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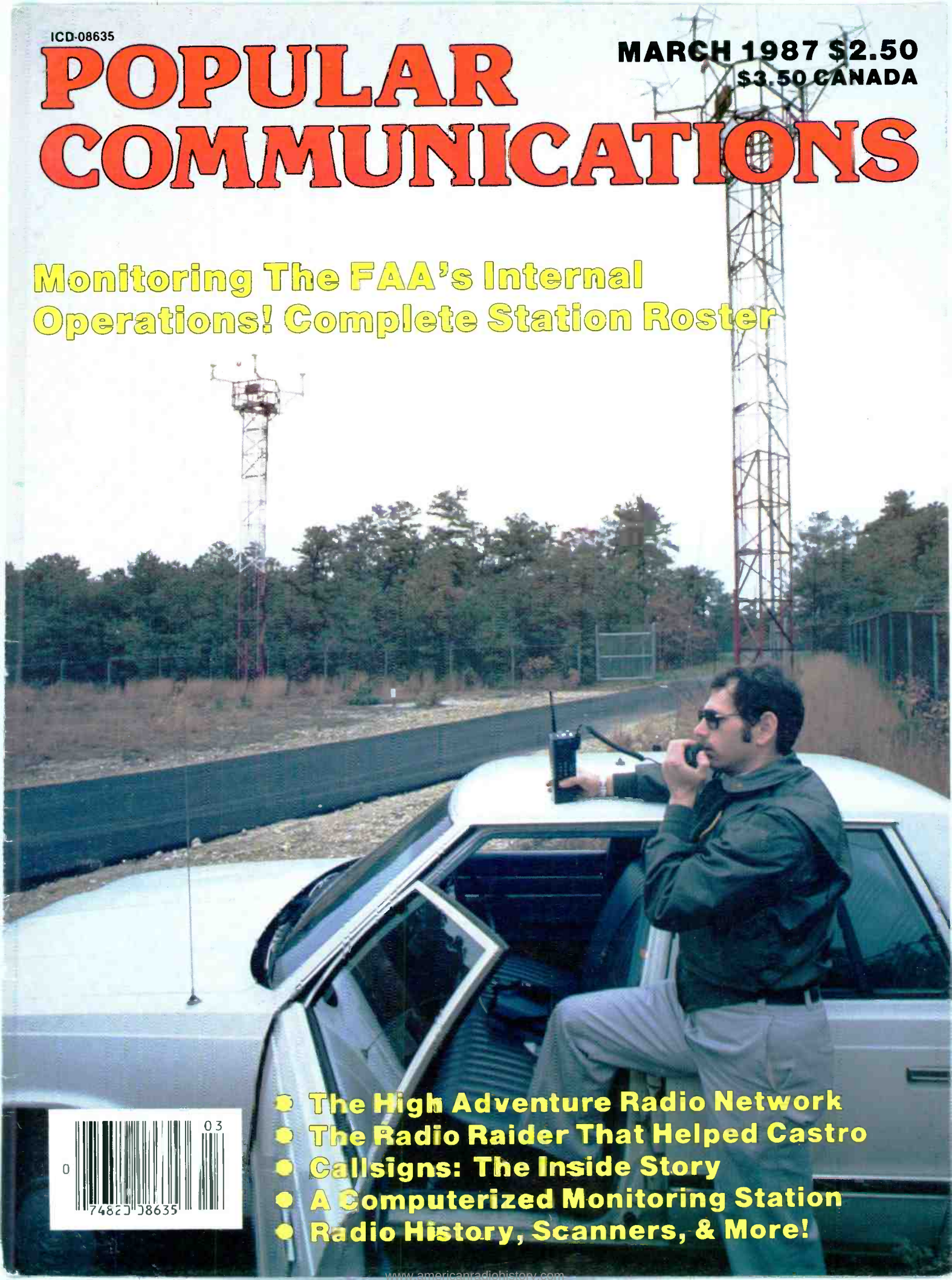

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AIR		108 - 136 MHz	25 kHz
FM		76 - 108 MHz	50 kHz
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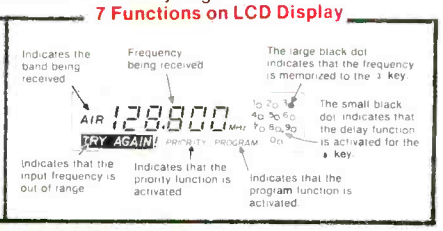
	LW	150 - 529 kHz (150 - 530 kHz)	1 kHz

7 Functions on LCD Display



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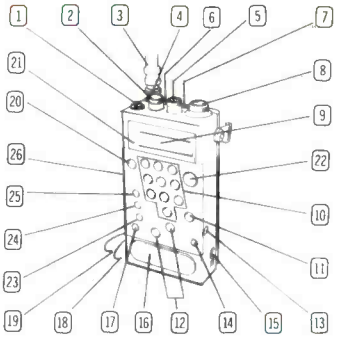

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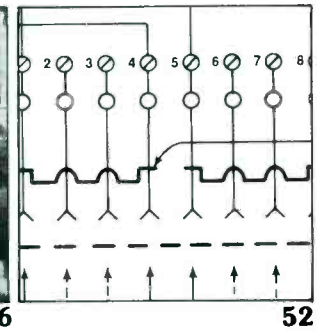

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FEATURES

This month's cover: *Martin Happes, electronics technician for the F.A.A., checks in with base from a remote site on Long Island, New York. Photo by Larry Mulvehill, WB2ZPI*

DEPARTMENTS

BEAMING IN

AN EDITORIAL

BY TOM KNEITEL, K2AES

Random Ramblings

I've been somewhat fascinated by the concept of this nation and the USSR ending the radio war that has been dragging on for about forty years. The more this nation broadcasts via VOA, Radio Liberty and RFE, the more the Soviets jam those broadcasts, and the more programming they attempt to send back towards our general direction. It's gone past the point of absurdity, with far too much money being spent, too much frequency space devoted to the game, and more noisy jamming signals than most listeners care to hear as each side attempts to zap and simultaneously one-up the other. It's a no-win situation.

When the Iceland Summit took place a few months ago, a proposal was made that the Soviets would end their attempts to jam our shortwave broadcasts if this nation would arrange for the Soviets to have their own broadcasts reach American audiences over this nation's domestic mediumwave broadcast stations.

Soviet broadcast jamming is blatantly illegal and a clear violation of international treaties to which the Soviets are signatories. Sometimes they deny that they're engaged in the business of jamming, but at other times they admit to it and claim it's a necessary defense against what they call "radio aggression." Jamming, which the Soviets regularly, and as a matter of general policy, direct against the broadcasts of several nations, is nothing more than a non-violent aspect of international terrorism.

Other than a few slip-ups, our nation's stated policy is not to grant concessions to, or negotiate with, terrorists. By all rights, this should also relate to those who are regularly engaged in broadcast jamming. When the jamming stops, and the broadcasts of *all* nations can be received without deliberate efforts to thwart reception, that's the point when we should commence to consider granting the Soviets free access to American mediumwave listeners. Moreover, we should demand equal access to Soviet listeners over their long and mediumwave broadcast facilities.

American broadcasters appear willing to make time available for the Soviet programs, and the prospect that VOA and other American features, entertainment, and news will be heard in the USSR without jamming is good news. But the thought of giving concessions in order to end their illegal broadcast jamming somehow irritates me. They're holding broadcast frequencies hostage and now offer to set the hostages free if we will permit them to send their broadcast band messages to citizens here. Although the free exchange of broadcasts is a good idea, this deal is less than it looks at first glance.

I'd also like to point out that while we consider rewarding forty years of illegal broadcast jamming by caving in to the demands of the jammers, we simultaneously ignore the efforts of many responsible members of the world's broadcasting community that strive to reach American listeners. Let's swap some FM and mediumwave time with the BBC, Radio Sweden, Deutsche Welle, Kol Israel, Radio Canada International, Radio Japan, and others. Not only are the programs from these broadcasters interesting, entertaining, and informative, access to them by the American public would drum up more interest in shortwave listening.

Next, I feel that I must comment on the 99th Congress' passage of the Electronic Communications Privacy Act (ECPA), a law that seemed assured of passage right from the first day it was proposed by Rep. Robert W. Kastenmeier (of Wisconsin). That this shameless and impotent piece of junk legislation should have been proposed at all is unfortunate. The power broker behind the ECPA is the rich and influential Cellular Mobile Telephone (CMT) industry. The primary intent of the ECPA is to permit the CMT industry to imply to CMT users that their mobile telephone conversations are assured, by federal law, of privacy. This commercial intent of the ECPA was cleverly buried under several thick layers of hogwash. In the words of Rep. Kastenmeier (in a letter to *POP'COMM* reader Terry O' Laughlin, WB9GVB, Madison, WI), "The bill is designed to extend the protection of the Wiretap Act . . . to new modes of communication, such as computer transmissions over telephone lines, data transmissions by satellite, as well as cellular telephones."

The self-imposed deadline for ending the 99th Congress was rapidly approaching and there were still many major pieces of legislation to consider—drug control, immigration reform, etc. The legislators were so afraid that they wouldn't be able to get everything finished on time (actually, the session ran two weeks late) they they were wearing lapel buttons reading, "Free the 99th Congress."

So desperate were they to close up shop and go home that, at one point the ECPA was even incorporated into pending drug control legislation! It was eventually reinstituted as an independent piece of legislation where it was, in the final hours of the 99th Congress, offered to the U.S. Senate Judiciary Committee for their consideration. After mulling it over for precisely 25 seconds, the Committee approved the bill unanimously and it went from there through its final approval by both Houses of Congress like BB's through a funnel!

Ultimately, all of our complaint letters and efforts to squash this legislation, with all of its sinister portents for the future of freedom of the public airwaves, meant absolutely nothing—not in the face of the CMT industry's powerful big-bucks lobbyists mixed in with legislative manipulators and strategists. These guys know the value of dragging out legislation so that it comes up for a vote when everybody is dying to clean out the cupboard and go home. Under those conditions, they probably could have figured out how to legalize or outlaw practically anything rather than face the spectre of a long and drawn out debate on the merits of proposed legislation.

You really have to question the sleaziness of everything surrounding the ECPA and just about everybody connected with that tatty little piece of work. You want so much to believe that the legislators in Congress and the Senate are going to be bright, clever, reasonable, fair, knowledgeable, and resistant to being played upon by lobbyists as if they were well-tuned Stradivarius violins. Sadly, and all too often, you end up shaking your head in dismay. It's not so much that you don't understand what they are doing, as you fear that they don't either!

Of course, you and I focus on such matters by means of seeing the way this ECPA was almost ramrodded through as the idiot half-brother of unrelated valuable legislation. You and I saw the non-impact of our complaint letters about the ECPA that were sent to legislators, and wondered about the stupidity of the replies from those who bothered to answer at all. The fact that they didn't understand our complaints was a good clue that they also didn't understand the ECPA itself, or its far-reaching harmful implications. Indeed, even the original sponsors of the ECPA seemed to know little enough about what was involved, based upon their own statements and letters.

Let's not forget that there are other Americans, persons who have never heard of or about the ECPA, who have seen this same scenario played out regarding many pieces of legislation relating to all sorts of things—the ecology, endangered species, natural resources, social programs, farming, etc., etc. They also sought, unsuccessfully, to present their legislative representatives with information in order to affect pending laws.

This takes upon itself frightening poten-

(Continued on page 73)

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MAILBAG LETTERS TO THE EDITOR

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

Calling All Callsigns

I am glad that our esteemed editor has finally been able to get all that numerical frustration off his chest in the October editorial, "Bingo! We've Run Out of Numbers." We record collectors have also had to deal with this for 97 years with thousands of record companies each issuing records with catalogue numbers, matrix numbers for each side, and variant numbers for different speeds, mono or stereo versions, different tape formats, re-issues, and now CD's!

Dr. Michael Biel, President
Association for Recorded
Sound Collections
Morehead, KY

POP'COMM's October editorial was tops, just the kind of approach and style that can be found only in your magazine. I never laughed so much; many a truth is said in jest. It made me wonder, what's the *real* story with the ITU and international callsign allocations? Callsigns are such an integral part of communications that I had never actually stopped to think about them, where they came from, what they're all about, and where they're going. How about a serious look at the topic in a forthcoming issue of *POP'COMM*? Guess I just took them for granted, but *POP'COMM* has made me wonder.

Anthony Prestifilippo
Modesto, CA

Our little irreverent excursion into callsigns last October brought in a lot of mail. A couple of readers said they though we were a bit too flippant about the prestigious ITU, although generally readers seemed to enjoy the editorial. Most who wrote echoed Tony Prestifilippo's hope that POP'COMM *would take a "real" look at the inside story of callsigns. This issue has a story which we offer to meet those requests. —Editor*

Electronic Privacy Commentary

Your November *Beaming In*, about the Electronic Communications Privacy Act did you proud. It was one of the most informative, incisive, and coherent articles I've ever read about this Act and the idiot legislators who have backed the legislation. I am unable to find out how these bubble heads from Texas voted, but I have been told that they all voted in favor of the Act. This doesn't surprise me.

