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POPULAR COMMUNICATIONS

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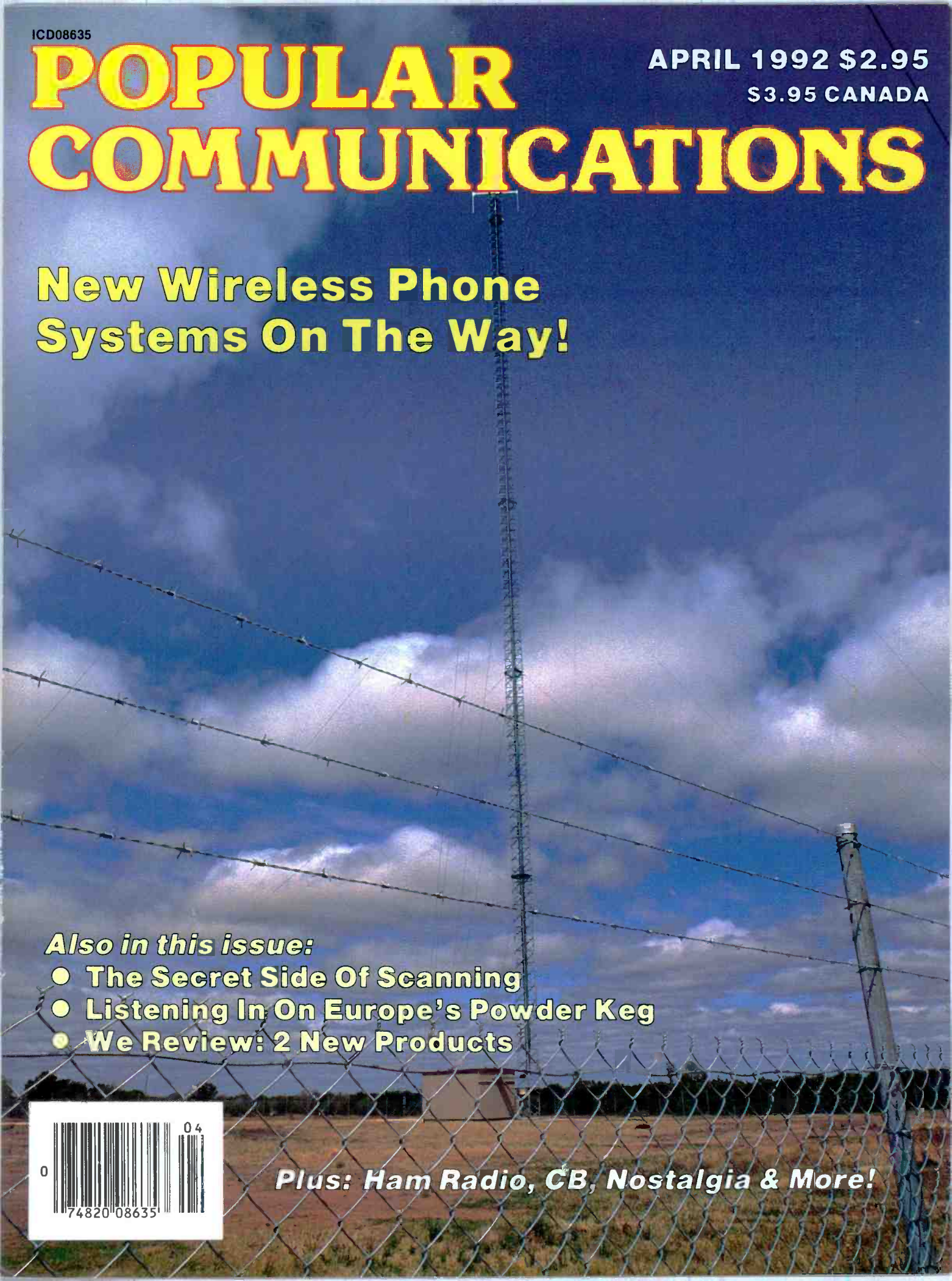

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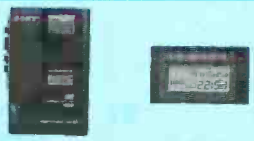

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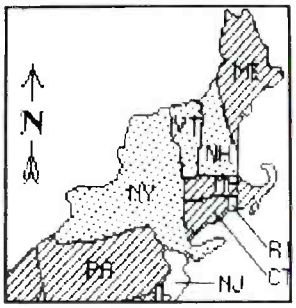
APRIL 1992 **VOLUME 10, NUMBER 8**



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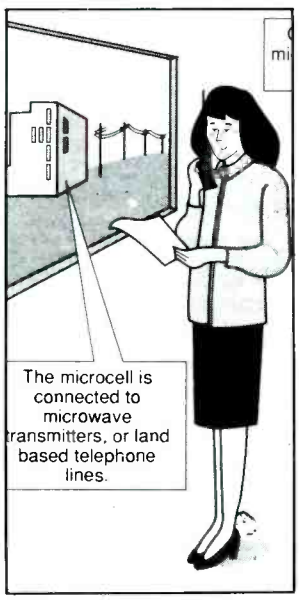

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FEATURES

COLUMNS

DEPARTMENTS

This month's cover: *Australia: Cellular phone transmitter site at Waikerie, South Australia bringing cellular service to remote areas of South Australia. Photo by Larry Mulvehill.*

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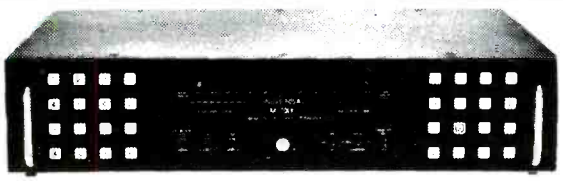

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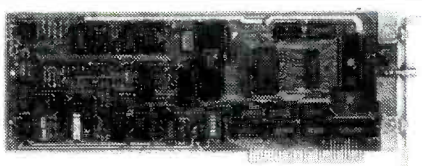
■ **Universal M-1000**



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BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

The April Fool, Naturally

When April rolls around, it usually reminds me of an incident in the late 1960's. At that time I was the editor of the old *S9 Magazine*, which was directed primarily at the CB user. In those years, the FCC was still attempting to force CB operators to fit into the severely restrictive confines of CB regulations that the operators mostly ignored.

The FCC's reaction was to continue strengthening the rules. Moreover, they had embarked on a vigorous enforcement campaign that saw hundreds of "monetary forfeitures" and notices of revoked licenses given out each month. These were for things like shooting skip, too high an antenna, improper station identification, etc. CB operators were furious, and this was reflected in the pages of *S9*. We wanted the rules made more realistic, and the FCC to stop harassing CB operators for relatively insignificant transgressions of the strict CB regulations. The FCC remained intransigent and, in fact, seemed to take some special delight in its relentless pursuit of CB operators.

Then came that fateful day when I met with several editors of other communications and electronics publications for our regular Friday lunch at *McSorley's Old Ale House*. We were all sitting around making rude FCC jokes and wondering if the agency would ever get off the backs of CB operators. One of those in our group suggested that what was needed was a massive group effort by all publications. Several ideas were suggested and rejected as not being workable. Then one guy had an idea that got a round of applause.

He suggested that each of our publications simultaneously tell our readers to mail at least one empty beer can to the FCC's main office in Washington. All of the cans would arrive on or about the same day. That way, when the FCC was knee deep in the cans, they might get some idea of the number of people who were angry at their CB policies.

The total silliness of the idea had a certain charm, probably because it was the 1960's, when everybody was protesting one thing or another. And, it was Friday. Some of those in attendance began saying they were going to go ahead with the project. Someone suggested that we coordinate the mailing so that it was mentioned in our April issues, and all of the cans would arrive the week of April Fool's Day. I thought it was a nice touch. By dessert, there was unanimous support for the concept and agreement on the target date.

For my part, I churned out a rousing and stirring appeal for my readers to send this important message to Washington. I gave a recap of the many reasons for annoyance, provided detailed mailing information for readers sending the cans immediately upon getting their April issue, advising everybody that this was a coordinated effort throughout electronics publishing that was being mentioned in just about all leading electronics publications.

As the April issues of the various magazines began arriving, I started checking to see how the topic was approached by each of my colleagues. Except, I couldn't find anything, anywhere. No FCC protest. No beer cans. Nothing! I thought that maybe I had gotten the date wrong, or else it had been changed and they had forgotten to tell me.

I was going to begin calling around to see what went wrong. There was no need for me to bother. My phone rang. It was the guy who first came up with the idea. He said he couldn't believe his eyes when he saw my April issue. I had been so passionate about the harassment of CB operators that I had taken seriously what everybody else saw as no more than casual goofing around. Subsequent amazed phone calls confirmed for me that nobody had realized that I wasn't kidding, too.

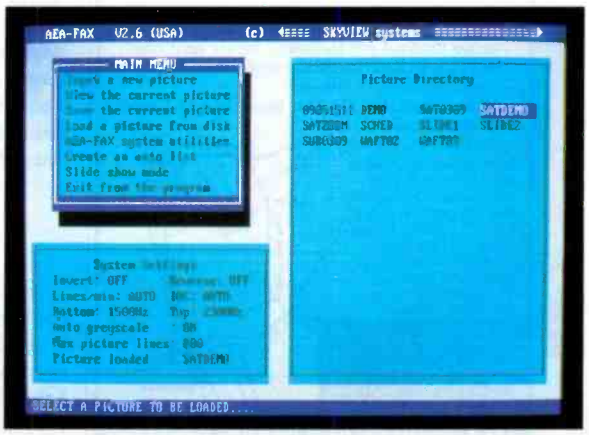
My own readers responded with mixed emotions. Some were absolutely appalled, while others told me of dutifully sending in one or more beer cans, as I had instructed. A couple of readers wrote to say that they had gone along the roadsides to collect and then mail all of the empties they could quickly round up, which I think amounted to several dozen per correspondent. Reader response was more positive than negative. This, in some small way, helped to lessen some of my own embarrassment at having played this rather dumb April Fool's trick on myself.

Don't ask how many beer cans were actually sent to the FCC. I have no idea at all. I wasn't going to ask anybody at the agency, and even FCC personnel with whom I was friendly didn't seem anxious to introduce the topic into any conversation.

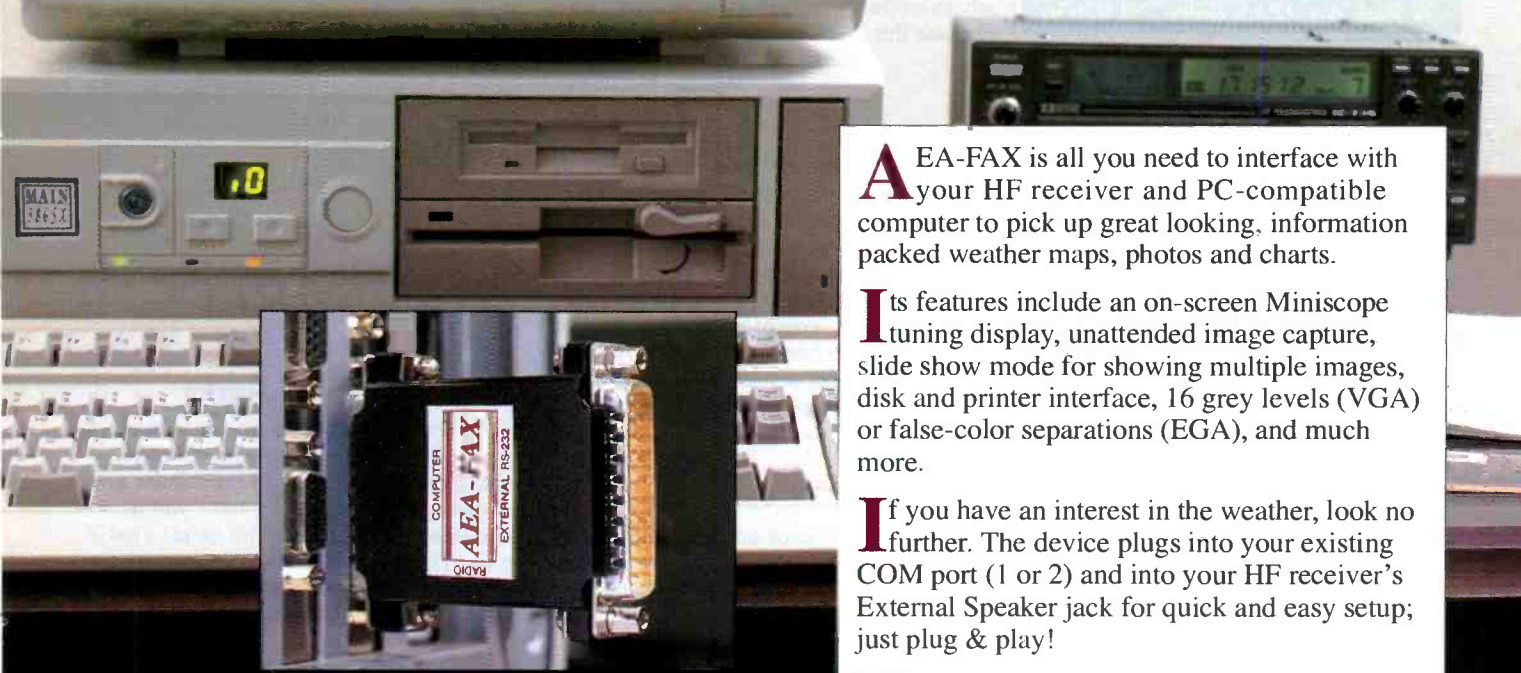
Almost ten years later, I found myself in Nashville, Tenn. I had been asked to appear in Federal Court there as an expert witness by a CB manufacturer who was the defend-

(Continued on page 72)

Weather FAX



AEA-FAX is menu-driven and mouse compatible for ease of use.



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MAILBAG

LETTERS TO THE EDITOR

Each month we select representative reader letters for our Mailbag column. We reserve the right to condense lengthy letters for space reasons. All letters submitted for consideration must be signed and show a return address. Upon request, we will withhold sender's name should the letter be used in Mailbag. Address letters to Tom Kneitel, Editor, Popular Communications Magazine, 76 North Broadway, Hicksville, NY 11801.

Book Him, Dano!

Just a brief note to comment that I think the book reviews in *POP'COMM* are always interesting, objective, and good reading in themselves. *Books You'll Like* is the section I always turn to first. Other hobby publications I have seen don't look to actually review books. I suspect they just run press releases, sent out by publishers. *POP'COMM* takes the trouble to actually open the books to see what's inside. Being an English teacher, I appreciate this.

William McGrath,
Boston, MA

I might point out that we receive far more books for review than actually make it into the Books You'll Like section. As has been mentioned in the column several times, we neither purchase nor request books for review purposes. They are sent in unsolicited. We discard ripoffs, spinoffs, and low grade publications right from the start. From what's left, we select three or four books we feel our readers will most enjoy and find useful. —Editor.

The FCC Story

I appreciated your editorial comments about the FCC (*Beaming In*, November issue). While I can't concur with every particular, it was nonetheless entertaining reading. I did want to comment on your mention (page 76, second paragraph) that an individual seeking a ham license should evidence a particular level of knowledge in respect to electronics. This I completely acquiesce. What I do not understand is that I was issued an FCC First Class Radiotelephone Operator License in 1969. Then the FCC changed the rules and I was issued an FCC General Radiotelephone Operator License (General Radiotelephone Certificate) in 1989. Yet, I presume this does not exhibit to the FCC that I manifest the intelligence needed to manage ham apparatus. I think that requiring me to take another exam is as logical as asking a surgeon to illustrate his proficiency at making incisions before being authorized to purchase a dressed piece of meat from a butcher. I have no interest in learning code. My principal interest is that ham radio would help to enhance my ability to communicate during an unanticipated contingency. At present, I have two PRO-2006 scanners, a BC-100XL scanner, a BC-200XLT scanner, and two cellular phones. I would like to obtain a ham ticket.

Norman Earhart,
Oroville, CA

Don't Argue With Success

I tried using the metal finger-stop on a rotary-dial telephone as an antenna for my radio. I ran a wire over and attached it with an alligator clip. Living in an apartment house where outside antennas aren't permitted, I find that this antenna works better than several other more promising schemes I have tried, including the bed springs. What bothers me is that I have mentioned my telephone finger-stop antenna to several people who know a lot about radio and they tell me it's stupid. Yet it works.

Maurice Wilson,
Washington, DC

Like someone told me years ago, Maurice, if it's stupid and it works, it ain't stupid. —Editor.

Getting It Right

I have followed your comments on the right of people to freely monitor all radio frequencies, including those used for cellular and cordless phone calls. Why have you never addressed the flip side of this issue? That is to say, I have a Constitutional right not to be a victim of the invasion of my privacy from such monitoring by my neighbors.

B.L. Volpe,
Vancouver, WA

Although this argument is frequently offered, the words "privacy" and "victim" never appear in the U.S. Constitution, even once. In fact, it's my impression that the Constitution was written to guarantee citizens a barrier from the government, not from one another. Under those circumstances, I haven't been overly concerned about this non-existent "Constitutional Right." —Editor.

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WITH 20 SOFT TOUCH DIGITAL PRESETS & A NARROW IF BAND

Since a SW station often transmits at different times, on different frequencies, to different continents, depending on the weather conditions, one frequency may give better reception than the other. The DC-777 lets you take advantage of this by offering the possibility to program up to 5 frequency settings on each of the four presets. You can then run through the frequencies to select the best reception.

Philips also incorporates a narrow IF band to counter transmitter problems. When the treble control is set to its lowest level, shortwave sound quality is optimized and the IF Band is automatically switched to a higher selectivity level.

YOU'LL GET GREAT SOUND

The Philips DC-777 features 50 Watts RMS for superb quality sound with low distortion and extended frequency response. It also has an Audio Super Control (ASC), which makes it possible to compensate for the variation in sound between different radio wavebands and the radio and cassette sections.

AND A HIGH-END CASSETTE DECK TO BOOT

The DC-777 features an autoreverse cassette deck that gives you the convenience of non-stop cassette play, avoiding the necessity of flipping the cassette over when one side is finished. Autostart sets the tape running as soon as it's inserted and radio reception automatically **CUTS IN** whenever a tape is being rewound or forwarded.

THE DC-777 IS THE CAR STEREO WITH SHORTWAVE RECEIVER THAT WILL MAKE YOU WELL TRAVELED AND WELL RECEIVED.

For more information about the Philips DC-777 and the names of dealers near you, call toll-free;

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CIRCLE 50 ON READER SERVICE CARD

Remembering Radio

A Stroll Through The Pages Of Radio History

BY ALICE BRANNIGAN

If you were a Kentuckian reading the September 19, 1947, headline of the *Maysville Public Leader*, you would have been thrilled to learn that the community was to get its own broadcaster, WKYO. You wouldn't have known that the station should have gone on the air about six years earlier, or that the new Maysville station wouldn't be WKYO when it did commence operation.

Actually, James M. Finch, Jr., and Charles P. Clarke, were all set to begin their station years earlier, even though both admitted knowing nothing about running a station. But they priced all of the equipment they would need, and even had the FCC paperwork all filled out and ready to go. But, along came the war in late 1941, and that scrubbed those plans, especially with Jim Finch in the military by early 1942.

With the war over in 1945, the plans for the station were revived. This time, Finch and Clarke's Standard Tobacco Company required the help of two lawyers and the Vice President of the United States (who happened to be from Kentucky) to get the paperwork processed and finally approved after innumerable FCC snags, denials, and unexplained delays.

What emerged was an FCC permit to construct a 250 watt radio station on 1240 kHz that was to use the FCC-selected call letters, WKYO. Finch and Clarke would have preferred that the station be known as WFTM, to represent the words "World's Finest Tobacco Market." The FCC turned down that request because those call letters were assigned to the Buffalo (New York) Police Department.

Finch then called up the Buffalo Chief of Police and explained that he would like to use WFTM for his new station because they tied in with the region's large tobacco market. The Chief said he had no special attachment to WFTM, and would be pleased to ask the FCC to swap it for the WKYO call letters, but that he wouldn't mind at all if Finch tossed in a Kentucky ham and a chew of burley tobacco to seal the bargain. The FCC approved the swap.

WFTM's Station Manager was J.W. Betts, a veteran radio broadcaster that Finch had met during the war. Then, one-by-one, other personnel were signed-on.

The latest-design equipment was obtained. The WFTM ground system was unique in that it was suspended over a ravine at the end of the Standard Warehouse, where the WFTM studios were located. A couple of test transmissions were made, and WFTM got FCC approval to begin broadcasting on December 31, 1947.

Outside the WFTM studios at night, a red neon sign shows the way.

WFTM's founders, Charles P. Clarke (left), and James M. Finch, Jr., strike a pose shortly after the station went on the air.

The first minute of 1948 is when WFTM actually started. When he threw the switch to begin WFTM, Bill Martin, the Chief Engineer, became so nervous and scared that he had to go home and go to bed. His assistant had to take over. There had been nothing to worry about, anyway, because DX reports arrived from Texas, Nebraska, Connecticut, and Ontario.

Over the years there have been some changes. In 1965, WFTM-FM/95.9 was put on the air. A couple of years later, satellite news was added. But many things remained the same, including the station's original owners, its power and frequency, and its local "hometown" flavor and dedication to community service.

Charles Clarke claims that WFTM is "the best 250-watt station in the United States."

WFTM's original Farm Director, J. Scott True (left), shown with President Harry S Truman (far right).

James Finch recalls that he and Charlie Clarke had no idea what they were going to do in the radio business when they got started more than 43 years ago, but they made up their minds they just had to give it a go. He tells of the fellow Charlie met one night years ago sitting around a country store. Charlie

Popular hostess of a WFTM children's program, Dorothy "Dot" Wood was known as the "Twilight Lady" and was with the station from 1948 to 1961. This photo is from 1952.

said to him, "I hear you're going to get married tomorrow."

"That's right," he answered, "I think I'm gonna take her and try her for a while." Well, Jim Finch, observes, "we decided to take this station and try it for a while. I hope we've done a good job."

We think so!

Pioneer Station Goes Dark

In the March '91 issue, we mentioned station WMMN/920, Fairmont, West Virginia. WMMN commenced operation on December 22, 1928, as a 500 watt broadcaster on 890 kHz owned by the Holt-Rowe Novelty Company.

Over the years, WMMN once tried operating from another city for a while, it changed its frequency once, and also upped its power to 5 kW. During the early 1930's, WMMN catered to DX'ers by starting up its *Sun Dodgers Club*, which consisted of a late night radio program and the distribution of station souvenirs for its distant listeners.

In recent years, WMMN, like so many AM stations, found the going rough. Many different program formats were tried in an attempt to capture the right audience to ensure survival, if not commercial success. This included rock, big band, country music, etc. Over the past nine years, WMMN had seven managers, each with different programming ideas.

Apparently, the correct format and management approach wasn't to be discovered. William W. Wright, of Fairmont, West Virginia, tells us that WMMN went dark last October after 63 years of operation. At 10 p.m. one evening, the owners phoned the station from out-of-town and said that when WMMN concluded its broadcast day at midnight, it would be the end of the station.

It meant not only the loss of the station to the community, but also the end of eight jobs to WMMN staffers. The station's President, Frank Lee, had been there since 1943.

All of the WMMN staffers were dismayed. None expected such news, or that any station would go dark with only two hour's notice. Even the owner of local competitor, WTCS, was appalled at the historic station being shut down after such a lengthy and proud career of community service.

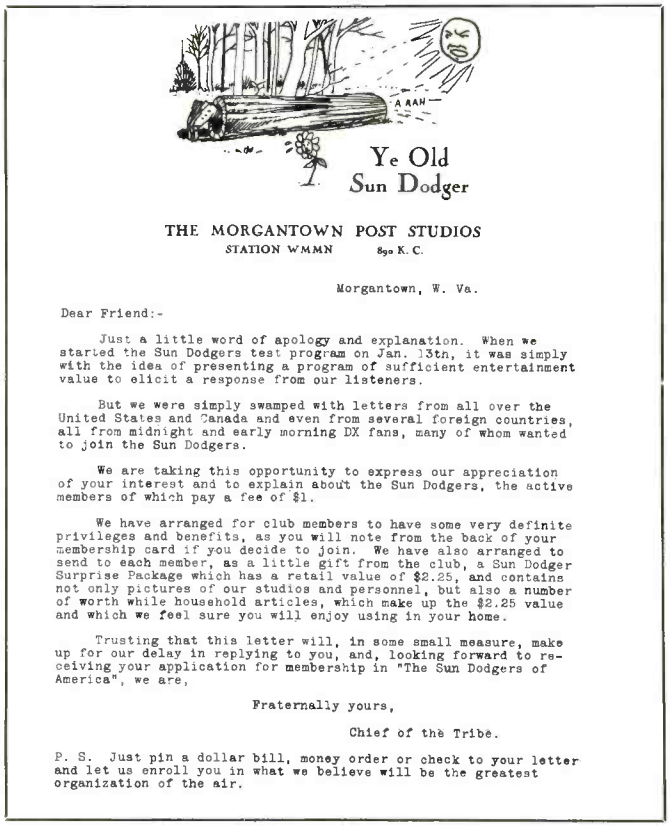
That Old Time Religion

Many readers brought to my attention the fact that another great old time station, Baltimore's WCAO/600, had a change take place that many regard as being as close to going dark as a station can get without actually pulling the switch. But first, let's check into where WCAO came from.

When WCAO first went on the air on May 16th, 1922, it was on 834 kHz, which is where most broadcasters were. Calling itself the *Gateway of The South*, WCAO stood out from the other stations on 834 kHz because it ran 250 watts, which made it somewhat of a giant in a world of puny 5, 10, 50, and 100 watt stations.

In 1929, the station's owners, Monumental Radio Co., moved the frequency to 600 kHz. By then, WCAO was known as *The Voice of Baltimore*, with studios at 811 West Lanvale Street, Baltimore, and a transmitter at Park Heights Avenue Extension. New owners soon took over; in 1942 they increased the power to 5 kW. The station was sold again in 1956, the new owners being Plough Broadcasting, who moved the studios to a mansion at 1102 North Charles St. (it had been designed by Stanford White).

The station's present owners, Summit-Bal-



Ye Old
Sun Dodger

THE MORGANTOWN POST STUDIOS
STATION WMMN 890 K. C.

Morgantown, W. Va.

Dear Friend:-

Just a little word of apology and explanation. When we started the Sun Dodgers test program on Jan. 13th, it was simply with the idea of presenting a program of sufficient entertainment value to elicit a response from our listeners.

But we were simply swamped with letters from all over the United States and Canada and even from several foreign countries, all from midnight and early morning DX fans, many of whom wanted to join the Sun Dodgers.

We are taking this opportunity to express our appreciation of your interest and to explain about the Sun Dodgers, the active members of which pay a fee of $1.

We have arranged for club members to have some very definite privileges and benefits, as you will note from the back of your membership card if you decide to join. We have also arranged to send to each member, as a little gift from the club, a Sun Dodger Surprise Package which has a retail value of $2.25, and contains not only pictures of our studios and personnel, but also a number of worth while household articles, which make up the $2.25 value and which we feel sure you will enjoy using in your home.

Trusting that this letter will, in some small measure, make up for our delay in replying to you, and, looking forward to receiving your application for membership in "The Sun Dodgers of America", we are,

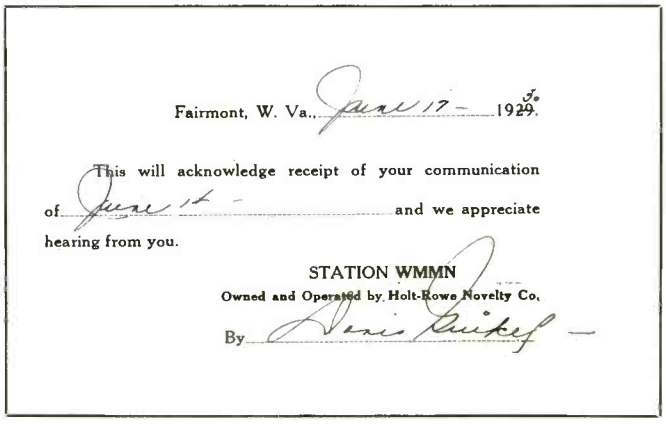
Fraternally yours,

Chief of the Tribe.

P. S. Just pin a dollar bill, money order or check to your letter and let us enroll you in what we believe will be the greatest organization of the air.

WMMN was once popular with the midnight DX'ing crowd, and promoted its "Sun Dodgers" club dedicated to these listeners.

A 1930 veri from WMMN was a very plain post card.



Fairmont, W. Va., June 17 — 1930.

This will acknowledge receipt of your communication of June 14 and we appreciate hearing from you.

STATION WMMN
Owned and Operated by Holt-Rowe Novelty Co.
By Denis Tuckey

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President
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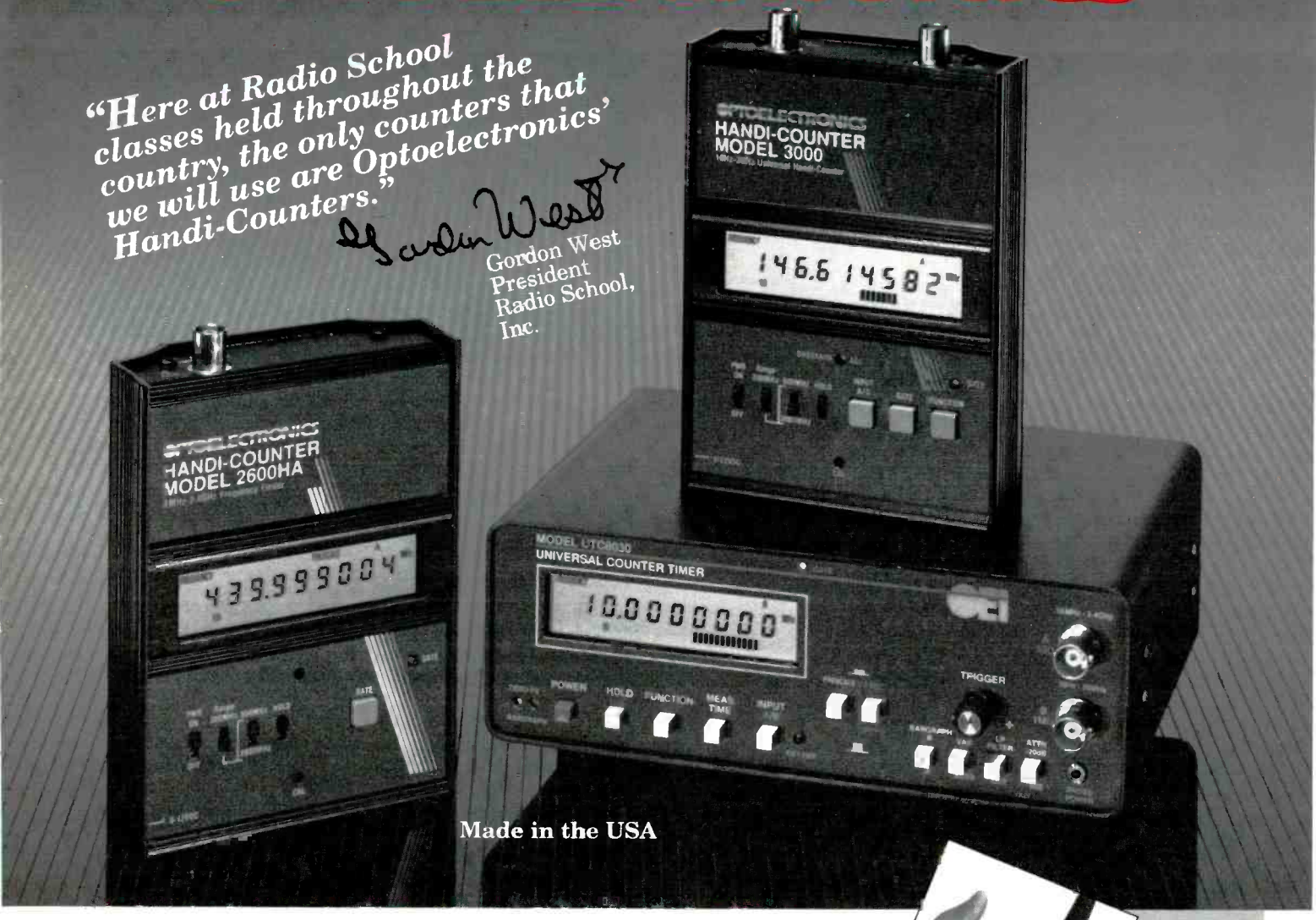

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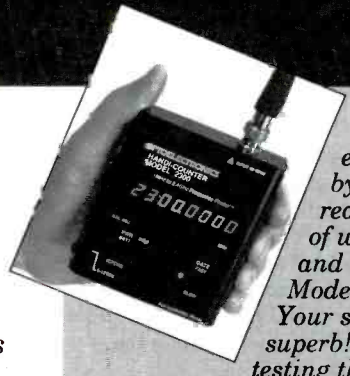
Gordon West



"I was encouraged by one of my readers words of wisdom, and bought the Model 2300. Your service was superb! After testing this unit I personally feel that all serious radio enthusiasts should own an Optoelectronics Frequency Finder"

Ron Bruckman
Radio Monitors Newsletter
Of Maryland

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Display	10 Digit LCD w/Function Annunciators	10 Digit LCD w/Function Annunciators	10 Digit LCD	10 Digit LCD	10 Digit LCD	8 Digit LED	8 Digit LED
RF Signal Strength Indicator	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	16 Segment Adjustable Bargraph	•	•	•	•
Hold Switch	Yes	Yes	Yes	Yes	Yes	No	Yes
Price	$579.	$375.	$325.	$259.	$225.	$179.	*$99.

Sensitivity: <1 to <10mV typical. Time Base: ± 1 ppm.; ±.2ppm add $100. - LCD Models only. Nicads & AC charger/adapter included except for 2300. *For 2300, available with NiCad installed & AC charger/adapter, complete package $128. **A full line of Antennas, Probes & Carry case are sold separately.** (One year parts & labor warranty.)

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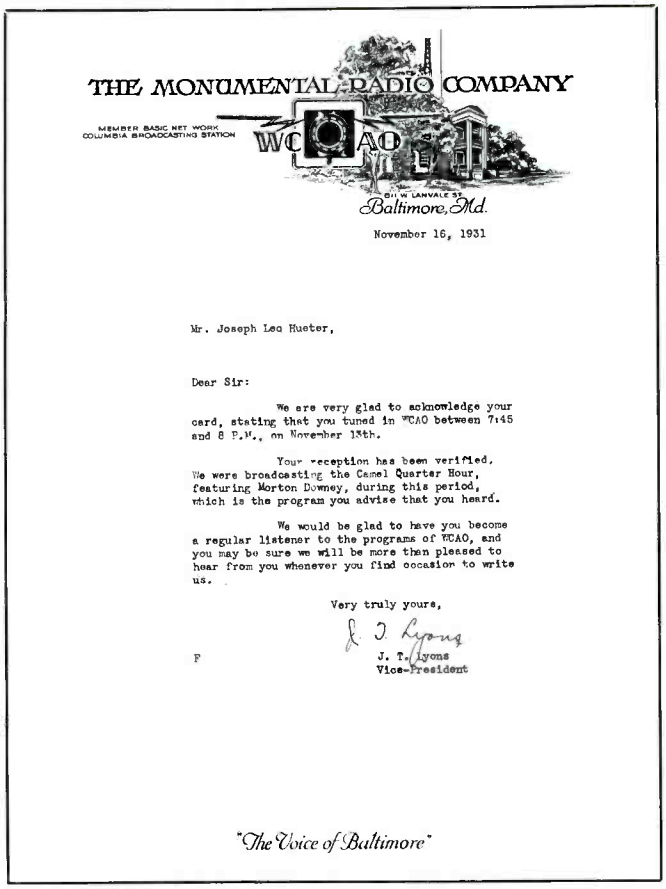


THE MONUMENTAL RADIO COMPANY

MEMBER BASIC NET WORK COLUMBIA BROADCASTING STATION

WCAO

211 W. LANVALE ST. Baltimore, Md.

November 16, 1931

Mr. Joseph Leo Hueter,

Dear Sir:

We are very glad to acknowledge your card, stating that you tuned in WCAO between 7:45 and 8 P.M., on November 13th.

Your reception has been verified. We were broadcasting the Camel Quarter Hour, featuring Morton Downey, during this period, which is the program you advise that you heard.

We would be glad to have you become a regular listener to the programs of WCAO, and you may be sure we will be more than pleased to hear from you whenever you find occasion to write us.

Very truly yours,

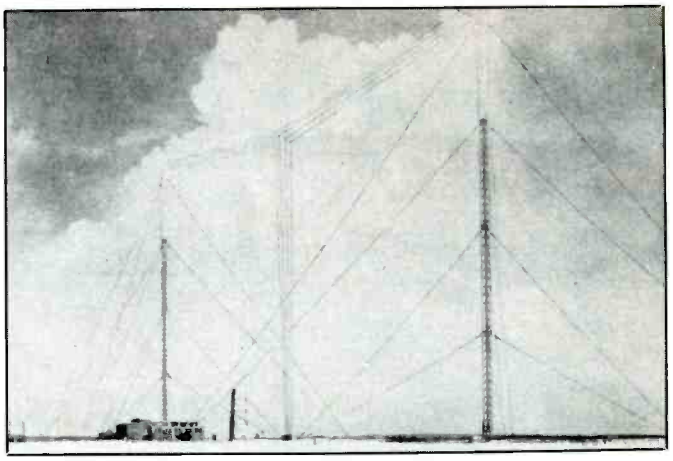
J. T. Lyons

J. T. Lyons
Vice-President

F

"The Voice of Baltimore"

Baltimore's WCAO sent Joe Hueter this veri letter in 1931. The reference to Morton Downey means "Sr.," the Irish tenor, and not his offspring, "Jr.," who had a recent audience-confrontation TV series.



The spectacular antenna array at Warsaw No. 1, a super-power station built back in 1931.

timore Broadcasting, located the station at 1829 Reisterstown Road.

Not long after Plough Broadcasting took over at WCAO, the station became a "boss sound" rocker and got a tight grip on Baltimore's youth audience, with heavy 20 share ratings earned on a regular basis.

That was then, this is now. With the rising popularity of FM for the rock music audience, things changed. In 1982, WCAO dropped its rock music and tried a country music format. The other thing that dropped was what was left of WCAO's Arbitron rating, which was recently listed as a 1 share. Even WBAL, the leading Baltimore AM'er, was recently rated at only an 8.3 share, which is a far cry from what WCAO was getting thirty years ago.

So, late last November, WCAO pulled its country music and switched to an all-gospel format. Every air personality was let go, including deejay Johnny Dark, who was there for 30 years and can remember when his shows garnered almost 65 percent of the entire listening audience in Baltimore.

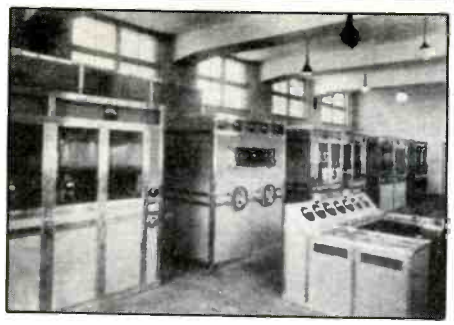
So, add WCAO to the list of great old Baltimore AM band rockers that are either dark or else have been forced into other formats that, by comparison, seem very bland; WFBR, WITH, WWIN, WSID, and WCBM. Fat Daddy, Lee Case, Larry Monroe; where are you now that we need you?

Rock 'em, Sock 'em Signal

In the 1930's some broadcasters ran very high power, even though it was nowhere near as popular as it has become today. In the mid-1930's, KDKA received permission to run some test broadcasts with 500 kW and many were certain it heralded the end of civilization. The concept behind such stations was to establish a transmitter that could produce a non-fading signal that could be heard nationally, even on cheap receivers.

One of the first of these stations was built in 1931, and was known as *Warsaw No. 1*, in Poland. Operating on 212.5 kHz, the transmitter was actually some 165 miles from Warsaw. The antenna rating of the station was 120 kW of unmodulated RF. With voice or music going out from the station, it was rated at 160 kW.

Henry Ward sent us this 1930's veri used by Canadian shortwave relay stations CJRX and CJRO.



The transmitter and control panel used by Warsaw No. 1, which ran 160 kW back in the days when 5 kW was looked upon as as much as any self-respecting broadcaster needed.

The antenna system at *Warsaw No. 1* was two steel masts, each 650 feet in height. These supported a four-wire "T" type antenna that radiated more than 100 kW. Harmonic radiation was held down by means of intricate filters at the transmitter output terminals.

The plate supply to the tubes was accomplished from an AC power line using a mercury arc rectifier with a filter system. The transmitter was built by British Marconi.

Canada Calling

A fine old 1930's QSL was sent in by Henry Ward, of Sherbrooke, Quebec. It marks the era when AM broadcasters were establishing commercial shortwave relays, having become evolved from their status as experimental stations. Henry's veri shows the stations with the new commercial callsigns as well as their earlier experimental callsigns.

The AM station was CJRC, Winnipeg, Manitoba on 1390 kHz, and its two shortwave relays, CJRX (VE9JR) on 11720 kHz, also CJRO (VE9CL) on 6150 kHz. These stations were owned by James Richardson & Sons, Ltd., of Winnipeg, which also operated CJRM, on 540 kHz, in Moose Jaw, Sask.

As private shortwave relays continued to develop and became a part of the scene in Canada, only the 49 meter band was permitted for such use. Today, all of the stations on the QSL are history.

Although Henry's QSL is undated, we note (in the book *Radio Station Treasury*) that VE9CL existed on 6150 kHz as early as 1931, and VE9JR on 11720 kHz was operating as of 1933. We would guess the date of the QSL as around 1935.

Passing of a Friend

A rich source of the QSL's that we have always used in these pages has been the enormous veri collection assembled over the decades by Mr. Joe Hueter, Sr., veteran DX'er and long-time *POP'COMM* supporter. We were saddened to learn of Mr. Hueter's recent passing at age 84. We extend our sincere sympathies to his family.

Thanks to the late Mr. Hueter's kindness and consideration, and his feeling that radio history must be preserved and handed on to future generations in our hobby, we will continue to be able to utilize his wonderful and historic resource of radio material.

We appreciate the information received from George Rech, of North Cape May, New Jersey, and from C.F. Streeper, Jr., of Havertown, Penna., who first let us know that Joe Hueter had passed away.

May You Join Us Next Issue?

We appreciate your letters, old QSL's, station lists, old photos and postcards, news clippings, and other materials relating to radio and wireless of the past. Please keep them coming, and join us in the May issue.

Cutting The Cord

New Wireless Devices Could Put A Phone In Every Pocket, But Will They?

BY JOSHUA QUITTNER

Think of Maxwell Smart's shoe phone and you're on the right track.

Or imagine microchips that could be attached to children's ears to track them through their day. Or transmitters embedded in cars that could communicate with satellites and get the best routes along crowded highways.

A new generation of wireless packet telephoes and miniature computers, based on radio-frequency transmission and known as "personal communciations services," holds the promise of eliminating phone tag forever and giving people freedom to exchange information. The phones would go with users everywhere, from home to work to the grocery store, and would be "intelligent" enough to screen calls, sending unwanted ones to answering machines or secretaries.

"By the end of the 1990's, a telephone with its bell ringing insistently for attention will strike us as a crude anachronism," Russell Neuman, a professor at the Massachusetts Institute of Technology, told the Federal Communications Commission during a hearing on the new services last week. "The call could be from virtually anybody and be intended for a half-dozen people in the office or household. We will come to see such a telephone call as something akin to an electronic SCUD missile—not well targeted and often unwelcome."

Though personal communications systems include cellular phones, the variety anticipated would be cheaper and clearer than the present form, mainly due to the introduction of digital handsets.

Neuman and other advocates say that the next generation of wireless-telephone services could even create a "hidden harvest" by creating wireless local telephone networks that will compete with local telephone monopolies. These alternative phone networks would drive down the cost of residential service in urban areas, while improving service quality to rural areas, experts believe.

Though interest in personal communications has been high since before the advent of cellular telephones, it reached supersonic pitch when the FCC announced in October that it will allocate precious radio spectrum for at least some of the new services within a year. When the FCC held a day-long hearing in Washington, to get feedback from would-be wireless tycoons, an overflow crowd of more than 300 people showed up—most of them an hour early and most of them clutching tiny, pocket phones.

FCC Chairman Alfred Sikes said that more than 80 people had wanted to testify, though the commission had time to hear from only about 20.

"Clearly, I believe the personal communications services' family of issues is one of the msot important we face," Sikes said.

Anticipated demand and high revenue from pocket telephones and their ilk are driving much of the recent regulatory interest.

Arthur D. Little Inc., a technology consulting firm, estimated that more than 60 million people would subscribe to personal communications networks within a decade of their introduction; that's more than 10 times the demand for current cellular phones. The consulting firm estimated $30 billion to $40 billion in revenues would flow to the providers, or about half the current revenues of local telephone companies.

As a result, many entrepreneurs believe that with prompt action by the FCC, advanced pocket telephones are just around the corner.

