busters, I would be sequestered in my own dimly lit room listening to the very same programs via the headset on my mighty Philmore. Constantly adjusting and tweaking the main tuning dial and coil tap for maximum clarity as if the signals were arriving from somewhere on the other side of the world, I could close my eyes and pretend that I was a wizened and grizzled wireless operator at a remote ocean outpost listening for a faint SOS, or that I was Admiral Byrd's radio operator tuning in the fragile sounds of civilization from a lonely shack at the South Pole. And it was tricky alright; I had to keep retuning the equipment because those elusive stations didn't want to be heard—they kept shifting around from one frequency to another, trying to sneak away from me.


PHILMORE CRYSTAL RADIO RECEIVING SET

LOUD, CLEAR AND SELECTIVE

No Batteries! No Tubes! No Noise!

No Distortion! No Expense to Maintain!

The world's best entertainment and educational features are to be had for the listening in. The very low price asked for these really good and practical sets puts them within the reach of every man, woman, boy or girl. "If you really wish to learn all about radio," advises the editor of Radio News, "start with a good crystal set." A crystal set has many advantages, but its main ones are simplicity and absolute clearness. There is no distortion and no noise. There are no batteries to buy. No tubes to wear out, in fact there is no maintenance expense whatsoever. They cost absolutely nothing to operate and they will give you constant service for an indefinite period of time. The reception is loud and clear. The PHILMORE CRYSTAL RECEIVING SET possesses unusual selectivity and is designed to give the most efficient results. Built with tapped coil matched with a .00035 Mfd. variable condenser, it will bring in one station after another and will tune out all other stations. With it you can hear messages broadcasted anywhere within 25 miles, or even up to 100 miles under favorable conditions. The reception on this set is loud and clear without distortion or other noises. It is contained in a beautiful cabinet with a panel of modernistic design in four bright colors—gold, silver, green and rose. On the panel is a dial for tuning and locking stations, two double posts to take two pairs of headphones, and a dust-proof case enclosed crystal detector which includes the Philmore Supersensitive Crystal. The set is sent all complete with super-sensitive headphones as illustrated, and a complete Aerial Kit consisting of the necessary copper aerial wire, lead-in wire, porcelain insulators, ground clamp, complete with full instructions. It is sent all ready for use and all you have to do is set up the aerial, make the necessary connections, place the phones by your ear, tune in and listen.

No. 6578. PHILMORE CRYSTAL RADIO RECEIVING SET COMPLETE. $9.95 Price Postpaid

SUPERTONE CRYSTAL SET

A rigidly constructed radio receiving set which will give everlasting service, has a range of 200 to 600 meters with a receiving radius of over 35 miles. Under favorable climatic conditions reception may be had within 100 miles from a broadcasting station. Reception is loud and clear without distortion of any kind. The Philmore glass-enclosed, dust-proof, fixed detector is used, including the Philmore supersensitive crystal, every set tested and positively guaranteed. Price includes Key and Coil.

No. 6575. Supertone Crystal Set. Price Postpaid $4.50

Little Wonder Crystal Set

Compact in size but big in results. This set will receive broadcasting within 25 miles of a station or even greater distances when conditions are favorable. The open detector permits adjustments to be made to the finest degree. The set includes the Philmore supersensitive crystal which assures quick results when "looking" for a station, because the entire surface of the crystal is sensitive. Price includes everything all complete—the Crystal Receiving Set, Ear Phone with cord, and complete Aerial Kit with all necessary connections. Nothing more to buy.

No. 6580. Little Wonder Crystal Set. Price Postpaid $2.95

The Philmore super-receiver looked as big as a Mosler safe in the ad, and look how happy it made the lucky kid who owned one!

"I could close my eyes and pretend that I was a wizened and grizzled wireless operator at a remote ocean outpost listening for a faint SOS . . ."

It was the thrill of tuning in stations on my very own receiver, the excitement of feeling that my listening post was set up to seek out these fleeting signals and drag them from their hiding places by means of the little magic box at my fingertips. There was the feeling of challenge and accomplishment at having wrenched and wrung the signals from the airwaves—and emotion which, I guess, has never really left me.

Holidays always make me think about this receiver and also the amazing array of radio goodies in that Johnson Smith Co. catalog. Even if the Tommys of today are no longer selling "Clover Leaf Ointment" in order to buy Phimore Crystal Radio Receiving Sets, hopefully they are out there shoveling snow or mowing lawns to save up for the magic boxes made by Kenwood, Bearcat, ICOM, and the other modern dream makers. And maybe—if they're especially lucky, as I was—someone will wave a wand to help turn those dreams into reality on a December morning.

Recently I learned that you can get a current Johnson Smith Co. catalog of "1600 Novelties." The catalog costs a dime (for postage) from the company, now located at 35075 Automation, Mt. Clemens, MI 48083. This catalog, with its tacky practical jokes ("Icky Upset Stomach Mess" and the "Hilarious Talking Toilet") has managed to retain its mystique by continuing to offer radio gadgets designed to dazzle, like the "Spy Pen Radio—A real working radio hidden in a pen case, fits into your pocket like a pen," all for only $4.98. Jeeves, do we still have that old carton of "Clover Leaf Ointment" in the attic? PC

Please send all reader inquiries directly.

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AD INDEX

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