Hugh M. Hawkins
San Antonio, TX

Just spent a half-hour scanning the Cellular Band. I spent four years in the U.S. Navy and in all of those years I never heard such vulgar language, so many four-letter words, such gross obscenities as I heard during those 30 minutes. I've been a Ham for over 30 years and I know the FCC has strict regulations about profanity on the air. That means about 95% of Cellular users are violating those laws. Bet the Congressmen never listened to Cellular, or maybe the new law is intended to protect listeners from being assaulted by such vulgarity. Thanks, but I'll go back to scanning police frequencies! A half-hour is all of the foul language, wife-cheating and "big deal making" I could handle. Hell itself would be having to listen to the Cellular band for all eternity.

Richard Krepps, W1ACG
Houston, TX

In regard to your comments about the Electronic Communications Privacy Act, you ought to run for political office. You're the only one who sees the situation for what it is and has the guts and ability to express those views in a candid, blunt, and forthright manner.

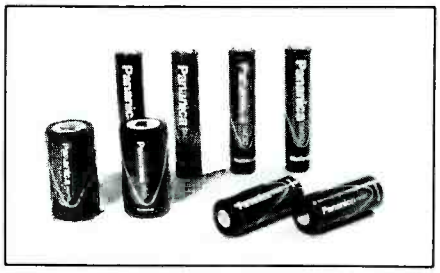
Jim Lindly
Manhattan, KS

Epilogue thoughts on the passage on the now-passed Electronic Communications Privacy Act are included in this month's Beaming In. —Editor

Frozen Juice

When I'm not using the batteries for my handheld scanner, I remove them from the equipment and store them in the freezer. I was told that this would extend the life of a battery, even though battery manufacturers don't provide this information on their packaging. Why isn't this information provided to consumers?

John Swensen
Lawton, OK



This is a popular rumor that has been circulating for years. A battery converts stored chemical energy into electricity. Inasmuch as lower temperatures can slow down chemical activity, it may extend shelf life, to some extent, by storing them in the refrigerator (but not the freezer since storage in the freezer can cause cracks in their jackets). Refrigerator storage isn't without potential problems from condensation. The most important factors in prolonging battery life are keeping them out of direct sunlight and away from temperatures above 72° F. Storage in a dry place at room temperature should do just fine, with the refrigerator as a secondary place during the heat of summer, although they should be protected against condensation when in the refrigerator. Best bet is to forget the freezer, especially if the batteries have been previously used. —Editor

It's Not Fair

When monitoring shortwave aeronautical weather (VOLMET) broadcasts I note that the descriptions of the cloud cover are totally different than the terms used to describe cloud cover on the NOAA's VHF weather broadcasts. VOLMET stations talk in terms of "broken sky" and "scattered clouds," the NOAA refers to "partly cloudy" and "cloudy." Why?

Charles Fredericks, Sr.
Camden, NJ

It's all a matter of how you look at things. The standard NOAA terminology calls for the term "partly cloudy" to describe a 31 to 70% cloud cover, the word "cloudy" to represent 71 to 99% cloud cover. Aviation weather forecasters in the U.S. and elsewhere use the term "scattered clouds" to describe a cloud cover of 10 to 50%, "broken sky" meaning a cover of 51 to 89%. In aviation forecasts, there has to be a 90 to 99% cloud cover for the word "cloudy" to be used. How does the NOAA determine the exact percentage of cloud cover? A forecaster goes up on the roof of the building and makes an educated estimate. In CW and RTTY aviation weather transmissions, you may come across the abbreviations "BKN" and "SCT" to represent "broken sky" and "scattered clouds." —Editor

An Odd Mix

While searching out new frequencies on my scanner, the set stopped on 153.34 MHz. On that frequency I've heard a CW identification of KLN305, also radio paging, what sounds like a police dispatcher, and sometimes an airport control tower. What's happening on this frequency?

Michael LaRocque
Haddam, CT

The CW identification belongs to United Technologies in Windsor Locks, CT; the radio paging is probably from that station. The other communications you describe are from the Calverton Naval Weapons Industrial Reserve Plant (and airport) on Long Island. This facility, operated by Grumman Aerospace, uses 153.35 MHz for various operations including its security force. Occasionally they also repeat their control tower comms on this frequency. —Editor

Fee-Fi-Ho-Hum

During the CB "boom" years I applied for (and paid a fee for) an FCC license. The FCC was ordered to refund those fees. They never sent my refund. By now, with compound interest, I figure they owe me a respectable amount of cash. How do I go about collecting this refund?

Harley Coles
Newlight, LA

Well, Harley, if you were sitting back waiting until now for the interest to compound so you could make a financial coup, I think you blew it. They paid out the refunds only to those who applied for them, and the cutoff date was many years ago. Sorry to have to be the one to break this news to you, however, the FCC has again proposed a rule to impose fees on certain communications facilities. We may all have our chance again to feed the kitty and then, at some point in the future, apply for refunds. Next time, Harley, forget about the fancy financial footwork. Take the money and run while you have the chance. —Editor

Seasonal Signals

I like to listen to station WHLI (1100 kHz, Hempstead, NY) while I work. About a half-hour before this station goes off the air every day their signal deteriorates substantially. This happens throughout the year, even though they leave the air at varying times according to the seasons. Why?

W. J. Cohen
Manhasset, NY

WHLI is a daytime-only station, as are many AM broadcasters across the nation. Therefore, the phenomenon you mention is familiar to many readers. In WHLI's case, during the summer months it operates with 10 kW from 5:30 a.m. to 8:30 p.m. In other seasons, when propagation conditions improve, daytime stations are generally required (by the FCC) to start broadcasting later and sign off earlier in order to avoid interfering with distant stations on their frequency. In WHLI's case, their normal winter schedule is 7:15 a.m. to 4:30 p.m. Some daytime stations, however, receive FCC authorization to extend their reduced broadcast hours by running lower-than-usual power and/or changing their antenna's radiating pattern. Three years ago, the FCC permitted WHLI to operate for an additional 30 minutes per day on the condition that the station reduce power to 500 watts during that brief period. Listeners will notice the switchover from full to reduced power because the station's signal leaves the air for a second or two during the change. Some listeners may not be aware of any drop in signal level at lower power, but those using communications receivers will see the change reflected on the S-meter reading. Some stations run 10 watts or less during their reduced power operations and, to the DX listener, it opens up an area of new challenges. This is especially true when stations indicate the lesser power on their QSL card. —Editor

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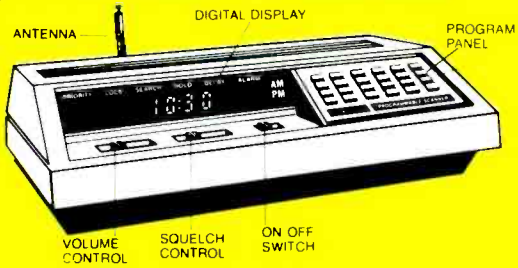

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Florida Law Points Out Danger Of Vague State Laws Regulating Scanners

Last month we unfortunately had to report on scanner owner arrests in two states for violating state laws on mobile and handheld scanners. This month we report on the response one SCAN member received when he inquired about the Florida laws to the local Sheriffs' office and the State Highway Patrol. The Florida law prohibits permanent installation of a scanner in a vehicle or place of business. The Attorney General of the State of Florida has issued an opinion that "permanent installation" means a scanner connected to the vehicle's power supply and an outside antenna. But here is what our member was reportedly told when he inquired about having a handheld scanner in the vehicle: A Sheriffs' deputy told him that he would not be arrested beccause the law was vague. However, a State Trooper said that he would arrest him because, although the law doesn't mention handhelds, there is serious doubt in his mind about the meaning of the law. Therefore, the Trooper said he would make an arrest and let a judge decide.

Now these are not the official views of the law enforcement agencies, only an example of how laws must be interpreted on the spot by local law enforcement personnel who have the impossible task of trying to know all of these laws. In fact, almost all law enforcement agencies support citizen use of scanners. But this is a clear example of how an uneeded law can cause all sorts of havoc and infringement on citizen rights. Imagine having to hire a lawyer to defend yourself, even though the Attorney General of your state says that the law doesn't apply to you. The sponsor of this legislation, when asked whether the law was intended to apply to handheld scanners, reportedly told our member that he should get his own attorney to interpret the law. This type of law is coercive. It tends to make law abiding citizens afraid to continue to do something that is perfectly legal . . . like carrying a handheld scanner with you when you travel in Florida.

Fortunately, most state laws that exist confine themselves to prohibiting illegal uses of scanners. As we mentioned last month, SCAN has a nationwide guide to state scanner laws available for $1.00 to cover our postage and handling costs. (Write to SCAN Legal Report, P.O. Box 414, Western Springs, IL 60558.) In the meantime, we ask that all scanner owners stay alert to any proposed legislation in their state and notify us immediately about the details. SCAN has been successful in a number of states with having legislation withdrawn, modified, or defeated . . . but we do need to be alerted as early as possible when proposals are made.

New Scanner Features Suggested By Members

In a recent column we called for readers to let scanner manufacturers know what we want in the next generation of scanners. This really did hit a responsive cord, because we have received a lot of mail on the subject . . . and some very interesting mail at that! We had started the ball rolling with a suggestion that a future scanner combine a paging receiver alerting function with a scanner. Wow! We had no idea that so many others had already thought of that concept. Most wrote that they were firefighters or emergency medical technicians . . . and they want this product *yesterday!*

There were plenty of other ideas suggested, too. One idea mentioned often was the addition of metering on scanners. Signal strength, yes, but also deviation meters for zeroing in with a fine tuning control. Readouts were also the subject of discussion, with many wanting a second readout for various functions, such as showing the frequency in the priority channel.

Frequency ranges came in for much comment. A suggestion made by several aviation buffs was for the inclusion on 216-400 MHz on a portable scanner to permit listening to the military aircraft band at air shows and the like. (A hint for those who would like this feature now: A small battery operated frequency converter will give you this feature on your portable. Unfortunately, I know of none that are commercially manufactured, but they are easy to build.)

Built-in data communications readout was another suggestion by many, especially from those in towns with police using data terminals in vehicles. As we've mentioned before, that's the wave of the future in communications. Even the Electronic Communications Privacy Act will permit this, providing that the data isn't scrambled or isn't using non-standard coding designed to prevent decoding.

Speaking of ECPA . . . one most interesting suggestion was a portable scanner without a frequency display! It would be programmed by a personal computer and then just LEDs (like on the older crystal scanners) would indicate which channel it was on, but not the frequency. According to the writer, this would protect the user from being caught with a "forbidden" frequency showing on the scanner in violation of ECPA. May I make one additional suggestion, though? How about a red instant memory erase button, just in case!

Probably the most thought provoking comment received was a call for manufacturers to bring back some features that have strangely disappeared. For instance, the automatic "search and store" feature that searched a programmed band and stored all frequencies found and even counted the number of times each was active. We used to be able to buy a scanner like that—why not today? In fact, many suggestions received from newcomers were about features we used to be able to buy on scanner models. There *was* a computer driven scanner on the market that did all sorts of amazing things. Unfortunately, only a few scanner fans were able to buy one before it disappeared from the market. The capability to display 10-codes and maps as each channel became active, to stack priorities, have hundreds of channels . . . they were all there. Someday soon I would hope that we will see "the wheel re-invented" and this product brought back on the market.

Our thanks to all those who sent in comments . . . and please don't stop. I know that there are plenty of other good ideas out there from the only people who really know what's needed . . . scanner users.

Now, Listening To Your Stereo System Could Make You A Law Breaker!

The ridiculousness of the Electronic Communications Privacy Act comes into sharper focus every day. In a recent editorial in *Personal Communications Technology* it was pointed out that if you receive interference from a radio common carrier on your TV or stereo, you could be violating the law. Many of us have had the experience of interfering two-way radio signals blasting through temporarily on our home entertainment equipment. If you want to stay by the letter of the law, better have your remote control handy. If you leave the set on you could be "intentionally" listening in, and therefore be subject to severe penalties.

Wouldn't it be really interesting if we could have someone charged in such a case and have the case brought to trial? There are enough people, in and out of government, who are so upset

(Continued on page 75)

High Adventure Radio

From Battle-Scarred Lebanon to Sunny California, This Unusual Network Has An Exciting Story to Tell!

BY GERRY L. DEXTER

Lebanon, California and Singapore are about as different from each other as three places can be and about as distant. Yet the three places are connected by a common thread. Shortwave radio stations operated by High Adventure Ministries either exist or are planned at all three locations.