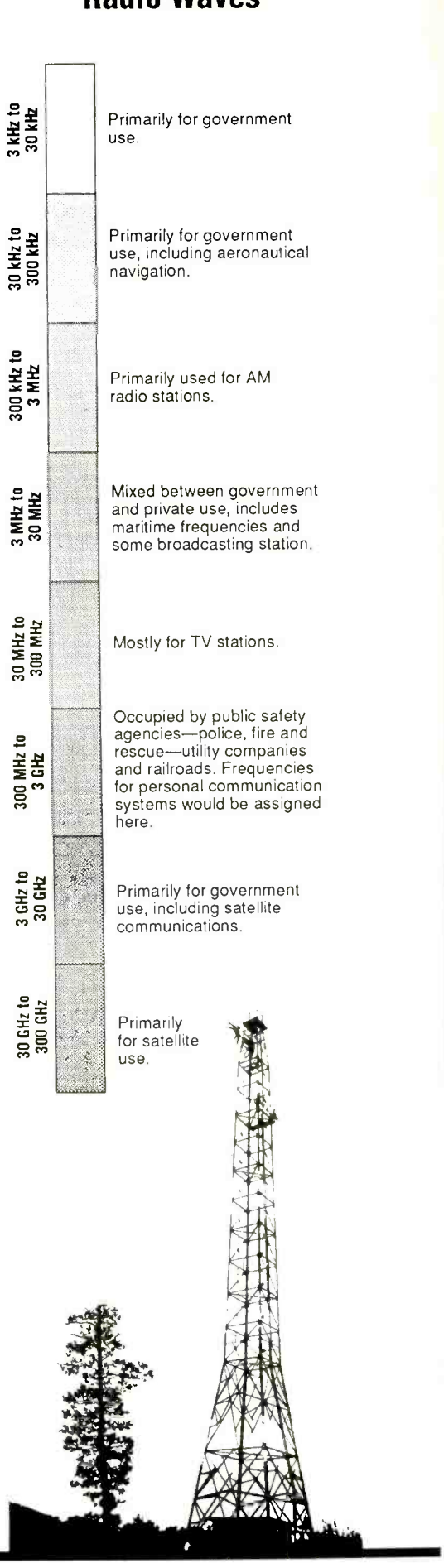
"We expect, if everything goes well, to have a system large enough in lower Manhattan to start charging for it by Nov. 1," said Matt Edwards of Advanced Cordless Technologies in Montville, NJ. Edwards' company holds an experimental license from the FCC and has been testing a new cordless telephone known as CT2, or telepoint, a technology that has been likened to cordless payphones.

But others say don't hold your breath.

Wireless pocket telephones and computers have "been just around the corner for four to five years. It's the same as home automation—people have been waiting for the 'smart house' forever," said Peter Hampton, a senior analyst for the Yankee Group, a Boston high-tech consulting firm.

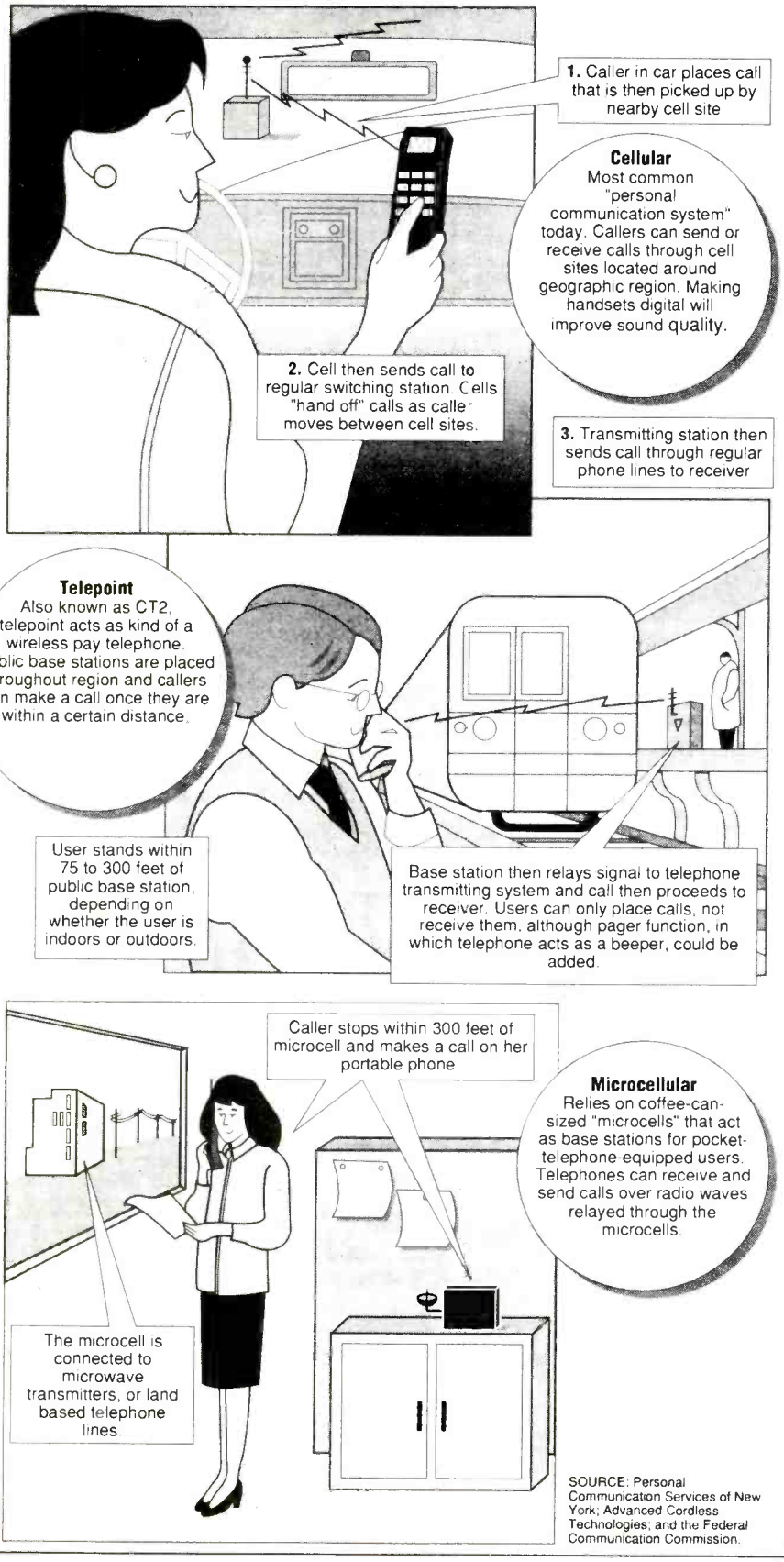
"Obviously, it's important that the FCC sets aside spectrum—it means investors interested in investing will have something to work with," said Aine NiShuilleabhain, assistant director at Columbia University's Institute for Tele-Information. "But nothing is going to change overnight."

All agree that a morass of regulatory, technological and marketplace concerns have yet to be settled.



Phones: The Next Generations

Three types of phone services that are or soon will be available.



SOURCE: Personal Communication Services of New York; Advanced Cordless Technologies; and the Federal Communication Commission.

Since only a limited number of radio waves can move across a given band in the same place at the same time, one of the roles of the FCC is allocating slices of the perpetually-filled radio spectrum. The FCC, which has said it may allocate to the new systems radio frequency between 1.8 and 2.2 gigahertz on the radio spectrum, a slice that the phone advocates say will give them the best reception.

But that frequency, used for microwave transmissions, is currently occupied by some police, fire and rescue departments. These agencies use the microwave bands as primary or back-up links to land-line phone service for substations, for instance. Utility companies use the frequency to detect gas and oil leaks from pipelines, to remotely detect problems on high-power electric lines and to provide communications at nuclear power plants.

"The commission must not displace public-safety users merely to allocate spectrum for a new, unproven technology such as PCS (personal communications systems), especially when there would appear to be reasonable alternatives," Capt. B.E. Wenke of the Los Angeles County Sheriff's Department testified. Wenke suggested that other users be displaced.

Costs of relocating the current users run to the millions of dollars, experts testified.

One way to pay for that could be to auction off that part of the radio spectrum to qualified bidders, a plan favored by Chairman Sikes. However, Sikes has said the FCC must have congressional authorization to do so.

Four kinds of systems are vying for space on the spectrum.

Apple and IBM are among those leading the fight to get radio frequency for data communications, in which pocket computers can get and send text. The computer manufacturers also see radio links as a better way to network computers in business.

Others, such as Motorola, see dedicated bandwidth for data communications as essential to the development of Intelligent Vehicle Highway Systems, in which a vehicle's location is identified by sensors, combined with a digital roadmap and broadcast—giving drivers a picture of road conditions.

Cellular telephones rely on large cells, radio receiver/transmitters strategically spread throughout metropolitan areas. The strength of the technology turns on its ability to hand off calls from cell to cell as a caller moves. Its weakness—in addition to its relatively high cost to consumers—is occasionally poor transmission quality. That should change as digital cellular telephone handsets come to market.

The next generation, though, is microcellular telephones, in which a profusion of coffee-can-sized microcells relay calls from low-power pocket phones into a larger cellular or land-line network.

Craig Roos, whose company, Personal Communication Network Services of New York, has been field testing a microcellular system in lower Manhattan since last fall, said that the possibilities for a microcellular system are limitless.

"Intelligence will be built into the handset," he said.

"I could program during the day who I wanted to receive calls from. For instance, say I'm in an important meeting and I only want to talk to my lawyer and the chairman of the board. I could program my phone so that all other calls went to my secretary.

"It will eliminate telephone tag," he added.

Roos said that the service would be somewhat cheaper for consumers than cellular, but more expensive than residential phone service.

Cheapest of the new phone systems would be telepoint. It proved to be a techno-dud in England and never made it out of field trials, some experts say, because of the confusing way in which it was deployed. But entrepreneurs like Edwards, of Advanced Cordless, are banking on U.S. consumers being drawn to the technology, in part because of its low cost.

In Edwards' scenario, consumers will purchase telepoint base stations for their homes—think of it as you would a normal cordless phone, he said, except one base station could accommodate as many as nine telephones in a home.

Edwards' company would install base stations in public places, such as convenience stores and railroad stations. Users, who would pay $5 per month for the service, could carry their telephones with them when they leave the house and make calls from the base stations. The calls would cost 35 cents for three minutes.

The downside is users cannot receive calls; they can only place them. Edwards said that his company, for an extra $7 a month, would enable the telephone to act as a beeper, displaying the call-back number of the party trying to reach the telepoint user.

Edwards says he thinks it will appeal to Americans: "It's sanitary, you don't have to have coins to make a call outside your home and it appears on your phone bill. You don't need pay phones anymore."

THE JAPAN RADIO CO.

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BOOKS YOU'LL LIKE

R. L. SLATTERY

Get Carried Away

What kind of archaeologist would hang up his shovel and begin digging into thrift shops and garage sales, for insights into who we are and how far we have come in the past hundred years?

The answer is an archaeologist who is willing to embark into areas other than dinosaur bones and ancient civilizations. Michael Brian Schiffer's new book, *The Portable Radio in American Life*, is a blend of scientific thought and an easy-to-read writing style. Its comprehensive text and hundreds of photos and reproductions of old ads are a resource for collectors, nostalgia buffs, as well as scholars of popular culture and technology.

This is a beautiful hardbound book containing 259 pages. It opens with a discussion of radio's inventors, and the early days of radio. From there, the author gets into the development of portable receivers, which I was surprised to learn started in 1918 with constructions plans in a hobby magazine.

Between that point and the latest portables that look like soda bottles and wrist watches, there's a fascinating story. It covers those bulky portables of the 1930's with the big dry cell batteries, the wonderful Zenith *Trans-Oceanic*, the invasion of the imported transistorized radios, and much more. More than simply a straight treatise on the radios themselves, Schiffer connects the development of the portable radio with the events in history that influenced its evolution, and also examines the influences the portable radio has had on our popular culture. Throughout the book, he draws parallels between the evolution of portable radios and concurrent change in American society and culture.

Schiffer discusses how technology is affected by consumer preference and how a vision of the technologically possible (as expressed, for example, in science fiction) can become translated into a need, and finally a reality. He also examines the decline of American supremacy in consumer electronics and the reasons for Japan's ascent in this field.

Michael Schiffer is professor of anthropology at the University of Arizona. His book is as entertaining as it is a great source of information. The hundreds of models mentioned in the text are fully indexed at the back of the book.

The Portable Radio in American Life, is available at many booksellers. It can also be ordered by mail for $45.00 from the University of Arizona Press, 1230 North Park, Suite 102, Tucson, AZ 85719.

Help For Motorists

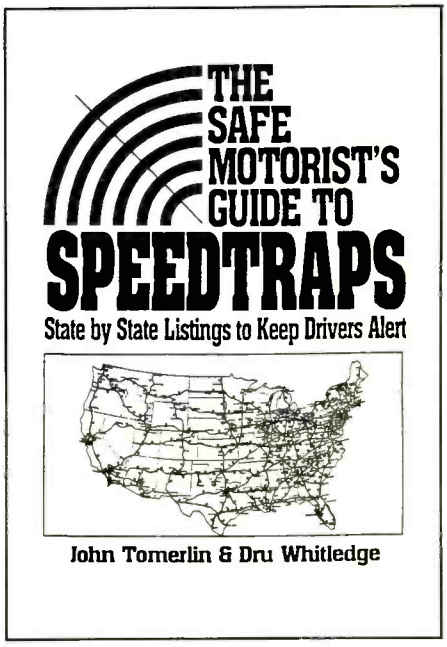
More than eighty percent of traffic on major highways, freeways, parkways, and expressways travels in excess of posted speed limits, which are often set by the federal government. Motorists who travel at the prevailing speed of the traffic flow are least likely to be involved in accidents, but are those most likely to get traffic tickets that can lead to fines, points against the license, and higher insurance premiums.

Speeding fines and arrests have grown more than 300 percent in the past decade, and will continue to increase as a direct result of developments in speed-measuring devices such as photo radar and laser speed guns. More and more safe motorists are now facing these predicaments. Unfortunately, as has long been the case, there are some police agencies that have realized the easy income producing potentials of speed-measuring devices placed on highways under their jurisdiction. Speed limit enforcement, to such agencies, is primarily for profit rather than out of any altruistic safety considerations. The current budget pressures on governmental entities has motivated an alarming increase in such speedtraps across the nation, where out-of-town motorists can be picked off like so many tin ducks at a carnival shooting gallery.

Gold Meadow, Louisiana, is an infamous speedtrap. It's so bad that last December 6th *ABC World News Tonight* carried a report on the many complaints the Louisiana State Police receive about the local police speedtrap there. Last year it generated $166,000, which paid for 47 percent of the town's (pop. 2,300) total budget. Powhatan, Louisiana (pop. 300) used to meet 80 percent of its town budget with its speedtrap, but since a new highway routed most traffic around the place, the speedtrap funds have been reduced. Roads leading into Powhatan still have large handmade warning signs reading "Speedtrap" erected on the lawns of area residents ashamed of the town's tacky method of generating revenue.

The Safe Motorist's Guide to Speedtraps, by John Tomerlin and Dru Whitledge, is a huge 300-page spiral bound book weighing almost 2.5 lbs. It was created to give savvy motorists a tool to help them avoid getting caught in such speedtraps. It isn't afraid to name names. Every popular route in the United States is covered.

Extensive state-by-state listings and maps warn drivers where to be wary and reveal the types of equipment and enforcement techniques used. Coverage is for the 48 contiguous states. Information provided includes many highly detailed police frequencies and their usage; types of patrol cars; speeding fines and points assessed; scanner and radar detector laws; where aircraft, VASCAR, and radar guns are in use, and the radar bands used; known/reported tactics; timing markers used on the highway; speed limits; listing of resident and non-resident driver's license



states; and other useful material. There are photos of many state highway patrol vehicles, showing their markings.

Special sections explain defenses against speedtraps, police tactics, avoiding speedtraps, what to do if you're stopped, and a state-by-state listing of the most notorious speedtrap hot spots.

The intent of this data isn't to encourage motorists to drive fast, far from it. It simply takes a realistic approach and acknowledges that speed limits are often unrealistically low, speed-enforcement strategies can be sneaky and underhanded, and that drivers (quite often *safe* drivers) are the victims who pay for the reluctance or inability of politicians and bureaucrats to come up with a sensible and realistic approach to these issues.

This book has a ton of information, easily arranged. It is recommended for all who travel America's roads, whether professionally, for business, or while on recreational trips. The authors have included an enormous amount of data, and the spiral binding is excellent for keeping the large book open to the pages you want while you're driving.

The Safe Motorist's Guide to Speedtraps is $24.95, plus $3.50 for UPS delivery to continental USA addresses (1st Class Mail to military addresses and elsewhere). Residents of NY State, please add $2.28 sales tax. Order it from CRB Research Books, Inc., P.O. Box 56, Commack, NY 11725.

California Dreamin'

Fifty years of Los Angeles broadcaster KRLA (ex-KPAS, ex-KXLA), better known as *Radio Eleven-Ten*, is the focal point of Bill Earl's book, *Dream House*. Bill Earl is a fine

radio historian, specializing in Southern California, with emphasis on those fantastic 1960's AM rockers that set the standards for a dozen years of AM pop radio across the nation.

Dream House is the 144-page story of Silver Age Top 40 personality radio at its best, and how one small AM'er rose from obscurity to Number 1 in the nation, with legendary air personalities like Casey Kasem, Shadoe Stevens, The China Man, Old Doc Frail, Motorcycle Mikel, and a host of others.

Then, as *Boss Radio* became the new leader, *Dream House* shows how this suburban station played serious catch-up, almost winning the race, before "growing up" (as was the audience), and maturing into a "progressive" album-oriented format. That continued until the inevitable rise of FM became so strong that it overshadowed AM and, tragically, caused it to fade as a contemporary music force. But, after hitting bottom, this written-off "last dinosaur" miraculously came back to hit the top again, surviving successfully into the 1990's.

Dream House, by Bill Earl, was first published almost three years ago as a limited edition, small-press effort, showing a number of the disadvantages of its low budget. Still, it sold out quickly and was highly regarded. That's why Bill Earl decided to reissue the book with new typesetting and a new, slicker, professional look. He also updated the text and rewrote major portions based upon additional information received after the 1989 printing came out.

Dream House is mostly about those exciting years in the 1960's and early 1970's when the voices of screaming jocks and the sounds of the Beatles, Brenda Lee, The Four Seasons, Jan and Dean, Sonny and Cher, Buddy Holly, Herman's Hermits, and The Beach Boys could be heard wafting across Main Street every weekend night via the radios in dozens of cruising Chevy convertibles. It has the feel of that era, and easily captures its fun and excitement.

If you lived through Top 40 Personality Radio during its heyday, *Dream House* will bring it back for you to enjoy again. If you weren't around in those years, now you will realize what it really was and just how much you missed out on. Whether you're a radio nut, historian, or music lover, you'll enjoy *Dream House*.

Dream House is $11.10, plus $1.90 shipping (to USA addresses, only), from Bill Earl and Associates, 633 North Taylor Avenue, Suite 18, Montebello, CA 90640-3337.

In Addition . . .

The Listening Post is an attractive scanner-oriented newsletter that we recently received in the mail. The publication is mainly directed at the San Francisco Bay area. The issue we saw consisted of ten pages containing local frequencies, chit-chat, commentary, club meetings, and other scanner-related information. It is put out by the Bay Area Scanner Enthusiasts (BASE) Club, 1465 Portobello Drive, San Jose, CA 95118. It comes out bi-monthly, which means six times a year. A subscription is $10. We thought it was interesting, well done, and a good deal for scannists in the Bay area.

The 3rd Edition of the *World Ham Net Directory*, by Mike Witkowski, was announced. This lists more than 900 ham radio nets devoted to special interests including aircraft, railroading, UFO's, weather, SWL's, religion, satellites, and everything else. Nets are listed by frequency as well as day/time. This is $9.95, plus $2 shipping, from Tiare Publications, P.O. Box 493, Lake Geneva, WI 53147.

A 172-page 4-by-7-inch pocket-guide to scanning in the New York and New Jersey Metro area is now out, covering police, fire, EMS, transportation, press and other services. NY includes New York City, plus the counties of Nassau, Rockland, Suffolk, and Westchester. New Jersey listings cover Bergen, Essex, Hudson, Passaic, Middlesex, Monmouth, and Union Counties. This is available from Firecom Communications, P.O. Box 61-K, New York, NY 10011. The pocket-guide is $13.95, plus $3.50 for UPS. Residents of NY State must add $1.44 tax.

The Secret Side of Scanners

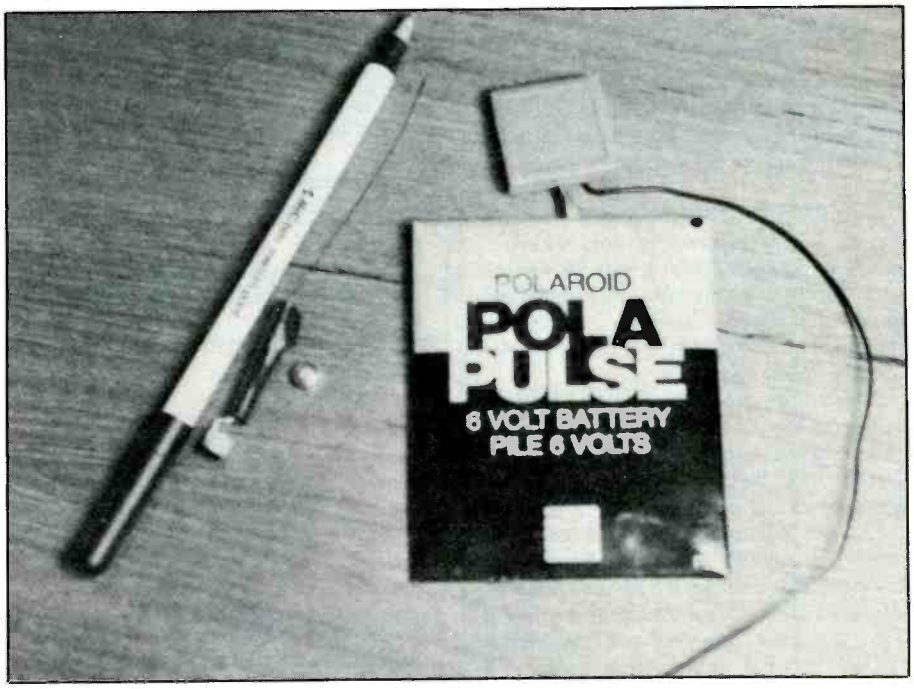
Eavesdropping On Room Bugs, Body Mikes, Surveillance Repeaters, & More!

BY CHUCK ROBERTSON

Few topics in the communications field arouse as much interest, curiosity, or excitement as surveillance comms. Most publications don't mention such things, either out of a lack of information or because of an unwillingness to delve into areas they fear might be too sensitive. Yet, it's perfectly legal for you to monitor these undercover operations.

The important consideration is not to divulge information that could possibly jeopardize an ongoing investigation, or might endanger any of those participating on behalf of an investigative or enforcement agency. Beyond that (which is not only common sense, but also the law), there is little more that can be reasonably expected of the average citizen who elects to listen in on local undercover comms.

So, let us embark upon a tour of the hidden world of covert comms. You probably already know where to look for the standard dispatching and car/car frequencies in your area, so we will concentrate on searching out the more obscure and intriguing aspects of surveillance operations. Get your trench coat, your sunglasses, and your scanner.



The pen transmitter shown here operates on 240 MHz, which is near the the military aircraft emergency frequency at 243 MHz. It uses a special thin battery for easy concealment. Courtesy Sheffield Electronics, 7223A Stoney Island Ave., Chicago, IL 60649.

Professional Eavesdropping

Wireless mikes and body mikes ("wires") are standard surveillance tools. Monitoring them puts you right there as deals are going down.

Most legal devices (which are the ones used by state or local law enforcement agencies during criminal investigations) operate in the 150 to 174 MHz band. Additionally, portions of the spectrum between 40 and 952 MHz might be used. See Table 1 for a breakdown of the FCC approved bands. Other bands might also be used with FCC special approval from the FCC.

If the purpose of the surveillance is to obtain information not intended for criminal prosecution, more obscure frequencies beyond those bands might be used. This reduces the chances of the device being accidentally discovered or detected by the suspect(s). Such devices can turn up in government, TV broadcast, and even the aero bands. Unauthorized bugs have turned up in all of these bands. See Table 2.

Legit wireless mikes use NFM mode. Unauthorized ones can turn up using NFM or WFM. Check both modes when trying to find signals from these devices, all of which run 2 watts, or less.

Active state law enforcement bugs and wires have been confirmed using the following frequencies: 161.02, 161.62, 165.1875, 165.2125, 167.3575. 169.385 MHz.

Federal agency devices aren't restricted to the bands in Table 1, and could turn up just about anywhere. See Table 3 for likely spots. Federal bugs and wires have also been reported between 72 and 76 MHz, also the 174 to 216 MHz TV broadcast band.

These devices don't usually look like the wireless mikes you see singers and stand-up comics using on TV. More than likely, they are concealed in ball caps, belt buckles, pens, coffee cups, fake beepers, in boots, desk lamps, wrist watches, tie clips, and other nondescript items.

Surveillance Repeaters

Law enforcement agencies and use mobile repeaters or extenders in their day-to-day communications activities. These low-power devices (usually around 15 watts) are typically located in patrol cars and retransmit comms of interest. This makes it possible for the officer, while out of his vehicle and carrying his short-range handheld transceiver, to monitor traffic and remain in communication with the dispatcher and other cars.

For instance, the Illinois State Police op-

Table 1

42.02 to 42.94 MHz	170.15 to 173.40 MHz
44.62 to 46.58 MHz	453.05 to 453.95 MHz
47.02 to 47.50 MHz	458.05 to 458.95 MHz
72.00 to 76.00 MHz	460.025 to 460.625 MHz
150.995 to 151.49MHz*	462.95 to 462.975 MHz
153.74 to 154.445 MHz*	465.025 to 465.625 MHz
154.635 to 156.25 MHz*	467.95 to 467.975 MHz
157.05 to 157.11 MHz	470.00 to 512.00 MHz
158.715 to 159.645 MHz*	821.00 to 824.00 MHz
166.25 MHz	866.00 to 869.00 MHz

Table 1. Wireless mike, room bug, and body mike bands used by state and local enforcement and investigative agencies. Frequencies beyond these bands may be used with special FCC permission. The well-known wireless-mike freqs in the 169 to 172 MHz band, used at fast-food drive-up windows, are available, too. Frequencies with an asterisk (*) may be in use by vehicle tracking transmitters.

Table 2

73.00 to 74.60 MHz	137.00 to 138.00 MHz
216.00 to 222.00 MHz	400.00 to 406.10 MHz
608.00 to 614.00 MHz	

Table 2. These bands are relatively obscure and quiet, so they have been used for covert transmitters.

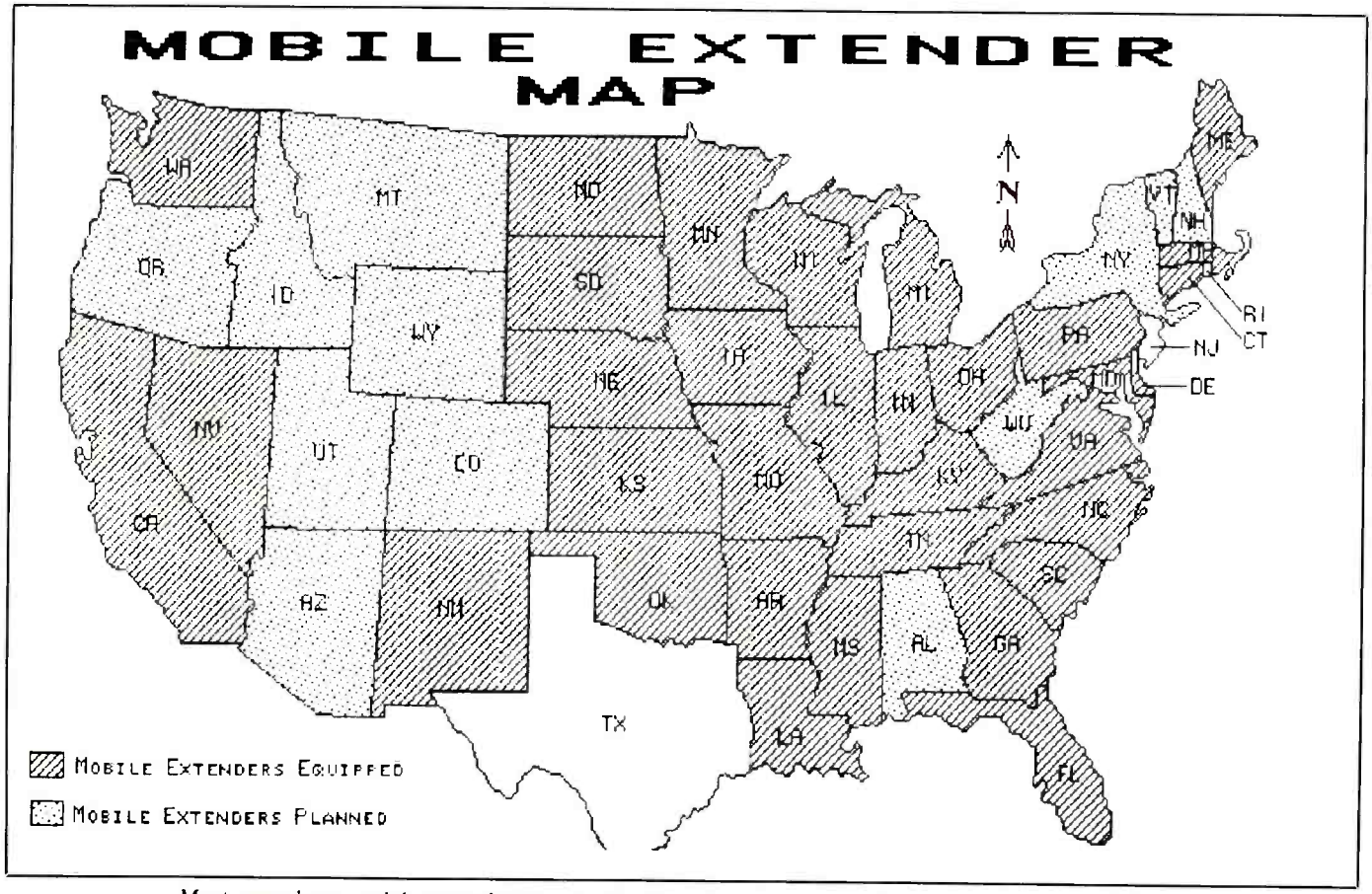
erate mobile extenders on 155.505 MHz. The channels that are rebroadcast over this frequency include 155.475, which is the nationwide law enforcement emergency net channel. Also, state district police channels (like 42.60 and 154.935 MHz), and local or city channels may be repeated.

But few people know that the mobile repeater channels in some states do double duty as surveillance frequencies. The reason is that they have less activity on them than other frequencies, such as those used by state troopers for handing out speeding tickets.

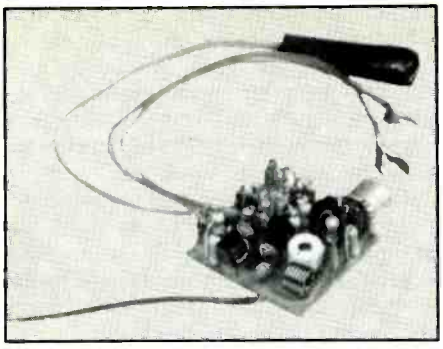
The Illinois State Dept. of Criminal Investigation uses 151.16 MHz for its surveillance mobile repeaters, even though the frequency is actually allocated for use by state conservation agencies. Most folks wouldn't think to listen on such a frequency for an undercover stakeout.

The channels repeated over surveillance extenders could vary depending upon the type of investigation. In my area, for instance, if the state investigators are working with city police, then city or county frequencies are used. In many instances, only the Illinois State Dept. of Criminal Investigation dispatch channel (154.905 MHz), the emergency net channel (155.475 MHz), and inter-agency channel (155.46 MHz) are repeated. Car/car and handheld comms are simplex on 154.95 MHz.

If you observe a surveillance mobile repeater tied up over a period of hours or days, it's



Most areas have mobile extenders in use. They're often good to monitor for undercover activity.



Combo telephone and room monitoring transmitter. It's for installation in a telephone, and is powered by the phone. It operates in the 65 to 305 MHz frequency range. Courtesy Sheffield Electronics.

Table 3

40.00 to 42.00 MHz	148.00 to 150.80 MHz
46.60 to 47.00 MHz	157.04 to 157.19 MHz
49.60 to 50.00 MHz	162.02 to 174.00 MHz
137.00 to 144.00 MHz	225.00 to 420.00 MHz

Table 3. Federal bands above 40 MHz are places where covert transmitters may be placed in use.

a safe bet that a stakeout is in progress. Given the output power used by mobile repeaters, you can assume that if you can hear it, then it's not far from your location.

Some types of surveillance repeaters are used to retransmit bug or body mike signals. The repeater puts out 5 to 15 watts and might be installed in an attache case. One model on the market can receive and transmit in two frequency ranges, 136 to 174 MHz, also 335 to 512 MHz.

Bird Doggin'

Law enforcement agencies sometimes keep track of suspect vehicles, or certain cargo shipments, by using special transmitters. In this manner, the targets can be kept track of from a safe distance by monitoring the small, self-contained transmitters. Such a transmitter might have a magnetic case that permits quick and secure attachment to a vehicle bumper or gas tank, or it might be placed in a box for inclusion in a cargo shipment.

The transmitter might emit a quarter-second *beep* each second, or possibly it sends out a continuous signal. If a motion detector is included, during periods of inactivity, the transmitter will reduce its activity level to only one *beep* every ten seconds. This not only prolongs battery life, but also provides information regarding the status of the surveillance target.

Vehicles used for tracking such transmitters are easy to spot. Look for four identical antennas mounted in a square configuration.

Another VHF/UHF direction-finding (DF) technique is portable, calling for a small, handheld yagi antenna. This is an inexpensive system (also less accurate) than the one with the vehicular mounted antennas.

Local and state tracking transmitters will show up in the bands indicated in Table 1. Federal agencies turn up anywhere.

Remote Control

Wireless mikes and other surveillance transmitters can be set for remote control operation. This permits them to be put into stand-by operational status to extend battery life during periods when no intelligence information is likely to be forthcoming. It also reduces the chances of the devices being detected during a countersurveillance electronics sweep of the premises. The remote control could also be used to increase or decrease the mike's sensitivity.

Look for radio control systems in the 72.01

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Mobile Repeaters (Extenders)

State	Frequency	Comments
Alabama	- -	May equip in the future.
Arizona	155.505	15% equipped; no more planned.
Arkansas	154.785	Fully equipped.
California	154.905	Fully equipped.
Colorado	- -	May equip in the future.
Connecticut	154.83	40% equipped.
Delaware	465.475	Fully equipped.
	460.50	Alternate frequency.
Florida	465.1625	Fully equipped.
	156.18	Turnpike units.
Georgia	458.4875	Fully equipped.
Idaho	- -	May be equipped.
Illinois	155.505	Fully equipped.
	151.16	Dept. of Criminal Investigation.
Indiana	155.445	Fully equipped.
Iowa	453.625	Fully equipped.
Kansas	154.92	Fully equipped.
Kentucky	154.665	Fully equipped.
Louisiana	453.45	Fully equipped.
Maine	460.225	Some cars equipped.
Maryland	155.73	Fully equipped.
Massachusetts	154.92	About 40% of cars equipped.
Michigan	154.695	More than half of cars equipped.
Minnesota	458.25	Fully equipped.
	453.25	Minneapolis.
Mississippi	158.97	Believed fully equipped.
Missouri	154.905	Fully equipped.
Montana	- -	May be equipped or will equip.
Nebraska	465.525	Fully equipped.
Nevada	154.92	Fully equipped.
New Hampshire	- -	May be equipped; has tested.
New Jersey	- -	Not now equipped.
New Mexico	460.15	Probably fully equipped.
	465.15	Alternate frequency.
New York	- -	Not now equipped.
North Carolina	155.445	Fully equipped; freqs. vary by district.
	154.68	Alternate frequency.
	154.92	Alternate frequency.
	159.21	Alternate frequency.
North Dakota	453.45	Partially equipped.
Ohio	465.55	Northern areas.
	465.375	Southern areas.
	465.425	Some units.
	465.525	Turnpike units.
Oklahoma	154.905	
	465.0125	Alternative frequency.
	465.1625	Alternative frequency.
	465.3875	Alternative frequency.
	465.5625	Alternative frequency.
Oregon	- -	May be equipped; or will soon.
Pennsylvania	154.755	Fully equipped.
Rhode Island	- -	May have future plans.
South Carolina	154.445	Some or all cars equipped.
South Dakota	453.375	Some cars equipped.
Tennessee	154.905	Fully equipped.
Texas	- -	Not now equipped.
Utah	- -	May have future plans.
Vermont	- -	May have future plans.
Virginia	453.35	Fully equipped.
Washington	453.475	Some cars equipped.
	453.975	Alternate frequency.
West Virginia	155.505	May be equipped, or will soon.
Wisconsin	465.125	Fully equipped.
Wyoming	- -	May use, or will soon.

Table 4. Mobile repeater (or extender) frequencies believed to be in use by state enforcement agencies.

to 72.99 MHz and 75.41 to 75.99 MHz bands (20 kHz steps). Some systems operate in the 300 to 350 MHz band.

The Big Ear

Wireless mikes are everywhere. In addition to law enforcement surveillance, they're used for wildlife recording, in the entertainment and TV news industries, and for illegal eavesdropping. Of course, even wireless room monitors and intercoms are wireless mikes.

Inexpensive models sell for as little as $30, so anybody can afford one. No license is needed for personal use of these devices, although you aren't supposed to cause interference to licensed services. Most suppliers point out that their device isn't sold for use in any manner contrary to law.

Low-priced models operate somewhere in the 65 to 320 MHz range, using either WFM or NFM.

The smallest (and more costly) units operate between 900 and 1200 MHz. They do not usually have the transmitting range of the larger units that use lower frequency bands, and their signals are subject to shadowing and absorption due to materials in the structure of the buildings or vehicles in which they are concealed.

The best results, from a distance standpoint, are on lower frequencies, like the 73.00 to 74.60 radio astronomy band. Signals there travel well and are unaffected by structures or other stations using the frequencies. Frequencies below 50 MHz are poor due to skip interference, although some bugs do exist in the 30 to 50 MHz band, anyway.

Can We Talk?

Sure you can talk, but remember that there's at least some chance that someone may be listening. If you've got something to hide, you're living in the wrong century, and the wrong part of the world.

When you walk into a department store, you're on their surveillance camera. Your boss may have your office bugged, or might be listening in on the calls from your office phone. Make an overseas phone call, and Big Brother is listening in. Pick up a cordless a cellular phone and someone may be listening. Cheating on your spouse or your taxes? Then you may well be under audio and/or video surveillance.

Suspected of doing something else illegal? Even if you're innocent, you can only guess at who might be listening—FBI, Secret Service, DEA, Treasury, Alcohol Tobacco & Firearms, Customs, ICC, Dept. of Labor, Organized Crime Task Force, Dept. of Agriculture, state or local police, county sheriff, and dozens of other agencies that are definitely interested in hearing what you're saying.

Fact is that there's a lot of surveillance going on by public agencies, private industry, and by individuals. Most of it is probably being done illegally. You can't get away from it. So you might as well enjoy it, understand it, and get to know something about the nature of the beast. ■

POP'COMM Reviews:

The Realistic HTX-202 2-Meter Ham Transceiver

Radio Shack was certainly not going to let the advent of the no-code ham ticket go by unnoticed. They responded with a new handheld that comes from its box ready to go on the 2-Meter band, which is the *Disneyland* of local ham ragchewing bands.

The set can be operated from power sources delivering between 7.2 and 13.8 VDC, and, depending upon the input voltage, the RF power output will be between 2 and at least 6 watts. There's also a provision for running only 1 watt output.

The operating range covers the entire band from 144 to 148 MHz, with programmable frequency steps of 5, 10, 20, 50, and 100 kHz. A multifunction scanning feature allows the user to put the unit into ascending or descending frequency search mode, with or without a scan delay. In search mode, the user can select the frequency steps, and can vary the scan delay from less than 1 sec. to as much as 4 secs.

In addition to selecting frequencies by the scan/search method, frequencies may also be selected with the keyboard, or with the tuning control on the top of the transceiver. There are 12 independently programmable memory storage channels, plus one calling channel, and three priority channels. Individually programmed repeater offsets provide maximum flexibility when setting up the unit for accessing non-standard repeaters. The CTCSS-type tones used in conjunction with many repeaters are also separately programmable (transmit and receive) to the meet the user's needs.

For ham autopatch telephone or selective calling, a built-in DTMF memory dialer is available. It will store five number sequences (up to fifteen digits each) in its memory.

There is a built-in condenser mike, however, provisions are there to plug in either an external dynamic or a electret condenser PTT mike. An external speaker can also be used, if desired. Although the HTX-202 comes with a rubberized whip antenna, it is attached by means of a BNC-type connector. That means the unit may also be easily operated with a separate base station or mobile whip for extended range; or it may be readily hooked up to drive a 2-Meter band linear amplifier.

The Realistic HTX-202 transceiver.

The receiver IF frequencies are 455 kHz and 21.4 MHz. Sensitivity is rated at 12 db SINAD: 0.2 uV.; 20 dB NQ: 0.4 uV. Spurious response attenuation is 80 dB, with intermod attenuation and adjacent channel (25 kHz) rejection both 70 dB.

There's a big LCD display that reads out in 8 digits. Operating status indicators are also provided in the display area.

The HTX-202 may be operated from any of several power sources, including the rechargeable 7.2VDC (600mAh) power pack (supplied with charger), or six "AA" alkaline batteries (9VDC), from a vehicle battery (using optional adapter), or from household power lines (using optional adapter). At 7.2VDC, the transmitter power drain is 0.8 amps; at 13.8VDC it is 1.1 amps. The HTX-202 weighs 1 lb., 3 oz.

The squelch, on/off switch-volume control, tuning knob, and antenna are on top of the unit. All of the programming controls are on the keyboard, which also includes a keyboard lock switch. The PTT bar is on the side of the HTX-202. At detachable clip allows it to be hung from a person's belt.

When you consider that this transceiver is roughly the size of a handheld scanner, you can appreciate the enormous amount of features put into the HTX-202 package. It's got pretty much all of the features you could reasonably want, and it's so versatile that it can even be connected directly to a packet radio terminal node controller.

Held in the hand, the HTX-202 has a good heft. The controls are well marked, easy to read, simple to understand. Operation is simple, and the illustrated 38-page instruction manual thoroughly covers every aspect of the set's operation very clearly.

Powering the set from our car's cigarette lighter, we hit a lot of repeaters with this unit, and got good reports on how it sounded from all contacts. Using internal battery power and the rubber duckie antenna, we had a solid simplex contact with a mobile unit a couple of miles away. Running the HTX-202 into a roof-mounted omnidirectional base station Cushcraft Ringo antenna, and powering it from 117VAC, we had a great little base station that got a lot of favorable comment.

We think this is a fine little rig that does a lot for the $259.95 that Radio Shack gets for the thing. If you are looking for a versatile little 2-Meter rig, the HTX-202 will easily fill that bill and let you enjoy the fun of 2-Meter hamming from home, your vehicle, or while you're on foot.

Keep in mind that in the USA, you require a current Amateur Radio License from the FCC to operate the HTX-202.

Reviewed by POP'COMM Staff

DX'ing Europe's Powder Keg

Monitoring Shortwave From Yugoslavia

GERRY DEXTER

History. Religion. Language. Discrimination. Politics. Armed Forces. Ethnics. Borders. Culture. Persecution. Communism. Economics. Poverty. Democracy. Power.

One or more of these are the ingredients behind every war or street riot news media reports. And *all* of them are elements in the complex Yugoslavian situation, factors which have led to civil war. It can be said with almost 100% certainty that the Socialist Federated Republic of Yugoslavia will never again be what it was.

Shortwave listeners have a sense of the radio history involved in the kind of changes brought about by midnight flag raisings marking independence from a colonial power or the breakup of a nation. With that in mind Yugoslavia becomes an interesting target of our attention.

Yugoslavia sits on the Balkan peninsula in southeastern Europe. It borders on seven other nations: Italy, Austria, Hungary, Romania, Bulgaria, Greece and Albania. This patchwork nation is rooted in a 1917 agreement, the Pact of Corfu, which called for the various peoples of the area to unite in a kingdom ruled by the Serbs, Croats and Slovenes which later became Yugoslavia. By that time, Europe was again at war and the government had taken a pro-Axis line. The Yugoslav government was overthrown in 1941 and Yugoslavia then took a neutral stance, a change in outlook which was invitation enough for the Axis to invade and take over.