High Adventure Ministries is perhaps better known to shortwave listeners as the Voice of Hope or, more specifically, the Voice of Hope International Radio Network. The Voice of Hope is a relative newcomer to the shortwave scene. Indeed, its parent organization, High Adventure Ministries, waited several years before it got into religious broadcasting.

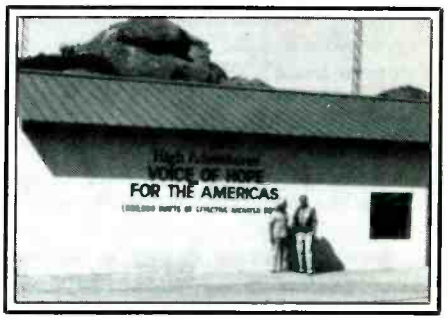
High Adventure was organized in 1972 as a non-profit Christian religious organization. The man behind (or perhaps we should say in front of) High Adventure is George Otis, a former executive at Lear Jet. Otis serves as President and Chairman of the Board.

Much of the organization's work during the first years has been through appearances on television, personal ministry to churches and religious groups, the production of films and literature. Otis himself has written 13 books, one of them, the *Voice of Hope* is about the Lebanese station. He has been a frequent guest on such programs as the "700 Club," the PTL Network and others.

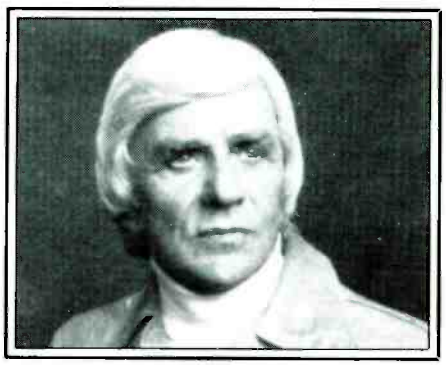
High Adventure describes itself as a Protestant, interdenominational, evangelistic and missionary organization. Its funding is completely dependent upon monthly support received from individuals, churches and other organizations, much of which is raised through personal appearances and direct mail solicitations. High Adventure says that its income represents only about 1% of the total amount collected by all such organizations in the country, or about 2 million per year.

The organization has conducted personal tours of the Holy Land for a number of years and so far some 5,000 people have made the journey. Over 200 TV programs have been produced under the titles "High Adventure" and "Adventures in Life" and these have featured top names in politics (including President Reagan), entertainment and sports. Several video and film documentaries about the Middle East have also been produced, including one co-hosted by Danny Thomas.

The Morning Star *which may one day beam AM, shortwave and TV signals to Asia from the South China Sea.*



Transmitter building for KVOH in California's Simi Valley.



George Otis, President of High Adventure.

Although it is not seen as a priority, High Adventure has also been involved in relief work, particularly in Lebanon during 1982-83 when it distributed hundreds of tons of food, medicine, toys, blankets and Bibles to all the factions of Southern Lebanon during the upheaval there. Work in providing medical, dental and eye care services continues in Southern Lebanon, including a small clinic and an aircraft called the "Wings of Hope."

For the past seven years though, High Adventure's main thrust has been in broadcasting.

Lebanon was where it started. In February, 1979, Otis, during one of his many trips to the area, met with the late Major Saad Haddad who was the leader of the Christian element in Southern Lebanon. Haddad wanted a radio station in his area. All of the other major factions in the Lebanon nightmare had their own radio broadcasts and Haddad needed a means of immediate communication with his people. The idea soon captured the imagination of Otis who went to work making contacts and raising money. Just seven months later the station was on the air!

The first High Adventure station, Voice of Hope's WORD, began broadcasting on mediumwave on September 9, 1979. With opposing factions everywhere, with terrorist attacks commonplace, it probably wasn't too surprising that the U.S. media, including the national TV networks, had reporters on the scene to cover the dedication.

The new station was located in the Valley of the Kings near Marj'uyun, within sight of the town of Metulla, across the border in Israel. Offices were set up in the Arazim Hotel in Metulla for this first independent Christian broadcasting station in the Holy Land.

The transmitter was placed in an abandoned building which once served as a French customs office.

WORD's programming was a blend of Christian and secular music (a lot of it country and western), along with news and Bible teachings. Every 15 minutes the station airs what it calls "God's commercials"—60 seconds of pure scripture. Considering all of the hostilities in the area, High Adventure looks upon its Lebanon broadcastin efforts as having produced extremely good results. Eventually a second transmitter went on—both of them rated at 12.5 kilowatts on 685 kHz and 945 kHz. Daytime coverage is about 120 miles with the WORD signal reaching out nearly 600 miles at night.

WORD's sister station, the KING of Hope, went on the air on the shortwave bands in January, 1981 over a 12-kW transmitter to an omnidirectional antenna. KING

A Lebanese guard watches over the Voice of Hope.

of Hope now airs broadcasts in about ten different languages and beams to the southern Soviet Union, Siberia, India and Europe. Prime coverage also includes the northern two-thirds of Africa. Initially operating on 6215 kHz, that frequency was changed to 6280 last year. The station is on the air from 0300 to 2300 UTC and can occasionally be received by listeners in the United States. It's been heard in over 50 countries. Eventually, High Adventure would like to increase the power of KING to 1.5 million watts of effective radiated power.

High Adventure's next move was to put the STAR of Hope television station on the air from Southern Lebanon. The Channel 12 station was the first Christian television station in the Middle East. The TV station went on the air only one month after KING began broadcasting. But, a year and a half later, STAR was turned over to the Christian Broadcasting Network, the organization that produces the 700 Club and operates the CBN Cable Satellite Network.

FM was next. On Christmas Eve in 1985, the Voice of Hope FM station signed on from a transmitter site on Mount Herman. The 100-kilowatt station operates at 105.1 MHz.

From the outset, the Lebanese operations of High Adventure had been, literally, under the gun. Numerous threats were directed against the station, even before it went on the air. Attempts were made against the lives of station personnel and elements within the Lebanese government have tried to force the station to include several hours of Moslem programming within its schedule. Members of the Christian militia and, later, private guards had to be employed to guard the facilities. Despite all the threats, the Lebanese radio escaped the turmoil which frequently raged in the area.

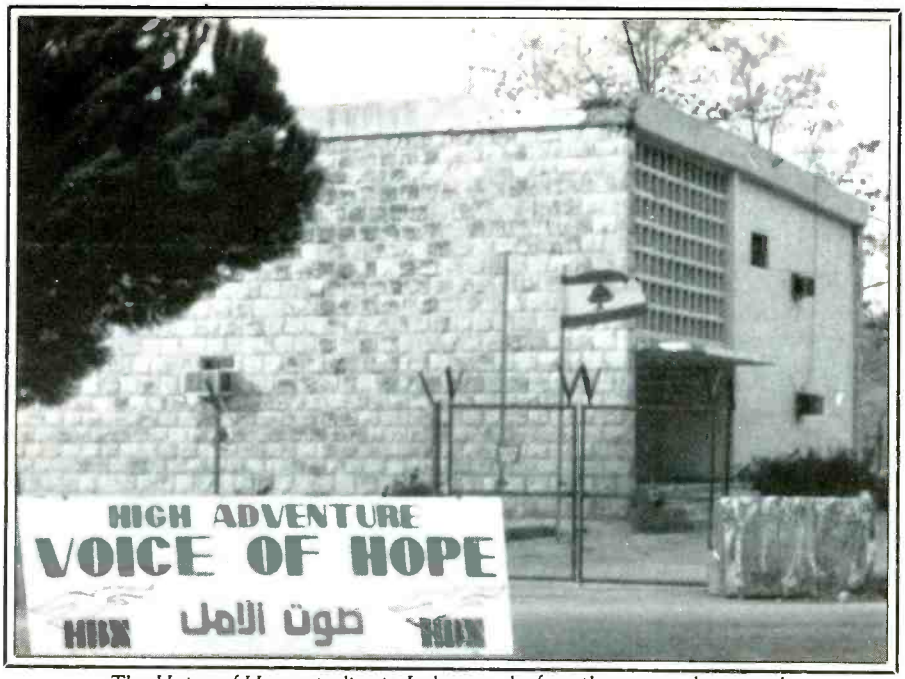
Safe until mid-October, 1985, when three guerrillas staged a suicide bombing of the studios. All three guerrillas were killed along with a station engineer and a Lebanese militiaman. The 220 pounds of explosive destroyed the studio installation, doing damage estimated at nearly half a million dollars.

Despite the bombing and the death and destruction the station was able to resume operations from its transmitter site in a matter of hours and studios were later set up in borrowed quarters with plans and negotiations with Israel underway to build new studios inside the buffer zone just a few feet from the Israeli border.

Meantime, the owner of the building that was being used as the transmitter site and whom Major Haddad had been unable to find to obtain approval when the station was being built, unexpectedly returned. A Moslem who had been with the PLO in the north, the owner demanded that the Christian station vacate his property and so the transmitter site, too, had to find new quarters.

Despite all of the hardships and hazards however, the Voice of Hope operations continue regular broadcasting inside Southern Lebanon.

Back home, at High Adventure's headquarters in California, new things were being considered. A project was launched in 1983 to put a powerful shortwave station on the air that would beam programs to Central and South America and the Caribbean. The call letters KVOH (Voice of Hope) were granted by the FCC and the station was targeted for a Christmas 1985 sign-on. But that date wasn't met, nor was the Easter 1986 date which was to have featured a live dedication of the station on the 700 Club program. As of this writing, KVOH has still



The Voice of Hope studios in Lebanon, before they were destroyed.

not been heard by U.S. listeners, although initial test broadcasts are expected to begin at any time.

Lack of money was at the root of most of the delays. A site had to be prepared up on Chatsworth Peak overlooking Box Canyon Road in the Simi Valley, just northwest of the Los Angeles area. Initially, KVOH was to put out 1.5 kW of effective radiated power but difficulties with the transmitter manufacturer have changed that, at least for the time being. In order to get things going KVOH purchased a used 100 kW transmitter from HCJB in Ecuador which was disassembled, shipped to th KVOH site and reassembled there.

After initial tests, scheduled for the daytime hours on 17775, regular programming will begin with about six hours per day of mostly English language broadcasts, but with an increasing amount of Spanish. Studio facilities are in the Los Angeles area and it's expected that KVOH will eventually have a satellite hook-up with the Lebanese stations. The cost of the KVOH project is estimated at about $750,000 with an annual operating budget of $360,000. Programming will be provided by High Adventure but will also include programs by "middle-of-road" evangelists. Almost certainly, KVOH will be on the air with regular programming by the time this is read.

The schedule, good through early March, 1987 is as follows: 0600-0800 on 6005, 1400-1600 on 9525, 0300-0600 on 9852.5, 0000-0300 on 11930, 2200-0000 on 15120 and 1700-2200 on 17775 with 50 kilowatts.

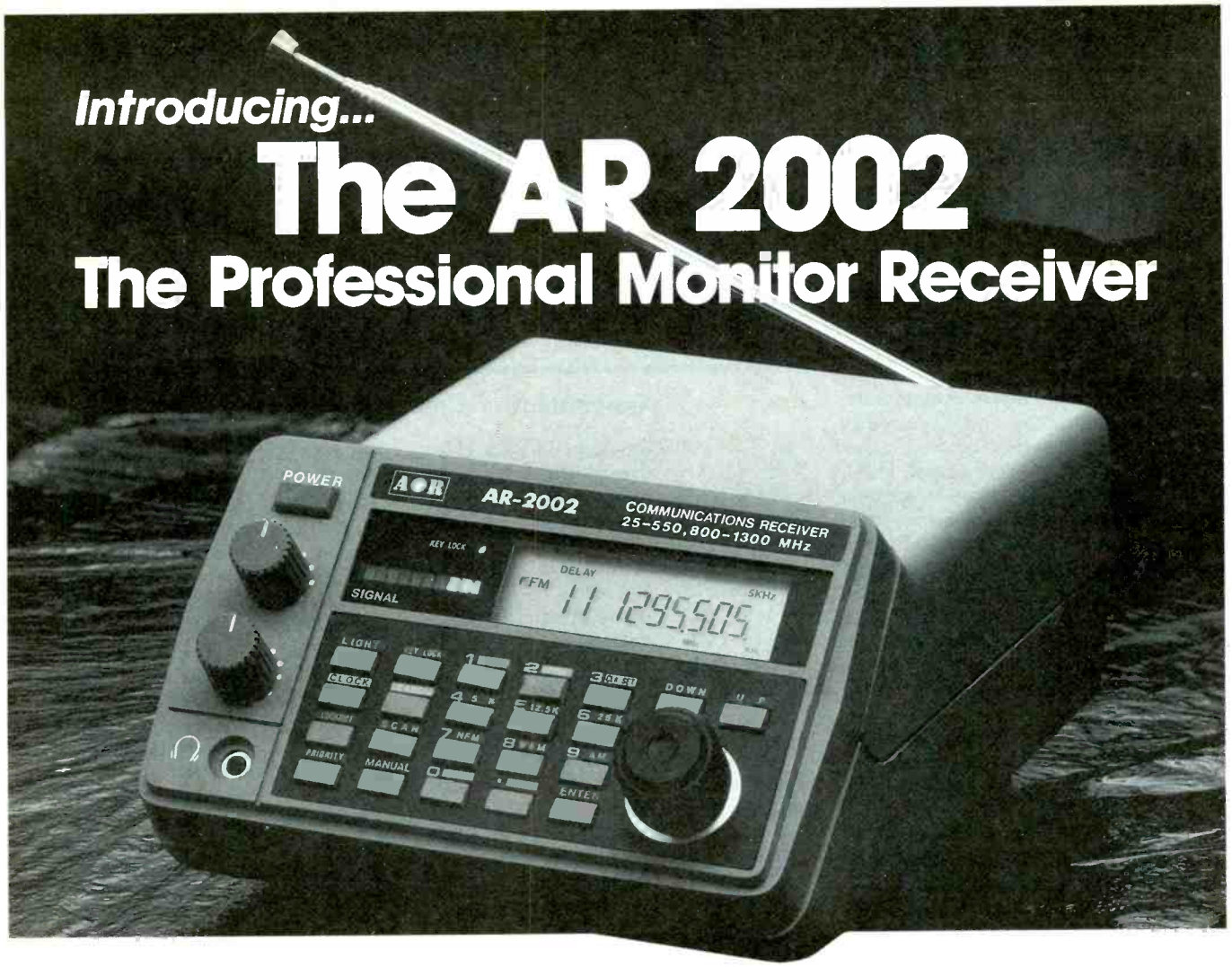
In what may be the most ambitious broadcasting effort High Adventure has yet undertaken, the group is proposing to place a broadcasting complex on a ship in the South China Seas, off the coast of Singapore. The facilities would include a 50-kilowatt mediumwave station, a shortwave station with an effective radiated power of 1.5 million watts and a television station. A ship which High Adventure believes ideal for this purpose has already been selected—it's the *Morning Star* formerly owned by a Singapore-based firm. The vessel is a 200-foot ocean container ship and would be anchored at Jahor Shoal in international waters just off the Singapore coast.

The new stations would beam Christian programming to a potential audience of 2.5 billion people in Asia in English and Mandarin, although additional languages would almost certainly be added later. High Adventure estimates it will take more than $650,000 to outfit the ship for broadcasting. An on-the-air target date of Easter, 1987 has been set but, if the KVOH experience is any example, the first programs from the *Morning Star* may not be heard until much later than that. But, (again), if past history counts for anything, broadcasts from the *Morning Star* are a question of "when" far more than "if."

High Adventure has accomplished a great deal—especially when one realizes that the main office has a staff of only ten, and the "satellite" offices in Canada, England, Austrailia and Singapore have staffs of only two or three persons each.

Reception reports on the Lebanon shortwave or the Simi shortwave stations may be sent to High Adventure headquarters. The address is P.O. Box 7466, Van Nuys, CA 91409.

The Voice of Hope Network may not yet be a match for the likes of HCJB or Trans World Radio but considering past and present accomplishments and its future plans, one day it very well may be. PC



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CIRCLE 23 ON READER SERVICE CARD

Callsigns: The Inside Story

You Hear Several Every Time You Turn On A Radio— But How Much Do You Know About Them?

BY TOM KNEITEL, K2AES, EDITOR

In the early days of wireless, owners of stations concocted the callsigns to be used by their stations. The system resulted in stations identifying themselves as BH, H, G, TD, MR, and others of that sort. In fact, after a while there was a considerable amount of duplication of these unofficial call letters even after three-letter systems were used. By 1908, things had gotten so confusing that it became necessary for world governments to agree upon an orderly system of assigning call letters using specific and distinctive prefixes and blocks set aside for individual nations.

Some of these first international assignments were tied directly to the names of the nations themselves. For example, all in Japan were given callsigns starting with the letter "J," Italian stations used "I," stations "F" stood for France, "G" for Great Britain, "R" for Russia, "D" meant Deutschland (Germany), etc. Stations of the United States could use K, N, or W. Canadian authorities were allocated VAA through VGZ. All other nations had similar groupings and it looked, for a while, as if the problems were solved once and for all. Actually, that was only the *beginning* of the problem, or multitude of problems.

As with all newly instituted, well-ordered and structured convenience systems, problems started to show up in short order. Some nations complained that they needed more allocations in order to meet their growing needs, complaining that other nations didn't need as many callsigns as had been set aside for their use. Adjustments had to be made, also taking into account that some nations were changing their names or going out of or coming into existence. In 1919, the callsign block UNA through UNZ was listed as Bosnia-Herzegovina; by 1924 this was changed to the Kingdom of Serbia; by 1930 it was shown as "Kingdom of Serbs, Croats, and Slovenes (Yugoslavia); by 1934 the allocation belonged to the USSR and Yugoslavia was told to use YTA through YUZ, an allocation previously assigned to Great Britain.

Fact is, that right from the very beginning, and continuing to the present time, the status of radio callsigns has been in a state of growth and constant change. Presently, callsign prefixes are allocated under the guidance of an international agency called the International Telecommunications Union

Assignment of Commercial Radio Calls

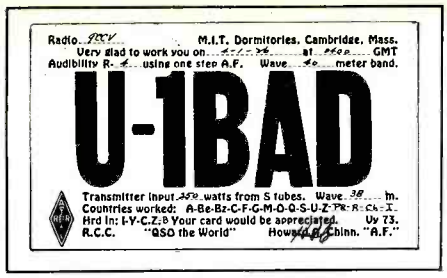
A .....See Note Below.
B* .....Great Britain.
CAA to CEZ ..Chile.
CFA to CKZ ..Great Britain and protectorates.
CLA to CMZ ..Spain.
CNA to CNZ ..Morocco.
COA to COZ ..Great Britain.
CPA to CPZ ..Bolivia.
CQA to CQZ ..Monaco.
CRA to CUZ ..Portugal and possessions.
CVA to CVZ ..Roumania.
CWA to CWZ ..Uruguay.
CXA to CXZ ..Spain.
CYA to CZZ ..Mexico.
D .....See Note Below.
EAA to EHZ ..Spain and colonies.
EIA to EZZ ..Great Britain.
F .....France and colonies.
G .....Great Britain.
HAA to HFZ ..See Note Below.
HGA to HHZ ..Siam.
HIA to HIZ ..Dominican Republic.
HJA to HKZ ..Republic of Colombia.
HLA to HNU ..Spain.
HNV to HNZ..
HOA to HZZ ..France and colonies.
I .....Italy and colonies.
J .....Japan and colonies.
KAA to KCZ ..See Note Below.
KDA to KZZ ..United States.
LAA to LHZ ..Norway.
LIA to LRZ ..Argentine Republic.
LSA to LUZ ..Great Britain.
LVA to LVZ ..Guatemala.
LWA to LWZ..Norway.
LXA to LZZ ..See Note Below.
M .....Great Britain.
N** .....United States.
OAA to OBZ ..Peru.
OCA to OFZ ..Great Britain.
OGA to OMZ ..See Note Below.
ONA to OTZ ..Belgium and colonies.
OUA to OZZ ..Denmark.
PAA to PIZ ..Netherlands.
PJA to PJM ...Curacao (Dutch).
PJN to PJZ ..Surinam (Dutch).
PKA to PMZ ..Dutch East Indies.
PNA to PPZ ..Brazil.
PQA to PQZ ..Portugal.
PTA to PVZ ..Brazil.
PWA to PZZ ..Netherlands.
Q .....Reserved for code abbreviations.
R .....Russia.
SAA to SMZ ..Sweden.
SNA to STZ ..Brazil.
SUA to SUZ ..Egypt.
SVA to SZZ ..Greece.
TAA to TMZ ..See Note Below.
TNA to TZZ ..See Note Below.
UAA to UMZ ..France and colonies.
UNA to UNZ .. Bosnia-Herzegovina.
UOA to UZZ ..See Note Below.
VAA to VGZ ..Canada (British).
VHA to VKZ ..Australian Federation (British).
VLA to VMZ ..New Zealand (British).
VNA to VNZ ..South African Union (British).
VOA to VOZ ..Newfoundland (British)
VPA to VSZ ..British colonies not autonomous.
VTA to VWZ ..British India.
VXA to VZZ ..Colonies and protectorates of Great Britain.
W** .....United States.
XAA to XDZ ..Mexico.
XEA to XMZ..Great Britain.
XNA to XSZ ..China.
XTA to XZZ ..Great Britain.
Y .....Great Britain.
Z .....Great Britain.

NOTE.—The calls beginning with A, with D, from KAA to KCZ, and from TNA to TZZ were reserved for Germany and possessions and are subject to change involved in results of the Treaty of Peace. The same applies to calls from HAA to HFC assigned to Hungary, LXA to LZZ to Bulgaria, OGA to OMZ to Austria, TAA to TMZ to Turkey, UOA to UZZ to Austria-Hungary.

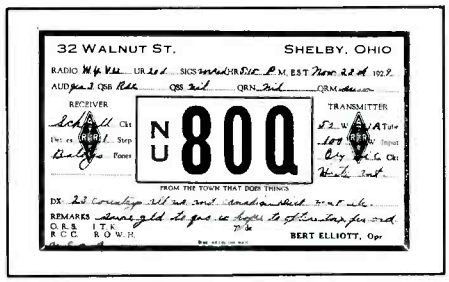
*The call letters BAA to BVC are no longer assigned to British vessels of war. Accordingly, all the calls from BAA to BVC may be canceled. The call letter BXZ henceforth designates any vessel of the British Navy whatsoever.

**All combinations beginning with the letter "N" are reserved for Government stations, and, in addition, the combinations from "WUA" to "WVZ" and "WXA" to "WZZ" are reserved for stations of the United States Army.

These are the official standings of the ITU assignments right after WWI. Footnotes reveal that everything was in a constant state of change, even then.



The addition of the unofficial prefix "U" to this 1926 Ham QSL from an American station was intended to stand for "United States." (Courtesy Will Jensby, W0EOM/6.)



In 1929, this American Ham QSL card displayed the unofficial prefix "NU" to indicate "North America United States."

(ITU) in Geneva, Switzerland. More than eighty ITU regulations (numbered RR-2055 through RR-2154) are supposed to be used as guidelines for the assignment and use of callsigns, including the formats to be utilized by broadcast, Ham, ship, aircraft, experimental, and a myriad of other stations. It is, to say the least, a well-intentioned set of guidelines that strives to cover all of the possibilities and combinations of alphanumerics that might be required in order to identify stations transmitting signals in the electromagnetic spectrum. It is so complete that it even recognizes its own loopholes.

Today's Station ID's

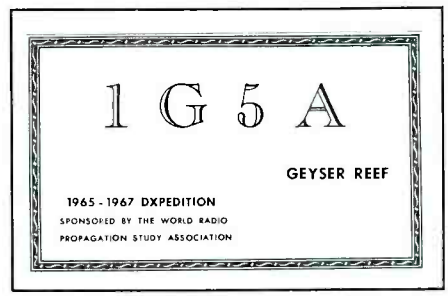
Looking over the ITU's current nation-by-nation callsign allocations, you can see that a few of the 1900's allocations have retained their original integrity, such as for stations whose callsigns begin with F, G, I, K, N, R, and W. Japan no longer retains exclusive rights to the letter "J," now sharing it with no less than eleven other nations. The loss to Japan has been made up with the assignment of prefixes "7J" through "7N" and "8J" through "8N" taken from alphanumeric blocks that were created after WWII in order to meet the increased demands for prefixes.

Japan definitely got shortchanged in the swap. World political conditions have also caused nations to split up, thus generating separate prefixes for two Germanys, two Koreas, two Yemens, etc. The ITU has seemingly taken no official position on separating the Peoples' Republic of China from Taiwan, letting the two contenders sort it out for themselves.

Despite the shortage of callsign prefixes for the world's nations, the letter "Q" remains reserved for service abbreviations such as QSL, QRA, QTC, and the like. To use callsigns starting with this letter would cause confusion. Likewise, prefixes "C7," "4U," and "4Y" have been set aside for use by international organizations. Further adding to the squeeze is the ITU's refusal to use either a zero or the numeral "1" in any of its official prefix blocks.

Certainly, there are nations and states that still have larger allocations than they will ever have any practical need to utilize to any great extent; Vatican City, San Marino, Andorra, Bhutan, and Djibouti would have to be included on any listing of such areas.

Of course, nations can create many callsigns for various types of stations using only a single prefix. As a hypothetical example, using the prefix "LX," a nation could generate formats that would include callsigns such as LXWS, LX2TW, LXT4, LXAGS, LXR3A, LX3JVD, LX7D, LX22, LXTG3, LXD317, LX2886, LXRS7453, and others. Many nations are therefore sitting on prefix allocations that aren't really required to meet their short-term or long-term needs.