Enter Josep Broz Tito, a communist who fought with the Red Army during the Russian Civil War. Tito, with his partisans, waged a long guerrilla campaign against the occupiers. After the Germans left, Tito soon forced the abdication of King Peter II and declared Yugoslavia a communist state. He broke with Stalin in 1948 and steered his own course toward developing what he called "nationwide communism" which allowed for somewhat more personal economic freedom. It is a measure of Tito's strength, power, and personality that, when he died in 1980, he was replaced by a multi-member presidency comprised of one person from each of the republics and autonomous provinces. Even while Tito was still in power questions were raised as to how long Yugoslavia would last after he left the scene. It may be yet another measure of Tito that it was a decade after his death before things finally fell apart.

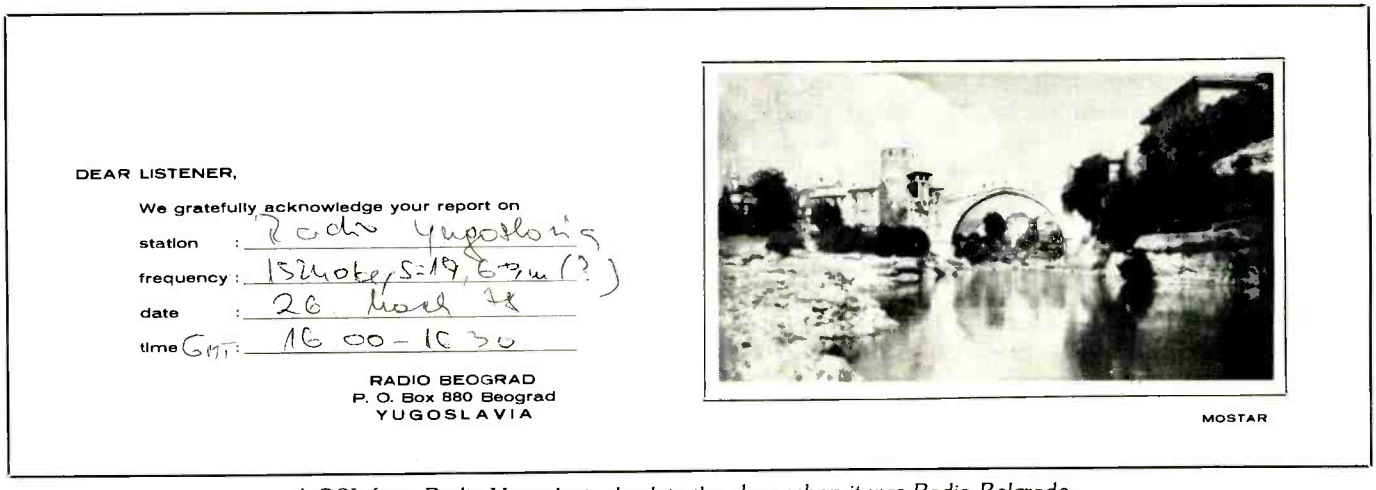
Yugoslavia consisted of six individual republics: Serbia, Croatia, Slovenia, Bosnia-Herzecovinia, Macedonia and Montenegro. In addition, there were also two autonomous provinces: Kosovo and Vojodina, both located within the Republic of Serbia. Most of the republics are dominated by a particular ethnic group (Serbs in Serbia, etc), although there are any number of ethnic minorities living within each.

Radio Yugoslavia has been active on shortwave for decades. Twenty or thirty years ago it was a fairly easy station to hear well. But increasing band congestion plus its own aging equipment and limited frequency usage made reception more and more difficult, at least for North American listeners. This problem was corrected about three years ago when Radio Yugoslavia put some new 500 kW transmitters on the air, and reception in North America is considerably more reliable now. The 500 kW transmitters are located at Bijeljina, a small town in the northern corner of Bosnia-Herzegovnia. The older units, 10-100 kW transmitters, are at Stubline near Belgrade.

The most recently available schedule shows transmissions as follows:

0000-0030 - Spanish to the Americas on 9720.

0130--0200 - Serbo Croat to the Americas on 9555.



A QSL from Radio Yugoslavia, back in the days when it was Radio Belgrade.

COMMUNICATIONS ELECTRONICS INC.

Emergency Operations Center

has expanded to our new two acre facility and World Headquarters. Because of our growth, CEI is now your one stop source for emergency response equipment. When you have a command, control or communications need, essential emergency supplies can be rushed to you by CEI. As always, for over twenty three years, we're ready, willing and able to help. For 1992, we're introducing new products from Uniden, Shinwa, ICOM, Ranger Communications Inc., Grundig, Sangean, Magnavox and RELM.

NEW! Shinwa SR001-B

List price $799.95/CE price $479.95/SPECIAL

Continuous coverage from 25.000 through 999.995 MHz.

If you're looking for an excellent synthesized scanner designed for mobile surveillance use, the new Shinwa SR001 scanner offers features never before offered at such a low price. When you purchase the wide band scanner from CEI, you'll get a free infrared wireless remote control that allows you to control your scanner from over 20 feet away. Selectable frequency steps of 5.0/10.0/12.5/20.0/25.0/50.0 or 100.0 KHz. are available. Dual antenna inputs terminating in an "N-type" and "BNC" connectors are included. Other features include 200 memory channels grouped in 10 banks of 20 channels, easy to read multi color LCD display, lithium battery for memory back-up, 35 channel per second high speed scanning, priority, timer and even an alarm to alert you to transmissions on your choice of one special frequency. We even include a mobile mounting bracket. The SR001 can be used for base station use with the purchase of the ACS-B 12 volt DC power supply for only $34.95 each. A great sounding external speaker #SPE-B is available for only $24.95.

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The fire department hazardous materials response teams and police department SWAT crews who need a reliable radio alerting system stake their lives on Shinwa. We offer a two-tone pocket pager with monitor feature and even a voice storage option at an affordable price. To order, we need your paging frequency as well as tone reed frequencies. For other configurations or two-way radio information, please fax us your specifications to 313-663-8888 or phone 313-996-8888.

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Now you can bring a wider world of broadcasting, VHF air and marine bands, emergency services and many more communicatons into your vehicle. Icom's advanced ICR100 fully covers all the stations worth hearing with up to 100 memory channels and a multitude of features.

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PRO510XL-B Uniden 40 channel CB Mobile $39.95
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RD3173-B Cobra 3 band radar detector $139.95
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Bearcat 200XLT-B

List price $509.95/CE price $239.95/SPECIAL

12 Band, 200 Channel, Handheld, Search, Limit, Hold, Priority, Lockout
Frequency range: 29-54, 118-174, 406-512, 806-956 MHz.
Excludes 823.9875-849.0125 and 868.9875-894.0125 MHz.

The Bearcat 200XLT sets a new standard for handheld scanners in performance and dependability. This full featured unit has 200 programmable channels with 10 scanning banks and 12 band coverage. If you want a very similar model without the 800 MHz. band and 100 channels, order the BC100XLT-B for only $179.95. Includes antenna, carrying case belt loop, ni-cad battery pack, AC adapter and earphone. Order your scanner from CEI today.

Bearcat 800XLT-B

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12-band, 40 Channel, Nothing excluded in the 800 MHz. band.
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CE price $48,880.00/Special order - allow 45 days for delivery. When war broke out in Iraq, you heard all the action because CNN had a satellite telephone. When a disaster such as an earthquake or a hurricane strikes your community and communications are disrupted, you can depend on instant reliable communications, just like CNN did using your Magnavox MagnaPhone. Inmarsat communication satellites are in geostationary orbit along the equator. They beam two-way voice and data transmissions between your satellite phone and fixed earth stations. In most instances, telephone calls are dialed directly once you have selected the satellite serving your location. No matter where you are on the planet, the MagnaPhone automatically selects the Land Earth Station (LES) nearest the destination called. This makes placing a call as easy as using a standard telephone. Dual ID numbers permit a separate Inmarsat telephone number to be used to route calls to one of the external telephone ports which could be used for a fax machine or a computer data line. For telephone, telex, fax and data communications anywhere in the world, the new MX2020P MagnaPhone is the most compact Inmarsat-A, Class 1 terminal available today. Like a cellular phone, airtime will be billed to your account. The new MagnaPhone weighs just 47 lbs (21 kg), including the antenna. Add the optional ruggedized case (only $950.00) and it can travel as airline baggage on commercial carriers. When you arrive at your destination, installation can be done in less than 5 minutes. For more information call our Emergency Operations Center at 313-996-8888.

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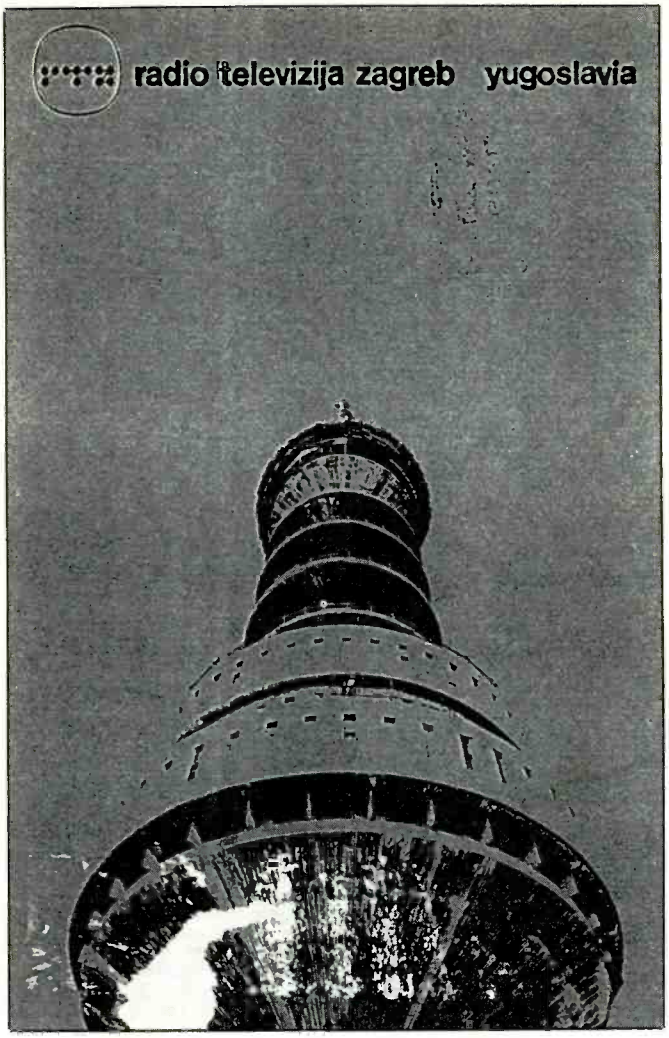


Radio Zagreb's card is in silver and black.

Radio Sarajevo's QSL features a photo of the city and information about the Republic of Bosnia and Herzegovina.


RADIO TITOGRAD
81000 Titograd, Yugoslavia

Gentleman,

confirming your QSL card, we are thanking you for the report.
we are sending every day from 05 to 23 h.
local time on 88kHz. AND VIA RADIO YUGOSLAVIA ON:
5980 KHz
7240 KHz
9620 KHz
11735 KHz
15325 KHz

truly yours
Radio Titograd

TITOGRAD

A QSL from Radio Titograd lists Radio Yugoslavia frequencies which were in use then.

0230-0300 - English to the Americas.
1230-1300 - English to Asia, Australia, the Americas on 17710, 17740 and 21645.
1600-1645 - Russian to Europe and Asia on 6100, 15175.
1700-1730 - French to Europe and Africa on 11750 and 15175.
1730-1815 - German to Europe on 9620.
1815-1900 - Arabic to the mideast and Africa on 9720.
1900-1930 - Russian to Europe and Asia on 6005 and 7165.
1930-2000 - English to Europe, Africa on 6100 and 15140.
2000-2030 - Spanish to Europe on 7220.
2030-2100 - German to Europe on 6100.
2100-2120 - Serbo-Croat to Europe and Asia on 6100 and 9720.
2130-2200 - French to Europe and Africa on 6100 and 15180.
2200-2245 - English to Europe on 6100 and 9505.

Several of the broadcasts to countries on Yugoslavia's borders have been discontinued, including those in Bulgarian, Greek and Albanian. Some of the still-existing transmissions appear to have been cut back by fifteen minutes. English to North America used to run 45 minutes, rather than 30, for example. One presumes these changes are due to the current situation in the country although the station has given no reasons for the changes.

As far back as one can remember Radio Yugoslavia has blown hot and cold on the subject of QSL's. There have been periods when replies came quickly but more often, coaxing a reply out of Belgrade is an exercise in patience and right now is no exception. These days, perhaps its just that they have a lot more important things on their mind. It is, at any rate, one of those common situations where simple persistence will bring a reply - eventually! Reports should go to Radio Federal Yugoslavia, PO Box 200, 11000 Belgrade. Reports in English are fine and no return postage should be necessary.

Yugoslavia is, in some respects, very much like the former USSR because it shares many of the same problems. There are major differences between the republics on such questions as communism vs. a western style democracy and communist economics vs. the free market. There are ethnic rivalries riding age-old hatreds. Several republics have proclaimed their own independence or intentions, stating they no longer recognize Belgrade's authority. Croatia, having declared its independence, now fights a war against the Serb-dominated Yugoslavian army which wants to incorporate the Serb-populated areas of Croatia into a greater Serbia. Some 5,000 people are believed to have died in the war which began in earnest last June.

For years, Radio Yugoslavia carried broadcasts of several of the republic stations in a couple of time slots, usually airing a different station each day. SWL's could heard broadcasts from such mediumwave stations as Radio Sarajevo (Bosnia and Hercegovina), Radio Novi Sud (Vojodina) Radio Titograd (Montenegro) and so on. Most of these would verify listener reports with their own QSL cards and letter, often sending tourist information as well. But the war has drastically changed this arrangement and most of these now seem to be off the air. Montenegro's Radio Titograd broadcasts in Serbo-Croat may still be relayed by Radio Yugoslavia although the exact, current schedule of this and the others is now unclear. Try Fridays at 2100

during the listed Serbo-Croat times on the main Radio Yugoslavia schedule. However, Titograd's broadcast in Albanian, formerly aired at 2030 on Fridays has been dropped.

The southern republic of Macedonia contains Turkish and Albanian minorities. It borders Albania, Greece and Bulgaria and the latter has designs on some of its territory. Radio Skopje also seems to still be on the air via Radio Yugoslavia, probably at 2100 Saturdays.

Kosevo's Albanian program from Radio Pristina, formerly on Thursdays at 2100-2115 has also been dropped. It appears that Radio Ljublijana's (Slovenia) Slovene language relay is no longer carried. Also, Hungarian programs from Vojodina's Radio Novi Sud are no longer listed in the scheduled. The status of the Radio Sarajevo (Bosnia and Hercegovina) and Radio Beograd (Serbia) broadcasts in Serbo-Croat is not known at present. They may well still have their own programs in that language relayed by Radio Yugoslavia in the former 2100 time period: Beograd was formerly carried on Sundays and Sarajevo on Wednesdays.

One which is certainly no longer being carried on Radio Zagreb, the radio of Croatia which has declared itself an independent nation. The government station, which claims to be southern Europe's first broadcaster, is active on shortwave, however. Last May, the station, officially Hrvatski (Croatian) Radio Zagreb, began relays via US religious broadcaster WHRI, IN. It can be heard daily from 0000 or shortly after on 7315 with a broadcast lasting about one hour. Most of the program is in Croatian, but there is an English segment around 0045. The Sunday broadcast begins about one half hour later. If you don't find them on 7315, check 9495. A couple of months later the station began operating 'round the clock on 7240 and 9830, relaying the station's mediumwave first program. There are English language segments at 1200 and 2200. Both frequencies are apparently coming direct from transmitters within Croatia. A few US DX'ers have already received QSL's for these direct broadcasts, despite the on-going war. The address is Hrvatski Radio Zagreb, Radnicka c 22, 41000 Zagreb.

A *POP'COMM* reader in Italy, Ciappi Roberto, says Croatian Radio sometimes airs a song called "Stop the War in Croatia," supposedly by a Croatian singer. Other such patriotic songs as "Falcons of Croatia" are also aired. He notes that the mediumwave broadcasts from various republics vary markedly in the tone of their broadcasts, insofar as the war is concerned. The Novi Sud, Sarajevo and Titograd stations, he says, are "smoother," running more folksongs, short newscasts and make one aware, just from the flavor of their programming, that they are not secessionist. The stations in Ljubljana, Skopje and Zagreb, however, air western music, longer newscasts and comments. Croatian Radio Zagreb airs a lot of easy listening music "to relax (the) population," he says. Belgrade's mediumwave station "is running serious news with cold-blooded speakers." Roberto feels it is trying to maintain an authoritative mood.

On a clandestine note, it's reported that the Serbian minority within Croatia have begun their own broadcasts from the town of Osijek. These are supposedly aired between 1200-1300 somewhere in the 40 meter band. This, likely, is via some sort of low power ham transmitter and not likely to be heard in North America.

Another Croatian broadcast, Radio Libertas, has been carried via WHRI at 1600 on 9465, Sundays at 2100 on 13670 and 17830. The program is produced by the Canadian-based Croatian Committee For Human Rights. But the broadcast appears to be in limbo as this is written. Canadian news reports say the organization is allegedly involved in shipping arms to Croatia.

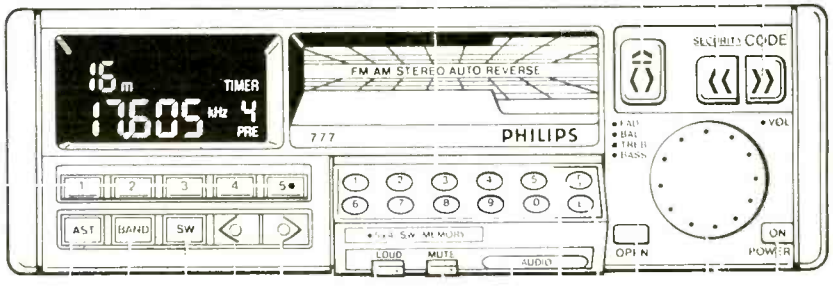
At this writing, anyway, Yugoslavia remains a war situation, with all the attendant uncertaintities—including the shortwave broadcasting picture. No one knows how it will all come out, of course. But (as it is almost always possible to say about shortwave) "right now is a good time to be tuning in."

POP'COMM Reviews:

The Philips DC777

Monitor Shortwave From Your Car!

The Philips DC777 offers shortwave reception in your car.



A closer look at the front panel of the DC777.

We have long wondered why there hasn't been any major effort to produce and market a mobile shortwave receiver in North America. It always seemed like it would be great to have the ability to cruise along while enjoying tuning in directly to London, Tel Aviv, Melbourne, Stockholm, Quito, and elsewhere.

Philips has met the challenge with the introduction into the North American market of their DC777, a handsome designer-styled car radio that receives shortwave in addition to doing everything else a good stereo car radio and cassette is expected to do.

Yes, the receiver picks up standard AM and FM with 5 preset channels on each band, and the cassette deck has auto reverse. There's a digital clock with an automatic timer capability. The audio section has a 50 watt low distortion amplifier, which has enough moxie to handle either two or four speakers. And there's even a nifty "mute" button that temporarily silences the amplifier. But what got us turned on was the unit's shortwave functions.

Essentially, the DC777 can also receive AM mode transmissions on all shortwave frequencies between 3170 and 21910 MHz, and you can load your favorite shortwave channels right onto 20 push-button positions. You can access shortwave frequencies several ways, including search tuning, manual tuning with a knob, direct entry of frequency or band via the programmable keyboard, or by recalling a preset position. Search tuning (which is also operational in the AM and FM bands) scans for shortwave signals in 1 kHz steps between low and high limits that you determine.

An interesting facet of the search feature is that the first time it scans through the band, the set will stop only on strong stations. If none are found, then the next time it goes through the frequencies, it will look for less potent signals. If it still finds no stations, the third time through, it will seek out weak signals.

The DC777 comes with an instruction book printed in English, Spanish, and Portuguese. We found the book's directions to be clearly stated and easily understood. Actually, the DC777 is quite user friendly and, considering all that it is and does, we found it relatively simple to operate.

Reception, using a mobile antenna, was excellent. The DC777 easily picked up the more powerful regulars, like RHC, WWCR, and VOA, but it also dove right into the next couple of layers of signals and pulled them through, too. The ability to vary the bass and treble adjustments can be used to enhance the readability of signals. There's a built-in patented noise suppression circuit to deal with any ignition interference.

Among the stations the DC777 pulled in the first day were VOIRI, in Iran, and UAE Radio, in Dubai. We were well satisfied with its ears.

The DC777 fits into the standard car-radio size aperture found in most cars. There are no special precautions to be observed, and no surprises should be expected. There's a security code number assigned to each individual DC777. When activated, the security feature will not allow the radio to operate until the proper code number has been entered on the radio's keyboard. That means, the DC777 will have little appeal to thieves—and window decals for your car point this out.

Philips has come up with a fine idea and product in the DC777, executed with the company's famous high degree of design quality and craftsmanship. If you thought it would be great to have shortwave reception in your car, truck, or RV, this unit is definitely worthy of your attention.

Philips radios are offered by many dealers. If you want more information, or the name of a dealer near you, call toll-free (800)-328-0975, or circle 101 on our Readers' Service. ■

Reviewed by POP'COMM Staff.

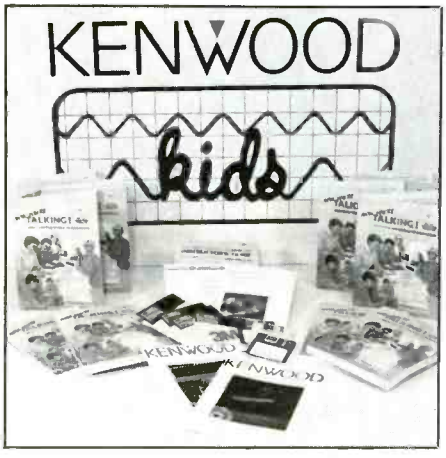
NEW PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

Amateur Radio Geared For Kids

Kenwood has created an exciting new program called Kenwood K.I.D.S. This program will help thousands of young people discover the excitement of Amateur Radio. But we need your club's assistance for the Kenwood K.I.D.S. program to succeed. Here is how the program works.

Kenwood wants you to co-sponsor a local school, scout troop, or youth group in the Kenwood K.I.D.S. program. As co-sponsor your club will provide local assistance and "Elmer" the youth group, while Kenwood provides the educational materials and prizes. Each new ham sponsored under the program will receive a $25.00 gift certificate from Kenwood, and for every ten Kenwood K.I.D.S. licensed, your club will receive ten $25.00 gift certificates.



All clubs that sponsor at least one group of ten Kenwood Kids by March 1, 1992 will be entered in a drawing for a Kenwood TS-950SD, our top of the line transceiver. And each of the youth clubs with ten or more new members will have a chance to win one of ten complete stations; consisting of a TS-140S transceiver, PS-430 power supply, AT-250 antenna tuner, and MC-60A microphone.

By returning the Kenwood K.I.D.S. form to Kenwood you set the process in motion. We will send you a Kenwood K.I.D.S. package containing:

Ten copies of "Now You're Talking," the new ARRL book introducing Amateur Radio with everything you need to pass the Technician or Novice Written exam.

One copy of the ARRL Novice/Technician Instructor's Guide, a companion to "Now You're Talking."

A certificate for 1 copy of Kenwood's Ham Windows software. An exciting new computer program that makes the computer an extension of the HF rig, while teaching science, geography, and social studies. See the enclosed brochure.

Kenwood K.I.D.S. program outline and promotional materials. Including forms to claim gift certificates and enter the prize drawings.

There are a limited number of Kenwood K.I.D.S. packages available. We will ship to clubs on a first come, first serve basis. By filling out a form provided by Kenwood, you set the plan in motion.

Join with Kenwood by co-sponsoring a youth group in your area. You can add new members to your club, earn Kenwood gift certificates, and maybe win a TS-950SD.

For further information, and mail forms for the Kenwood K.I.D.S. package, contact: Kenwood, PO Box 22745, Long Beach, CA 90801-5745, or call (310) 639-900 and ask for Wayne Yoshida (Eastern Sales) or Mike Forsyth (Western Sales).

Model 10-30 Compact HF Antenna

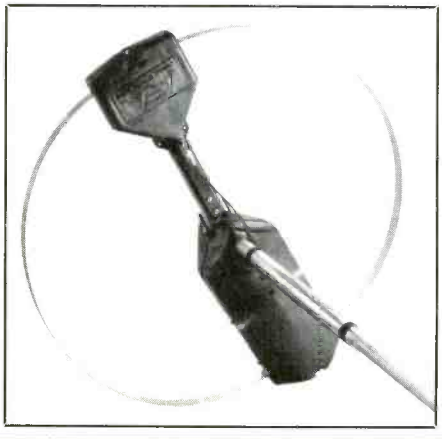
Following up on the success of the IsoLoop 14-30, the IsoLoop model 10-30 sets the standard of performance for compact HF antennas. This antenna is particularly well-suited for DX operation in locations that have antenna restrictions.

The omni-directional IsoLoop is ideal for people living in apartments and condos, and it's also great for mobile or portable use. Power capability: 150 watts. The IsoLoop will be available December, 1991.

The IsoLoop can actually exhibit gain over dipole at takeoff angles between 5 and 15 degrees and below half-wave above the ground.

• Easy to install. Tighten two nuts and the IsoLoop is mounted to your TV mast. Connect the coax cable from the transmitter to the antenna, connect the control cable to the LC-2. No ground radials, antenna tuners, rotators, towers, construction permits or heavy labor needed.

• Compact. Measuring only 43 inches in diameter, the IsoLoop is the ideal "go anywhere" antenna. Use it in an attic, on a boat, on an RV, for field day, in a hotel room . . . the possibilities are endless.!



• Breakthrough design. The feedline is properly decoupled from the antenna without need for groundplane radials. This means computer noise picked up on the outside shield of the feedline does not spill over to the inside surface, covering up otherwise readable signals in your receiver.

• High Q—Narrow Bandwidth. Attenuates out-of-band signals and harmonics. Keeps television interference to a minimum. IsoLoop can be mounted vertically to null out a local interfering signal.

• All Welded Construction. No mechanical joints means maximum efficiency even after years of exposure to weather elements.

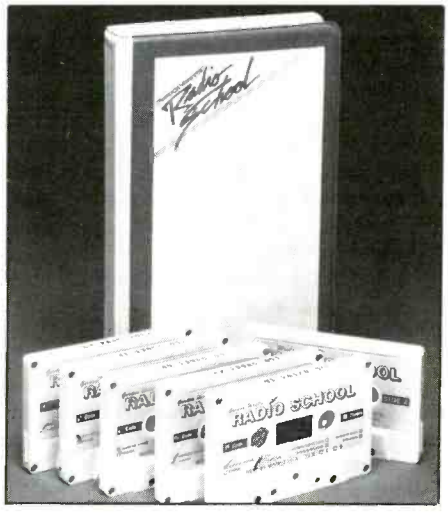
• Continuous Tuning. Covers all frequencies from 10 to 30 MHz. Tuning is accomplished with the included LC-2 Loop Controller. An optional frequency indicator is available for easy tuning. No external hard-to-use antenna tuner is necessary.

For more information, contact your nearest AEA dealer.

Radio Operating Cassettes

Gordon West, WB6NOA, of Radio School now offers stereo audio cassettes to aid in the use of selected pieces of amateur radio equipment.

The cassettes make it easy to program the tricky new ham sets and also offers some modifications which will make the most of your radio.



Alinco, Kenwood, ICOM, and Yaesu have expressed interest in West's audio cassettes, and we anticipate them being a part of their product lines soon.

What's more, "On The Air" audio cassettes allow you to hear all that is happening while you are programming your set, helping you to polish your operating techniques.

Look for these cassettes at most hamfests.

For more information, write Gordon West Radio School, 2414 College Drive, Costa Mesa, CA 92626.

BY GORDON WEST, WB6NOA

Using Portable Frequency Counters

The portable LCD frequency counter may be used in a variety of ways by emergency communications personnel. Some portable counter applications are logical, such as double-checking that all of your 2-way radio equipment is on frequency. Other applications may not necessarily be found in the instruction book like tracking down an emergency locating transmitter (ELT) from an aircraft that plowed into a snow-covered mountain.

The portable frequency counter for outside use should feature an LCD display. The LCD display allows for viewing in the sunlight and may be back-lit for nighttime use. Attempting to use a red LED counter out in the open will only lead to frustration, and the possibility of misreading the difficult-to-see digits in the open. Inside, the red LED portable or fixed counter is fine for bench work. But outside, only the LCD counter should be chosen.

The portable frequency counter should have rechargeable nickel cadmium batteries. A fully charged nickel cadmium pack should be able to sustain a turned-on frequency counter for at least 3 hours. If the counter does not contain a temperature compensated TXO circuit, it will probably run for at least 6 continuous hours.

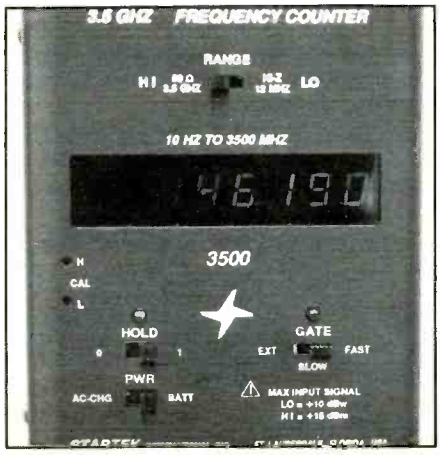
A good portable frequency counter will go up as high as 1,000 MHz with 10 mV sensitivity. This allows you to count-out frequencies all the way up into the cellular telephone band.

One time I was using a frequency counter to home in on a cellular telephone handset, and it worked terrific. Make sure you have 1,000 MHz capabilities.

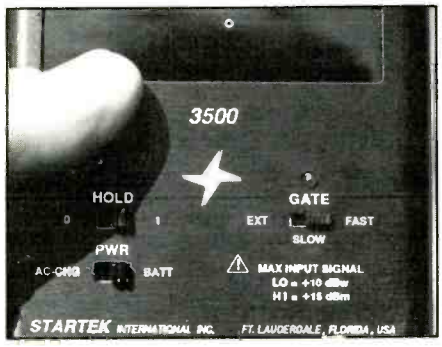
Your portable frequency counter is a sensitive all-band receiver. Any signal that is stronger than 100 mV will instantly read out on the LCD display. In the "quick count" mode, the frequency read out can be resolved down to 100 Hz, which is 1/10th of a kilocycle. That's plenty accurate enough for most applications. However, if you're calibrating a 2-way radio on the test bench, go to the every second count rate, and resolve your frequency down to 10 Hz.

The sensitivity of the counter is also an important factor when choosing the right equipment for your emergency communications system. You will want a counter with high sensitivity to give you the capability of tracking down and locating nearby radio transmitters.

Here's what you might expect for range on a high sensitivity counter: ELT, 121.5 MHz, 100 feet away; mobile cellular telephone, 800 MHz, 30 feet away; UHF handheld transceiver, 50 feet away; VHF 1-watt transceiver, 90 feet away; 5-watt CB transceiver, 35 feet away; Ham radio 2-meter transceiver, mobile unit, 175 feet away; and cordless telephone, 3 feet away.



The LED readout counter is best used inside or in the shade.



The hold button locks the counted frequency into the display.

These figures on count-range are found by using a simple telescopic whip with counter. This allows you to "sniff around" and home in on a signal until you find a threshold where the counter begins to register. The closer you get, the more you can lower your counter's telescopic whip. When you're within a foot of the signal source, the whip is completely collapsed.

The better frequency counter will also feature an LCD signal strength bar graph. This is handy if you tie your counter into a portable beam antenna for signal tracking. A 4-element VHF beam would make it possible for you to spot a distress signal on 156.8 MHz up to 300 feet away. I have used the counter

Counting a cordless phone—both antennas must be within a few inches of the reading.

and the beam to help track down stuck transmitters on the VHF marine band.

The portable frequency counter starts in where conventional direction-finding techniques leave off. You can use a regular radio direction-finder to get close to a signal source, but when you get right on top of the source, the ADF or RDF reaches saturation. This is because your unit is trying to tune in microvolts of signals in a millivolt signal area.

Now take out your counter, and use the bar graph as an indication of how close you are getting to the signal source. The closer you get, the more you need to diminish your antenna system. The counter should be able to lead you right up to the transmitter.

I once used a counter to "sniff out" a ham radio "repeater chunker" that was constantly locking up the local repeater system. The "repeater chunker" was a sophisticated jamming device that would send out a pulse of signal 100 milliseconds long, which was just enough time to cycle the repeater's COR circuitry. This device was nowhere to be found around the repeater site. I came in with an Optoelectronics Model 3000 counter, and sniffed it out within 10 minutes. Some enterprising jammer hid this device in a hollowed-out log 50 feet away from the repeater's input antenna system. A concealed solar cell would have kept this thing running for years!

The backlight and beeper option may be retro-fitted to most Optoelectronics counters for under $100.

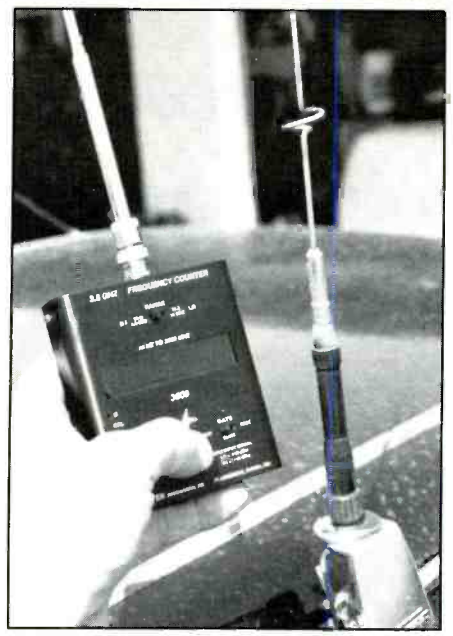
The LCD signal strength bar graph is necessary to track down local signal sources.

Another handy feature that may be added to your present Optoelectronics Model 3000 counter is option BLB-30, beep and lamp modification. The lamp modification is straight-forward; the factory installs tiny, (the size of a grain of wheat), bulbs behind the big LCD display to give you nighttime viewing. Sure beats holding a flashlight in your mouth so you can read the display!

The beep option is nice, as soon as something transmits near your counter, it sounds. This way you don't need to be looking at your counter to detect a nearby signal. If you're real quick, hit the hold button, and whatever was transmitting is now locked onto your counter's display.

Using a frequency counter to determine who is transmitting on what frequencies is important for emergency communication coordinators. Let's say you are called into a local mountain rescue, and the other rescue squad is using radio equipment similar to yours, but on a different frequency. The counter will tell you exactly what frequency they are transmitting on. This might allow you to better coordinate your monitoring capabilities, and in an emergency, a programmable transceiver might be able to come up on the other frequency, too. No, the counter can't tell you what the CTCSS tone is, but with a little trial and error, you can ultimately get into the system. And, during joint search and rescue activities, all stations might switch off of normal CTCSS decode.

The LCD frequency counter requires little maintenance. Since they use nickel cadmium rechargeable batteries, you will need to regularly cycle the counter up to a full charge, run it to exercise the batteries, and then recharge it regularly every few weeks. Keep in mind that rechargeable batteries normally self-discharge approximately 10 percent per week.



The counter can quickly readout a transmitters frequency.

In extremely cold weather, the frequency counter should be kept in someone's pocket, especially when being used for search and rescue applications. This keeps the counter warm. If the counter is allowed to freeze, the LCD readouts begin to turn black (temporarily), the batteries begin to malfunction, and you'll need to literally thaw out the counter before you can get it back into operation. If you have plenty of spare battery packs, leaving the optional light turned on behind the LCD display will help keep the insides warm.

Frequency counter manufacturers usually sell their equipment direct. Many times they will offer quantity purchase prices for a multiple buy-in. They may also extend a courtesy discount to search and rescue organizations.

For more information on quality portable LED and LCD frequency counters, write the following companies on your search and rescue communications letterhead for pricing and availabilty: Optoelectronics, 5821 N.E. 14th Avenue, Fort Lauderdale, FL 33334, 305/771-2050; Startek, 398 N.E. 38th Street, Fort Lauderdale, FL 33334, 305/561-2211; Ramsey, 2575 Baird Road, Penfield, NY 14526, 716/586-3950; MFJ, PO Box 494, Mississippi State, MI 39762, 601/323-5869.

So consider the portable frequency counter as an essential piece of emergency communications equipment. Whether you purchase the counter with the optional precision TCXO, or simply buy an inexpensive LCD counter for outside use, or a very inexpensive LED counter for a handy piece of test equipment, the agile and portable frequency counter will serve your emergency communications system well. ■

TELEPHONES ENROUTE

BY TOM KNEITEL, K2AES

WHAT'S HAPPENING WITH CELLULAR, MARINE & MOBILE PHONES

We are always pleased to get clever and useful tips and then share them with everybody. A letter from R. Dan Park, Houston, Texas, contained one of those gems.

Dan relates that he recently replaced his digital pager and car phone with an NEC P-200 portable cellular. The reasons for doing this were, first, that the monthly contract amount for the portable alone would be less than that for the pager and car phone combined. So, he changed companies and upgraded his contract.

The second reason was that he has an answering machine at home with a message transfer feature. Since nobody knows his cellular number, every call he receives is a "page" that lets him know he's received a message at home. He doesn't answer these calls (he calls the machine back via landline), so there are no airtime charges for them.

A third reason is that if a landline isn't immediately available when he needs one, he still has the option to use the cellular to place the call.

Lastly, the *NationLink Network* service used by his new cellular company provides him, in effect, with a pager that receives his pages from the answering machine from across the nation, and all free of charge because he doesn't answer the calls on his cellular. It's all legal, and it works!

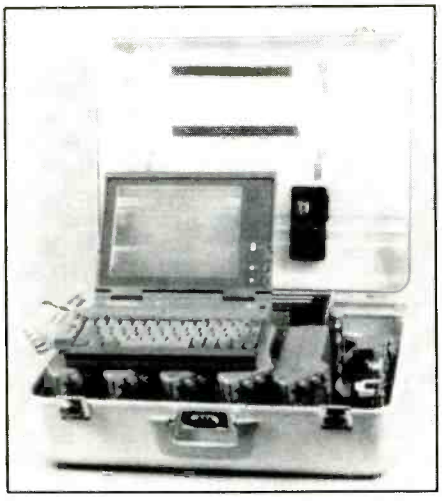
Junk Cellular Calls?

In my area, and maybe yours too, the practice continues of boiler room pitchmen attempting to switch cellular customers from one service supplier to another. I guess they get a bounty for each subscriber they can pressure into leaving one company and shifting over to another.

As if it weren't annoying enough to be on the receiving end of one of these high-pressure sales pitches, they make their calls to your cellular phone so that you get stuck for the cost on your air time charges. Quite a few inquiries have arrived asking how these headhunters were able to get their cellular numbers. It's simple.

Cellular phones are not assigned numbers from regular landline number exchanges. Each service provider assigns numbers to its subscribers from within special exchange prefixes designated for that purpose. Those exchange prefixes are known by the cellular service providers in each area. All the headhunter need do is begin calling all of the numbers, in numeric sequence, within the exchanges designated for use by the company whose subscribers are being raided. Still, receiving the calls has gotten many cellular users concerned that somehow information regarding their number or account was provided to these sharks, many of whom strongly imply that this is the case.

The ROLM telecommunications device for the hearing/speech impaired shown during a demo by two ROLM engineers. The typewriter-like terminal sends/receives written messages.



Portable configuration of the Melpar Celltap monitoring system.

The cellular service supplier I use sent out a notice reassuring their subscribers that they have not provided anyone with information about customer phone numbers or accounts. Furthermore, they caution their customers to be wary of fraudulent claims made by these callers. They also assure customers that they will credit their accounts for all costs of such incoming calls.

Cellular Monitoring Device

At the National Technical Investigator's Association show in Washington, DC, there was a device of interest called *Celltap*. This is a professional law enforcement surveillance device made by E-Systems Melpar Division.

Celltap is a compact dialed number recorder and monitoring system that may be used at a fixed location or as a battery-powered portable. It is intended for monitoring and recording cellular telephone signaling activity and audio. The activity monitoring includes off-hook, on-hook, and dialed numbers. Using optional accessories, the device can be made to monitor multiple cellular channels simultaneously.

It looks like the basic system is comprised of four AOR scanners and a laptop computer. The software supplied provides user-friendly operation with menu and function key driven commands. The data collected by the system is stored in the PC clone's hard disk drive, along with the time and date in a format appropriate for standard database programs. The standard format allows data to be sorted and analyzed, and then, using the resulting data, provides the means for an operator-generated report.

The compact size of the system allows a number of packaging options. For example, a two-channel system that includes a notebook style PC and microcassette recorders fits in a standard 5-inch briefcase, while a 16-channel system occupies 17.5-inches of rack space.

Of course, monitoring by a law enforcement agency may be accomplished by placing a tap at a cellular switching office. One advantage of the *Celltap* device is that it has the ability for mobile monitoring. It remains to be seen what kind of restrictions, such as court orders, might come into play in the use of a system such as this and who might be allowed to purchase the system.

Towards More Versatile Comms

IBM's notebook style computer has been married to the Motorola RPM-400 packet radio modem for the purpose of allowing portable access to mainframe computers. The units are installed in a carrying case and marketed as a package called the *PCradio*.

The modem operates at up to 4800 bps, and at 2400 bps for landline phone systems. It can also send/receive FAX. Using a telephone handset, it can be used as a regular cellular.

The ROLM Company's voice messaging application for hearing and/or speech impaired or disabled people is now in use at TV station WGBH, Boston (PBS). The ROLM innovation provides telephone (landline, or can be used through a cellular) access *PhoneMail* services at any hour of the day or night. The system is compatible with all existing

TDD (Telephone Devices for the Deaf) terminals.

Currently, when a call comes in, operators need to be available to work the terminals at the receiving end, and place the telephone handset on the TDD acoustic coupler to answer the phone call. Callers receive the call by having it printed or scrolled across an electronic display; it can optionally be printed out in braille for sight-impaired people.

If an operator isn't available, the call goes unanswered. With the new ROLM system, a user can now call a TDD number and either communicate directly with the operator by exchanging typed messages, or, if no operator is available, have the call answered by ROLM's *PhoneMail* system that is configured for TDD use.

ROLM is located at P.O. Box 5017, Norwalk, CT 06856-5017.

The FCC advises that there are now 122 different companies with applications filed to experiment in the Personal Communications Services (PCS). Some companies are interested in testing on only one band, although some would like to run tests on several bands. Of the applications on file, 95 are for the 800 to 900 MHz band, 84 are for the 2 GHz band, and 48 are for other frequency bands.

New Hardware

Two compact cellulars, entitled the 800 Series, that feature a transferable and mobile phone configuration, have been introduced by Panasonic Communications & Systems Company (PCSC).

The TF800 transferable phone and CM800 mobile phone have the capability to be converted to soft-pack transportable phones ("bag phones"). In addition, the TF800 can also be converted into a car phone.

The TF800 can go from car-to-car, and features hands-free operation. It also offers an optional battery providing 70 minutes of talk time at 3 watt, or 170 minutes at lower power. It will operate in standby mode for 20 hours. An optional travel charger rejuvenates the battery in eight hours.

The CM800 converts into a bag phone when combined with the EB-830 conversion kit, which includes a carrying bag, a battery, cigarette lighter cable, battery cable, antenna, travel charger, and TF case. The unit has a call-in-progress function that allows for continuous use even after the vehicle's ignition has been turned off.

Both units offer many easy-to-use features, including Any Key Answer, Automatic Redial, 100 numeric memory locations, dual NAM's, scratch pad dialing, horn alert, radio mute, last number memory, two-level electronic lock, etc.

The MSRP of the TF800 is about $500, with the MSRP being about $500. For more information, contact Panasonic Communications & Systems Company, Secaucus, NJ 07094.

Panasonic TF800 tranferable cellular.

Panasonic CM800 mobile cellular.

Overseas Notes

Nokia received an order from Deutsche Bundespost Telekom to provide wireless local loop telecomm networks to the cities of Berlin, Leipzig, Dresden, Chemnitz, and Zwickau in eastern areas of Germany. The $70-million order will help to rapidly increase the number of telephone connections in the New Bundeslander. Previously, many subscribers in that area had to wait several years for telephone connections. The system will be operational this year.

Nokia is also working on expansions of existing networks in Thailand and Turkey.

Motorola, Inc.'s Radio-Telephone Systems Group announced that Movicom initiated the commercial service of a new cellular system in Montevideo, Uruguay. Movicom is the name that Abiatar (a consortium consisting primarily of Bellsouth Corporation and Motorola, Inc.) uses to market cellular services and products in Uruguay.

The 800 MHz cellular system is the first to become operational in Uruguay, and by extends into the resort center of Maldonado/Punta del Este, with roaming to Buenos Aires, Argentina. Subscribers can place/receive calls anywhere in both nations' cellular service areas.

Millicom International Cellular received a national cellular telephone license in El Salvador. The 800 MHz system will initially serve San Salvador, Santa Tecla, Comalapa, plus the tourist zone of Costa del Sol. Operations are scheduled to begin around now. The three-cell start-up system will have a capacity of 2,000 subscribers and will be expanded on a modular basis.