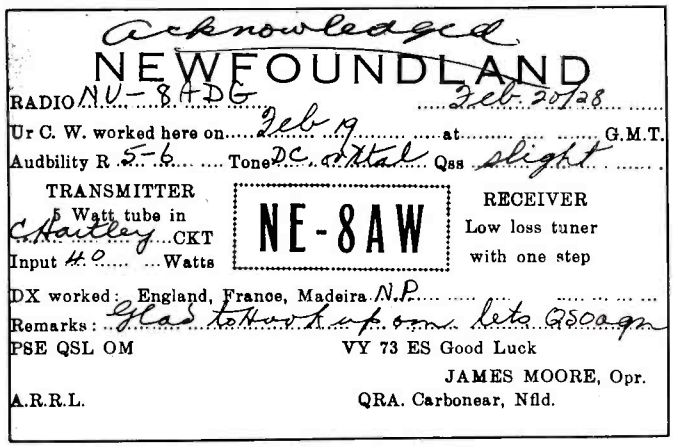


It's easy to peg "1G" as an unofficial prefix because ITU doesn't allocate callsign blocks containing a zero on the numeral "1."

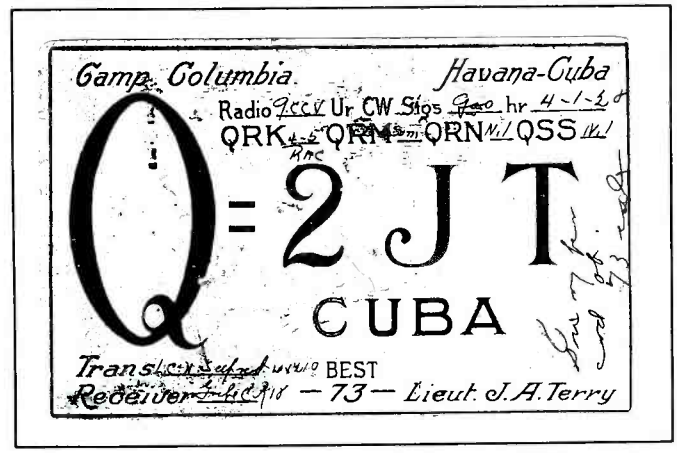
With the Amateurs

Ham radio operators, ever-resourceful, have always done the best they could to work within the limitations of the established rules of the road. American Hams, for instance, before they were assigned "W" prefixes (about 1928), often added an unofficial "U" or "NU" (representing "United States" and "North America United States") to their callsigns. Hams in other nations also created their own unofficial prefixes; that practice (when inspired by necessity) has continued to the present in various parts of the world.

Other unofficial Ham prefixes used over the years include "MX" for Manchukuo, "PX" for Andorra, "AR" for Syria, "AC3" for Sikkim, "AC4" for Tibet, "LI" for Libya, "M1" for San Marino, "TT" for Tannu Tuva, and the only known use of the forbidden prefix, "Q" used unofficially by early Cuban Hams (probably stood for the phonetics of "Q-ba"). Fanciful unofficial Ham prefixes have been made up from the ITU's off-limits list by DXpeditions going to uninhabited reefs and islets. Memorable ones from this category include: "1M" for Minerva Reef, "1S" for the Spratly Islands, "1G" for Geyser Reef, and "1B" for Blenheim Reef. Hams even made up an unofficial "1A" prefix for the Sovereign Military Order of Malta (S.M.O.M.), an ancient religious order in Rome housed in a building that has

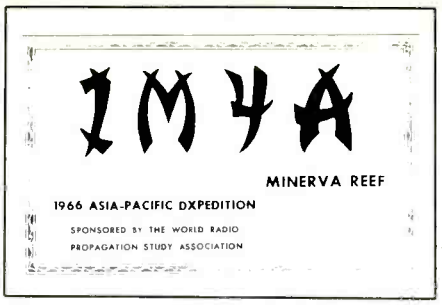


From one Ham with an unofficial prefix to another. This 1928 QSL from a Ham in Newfoundland identifies the operator as NE8AW. The card is made out to American operator NU8ADG!

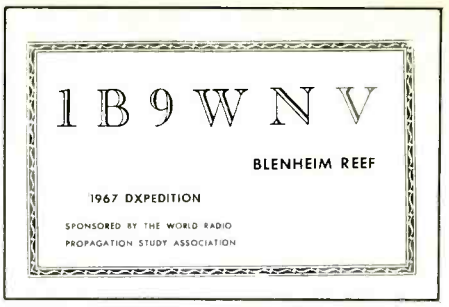


Callsigns aren't supposed to begin with the letter "Q" since they might be confused with radio's Q-signals. This 1928 QSL from an operator in Cuba does show that it was in unofficial use at some point in the past. (Courtesy Will Jensby, W0EOM/6.)

The Spratly Islands are uninhabited and don't belong to any nation, therefore they don't qualify for an ITU callsign allocation. That didn't stop somebody from creating their own fantasy prefix. Later DXpeditions to Spratly used that prefix, too.



Not too much in the way of radio operations from Minerva Reef, so the prefix "1M" isn't heard too often. The ITU wants no part of it, but the ARRL will count it for country credit towards their DX awards—only if the operations took place before mid-July, 1972.



"IB9" was another spectacular self-generated callsign prefix for a location that didn't have an ITU prefix allocation, Blenheim Reef.

always enjoyed diplomatic recognition as a sovereign state.

Out of Kilter

Not all stations have been assigned callsigns in accordance with the ITU's comprehensive callsign blocks. Some stations don't even have callsigns; others have them but don't use them. Often this is done within the framework of the ITU's regulations.

Airliners, for example, use the name of the air carriers plus a flight number (such as "United 544") for identification in lieu of call letters. Radio beacons identify only by two or three letters and numbers that don't usually match up with international callsign blocks. One example would be RYN, which (according to the ITU allocations) should be in the USSR. Actually it's in Tucson, Arizona and the station doesn't have any formal callsign from within blocks assigned to the United States. Most radio beacons throughout the world are similarly established and identified, and there is considerable duplication of identifiers.

Within the United States, many stations operated by the government don't have formal call letters. This includes everything from two-way land mobile and military stations to international shortwave broadcasters such as the Voice of America's transmitters. Insofar as the VOA's transmitters go, ITU regulation RR-2069 is the one that saves the day.

ITU regulation RR-2069, in fact, is practically self-defeating for everything else in the ITU's rules that drones on about callsigns, prefixes, and the like. It gives the ITU's approval for using, as an alternative to formal callsigns, "other recognized means of identification which may be one or more of the following: name of station, location of station, operating agency, official registration mark, flight identification number, selective call number or signal, selective call identification numbers or signal, characteristic signal, characteristic of emission or other clearly distinguishing features, readily recognized internationally." Of course, individual nations have the ability to structure their own radio laws to permit identification only by formal callsign if they wish to do so. However, insofar as the ITU is concerned, just about anything that is distinctive and readily recognized internationally will suffice—such as calling a station The Voice of America, or perhaps using an interval signal, or theme music, saying "United 544," etc.

This brings up the question of some Canadian broadcasters, the ones that identify as CBL, CBA, CBI, CBU, and others with a "CB" prefix. The prefix has been allocated to Chile for their exclusive use for more than sixty-five years, yet the CBC has been calling its stations CBL, CBA, for more than 45 years. Official ITU callsign registries ignore the Canadian use of such callsigns and, instead, list only Chilean stations with those callsigns. Apparently the Canadian "callsigns" from this series aren't recognized as such by that agency. Their use, however, would fit into the ITU's very broad and liberal regulation RR-2069 that says just about anything goes. Chile doesn't seem to care, so there's no real problem.

Then there are tactical callsigns, and the ITU doesn't seem to mind anything that doesn't infringe upon some nations prefixes to the point where they squawk. The Spanish Navy has used all sorts of tactical callsigns such as 72JKL, 54HDZ, 51DEL, 78EAL, and others that are from unallocated series. Nevertheless, the shortwave bands abound with tactical callsigns using prefixes that were borrowed—such as "RETJ" in Spain, "P6Z" in France, "RFLIG" in French Guyana, "RFLIA" in Martinique, "SFA" in Turkey, and "HVQ20" in Vietnam. The locations of many stations using tactical stations aren't known, except that they certainly aren't from where their callsigns would seem to indicate. Obviously, there's no way a nation can file a formal complaint against a mystery station!

American Matters

The FCC requires that all non-government transmitters (except CB Radio Service transmitters) be licensed. America's prefix allocations are "AAA" to "ALZ," "K," "N," and "W." With the exception of Ham stations, the "A" prefixes have been used exclusively by stations of the U.S. Army and U.S. Air Force, and "N" has been traditionally used by the U.S. Coast Guard, U.S. Navy, and U.S. Marine Corps. Broadcast stations west of the Mississippi River almost always receive callsigns commencing with the letter "K," while those east of the Mississippi River use the letter "W." The few exceptions to this (such as WKY in Oklahoma and KDKA in Pennsylvania) are stations that had been operating before that policy was adopted by our government.

Broadcasting House, home of the BBC in London. When this photo was taken during WWII, the BBC was announcing G-prefixed callsigns for its shortwave stations. Today, the callsigns are still officially in effect but are never announced on the air.

In retrospect, such geographic assignments for eastern and western broadcasters seem to no longer serve any practical purpose, if they ever had any purpose to begin with. It would be great to see the FCC become more flexible in its broadcast station callsign policies. One who shares my sentiments is broadcaster Dickson Norman of Alabama. He's been trying to get the FCC to assign his planned international shortwave stereo broadcasting station the callsign NDXE (it means "in Dixie"), but thusfar he hasn't gotten their approval.

Broadcasters have long been able to secure the FCC's cooperation in assigning available callsigns that spell our relevant words or are comprised of the station's on-the-air slogan or corporate initials. Miami's WIOD was given out because it meant "Wonderful Isle Of Dreams. WOWO in Ft. Wayne once meant "Wayne Offers Wonderful Opportunities." KWKH said that it's callsign stood for "Kill Worry, Keep Health," but the callsign was actually the initials of its owner, William K. Henderson.

A quick flip through a list of broadcasting stations reveals callsigns that spell out words to tie-in with the image or location of the creative stations that convinced the FCC to award them those identifications. Look at KANS (in Kansas), KASH, KEEN, KEEP, KOOK, KORN (in the heart of South Dakota's corn belt), WACO (of Waco, TX), WAGE, WAIT, WAKE, WARE (in Ware, MA), WARM, WELL, WEST, WHAM, WHIZ, WHO, WOLF, WORD, WOW, and others.

The value a station's callsign has in projecting its desired image to the world shouldn't be underestimated. About ten years ago there was a major hassle in Indianapolis between several broadcasters regarding who had first claim on the callsign WIFE!

In 1976, New York FM station WNCN (104.3 MHz) was sold to new owners who promptly dropped the station's long-standing classical music programming and started transmitting hard rock. To indicate the station's new image, the new licensee got the FCC to approve a callsign change to WQIV (standing for "Quad-4"). The WNCN audience was mortified and eventually raised such a ruckus that the ownership of the station was again transferred to owners who promised to restore the classical music. But listeners wanted more than just Vivaldi and Bartok—they demanded that the station's former image be fully resurrected by restoring the station's old callsign, WNCN, replacing the detested image that the WQIV callsign conjured up in their minds. While the FCC was processing this change, the station used the curious identification, "WNCN programming coming to you over the facilities of WQIV." Today, it's WNCN again; Beethoven prevails, and the listeners are content.

Another example of how broadcast callsigns can be creatively used to project a desired image involved New York City FM station WNBC-FM, (image: listeners being made aware of major network ownership by incorporating the letters NBC into the callsign). The station switched to an all-news format and then changed the callsign to WNWS, (image: the callsign implied the word *news*). When that format was dropped, the image of WNWS was no longer and the station selected yet another callsign.

The fact is, for decades, commercial broadcasters have been paranoid about the possibilities of other stations cashing in on the images and identities contained in their callsigns. Broadcasters frequently complain to the FCC about the possible assignment of callsigns in any way similar to their own if sought by another broadcaster in their coverage area. If the FCC is asked to assign a callsign that either looks or sounds like one already in use in a given area, the complaints are long and loud.

For instance, if there was a broadcaster whose callsign was WYZT, anybody hoping to establish another station in the same area using a callsign like WIZT, WICT, WYZP, WIZP, WYCT, would certainly hear about it from WYZT's licensee. Chances are, the FCC would protect WYZT's identity and tell the new broadcaster to pick another callsign. It's a common situation—happens all of the time!

Some broadcasters, nevertheless, seem to prefer to build their images on a slogan or catch-phrase, using them in preference to callsigns for audience identification. In my own local area, there is a "K-Joy," a "K-Rock," and a "Z-100," all of which are far better known by those identifications than by their actual callsigns.

Indeed, most people don't know that the BBC's shortwave transmitters all have callsigns running from GRA through GSZ, although they haven't been announced over the air for decades. Broadcasters in nations such as Austria, Belgium, France, West Germany, Italy, Spain, Republic of South Africa, India, and a number of others either no longer have formal call letters, or else don't announce them over the air. The stations are known by slogans, interval signals, musical signatures, locations, or other

The prefix "N" has long been allocated for use by the United States. Some Hams have received assignments with that prefix, but traditionally it has been reserved exclusively for use by stations of the U.S. Navy, Marine Corps, NASA, Coast Guard, and Navy MARS. It has not been made available for any commercial broadcast or communications stations. That could change if the FCC grants the request of an Alabama broadcaster who wants the callsign NDXE given to his proposed international shortwave station.

means of identification in lieu of call letters within the scope of the ITU's regulations.

A look at the accompanying table will give you a picture of the present status of ITU callsign allocations. As you can see, there isn't very much room for expansion under the existing prefix formats unless they start taking blocks away from over-allocated nations. Whatever the ITU decides to do, it will probably have to take action in the forseeable future. Now that you have some background on what's involved, the whole process should take on more or new meaning to you as you watch the events unfold.

International Callsign Prefix Allocations - 1987

AAA	-	ALZ	United States of America
AMA	-	AOZ	Spain
APA	-	ASZ	Pakistan
ATA	-	AWZ	India
AXA	-	AXZ	Australia
AYA	-	AZA	Argentina
A2A	-	A2Z	Botswana
A3A	-	A3Z	Tonga
A4A	-	A4Z	Oman
A5A	-	A5Z	Bhutan
A6A	-	A6Z	United Arab Emirates
A7A	-	A7Z	Qatar
A8A	-	A8Z	Liberia
A9A	-	A9Z	Bahrain
BAA	-	BZZ	China
CAA	-	CEZ	Chile
CFA	-	CKZ	Canada
CLA	-	CMZ	Cuba
CNA	-	CNZ	Morocco
COA	-	COZ	Cuba
CPA	-	CPZ	Bolivia
CQA	-	CUZ	Portugal
CVA	-	CXZ	Uruguay
CYA	-	CZZ	Canada
C2A	-	C2Z	Nauru
C3A	-	C3Z	Andorra
C4A	-	C4Z	Cyprus
C5A	-	C5Z	Gambia
C6A	-	C6Z	Bahamas
C7A	-	C7Z	World Meteorological Organiz.
C8A	-	C9Z	Mozambique
DAA	-	DRZ	Federal Republic of Germany
DSA	-	DTA	Rep. of Korea
DUA	-	DZZ	Philippines
D2A	-	D3Z	Angola
D4A	-	D4Z	Cape Verde
D5A	-	D5Z	Liberia
D6A	-	D6Z	Comoros
D7A	-	D9Z	Rep. of Korea
EAA	-	EHZ	Spain
EIA	-	EJZ	Ireland
EKA	-	EKZ	USSR
ELA	-	ELZ	Liberia
EMA	-	EOZ	USSR
EPA	-	EQZ	Iran
ERA	-	ESZ	USSR
ETA	-	ETZ	Ethiopia
EUA	-	EWZ	Byelorussian SSR
EXA	-	EZZ	USSR
FAA	-	FZZ	France
GAA	-	GZZ	United Kingdom
HAA	-	HAZ	Hungary
HBA	-	HBZ	Switzerland
HCA	-	HDZ	Ecuador
HEA	-	HEZ	Switzerland
HFA	-	HFZ	Poland
HGA	-	HGZ	Hungary
HHA	-	HHZ	Haiti
HIA	-	HIZ	Dominican Republic
HJA	-	HKZ	Colombia
HLA	-	HLZ	Rep. of Korea
HMA	-	HMZ	North Korea (PDR)
HNA	-	HNZ	Iraq
HOA	-	HPZ	Panama
HQA	-	HRZ	Honduras
HSA	-	HSZ	Thailand
HTA	-	HTZ	Nicaragua
HUA	-	HUZ	El Salvador
HVA	-	HVZ	Vatican City State
HWA	-	HYZ	France
HZA	-	HZZ	Saudi Arabia
H2A	-	H2Z	Cyprus
H3A	-	H3Z	Panama
H4A	-	H4Z	Solomon Islands
H5A	-	H5Z	
H6A	-	H7Z	Nicaragua
H8A	-	H9Z	Panama
IAA	-	IZZ	Italy
JAA	-	JSZ	Japan
JTA	-	JVZ	Mongolia
JWA	-	JXZ	Norway
JYA	-	JYZ	Jordan
JZA	-	JZZ	Indanesia
J2A	-	J2Z	Djibouti
J3A	-	J3Z	Grenada
J4A	-	J4Z	Greece
J5A	-	J5Z	Guinea-Bissau
J6A	-	J6Z	Saint Lucia
J7A	-	J7Z	Dominica
J8A	-	J8Z	St. Vincent & the Grenadines
J9A	-	J9Z	
KAA	-	KZZ	United States of America
LAA	-	LNZ	Norway
LOA	-	LWZ	Argentina
LXA	-	LXZ	Luxembourg
LYA	-	LYZ	USSR
LZA	-	LZZ	Bulgaria
L2A	-	L9Z	Argentina
MAA	-	MZZ	United Kingdom
NAA	-	NZZ	United States of America
OAA	-	OCZ	Peru
ODA	-	ODZ	Lebanon
OEA	-	OEZ	Austria
OFA	-	OJZ	Finland
OKA	-	OMZ	Czechoslovakia
ONA	-	OTZ	Belgium
OUA	-	OZZ	Denmark
PAA	-	PIZ	Netherlands
PJA	-	PJZ	Netherlands Antilles
PKA	-	POZ	Indonesia
PPA	-	PYZ	Brazil
PZA	-	PZZ	Suriname
P2A	-	P2Z	Papua New Guinea
P3A	-	P3Z	Cyprus
P4A	-	P4Z	Netherlands Antilles
P5A	-	P9Z	N. Korea (PDR)
RAA	-	RAZ	USSR
SAA	-	SMZ	Sweden
SNA	-	SRZ	Poland
SSA	-	SSM	Egypt
SSN	-	STZ	Sudan
SUA	-	SUZ	Egypt
SVA	-	SZZ	Greece
S2A	-	S3Z	Bangladesh (PDR)
S4A	-	S5Z	
S6A	-	S6Z	Singapore
S7A	-	S7Z	Seychelles
S8A	-	S9Z	Sao Tome & Principe
TAA	-	TCZ	Turkey
TDA	-	TDZ	Guatemala
TEA	-	TEZ	Costa Rica
TFA	-	TFZ	Iceland
TGA	-	TGZ	Guatemala
THA	-	THZ	France
TIA	-	TIZ	Costa Rica
TJA	-	TJZ	Cameroon
TKA	-	TKZ	France
TLA	-	TLZ	Central African Rep.
TMA	-	TMZ	France
TNA	-	TNZ	Congo
TOA	-	TQZ	France
TRA	-	TRZ	Gabon
TSA	-	TSZ	Tunisia
TTA	-	TTZ	Chad
TUA	-	TUZ	Ivory Coast
TVA	-	TXZ	France
TYA	-	TYZ	Benin
TZA	-	TZZ	Mali
T2A	-	T2Z	Tuvalu
T3A	-	T3Z	Kiribati
T4A	-	T4Z	Cuba
T5A	-	T5Z	Somalia
T6A	-	T6Z	Afghanistan
T7A	-	T7Z	San Marino
T8A	-	T9Z	
UAA	-	UQZ	USSR
URA	-	UTZ	Ukrainian SSR
UUA	-	UZA	USSR
VAA	-	VGZ	Canada
VHA	-	VNZ	Australia
VOA	-	VOZ	Canada
VPA	-	VSZ	United Kingdom
VTA	-	VWZ	India
VXA	-	VYZ	Canada
VZA	-	VZZ	Australia
V2A	-	V2Z	Antigua
V3A	-	V3Z	Belize
V4A	-	V4Z	St. Christopher & Nevis
V5A	-	V7Z	
V8A	-	V8Z	Brunei
WAA	-	WZZ	United States of America
XAA	-	XIZ	Mexico
XJA	-	XOZ	Canada
XPA	-	XPZ	Denmark
XQA	-	XRZ	Chile
XSA	-	XSZ	China
XTA	-	XTZ	Burkina Faso
XUA	-	XUZ	Kampuchea
XVA	-	XVZ	Vietnam
XWA	-	XWZ	Laos
XXA	-	XXZ	Portugal
XYA	-	XZZ	Burma
YAA	-	YAZ	Afghanistan
YBA	-	YHZ	Indonesia
YIA	-	YIZ	Iraq
YJA	-	YJZ	Vanuatu
YKA	-	YKZ	Syria
YLA	-	YLZ	USSR
YMA	-	YMZ	Turkey
YNA	-	YNZ	Nicaragua
YOA	-	YRZ	Romania
YSA	-	YSZ	El Salvador
YTA	-	YUZ	Yugoslavia
YVA	-	YYZ	Venezuela
YZA	-	YZZ	Yugoslavia
Y2A	-	Y9Z	German Demacratic Republic
ZAA	-	ZAZ	Albania
ZBA	-	ZJZ	United Kingdom
ZKA	-	ZMZ	New Zeanald
ZNA	-	ZOZ	United Kingdom
ZPA	-	ZPZ	Paraguay
ZQA	-	ZQZ	United Kingdom
ZRA	-	ZUZ	Rep. of South Africa
ZVA	-	ZZZ	Brazil
2AA	-	2ZZ	United Kingdom
3AA	-	3AZ	Monaco
3BA	-	3BZ	Mautitius
3CA	-	3CZ	Equatorial Guinea
3DA	-	3DM	Swaziland
3DN	-	3DZ	Fiji
3EA	-	3FZ	Panama
3GA	-	3GZ	Chile
3HA	-	3UZ	China
3VA	-	3VZ	Tunisia
3WA	-	3WZ	Vietnam
3XA	-	3XZ	Guinea
3YA	-	3YZ	Norway
3ZA	-	3ZZ	Poland
4AA	-	4CZ	Mexico
4DA	-	4IZ	Philippines
4JA	-	4LZ	USSR
4MA	-	4MZ	Venezuela
4NA	-	4OZ	Yugoslavia
4PA	-	4SZ	Sri Lanka
4TA	-	4TZ	Peru
4UA	-	4UZ	United Nations
4VA	-	4VZ	Haiti
4WA	-	4WZ	Yemen Arab Republic
4XA	-	4XZ	Israel
4YA	-	4YZ	International Civil Aviation Organization
4ZA	-	4ZZ	Israel
5AA	-	5ZZ	Libya
5BA	-	5BZ	Cyprus
5CA	-	5GZ	Morocco
5HA	-	5IZ	Tanzania
5JA	-	5KZ	Colombia
5LA	-	5MZ	Liberia
5NA	-	5OZ	Nigeria
5PA	-	5QZ	Denmark
5RA	-	5SZ	Madagascar
5TA	-	5TZ	Mauritania
5UA	-	5UZ	Niger
5VA	-	5VZ	Togo
5WA	-	5WZ	Western Samoa
5XA	-	5XZ	Uganda
5YA	-	5ZZ	Kenya
6AA	-	6BZ	Egypt
6CA	-	6CZ	Syria
6DA	-	6JZ	Mexico
6KA	-	6NZ	Rep. of Korea
6OA	-	6OZ	Somalia
6PA	-	6SZ	Pakistan
6TA	-	6UZ	Sudan
6VA	-	6WZ	Senegal
6XA	-	6XZ	Madagascar
6YA	-	6YZ	Jamaica
6ZA	-	6ZZ	Liberia
7AA	-	7IZ	Indonesia
7JA	-	7NZ	Japan
7OA	-	7OZ	Yemen (PDR)
7PA	-	7PZ	Lesotho
7QA	-	7QZ	Malawi
7RA	-	7RZ	Algeria
7SA	-	7SZ	Sweden
7TA	-	7YZ	Algeria
7ZA	-	7ZZ	Saudi Arabia
8AA	-	8IZ	Indonesia
8JA	-	8NZ	Japan
8OA	-	8OZ	Botswana
8PA	-	8PZ	Barbados
8QA	-	8QZ	Maldives
8RA	-	8RZ	Guyana
8SA	-	8SZ	Sweden
8TA	-	8YZ	India
8ZA	-	8ZZ	Saudi Arabia
9AA	-	9AZ	San Marino
9BA	-	9DZ	Iran
9EA	-	9FZ	Ethiopia
9GA	-	9GZ	Ghana
9HA	-	9HZ	Malta
9IA	-	9JZ	Zambia
9KA	-	9KZ	Kuwait
9LA	-	9LZ	Sierra Leone
9MA	-	9MZ	Malaysia
9NA	-	9NZ	Nepal
9OA	-	9TZ	Zaire
9UA	-	9UZ	Burundi
9VA	-	9VZ	Singapore
9WA	-	9WZ	Malaysia
9XA	-	9XZ	Rwanda
9YA	-	9ZZ	Trinidad & Tobago