A subsidiary of Millicom entered into a $50-million long-term financial funding agreement with International Finance Company for cellular service in Mexico. This will fund Celular De Telefonica, S.A. de C.V.'s new system to be built in the Monterey region of Mexico. This region consists of the city of Monterey, as well as Ciudad Victoria, Nuevo Laredo, Matamoros, Reynosa, Saltillo, and Tampico/Madero.

We look forward to reader comments, questions, and ideas. Also to receiving information from cellular, paging, and air/ground phone, and marine telephone service providers as well as manufacturers of cellular, paging, PCS, maritime communications products.

YOU SHOULD KNOW

HARRY HELMS, AA6FW

INTERESTING THOUGHTS AND IDEAS FOR ENJOYING THE HOBBY

Understanding Synchronous Detection And Passband Tuning

If you're like me, you probably spend lot of time each month longingly examining the ads for new receivers that appear each month in *POP'COMM*. I've been in the SWL'ing game since the 1960's, and I can't recall when there's ever been such a selection of hot performers available from different manufacturers. But I've gotten a couple of letters recently that indicate some of you might be wondering about two relatively new features—*passband tuning* and *synchronous detection*—that are being designed into many of the better communications receivers available today. These features are really helpful in chasing rare DX once you understand how they work and how to use them!

Move That I.F.!

Passband tuning is called *I.F. shift* on some receivers. "I.F." stands for *intermediate frequency*, and I.F. shift is actually a better description of what a "passband tuning" control does.

All contemporary shortwave receivers are of the superheterodyne type. In a superheterodyne receiver, all incoming signals are converted to one or more fixed intermediate frequencies. The most common intermediate frequency is 455 kHz, with 8 MHz and 10.7 MHz being two other common ones. Regardless of which frequency your receivers dial is tuned to—830 kHz, 9650 kHz, or 15250 kHz—the signal is converted inside your receiver to 455 kHz and any other intermediate frequencies your receive might use. The reason for intermediate frequencies is that such functions as selectivity and signal amplication can be performed better and more easily at a single fixed frequency than over a wide range of frequencies.

In most receivers, the bulk of a receiver's selectivity is performed at the 455 kHz intermediate frequency. This selectivity is determined by the tuned circuits operating at 455 kHz along with any crystal or mechanical filters having a center frequency of 455 kHz. (In some receivers, crystal or mechanical filters may have other center frequencies.) The selectivity curve at 455 kHz will normally be a bell-shaped curve as shown in Figure 1. The selectivity curve is like a window. Anything within the curve you'll hear; anything outside you won't. The center point of the curve is normally found at the frequency your receiver is tuned to. In Figure 1, 9650 kHz is where the receiver is tuned to and where the center point of the curve lies.

Now look at part A of Figure 2. Our hypothetical receiver is still tuned to 9650 kHz, but there's now an interfering signal on 9645 kHz. Since it's within the selectivity curve of the receiver, it will cause some interference to the signal we want on 9650 kHz. What to do? Well, suppose we could slide the selectivity curve "up" so that the 9645 kHz signal would be outside the curve, as shown in part B. In this case, 9650 kHz signal we want would be free of interference from 9650 kHz. This ability to move the receiver's selectivity curve up or down without affecting the frequency the receiver is tuned to is what passband tuning is all about.

Besides its interference reducing abilities, passband tuning can also improve the audio you hear. For example, let's suppose the selectivity curve shown in Figure 1 is 6 kHz wide (that is, signals are received 3 kHz above and below 9650 kHz center position). Since the upper limit of audio frequencies you can hear is a function of the signal bandwidth, this means the audio you hear will rapidly drop off above 3 kHz. It might be that the station is broadcasting audio frequencies up to 5 kHz, in which case the total bandwidth of the signal would be 10 kHz. But since the intermediate frequency selectivity is only 6 kHz, the extra audio frequencies and resulting extra radio frequencies are lost. On the other hand, if we have passband tuning on our receiver, then we could shift the passband up to cover the entire 5 kHz upper sideband. All we need to hear this AM signal would be the carrier at 9650 kHz and the upper sideband; the lower sideband is redundant and we can enjoy satisfactory reception without it.

Locking On The Carrier

The idea of synchronous detection isn't new. The theory behind it first appeared in *Electronics* magazine back in 1952 in an article by O.G. Villard. In this article, it was established that the detector stage of an AM receiver is "controlled" by the strongest signal present in the receiver's selectivity bandwidth, and that the strongest signal should be the carrier of the AM signal being received. For best results, the carrier should be at least 15 to 20 dB stronger than the sidebands of the AM signal or any other signal present in the received bandwidth. If the carrier isn't sufficiently stronger than the sidebands or other signals, the proper demodulation can't take place and you can't get intelligible audio from the signal.

Why would the carrier strength vary? There is a phenomenon known as *selective fading*, which is caused by the fact that the propagation of a signal can vary greatly within only a kHz or two. It's common for the carrier of an AM signal to fade while one or both of the sidebands fade less or not at all. If you've heard an AM signal suddenly fade and become distorted (even to the where it sounds like a SSB signal), then you've heard selective fading in action. If you tune shortwave at all, you've run into a lot of selective fading.

Villard suggested using a once-common receiver accessory known as a "Q-multiplier" to boost the level of the AM signal's carrier relative to the sideband and other signals. Later, SWL's started using a technique I've described in an earlier column, exalted carrier sideband (ECSS), to achieve similar results. This technique involves tuning AM signals using the LSB or USB reception modes of your receiver, and tuning so that the signal from your receiver's BFO is exactly matched ("zero beat") with that of the received AM signal. The receiver's BFO signal is the one that controls the detector, and remains constant regardless of how the original carrier fades.

However, neither of these approaches is a fully satisfactory solution because of the drift inherent in any receiver. In a tube receiver, you might be lucky to experience a full second of ECSS reception before you have to retune the receiver for zero beat due to drift. Solid state receivers are better in this regard, but they will eventually need retuning as well. Moreover, tuning for ECSS reception when

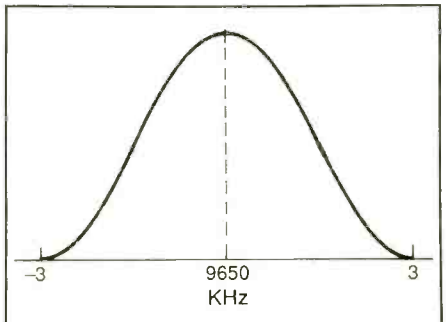


Figure 1

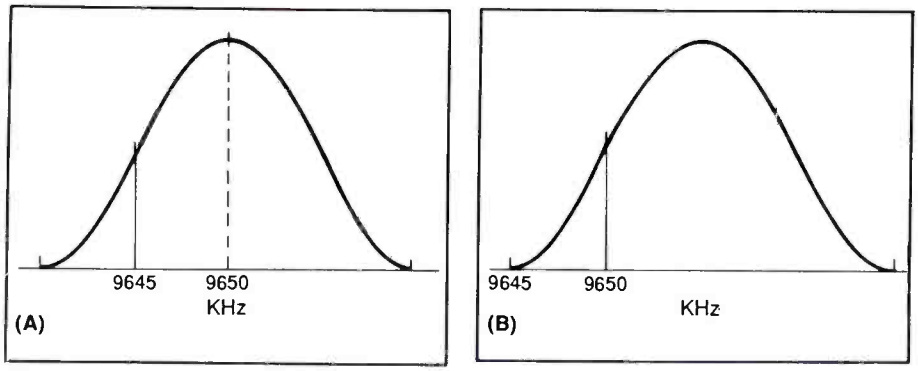


Figure 2

a signal is weak or heavily fading can be difficult.

Today's synchronous tuning circuits were made possible for the introduction of phase-locked loop (PLL) integrated circuits in the late 1970's. A PLL monitors two frequencies (the carrier frequency and receiver BFO frequency in this case) and tracks when they differ. When used in a synchronous detector circuit, the PLL notes whenever the receiver BFO frequency differs from the carrier frequency. If the receiver BFO frequency drifts away from the carrier frequency, the PLL generates a correcting voltage to "steer" the BFO back onto the carrier frequency. When a PLL tracks the BFO frequency in this way, it is said to be *locked* on the carrier frequency.

A synchronous detector is simple to use. Just tune in the station you want to hear, switch on the synchronous detector, wait a few seconds for the PLL to lock on the received carrier, and then sit back and listen. (Some receivers also let you tune for either the upper or lower sideband if you wish.) The result should be greatly reduced distortion due to fading as long as some carrier from the original AM signal is present; if the original carrier fades, the synchronous detector has nothing to lock onto and cannot do its job.

How effective are synchronous detectors? At the risk of sounding like a real weasel, I have to say it depends. I've used two different receivers with synchronous detectors, and their effectiveness varies all over the place. On some signals, I've noticed no difference whatsoever. On other signals—including some weak ones right at the noise level—the synchronous detector has been the difference between readable audio and a signal that is "there" but not copyable.

Using Them Together

Many premium communications receivers include both passband tuning and synchronous detection circuits. Used together, these provide some terrific reception options.

Let's suppose a signal you want to receive is in heavy interference and subject to some heavy fading. You can use a narrow receiver selectivity bandwidth than normal for AM, and use the passband tuning to tune for the carrier and sideband (upper or lower) that has the least interference. The synchronous detector can then be switched in to lock on the carrier and reduce fading. The result is a signal that would otherwise be unreadable is now listenable.

Another condition might be with stronger signals. In this case, you could switch in the synchronous detector to minimize any fading that might be present and then use the passband tuning until you find the point where you get the best quality.

Strictly speaking, passband tuning and synchronous detection aren't essential for most SWL'ing. However, after having used a receiver equipped with both for a few weeks prior to writing this column, I've come across some situations where the ability to use both circuits was the deciding factor that made it possible to hear certain signals under difficult conditions. If you're in the market for a new communications receiver, I suggest that you give careful consideration to receivers with these circuits! ■

POP'COMM'S World Band Tuning Tips

April – 1992

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

Freq.	Station/Country	UTC	Notes
2410	R. Enga, Papua New Guinea	1200	
2485	VL8K, Katherine, Australia	1045	
3200	Trans World Radio, Swaziland	0300	
3215	Radio Oranje, South Africa	0300	Afrikaans
3235	R. West New Britain, P New Guinea	1130	Pidgin
3235	R. Clube Marila, Brazil	0200	PP
3240	Trans World Radio, Swaziland	0345	close
3250	R. Luz y Vida, Honduras	0230	SS
3260	R. Madang, Papua New Guinea	1030	
3270	R. Namibia, Namibia	0430	EE
3280	La Voz del Napo, Ecuador	0300	SS
3295	INBS, Iceland	0400	Icelandic
3315	R. Manaus, Papua New Guinea	1200	
3320	R. Orion, South Africa	0245	
3325	R. Maya, Guatemala	1030	SS
3365	R. Cult. Araraquara, Brazil	0100	PP
3377	R. Nacional, Angola	0430	PP
3380	MBC, Malawi	0400	
3905	R. New Ireland, P. New Guinea	1100	SS
3925	R. Tanpa, Japan	1130	JJ
3940	Hubei PBS, China	1200	CC
3970	CRTV, Buea, Cameroon	0500	
4238	R. Inca, Peru	0400	SS
4485	Kamchatka R, CIS	1300	RR
4600	R. Perla del Acre, Bolivia	0230	SS
4745v	R. Popular, Ecuador	0130	SS
4760	R. Frontera, Venezuela	1030	SS
4770	R. Nigeria, Kaduna	0500	
4795	R. Douala, Cameroon	0430	FF
4800	R. Popular, Ecuador	0200	SS
4809	Rdf. Libertad, Bolivia	1030	SS
4810	R. San Martin, Peru	0930	SS
4815	RTV Burkina, Burkina Faso	0600	FF
4815	Rdf. Londrina, Brazil	0130	PP
4830	R. Tachira, Venezuela	0330	SS
4835	R. Tezulutlan, Guatemala	0130	SS
4845	RTVM, Mauritania	2330	FF
4850	CRTV, Cameroon	0430	FF/EE
4855	R. Centenario, Bolivia	0000	SS
4865	La Voz del Cinaruco, Colombia	0300	SS
4865	Gansu PBS, China	1130	CC
4870	ORTB, Benin	0457	sign on, FF
4875	La Cruz del Sur, Bolivia	0030	SS
4885	Ondas del Meta, Colombia	1000	SS
4890	ORTS, Senegal	2345	FF
4895	R. Brazil Central	0030	PP
4900	La Voz de Saquisili, Ecuador	0230	SS
4904.5	R. National, Chad	0427	sign on, FF
4910	Radio One, Zambia	0300	
4918	R. Relogio Federal, Brazil	2330	ex-4905
4934	R. Tropical, Peru	1000	SS
4939	R. Continental, Venezuela	1000	SS
4960	R. Juan XXIII, Bolivia	0000	SS
4965	R. Santa Fe, Colombia	0400	SS
4980	Ecos del Torbes, Venezuela	0200	SS
5005	R. Libertad, Bolivia	1000	SS
5011	Escuelas R/fonicas, Ecuador	0225	sign off, SS
5015	R. Pioneira, Brazil	0230	PP
5020	ORTN, Niger	0500	FF
5025	ORTB, Benin	0600	FF
5030	R. Catolica, Ecuador	0200	SS
5035	R. Aparecida, Brazil	0030	PP
5035	RTVC, Central African Rep.	0428	sign on, FF
5040	R. Ala, Russia	0330	s/on
5044	R. Rebelde, Cuba	0000	irr. SS
5062	R. Progresso, Ecuador	1000	SS
5260	R. Alma Ata, Kazakh	2230	RR
5275	WYFR, Florida	1500	via Taiwan
5290	Krasnoyarsk R., Russia	2300	RR
5935	R. Riga Int'l, Latvia	0700	
5955	R. Gazeta, Brazil	0900	PP
5975	BBC	0030	via Antigua
5995	VOA via Germany	0600	
6005	CICQ, Canada	0600	
6006	R. Reloj, Costa Rica	0700	SS
6010	R. Mil, Mexico	0300	SS
6010	R. Bahrain, Bahrain	0300	AA
6010	R. America, Peru	0145	SS
6015	R. Austria Int'l	0530	via Canada
6025	R. Amanacer, Dominican Rep.	0230	SS
6040	Deutsche Welle, Germany	0130	via Antigua
6050	R. Nigeria, Ibadan	2306	sign off
6050	Caracol, Colombia	0100	SS
6050	R. Nigeria, Ibadan	2230	
6060	Voice of America via Germany	0500	
6095	Radio Canada Int'l	1330	via Korea
6105	Su Panera, Mexico	1130	SS
6115	V of the Strait, China	1000	CC
6120	R. Globo, Brazil	0900	PP
6130	R. Portugal	0700	sign off
6135	R. Aparecida, Brazil	0930	PP
6135	Swiss Radio Int'l	0230	
6165	Swiss Radio Int'l	0630	
6170	La Voz de la Selva, Colombia	0958	s/on, SS
6180	R. Nac. Amazonia, Brazil	0900	PP
6190	Sender Freis Berlin, Germany	0430	GG
6210	R. Juanjui, Peru	0030	SS
6299	Sani Radio, Honduras	0000	s/off, SS
6540	R. Baghdad, Iraq	0400	AA
6900	Turkish Meterological R.	0430	TT
6910	Africa 2000, Eq. Guinea	2100	SS
7100	A Voz do Galo Negro (clandestine)	0045	PP
7140	R. Australia	1030	
7145	R. Algiers, Algeria	2200	FF
7160	RT Malaysia, Sarawak	1300	CC
7190	Rep of Yemen Radio, Aden	0300	sign on, AA
7190	R. Africa, Eq. Guinea	2100	
7200	Somali Bc. Service, Somalia	0259	sign on
7203	R. Lubumbashi, Zaire	0430	FF
7205	Adventist World Radio, Italy	0530	
7215	R. Cote d'Ivoire, Iv. Coast	2100	FF
7235	Deutsche Welle, Germany	0400	AA via Mali
7240	Croatian Radio, Croatia	0300	
7250	Vatican Radio	0630	4 Voices Svc.
7270	R. Polonia, Poland	2330	
7275	ELBC, Liberia	0650	sign on
7315	Croatian Radio	0000	via WHRI
7345	R. Prague Int'l, Czechoslovakia	0100	
7375	R. for Peace Int'l, Costa Rica	0600	
7390	Deutsche Welle	1200	via Russia
7400	R. Kiev, Ukraine	0100	
7400	R. Ala, Russia	1300	RR
7475	RTV Tunisienne, Tunisia	0400	AA
7490	V of Broad Masses of Eritrea	0325	s/on
7500	R. Baghdad, Iraq	0400	AA
8638	VNG, Australia	1200	time sigs
9265	Icelandic Ntl Bc Svc	0730	EE
9325	Israel Radio	1330	home service
9395	V of Greece	1190	GG
9420	R. Europe Int'l, Italy	1000	II
9445	Voice of Turkey	2330	TT
9445	WCSN, Maine	0200	
9465	WMLK, Pennsylvania	0400	
9480	TWR, Monaco	0645	
9486	R. Tacna, Peru	0400	SS
9505	R. Yugoslavia	2230	to Europe
9520	R. Veritas Asia, Philippines	1200	
9535	TWR, Bonaire	0345	
9540	R. Tashkent, Uzbek	1200	
9540	R. Polonia, Poland	1500	German
9545	R. Tirana, Albania	0530	sign on
9546	LV de Veracruz, Mexico	1200	SS
9555	R. Portugal, Portugal	0200	PP
9560	RS Atlantika, Russia	0000	RR

Freq.	Station/Country	UTC	Notes
9564	R. Universo, Brazil	0100	PP
9570	R. Romania Int'l	0300	SS
9570	R. Korea, S. Korea	1400	
9580	R. Tirana, Albania	0230	
9580	Africa No. One, Gabon	1900	FF
9590	R. Norway Int'l	1300	
9600	Vatican Radio	0300	
9615	R. Veritas Asia, Philippines	1500	CC
9625	CBC No. Quebec Service, Canada	2100	
9635	R. Portugal	2200	PP
9640	R. Pyongyang, N. Korea	1500	EE
9655	Trans World R., Swaziland	0330	s/off
9660	KNLS, Alaska	1500	sign on
9660	R. Rumbos, Venezuela	1100	SS
9665	R. Marumbi, Brazil	2300	PP
9690	R. Beijing, China	0330	via Spain
9695	R. Sweden	0330	
9700	R. New Zealand Int'l	0830	
9700	R. New Zealand	1100	
9710	R. Centras, Lithuania	0600	(last Sat/mo)
9720	Sri Lanka Bc. Corp.	1230	
9725	Adventist World R., Costa Rica	1250	
9735	R. Nacional, Paraguay	0000	SS
9735	Cyprus Bc. Corp.	2230	wknds, Greek
9740	BBC via Singapore	1100	
9746	R. Bahrain	2000	AA QRM-HCJB
9750	R. Korea, S. Korea	1245	EE
9755	R. Monte Carlo Middle East	0400	via Canada
9765	V of Mediterranean, Malta	0600	
9765	V of Mediterranean, Malta	0630	
9800	R. Kiev, Ukraine	0100	
9815	KNLS, Alaska	0900	RR
9830	Croatian Radio	0600	
9870	R. Austria Int'l	2230	SS
9875	Spanish National Radio	1900	
9900	R. Cairo, Egypt	0300	AA
9905	BRT, Belgium	2100	
9910	All India Radio	0115	s/off
9942	La Voz del CID (clandestine)	1330	SS
9950	All India Radio	2200	
10058	V of Vietnam	2300	sign on, VV
11092	BSKSA, Saudi Arabia	0530	AA, feeder
11455	R. Kisangani, Zaire	0400	s/on, FF
11530	V of Hope, Lebanon	0500	AA
11590	V of the Strait, China	1100	CC
11595	RS Macedonias, Greece	0500	Greek
11600	R. Beijing, China	1330	
11620	All India Radio	2000	
11625	Vatican Radio	0250	sign on
11655	Deutsche Welle, Germany	1400	GG
11680	KGEI, California	0700	RR
11685	R. Prague Int'l, Czechoslovakia	0100	EE
11695	BRT, Belgium	0600	Dutch
11705	R. Sweden	0125	EE
11710	RAE, Argentina	0100	
11715	R. Beijing, China	0330	via Mali
11715	KNLS, Alaska	0800	sign on
11715	R. Korea, S. Korea	1030	via Canada
11720	R. Sofia, Bulgaria	0300	
11730	BBC	0300	via Seychelles
11730	Spanish National Radio	0500	SS
11735	R. Japan	2300	
11740	R. Portugal	1900	EE
11760	R. Tbilisi, Georgian SSR	2000	
11760	R. Vedo, Russia	1600	RR
11780	RN Amazonas, Brazil	2200	PP
11790	R. Kiev, Ukraine	0000	
11790	R. Vilnius, Lithuania	2300	
11795	UAE Radio, Dubai	1600	
11795	Cyprus Bc. Corp.	2213	s/on, weekends
11805	R. Globo, Brazil	2300	PP
11810	Deutsche Welle, Germany	0035	SS via Brazil
11815	Trans World R., Bonaire	1230	
11820	BBC, Hong Kong relay	1300	sign on
11823v	R. Nacional, Colombia	0130	SS
11840	R. Moscow	1430	via Cuba
11840	R. Japan	1500	
11865	R. Norway Int'l	0400	EE/NN
11865	R. Denmark	0430	DD, via Norway
11900	R. RSA, So. Africa	0400	
11920	R. RSA, South Africa	0445	
11925	R. Bandeirantes, Brazil	2330	PP
11938	V of People of Cambodia	1300	VV
11940	R. Romania Int'l	0200	
11940	R. Singapore	1100	
11950	R. Havana Cuba	0000	
11955	Voice of Turkey	0400	TT
11960	Sweden	1130	
11975	R. Tashkent, Uzbekistan	0100	EE
12000	R. Australia	1400	
12005	RTT, Tunisia	0430	AA
12040	R. Pamyat, Russia	1530	irr., RR
12070	R. Georgia, Georgia	1700	GG
12085	R. Damascus, Syria	2110	
12160	WWCR, Tennessee	2330	
13605	Capital Radio, via Voice of UAE	2230	
13610	R. Australia	1000	
13630	R. For Peace Int'l, Costa Rica	0200	
13635	Swiss Radio Int'l	2130	
13650	R. Pyongyang, N. Korea	2300	EE
13655	BRT, Belgium	2330	
13670	R. Canada Int'l	0245	
13675	UAE Radio, Dubai	2000	AA
13685	Swiss R. Int'l	0700	
13710	BRT, Belgium	2330	
13710	Voice of Europe, Italy	0500	24 hrs
13770	WCSN, Christian Science Monitor	2000	
15020	All India Radio	1300	
15060	BSKSA, Saudi Arabia	1700	AA
15084	VOIRI, Iran	0430	Farsi
15095	R. Damascus, Syria	2110	
15100	Kol Israel	2130	EE
15110	Spanish National Radio	2000	SS
15115	R. Pyongyang, N. Korea	0030	
15140	R. Havana Cuba	0300	
15170	R. Rep. of Armenia	2345	
15180	R. Vilnius, Lithuania	2300	
15185	R. Finland Int'l	2300	
15195	R. Japan	0500	
15200	France Int'l	0100	SS
15205	Voice of America	2300	
15208	R. Bangladesh	1230	
15215	V du Sahara Libre (clandestine)	2200	via R. Algiers
15230	R. RSA, S. Africa	0355	s/on
15260	VOIRI, Iran	0230	sign on
15265	RadioBras, Brazil	1800	EE
15320	UAE Radio, Dubai	2300	
15325	R. Japan	1500	via Fr. Guiana
15325	Spanish National Radio	2230	SS
15330	R. Sofia, Bulgaria	2330	
15345	Trans World Radio, Bonaire	1230	
15345	RTM, Morocco	1400	Berber
15350	R. Luxembourg	1900	EE
15365	R. RSA, S. Africa	0300	sign on
15425	R. Portugal	1500	
15430	R. Austria Int'l	1330	
15440	R. Finland Int'l	1459	s/on, Finnish
15460	R. France Int'l	1600	via Hungary
15474	R. Nac. Arcangel, Arg. Anarctica	2307	s/off, SS
15485	R. Vilnius, Lithuania	2300	
15510	R. Afghanistan	1730	GG, via USSR
15525	R. Kiev, Ukraine	0000	
15530	R. France Int'l, via Hungary	0630	FF
15550	V of Greece	1530	
15585	R. Moscow	2300	
15600	V of Free Iraq (clandestine)	1700	AA
15650	V of Greece	1235	EE
15750	R. Russia	1800	RR
17555	R. Beijing, China	0100	sign on
17595	RTV Morocaine, Morocco	1630	
17630	Africa No. One, Gabon	1500	FF
17665	R. Kiev, Ukraine	0000	
17710	R. Norway Int'l	1200	NN/EE
17725	Libyan Jamahiriya Bcsting	1900	AA
17730	R. Alma Ata, Kazakh	2130	
17740	R. Yugoslavia	1200	
17740	R. Sweden	1300	EE
17740	R. Jamahiriya, Libya	2200	AA
17745	RTV Algerienne, Algeria	2000	AA
17800	R. Audizione, Italy	1400	II, home svc.
17810	R. Japan	2330	
17840	R. RSA, S. Africa	1630	EE
17860	Qatar Bc Service	1300	AA
17865	Vatican Radio	1550	
17880	V of Turkey	2230	
17890	Spanish National Radio	1200	
17950	V of Free Iraq (clandestine)	2245	AA
21480	HCJB, Ecuador	1630	
21510	V of UAE, Un. Arab Emirates	0630	AA
21555	Qatar Bc Service	1330	AA
21580	R. Pilipinas, Philippines	0230	
21690	R. Moscow	0800	RR
21705	R. Norway Int'l	2200	NN

■

BY DON SCHIMMEL

COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

A new state-of-the-art communications and computer complex is now in operation for the US Coast Guard. The installation, located near Martinsburg, West Virginia was dedicated in November 1991. This Operations Systems Center houses the following computer systems:

Automated Mutual-Assistance Vessel Rescue System (AMVER), which tracks merchant vessels as an aid to maritime search and rescue.

Law Enforcement Information System, used in CG enforcement activities.

Marine Safety Information System, supports CG efforts in regulation of the maritime industry.

Computer Assisted Research Planning, an analytical tool used in the planning of search patterns.

Joint Maritime Information Element, which will support a consortium of 15 government agencies in anti-drug operations.

The computer center had been previously located on Governor's Island, New York plus some other offices across the country. Now all of the operations are co-located in one building.

Michael Willmer, MI wrote "In the Nov-91 issue DP, NC wondered about the mode of reception he heard on 4640 kHz. The mode was Reduced Carrier Sideband (RCS) and is used by the "Long Count" numbers broadcasts and the 5L group activity associated with the Mossad. You wrote about this mode in the article on numbers broadcasts in the 6-88 issue of *POP'COMM*. As pointed out, the transmission can be heard in AM, (not the chipmunk like sound associated with true USB monitored in the AM mode), but it is more audible in the USB mode. I've noticed much confusion about this mode with readers reporting either AM or USB modes when it was RCS transmissions. Hopefully this will help clear up the confusion.

The Nov-91 issue also contained a request by Simon Mason to identify the broadcast station on 7375 kHz heard in the background of a YL/GG 5F transmission at 0600 UTC. I am almost positive this is Radio For Peace International from Costa Rica which has been using that frequency for some time now."

From Patrick Griffith, CO we received details from when he monitored a Traffic Information Station (TIS) located in Ogallala, NE. Here is what Patrick had to say: "This station operates on 530 kHz and has the longest range of any TIS I have ever encountered. I recently travelled through the area and could hear it well on my car radio 20 miles either side of Ogallala on I-80!! I believe this may be due to the extremely flat terrain in that area. The transmitter is located at a vocational college on the east edge of the city and appears to be operated by the Chamber of Commerce of the City itself."

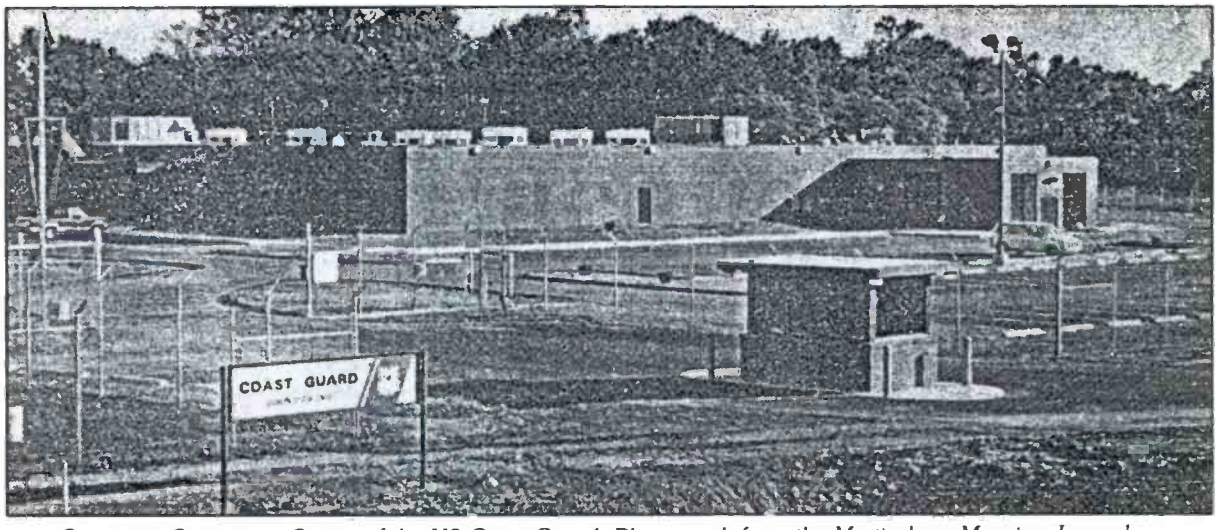
Some very interesting loggings were received from Henry Chinaski, Italy reflecting his coverage of Yugoslavian and Albanian Utility transmissions. Henry indicated that he was using a Racal RA17A British Naval PROCOMM receiver which dates to 1957. The unit has a built-in antenna tuner, and for an antenna he is using a 15 Mtr. Isotropic Dipole.

Esther Miller, CA explained she enjoyed "prowling for LW beacons." She added "I was worried that my 80-meter dipole wasn't quite cutting it as a receiving antenna, then I started identifying some of the beacons I'd been hearing from the listings in the column and decided I wasn't doing so badly after all.

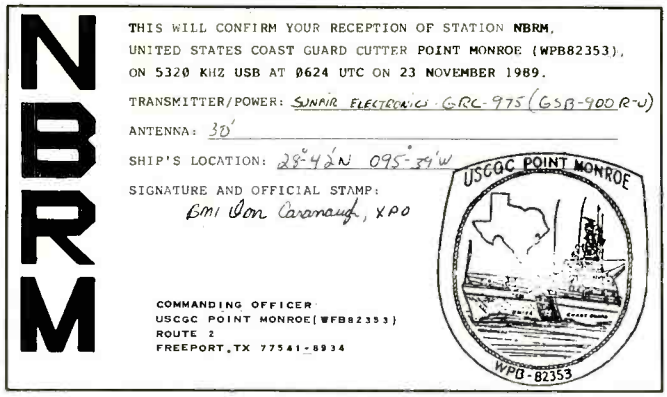
Traffic Information Station located in Ogallala, NE. Photo courtesy of Patrick Griffith, CO.

I'm still hoping to get a 'real' LW antenna up because I think I'm hearing something in Spanish on 240 kHz and maybe something on 200 kHz, and who knows what else is out there?"

Esther also had a query regarding a signal she heard. "At 0413 I heard what sounded like Donald Duck doing CW . . . no discernible tone, just incredible splatter from about 5845 kHz to 5900 kHz. It was 5-letter groups, but maybe cut numbers . . . lots of n's, w's,



Computer Operations Center of the US Coast Guard. Photograph from the Martinsburg Morning Journal.



NBRM

THIS WILL CONFIRM YOUR RECEPTION OF STATION **NBRM**, UNITED STATES COAST GUARD CUTTER **POINT MONROE (WPB82353)**, ON 5320 KHZ USB AT 0624 UTC ON 23 NOVEMBER 1989.

TRANSMITTER/POWER: SUNAIR ELECTRONICS GRC-975 (GSB-900 R-W)

ANTENNA: 30'

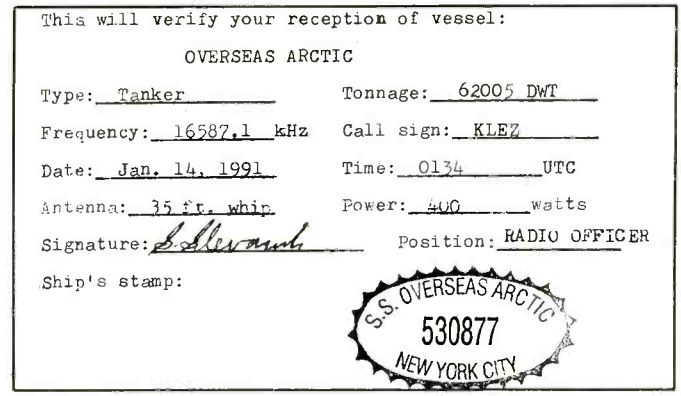
SHIP'S LOCATION: 28°42'N 095°59'W

SIGNATURE AND OFFICIAL STAMP:

BMI Don Caranagh, XPO

COMMANDING OFFICER
USCGC POINT MONROE (WFB82353)
ROUTE 2
FREEPORT, TX 77541-8934

Here is a PFC from Dave Sabo, CA



This will verify your reception of vessel:

OVERSEAS ARCTIC

Type: Tanker — Tonnage: 62005 DWT

Frequency: 16587.1 kHz — Call sign: KLEZ

Date: Jan. 14, 1991 — Time: 0134 UTC

Antenna: 35 ft. whip — Power: 400 watts

Signature: [signature] — Position: RADIO OFFICER

Ship's stamp:

Russ Hill, MI sent in this PFC

Abbreviations Used For Intercepts

AM	**Amplitude Modulation mode**
BC	**Broadcast**
CW	**Morse Code mode**
EE	**English**
GG	**German**
ID	**Identifier/ied/ication**
LSB	**Lower Sideband mode**
OM	**Male operator**
PP	**Portuguese**
SS	**Spanish**
tfc	**Traffic**
USB	**Upper Sideband mode**
w/	**with**
wx	**Weather report/forecast**
YL	**Female operator**
4F	**4-figure coded groups (i.e. 5739)**
5F	**5-figure coded groups**
5L	**5-letter coded groups (i.e. IGRXJ)**

r's, d's and g's. The transmission ended at 0421 with AR AR AR SK SK SK. Any ideas?"

My Refs show two 5L (cut nbr) frequencies in the vicinity of the above signal. One is 5789 kHz and the other is 5897.6 kHz.

Long-time Ham, SWL'er, and scanner freak, Art Harris, NY, says he is just getting back into Ute monitoring. "To prove that you don't need fancy equipment to hear interesting stuff, most of the intrcepts I have forwarded were made using a 30-year-old Lafayette HE-80 receiver. To get good frequency readouts I used a WWII surplus BC-221 frequency meter! Not the most convenient setup, but it works. I'm currently in the market for a more modern radio. I've been going through back issues of the column and picking up lots of good tips."

Roger Caldicott, MA says "I have been an avid reader of *POP'COMM* since 1987 and especially enjoy the articles and look forward to the loggings under 'Utility Communications'. Ever since I bought a Hallicrafters S-38E receiver on the day of the Kennedy inauguration, I have been logging new countries, utilities, military facilities and the like but was unable to forward these loggings due to the inability to record actual frequencies on a slide indicator receiver. All this has changed recently since I purchased a Radio Shack DX440 and hopefully the loggings are as accurate as possible.

Overall reception has been quite good using an 80' longwire however, after reading an article on antennas, I switched to my old roof mounted Archer VHF/UHF ground plane for reception from 150 kHz through 3.0 MHz and much to my surprise the entire spectrum up through 29 MHz has shown a significant improvement."

Ken Wirsing, MI says he is a Ham and is active in SWL'ing with his R-5000 receiver. He indicated that the column loggings are a big help to him. Ken mentioned he found the information on "crickets" described in the November column to be of interest and said he had logged two of them on 1722 kHz at 2356 and also heard one on 1730 kHz.

Ute Intercepts

60: WWVB, Fort Collins, CO w/standard time & frequency, at 1800. (Vaage, CA)

205: Beacon, COR, Corcoran, CA at 0530. (Miller, CA)

223: Beacon LPC, Lompoc, CA at 0535. (Miller, CA)

253: Beacon RHZ, Zephyrhills, FL at 0108. This is a newly commissioned NDB operated by the City of Zephyrhills at the Municipal Airport. (Shellenberg, FL)

254: Beacon SPK, Reno International, NV at 0845. (Vaage, CA)

278: Beacon BKV, Brooksville, FL at 0100. This is Hernando County Municipal Airport. (Shellenberg, FL)

288: Beacon SL, San Luis Obisbo, CA at 0541. (Miller, CA)

311: Beacon AFT, Ft. Smith, AR at 1215; Beacon U, Partridge Island, NB, Canada (ex-308 kHz) at 0832. (Crabill, VA) Beacon MB, Morro Bay West Breakwater LS, CA at 0545. (Miller, CA) Note: My refs shows this to be 310 kHz. (Ed.)

312: Beacon D, Cove Island LS, Ont., Canada at 0924. (Crabill, VA)

317: Beacon PB, Piedras Blancas LS, CA at 0547. (Miller, CA)

320: Beacon OM, Omaha, NE at 0930. (Crabill, VA)

322: Beacon C, Muskegon, MI at 0939. (Crabill, VA) Beacon S, Pt. Sur, CA at 0549. (Miller, CA)

323: Beacon OUK, Calhoun, GA at 0941. (Crabill, VA)

328: Beacon YTL, Big Trout Lake, Ont., Canada at 0944. (Crabill, VA)

344: Beacon SIT, Sitka, Biorka Island, AK at 1010. (Vaage, CA) Beacon FCH, Fresno, CA at 0553. (Miller, CA)

348: Beacon MNC, Shelton, WA at 1013. (Vaage, CA)

353: Beacon LLD, Lanai, HI at 0904. (Vaage, CA)

359: Beacon BO, Boise, ID at 0556. (Miller, CA)

367: Beacon MO, Modesto, CA at 0559. (Miller, CA)

368: Beacon SIR, Rawlings Municipal, WY at 0909. (Vaage, CA)

374: Beacon LV, Livermore, CA at 0601. (Miller, CA)

377: Beacon EHA, Elkhart, KS at 0920. (Vaage, CA)

385: Beacon MR, Monterey Peninsula, CA at 0941. (Vaage, CA)

388: Beacon AM, Tampa, FL. Serves as Outer Compass Locator Runway 36L, Tampa Int'l Airport. (Schellenberg, FL)

397: Beacon LLJ, Challis, ID at 0609. (Miller, CA)

400: Beacon HU, Sacramento, CA at 0609. (Miller, CA)

404: Beacon HEQ, Holyoke Municipal, CO at 0852. (Vaage, CA)

410: LALF2, MV E1 Delantero in CW at 1000 w/DF activities. (Boender, Netherlands)

411: Beacon RD, Redmond, OR at 0613. (Miller, CA)

413: Beacon OEG, Yuma Proving Grounds (Golden Eagles), AZ, at 0614. (Miller, CA)

414: Beacon SKX, Taos Municipal, MN at 1019. (Vaage, CA)

415: Beacon IEE, Platform Irene (Union Oil), Pacific Ocean at 0615. (Miller, CA)

425: UIYT, MV Vyshgorod in CW at 1115 wkg u/i stn w/ETA. (Boender, Netherlands)

432: CG Sta NMG, New Orleans, LA w/wx for Gulf area in CW at 2325. (Vaage, CA)

461: PCH, Scheveningen, Holland w/nav wrng (drifting containers) in CW at 0905. (Boender, Netherlands)

487: OXZ, Lyngby, Denmark in CW at 1005 w/tfc list. (Boender, Netherlands)

512: SXNM, MV Aghios Makarios in CW at 1015 w/msg to Elbe pilot; SWUZ, MV Atlantic Statesman clg PCH, Scheveningen, Holland in CW at 0835; P3WA, MV Mona Lisa in CW at 0840 clg OST, at 0842 w/test; 3FGU, MV Baltic Star clg GNF, Northforeland, England in CW at 0903. (Boender, Netherlands)

2670: USCG Boston w/High Seas wx. Daily at 0400; USCG NY at 1210 w/Buoy & Channel Light Advisories; USCGC Bear wkg USCG Group Woods Hole re Inspection of a cover to an explosive device detected in 400 fathoms. Woods Hole advised caution and to try obtain any markings on device. Hrd at 1208. (Caldicott, MA)

4740: EUN, u/i in CW at 2116 sending mkr VVV DE EUN H329789 UO. Off at 2120. (Chinaski, Italy)

5360.5: JADRAN wkg USHIZE in LSB at 1625 in Croatian. Talking about telegram to be delivered that net via RTTY. Hrd FSK tones then and off at 1635. (Chinaski, Italy)

5685: ISSGD (C-130 SAT a/c) in USB at 1440 wkg SAR Center in Martina Franca (Southern Italy) during rescue ops in Southern Adriatic sea east of Tremiti Islands. A Fishing vessel was sunk by a cargo ship. Three sailors missing. At scene were 2 Navy ships, CG vessels, SAR Helo, & number of private yachts. Later 2 sailors rescued. Patrols conducted till sunset. This is Primary SAR freq in Italy; Secondary is 6737 kHz. (Chinaski, Italy)

5696: USCG rescue helo to Honolulu Comm Center re transfer of 5 POB to hospital. Reception quite faint as it was 1/2 hour after East Coast sunrise; USCG helo 1471 kg ComSta Boston w/10 POB being transferred to OTIS AFB, Cape Cod from No Man's land. This took place between outer winds of hurricane and bad sea storm. Hrd at 2058. (Caldicott, MA)

5887: This voice net is probably the National Crisis Committee in Croatia. Net Controls was EUROPA, changing to EUROPA 1 or EUROPA 724 as different officers spoke in the mike. Control probably at Hq in Zagreb. Other stations were probably Regional Info Centers (so-called by Croatian radio). DEVET (means 9) possibly the RIC at Sisak in Banjia region. JADRAN means Coast or Shore in Croatian so it possibly the RIC at Zadar. Serbian Air Force has struck major cities in Croatia and air alarm was taking place all day. Msgs mentioned Minas (mines),

Kazarn (gunshells), and Ammoniaka Serbatje (ammonia tank destroyed by mortar shell in Petrinja. Net was regular on this freq and then one day disappeared. Apparently had changed frequency. (Chinaski, Italy)

6302: USCG ComSta Miami in USB at 1230 wkg fishing vessel Italy which near or in Cuban waters. The Italy was being approached by Cuban gun boat and had then received five warning shots across its bow. USCG Miami was going to call vessel's owner and alert them after collecting further info. Miami asked in the Italy was within the Cuban 12 mile limit. (Caldicott, MA)

6714: USCG Cutter Spencer in USB wkg ComSta Boston during unsuccessful search for ANG Airman whose helo ditched 60 mi. south of Long Island. Navy Rescue 03, AF Rescue 974 & 988, "Screwtop" and others were heard during the week-long search. (Harris, NY)

6716: SPAR 99 wkg Andrews AFB in USB at 0130. (Harris, NY)

6731: SAM 049 wkg Andrews AFB at 0045. Running p/p's during VIP flight. Started in LSB but switched to USB due to QRM. (Harris, NY)

6735: BAT11 clg Huntress (NORAD) in USB at 1612. Huntress had requested rdo check this freq during exercises I had monitored on 288 MHz. (Harris, NY)

6762: Tangerine in USB clg Sk-king w/coded msg at 1950. (Harris, NY)

6779: First Hand in USB in contact w/8C at 2216 advising they were establishing digital circuits for the Wing. (Willmer, MI)

6800: MFA Tirana in CW at 1355 sending clear tfc to Budapest and Varshave. Telex signed "Minjashmine". Was a duplex ckt. (Chinaski, Italy)

7439: USCG Cutter SPencer in USB wkg ComSta Boston w/pp to District 1 Ops re search for lost airman. (Harris, NY)

7605: Victor Lima Bravo in AM at 2348. Mossad. (Boender, Netherlands)

8294: WPA, Port Arthur, TX wkg ships in Atlantic. Ships were providing sea conditions, temps, wind direction and ETA's. Hrd at 0530. (Caldicott, MA)

8445: YUR, Rjieka, Croatia in CW at 1220 w/nx in Croatian fm National News Agency after a tfc list at 1200. Also nx at 1600 after tfc list. More tfc lists at 1400, 1800, & 2000. Nx is called "Radio Vigesti" (Radio News) and the addressee is YUST which is the collective c/s for "All ships listening to YUR." (Chinaski, Italy)

8446: ZAD2, Durres, Albania in CW at 1320 wkg ships in Mediterranean after tfc list callup at 1300. (Chinaski, Italy)

8606: ZRQ, Fisantelkraal, So. Africa Navy w/VVV DE mkr at 0530. (Caldicott, MA)

8646: FUJ, Noumea, New Caledonia w/VVV DE mkr in CW at 1212. (Caldicott, MA)