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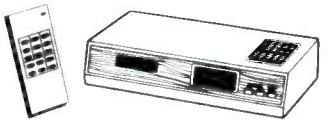

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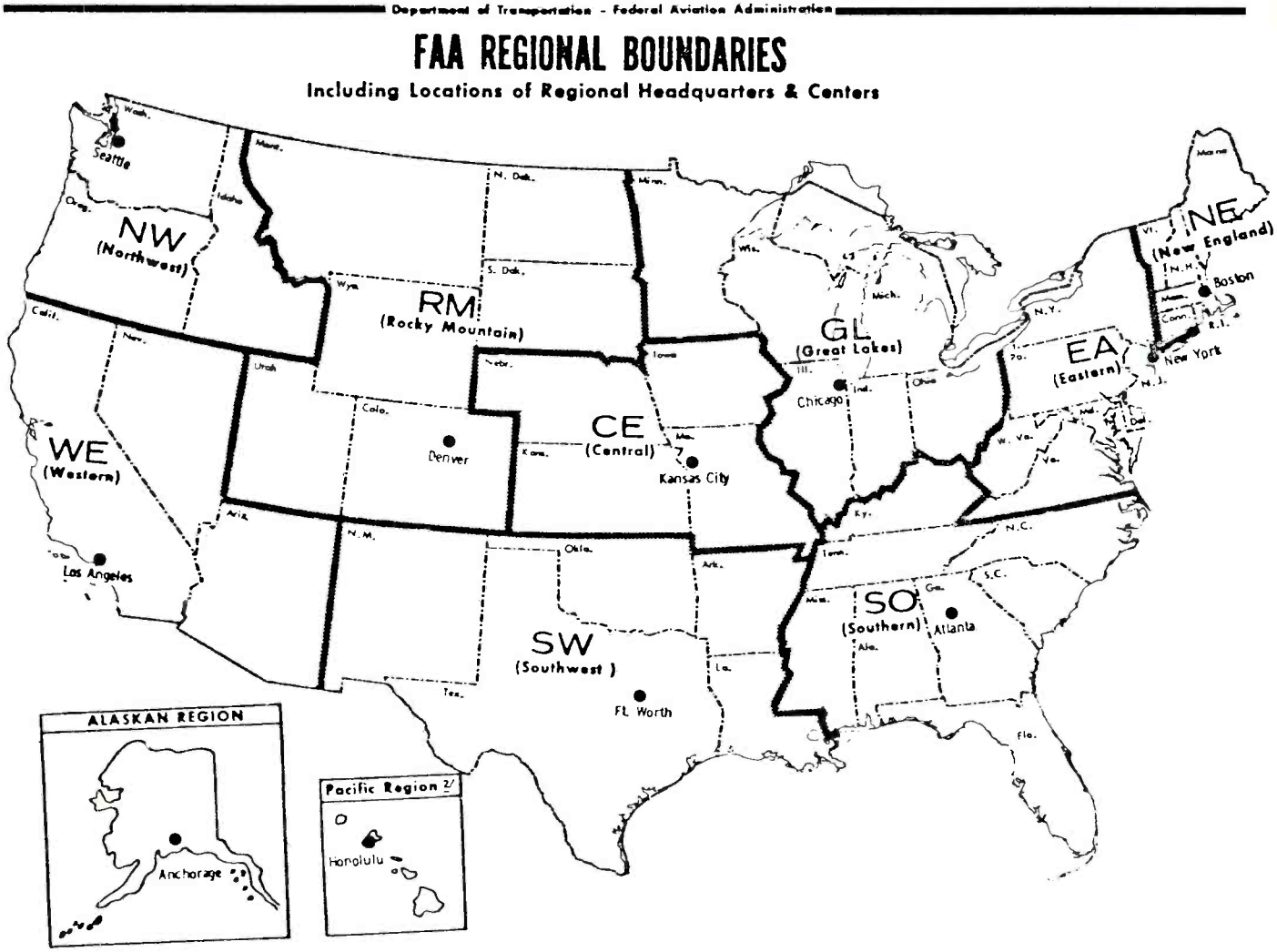


Monitoring The Little Known:

FAA Land Communications

You've Heard the FAA's Air Traffic Control Comms, But What About the Agency's Internal Communications Networks? Here's the Story!

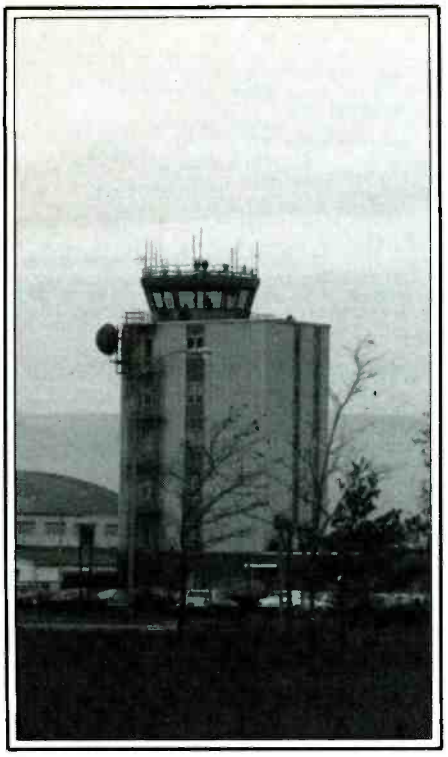
BY TOM KNEITEL, K2AES, EDITOR

Ask any communications enthusiast about Federal Aviation Administration Agency communications and you'll hear about airport control towers, navigational aids, Flight Service Stations, Air Route Traffic Control Centers, and several other types of operations required to promote aviation safety. It seldom occurs to many casual observers that this large agency (50,000 employees) requires many internal communications facilities in order to coordinate its operations and maintain its facilities.

The FAA is charged with regulating air commerce in order to foster aviation safety; promoting civil aviation and a national system of airports; achieving efficient use of navigable airspace; and developing and operating a common system of air traffic control and navigation for both civilian and military aircraft.

The agency is responsible for the location, construction or installation, maintenance, and operation of visual and electronic aids to air navigation. It operates and maintains communications equipment, RTTY circuits and equipment, as well as the equipment at its control towers and centers. Moreover, the agency participates in accident investigations involving aircraft. At larger commercial airports, members of the FAA's own police force are on duty.

Voice communications required for the support of such a wide range of activities include long-range SSB circuits and networks to be used between FAA facilities in various regions. Such units operate on numerous



FAA landmobile transmitting antennas are often high atop control tower facilities, thus providing excellent signals over considerable distances.

An FAA land unit sports a clip-on VHF antenna.

frequencies below 30 MHz and are used for the exchange of weather-related and emergency and disaster communications, or as backups in the event of the failure of landline communications facilities.

Above 30 MHz, numerous types of land and air facilities are in use. Nationally, the VHF aero band frequencies of 135.85 and 135.95 MHz are used by FAA aircraft to communicate with ground stations while they are checking the accuracy of airport electronic aids to navigation.

Above 162 MHz, and in the UHF FM band, the FAA has two-way communications systems for police, accident investigation, equipment maintenance, and other activities in and around airports and FAA facilities. There are also VHF and UHF links and point-to-point communications facilities on these frequencies.

One commonly used FAA on-site frequency noted in use in many areas is 166.175 MHz, used for many of the agency's day-to-day operational communications between its offices and mobile units. Some FAA units have standard-type call letters, but some stations have not been assigned callsigns. In any event, you'll seldom hear anything that sounds like call letters in actual use over the air. On the lower frequencies, stations have been monitored using tactical identifiers, while above 30 MHz you'll often hear units communicating with identifications relating to the city or airport name.

We have compiled a listing of known FAA voice communications facilities used for purposes *other than* routine air/ground air traffic control. These are the communications systems required to meet the agency's own internal operational needs as described. This list does not indicate specific stations operating on 135.85 and 135.95 MHz inasmuch as their use appears to be so widespread.

Also given here is a roster of the FAA's own aircraft, as these have also been noted operating on some of the agency's communications frequencies.

The map shows the states included in each of the FAA's regions, while a chart indicates some of the HF networks used within and between various regional facilities.

This should give you a reasonably good overview of what there is to hear in the way of voice communications. The listings do not include circuits believed to be used exclusively for radio control (of lights, etc.) and other non-voice purposes (such as data, CW, RTTY, and FAX).

Federal Aviation Administration

Alabama

Anniston	KLE78	5860 7475 8125 13626 kHz 27.625 408.825 MHz
Birmingham	KVA93	7475 8125 13626 16280 kHz
Dothan	KUR68	7475 8125 13626 16280 kHz
Evergreen		408.825 MHz
Huntsville	KVA95	7475 8125 13626 16280 kHz
Mobile	KMJ20	3331 4055 6870 7475 8125 13626 16280 20852 kHz
Montgomery	KLC48	4055 5860 6870 7475 8125 13626 kHz
Tuscaloosa	KLM37	7475 8125 13626 16280 kHz

Alaska

all areas		3253 5286 5357.5 5906 7375 kHz
Alsek River		169.325 MHz
Anchorage	KBX44	KDM53 3253 4055 5357.5 7375 7475 8125 13626 16280 20852 kHz 165.6375 166.10 172.825 172.925 172.95 MHz
Aniak	KAZ28	
Barrow		172.825 MHz
Bethel	KBB54	4055 5357.5 7375 kHz 172.825 MHz
Bettles	KBE43	2758 4055 5357.5 kHz 27.625 MHz
Big Delta	KBD82	4055 5357.5 7375 kHz 172.825 172.925 MHz
Biorka Island	KMA50	4055 7475 8125 kHz 169.325 MHz
Byers Creek		172.825 172.925 MHz
Cape Romanzoff		166.10 MHz
Chandalar Lake	KEE67	2758 4055 5357.5 kHz
Coghon I.	KGC38	4139.5 kHz
Cold Boy	KCB22	4055 5357.5 7375 kHz 172.825 MHz
Cordova	KAC26	2758 3253 4055 5357.5 7375 kHz 172.825 172.925
Craig		169.25 MHz
Deadhorse		172.825 MHz
Dillingham	KKE47	7375 kHz 172.825 172.925 MHz
Duncn. Cnl.		169.325 MHz
Ester		172.15 MHz
Fairbanks	KBF94	KJK74 172.825 172.85 172.925 172.95 MHz
Fairwell	KCF31	172.825 172.925 MHz
Finger Mtn.		169.325 MHz
Flattop Mtn.		172.15 MHz
Galena	KCG31	
Grant Mtn.		172.175 MHz
Gulkana	KGA25	172.825 MHz
Gustavus	KGG20	4139.5 kHz
Haines	KAH94	4139.5 kHz
Hinchinbrook	KKD61	
Homer	KCH20	5357.5 7375 kHz 172.825 172.925 MHz
Iliamna		172.825 172.925 410.30 MHz
Johnstone Point	KJK78	
Juneau	KAJ28	4055 4139.5 5357.5 7375 kHz
Kake		169.325 MHz
Kenai	KBL69	WSX70 4055 5357.5 7375 7475 8125 13626 16280 kHz 172.825 172.925 416.875 MHz
Ketchikan	KKY21	7375 kHz 172.825 172.925 MHz
King Salmon	KCK35	4055 5357.5 7375 kHz 172.825 172.925 MHz
Kodiak	KAK20	172.825 172.925 MHz
Kotzebue	KEJ28	3253 4055 5357.5 7375 kHz 172.825 MHz
Kuiu I.		172.875 MHz
Level I.	KQA59	4139.5 kHz
Lclrk. Pass		410.30 416.875 MHz
Lclark. #3		410.30 MHz
McGrath	KCR60	4055 5357.5 7375 kHz 172.825 172.925 MHz
Middleton I.	KGB20	172.825 172.925 MHz
Minchumina	KAM24	
Moses Point		172.175 MHz
Mt. Fanshaw		169.325 MHz
Mt. Susinta		172.125 172.70 MHz
Murphy Dome	KLH70	4055 7375 kHz 172.125 172.825 172.925 MHz
Newton Pk.		169.25 MHz
Nome	KBN58	4055 kHz 172.125 172.825 MHz
Northway	KBJ85	4055 5357.5 7375 kHz 172.825 172.925 MHz
Palmer		172.825 172.925 MHz
Puntilla Lk.	KLF28	
St. Marys		165.6375 MHz
Sisters I.	KAS24	4139.5 kHz
Sitka	KAW27	4055 5357.5 7375 kHz
Skwenta	KGD33	167.90 MHz
Snntht. Mtn.		169.25 MHz
Summit	KBS48	
Talkeetna	KAV83	172.825 172.925 MHz
Tanana	KBO67	
Tatolina		172.825
Tolsona		172.925 MHz
Unalakleet	KAU51	4055 5357.5 7375 kHz
Wrangell		410.30 413.60 MHz
Yakutat	KKW92	5357.5 7375 kHz 172.825 MHz