8762: WOO, Ocean Gate, NJ w/high seas tel comms. Party in NYC area soon to leave on flight to Bermuda and spoke to party on ship in Bermuda re wx conditions since hurricane was close by. (Caldicott, MA)

8835: Italian Army Humanitarian Force in Albania wkg on USB at 0903 w/duplex ckt w/Rome. This Force carrying food & first-aid supplies. Two camps set up. IEX45 is Durres camp and IEX50 was Vlore camp. (Chinaski, Italy)

8857: Simplex ckt in USB at 0930 w/chatter between 2 Italian soldiers. Call "ISTRKE" (means Porcupine) believed to be Army camp at Vlore, Albania. Wkg 'FIDO1" (means Devoted 1) believed be truck or van shuttling between the two bases. (Chinaski, Italy)

8935: Simplex clt in USB at 0919 between IEX45, Army Camp in Durres and "83", Italian Army Battalion at Vittorio Veneto (town East of Verona). Wanted to run pp's but equip faulty so just tel nbrs passed. IEX50 wanted to be connected with "11" (L'Aquila, city in Central Italy) but again equip was faulty to had pass pp's to Rome on 8835 kHz. Also noted on this freq some mobiles in trucks or cars carrying senior officers. (Chinaski, Italy)

8960: U/i a/c 4821 w/pp to Company at Dublin Airport via Portishead radio requesting security personnel at arrival gate due to 10 passengers on board "cursing & swearing to crew hostesses, making things very nasty." Company said they'll "take care of the vandals." (Chinaski, Italy)

8971: ISSL04, Fire Ops C-130 a/c in USB at 1626 coming from 46th Air Transports Command in Pisa wkg SAR Center at Monte Venda (SE of Verona) for fire ops in a large pinewoods area North of Genova. This is primary HF Fire Ops freq & widely used in summertime when woods fires are frequent. Secondary is 6743 kHz. (Chinaski, Italy)

8984: USCG Rescue helo 1502 in comms w/USAF Rescue 988 (C-130) attempting to locate mising Japanese vessel in Hurricane Grace. USAF 988 advised USAF helo 110 to assist in rescue. The MH60 USAF helo crew was going to attempt pulling the crew however wx conditions prevented it. CG helo dropped 5 flares until USAF helo arrived. Sea conditions unfavorable so a 20 man life raft was to be lowered for the crew to enter. Appeared there were 8 crew members on board the ship at time of attempted rescue. (Caldicott, MA)

8993: Navy a/c hrd wkg Norfolk during Airevac ops at 0143 in USB. (Harris, NY)

9000: At 1355 Falcon advising Red 3 and Gator in USB re their signal strengths as they tested various antenna types, incl a window frame and pipes from the second story of a building. QSY'd to 6 MHz for continued testing. (Willmer, MI)

9043: Agar 94 in contact on USB at 1541 w/Aria Sim passing pseudorandom data. Aria Sim advised that data looked good and Agar 94 proceeded w/mission data. Also passed Pinehurst (?) encrypted traffic.. (Willmer, MI)

9090: At 2100 callup 183, 1-0 count then off for 5 mins. Then tone, 12 tones, Count 77 & msg in EE 3/2F grps. Next day at 2100 callup 754, Count 157, YL/EE w/3 + 2F grps. (Mazanec, OH)

9220: Jepson, Joggel, and Bracer (apparent radar sites) in USB at 0140 in net (Channel 10) w/war games exercise. Jepson apparently in charge. He gave permission for Bracer to take his radar off line for maintenance. Jepson also advised Joggel to sweep Bracers sector for moving targets due to Bracer being down. Joggel requested immediate Medivac but was advised by Jepson that impossible due to mechanical trouble, and no ground facilities available due to high area casualty rate. Joggel advised they had received no damage from the ARM (Anti-Radiation Missile) attack. Jepson was wkg data link w/Joggel on circuit AFH99. Various other cirucits in use such as AFS43 (designator 301), AFH43 (no designator, used for testing), and AFH39. (Willmer, MI)

9223: YL/GG in RCS w/263 x3 1-0 until 0310. Ten tones and into 89 3/3F grps. (Willmer, MI)

9332: Naval units H7V and E8B in USB in probable drug interdiction op at 0032 trying pass what sounded like ANDVT encryption. When this failed H7B advised E8B to pass R10's alpha report to A7V. the alpha report contained info on a ship and requested a boarding. (Willmer, MI)

9830: An u/i Serbian Military CW jammer sending "Franjo Tudjman is Dog" repeatedly 6 times during the 0800 English news segment. Note that the jammer went into action when English language was used and the msg itself was in English so it evident that intent was to discredit Croations. Hrd at 0807. (Chinaski, Italy)

10122: At 0130 hrd 518 518 00000 rptd for 5 mins, down at 0135. Foll week same xmsn. On later date at 0045 hrd YL/EE with ClO2 callup. (White, ME)

10360: Callsign P7B hrd in CW at 2250. (White, ME) This activity believed be Vietnamese diplomatic link. (White, ME)

10306: ZAF, MFA Tirana in CW at 1034 clg ZAF4, u/i Albanian Embassy. Possible duplex dkt as other end not heard. (Chinaski, Italy)

10601: At 2200 callup 491, 1-0 count. At 2210 Grupo 154. Station was YL/SS w/4F grps. (Mazanec, OH)

10700: Marco 3 telling Marco 1 that exercises terminated. This is Army disaster net simulating earthquake emergency in Sicily. LSB at 1807. (Chinaski, Italy)

10998.5: U/i CW activity at 1020. DE J14 INT QRK K, 0 DE S14 INT QRK K. (Chinaski, Italy)

11118: Wet Water in contact w/Chroughton in USB at 0130 confirming injection of EAM. (Willmer, MI)

11491: Four grp msg 0804 2555 0842 4097 at 1830. Simulcast w/16310 kHz. (White, ME)

11229: Air Force One in USB at 0155 wkg Andrews AFB while returning from dedication of Reagan Library in CA. (Harris, NY)

11364: YRA, u/i Romanian ACC in CW at 1537 during tfc in progress w/YRIMF (a/c) passing METAR concerning Lajpat. (Chinaski, Italy)

12008: EBC, Navy in Cadiz, Spain in CW at 0959 w/CQ DE EBC. (Chinaski, Italy)

12023: YL/EE rptng 806, 1-0 in RCS until 1310. Then ten tones and into 210 3/2F grps. (Willmer, MI)

12719: ZLO, Royal Navy, Irirangi, New Zealand w/mkr in CW at 1200. (Caldicott, MA)

12968: PKX, Jakarta, Indonesia w/CQ mkr in CW at 1135. (Caldicott, MA)

13113: Canadian Coast Guard, Halifax, NS assisting vessel Korea w/pp tfc to gain docking permission. Hrd at 1430. (Caldicott, MA)

114270: YL/SS in AM at 0155 w/5F grps. Right smack in the middle of the 20 meter bank. Lasted until 0215. (Penson, MN)

14445: CFARS net w/CIW610 said to be opr in Ottawa wkg CIW8104 u/i ship in USB at 2110. (Chinaski, Italy)

14819: NNN0CMC MARS USS Aubrey Fitch wkg NNN0ZTI MARS Virginia Beach in USB at 2140 w/pp. (Chinaski, Italy)

15682: Two buzzers, two tone beep, rptd 4 times foll by RTTY. Have you hrd this Ute before? Provencher, ME) My refs show Interpol Paris on 15684 kHz w/Sitor A encrypted tfc. (Ed.)

15999.5: YL/GG in RCS rptng 223, 1-0 until 1910. Then ten tones and into 3/2F grps. (Willmer, MI)

16310: YL/EE in RCS at 1715 w/3 + 2F grps. (Willmer, MI)

16318.5: OM advising 1B in USB that they would fire 10 rounds per target and after 5th target would shift to the West. Also mentioned time of flight of 36 secs. (Willmer, MI)

16947: VIP, Perth, Australia w/CQ mkr in CW at 1030. (Caldicott, MA)

17043: JCU, Choshi, Japan w/mkr in CW at 2150. (Caldicott, MA)

22247: Mare Vikingo (ICSM), general bulk vessel, in CW at 1230 wkg IAR, Rome. IBVR, MV Cielo Di Roma, tanker, also wkng IAR. Both vessels in Indian Ocean. Were sending ARES (Automazione Ricerca E Soccorso - Automated Search & Aid) Italian National System equal to USCG AMVER. (Chinaski, Italy)

22261: Liberian flagged Atlas Trader, ELFC7, w/msg to LGG, Rogaland, Norway. CW at 1645. (Chinaski, Italy)

29496: PPJ, Juncao, Brazil w/mkr in CW at 1955. (Caldicott, MA)

22652: CKN, Vancouver, BC, Canada w/NAWS DE mkr in CW at 1929. (Caldicott, MA)

25700: Two individuals in USB at 0957 w/chatter in GG talking about a repeater in South America & other tech matters. Possibly Deutsche Welle engineers. Off at 1010. (Chinaski, Italy)

PIRATES DEN

BY EDWARD TEACH

FOCUS ON FREE RADIO BROADCASTING

It seems that it's about time I went through my little semi-annual routine again (those of you who are aware of how things work are excused to the next paragraph) Ahem. Neither the *Pirates Den* column nor *Popular Communications* serves as a mail drop or mail forwarder for *any* pirate station. We never have and never will. Please do not believe pirate broadcasters who ask you to send reports via *POP'COMM*. We'll be glad to print your loggings in this column, and we welcome news about pirate station activity, but *don't* send mint stamps or expect us to forward actual reception reports to stations. That's part of our ballgame, OK.

We have several stations that are being reported for the first time this month. Joshua Wilkes in KY heard WSKY on 7413.9 at 0358-0408 on its premiere broadcast and suffering QRM from the Voice of America. Brian J. Murray of IN had them at 0215 on 7414 with a show hosted by Mike Richards who played mostly 60's and 70's rock. Richards said WSKY was an experimental station operating from the east coast. Steve Evanchuck in OH had them on 7416.7 at 0235, announcing a test. ID as "Whiskey Radio—the station that Jack Daniels built." WSKY pronounced as "whisky." Said engineering was by the "Voice of Doug." Doug replaced Mike at 0359.

WFRW was picked up by Joe Wright in MA on 7415 at 0327 to 0343 sign off. He tuned into a phone conversation with a listener but it was very poor technically. The announcer said it was a test transmission and gave power as 100 watts. Also had live music by a band, which was also badly done. Call letters apparently stand for Radio Free With You. Wilkes heard this one at 0507 with heavy metal and broadcasts of scanner activity, announcing 1,000 watts.

CIDA radio was logged by Pat Murphy in VA on 6250 at 2343 to 0013 with rock music and a lot of electronic effects. Pat says it sounded like the announcer was using a Harmonizer to give his voice a "Darth Vader" sound. Pat says the modulation and signal strength were good.

Cranker Radio's another apparent new one logged by Murphy. He heard this on 15048 at 2033-2109 with a very laid back announcer playing jazz. ID'd with "explore the universe, Cranker Radio."

Radio Garbanzo was spotted way up on 2752LSB by Bill Donovan in North Carolina. This was at 1600. The announcer called himself Fearless Fred and said that Radio Garbanzo had been shut down back on April 1, 1991. He said their secretary, Anne, had turned them into the FCC. According to Fred, the station had been broadcasting from a panel truck and that the FCC had completely destroyed their station but that they would not be stopped—no matter what! The announcer said they'd get even with the secretary.

John Minkewicz of Ashtabula, OH recently heard his first pirate station in this nicely appointed shack.

William T. Hassig of IL had the Voice of Larynigitis on 15050 at 2000 with bits about Desert Storm, country music, fake commercials and off the music used on those TV commercials for "The Clapper." Gave Box 452, Wellsville, NY 14895.

Bill also caught WLR on 7417 at 0100 with an old Hank Williams number. Although the signal was strong, poor modulation prevented copying very much of the content. Bill said they began fading around 0130. Send reports to Box 109, Blue Ridge Summitt, PA 17214.

Radio USA continues to be quite active. Sean Williams in Maryland had them at 0038 on 7415. They gave the Wellsville address and discussed their broadcast of a couple of weeks earlier. Off at 0050. for John Minkewicz in OH, Radio USA was his first pirate logging. He had them on 7409 from 1928 to close at 1947. He mentions this as being Saturday "evening" so we're probably really talking 0028-0047 UTC.

Pat Murphy has had a good bit of success with QSL's from pirates recently. He says he's had replies from Live Wire Radio, Voice of Laryngitis and Radio USA.

That will do it for this time. Please keep those pirate loggings coming in! I'm also interested in having copies of pirate QSL's, or samples, clippings about pirate radio and, of course, news from and about station operators. *Pirates Den* readers like to know what kind of equipment and power you're using, what your programming approach is and all that sort of thing. Photos of station installations are really appreciated.

SATELLITE VIEW

BY DONALD E. DICKERSON, N9CUE

INSIDE THE WORLD OF SATELLITE COMMUNICATIONS

Shuttle Communications

Primary communications for Shuttle flights are conducted through the Tracking and Data Relay Satellite (TDRS) system. This three satellite geo-stationary system was completed with the successful launch of TDRS-4 (TDRS-3 was lost on Challenger) in March of '89.

Before TDRS, all manned space missions used a series of ground stations around the world to relay data and voice communications back to the Kennedy Space Center and mission control at Johnson Space Center. The network of ground stations is known as the Spaceflight Tracking and Data Network (STDN). There were not enough stations in the network to provide continuous communications with the Astronauts. For this reason, and the fact that satellites are more economical that manned ground stations, NASA developed the TDRS system.

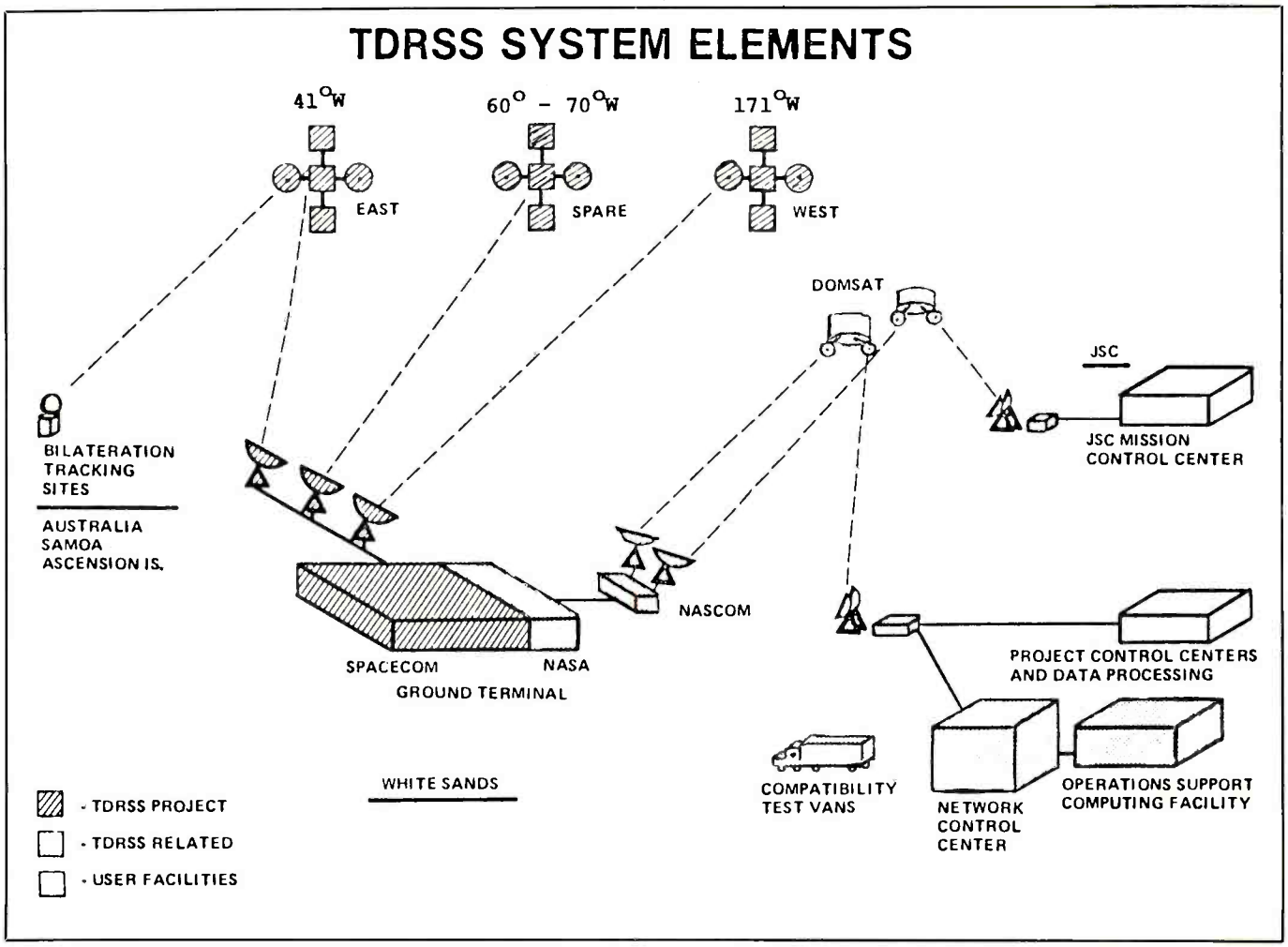
The NASA Communications Network (NASCOM) of Goddard Spaceflight Center in Greenbelt, MD is responsible for all voice, data, and TLM from our manned spaceflights. This includes NASA and military ground stations and satellites. Providing these communications links is no small task. Goddard, Johnson, Kennedy, White Sands and Wallop Island, VA all receive voice TLM and data from the shuttle.

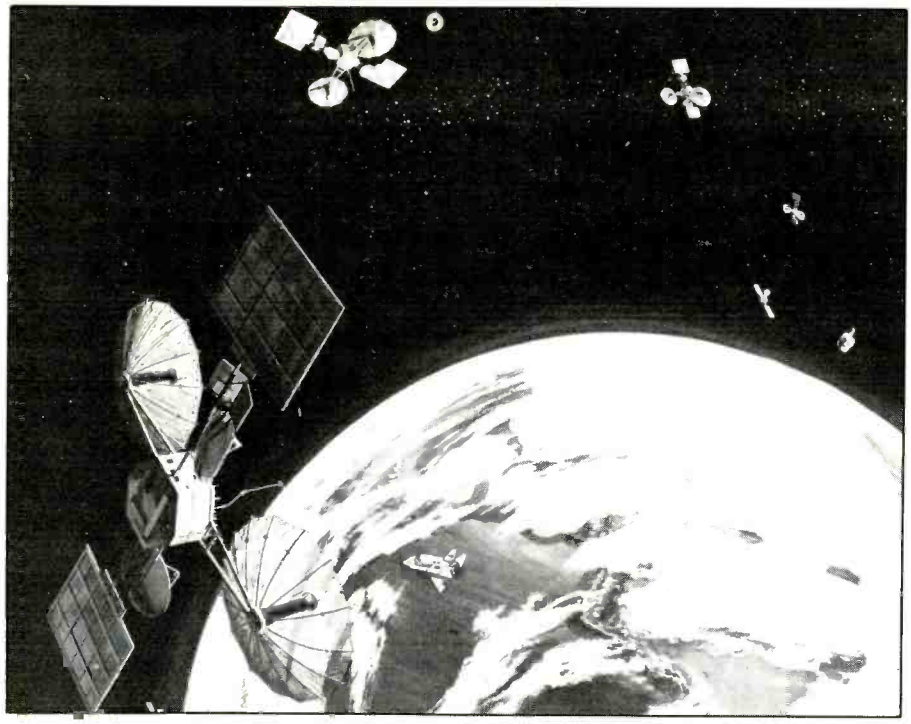
There are 14 stations in the STDN. In addition, 9 DOD support stations, run by the US Space Command and numerous other military communications centers and space sensor facilities, assist NASCOM in collecting shuttle data. NASA's 14 ground stations each have a 85, 30 and 14 foot dish antenna. These are used for S-Band voice and TLM and C-band (ranging) radar. The DOD stations use a single 60 foot dish for both S and C bands.

All of these antennas require accurate navigation information in order to track the space Shuttle as it orbits the earth at an average speed of 17,000 mph at just under 200 miles high. An additional network of computing stations makes these antennna pointing calculations for each ground station and then distributes this information, real-time to STDN. Goddard, White Sands, Vandenberg AFB, Wallops Islands and the Air Force Satellite control facility at Colorado Spring supplies this computer support.

There is an additional navigation system on board the shuttle. It is called TACAN. It is a distance and bearing beacon system that the Pilot and Commander listen to. The tone beacon signal is uplinked to the Shuttle between 962 and 1230 MHz.

Redundant systems have always been a part of NASA's safety provisions for manned spacecraft. This thinking also applies to the communications system. If, for example, mis-





Here is an artist conception of the Tracking and Data Relay Satellite System (TDRSS). Photo courtesy NASA.

SHUTTLE FREQUENCIES

Shuttle Frequencies (UHF)

279.0 MHz
259.7 MHz
296.8 MHz

STDN Frequencies (S-Band)

2106.4 MHz	Uplink	2287.5 MHz	Downlink
2041.9 MHz	Uplink	2250.0 MHz	Downlink
1831.8 MHz	Uplink	2217.5 MHz	Downlink
1775.9 MHz	Uplink	2214.0 MHz	Downlink
		2205.0 MHz	Downlink

TDRS Satellites Frequencies

1750.0 - 2300.0 MHz (S-Band)
15,200.0 - 17,250.0 MHz (K-Band)

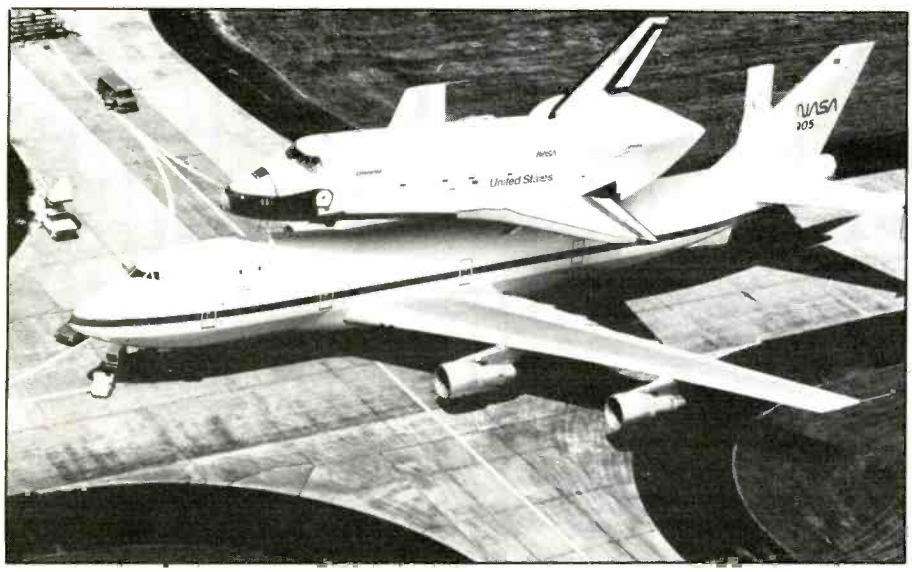
WA3NAN Shuttle Audio

3.860 MHz	21.395 MHz
7.185 MHz	28.650 MHz
14.295 MHz	147.450 MHz

sion control at Johnson Space Center should become inoperative for any reason, the White Sands NM facility could take over their responsibilties. Should White Sands fail, Goddard could take control.

Many of the names of NASA's facilities are no doubt familiar to the space enthusiast. There is, however, a NASA control center for engineering data which may not be as familiar as Kennedy or Johnson. It is called the Huntsville Operations Support Center (HOSC) and is a part of the Marshall Spaceflight Center, Huntsville, AL.

During pre-launch, the count-down, launch and flight of the Shuttle, NASA and their contract engineers and scientists man consoles which provide them with real-time data on the Shuttle propulsion systems. This includes the engines, external tank and solid rocket boosters. This information is transmitted directly from the Shuttle to Huntsville. The information is processed by computer and displayed on screens and other specialized instruments at 15 stations in the engineering console room. During their busiest ten hour period of the Shuttle launch, the center will assess more than eleven million measurements of the propulsion system. The center is staffed by over 150 specialists. There are 25 direct communications links between Huntsville, Kennedy and Johnson Space Centers.

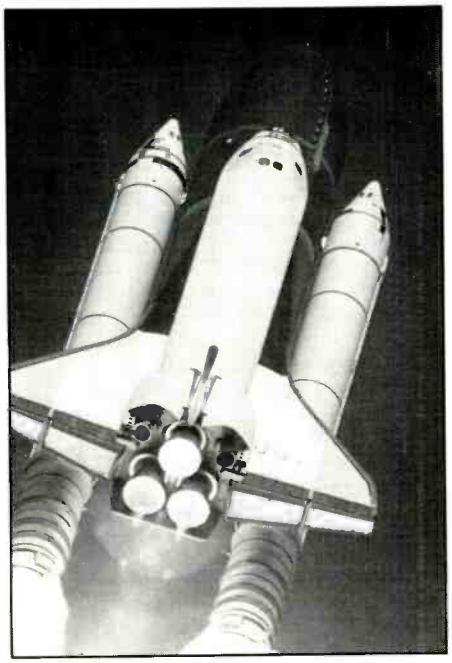


The Space Shuttle Enterprise on a stopover in Washington, DC after a tour of Europe back in June of 1983. Photo courtesy NASA.

Launch

Just prior to lift-off, shuttle communications switch from intercom to UHF, air-to-ground. During ascent three UHF ground stations provide all voice, TLM and data channels. The stations are located at Merritt Island, Ponce de Leon, FL and Bermuda Island. For the first minute and twenty seconds of flight, communications are relayed to other NASA facilities through Merritt Island. At this point, the exhaust from the solid rocket boosters, which consists of super-heated chemicals, block radio communications out completely. The communications are then picked up by the station at Ponce de Leon, which is located thirty miles north of the launch site. This station will maintain communications for two minutes before Merritt Island again relays for an additional minute and twenty seconds. Approximately six minutes into the flight, Bermuda takes over these responsibilities for an additional five minutes. TDRS-East located at 41° East will then take over. TDRS-Central is located at 79° West and TDRS-West is at 171° West. After the Shuttle reaches orbit, TDRS satellites will relay all communications to ground stations. On re-entry communications will again revert to UHF air-to-ground.

With the success of TDRS, NASA has closed three stations in STDN. These are Chile, Hawaii and Ascension Island. In addition, the Senegal, Africa stations was closed in December, 1990. Three other stations in the STDN, Gladstone, CA; Canberra, Australia; and Madrid, Spain, have become part of the Deep Space Network which is managed by the Jet Propulsion Laboratory (JPL). These stations could be pressed into service again should the need arise.



The Space Shuttle Columbia being launched a couple of years ago. Photo courtesy NASA.

VHF Support Frequencies

Kennedy Operations	Aircraft	Ships	Edwards AFB	
117.8 MHz	117.8 MHz	148.5 MHz	120.7 MHz	236.0 MHz
121.9 MHz	118.4 MHz	149.1 MHz	121.8 MHz	290.0 MHz
126.4 MHz	120.7 MHz	162.0 MHz	162.6 MHz	318.0 MHz
148.4 MHz	126.3 MHz		164.1 MHz	348.7 MHz
162.6 MHz	127.8 MHz			
170.1 MHz	164.8 MHz			
284.0 MHz				

HF Support Frequencies (MHz)

Aircraft	NASA		Ships
6.693	2.678	9.974	2.625
6.896	4.510	10.780	5.190
6.983	4.760	11.104	5.696
7.461	4.855	11.416	5.810
8.891	5.350	11.548	9.125
9.043	6.723	11.805	11.407
9.131	6.740	13.218	
10.780	6.896	14.615	
11.205	6.983	19.306	
13.170	7.675	20.185	
15.015	8.993	20.390	
18.200	9.315	20.475	

The TDRS control center and ground terminals are located at White Sands, NM. This site was chosen because of its year round low cloud cover. White Sands provides all network links for the TDRS spacecraft date to the NASCOM, DOD and NOAA systems.

TDRS is a large spacecraft 42 by 57 feet. Each satellite has seven antennas. Two of these antennas are 16 feet across and are plated with 14K gold. This satellite uses frequencies in the 2, 14 and 15 GHz range.

On re-entry, the Shuttle switches back to UHF air-to-ground. The Ames-Dryden flight research facility and the Gladstone facility of the Deep Space Network provide primary communications for the approach and landing at Edwards AFB.

Support Operations

Specially equipped EC-135 aircraft are deployed before every shuttle launch. They are called Advanced Range Instrument Aircraft (ARIA). Based at Wright-Patterson AFB in OH, these planes relay launch data on both the Shuttle and any spacecraft it may deploy. They are used for back-up, missile and SDI tests. They can use any frequency in the HF, VHF, UHF band and satellites. (See Jan '89 issue for close-up.)

Throughout Shuttle operation you can find a variety of support communications from chase aircraft, safety ships and more. NASA even has its own fleet of ships to cover Shuttle launches and recover the solid rocket boosters. When looking for this traffic, check known frequencies (see the list provided) and search for new ones in the same portions of the bands as the known frequencies. Let me know your findings.

Live video from the Shuttle is sent to Johnson Space Center through SatCom F-2R located at 72° W. NASA feeds are found on transponder 13 (3,960.0 MHz), vertical polarization in monaural audio at 6.8 MHz (audio sub-carrier). A schedule for these broadcasts is updated daily during Shuttle missions. This information is yours by simply dialing (202) 755-1788.

Live audio feeds from the Shuttle can be heard in the Ham bands. The Amateur Radio Club of Goddard Spaceflight Center rebroadcasts live, unedited voice communications from the Shuttle. Their callsign is WA3NAN. I have provided a list of frequencies they use. See you next month.

BROADCAST DX'ING

BY ROGER STERCKX, KVT1JH

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

Broadcaster/Reader: This column has a large number of readers who are broadcasters as well as hobbyists. One is Roy Hafeli, VE7IBJ, who works as a DJ at CFVR/850, Abbotsford, Alberta. He hosts the farm show from 5:30 to 6:30 a.m., then does a regular airshift from 8:30 a.m. to 1 p.m. Those who have put in mike time at a broadcast station will quickly appreciate that this is a pretty heavy sked. The music format is adult contemporary.

Roy passed along a photo showing him busy at work in the CFVR control room. The equipment seen in the photo includes two McCurdy turntables, a rebuilt Collins board, an ITC three deck cart machine, two Ampex RTR tape machines, one Technics cassette deck, three Technics CD players, and Senneiser mikes.

Another Broadcaster: We have received (and mentioned) previous correspondence from the APW Broadcast Consortium. These folks are activists devoted to the establishment of a low-power FM (LPFM) radio service, similar to LPTV. The FCC does not presently have a LPFM category, and isn't particularly interested in starting one.

However, APW has been so interested in moving along with the idea that they have notified us that they are running KAPW/88.9 for "limited, evening low power FM operation for the residents of North Phoenix-Deer Valley." They wrote that it is Arizona's first "Community Access" radio outlet, and also "Arizona's most controversial radio."

For more information on LPFM or KAPW, contact Bill Dougan, KAPW, P.O. Box 47473, Phoenix, AZ 85068-7473. If you furnish a stamped, self-addressed, return envelope for the reply, it will no doubt be greatly appreciated.

Ice Wasn't Nice: Broadcast towers are designed, built, and installed to stand up under the most severe weather conditions. That usually hold true, but last November a wild ice storm slithered through Iowa. It was bad enough to do in the top half of the 1,000 ft. tower used by KEZT/104.1, a 100 kW station in Ames. The tower is near Madrid, Iowa.

The damage to KEZT was about $500,000, covered by insurance. The station was initially knocked off the air, but soon came back on frequency running full power using what was left of the tower. A new tower, to be situated next to the remains of the old one, was immediately planned.

Engineers examined the damaged tower for flaws, but were unable to find any, saying it was a "one in a million" occurrence. KEZT's owner, Bob Bunce, commented that he hadn't seen anything quite like it during his 38 years in broadcasting. Thanks to Bill Vaughn, of Iowa Falls, Iowa, for letting us know.

Here's Roy Hafeli, VE7IBJ, seated at the master console of station CFVR.

Towers That Stayed: Pat Griffith, N0NNK, of Denver, sent us a photo that he took of the antenna tower used by WBBM/780, Chicago. Pat advises that the antenna system is approximately ten miles west of O'Hare Airport, not far from Schaumburg, Illinois.

There are two towers in the photo, a large one at the left, plus a smaller one at the rear of the transmitter building to the right side of the shot. The smaller one is either used as a back-up or auxiliary tower, and/or for supporting microwave STL dish antennas.

Pat notes that WGN/720 uses an antenna site only about a mile north of the WBBM antenna.

The Bigger They Are: The FCC told the owner of the old WHVK (ex-WKQD) tower in Manchester, Tenn., that the 755-ft. structure must be taken down because it's an air navigation hazard.

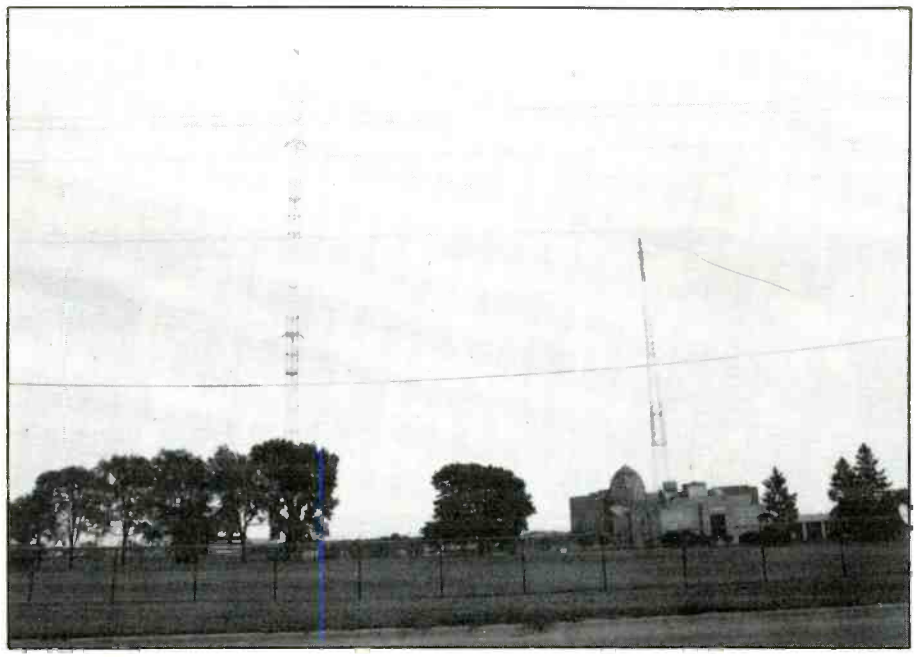
The tower hasn't been used since April of 1990 when the station began using a tower at another location. Sometime in 1990, the local electric company stopped supplying power to the old tower site. At that point the tower was unlighted, as required by FCC regulations.

Even though a tower ceases to be used for broadcasting purposes, its owner is required to maintain prescribed painting and lighting until it is dismantled. The owner of this tower said that he will be unable to maintain the lighting of the tower, and the FAA determined that the unlighted tower may constitute a menace to air navigation. Therefore, the FCC says it must come down.

In case you hadn't thought about what's involved in dismantling a 755-ft. tower, let's just say it is practically as complicated and costly as putting it up. Would have been easier just to light the thing and try to lease out space on it to two-way repeaters.

Tower painting and lighting requirements are specified in FCC Part 17, and information is also available from FCC field offices (FO Bulletin No. 13, *Radio Tower Painting and Lighting*).

According to the FCC, radio users have increased compliance with tower painting and



The WBBM tower of power runs 50 kW, has no guy wires. (Courtesy Pat Griffith, Denver, CO.)

Applications Filed For New FM Stations

AR	Osceola	107.3 MHz	3 kW
AR	Pine Bluff	89.7 MHz	
CA	Arnold	106.1 MHz	1.6 kW
CA	Chico	92.7 MHz	
CA	Gridley	101.5 MHz	
CA	Paso Robles	103.1 MHz	1.2 kW
CA	Joshua Tree	92.1 MHz	
FL	Pennsuco	88.3 MHz	3 kW
HI	Waimea	99.1 MHz	
IA	Eagle Grove	100.7 MHz	25 kW
IA	Eldon	104.3 MHz	
IA	Milford	102.1 MHz	
ID	Rexburg	91.5 MHz	1 kW
KS	St. Mary's	102.9 MHz	
ME	Bar Harbor	107.7 MHz	6.3 kW
MI	Bronson	94.7 MHz	6 kW
MI	Sandusky	90.7 MHz	18 kW
MI	Sault Ste. Marie	90.1 MHz	
MN	Sleepy Eye	107.3 MHz	
MO	Garapan, Saipan	100.3 MHz	1.3 kW
MS	Forest	89.1 MHz	
MT	Kalispell	106.3 MHz	
ND	Jamestown	91.5 MHz	
NJ	Manahawkin	89.9 MHz	
NM	Socorro	92.7 MHz	6 kW
NY	Hague	93.7 MHz	4.8 kW
OH	Greenville	89.9 MHz	50 kW
OK	Del City	91.7 MHz	150 watts
OR	Cottage Grove	105.5 MHz	1.9 kW
OR	Reedsport	99.5 MHz	
OR	Sutherlin	101.1 MHz	2 kW
SC	Chesterfield	107.3 MHz	3 kW
SC	Summerton	95.5 MHz	6 kW
TN	Jamestown	91.5 MHz	
TX	Hempstead	105.3 MHz	6 kW
TX	Victoria	89.3 MHz	
VA	Crozet	103.5 MHz	
WA	Yakima	90.3 MHz	5 kW
WV	Clarksburg	88.1 MHz	24 kW

Permits Granted For New FM Stations

AK	Nome	96.1 MHz	1 kW
AL	Hartsdale	106.1 MHz	3 kW
AL	Orange Beach	105.7 MHz	
CA	Indio	89.3 MHz	775 watts
CA	Oxnard	89.1 MHz	2 kW
CA	Susanville	96.3 MHz	25 kW
CO	Buena Vista	104.1 MHz	6 kW
GA	Coosa	95.3 MHz	3 kW
GA	Ft. Gaines	90.9 MHz	100 kW
HI	Hillman	94.9 MHz	50 kW
ID	American Falls	104.1 MHz	3 kW
IL	Hillsboro	99.7 MHz	50 kW
IN	West Lafayette	106.7 MHz	3 kW
IN	Westport	91.5 MHz	14.6 kW
KS	Seneca	92.1 MHz	3 kW
KY	Russell Springs	92.7 MHz	6 kW
LA	Alexandria	91.7 MHz	1 kW
LA	Larose	100.3 MHz	3 kW
MD	Hagerstown	89.1 MHz	9 kW
MN	Cloquet	96.5 MHz	6 kW
MN	Blue Earth	98.1 MHz	25 kW
MS	Woodville	95.9 MHz	3 kW
NC	Kill Devil Hills	104.1 MHz	100 kW
NH	Concord	91.5 MHz	1.5 kW
NY	Oswego	88.9 MHz	1kW
OH	Englewood	94.5 MHz	3 kW
OH	Wooster	89.3 MHz	
PA	Hawley	105.3 MHz	3 kW
PA	Oliver	94.9 MHz	20 kW
SC	Greer	103.3 MHz	3 kW
SD	Rapid City	98.7 MHz	
TN	Knoxville	104.5 MHz	2 kW
VA	Lexington	89.9 MHz	1 kW
WA	Chehalis	90.5 MHz	3 kW

AM Facility Change Requests

KT66	Spring Arbor, MI	1540 kHz	Drop to 450 watts.
KTIM	Wickenburg, AZ	1250 kHz	Drop to 350 watts.
WLIB	New York, NY	1190 kHz	Use 1200 kHz at night, 3.5 kW.
WTRB	Ripley, TN	1570 kHz	Drop to 28 kW.

Changed AM Facilities

KFIA	Carmichael, CA	710 kHz	Power 25 kW/5 kW.
WTKY	Tompkinsville, KY	1370 kHz	Dropped to 2.1 kW.

FM Facility Change Requests

KCDH	Nephi, UT	92.7 MHz	Seeks 103.9 MHz.
KSWP	Lufkin, TX	91.1 MHz	Seeks 90.9 MHz.
KWFX	Woodward, OK	93.5 MHz	Seeks 100.1 MHz.
KXKX	Knob Noster, MO	105.5 MHz	Seeks 105.7 MHz.
WCLA-FM	Claxton, GA	107.1 MHz	Seeks 107.3 MHz.
WMHI	Cape Vincent, NY	94.7 MHz	Seeks non-commercial status.
WMHR	Syracuse, NY	102.9 MHz	Seeks non-commercial status.
WPGB	Blountville, TN	88.3 MHz	Seeks move to Kingsport.
WWRT	Scotland Neck, NC	102.7 MHz	Seeks 95.5 MHz.

Changed FM Facilities

KBNJ	Corpus Christi, TX	91.9 MHz	Moved to 91.9 MHz.
KOCD	Columbus, KS	98.3 MHz	Moved to 105.3 MHz.
WCKQ	Campbellsville, KY	103.9 MHz	Moved to 104.1 MHz.

CFSR-FM, a/k/a "Star FM 105," is the sister station of CFVR.

lighting requirements to about 95%. Two surveys conducted by the FCC recently proved this. The high compliance rate may be the result of the FCC's aggressive educational and enforcement program during the past two years. Prior to the enforcement program, compliance was in the 70's.

New Band: Ken Wirsing, KF8OR, and Registered Monitor KMI8HX, of Wyoming, MI writes that he's copying activity in the new 1605 to 1705 kHz portion of the broadcasting band. WLAV/1340, Grand Rapids, Mich. was noted simulcasting on 1620 kHz at 3 p.m. Eastern. At the same time, WMAX/1480, also of Grand Rapids, was simulcasting on 1660 kHz. This was during the weekend.

Not Laughing: Station KROQ-FM, Pasa-

Proposed Stations Cancelled; Call Letters Deleted

KBNJ	Corpus Christi, TX	91.9 MHz
KBTB	Bethel, AK	107.9 MHz
KEAN-FM	Abilene, TX	105.1 MHz
KVNZ	Marianna, AR	106.9 MHz
KWNL	Downs, KS	94.1 MHz
KYAY	Richfield, UT	97.5 MHz

Requesting AM Call Letter Change

Now	Seeks	
KATY	KGLW	San Luis Obispo, CA
KGUC	KPKE	Gunnison, CO
KOUR	KQMG	Independence, IA
WWCS	WKJS	Canonsburg, PA
WYNE	WHBY	Kimberly, WI

Changed AM Call Letters

New	Was	
KCCD	KYIY	Moorhead, MN
KDBS	KZTZ	Eugene, OR
KMXE	KSIF	Idaho Falls, ID
KOZZ	KONE	Reno, NV
KULL	KRPM	Seattle, WA
KZXY	KQKL	Apple Valley, CA
WAQY	WIXY	E. Longmeadow, MA
WERQ	WYST	Baltimore, MD
WFWC	WSPQ	Springville, NY
WHJX	WPIQ	Brunswick, GA
WMNY	WORK	Elloree, SC
WMRV	WENE	Endicott, NY
WMRY	WSTH	Columbus, GA
WNZS	WRXJ	Jacksonville, FL
WYPC	WKOV	Wellston, OH
WZLB	WFRG	Rome, NY

Requesting FM Call Letter Change

Now	Seeks	
KOUR-FM	KQMG-FM	Independence, IA
KVLR	KNDK-FM	Langdon, ND
WHVE	WHPT	Sarasota, FL
WPFR	WLEZ	Terre Haute, IN

Changed FM Call Letters

New	Was	
KBCY	KTLC	Tye, TX
KHYI	KZKF	Howe, TX
KKCD	KKVU	Omaha, NE
KLPQ	KVQB	Cabot, AR
KMXE	KSIF	Idaho Falls, ID
KMXV	KLSI	Kansas City, MO
KOZZ-FM	KOZZ	Reno, NV
KYFI	KEQH	Lafayette, LA
WAQY-FM	WAQY	Springfield, MA
WDRK	WBKL	Callaway, FL
WERK-FM	WOKZ	Muncie, IN
WERQ-FM	WYST-FM	Baltimore, MD
WFGI	WEZI-FM	Germantown, IN
WHJX-FM	WHJX	Brunswick, GA
WJBT	WZAZ-FM	Green Cove Springs, FL
WKMK	WVYF	Sylvester, GA
WKXD	WRJT	Monterey, TN
WLOL	KXLV-FM	Cambridge, MN
WLVW-FM	WDVH	Salisbury, MD
WLYK	WKZZ	Lynchburg, VA
WMRV-FM	WMRV	Endicott, NY
WNDJ	WVZG	White Stone, VA
WOHP	WQFC	Portsmouth, OH
WORG	WMNY-FM	Elloree, SC
WRAK-FM	WGBE	Williamsport, PA
WRVF	WXMX	Arlington, OH
WTRY-FM	WSHZ	Rotterdam NY
WXML	WVZX	Upper Sandusky, OH
WXMX	WGOR-FM	St. Johns, MI
WWNJ	WKTW	Dover Township, NJ
WZZV	WAXH	Olyphant, PA

New FM Call Letters Assigned

KAEZ	Amarillo, TX
KEQF	Ludlow, CA
KEQG	Great Bend, KS
KEQH	Lafayette, LA
KEQI	Kings Beach, CA
KHME	Winona, MN
KMZA	Seneca, KS
KNJM	Lincoln City, OR
KNOM-FM	Nome, AK
KOUT	Rapid City, SD
KOUU	American Falls, ID
KOUV	Cloquet, MN
WHRH	Warner Robins, GA
WIWC	Kokomo, IN
WMRL	Lexington, VA
WPBI	Martinsville, WV
WQFA	Hudson, NY
WQFB	Concord, NH
WQFC	Portsmouth, OH
WQFE	Brownsburg, IN
WXAF	Charleston, WV
WXAH	Orange Beach, AL
WXAI	Kill Devil Hills, NC
WXAJ	Hillsboro, IL
WXAK	Oliver, PA
WXAW	W. Lafayette, IN
WYAM	Hartselle, AL

dena, Calif., got a strongly worded letter from the FCC admonishing it for broadcasting a hoax murder confession.

Seems that in June of 1990, the *Kevin & Bean Show* carried a segment called "Confess Your Crime" in which listeners were asked to call in to confess crimes they had committed. Among the calls received was one supposedly from an anonymous listener confessing to the murder of his girlfriend. This resulted in widespread publicity and an intensive homicide investigation.

It turned out that the confession was a hoax, spontaneously thought up by the two morning DJ's without the station management's knowledge or approval. The person who "confessed" was a friend of the two DJ's, who was later hired as an announcer at

KEZY/95.9, in Anaheim, Calif., can't be easily forgotten with these orange, blue, and green bumper stickers. (Courtesy Jim Cooper, N6MKJ, Calif.)

KROQ-FM. After the broadcast, the parties involved in the incident made an effort to conceal the true nature of what had gone on.

In April of 1991, the station's owners learned from law enforcement officials that the broadcast had been a hoax. Following an

internal investigation, the station temporarily suspended the announcers without pay. Also, on-the-air apologies for the hoax were broadcast. In addition, the show's two DJ's had to provide a specified number of hours of community service, in addition to making full restitution to the Los Angeles Sheriff's Department for the cost of its investigation. The station said it would pay for the preparation and distribution of educational literature relating to the broadcasting of false and misleading information. This literature was to be distributed to all broadcasters.

The FCC didn't blame the station for being involved in the hoax, and noted that the station quickly reacted with disciplinary action as soon as it learned the truth of what had transpired. Still, the FCC said that it has long considered deliberate programming distortions not to be in the public interest. The agency felt that the buck had to stop somewhere, and that was at the feet of the station management, which, ultimately, has to be held responsible for the actions of its employees.

The FCC expected the KROQ-FM management to respond to its letter with an assurance that the violation will not be repeated.

Free Fee: Operators of non-commercial educational broadcast stations have been excused from certain FCC fees. Applicants for the fee-exempt Restricted Radiotelephone Operator Permits will not be able to use the permit at commercial broadcast or other facilities, and will be so marked.

Regular permits require a $35 fee by persons who want to have full privileges, or who can qualify for a fee-exempt permit now but may later wish to use the permit where the fee-exempt permit cannot be used.

To apply for a fee exempt permit, applicants require two things. First, a completed FCC Form 753. Also, a signed certification stating, "The Restricted Radiotelephone Operator Permit being applied for will be used only at a non-commercial educational station." These items must be mailed to: Federal Communications Commission, 1270 Fairfield Road, Gettysburg, PA 17325-7245.

If you need more information, call the FCC at (202) 632-FEES, or (717) 337-1212.

Why not send us station photos, bumper stickers, newspaper stories, and other AM/FM related material?

BY GERRY L. DEXTER

CLANDESTINE COMMUNIQUE

WHAT'S NEW WITH THE CLANDESTINES

Florida DX'ers have spotted yet another new anti-Castro broadcaster. La Voz de la Federacion de Ex-Presos a Politico de Cubanos (World Federation of Former Cuban Politicali Prisoners) operates on 7080. Broadcasts run from approximately 0030 to 0100, generally on Mondays, Wednesdays and Fridays. All of the specs on this station seem somewhat variable, though—frequency, hours and broadcast days. There are probably a dozen or so anti-Castro voices on the air at present, including the many programs aired by various Cuban political groups over WWCR. The opposition groups surely believe Castro's days in power are numbered and more and more apparently want to join the radio war against him. This area of the clandestine scene should remain active, if it does not, in fact, actually grow, as long as Castro stays in power.

Finding the correct address for these operations continues to be a chancy thing. We noted last time that a couple of previously listed addresses proved inoperative. Now Mike Hardester of North Carolina reports his letter to the Junta Patriotica Cubana was returned, marked "moved." Mike also had a letter to Directoria de Revolucionario Democratico Cubano returned.

The anti-Cuban broadcaster for which no address has ever been found—Radio Caiman—continues to operate, running on 9965 from 1200 to 1530 and 2300-0400. This split schedule has been in effect for quite sometime, although earlier the station operated continuously from early morning until late evening. Seems a bit odd that, with the radio ware against Castro heating up, this quite professional operation continues on a limited schedule.

The Colombian clandestine, Radio Patria Libre, is now being noted hanging around its former 6300 as well as the newer 4710 area mentioned last time. We've received some information about the National Liberation Army (Ejercito de Liberacion Nacional—ELN) which is believed to operate this station. It was founded in July, 1964 and is believed to have less than 1,000 members. It is primarily active in the north and northeastern parts of Colombia, near the Venezuelan border and expanding into the central area. Its leaders are Manuel Perez Martinez and Nicholas Rodrigues Bautista (aka "Dario"). The group is pro-Castro, anti-US and Marxist-Leninist and is the only Colombian insurgent group which did not go along with a 1984 truce with the government. It is believed to be assisted by Cuba. Thanks to "Zephyrus" in MA for making this information available to us.

Ciappi Roberto of Italy forwards a couple of his clandestine loggings: He hears the "Voice of Iraq" on 7500 with news in Arabic at 1700 but noted as early as 1400 to 1800 sign off. The signal was interfered with by a bubble jammer and Ciappi wonders if the jamming is Iraqi or a case of "autojamming."

Ciappi notes a station, probably in Turkeman or Kurdish, on 15060 signing on at 1700 and off with an anthem at 1800. He thinks it may be "Aira Dangi Kurdistan." The Voice of the People of Kurdistan was listed for operation in the area around 15050 but, to our knowledge, has not been heard in north America.

"Saia Hureriat-e Kashmir" is the name of an anti-Indian clandestine station seeking an end to that country's dominance of the state of Kashmir. It's on the air with four one hour broadcasts a day: 0230-0330, 1130-1230, 1400-1500, all on 5000, plus 1630-1730 on 5000 and 5900. That info from the Indian DX League, via Harold Sellers of the Ontario DX Association. Little chance North Americans will be able to hear this one (if only the 1130 broadcast were on 5900!)

There's a move afoot in Congress to establish a "Radio Free China" which would serve as a surrogate broadcaster to the mainland, much like Radio Free Europe/Radio Liberty beams to Eastern Europe and the USSR. In addition to that, there's another proposal to establish a broadcaster which would focus on the still communist nations of Laos, Vietnam and Cambodia.

We welcome your reports and information for this column. Clandestine station loggings and observations, literature, news clippings, clues to addresses or locations and similar information are very useful. Thanks to Zephyrus, Ciappi Roberto, DX South Florida, Mike Hardester and Harold Sellers for their input this month.

Until next month, good hunting! ■

PRESENCIA

Organo Oficial de la Junta Patriotica Cubana

VOL. IV — SEPTIEMBRE 30 DE 1983 — NUMERO 39

LA VOZ DE LA JUNTA PATRIOTICA CUBANA WOCN - OCEAN RADIO DOMINGOS: 11 P.M. 1450 KCS. (MIAMI)

CUBANOS REFUGIADOS EN JAMAICA SALEN PARA CANADA

Desde hace varios meses, para la Junta Patriótica Cubana fue de gran preocupación la situación de los cubanos exiliados en Jamaica. A los efectos de tratar de resolver esta situación y ayudarles en el orden económico, la Junta representada por su presidente Dr. Varona, visitó Jamaica para llevar a los cubanos ayuda material y moral, además de hacer gestiones ante las autoridades de aquel país para tratar de solucionar la situación en extremo difícil en que se encontraban los cubanos.

A raíz de aquella visita, los cubanos, ya organizados, comenzaron a recibir ayuda remitida por la Junta, sobre todo de ropas y zapatos, así como cantidades en metálico. Esto produjo un gran afecto entre los refugiados, que por primera vez se sintieron participantes de la preocupación de sus hermanos de Miami. Todos los esfuerzos han dado resultados. Ahora vemos como han partido para Canadá un grupo de los cubanos de Jamaica, haciéndose gestiones para que otros sigan la misma ruta.

Las fotos que presentamos y las cartas de la Sra. Luisa María Serrano, así lo atestiguan. La Junta Patriótica, como siempre, está presente y ayudando de acuerdo con sus posibilidades. Pasa a p/6

Fotografías de los cubanos que partieron para Canadá, para residir en aquella nación. Aparecen en las fotos, además de otros cubanos que esperan ser seleccionados, los que ya están viviendo en Canadá. Son ellos: Tony Labrada Alcolea, Ernesto Labrada Machado, Johnny Labrada Alcolea, Clemente Puig Barrios, Eddy Labrada Alcolea, Casilda de Labrada y Camilo Labrada Machado. También aparece Luisa María Serrano, Coordinadora de la Sección Femenina.

EN ESTE NUMERO

People are having trouble finding an address for Junta Patriotica Cubana which broadcasts "Pueblo Libre" via WWCR. We're told, now, that reports may be sent via Radio Miami International, 8500 SW 8th St., Suite 250, Miami, FL 33144. Years ago JPC broadcast via its own clandestine transmitter.

CB SCENE

BY BILL SANDERS, SSB-295

27 MHz COMMUNICATIONS ACTIVITIES

We like the Radio Shack Realistic TRC-435 top-of-the-line AM mobile rig; even more since they dropped the price from $139.95 down to $129.95.

This unit has variable RF gain, a switchable ANL, an instant Channel 9 switch, and variable audio tone. There's a hefty channel switch knob, plus an LED read-out of incoming signals as well as relative transmitter output power. Nice looking little package, and a good performer while you're rolling down the pike since the receiver is good enough not to freak when hit with a hefty signal from a nearby vehicle.

The Realistic TRC-435, a set for all seasons.

Radson's RT-75A is a rare CB set from 30 years ago.

Early Contender

Looking back at CB rigs of the past, we have an opportunity to peek at a very early CB unit whose main fault was being far ahead of its time. The unit was a commercial failure, and its manufacturer didn't fare well, either.

We would peg the Radson RT-75A (and variant RT-70A) at being from 1960. It was produced by the Radson Engineering Corp., of Macon, Ill. This was a single-channel transceiver that had a couple of unusual (for its era) features. For one thing, the set employed a push-to-talk telephone handset. It had a push-to-call tone-calling feature that would activate a buzzer in another similarly equipped transceiver.

There was a superhet receiver with two IF stages, and an ANL. The receiver had a 5-tube circuit, the transmitter had a 2-tube circuit with a 6AQ5 final. The unit was intended for bulkhead mounting, with the handset and power connectors at the bottom. The top of the set would accept a chassis-mounted whip antenna or cable for an outside antenna.

The design and construction was excellent, but the radio was so completely different from anything else being offered to the public that it seemed baffling to people. Also, the small manufacturer didn't try hard enough to market the unit. In 1962, Radson brought out a two-channel companion transportable unit, the RP-612, which had similar features and could operate from 6 or 12 VDC. A variant unit was the RP-115, which operated from 117 VAC. These sets were priced at about $170.

By 1962, Radson, along with its clever designs, seemed to be gone from the world of CB radio. One of the rare RT-75A units, along with its original operating manual, is owned by a collector in Decatur, Ill. They don't get much rarer than Radson CB sets. He snapped a photo which we can share with you.

Power Leak?

After an hour of warming up his ratchet jaw, my old Army buddy, Mule, usually gets around to telling his favorite story. He insists it actually happened some years ago to his grandma. It seems that Granny was annoyed about the AC power outlets in her wall. Her logic was convincing: if electricity freely flows out of those outlets, they must be plugged up at all times. Otherwise, they would leak electricity out all over the floor. So, Granny made it a point to see that no socket in her home was ever left unplugged. Satisfied that she would not be charged by the power company for any leaked electricity, she had peace of mind.

Oddly enough, this story ties in with CB antennas. For instance, if asked if the same antenna is as efficient on receive as on transmit, most people would answer yes. A closer look, though, reveals nasty complications.

Antennas, on transmit, if well-designed and properly and matched, are marvelous radiators. They convert nearly all of the transmitter power into useful signal.

Now, reverse the process for receive. Passing radio waves cut across the antenna and turn into electrical currents that drive the receiver. These currents, however, are moving along the antenna elements. Isn't this the same thing that happened during transmit? Though receive currents are much weaker than they are on transmit, they also radiate a signal. So there's a double action on receive; part of the energy goes down the line to the receiver as useful current flow; part of it evaporates back into the air as re-radiation. It's about a 50/50 split, so half the received signal is lost.

But, before you write a complaint letter to the company that made your antenna, ponder this. The power loss sounds large, yet in practical operation it isn't too serious in terms of what the ear hears from the loudspeaker. The action also explains why multi-element antennas (like beams) pack on extra iron. The added elements pick up that re-radiated energy and send it back into the line. So the loss in a conventional antenna is just about as alarming as Granny's leaky AC sockets.

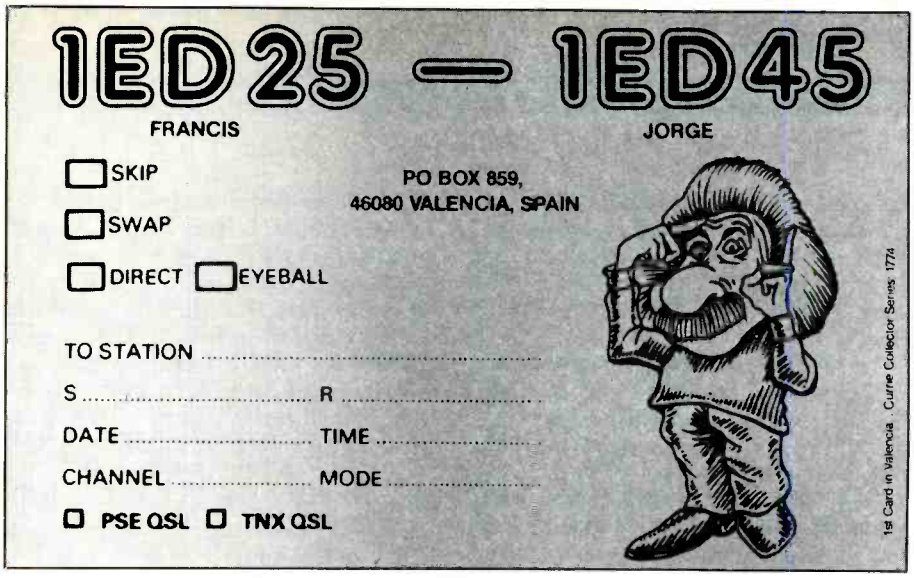
Home On The Range

Estimating antenna range can be like buying junk bonds. Looks good on paper, but try to spend the profits. Trouble is that unknown factors weigh heavily. A respectable antenna pattern should resemble a dough-nut, expanding outward in a smooth fashion. But in actual practice, the pattern is more like a puffed-out pretzel.

Objects near the antenna tend to warp and distort the symmetry of the pattern. Such disruptive objects can include overhanging wires, other antennas, vegetation, structures, and even the underlying earth. So, judging from range purely on theory (distance vs. signal strength) rarely produces an accurate or useful answer.

But a chart, such as given in Table 1, is interesting in another respect. It won't read out operating range with pinpoint accuracy, but it indicates something about differences in antenna height. Most significant: if you are going to raise your antenna, to increase your range, it's got to go up by more than a foot or two to make enough of a noticeable difference to be worth the bother.

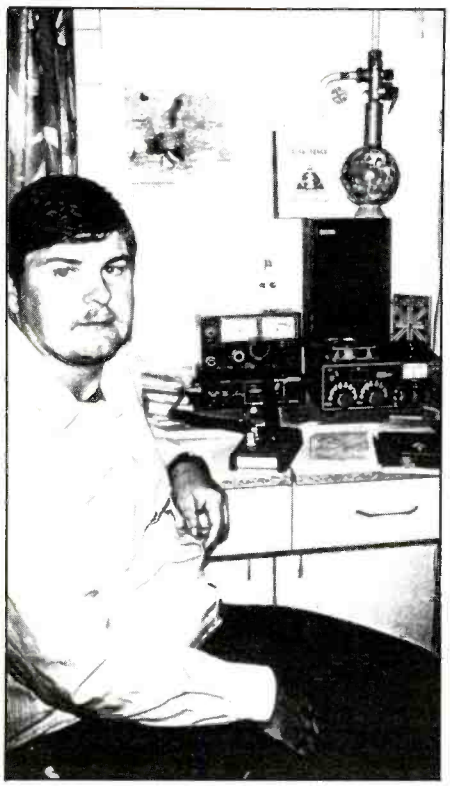
The chart is based on a typical AM transmitter and antenna working at reasonable efficiency. It doesn't take into account, say, a large nearby obstacle that could block the signals. In that instance, even a few extra feet, enough to clear that obstacle, can significantly improve range in the blocked direction.



A QSL from Francis, 1ED25, in Valencia, Spain.

Antenna Height	Approx. Range (miles)
10′	4
15′	4¾
20′	5½
25′	6¼
30′	6¾
40′	7¾
50′	8½
60′	9½
70′	10
90′	11½
100′	12
150′	14½
200′	16

Table 1. A range chart, subject to much variation due to differences in terrain, noise, co-channel interference, height of receiving antenna, etc.



Here's Frank, 14-AT-545, of Paris, France.

QSL from 14-AT-545, in France.

A Salty Inquiry

A letter from Bart LoPresto, of Indiana, concerns a mike problem. Bart purchased a mobile CB rig that came with a dynamic mike, but he felt it wasn't loud enough. He then bought a crystal mike and hooked it up. It worked fine for several months, but last fall it quit on him one rainy day. He's back on the stock dynamic mike again, but he's not at all happy. He wonders if we can offer any thoughts.

We think Bart was hit by the one major disadvantage of the crystal mike, the fact that it is a crystal. To be specific, it is a crystal of Rochelle Salt, a substance that tends to sop up moisture as efficiently as a shaker full of table salt left out on your picnic table on a rainy day! They're great for base station use, where the temperature and humidity are under some control.

In a mobile unit, it's a wonder the crystal mike lasted through the summer. I lost several crystal mikes stored in my garage once when I forgot this basic fact and left them out there when the rains came. Try a ceramic mike instead of a crystal next time. If it's made by the same firm under approximately the same model number, it will deliver the audio you want, and will hold up under the rigors of temperature and moisture found in mobile installations.

From The Mail Sack

A letter was received here from Francis, 1ED45, an enthusiastic *POP'COMM* reader in Spain. He'd like to hear from operators in the USA and Canada, and advises that there are nor 200,000 CB'ers in Spain. Francis is also a scanner fan, and owns an AOR AR-1000 unit. Those who would like to send him a card or letter can write to: Francis Garcia, 1ED45, P.O. Box 859, 46080 Valencia, Spain.

We also heard from Frank, 14-AT-545, who hails from Paris, France. Frank is a new *POP'COMM* reader, and asks if we can tell him how many national publications covering CB there are in North America, as there are three in France. So far as we are aware, *Popular Communications* is the only national publication presently on sale in North America that regularly carries coverage of 27 MHz communications.

Those who would like to get in touch with Frank can write to: 545 Frank, BP 6, Vanves Cedex, 92173 France.

Charles Howard, of Florida, sent us a clipping from the *St. Petersburg Times* that wasn't fun to read. It tells of an incident that began on CB Channel 17 in Tampa and ended in something really scary. *Greek*, a local CB'er who monitors Channel 17 says he has been threatened over the air by several other operators for the past few months. He believes it may be related to jealousy over a CB repair business he runs as a sideline.

For whatever inspired the threats, it was apparently the motive for someone sending a powerful bomb crashing through the front window of his home at about 2 a.m., causing several thousand dollars worth of damage. *Greek*, who was partially deafened by the sound of the bomb, said that if it wasn't for the fact that a TV set near the window blocked some of the force of the blast, it might have killed him. The blast tore a hole in the front wall, put the curtains on fire, and sent shards of jagged glass all over the house.

Shortly after the blast, another CB'er heard a voice on Channel 17 announce, "*Greek*, did you like your present?"

The incident was being investigated by the Tampa Police, the Fire Marshal's Office, the BATF, and the FBI.

Too bad to see that such things take place in connection with CB radio. There are a lot of channels. If you don't like somebody on one channel, then you'd think it would be easier to take it to another channel than trying to kill the guy.

We'll leave you with that thought for April. Keep us posted with clippings, QSL's, questions, shack photos, and whatever you have relating to CB radio. ■

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Once in awhile we win one. Kol Israel, which had cut overseas broadcasts, reinstated them about three months later, on order of the government's Minister of Education and Culture. Not only that, but the station was ordered to improve audibility in its target areas. The initial schedule for English language broadcasts to North America was 0000-0030, 0100-0125 and 0200-0225 on 7465, 9435 and 11605; 0500-0515 on 11588; 1100-1130 on 11588 and 17545; 1430-1500 on 11588, 11605, 15640 and 17575; 1800-1815 on 11675; 2000-2030 on 11675 and 2230-2300 on 7465, 9435, 11588, 11605, 11675. Thanks to Israel Radio's London office for this information.

Last month we mentioned the still-hard-to-believe news that Deutsche Welle would be relayed by some of Russia's former jamming transmitters. If you want to try for this historic pairing here's the most recent schedule (all beamed to the Far East and Southeast Asia): 0200-0250 English, followed by Pashto at 0300-0350. Dari airs at 0800-0850 on that frequency. 1000-1400 is German on 11730, 1100-1150 Japanese on 15560, 1400-1515 Urdu on 9875, 1515-1600 Hindi on 9875, 1600-1650 English on 9875 and 2200-0000 German on 9885.

One of the private Canadian broadcasters relayed on shortwave has changed the call of its mediu mwave outlet. So, instead of mediumwave ID's for CFCF-Montreal on 6005 we're hearing the call letters CICQ. The change was apparently part of a switch to an all country-western format. Several monitors have noted that the ID's for the shortwave relay continue to be CFCX so perhaps that call hasn't changed.

One of the toughest European shortwave targets has been even tougher for the last several years: it's been off the air! Now comes the good news that the Polish Pathfinder's Station has resumed shortwave broadcasts. It'll still be an excellent catch though—running what's believed to be just one kilowatt. The schedule is 0900 to 1700 on 7205, all in Polish.

Preacher Gene Scott is reported to be making progress along the path to put shortwave on the air from the Caribbean island of Anguilla. We can very likely expect to add this new country to our logs sometime this year.

Another religious group has plans to put yet another religous station on the air from the US. Worldwide Gospel Radio is building a new shortwave station near Upton, Kentucky which will have 2-50 kilowatt transmitters.

The longtime Mexican station, La Voz de Veracruz, which has been inactive for sometime, is reported active again on 9546 (nominal 9545). Look for it, in Spanish, around 1200.

Watch for signals from a new station out of Honduras, to be operated by Jeff White's Radio Miami International. Frequencies of 9950 and 15670 are said to have been granted. The station will use one kilowatt but, as yet, we've seen no indication of when to expect this one to get on the air.

Radio Surinam International has discontinued its broadcasts, which were aired over the facilities of Radiobras, Brazil and ran on 17755 at 1700 Monday through Friday.

Over recent months Radio Havana Cuba has run single sideband tests on 5960 and has also run tests on 6000. There's a chance that RHC may put a transmitter on the air on the 120 meter band, mostly for DX'ers to chase. It could even be active now. By the same token the whole thing may never happen. Still, it's worth a run through this band now and then just to check.

Lots of changes are being reported at Radio Tirana, mostly in the form of a far more open programming style. Glasnost comes to Albania, sort of. But there have also been cutbacks. The station has kaboshed broadcasts in Hungarian, Polish, Czech and Portuguese.

HCJB has instituted a regular telephone call-in program, hosted by HCJB's Ken MacHarg. The program will focus on a particular topic each week, feature special guests and invite phone calls from listeners around the world. For callers in the US, at least, the number is 011-593-2-241-560. The show, "Open Line" airs Monday evenings, US time, at 0130 UTC.

MAIL CALL: David Gasque in Orangeburg, South Carolina is wondering about how to address mail destined for various parts of the former USSR, now that there isn't a USSR anymore. At this writing there weren't any sure answers to this one yet. We noted last month that the USPS had recognized the independence of Lithuania, Latvia and Estonia, so those country names will work by themselves. But it's a rapidly changing scene, so check with your local post office periodically, especially since the US government granted recognition to other USSR republics. The post office wants letters addressed "by the book" so if we want our letters to at least get out of the country we'd better follow along until they change the book.

In Princeton, IL Todd Borsch is tuning shortwave again after a nine year break and he notes with regret that a number of stations aren't broadcasting to the US anymore, particularly Radio USA, and some seem to be gone completely. There's a never-ending parade of comings and goings on shortwave, Todd. You asked about the Voice of Chile and that's been off for a number of years, due partly to politics. Radio Uganda is still on the

Kol Israel has resumed its international services, including English to North America.

BRT in Belgium sent this card to Todd Borsch, Princeton, IL more than a decade ago.

SBC, Singapore sent Larry Zamora this bookmark with his QSL.

air with its domestic service (heard rarely on 4976 or 5026 around 0300) but the international service has shown up only briefly and rarely. Every now and then they say there are plans to reinstate it. It appears the facility is in considerable disrepair.

Larry Zamora is pleased with replies from CFRX in Toronto and the Singapore Broadcasting Corporation. Larry says their QSL card features a great view of the city skyline. Larry is currently awaiting a reply from Malaysia.

Marie Lamb in Brewerton, NY reports a reply from Radio Damascus and recent replies from RAI, Radio Budapest, UAE-Dubai, Radio Norway and Radio Austria. She also got one of the numbered, first-day cards for the new VOA-Bethany transmitters.

Another New Yorker, Jonathan Baldwin of Endicott says he especially enjoys the tropical bands, and does his listening with a Kenwood R-600 and a couple of Sangean portables. He'd like to correspond with other R-600 owners. His address is 34 Jane Lacey Dr, Endicott, NY 13760.

Bill Moser in New Cumberland, PA says a recent first time logging of Radio Pakistan is due to a logging he spotted in this column. That's one of the reasons we're here, Bill!

Hope to hear from *you* next month! We welcome your logs but we do ask that you follow a couple of very simple rules. List your catches by country, leave some space between each one so we can cut and sort and put your last name and state abbreviation after each so we know who the logs belong to after they're cut!

Your letters with QSL notes, comments, station news, schedules and what-have-you-are also welcome. We're in real need of shack photos, too! If you haven't sent in your photo yet why not do it this month!

Here are this month's loggings. Broadcast language is English (EE) unless otherwise noted as Spanish (SS), Arabic (AA), etc. All times are UTC.

SWBC Loggings

Albania: Radio Tirana, 9760 at 0233. (Rocker, NY)
Antigua: BBC West Indian relay, 5975 at 0008. (Moser, PA)

Radios by the names of yesteryear (Allied, National, Worldstar) are featured in the listening post of Douglas Schweitzer, Nebraska City, NE.

Abbreviation Used In Listening Post

AA	Arabic
BC	Broadcasting
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America
nx	News
OM	Male
pgm	Program
PP	Portuguese
RR	Russian
rx	Religion/ious
SA	South America/n
SS	Spanish
UTC	Coordinated Universal Time (ex-GMT)
v	Frequency varies
w/	With
WX	Weather
YL	Female
//	Parallel frequencies

Argentina: RAE, 11710 at 0100. (Borsh, IL)
Radio Nacional, 6060 at 0504 with Argentine music, IDs, SS. (Lamb, NY)

Ascension Island: BBC relay, to Africa, 11790 at 0628. African news and "Network Africa." (Lamb, NY)

Australia: Radio Australia, 9580 at 1303 with news. (Moser, PA) 12000 at 1849. (Lamb, NY) 13605 at 1550 pops and "International Report." (Carson, OK) 15365 at 0600. (Borsch, IL)
VNG time station, 16000 at 0611, time pips, ID, frequency, address at 0614. (Lamb, NY) 0500. (Borsch, IL)

Austria: Radio Austria International, 6015, via Canada, with DX program at 0635. (Rocker, NY)

Belgium: BRT, 21810 at 1320. Women in business. (Carson, OK)

Benin: ORTB, 4870 at 2124 in FF with ID, news, IS at 2130, pops. (Lamb, NY)

Brazil: Radio Nacional Amazonia, 6180//11780 at 2255 with Latin music, PP ID 2259. (Moser, PA)
Radio Liberal, 3324.85 at 1055, ID in PP 1100, followed by talk and occasional music. QRM from CHU. (Gasque, SC)
Swiss Radio International via Radiobras transmitter, 17730 at 0220. (Carson, OK)
Radio Intergracao, 4765 at 0313 in PP. (Baldwin, NY)
Radio Journal do Brazil, 4875 at 0322, music. PP. (Baldwin, NY)
Radio Nacional, San Gabriel Cachioera, 3375 at 0253 wiht US music, ID, news in PP. (Lamb, NY)
Radio Cultura, Sao Paulo, 9615//17815 in PP at 2315 with ID, news. (Lamb, NY)
Radio Brazil Central, Goiania, 4985 at 0803 with PP ID, Brazilian pops. (Lamb, NY)
Radio Globo, 6120 in PP at 0810 with pops, ID, coo-coo clock. (Lamb, NY)
Radio Super, Roraima, 4875 at 0745 in PP with pops, commercials, ID at 0800. (Lamb, NY)
Radio Inconfidencia, 6010 at 0649 in PP with pops, ID, station spots with music by Vivaldi and Bach. (Lamb, NY)
Radio Guiaba, 6000 at 0725 in PP with IDs, easy listening music. (Lamb, NY)
Radio Marajoara, 4955 at 0213 in PP with IDs, pop music. Heavy QRM from CW on this frequency. (Lamb, NY)
Radio Cancao Nova, 4825 at 2257 with ID, commercial, news in PP. 9675 at 0009 in PP with religious talk, religious music in PP and EE. (Lamb, NY)
Radio Universo, 9565 at 0747 in PP with religious speech before a crowd, ID, religious music. (Lamb, NY)
Radio Bandeirantes, 9645 (not the 6090 I reported earlier) 0059 in PP with time, pops, ID, presumed news. (Lamb, NY)
Radio Aparecida, 5035 at 0704 in PP with pop music, laser effects, ID's. (Lamb, NY)

Bulgaria: Radio Sofia, 11660 at 2157 with music. (Moser, PA) 11720 at 0314 with their world service. (Carson, OK)

Canada: CFRX relaying CFRB on 6070, 2159 with sports. (Moser, PA)
BBC Sackville relay, 9590 at 2159 with ID, news. (Moser, PA)

Radio Japan Sackville relay, 6120 at 1120 with discussion. (Moser, PA)

CHNX, Halifax on 6130 at 0803 with rock, ID, station promo, weather. (Lamb, NY)

CFCX at 1950 on 6005 with IDs, country, commercials, traffic reports. The relayed mediumwave station is now CICQ (ex-CFCF, editor). (Lamb, NY) (Unsure yet whether CFCX call was retained. editor)

Radio Canada International, 5960 at 0030, ID and program "Double Exposure." (Mullican, TX)

CHU time station, 7335 at 0158 with time signals. (Mullican, TX)

Radio Austria International, via Sackville, 9870 at 0343. (Carson, OK)

CBC Northern Quebec Service, 9625 at 0547 with jazz and classical music, ID, frequencies, address, news. (Lamb, NY)

Central African Republic: RTV Centrafricaine, 5024 at 2048 in FF with Africa and easy listening music. (Lamb, NY)

China: Radio Beijing, 9690//9770 at 0337. (Rocker, NY) 11715 (via Mali) at 0313 and 11840 at 0430. (Carson, OK)

Fujian Peoples Broadcasting Service, 4975 in CC with EE lessons, time check and ID at 1400. (Zamora, CA)

Colombia: La Voz del Rio Arauca, 4985 at 0219 in SS with pops, station ID jingle. (Lamb, NY)

Radio Bucaramanga, 4845 at 0207 in SS with pops, Caracol and Bucarmanga IDs, news. (Lamb, NY) (This station is frequently inactive. Editor)

Caracol Bogota, 6075 at 0631 in SS with Caracol ID, pops. 6150 at 0706 in SS with, tangos, mambos, commercial for Esso gasoline. (Lamb, NY)

La Voz del Cinaruco, 4865 at 2318 in SS with Latin music, ID, news, Coca-Cola commercial. (Lamb, NY)

Ondas del Meta, 4885 at 2306 in SS with pops, ID. (Lamb, NY)

Congo: RTV Congolaise, 4765 at 2135 in FF with African music, IDs. (Lamb, NY)

Costa Rica: Radio For Peace Int'l, 7375USB at 0110, 21465 at 0237. (Carson, OK) 15030 at 0140. (Miller, GA)

AWR/Radio Lira, 9725 at 2359 with ID, mailing address, "Perfect Peace" program. (Zamora, CA)

Faro del Caribe, 5055 at 0427 in SS with religious music, ID, "Momento de Decision." (Lamb, NY)

Cuba: Radio Havana, 11950 at 0011, news about regional integration in broadcasting. (Moser, PA) 17705, 2208 music, news. (Carson, OK)

Czechoslovakia: Radio Prague International, 5930//7345 at 0017 with DX program. (Rocker, NY)

Ecuador: HD2IOA, time station, 3810 at 0702 with time pips, SS time announcements each minute. (Lamb, NY)

Radio Quito, 4920 at 0240 in SS with pops, IDs, commercials. (Lamb, NY)

Radio Catolica Nacional, 5030 at 0058 with folk music, SS talks, IS of Beethoven's "Ode to Joy," ID, religious talk. (Lamb, NY)

HCJB, 9695//11730 at 0705 with mailbag. (Rocker, NY) 17790 at 2156 with music. (Moser, PA) 21480 at 1910. (Carson, OK)

Egypt: Radio Cairo, 9900 at 2158. Mideast economic conditions and agriculture. (Moser, PA)

England: BBC, 3955 at 0630. Music from the 30's. (Gasque, SC) 7325 with country. (Mullican, TX) 9915 at 0009, farm news. (Moser, PA)

Finland: Radio Finland International, 9560 at 0230. (Borsch, IL; Miller, GA) 15185 at 2300 at 2300 with news & discussion of regaining territory lost to USSR in WWII. (Moser, PA) 15400 at 1334 with "Northern Report." (Carson, OK)

France: Radio France International, 3965 at 0615, man and woman talking, pops. (Gasque, SC) (Presume FF, Editor) 4890, via Gabon, 0500 with time check, ID in FF. (Zamora, CA) 17650 at 1400 with news, press, sports, arts in France. (Miller, GA) Here and //21770 at 1443. (Rocker, NY)

Gabon: Africa Number One, 17630 at 1545 in FF with African music, drum IS at 1555 sign off. (Lamb, NY)

Germany: Deutsche Welle, 3995 in GG at 0310. (Baldwin, NY) 7225 via Rwanda at 0440. (Rocker, NY) (Language? Editor) 17765 with sign on and news at 1500. (Zamora, CA) 21600 at 1121 with history feature. (Moser, PA)

Bayerischer Rundfunk, 6085 at 0242 with "music of your life" type format. DW Sackville relay over the top at 0259 but ID heard during break between DW IS and talk. Good signal before DW came on. (Gasque, SC)

VOA Munich, 3980 from 0545 in GG. EE ID at 0600 and news and "VOA Sunday Morning" at 0610. (Gasque, SC)

Ghana: GBC on 3366 at 21335 in EE with talk about South Africa. Also 4915 at 2302 with choral music to 2303 sign off. Also at 0558 with African music, IS, news in EE at 0600, into vernacular at 0616. (Lamb, NY)

Greece: Voice of Greece, 7430 at 0153 with EE news, into Greek talk and music at 0154. (Gasque, SC) 11645 at 0655 in Greek. (Lamb, NY)

Macedonian Radio, 11595 at 1756 in Greek, folk and pop music, ID and presumed news. (Lamb, NY)

Guam: KTWR, 11650 at 1555 with "Wesleyan Hour," ID 1557 and "Verse by Verse" program at 1559. (Zamora, CA)

Guatemala: Radio Tezulutlan, 4835, 0109 in SS with marimbas, mention of station's city—Coban. (Lamb, NY)

TGNA/Radio Cultural, 3300 at 0158 with EE religious music, ID and religious radio drama. (Lamb, NY)

Hawaii: WWVH, 5000, 1120. Woman with time checks. (Moser, PA)

Honduras: Radio Luz y Vida, 3250 at 0234 in SS in 3250. IDs, guitar, presumed religious talk. (Lamb, NY)

HVRC, 4820 at 0253 with religious talk in SS. (Lamb, NY)

Hungary: Radio Budapest, 9835 at 0300. (Miller, GA) 11910 at 0300. (Borsch, IL)

Iceland: INBS, 9265 in Icelandic with classical piano and opera 0732-0745, man announcer in between. Woman with news at 0745, classical music again from 0751, YL with ID and frequencies at 0757. (Gasque, SC)

India: All India Radio, 11620 at 2202 with news. (Moser, PA) 11630 heard here one day only, 1853 with tourist program, ID, news. Back on 11620 at this time the next day. (Lamb, NY)

Iran: VOIRI, 9022 at 0241. (Rocker, NY) (Language? Editor) 0028 with ISA and hour long EE program. (Lamb, NY)

Iraq: Radio Baghdad, 11830 at 0039 with mideast music, ID in AA. Off abruptly at 0100. (Lamb, NY)

Israel: Kol Israel, 7465 at 0212 in Hebrew. (Lamb, NY) 11588 at 0500 with restored EE news, into FF at 0515. (Lamb, NY; Rocker, NY) 15095 with relay of home service program D at 0511 in AA. 15615 Reshet Bet service at 0346 in Hebrew, 17545 at 0706. (Lamb, NY)

Italy: RAI, 9575//11800 at 2341 in Italian. (Lamb, NY) 0108 with EE news. (Carson, OK)

Ivory Coast: RTV Ivoirienne, 7215 at 2331 in FF. (Moser, PA) 0500 with national anthem, frequencies in FF, African and reggae music, news. (Lamb, NY)

Japan: Radio Japan, 5960 via Canada at 0330. (Mullican, TX) 9505 at 1407 with ID, news. (Zamora, CA) 11735 via Gabon at 2250. (Rocker, NY) 15195 at 1310, in CC? (Northrup, MO) 17825 at 0550. (Lamb, NY)

Jordan: Radio Jordan, 11940 at 0607 with AA music and call-in show, mentions of Amman. (Lamb, NY)

Lesotho: BBC relay on 3255 at 0313 with news, sports. Heavy fading. (Lamb, NY)

Lithuania: Radio Vilnius, 11790 at 2300 sign on. Beijing QRM. (Carson, OK) 15180 at 2303, poor. (Moser, PA) 17605 0000. (Borsch, IL) 17690 at 0017. (Lamb, NY)

Luxembourg: Radio Luxembourg, 6090 at 2243 in German with rock. (Lamb, NY) 0013 in EE. (Moser, PA)

Madagascar: Radio Netherlands relay, 21480 at 1531 in Dutch with international news. (Carson, OK)

Mali: Radio Beijing relay, 11715 at 0007 with news. (Moser, PA)

RTV Malienne, 5995 at 0709 in FF with news, local music, ID. (Lamb, NY)

Malta: Voice of Mediterranean, 9765 at 0600 in EE. (Borsch, IL)

Mauritania: ORTM, 4845 at 0722 in FF with chants, ID and news. (Lamb, NY)

Mexico: Radio Mil, 6009 in SS at 0429 with lots of SS pop music, ID's, commercials for Autocraft and Ford. (Carson, OK)

Radio Educacion, 6185 at 0735 in SS. Latin pops, ID. (Lamb, NY)

Monaco: Trans World Radio, 9480 at 0746 with religious talk. (Lamb, NY)

Morocco: RTV Marocaine, 15335 at 0050 in AA with interview, local music to 0059 close. (Lamb, NY)

Namibia: Radio Namibia, 3290 at 0402 with news, commercials for Chrysler, Rembrandt cigarettes and Coke classic. Gone by 0415. (Lamb, NY)

New Zealand: Radio New Zealand, 9700 at 0700; 0750; 0825; 1201. (Lamb, NY; Borsch, IL; Rocker, NY; Moser, PA)

Netherlands: Radio Netherlands, 6020//15560 at 0050. Also 1509 on 13770. (Carson, OK) 15570//17605 at 1828 to Africa. (Moser, PA)

Netherlands Antilles: Radio Netherlands Bonaire relay, 11720 at 0350. (Carson, OK)

Trans World Radio, Bonaire, 11815 at 1118 with feature on Caribbean travel. (Moser, PA) 15345 at 1200. (Carson, OK)

Niger: La Voix du Sahel, 5020 in FF at 0532 with African music, IDs, flute IS at 0545, news. (Lamb, NY)

Nigeria: Voice of Nigeria, 7255 at 0509, lively music. (Moser, PA)

Radio Nigeria, Kaduna, 4770 at 0511 with "News Nationwide." (Lamb, NY)

Northern Marianas: KHBI, 9530 with ID, news at 1400. (Zamora, CA) 11580 at 1557 with IS, ID, news. (Lamb, NY)

North Korea: Radio Pyongyang, 9977//11335 at 1123 with Korean music, man in EE. (Moser, PA)

Norway: Radio Norway at 0301 on 9645 with "Norway Today." (Carson, OK) 15165 with EE ID 2001, news in NN. (Vaage, CA)

Pakistan: Radio Pakistan, 15550 at 1705 with woman and news in EE, several IDs, poor. (Moser, PA) 1840 in AA with Indian and western music, chants, ID and sign off with anthem at 1900. (Lamb, NY)

Paraguay: Radio Nacional, 9735 in SS at 0901 with ID, frequencies, local music. (Lamb, NY)

Peru: Radio San Martin, 4810 in SS at 0943 with Peruvian music, ID, commercials. (Lamb, NY)

Radio Andahuaylas, 4840 at 2302 in SS with presumed news, IDs, brass band music. (Lamb, NY)

Philippines: Radio Veritas Asia, 9615 in CC with presumed religious talk, choral and Chinese music, ID and sign off in EE at 1555. (Lamb, NY)

Portugal: Radio Portugal, 9555 at 2233 with music, PP talks. (Moser, PA) 9705 at 0242 with tourism program, ID, frequencies and times. (Carson, OK)

Romania: Radio Romania International, in EE at 0400. (Borsch, IL) Off 0428. (Carson, OK)

Rwanda: Deutsche Welle relay, 7225 at 0411 with "European Journal" and "Africa Report." (Lamb, NY)

Saudi Arabia: BSKSA, 15060 at 0434 in presumed Turkish, with ID, Arabic music, mentions of Amman, Medina, Jordan. (Lamb, NY)

Senegal: ORTS, Dakar, 4890 at 0711 in FF with African music. (Lamb, NY)

Seychelles: BBC relay, 15420 at 0304 with news. Into Swahili at 0315. (Lamb, NY)

FEBA, 11810 at 0134 in Swahili with IS, presumed religious talk, African music. (Lamb, NY)

Solomon Islands: SIBC, 5020 at 1115 with man in EE, numberous mentions of the Solomon Islands. (Moser, PA)

South Africa: Radio RSA at 0400 7270//11900//15230//15440. 0300 in FF on 11920//15365. (Borsch, IL) 15230 at 0400, special broadcast for India of India-South Africa cricket match. (Miller, GA)

Radio Oranje, 3215 at 0339 in Afrikaans with ID, US and local pops. Faded quickly. (Lamb, NY)

Radio Suid Africa, 4810 at 0321 with pops, ID, news in Afrikaans. (Lamb, NY)

Radio Five, 4810 at 0228 in Afrikaans with US pops, ID, commercials. Into Radio Orion in EE at 0235. (Lamb, NY)

South Korea: Radio Korea, 9570 at 1445 with letters program. (Zamora, CA) 9750 at 1302. (Carson, OK) 11810 at 0600. (Borsch, IL)

Spain: Spanish National Radio on new 9530 at 0515 with news about Spain. (Rocker, NY) 9630 at 0508 with news. (Moser, PA)

Sri Lanka: SLBC, 15425 in EE at 0100. (Borsch, IL)

Swaziland: Trans World Radio, Swaziland, 3200 at 0304 in presumed Ndebele with African religious music. (Lamb, NY)

Sweden: Radio Sweden, 9695 at 0340, 11705 at 0201. (Carson, OK) 17870//21500 at 1535 with "60 degrees North" program. (Rocker, NY)

Switzerland: Swiss Radio International, 9885 at 0210 with "Dateline." (Mullican, TX) 17670 at 0808 in Italian. (Lamb, NY) 1210 African news in German. (Northrup, MO)

Tahiti: Radio Tahiti, 11827 at 0606 with news in FF. Also 15171 in FF with rock, ID, news. (Lamb, NY)

Taiwan: Voice of Free China, 5950 via WYFR at 0315. (Mullican, TX)

Togo: RTV Togolaise, Kara, 3222 at 0537 in FF with jazz and African music. (Lamb, NY)

Tunisia: RTV Tunisienne, 11550 at 0521 in AA with news, local music, ID. (Lamb, NY)

Ukraine: Radio Kiev, 4825 at 0245 in EE with IS, ID, news. (Lamb, NY) 11790 at 0012 with news. (Moser, PA)

United Arab Emirates: UAE Radio on 9600//11965//13605 at 2200 with anthem and sign on, frequencies. (Moser, PA)

United States: WHRI relaying Croatian Radio at 0005 on 7315 with domestic war news to 0008, then world news ending at 0023. ID and into Slavic language. (Gasque, SC) 9495 at 0000 with news to 0010. (Miller, GA)

Radio Marti to Cuba, 9590 at 1330 in SS. (Carson, OK)

KGEI, 15355 at 1210 with SS religious programs. (Northrup, MO)

Voice of the OAS, 15160 in SS at 0018. IDs, address and sign off in SS and EE at 0028. (Lamb, NY)

VOA feeder, Bethany, Ohio, 1575USB at 0351. (Lamb, NY)

Unidentified: 5680 in SS with usual Latin pop and talk. Mentions of "Republica Dominicana" and "Santo Domingo." Possible ID sounding like "Radio Elamys" (e-laam-yez). QRM from a ute. Usually heard all night, i.e. 0100-1100. (Gasque, SC) (No ideas, David. Might be a harmonic but don't see any Dominican Republic MW listings that would match that ID. Quite sure it's not a legitimate SW signal. Editor.)

USSR (former): Radio Moscow, 4860 at 2314 in SS. 8005 USB feeder in RR at 0550. (Lamb, NY) 6000 at 0322. (Rocker, NY) 6045 at 0300. (Mullican, TX) 9600 at 0431, 9755 at 0141, 11730 at 0127, 15425 at 2325, 15470 at 1259 and 17655 at 0259, all EE. (Carson, OK) 15155 at 1210, 15405 at 1220, 17775 at 1210, 17810 at 1205, 17830 at 1210. (Northrup, MO) 15375 at 2100. (Zamora, CA)

Uzbek: Radio Tashkent, 17831 at 1210 in AA. (Northrup, MO)

Vatican: Vatican Radio, 5895 at 2305 in Italian, classical music. 7165 at 0641 with Latin mass. (Lamb, NY) (Seems a new frequency, Marie. Editor) 15090 at 1500 sign on in Hinoi. news. (Carson, OK) 0630 to Africa. (Borsh, IL)

Venezuela: Radio Nacional, 0335 in EE/FF on 9540. (Carson, OK)

Radio Valera, 4840 at 0249 in EE with Latin music, ID, frequencies and national anthem before 0252 sign off. (Lamb, NY) 0321 in SS. (Baldwin, NY)

YVTO/Observatorio Naval, time station, 5000, time checks. Over WWV. (Baldwin, NY) 0303 in SS. (Mullican, TX) 0500 with SS IDs, time checks. (Lamb, NY)

Radio Capital, 4850 at 2323 in SS with Latin music, ID. (Lamb, NY)

Radio Continental, Barinas, 4940 at 0159 in SS with ID, Latin pops. (Lamb, NY)

Radio Rumbos, 4975 (4970? editor) at 0536 in SS with pops, commercials, ID, sign off in SS, EE, FF at 0556. Also heard closing at 0601 another time on 9660. Also 9660 at 2353 in SS with pops, ID, time checks. (Lamb, NY)

Radio Maturin, 5040 at 0227 with pops, ID with "Love Is Blue," as signature tune. (Lamb, NY)

Radio Tachira, 4830 at 0320 in SS with radio drama, commercial for "Johnson's Para Nino's" baby shampoo, sign off af 0354. (Lamb, NY)

Yugoslavia: Radio Yugoslavia, 9555 at 0230. QRM from Portugal on the same frequency. (Borsch, IL) 11735 at 0003 EE to North America. (Carson, OK)

Raise your glass to the following: Jonathan Baldwin, Endicott, NY; Marie Lamb, Brewerton, NY; Todd Borsch, Princeton, IL; Cliff Mullican, Ferris, TX; John Spencer Carson, Jr., Norman, OK; John Miller, Thomasville, GA; Larry R. Zamora, Highland, CA; Bjorn F. Vaage, Granada Hills, CA; David A. Gasque, Orangeburg, SC, Daryl E. Rocker, Frankfort, NY and Mark A. Northrup, Gladstone, MO.

Thanks to all and, until next month, good listening! ■

THE HAM COLUMN

KIRK KLEINSCHMIDT, NT0Z
AMERICAN RADIO RELAY LEAGUE HQ

GETTING STARTED AS A RADIO AMATEUR

Tuning the Amateur Satellites

In a recent issue we talked about amateur satellite modes—what uplink frequency goes with what downlink frequency, and such. This month, let's look at the frequencies used by the ham satellites and the kinds of signals you can monitor.

What's Up There

Today's satellite operators have a veritable "banquet" of satellites available—one for every occasion! I can cover only a limited amount of material here, so refer to the resources listed below for more information.

Radio Sputnik 10/11 carries two electronics packages on a single spacecraft. It carries 15-meter-to-10-meter transponders in addition to other HF/VHF transponders.

OSCAR 13 provides worldwide communications using 23 cm-to-70 cm and 70 cm-to-13 cm transponders.

OSCAR 14 carries a 2-meter-to-70-cm store-and-forward packet radio transponder called the Packet Communications Experiment (PCE), and other scientific experiments.

OSCARs 16 through 19 are the Microsats. These tiny satellites (approximately 9-inch cubes) include Pacsat-OSCAR 16, Webersat-OSCAR 18 and Lusat-OSCAR 19, which carry 2-meter-to-70-cm store-and-forward packet transponders. Webersat carries a small TV camera for Earth imaging. LUSAT includes a 70-cm CW beacon transmitter. DOVE-OSCAR-17 consists of a 2-meter transmitter that can transmit packet or digitized voice messages.

OSCAR-20 is similar to OSCAR 12, the first Japanese store-and-forward packet satellite.

RS-12/13, like RS-10/11, carries multiple HF/VHF transponders.

OSCAR 21, also known as RS-14, is the first Soviet amateur satellite to carry and OSCAR designation. It carries a Mode B transponder and several satellite experiments.

Getting Started

Many amateurs are introduced to satellite operating through the use of the Soviet Radio Sputnik (RS) satellites. These low-flying satellites carry transponders that receive signals on the 15-meter band (21.00-21.45 MHz) and retransmit on the 10-meter band (28.00-29.7 MHz).

Unlike the higher-flying satellites, when using the RS transponders, you don't need to know precisely where the satellite is positioned in the sky. Mainly, you want to know when the satellite will be in view. (Contact AMSAT for information on tracking satellites with your personal computer, its address is listed at the end of the column.) Once you've determined when the satellite is due to rise above the horizon at your location, listen for the satellite's telemetry beacon (see Table 1). This signal is transmitted constantly by the satellite and carries information about the state of the satellite's systems. As soon as you can hear the beacon, start tuning across the downlink passband for signals. (This procedure works with just about every amateur satellite.)

VHF/UHF Satellites

While HF satellites are fun and exciting, there's much to be said for VHF operation. If you have an all-mode (CW and SSB) 2-meter transceiver and an HF transceiver, you're set to operate on these modes.

Phase 3 satellites (OSCARs 10 and 13) spend most of their time at very high altitudes—they're the satellite DXer's mainstay.

OSCAR 13, the only active Phase 3 satellite, contains four transponders. The 70-cm band is common to all of them, as an uplink or a downlink. A more-robust station is needed to work through Phase 3 satellites, so most beginners stay with the RS birds until they're acclimated!

Packet Satellites

A PACSAT is a satellite carrying a packet radio transponder and a computer—they operate much like ground-based packet bulletin boards systems (PBBSs). In fact, it's handy to think of them as "flying bulletin boards!"

Packet satellite operation is similar to terrestrial packet. The same AX.25 protocol is used to communicate with the satellite, but the radio equipment is different. For FO-20, AO-16, WO-18 and LO-19, a phase-shift-keying (PSK) modem is used in with a 2-meter FM transmitter and a 70-cm SSB receiver. The FO-20 satellite uses a store-and-forward system that looks much like a common terrestrial packet bulletin board. The ground stations connect to it via packet radio and issue commands to list, read or store messages.

Most of the store-and-forward PACSATs use a common scheme for communicating with ground stations. This scheme requires special-purpose software at the ground station. Software packages are available from AMSAT.

One-Way Signals

A few digital satellites are intended for monitoring only. The Digital Orbiting Voice Encoder (DOVE), DO-17, simply transmits digitized voice messages or packet telemetry. DOVE's primary mission is education.

If you operate 2-meter packet, your station is DOVE-capable! Monitoring DOVE is a great way to get your feet wet in digital-satellite operation.

Other transmit-only satellites include UO-11 and WO-18. UO-11 transmits on 145.825 MHz and sends mostly telemetry, although it can also send digitized speech.

Webersat (WO-18) transmits using the 1200-baud PSK standard. It contains an onboard camera for earth imaging. Software for decoding and viewing Webersat images is available from AMSAT.

Analog Transponder Frequencies

RS Satellites

	RS-10	RS-11	RS-12	RS-13
Mode A				
Uplink	145.860-145.90	145.910-145.950	145.910-145.950	145.960-146.00
Downlink	29.360-29.40	29.410-29.450	29.410-29.450	29.460-29.500
Beacons	29.357/29.403	29.407/29.453	29.408/29.454	29.458/29.504
Mode K				
Uplink	21.260-21.20	21.210-21.250	21.210-21.250	21.260-21.30
Downlink	29.360-29.40	29.410-29.450	29.410-29.450	29.460-29.50
Beacons	29.357/29.403	29.407/29.453	29.408/29.454	29.458/29.504
Mode T				
Uplink	21.160-21.20	21.?10-21.250	21.210-21.250	21.260-21.30
Downlink	145.860-145.90	145.910-145.950	145.910-145.950	145.960-146.0
Beacons	145.857/145.903	145.907/145.953	145.912/145.958	145.862/145.908

Table 1

Phase 3 Satellites

Satellite	Mode	Uplink (MHz)	Downlink (MHz)
AD-13	B	435.420-435.570	145.825-145.975
	J	144.425-144.475	435.990-435.940
	L	1269.330-1269.620	435.715-436.005
	S	435.601-435.637	2400.711-2400.747
	Beacons:	145.812, 145.985,	435.651, 2400.325

Other Satellites

Satellite	Mode	Uplink (MHz)	Downlink (MHz)
FO-20	J(A)	145.9-146.0	435.9-435.8
	Beacon:	435.795	
AO-21	B(1)	435.102-435.022	145.852-145.932
	B(2)	435.123-435.043	145.866-145.946
	Beacons(1):	145.822, 145.952	
	Beacons(2):	145.948, 145.838	

Get Involved

For satellite newcomers, the Radio Amateur Satellite Corporation of North America (AMSAT-NA), a nonprofit amateur group, is the place to turn for information, software and other goodies. For information, send a self-addressed, stamped envelope (SASE) to AMSAT, PO Box 27, Washington, DC 20044.

It's easier than ever to add satellite communications to your list of operating modes. With new technologies on the horizon, it promises to become even easier in the future. Just like CW, RTTY, DXing, contesting and so on, satellites can become an integral part of your enjoyment of Amateur Radio. Don't be fooled into thinking that satellite operating is only for wealthy hams with lots of equipment and real estate. It's for you too!

Send your photos, letters and suggestions to me at ARRL, Department PCN, 225 Main Street, Newington, CT 06111.

Information Sources

The Satellite Experimenter's Handbook, 2nd edition, ARRL (Order #3185, $20). This is a complete guide to amateur satellites.

A Beginner's Guide to OSCAR 13 ($7) and *The PACSAT Beginner's Guide* ($10) walk you through the process of setting up your station for OSCAR 13 or the PACSATs, respectively, then show you how to operate these satellites. Available from AMSAT. ■

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

BY ROBERT MARGOLIS

Some U.S. Army posts may be running computerized packet radio bulletin board systems over HF Radio for purposes other than sending Military Affiliate Radio System (MARS)-related traffic.

The transmissions were not eye poppers. From what I saw they were rather ho-hum in content. But because unorthodox, nonmilitary type callsigns were being used, I wanted to know the underlying purpose for the bulletin boards.

I monitored two heavily used frequencies of 14646.5 and 14897.8 kHz incessantly last autumn and winter, but hardly learned much about the apparent military masquerade.

All messages were sent during the daylight hours. One station with the callsign WE1COM was transmitting from Fort Monmouth, New Jersey. Fort Monmouth is the home of the U.S. Army Communications-Electronics Command. The station operated on 14646.5 kHz, and seemed to be in charge of the BBS that was used regularly by KF2XEW, RFC, Rochester, New York; PI9STC, Staelduin, The Netherlands; and VE9LBQ, CRC, Ottawa, Ontario, Canada. I first wrote about these stations in last month's column and learned about Fort Monmouth's role afterward. The location, and mention of CECOM, the communications-electronics command, came out in a couple of packet radio transmissions.

I came across a packet radio transmission at 1706 UTC on 14896.6 kHz, between "P9I60" and I2J80." The entire transmission, which lasted about a half hour, is shown in figure 1, to give you the flavor of the activity that occurred.

A week later, I came across "T8E81" on 14897.8 kHz, talking to "R9C39" on packet radio at 1725. The gist of the transmission was remarkably similar to that between "P9I60" and "I2J80" viewed a week earlier. I think "P9I60" and "T8E81" are the same station, because some sentences were worded the same in both transmissions, and the word "equipment" was always misspelled "equiptment." One example of the same sentence found in both transmissions was "3. Equiptment (sic) status: inop have Harris radios but do not expect them to be installed. Requested to possibly be deleted from this net due to post closure." The words "post closure" gave me more reason to believe that the U.S. Army is somehow involved with the BBS's.

In a transmission to "T8E81" on 14897.8 kHz," "R9C39" described in a series of training messages the equipment used to run the BBS. "The controller," said "R9C39," "is a solid-state, microprocessor-controlled unit that works in conjunction with the R/T to provide automatic network frequency management with other stations equipped with a controller.

Does anyone know what station sent this Russian-language transmission and where it's located? The RTTY editor says he logged it on 10540 kHz at 0700 UTC. The speed was 50 baud.

"The modem is a solid-state modulator/demodulator that permits radio data communications via the R/T. It can accept data or CW keyed inputs and outputs with a frequency range of 400 to 4,000 Hz.

"The log periodic antenna is a directional, long-range antenna that consists of a planar array of dipole elements mounted on a support boom, a 40-foot support mast, an antenna rotator, and a remote control that activates the antenna rotator to control antenna direction.

"The R/T is a solid-state, synthesized sideband (SSB) transceiver that operates in the high frequency (HF) band. The R/T can operate in USB, LSB, AME, CW and AFSK modes and will accept or receive voice or data from a microphone CW key or other source.

"The whip antenna consists of eight antenna sections that screw together to form a 32-foot antenna which screws into a mounting base. The mounting base has flange at the bottom which is used to mount the antenna to a flat surface. The antenna cable is connected to a terminal lug located on the side of the mounting base."

"T8E81," said that stations on the BBS "are identified by letter-number callsigns obtained from the unit CEOI."

The frequency used by "T8E81" and his companion was also the spot where I caught "A1B" sending RY's to "A1D" on packet radio at 1656 UTC on Dec. 11. About half an hour later, "A1B" signed off with "wewewe bye bye."

I also picked up a conversation on lower sideband that involved an experimental radio station in Florida which was testing some type of modem hooked up to a fax machine.

The base station was KK2XCE, Sunair

Electronics, Inc., Fort Lauderdale, FL. It was trying to send a mechanical drawing, showing a block and pulley, to a second station called "Portable One." This occurred on on 17555 kHz at 1838 UTC. The drawing was sent in data mode via modem at 2400 baud from one fax machine to another.

It appears from what I heard that the data transmission was sent in 61.2-bit block chunks at two bits per second. "Portable One" said he had problems receiving the picture because his "1102 failed to respond" to an incoming signal. At the end of the test, KK2XE said that the transmission was "no worse than what you experience over the telephone."

Nothing can be as frustrating during a RTTY monitoring session as tuning in an interesting transmission which suddenly ends, leaving one without knowing who is running the station, or where it's located.

I was twirling the dial across the 14 MHz band, shortly before 1500 UTC last December, and had my decoder preset to 75 baud from monitoring a station elsewhere on the band. As the radio's frequency showed 14831.5 kHz, some words began to appear on the video monitor, "Work out corrective action," the green-colored letters read, "Julius Caesar sends. NNNN."

That message had gotten my attention, so I waited eagerly to see more. Ten minutes went by. Then 30 minutes. Then an hour. Nothing more was heard. The silence was broken only by an occasional data burst from a station 500 Hz higher in frequency. I threw my hands up in despair and sighed. I reflected on my misfortune and remembered that Julius Caesar never was one of my boyhood heroes. His spirit must've come back to get even with me.

"Jeca" is a Portuguese word used in Brazil to mean a crude country man. Is it supposed to fit the description of the person who operated a packet radio station 24 hours daily, including weekends and holidays several months ago on 6751.2 and 6756.3 kHz?

I came across the code name "Jeca" for the first time last November 22, and heard it every day until the night of December 17, when both frequencies fell silent. "Jeca" would always send what appeared to be encryption to "CQ." The transmissions on each frequency differed in the contents of the packet data.

Examining the data for a particular day, one could notice some similarities in the way the packet data began. In Figure 2a, the first three characters are are always "2," space, lower case "d." The fourth consisted of capital letters running in alphabetical order, I through O in our example. The remainder of the packets appeared scrambled, but with some slight similarities in content. Figure 2b shows "2," space, and an ampersand, as the initial three characters. The fourth character, again in alphabetical order (here as L through O), was this time in lower case.

As a third example (figure 2c), the first three characters, "2," space, and semicolon,

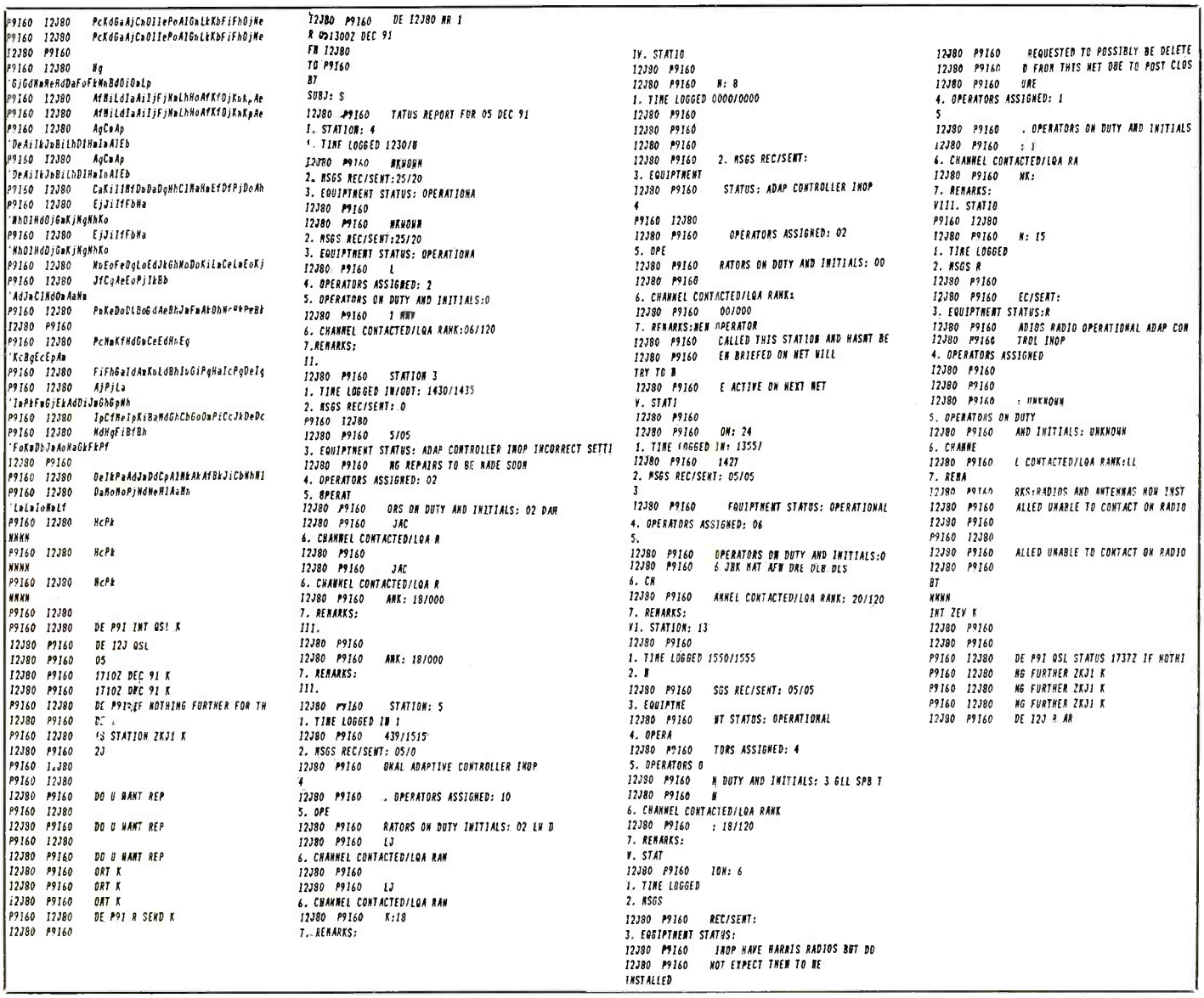


Figure 1

are used consistently, but the fourth character has changed. Other similarities can be readily seen: most left parentheses have asterisks before them, the frequent use of the character string "fgm," and the character string "QahY}" appears on every line while the the numbers after them are in numerical order (4 to 7 in the example).

The packet always differed from day to day. They would always be seen in the "U" packet frames. Nothing was ever observed in the "I" frame.

Fred Hetherington of FL sent in an interesting logging which he and I believe originated in Malaysia. At 1100 UTC last November, Fred tuned to 8632 kHz and saw a 75-baud transmission containing the Malaysian callsign of 9MR, and traffic being sent from one small village to another.

He said he spotted among some RY's and SG's headers reading "9MR/11/15 RMMJ MRB" and "FM COMCENLUMUT TO KE LEKIR." Lumut is on Malaysia at 4.13 north and 100.39 east, and Lekir is a short distance away at 4.07 north and 100.44 east.

I'm wondering if this transmission was from the Royal Malaysian Navy, or the Royal Malaysian Police, which operates a huge fleet of armed patrol launches. Fred said the signal became unreadable by 1300 UTC, but that he heard it again later the same day at 2245 UTC with the same tape being sent. The earlier transmission was the stronger of the two, he adds.

The British Royal Navy has a new RTTY station on the air, which I found transmitting last December on 6336.3 and 14634 kHz. It is MTO, Rosyth Naval Radio, England, and has test transmissions similar to those seen in recent years from GYA, London (see figure 3). The transmitting speed is 75 baud.

A station using the callsign WJI was on 17526.2 kHz at 1506 UTC sending RY's at 100 baud (see figure 4), followed by Q- and Z-codes, and either encryption on badly garbled text. I wrote a letter to Igert, Inc., Paducah, KY, whose shortwave radio station call letters are WJI. It came back from the U.S. Postal Service rubber stamped "Returned to sender. No mail receptacle." Well, it was worth a try.

In December's column, I mentioned that I had not heard RTTY signals for a long time between Kitt Peak National Observatory Tucson, AZ, and Cerro Tololo Observatory in Chile. They operated on the 20 MHz band in the 1980's. Reader Michael Matus of CA saw the item and made an inquiry. Kitt Peak's answer was, ". . . we no longer use the teletype circuit with CTIO. The machine is unplugged; it maybe possible to use it. But we no longer do. We are now slaves to email (sic) and the telefax."

RTTY Intercepts

518: NMA, USCG, Miami, FL, w/Navtex B/C at 0559, FEC; NMN, USCG, Portsmouth, VA, w/Navtex B/C at 0730; & NMG, USCG, New Orleans, LA, at 0900. (Ed.)

2137.5: WLC, Rogers City R., MI, w/Great Lakes wx, FEC at 0317. (Ed.)

2654.6: CCM, Magallanes Navrad, Chile, w/5L grps, 50 baud at 0135. (Harold Manthey, NY)

```
TO: CQ      FROM: JECA    (U)     2 dJ(w4Efgm¦sQ4e$x%8L*<8@X^*XO
z5bm()u
TO: CQ      FROM: JECA    (U)     2 dJO_4Gfgm
y!2e$x%&w <8@Xn*NG+Nj5"m(8Du$>U&GL[GeS>JgTh¦j,E
TO: CQ      FROM: JECA    (U)     2 dJ:A4JLHfgmDR)+edx%PzB<Xn)uN"5"m&YDup.$>U%1Q/
GePBb<h¦j,EI
TO: CQ      FROM: JEC_    (U)     2 dJQy4~(<!Y
TO: CQ      FROM: JEC_    (U)     2 dJz{4ZZfgme4ex&-)=X<8n%,ny
j5"m,yDu.$>5%?&N3CHD#2&"3>5"R
TO: CQ      FROM: JECA    (U)     2 dJ34`Hfgm]i*ex&3G8
TO: CQ      FROM: JECA    (U)     2 dJ4bBfgmTa)ex&55>;X<Xm#P%OB4"M,Duf$>U%IlEgGe/
.>tkh¦j,Ef
TO: CQ      FROM: JECA    (U)     2 dJ!4d<fgmuh!ex&6#&<8<XmENJ5"m,Dupn$>U%JCGGeON
Deqh¦j,E>
TO: CQ _    FROM: _ECA    (I) 8   2 hKB,lcHfWa
@vhOgx&=,ML
TO: CQ      FROM: JECA    (U)     2 d
TO: CQ      FROM: JECA    (U)     2 dLC4HfgmcOGQNerx&]d=tp*1Z1;TnDN$j2¦H}*.K:A^#J
¦x6.QxTY
4
TO: CQ      FROM: JECA    (U)     2 dLKy4zHfgmlBevx&_Qx>X@Xmv:#z6"M((Duc^$>U%1*OG
e2k."h¦j,Eq
TO: CQ      FROM: J_CA    (U)     2 dLSa4t(fgmvy5etzx&yYJOE$1ZjbglD[\Lj¦K=T^,2t"<
F&9h*U"1Qc)nlxyuprlyn6oAtGE
TO: CQ      FROM: JECA    (U)     2 dL[I4nHfWmhVQK}*=\1O",!J,6
TO: CQ _    FROM: JECA    (U)     2 dM(]4:sHfgmH"/i5fD~xf!4ZBxHXmiENz5"
,(DuJ~$>U&
lwwGe'I0nh¦j,ES
TO: CQ      FROM: JECA    (U)     2 dN,G4F
fgmO!f4x&eb;8DXmeuo/z7"m*D5ZN$>U&K1iwGeB%~5vh¦j,EC
TO: _Q      FROM: JEEA    (U)     2 NUyBQQ6Hfdk6UY2ftzx&=hL@@"un-jNry#yt
TO: CQ      FROM: JECA    (U)     2 dN[17S(Hfgm@1*a2fDzx& )k@EX@Xma#N
R5"M(DuV$8*.K97^#J >ov¦PxTX
 &
TO: CQ      FROM: JEBA    (U)     2 dNd4T"HfgmIa2fDvx&!i&Ex@XmaXiIb6"M(Du`n$8*.K8
3#J^P<QxTX
0
TO: CQ      FROM: JECA    (U)     2 dN14VHfgmSfV)3fDzx&#b`=DXm#
).6"M(DuJN$>U%LW/De,23h¦j,EQ
TO: CQ      FROM: J_CB    (I)  @&2`¦':4',K$@326J/&.3"=¦II'&P%V"[
hIY')OUeW'[#adbOYPL%(¢KJB
TO: CW_     FROM: JECA    (U)     2 dN94\Hfgmps7 fDzx')E:J?x@Xm_,MNZ6"M(DuGN$>U%L
POGeO$th¦j,E
TO: CQ      FROM: JECA    (U)     2 dN
4_Bfgm¦
Of4zx'+kz?x J,6/'7G=Q&":)/R*K%N"3CHD#2FC4>5"/
TO: CQ      FROM: JECA    (U)     2 dN4a<fgmY(f4~x'-W=8@XmlqN*6"M'?Du]>$>U%JKGGeJ
;j
h¦j,E7
TO: CQ      FROM: JECA    (U)     2 dNk4c6fgm1MHf4x'/Ce1@Xm]8)M*6"m+9Df&$>U%^i'Ge
13h¦j,E8
TO: CQ      FROM: JECA    (U)     2 dO%S4eOfgmPXf4x'1/C:x@Xm\mjL6"m'ODuPn$>U%J,>G
eMh¦j,E>
TO: CQ      FROM: JECA    (U)     2 dO-;4g*fgm#^Xf4x'2H9x@XmE"G
j6"M'3DuZN$>U%HLDgGebnOe h¦j,E
TO: CQ      FROM: JECA    (U)     2 dO4#4h$fgm-5*&e$~x'4t";x<XmEVd
5"m':Duc$>U%IlBGGec>*K'h¦j,E
TO: CQ      FROM: JECA    (U)     2 dO<4jfgm6
q/e$~x'6rGP?X<XmZl;
j5"m)F%5M~$>U%UoC'Ge2;c^-h¦j,E5
TO: CQ      FROM: JECA    (U)     2 dODs41fgm@_*e$~x'8],>8<XmZ@3lLz5"m'2Du7^$>U%F
5GeX_ O4h¦j,E>
TO: CQ      FROM: JECA    (U)     2 dOL[4nfqmJ4'e$~x':I^!> <XmYtsL
```

Figure 2A

3617: "UBDAD" of the British Royal Army, w/RYRY, 50 baud at 0650. (Ary Boender, NLD)

4023.5: 3BG, Bigara Meteo, Mauritius, w/coded wx, ARQ-E3/48 at ???. (Fred Hetherington, FL)

4172: FNBU, ship Port Bara (French oil tanker—Ed.), w/msgs, ARQ at 2043. (Boender, NLD)

4788.2: TJK, ASECNA, Douala, Cameroon, w/coded wx at 0036, 50 baud. (Ed.)

4975: "UBDDFD" of the British Royal Army, w/RYRY, 50 baud at 0625. (Boender, NLD)

5020.2: RWW74, Moscow Meteo, Russia, w/wx data for Cyprus, 50 baud at 0117. (Manthey, NY)

5112.2: 4OC3, Tanjug, Belgrade, Yugoslavia, w/nx in SC, 75 baud at 0356. (Ed.)

5240: 4OC2, Tanjug, Belgrade, Yugoslavia, w/nx in EE, 50 baud at 1933. (Robert Hall, RSA). Same sta. w/RYRY at 0353. (Ed.)

5797.5: ID's of VDT, IAD, QGD, QXW, & YDR, seen in packet radio xmsns at 1234. These are either USMC or USN MARS stas not using the NNNO prefix. (Ed.)

5813.7: "EIAAYHYX," Shannon Aero, Ireland, w/RYRY, 50 baud at 0549. (Ed.)

6307.3: PWZ33, Rio de Janeiro Navrad, Brazil, w/RYRY & SGSG at 0345, 75 baud. (Ed.)

6316: NMN, USCG, Portsmouth, VA, w/ARQ phasing sig + ID in CW, at 0748. (Ed.)

6318: NOJ, USCG, Kodiak, AK, w/ARQ phasing sig & CW ID at 0744. (Ed.)

6336.6: GYA, Royal Navy, London, England, w/a test tape sans ID, 75 baud at 0741. MTO, Royal Navy, Rosyth, England, using test tape similar to that used by GYA, but w/MTO ID. Was 75 baud at 0327. (Ed.)

6344: WLO, Mobile R., AL, w/a tropical wx outlook, FEC at 0739. (Ed.)

6736.5: ETD3, Addis Ababa Aero, Ethiopia, w/RYRY, 50 aud at 0440. (Ed.)

6751.2: "Jeca" w CQ's & crypto, packet radio. Operated 24 hrs daily, 7 days a week, including holidays. Under computer control. "Jeca" is also on 6756.3 at the same time, but content of xmsn is different. Apparently closed down on Dec. 16. (Ed.)

6775: XTU, ASECNA, Ouagadougou, Burkina Faso, w/aero wx, ARQ-M2/96, channel A, at 0411. (Ed.)

6794-6796: VER, Canadian Forces, Ottawa, ONT, w/encryption on all FDM channels, 75 baud at 0628. (Ed.)

6830: RDW72, Khabarovsk Meteo, Russia, w/coded wx, 50 baud at 1345. (Ed.)

6852: GFL22, Bracknell Meteo, England, w/coded wx, 50 baud at 0258. (Ed.)

6980: "UBDA" of the British Royal Army, w/RYRY, 50 baud at 0655. (Boender, NLD)

7396: Un-ID using an undetermined RTTY mode at 300 baud, at 0526. (Ed.)

7520: BZP57, Xinhua, Yuryumqi, China, w/nx in EE at 0100, 75 baud. (Hetherington, FL), and at 1830. (Boender, NLD)

7543: "UBUB" of the British Royal Army w/RYRY,

```
TO: CQ      FROM: JECA    (U)     2 &lb?%VK@fgm@glynkTwx&#%uhx17RCLA"u(JDtU &2;^M
yIea5H_P,5a
TO: CQ      FROM: JECA    (U)     2 &lj'%VE@fgmZuwkd(x'%k}~
TO: CQ      FROM: JECA    (U)     2 &lq%V?@fgmcAwkd(x''Njg dx16cY@L)"u(ODtr}U &-K
^MyI}&k:UK7E(O
TO: CQ      FROM: JECA    (U)     2  tzw%V5x336K.H%@g91{KIR>&6[
$TcL$hJ]^_he&%&/
TO: CQ      FROM: JECG__  (U)     2 &l_%V3@fgmuUqUkd(x'*4"&udx15=D'L1"u(IDtm
TO: CQ      FROM: JECA    (U)     2 &l)%V efgljZ5QRkdwx'.Uz+udH13*JM)"U&MDt}U fT1
,^MyIeMP.I_P,5e
TO: CQ      FROM: JECA    (U)     2 &l"y%V$Yfgmpy0Dkd(x'2Z}T)5dx12[X2Y"U&JDtrJU,&
S1#^MyIeK_P,5
TO: CQ      FROM: JECA    (U)     2 &m*a%W&Sfgm%[NYWkdwx'4=(udx11$
K"m&%Dt{JU &O1k^MyIeG?~%_P,5
TO: CQ      FROM: JECA    (U)     2 m2I%W(Mfgm.bmkdwt'5 \'ed.x14iKA"U&\DtMU &TL#3
^MyIeZfk+
TO: CQ      FROM: JE_A    (U)     2 &m:1%W*Gfgm76)'kdwx'7C u%u$x10a'0$U&NDtm=U &N
L(^MyIe9
02_P,5"
TO: CQ      FROM: JECAS_  (U)     2 &m[K%W2n@fgm^RXICkd(x'?Ng5dx1-}\nny%#U,mDt(%U
 %G^MyIedP~-_
P
TO: CQ      FROM: JECA    (U)     2 &mzk%W:V@fgmjGafkTwx'FS+51x1+-eJ"u,~Dt~
U %c^MyIedJWnG_MP,5
TO: CQ      FROM: JECA    (U) i&#
mS%O<P@fgmnimTwx H:_M,x1*A^!8J0*=":3>*PJLIFLF/&<$2;,*&/E(^N
TO: BQ      FROM: JE_M    (U) &@ 2 &=:;ePL
TO: CQ      FROM: JDCA    (U)     2 &3=%WHjfdmC)\kD(x'S>cz%hx1&K)UL"U*hDtG]U %Mv^
MyIe/~iV_P,5
JL
TO: CQ      FROM: JECA    (U)     2 &nJu%WNXfgm^[)FkD(x'Xe:*hxka^gA"U*jDtb&U EO
TO: CQ      FROM: JECA    (U)     2 &n\?%WR@fgms9U;k4wBg\', 3ulxk"!UK1"U(Dt^MU &,
s^MyIeOhcW_P,5
TO: CQ      FROM: JECA    (U)     2 &nd'%WT@fgm!6m!?k4x'^EQ03UpxkNC5A"U(h\tG=U &
q_^MyIdZ=*=>!XjRV
TO: CQ  _   FROM: JECA    (U)   , 2`&nsw=WXy@fgm.qPj$x'ag.*5@x[
TO: CQ      FROM: JECA    (U)     2 &nG%W\m@fgm$t)Fj$x'eNO-UpxkwzlNi!(gDtJU &
g{^MyIe/rqox_P,5i
TO: CQ      FROM: JECA    (U)     2 &n/%W^g@fgm(SyDj$x'g09v-pxkw%&O!(DtS
U &,JC^MyIe^)JH^_P,5$
TO: CQ      FROM: JECA    (U)     2 &n%W`a@fgm1_IFj$wx'h=/Utxk^P
sO"5(Dt\}U &b^MyIe<`a_P,5#
TO: CQ      FROM: JECA    (U)     2 &nw%Wb[@fgm:1Zj$(x'jt>*+Utxk}(vOI"U(DtE}U &,
O^MyIe/<r_P,5c
TO: CQ      FROM: JECA    (U)     2 &n$a%WdfgmF%y^j$(x'lw\*txk!NGNi"U&DtX
V%5&M,WG^MyIe_>v[s_P,5,
TO: CQ      FROM: JECA    (U)     2 &o,I%Wf
fgmNej$(x'npkx+txk!<7
y"u^DtG=O%$-&Pl\^MyIe*wxy_P,5
TO: CQ      FROM: JECA    (U)     2 >O+4C@L336M+J,B.5R(<B)-A:I<5=3M=&OLQ:?J":)&2'
&L-+/&<$2#0@/E(<
TO: CQ      FROM: JECA    (U)     2 &o;%Wjfgm`R1Qj$wx'r4D35txkzyQI"^DtQ}D&%&QLW^M
yIeJk__P,5
TO: CQ      FROM: JECA    (U)     2 &oC%Wl{fgmi~Uj$wx's+45uxxkz<Q
q"^DtEmF'D%&QLMc^MyIeS&>M
_P,5
TO: CQ      FROM: JECA    (U)     2 &oKi%WnufgmrsB9\j$(x'uw8Uxxkyf$,
y"~ DtN=J''&TS+^MyIezaah_P,5
TO: CQ      FROM: JECA    (U)     2 &oSQ%WpofgmCg(yaj$wx'wYf75!xkxqmJY"^DtQ<'d'&M
,Ps^MyIeKGM_P,5k
TO: CQ      FROM: JECA    (U)     2 &o[9%WrifgmCJQXj$wx'y;?3xkx<9tJy"u^Dta}2'C&OL
N;^MyIe7YrP _P,5[
```

Figure 2B

Abbreviations Used In The RTTY Column

AA	**Arabic**
ARQ	**SITOR mode**
BC	**Broadcast**
EE	**English**
FEC	**Forward Error Connection mode**
FF	**French**
foxes	**"Quick brown fox . . . "test tape**
GG	**German**
ID	**Identification/ied**
MFA	**Ministry of Foreign Affairs**
nx	**News**
PP	**Portuguese**
RYRY	**"RYRY . . . "test tape**
SS	**Spanish**
tfc	**Traffic**
w/	**With**
wx	**Weather**

50 baud at 0837. (Boender, NLD)

7621: IBH, USAF, Vicenza AB, Italy, w/METAR's 75 baud at 1447. (Boender, NLD)

7624.9: HZN47, Jeddah Meteo, Saudi Arabia, w/coded wx, 100 baud at 0135. (Manthey, NY)

7626: TZH42, ASECNA, Bamako, Mali, w/RYRY, 50 baud at 0234 & 0445. (Ed.)

7658: YZD, Tanjug, Belgrade, Yugoslavia, w/nx in EE. 50 baud at 1931. (Hall, RSA)

7685.2: RBV75, Moscow Meteo, Russia, w/coded wx, 50 baud at 0455. (Ed.)

7710.5-7712.5: MKK, RAF, London, England, w/RYI's, foxes & 10 count on all FDM channels, 50 baud at 0500. (Ed.)

7727.5: FDY, French Air Force, Orleans, France, w/RYRY, bricks, 10 count, & ID, at 0538, 50 baud. (Ed.)

7760: RGH77, Arkhangelsk Meteo, Russia, w/coded wx, 50 baud at 0035. (Manthey, NY)

7806.2: YZD7, Tanjug, Belgrade, Yugoslavia, w/nx in EE at 1936, 50 baud. (Hall, RSA)

7946.5: Un-ID sends QEMP selcall in ARQ for a very long time. Tuned in at 0542. (Ed.)

7962.7: "AAA" w CQ in packet mode at 0424. (Ed.)

8015: "TLM" w msgs to "FRQ," packet radio at 0206. (Ed.)

8026.2: MKT, RAF, Stanbridge, England, w/encryption at 0432, ARQ-M2/96. (Ed.)

8461: Un-ID w/continuous "339," 1615-1635, 50 baud. (Boender, NLD)

8571: UFN, Novorossisk R., Russia, w/msgs in RR at 0115, 50 baud. (Hetherington, FL)

8631.8: NRPZ, USCGC Papaw (WLB-308), & NMG, USCG, New Orleans, LA, working each other, 75 baud at 2129. (Ed.)

8673: GYA, Royal Navy, London, England, testing at 0130, 75 baud. (Hetherington, FL)

8677.5: URD, St. Petersburg R., Russia, using ARQ & CW modes at 0338. (Ed.)

8697.2: Un-ID w/encryption, 300 baud ASCII at 0430. (Ed.)

9114.1: HGG31, MTI, Budapest, Hungary, w/nx in EE, 50 baud at 1706. (Ed.)

9130: GYA, Royal Army, London, England, testing at 0200, 75 baud. (Ed.)

9154: D4B, Sal Aero, Cape Verde, w/RYRY, 50 baud at 0609. (Ed.)

9187.6: FZI91, DIPLO, Noumea, New Caledonia, w/nx in FF, 50 baud at 0725. (Ed.)

9190: RDZ75, Moscow Meteo, Russia, w/coded wx, 50 baud at 0737, 1230, & 1556. (Ed.)

9206: Tuned in at end of xmsn, caught un-ID sending "r rr r rr qsa 4 zbz 4 zar ? zbz 4 zar ? r r r as as as." Was 100 baud at 0326. (Ed.)

9318: DHJ51, Grengel Meteo, Germany, w/coded wx at 0615, 100 baud. (Ed.)

9341: FDY, French Air Force, Orleans, France, w/RYRY, bricks, 10 count, & ID, 50 baud at 0617. (Ed.)

9355.2: RWJ73, Alma Ata Meteo, Kazakhstan, w/coded wx at 0618, 50 baud. (Ed.)

9420: XVB50, VNA, Hanoi, Vietnam, w/nx in EE at 1611, 50 baud. (Hall, RSA)

9994: CSY, Santa Maria Aero, Azores, w/coded wx at 0632, 50 baud. (Ed.)

10161: Un-ID idling, 0335 to past 0445, ARQ-E/48. (Ed.)

10215.3: HZN48, Jeddah Meteo, Saudi Arabia, w/coded wx, 100 baud at 0021. (Ed.)

10318.6: BAA8, Beijing Meteo, China, w/coded wx at 0015, 50 baud. (Hall, RSA)

10523.3: HMF45, KCNA, Pyongyang, North Korea, w/nx in FF at 1153, 50 baud. (Ed.)

10638.8: Christchurch Meteo, New Zealand, w/coded wx at 1336, 75 baud. (Ed.)

10640: Un-ID w/tfc in RR, 50 baud at 0628. (Ed.)

10704.6: Un-ID in ARQ-M2/96 mode at 0030. (Hall, RSA) I have no idea either—Ed.)

10749.4: Un-ID w/encryption, ARQ-E/192 at 0625. (Ed.)

10830: ULV, SA/AAMC, Moscow, Russia, w/hand-typed msgs in RR at 0823, 50 baud. (Ed.)

10905: ANSA, Rome, Italy, w/nx inn II at 0716, 50 baud. (Ed.)

11715.6: 5HD, Dar-es-Salaam Aero, Tanzania, heard at 0119, 50 baud. (Hall, RSA)

11241.7: Un-ID, possibly Egyptian diplo, w/a few words that appeared to be in AA in s/off at 2007, ARQ. (Ed.)

11278.5: CBDC in Chile w/a msg to CBDFA, CBNFD, & CBDFE, at 0220, ARQ-M2/96, channel A. (Hetherington, FL)

11322: "Echo Cuatro Zulu" clg "Delta Cinco Hotel," foll by a msg in SS at 0140, 50 baud. (Hetherington, FL)

11352: "Hotel Uno Zulu" w/a msg in SS at 0250, 50 baud, foll by msg from "Zulu Dos Victor" to "Kilo Seis Mike," Other tactical c/s's seen. No clue as to who was relaying these msgs. (Hetherington, FL)

11453.3: IMB3, Rome Meteo, Rome, w/coded wx, 50 baud at 0153. (Manthey, NY)

11485: Un-ID w/several 5L msgs, 100 baud, 0441-0503, then to CW. (Ed.)

11507.6: STK, Khartoum Aero, Sudan, w/RYRY at 0249, 50 baud. (Ed.)

11606: BZS21, Xinhua, Yuryumqi, China, w/nx in EE at 1520, 75 baud. (Manthey, NY)

11638: DDK8, Offenbach Meteo, Germany, w/coded wx & B/C sked, 50 baud at 0926. (Ed.)

12082.6: IRJ50, ANSA, Rome, Italy, w/nx in EE at 1859, 50 baud. (Ed.)

12157.5: Un-ID meteo sta in Chile, but possibly from Magallanes, w/coded wx at 0300, ARQ. Gave circuit ID of MSA. (Hetherington, FL)

12186: Jana, Tripoli, Libya, w/nx in EE, 50 baud at 1743. (Ed.)

12311: Un-ID in (former) USSR w/RYRY + "CQ de RCF for all nr 111 all gr 1277 for bxl nob qru." Was 75 baud at 0903. (Boender, NLD) RCF was the c/s for MFA, Moscow, which was still in the USSR when you logged it, but now it is the Commonwealth of Independent States—Ed.

12501: C4MQ, Alecos M. (Cypriot naviplane), w/telex tfc at 2003, ARQ. (Ed.)

133660.8: GPA, Portishead R., England, w/ARQ phasing sigs at 0532. (Hall, RSA)

13440: YZJ5, Tanjug, Belgrade, Yugoslavia, w/RYRY & nx in EE, 50 baud at 0905. (Ed.)

13505.2: Un-ID using an unknown TTY mode that ran at 100 baud & in 55-bit blocks, 0415-0455. (Ed.)

13587.8: "Peca" w/a ton of 5F grps to "Tito," packet, 2125-2000. This xmsn is becoming routine on this freq. (Ed.)

13656: XVN8, VNA, Hanoi, Vietnam, w/nx in VV, 50 baud at 0205. (Ed.)

13664.6: 6VU73, Dakar Meteo, Senegal, w/RYRY & coded wx, 50 baud at 0145. (Ed.)

13779: Un-ID w/continuous RYRY, 50 baud at 0600. (Hall, RSA)

14398: NSS, USN, Washington, DC, w AP/UPI nx, FDM 50 baud at 0145. (Hetherington, FL)

14486: Possibly MFA, Paris, France, w/diplo msgs in FF, 75 baud at 1155. (Ed.)

14497.5: CSY, Santa Maria Aero, Azores, w/details of Queen Elizabeth II's flights to various cities in England. Details included A/C type, date of flight, ETA's and VOR, + the code name of the flight. Was 50 baud at 1915. Odd that this info was not in crypto, because of its nature. (Paul Scalzo, PQ) Air traffic controllers at airports are not trained to be cryptographers. The flight plans have to be sent in the clear because the controllers have to plan how to divert a/c away from the the Queen's plane when it is in the air—Ed.

14508: D4B, Sal Aero, Cape Verde, w/coded wx, 50 baud at 1859. (Manthey, NY)

14573: Jana, Tripoli, Libya, w/nx in AA at 1627, 50 baud. (Ed.)

14597.3: SOO259, PAP, Warsaw, Poland, w/nx in EE, FEC at 1512. (Ed.)

14634: MTO, Royal Army, Rosyth, England, w/test tape similar to that used by GYA, 75 baud. (Ed.)

14681: MFA, Bucharest, Romania, w/encryption at 1128, ROU-FEC/165.4. (Ed.)

14647.3: "AFA01" w/msgs to "AFA02," packet radio at 1837. (Ed.)

14674: "DFZG," MFA, Belgrade, Yugoslavia, w/Tanjug nx in SC at 1438, 75 baud. (Ed.)

14756.3: RFFZI, French Mil., Bangui, Central African Republic, w/a 5L msg at 2345, ARQ-E/72. (Ed.)

14761.3: YWMI, Maracaibo Navrad, Venezuela, w/RYRY, SGSG, 10 count, & maroon foxes, 75 baud at 2252. (Ed.)

14784.5: ATP65, MEA, Delhi, India, w/RYRY & nx in EE, 50 baud at 1432.(Ed.)

```
TO: CQ      FROM: JECA    (U)     2 ;wXi*(qBfgm.B;k4ox+-c$te5K!wHQahY}4Pw!i$0%?>y
Ie(sh`J,ud
TO: CQ      FROM: JECA    (U)     2 ;w`Q*(sBfgm.YaWk4sx+/MX
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```

Figure 2C

14817.4: Un-ID w/encrytion, ARQ at 0011. (Ed.)

14824.5: Un-ID w/a 5F msg at 2210, 50 baud. Also uses CW. (Ed.)

14831.5: Un-ID ending xmsn w "work out corrective action. Julius Caesar sends. NNNN." Was 75 baud at 1458. No further tfc heard after that. (Ed.)

14842.2: Un-ID w s/off msg at 1632, DUP-ARQ. (Ed.)

14896.6: "P9I60" & "I2J80" w/packet radio xmsn at 1706. (Ed.)

14897.7: "A1B" w/RYRY to "A1D," packet radio at 1656. ID's of "R9C39" & 't8E81" seen at 1725. (Ed.)

14912: DFZG, MFA, Belgrade, Yugoslavia, w/crypto & nx in SC at 1446, 75 baud. (Ed.)

14932.3: APS, Algiers, Algeria, w/RYRY & nx in AA, 50 baud at 1400. (Ed.)

14988.7: TNL77, ASECNA, Brazzaville, Congo, w/coded wx, ARQ-M2/96 (which channel?—Ed.) at 0957. (Hall, RSA)

15637.5: IPG20, MFA, Rome, Italy, w/crypto after GGGGG, & ANSA nx in II, FEC at 1924. (Ed.)

15670: HGM36, MTI, Budapest, Hungary, w.nx at 1620, 50 baud. (Boender, NLD)

15726: Polish Embassy, Havana, Cuba, w/telexes in Polish, POL-ARQ, 1745-1803. (Ed.)

15751: CNM66, MAP, Rabat, Morocco, w/nx in EE, 50 baud at 1416. (Manthey, NY) Same sta found on 15752.7 at 1615, w/nx in FF. (Ed.)

15819: MKD, Akrotiri, Cyprusk, w/RYI's & foxes, FDM 50 baud at 1903. (Ed.)

15835: HET5, SRI, Schwarzenburg, Switzerland, w/nx in EE at 1715, 50 baud. (Ed.)

15875: TAD, MFA, Ankara, Turkey, w/nx in Turkish, telexes, & 5L msgs, 1709-1735, 100 baud. (Ed.)

16015: OLG, PTT, Prague, Czechoslovakia, w/RYRY & ID, 50 baud at 1318. (Boender, NLD)

16067: IRO30, ANSA, Rome, Italy, w/RYRY, foll by wx in EE, 50 baud at 1704. (Ed.)

16106: Possibly FZF61, Fort de France, Martinique, w/"DIPLO News Paris France" at 2030, 50 baud. (Scalzo) NOt FZF61, but FZM62, Noumea, New Caledonia. The Martinique relay has been shut down for a couple of years now—Ed.

16109.2: Un-ID w/encryption, 100 baud at 1455. (Ed.)

16170.2: Un-ID w/an asynchronous sig at 192 baud at 1508. (Ed.)

16186.3-16188.7: 4UA, UN, Rawalpindi, Pakistan, w/UN nx in EE, telexes, & job listings, 75 baud on all FDM channels at 0950. Used circuit ID at RAL. (Ed.)

16203: Un-ID w/list of msg ###'s for upcoming tfc, foll by RYRY & several 5L/5F msgs, 75 baud at 1444. Was // 16229 kHz. (Ed.)

16457: Un-ID w/encryption, ARQ-E/192 at 1614. (Ed.)

16668: LASM2, ship Barde Team (Norwegian dry cargo—Ed.), clg Stockholm R., ARQ at 1006. (Boender, NLD)

16695.5: HCFB, ship Rio Daule (Ecuadorean fruit carrier), w/telex tfc, ARQ at 2048. (Ed.)

16699.5: ZDAM5, ship Jyoti (Gibraltarian cargo), w/ETA Dakar, Senegal, msg to Bombay, India, ARQ at 2152. ATLN, ship Jag Shanti (Indian bulk carrier), w/ETA Singapore msg, ARQ at 0135. Ship was "carrying bright yellow Canadian sulphur for India." (Ed.)

16701: S6FI, ship Ikan Belia (Singaporean cargo—Ed.), w/msg to Oslo, Norway, re berthing/loading prospects, ARQ at 1225. (Boender, NLD)

16708: OWJE, ship Peder Most (Danish coaster), w/a telex to Paramaribo, ARQ at 0106. A coaster is a vessel that carriers cargo from one port to another within the same country. (Ed.)

16789.5: Un-ID w/nx in Polish, FEC, 1130-1139. (Hetherington, FL) One would almost say it's PAP, which uses FEC mode for its nx B/C, as opposed to SPW, Warsaw R., which uses ARQ mode. But PAP is not known to use the marine bands, leaving the ID of this sta up in the air—Ed.

17018: EBA, Madrid Navrad, Spain, w/navreas, 75 baud at 1020. (Boender, NLD)

17340: RCF41, Tass, Moscow, Russia, w/nx in AA, 50 baud at 1546. (Ed.)

17364.4: CCS, Santiago Navrad, Chile, w/coded grp msgs to "GMSO" at 0043, 100 baud. (Hetherington, FL)

17432: "DFZG," MFA, Belgrade, Yugoslavia, w/nx in SC, 75 baud at 1500. Was // 18055 kHz. (Ed.)

17443.2: BZG48, Xinhua, Beijing, China, w/nx in FF, 59 baud at 1412. (Ed.)

17457.2: MFA, Bucharest, Romania, w/encryption at 1530, ROU-FEC/164.5. To CW at 1541. (Ed.)

17469.3: Un-ID w/rpts of "De YGN testing with Shanghai ZRO ZHC" at 1323, 50 baud. (Hall, RSA) YGN is at Neira, Indonesia—Ed.

17472.5: RPFN, Monsanto Navrad, Portugal, w/RYRY, foxes, & 10 count to RPTI, foll by a msg in PP, 75 baud at 1515. (Ed.)

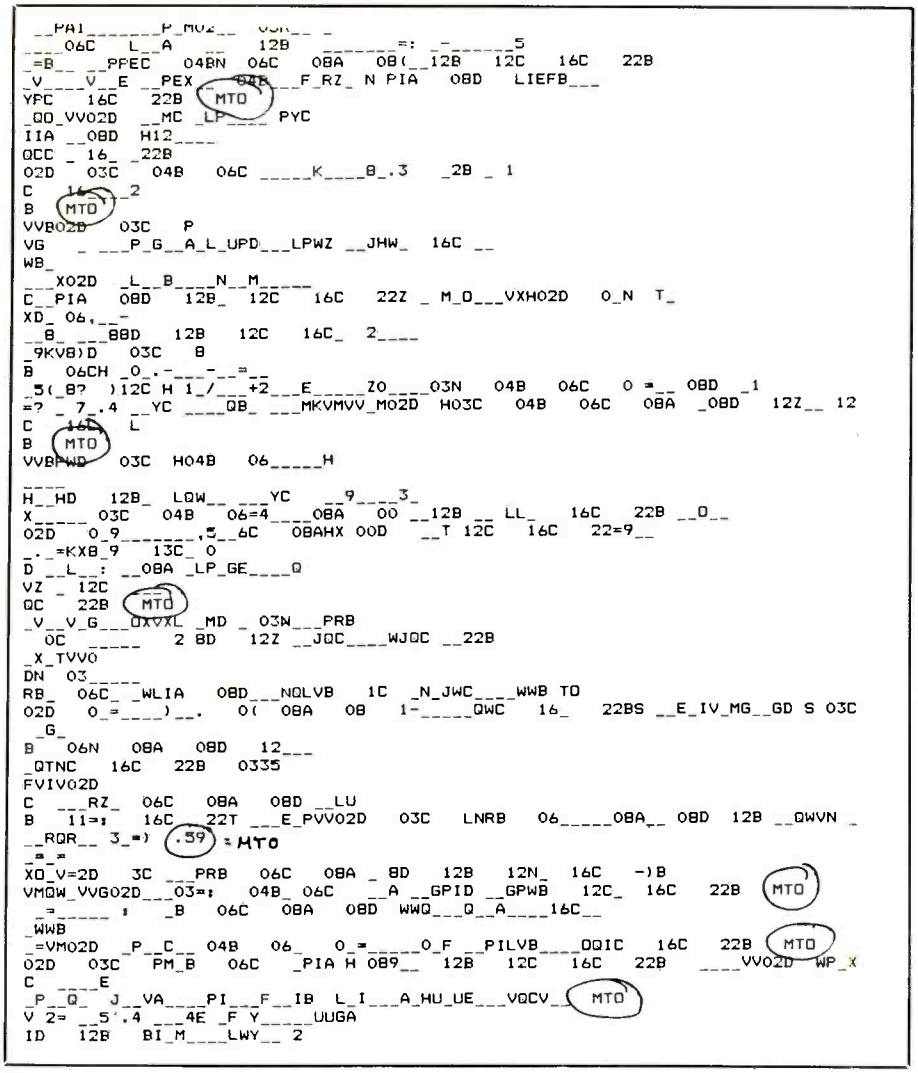


Figure 3

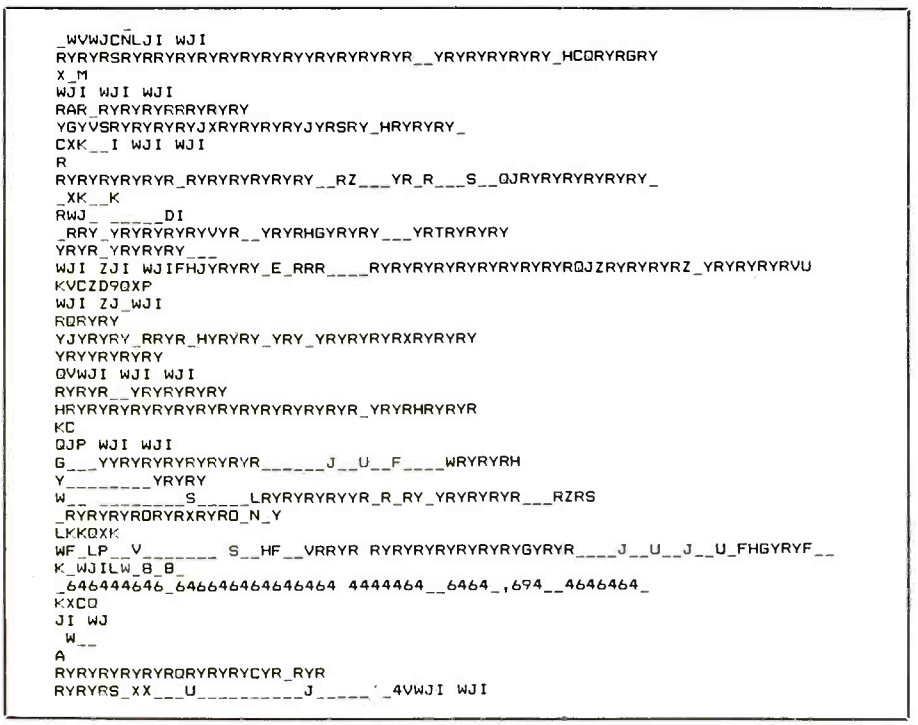


Figure 4

17490.2: "NDO" w/RYRY, then QRU QRU SK SK, 50 baud at 1650. "NDO" has appeared on this freq. in the past. (Ed.)

17510: RFD53, Tass, Moscow, Russia, w/nx in FF at 1632, 50 baud. (Ed.)

17526.2: "WJI" w/RYRY, Q- and Z-codes, and either encryption or garbled text, 100 baud at 1506. (Ed.)

18384.8: RRQ20, Tass, Alma Ata, Khazakhstan, w/nx in EE, 50 baud at 1133. (Hall, RSA)

18592.6: CLP12, Cuban Embassy, Lima, Peru, w/Cuban-related nx from a Peruvian newspaper, 50 baud at 2100. (Hetherington, FL)

18602.5: VOA, Greenville, NC, w/RYRY to Morocco & a closing msg, 75 baud at FDM, at 1408. (Ed.)

18846.2: Un-ID w/5F grps at 1614, 50 baud. Caught just the last two lines of the msg & QRU QRU SK SK. (Ed.)

19211.8: "TBP" w/RYRY, foll by crypto, 50 baud. Off the air at 1802. (Scalzo, PQ)

19234.5: "KAWN," Offutt AFB, Elk Horn, NE, w/aero wx, 75 baud at 1652. (Ed.)

19306.7: Un-ID sending only XTVV selcals in ARQ at 1753. (Ed.)

19703: Un-ID w/a msg that mentd Iran & Teheran, and another msg that the word "Iranska" + "CC4/7 BK GB PA + +/." Was 75 baud at 1145. (Hetherington, FL)

19712: URD, St. Petersburg R., Russia, w/RYRY, foll by nx in RR, 59 baud at 1200 & 1515. (Hetherington, FL)

19731.7: Un-ID w a selcal seen as KTVQ on one decoder & TVQK on another, in ARQ at 1640. Wonder which decoder is correct. (Ed.)

19865.5: YZJ4, Tanjug, Belgrade, Yugoslavia, w/nx in SS at 1649, 50 baud. (Ed.)

19866.2: Un-ID in ARQ at 1651. Sig got clobbered by YZJ4 RTTY 700 Hz lower in freq. (Ed.)

19928.5: OEC, MFA, Vienna, Austria, w/nx briefs in EE, ARQ-S6/96 at 1340. (Hetherington, FL)

19866.1: Msg beginning "U.N. Foodagi Rome Telex" being sent possibly to Khartoum, Sudan, ARQ at 1445. (Hetherington, FL) This may've been 4UZ, UN, Geneva, Switzerland, relaying the telex from Rome—Ed.

19951.7: Un-ID idling in ARQ mode at 1704. (Ed.)

19988.7: CLP1, MFA, Havana, Cuba, w/tfc to CLP5, 50 baud at ???. (Hetherington, FL)

20166.9: Un-ID w/coded grps at 1315, ARQ-E/96, foll by s/off at 1336. (Hetherington, FL) You logged MFA, Rome, Italy--Ed.

20352.2: RFFI, Paris, France, w/a 5L msg to Cayenne, French, Guiana, at 1500, ARQ-E3/96. (Ed.)

20401.5: Indonesian Embassy, Dae-es-Salaam, Tanzania, w/text re Tanzanian-Indonesian affairs in EE & Indonesian, ARQ at 1330. (Hetherington, FL)

20402.3: YWM1, Maracaibo Navrad, Venezuela, w/RYRY & SGSG at 1414, 75 baud. (Manthey, NY)

20584: Un-ID in Rome, Italy, w/msg in Il re industry, to Sierre Leone, ARQ at 1610. (Hetherington, FL)

20679.7: CLP1, MFA, Havana, Cuba, w/prensamin-rex, 50 baud at 1910. (Ed.)

20965: RKB70, Tass, Moscow, Russia, w/nx in FF at 1429, 50 baud. (Manthey, NY)

22288: ELFO3, the lighter, Rhine Forest, (Liberian registry), w/a telex at 1709, ARQ. A lighter is a barge used in unloading/loading ship & transporting freight around a harbor. (Ed.)

22299.5: D5VG, the vehicle carrier, Atlantic Pride (Liberian registry), w/msg saying it passed USDA inspection, ARQ at 1703. (Ed.)

22888: DFZG, MFA, Belgrade, Yugoslavia, w/crypto after XPXPXP, 75 baud at 1538. (Ed.)

22955: ISX22, ANSA, Rome, Italy, w/nx in EE at 1533, 50 baud. (Ed.)

23012.3: PWX33, Brasilia Navrad, Brazil, w/tfc to NBA, 75 baud at 1849. (Manthey, NY)

23370: HZN50, Jeddah Meteo, Saudi Arabia, w/coded wx at 1550, 100 baud. (Ed.)

23520: RFVI, French Mil., Le Port, Reunion, w/tfc in EE re satellite maintenance, ARQ-E3/100 at 1440. (Hetherington, FL)

24102: DFZG, MFA, Belgrade, Yugoslavia, w/nx release in EE & SC, 75 baud at ??? (Hetherington, FL). Same sta w/RVRY & msgs at 1430 (Manthey, NY)

29460.7: DMK, MFA, Bonn, Germany, w/tfc in GG, foll by encryption, ARQ-E/96 at 1452. (Hetherington, FL)

29802: Tass, Moscow, Russia, w/nx in EE, 1254-1310, 50 baud. (Manthey, NY) This is an hx of 14901 kHz, therefore this is CLN451, Tass, Havana, Cuba, on a relay from Moscow—Ed. ■

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Investigate Hoax Distress Signal

The Federal Communications Commission is investigating a false radio distress signal which resulted in the deployment of a United States Coast Guard (USCG) helicopter and ship to the Duck, North Carolina, area, during severe weather conditions.

At approximately 10:00 P.M. EST, a ham radio operator heard a distress call from a station identifying itself as KD4NTT. Transmissions from the alleged distress station indicated that the boat had run aground and was taking on water on a reef 20 miles due east of Duck, North Carolina. The amateur radio operator who heard the distress message then alerted the USCG. Deployment of the helicopter and Coast Guard ship, particularly under the severe weather conditions that existed, directly placed USCG personnel at great personal risk and resulted in the unnecessary expenditure of government funds.

Available information indicates that the false distress signal was transmitted from the northern Virginia area. The FCC has a recording of the event in question and requests that any person with information concerning this matter contact us.

False Distress Signals Traced

The FCC's Philadelphia office identified a minor responsible for transmitting false distress signals from a marine radio. The subject admitted making the false distress transmissions to the Coast Guard from his residence in Hamilton Township, Mercer County, New Jersey. These transmissions, which were made on the distress frequency, Channel 16, included reports such as "we've run aground" and "we're taking on water."

The knowing and willful communication of a false distress message is prohibited by the Communications Act, 47 U.S.C. § 325(a); it is also a violation of 14 U.S.C. § 88. A person convicted of a violation of 14 U.S.C. § 88 is subject to a fine of up to $250,000 and/or imprisonment of no less than five but not more than 10 years. Under the Communications Act, the violation of § 325(a) is a criminal misdemeanor punishable by a first time offense fine of up to $100,000 and or imprisonment of up to one year. Violators of this statute are also subject to a Commission administrative fine of up to $10,000 for each day of a violation. Under the Coast Guard provision, civil penalties could be as high as $5,000 in addition to liability for costs incurred by the U.S. Coast Guard in responding to the false distress calls.

Action Against Unauthorized Computer Equipment

The FCC issued more than 100 violation notices to vendors who exhibited unauthorized computer equipment at the Fall 1991 COMDEX computer trade show held in Las Vegas, NV. Before computers and associated equipment can be exhibited, advertised, shipped, or sold, manufacturers must first obtain FCC authorization for the devices by demonstrating that the devices meet FCC technical standards. The technical standards are designed to limit undesirable signal radiation from the computing devices which could interfere with televisions, radios, and many two-way radio conversations.

The FCC took these actions in an effort to increase compliance with its computer rules. A recent FCC survey showed that compliance is only 82 percent.

The marketing of unauthorized radio frequency devices, including computer equipment requiring Commission approval, is a violation of Section 302 of the Communications Act of 1934, as amended, and Commission Rules. Sanctions may include administrative fines of up to $10,000 for each violation or for each day of a continuing violation up to a total of $75,000; and/or federal court civil seizure and forfeiture of the unauthorized equipment inventory; and/or issuance of a federal court injunction against further violations; and/or criminal penalties, upon conviction, of a criminal fine of up to $100,000 and/or imprisonment for up to one year.

FCC Employee Shot and Fatally Wounded Outside New York Field Office

Catherine (Cathy) Forster, Office Automation Clerk, FCC New York Field Office, was shot and killed by an assailant. Ms. Forster was leaving the office to drop off mail at the post office when she was allegedly approached outside the building and allegedly shot several times by a woman identified as Jeanette Demarest of Greeley, Colorado. Demarest was taken into custody at the crime scene. Demarest is believed to have visited the Denver, Washington, DC, and New York offices in prior years with complaints that she was "under surveillance" and experiencing other "radio" problems. It is believed that she was last seen in the New York office about two years ago.

Rules To Implement Section 5301 Of The Anti-Drug Abuse Act

The Commission adopted rules to implement Section 5301 of the Anti-Drug Abuse Act of 1988. Under the rules, in order to be eligible for any instrument of FCC authorization, an applicant must certify that neither the applicant nor any party to the application is subject to a denial of Federal benefits under Section 5301.

Section 5301 provides Federal and state court judges the discretion to deny Federal benefits to individuals convicted of offenses consisting of the distribution or possession of controlled substances. Federal benefits include the issuance of any grant, contract, loan, professional license, or commercial license provided by an agency of the United States, or by appropriate funds of the United States. FCC licenses are included within the scope of the statute.

The Office of National Drug Control Policy (ONDCP) plan for implementing Section 5301, submitted by the President to Congress on August 30, 1989, called for a two-pronged approach by agencies: 1) use of the General Services Administration's (GSA) "Debarment List"; and, 2) use of an applicant certification. Consistent with the ONDCP plan, the FCC will require applicants to certify as to their eligibility and to inform the Commission if they or their principals become ineligible under Section 5301 during the course of the license term. The Commission noted that on September 11, 1990, the United States Department of Justice issued its Guideline on Section 5301 which reiterated the ONDCP implementation procedures for Federal agencies previously submitted to Congress by the President. The commission is separately implementing use of the GSA Debarment List.

The Commission said that the new rules will apply to all forms of instruments of authority including authorizations for radio spectrum, radio operator authorizations, equipment certification, type acceptances or type approvals, and certificates of authority to construct communications licenses. Because Section 5301 applies only to professional and commercial licenses, the Commission will exempt amateur authorizations which may not be used for professional or commercial purposes.

Long Distance Carrier Selection

Customers have complained to the FCC that their interstate long distance service was changed to another company without their permission. In order to provide additional safeguards for consumers against such unauthorized switching, the Commission has modified its procedures concerning changing long distance carriers.

The Commission now requires that interexchange carriers (IXC's) who, based on their telemarketing, inform local exchange carriers (LECs) that they have obtained authorization from a customer to change their long distance carrier, to first obtain verification from

customers in one of four ways. These IXC's must:

1) obtain the customer's written authorization; or

2) obtain the customer's electronic authorization by use of an 800 number; or

3) obtain the customer's oral authorization verified by an independent third party; or

4) send an information package, including a prepaid, returnable postcard, within three days of the customer's request for a change in long distance company, and wait 14 days before submitting the customer's order to the LEC, to give the customer sufficient time to send back the postcard denying or cancelling the change order.

Methods 1 through 3 were agreed to by AT&T and MCI pursuant to a settlement of outstanding litigation between them on the unauthorized switching issue. The Order specifically includes the fourth option, based on a proposal by the National Association of Regulatory Utility commissioners and others, out of concern for the costs and other burdens which methods 1 through 3 might impose on smaller IXC's.

The Order does not require that all carriers in addition now implement the monthly audits or the Quality Assurance Program that were also part of the agreement between AT&T and MCI. The Order states that these programs would appear to unnecessarily require extensive involvement by the Commission in the business operations of these other IXC's and suggests that carriers implement such programs on their own behalf.

The Order also requires IXC's to institute the same verification procedures for customer-owned payphone, and for both business and residential solicitations.

Apparently Liable For Two $28,000 forfeitures

The Commission notified McCaw RCC Communications, Inc., that it is apparently liable for two forfeitures, each of which is for $28,000, for unauthorized operation of Public Land Mobile Radio Stations KAA276 and KWU329 at Cheyenne Mountain near Colorado Springs, CO. The total forfeiture for the two violations is $56,000.

McCaw operated the stations from this unauthorized location from August 11, 1989, the date it acquired the stations' facilities, to May 21, 1991, the date of receipt of McCaw's request for Special Temporary Authority and application to relocate to the Cheyenne Mountain location.

Although the Commission could have assessed a $40,000 forfeiture for each station in violation of the rules, it adjusted the amount downward because McCaw voluntarily disclosed its unauthorized operation of these facilities, which had been constructed incorrectly by the previous owner. ■

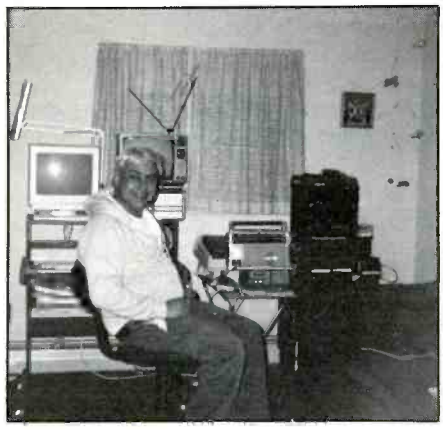
HOW I GOT STARTED

We invite our readers to submit, in about 150 words (more or less), how they got started in the communications hobby. Each month, we'll accept them (hopefully, typewritten, or otherwise easily legible) for consideration to be used in this section of the magazine. If you have a photo of yourself, please include it with your submission. We can't return or acknowledge material, whether or not it is used. Your story need be sent in only once, we'll keep it on file to consider it for future issues. All submissions become the property of *Popular Communications*.

Entries will be judged taking into consideration if the story they tell is interesting, amusing, or unusual. We reserve the right to make any necessary editorial changes to improve style or grammar.

Each month, we will select one of the entries to run in *POP'COMM*. Its author will receive a 1-year gift subscription (or subscription extension, if already a subscriber) to *Popular Communications*.

Address all entries to: How I Got Started, Popular Communications, 76 North Broadway, Hicksville, NY 11801.



Allen Brown still owns the original receiver that got him started in 1965. It's a Zenith Trans-Oceanic.

Our April Winner

The winning personal story for April was sent in by a new reader, Allen Brown, of Smithtown, New York. He wrote:

"I got started one summer morning in 1965 while I was in the US Air Force, and stationed at Otis Air Force Base, Mass. At the time, I was an aircraft mechanic working on an EC121H *Constellation* radar picket plane when the roll of wire I was holding suddenly began to buzz and crackle. The tip of the wire was glowing like a blue golf ball.

"When I told my sergeant, he bolted up the stairs and into the aircraft. Two seconds later the glowing and crackling stopped. Soon enough I learned that the radar tech activated the main radar search with the antenna connected instead of the dummy load. He nearly fried everyone working around the aircraft.

"After that experience, I began trying to find out more about what had happened. I started reading up on antennas, radar, and radio. That's when the radio bug bit, causing me to buy a Zenith Trans-Oceanic receiver. I began DX'ing, and I still own that radio that got me started. I recently got into scanning with a Realistic PRO-2006. Best of all, I passed the Technician Class ham exam and am now awaiting my license and callsign to come through.

"Becoming a radio hobbyist seems to be the only strange reaction to that blast of radar I got back in '65." ■

Beaming In

(from page 4)

ant in a legal action. The defense attorney put me on the stand and introduced me to the court, presenting a glowing word picture of my qualifications to testify as an expert.

The attorney for the plaintiff said he was very impressed. However, he was curious to know if I was the same irresponsible Tom Kneitel who told people to mail empty beer cans to the FCC. I admitted that I was, but that it was an April Fool's joke gone haywire. By now, with the exception of the defense table, there was laughter coming from many areas of the courtroom. The judge, who looked as if he had been weaned on a lemon, rapped his gavel and asked if I would be kind enough to share this joke with him.

I thereupon spun out the sad tale of the fateful editors' luncheon and its horrible aftermath. The judge listened patiently. When I was through with my story, he seemed to be thinking for a moment. Finally, he shook his head and smiled, saying, "Looks like it's the April Fool's prank that just won't die."

He was right. Ever since then, when April shows up, that ghost comes back to haunt me. What's worse, I have hideous visions that in a dark storage area of the FCC's basement, there still repose hundreds or thousands of twenty-five year old empty beer cans as part of some official file bearing my name. Try living with them ghosts, Bunky!

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BEARCAT BC142XL	94.99	(7.00)
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BEARCAT BC172XL	139.99	(7.00)
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(Plus $9.00 Shipping Each)

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100 Channel Digital Programmable Hand-Held Scanner

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Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

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SR-901

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ONLY! **$74.99** Each

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Receive Cellular Phone Calls

Plus police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (includes cellular). 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9¼"D x 4½"H x 12½"W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

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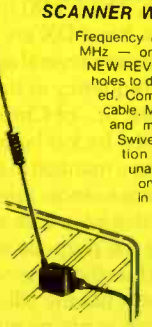

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CIRCLE 34 ON READER SERVICE CARD

SCANNING VHF/UHF

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

It's getting near the time of year to check your outside antennas if you haven't done so already. Make sure your cable connectors are in good condition, and preferably, shielded from the weather with at least electrical tape if not a commercial sealer made to encase connectors. Make sure your antennas withstood winter's fierceness and are still firmly mounted. Check to see that all the antenna's elements are intact and undamaged. It only helps to make your listening more enjoyable. It's also the time of year to start thinking about new antennas you may want to erect during the year's warmer months.

Tom Meredith of San Antonio, TX, says he enjoys *Scanning VHF/UHF*. While in college, he served with volunteer fire departments in West Virginia. He also had been an emergency dispatcher at one time. He also served in the Air Force. Tom says that "once you get emergency communications in your blood, it's nearly impossible to quit listening." That's one statement I won't disagree with. Tom's current scanner lineup consists of an RCA crystal scanner (that's got to be about 15 years old!), and Uniden Bearcat 580XLT and 950XLT scanners. He says that since San Antonio has switched to a 40-channel 800 MHz trunked system, scanning the local action has become more of a challenge. During the spring and fall, Tom says he likes to tune in the low band skip from "back east." Here's some frequencies he'd like to add to those that appeared in the November 1991 issue: 33.70, Caroline County, Maryland, fire; 33.74, Harford County, Maryland, fire; 33.78, Delaware statewide fire dispatch; 33.82, Woodbridge, Virginia, fire; 33.86, Chester County, Pennsylvania, and Washington County, Maryland, fire; 33.90, Berkeley County, West Virginia, and York County, Chester County and Lancaster County, Pennsylvania, fire. The 33.90 frequency is a good one for low band DX'ers to keep an ear on because there are several agencies that dispatch on that frequency in the east.

David A. Walters, Jr., of Chico Hills, CA has some information for low band skip chasers. He follows up to a mention in the December 1991 issue where a reader asked whether there is a directory that lists public safety agencies' addresses for the purpose of obtaining QSL's. David says that the *National Directory of Law Enforcement* fills the bill. The guide contains entries such as phone numbers, fax numbers, addresses, names and titles for all city, county, state and federal police agencies, including correctional institutions. David says that although special police agencies such as park police and school police aren't included, he had yet to find even the smallest police department not listed. The guide is updated annually. For more information on the 600 page large size guide, contact the National Police Chiefs and Sheriffs Information Bureau, PO Box 365, Stevens Point, WI 54481.

Here's the radio shack of Eddy Methot, SSB Network member SSB-77D, of Campbellton, New Brunswick, Canada. Eddy has been a reader since 1986. In addition to CB and shortwave gear, Eddy's Radio Shack PRO-2011 scanner can be seen here. It's hooked up to a Valor Scan-Tenna outdoors.

David Walters goes on to tell us that he's been a deputy sheriff for the Los Angeles County Sheriff's Department for six years and a scanner listener for 12 years. His department uses about 60 frequencies for voice communications and eight frequencies for mobile data terminals. All except two of the current channels were carved from TV Channel 16, 482-488 MHz, in a special FCC action. David owns Radio Shack PRO-2005 and PRO-34 scanners, as well as a Sony ICF-2010 receiver to discover action below 30 MHz. He also recently received an Optoelectronics frequency counter for tinkering with.

Steven M. Garber of Ajo, AZ checks in to say he has recently re-entered the scanning hobby with a Uniden Bearcat 210XL scanner and a ground plane antenna 25 feet in the air. After reading in the October issue about tuning in DX signals on VHF low band, he tried it. He says he's hearing long-haul signals, but wonders how you can figure out what agency you are hearing. That's not an easy question to answer, because, the more experience you get with low band skip listening, the more you'll be able to figure out what you are hearing. First, try to notice the dialect. Is it a southern drawl or a New Yawker's (that's New Yorker) accent? That can be your first clue. What about the time given over the air for dispatch? See what time zone it's in. How about town names given for directions to responding units? Jot down any call signs heard. Also note highway locations. For instance, with a good road atlas, you could track down a location if the dispatch is for a car fire on Interstate 74, two miles west of Danville. Look around the stretch of I-74 and you'll see it passes through Danville, IL for instance. If you snag town names, you can try looking them up in a good atlas. Sometimes county dispatches will identify their county every half-hour or so, such as "KUE698, Montgomery County fire radio" with a time and dispatcher's ID number for instance. Some departments also may ID just once a day. Keep an ear on a channel and learn all you can by taking notes. Your notes than can transform into effective low-band skip logging. Then, send in your DX reports to this column.

Morris Murphy of Des Moines, IA, says he owns a Uniden Bearcat 210XLT. He encouraged a friend to purchase one, too, however, his friend's radio would not receive cellular phone calls in the 440-450 MHz band. Thus, Morris' friend bought a Uniden Bearcat 800XLT to have capability on that band. Morris wants to know what gives with the two radios. First, cellular phones do not operate in the 400-450 MHz band, hams use that band for repeaters, links and other purposes.

If Morris was receiving cellular phone calls in that band, perhaps he lives close to a cellular tower and the signals are overloading the front end of his receiver, meaning he'll hear cellular phone calls all over the scanner bands perhaps. His friend probably does not live near a cellular tower and, of course, would not experience the same interference problem. Cellular phone calls can be heard in the 869-894 MHz band.

From Canada, we hear from Arthur R. Bungay, Jr., of St. John, New Brunswick, also known as the Greatest Little City in the East. Arthur uses a Radio Shack PRO-38 scanner and wants to know if it can be modified to receive either the 108-136 MHz aero band or the 800-1300 MHz region. He also wonders whether his 10-channel capacity could be expanded. Sorry, this scanner can't be doctored in any way I know of to increase its frequency coverage or channel capacity. The configuration has to be there first for it to be modified. Even if you could trick the scanner into reading out 108-136 or 800-1300 MHz bands, the radio's internal circuitry would not be able to electronically tune in those bands and hear signals. In addition, the aero band uses AM and your scanner receives FM signals only, so even if you could tune in this band, it would be in FM and not AM, making signals unintelligible. The AM detection electronics has to be in the radio first in order to reach into that band. My advice to those who want to modify anything other than those scanners readily known to be modifiable (i.e., Radio Shack PRO-2006, etc.), is to know what you want your scanner to do before you buy it and make sure your new scanner is capable of tuning in what you want to hear. If you want 800 MHz, buy a scanner that has 800 MHz capability. Other than some ham handhelds that can be modified, no scanner that doesn't already tune in 800 MHz can be modified to tune in a band so high in frequency.

While checking in, Arthur sends in some frequencies of interest for the St. John, New Brunswick, area: 412.5875, St. John police, F-1 dispatch; 412.6625, St. John police, F-2 special; 412.8875, C-PIC, car-to-car, F-3, St. John police; 413.6125, St. John police, special, car-to-car, F-4; 143.745, St. John fire, F-1 dispatch; 143.025, St. John fire, F-2, Tac-2; 143.055, St. John fire, F-3, Tac-3; 150.650, St. John waterworks; 155.820, 155.700, St. John Royal Canadian Mounted Police. Arthur also inquires as to whether Canadian listeners can become registered monitors. We suggest you inquire to: CRB Research Books, Inc., PO Box 56, Commack, NY 11725.

What kind of things are you hearing on your scanner these days? Hear any interesting low band skip? What questions do you want answered about scanning? We also welcome frequency lists and photos of your listening posts or antenna farms. Write: Chuck Gysi, N2DUP, Scanning VHF/UHF, Popular Communications, 76 N. Broadway, Hicksville, NY 11801-2909.

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- Delay, Hold Features.
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- Earphone.

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External Speaker. Mobile Mount.	MS190	$19.50
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Specifications:

Coverage:	500KHz-1300MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM
Speed:	20 ch/sec. scan. 40 ch/sec. search
IF:	561.225, 58.075, 455KHz or 10.7MHz
Increments:	5 to 955KHz selectable/ 5 or 12.5 steps.
Audio:	.4 Watts
Power:	Input 9 - 13.8 V. DC
Antenna:	BNC
Display:	LCD
Dimensions:	6 7/8H x 1 3/4D x 2 1/2W. 12oz wt.

AR950/AR900 $259/$269

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

Standard Features:
- Extremely compact size.
- Unrestricted 800MHz coverage.
- 100 channels permanent memory.
- Earphone Jack.
- Delay, Hold features.
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- 5 Scan Banks, 5 Search Banks.
- Two antennas included.
- AC & DC Power cord w/mobile mnt. hrdwr. (AR950)
- NiCad battery w/chgr adapter. (AR900)
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Options:

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25 to 1000MHz w 50'coax.	AS300	$59.95
Mag Mnt Mobile Antenna. 15' coax.	MA100	$25.00
Cigarette Lighter power adaptor.	CP100	$5.00
Wide band preamp	GW-2	$89.00
Extended Warranty. 2/3 yrs		$40/$55

Specifications:

Coverage:	27-54, 108-174, 406-512, 830-950MHz
Sensitivity:	.4uV Lo,Hi. .8uV Air. .5uV UHF. 1.0uV 800
Scan Speed:	15 ch/sec.
IF:	21.4MHz, 455KHz
Increments:	10,12.5,25,30
Audio:	1W
Power:	12.8VDC, 200MA
Antenna:	BNC
Display:	LCD w/backlight
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AR2500 $499

2016 Channels. 1 MHz to 1500 MHz

Standard Features:

- continuous coverage.
- AM,FM, wide band FM, & BFO for SSB, CW.
- 64 Scan Banks.
- 16 Search Banks.
- RS232 port built in.
- Includes AC/DC pwr crd. Antenna, Mntng Brckt.
- One Year Limited Warranty.

Options:

Earphone.	EP200	$2.00
External Speaker. Mobile Mount.	MS190	$19.50
Extended Warranty. 2/3 yrs.		$65/$75
Mobile Mounting Bracket.	MM1	$14.90
RS232 Control Package (software & cable) offers spectrum display and database.	SCS2	$295.00
Wide band preamp	G-W2	$89.00

Specifications:

Coverage:	1MHz-1500MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM/SSB/CW
Speed:	38 ch/sec. scan. 38 ch/sec. search
IF:	750.00, 45.0275, 5.5MHz 455KHz
Increments:	5,12,5,25 KHz
Audio:	1.2 Watts at 4 ohms
Power:	Input 13.8 V. DC 300mA
Antenna:	BNC
Display:	LCD, backlighted
Dimensions:	2 1/4H x 5 5/8W x 6 1/2D Wt. 1lb.

AR3000 $1095

400 Channels. 100KHz to 2036MHz.

Standard Features:

- Extremely compact size.
- Continuous coverage.
- Attenuation Programmable by Channel.
- Manual tuning knob.
- Tuning increments down to 50Hz.
- AM, FM, wide band FM, LSB, USB, CW modes.
- Backlighted LCD display.
- 4 Scan and Search Banks, Lockout in Search.
- 4 Priority Channels.
- RS232 control through DB25 connector.
- Delay, Hold Features.
- 15 band pass filters, GaAsFET RF amp.
- Sleep and Alarm Features.
- AC adaptor / charger. DC power cord.
- Telescopic Antenna
- One Year Limited Warranty.

Options:

Earphone.	EP200	$2.00
External Speaker. Mobile Mount.	MS190	$19.50
Extended Warranty. 2/3 yrs.		$65/$75
Mobile Mounting Bracket.	MM1	$14.90
RS232 Control Package (software & cable) offers spectrum display and database.	SCS3	$295.00
Wide band preamp	G-W2	$89.00

Specifications:

Coverage:	100KHz-2036MHz
Sensitivity:	.35uV NFM, 1.0uV WFM, 1.0AM/SSB/CW
Speed:	20 ch/sec. scan. 20ch/sec. search
IF:	736.23, (352.23) (198.63) 45.0275, 455KHz
Increments:	50Hz and greater
Audio:	1.2 Watts at 4 ohms
Power:	Input 13.8 V. DC 500mA
Antenna:	BNC
Display:	LCD
Dimensions:	3 1/7H x 5 2/5W x 7 7/8D Wt. 2lb 10oz.

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

R-2000

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

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

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

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

RZ-1
Wide-band scanning receiver

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

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

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

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