Arizona

Ajo	172.175 172.975 MHz
Bowie	172.125 172.925 MHz
Cochise	172.125 172.825 MHz
Douglas	172.125 172.925 MHz
Eldon Mtn.	172.925 MHz
Flagstaff	172.125 172.925 MHz
Globe	172.175 172.975 MHz
Heliograph Peak	172.925 MHz
Hualph Mtn.	172.95 MHz
Humboldt Mtn.	172.175 172.975 MHz
Mt. Lemmon	172.95 MHz
Phoenix	172.175 172.975 MHz
Pima	172.125 172.925 MHz

Pinal Mtn. 172.975 MHz
Prescott 172.15 172.95 MHz
Safford 172.125 172.925 MHz
San Simon 172.125 172.925 MHz
Tempe 172.175 172.975 MHz
Thatcher 172.125 172.925 MHz
Tucson 171.125 172.15 172.925 172.95 MHz
Wilcox 172.125 172.925 MHz
Yuma 172.175 172.975 MHz

Arkansas

Little Rock 164.05 165.5375 165.6125 165.7375 165.7625 169.225 MHz

California

Angels Camp 172.15 172.95 MHz
Arcata 172.125 172.925 MHz
Bakersfield 172.125 172.925 MHz
Bay Pt. 172.125 172.925 MHz
Beale AFB (Marysville) 172.15 172.95 MHz
Blythe 172.15 172.95 MHz
Boron 171.175 172.975 MHz
China Lake 172.125 172.925 MHz
Concord 172.125 172.925 MHz
Coyote 172.125 172.925 MHz
Crescent City 172.125 172.925 MHz
Crystal Pk. 172.95 MHz
Daggett 172.175 172.975 MHz
Edwards AFB 172.175 172.975 MHz
El Toro MCAS (Santa Ana) 172.15 MHz
Ferndale 172.925
Foxfield 172.175 172.975 MHz
Fremont KMR96 3353 4055 4060 7475 13905 kHz 172.125 172.175 MHz
Fresno 172.125 172.15 172.175 MHz
Friant 172.975 MHz
Grapevine 172.925 MHz
Half Moon Bay 172.175 172.975 MHz
Hawthorne KJK73 3353 4060 7475 8125 13626 13905 16280 kHz 166.275 162.30 165.75 166.175 169.25 172.10 172.125 172.15 172.175 172.825 172.90 172.925 172.95 172.975 MHz
Julian 172.975 MHz
Lake Tahoe 172.95
Lancaster 172.175 172.975 MHz
Long Beach 172.15 172.95 MHz
Los Angeles KOJ77 3353 4055 4060 7475 8125 13626 13905 16280 20852 kHz 172.125 172.825 MHz
Marysville 172.125 172.925 MHz
Mather AFB (Sacramento) 172.15 172.95 MHz
McClellan AFB (Sacramento) 172.15 172.95 MHz
Modesto 172.15 172.95 MHz
Montague 172.15 172.95 MHz
Mt. Diablo 172.95 MHz
Mt. Shasta 172.95 MHz
Mt. Soledad 172.175 172.975 MHz
Mt. Tamalpois 172.975 MHz
Mountain View 172.125 172.925 MHz
Needles 172.15 172.95 MHz
Oakland 172.125 172.925 MHz
Ontario KKV96
Oxnard 172.15 172.95 MHz
Palm Springs 172.15 172.95 MHz
Palmdale KJK77 3353 4055 4060 7475 8125 13626 13905 16280 kHz 172.175 MHz
Paso Robles 172.175 172.975 MHz
Red Bluff KKV65 172.15 172.95 MHz
Redwood Pk. 172.925 MHz
Rand Mtn. 172.925 MHz
Riverside 172.15 MHz
Sacramento 172.15 172.95 MHz
Saddle Peak 172.925 MHz
San Diego 172.175 172.975 MHz
San Francisco KSF70 162.325 172.15 172.175 172.95 172.975 MHz
San Jose 172.125 172.925 MHz
San Luis Obispo 172.975 MHz
San Pedro Hill 170.20 172.15 172.90 172.95 MHz
Santa Barbara KJK75 3353 4055 4060 7475 13905 kHz 172.15 172.95 MHz
Santa Maria 172.15 172.95 MHz
Santa Rosa 172.175 172.925 172.975 MHz
Sausalito 172.125 MHz
Snow Peak 172.95 MHz
Stockton 172.15 172.95 MHz
Tracy 172.125 172.925 MHz
Ukiah 172.175 172.975 MHz
Upland 172.95 MHz
Van Nuys 172.15 172.95 MHz
Watsonville 172.125 172.975 MHz

Colorado

Akron 165.3375 MHz
Alamosa 165.3375 MHz
Aurora 166.175 MHz
Cheyenne Mountain 166.175 MHz
Colorado Springs 165.3375 MHz
Denver WHX46 4055 4060 7475 8120 8125 13626 13905 16280 20852 kHz 165.6875 166.175 MHz
Douglas Springs 165.3375 166.175 MHz
Eagle 165.3375 166.175 172.975 MHz
Grand Junction KBA29 7475 8120 kHz 166.175 MHz
Grand Mesa 166.175 MHz
Gunnison 166.175 MHz
Idaho Springs 166.175 MHz
Kremmling 166.175 MHz
La Junta 165.3375 MHz
La Veta 166.175 MHz
Longmont KCP63 4055 4060 7475 8125 13626 13905 16280 20852 kHz
Meeker 166.175 MHz
Parker 166.175 MHz
Thurman 166.175 MHz
Trinidad 7475 kHz 165.3375 MHz

District of Columbia

Dulles 164.825 165.50 165.6375 165.7125 166.0875 409.30 415.125 416.875 MHz
FAA Headquarters KEM80 4055 7475 8125 13626 16280 20852 kHz 162.275 408.825 410.25 410.90 MHz
Wash. Nat'l. Apt. KKW89 3353 5860 7475 8125 13626 kHz 27.625 162.2125 165.10 165.4125 165.50 165.6375 165.6625 408.175 416.875 MHz

Florida

Crestview KUU58 4055 6870 7475 8125 13626 16280 kHz
Daytona Beach KXG85 4055 6870 7475 8125 13626 16280 kHz
Ft. Lauderdale WHZ71 4055 6870 7475 8125 13626 16280 kHz
Ft. Myers KWF53 4055 6870 7475 8125 13626 16280 kHz
Gainesville KUA21 4055 6870 7475 8125 13626 16280 kHz 27.575 408.825 MHz
Hilliard KJK79 4055 6870 7475 8125 13626 16280 20852 kHz
Jacksonville WHX49 4055 5860 6870 7475 8125 13626 16280 kHz 162.05 408.825 MHz
Key West KLD95 4055 6870 7475 8125 13626 16280 20852 kHz 408.825 MHz
Melbourne KXC70 4055 6870 7475 8125 13626 16280 20852 kHz 408.825 MHz
Miami KMA47 WHX50 4055 5860 6870 7475 8125 13626 16280 20852 kHz 162.30 162.50 172.10 408.825 MHz
Orlando KOR82 4055 6870 7475 kHz 408.825 MHz
Panama City KSE31 4055 6870 7475 8125 13626 16280 kHz
Patrick AFB KLH60 4055 6870 7475 8125 13626 16280 kHz
Pensacola KGC34 4055 6870 7475 kHz
Perrine KUZ66 4060 kHz
St. Petersburg WHX48 7475 8125 13626 16280 kHz
Sarasota KVH40 4055 6870 7475 8125 13626 16280 kHz
Tallahassee KKA36 4055 5860 6870 7475 8125 13626 kHz 408.825 MHz
Tampa KEX63 4055 5860 6870 7475 8125 13626 kHz
Vero Beach WHX47 7475 8125 13626 16280 kHz 162.30 MHz
West Palm Bch. KEH74 4055 6870 7475 kHz 408.825 MHz

Georgia

Albany 408.825 MHz
Alma WSG70
Athens 408.825 MHz
Atlanta KDM49 KUV62 KUV64 4055 5860 6870 7475 8125 13626 16280 20852 kHz 27.585 27.625 164.60 165.75 166.175 MHz
Augusta KUZ66 4055 6870 7475 8125 kHz
Brunswick KUQ95 4055 6870 7475 8125 13626 16280 20852 kHz
Columbus KUZ31 4055 6870 7475 8125 13626 16280 kHz
Fulton County 27.575 27.585 27.625 MHz
Hampton KDM50 4055 6870 7475 8125 13626 16280 20852 kHz
La Grange 408.825 MHz
Macon KVA27 4055 6870 7475 8125 13626 kHz
Savannah KBN72 4055 6870 7475 kHz
Toccoa 408.825 kHz
Valdosta KUR67 4055 5860 6870 7475 8125 13626 16280 kHz 408.825 MHz

Hawaii

Diamond Head KCC97 3353 6870 6874 14464 20480 kHz 27.6265 162.6125 170.15 171.2625 kHz
Ewa KVM70
Haleakala Nat. Pk. 172.25 MHz
Hilo KBH49 3353 6870 kHz 169.225 170.15 MHz
Honolulu KGA32 3353 4055 6870 6874 7475 8125 13626 14464 16280 20480 20852 kHz 27.6265 162.025 169.225 170.15 173.075 173.5625 173.8125 MHz
Hoolehua 172.15 MHz
Kahului, Maui KCU94 3353 6870 kHz 27.625 171.2625 172.15 MHz
Keahole KLI52 3353 6870 kHz 172.15 MHz
Kona 171.2625 MHz
Lanai KLI51 3353 6870 kHz 171.2625 MHz
Lihue, Kanai KAL38 3353 6870 kHz 171.2625 172.15 MHz
Mauna Kea 408.825 MHz
Mauna Loa 170.15 171.2625 MHz
Molokai KLK48 3353 6870 kHz 171.2625 MHz
Mt. Kaala WHX44 3353 6870 kHz 172.15 408.825 MHz
Oahu 171.2625 MHz
Upolu Point 171.2625 MHz
Waimanalo KLI79 3353 6870 kHz

Idaho

Boise WHX22 3353 4055 5860 7475 kHz 166.175 408.825 MHz
Coeur d'Alene 165.4375 166.175 MHz
Emmett 165.4375 MHz
Idaho Falls 166.175 MHz
McCall 166.175 MHz
Mullen Pass 165.4375 166.175 MHz
Pocatello WHX37 4055 7475 kHz
Salmon 165.4375 166.175 172.875 MHz
Sand Point 165.4375 166.175 MHz

Illinois

Aurora KBJ96 4055 7475 8125 13626 kHz
Chicago KLE72 (Midway); KLG27 (O'Hare) 3353 4055 7475 8125 13626 kHz 27.265 165.6125 165.7175 165.7375 165.75 166.175 169.35 172.175 172.875 172.90 172.975 172.95 172.975 MHz
Des Plaines WHX51 4055 7475 8125 13626 16280 20852 kHz
Moline KKZ74 3353 4055 7475 8125 13626 kHz 27.625 MHz
Springfield KBU29 3353 4055 7475 8125 13626 kHz 27.625 MHz
Wheeling 172.175 172.925 172.975 MHz

Indiana

Indianapolis KLB48 KLB58 3331 3353 4055 7475 8125 13626 kHz 27.625 172.175 172.925 172.975 MHz
South Bend KKY72 3353 4055 7475 8125 13626 kHz 27.625 MHz

Iowa

Burlington 27.265 172.125 172.225 172.925 172.975 MHz
Cedar Rapids 27.625 172.125 172.15 172.925 172.95 MHz
Des Moines WHX57 3353 4055 5860 7475 8125 13626 kHz 27.625 172.15 172.925 172.95 MHz
Dubuque 27.625 MHz
Fort Dodge 172.975 MHz
Mason City 27.625 172.15 172.225 172.95 172.975 MHz
Maquoket 172.975 MHz
Oelwein 172.975 MHz
Ottumwa 27.625 172.975 MHz
Sioux City 27.625 172.125 172.225 172.925 172.975 MHz
Spencer 172.925 MHz
Waterloo 27.625 172.225 172.875 MHz

Kansas

Chanute 172.975 MHz
Dodge City 172.95 MHz
Emporia 27.625 172.95 MHz
Garden City KFS50 3353 4055 5860 7475 8125 13626 kHz 27.625 172.125 172.15 172.225 172.925 172.95 172.975 MHz
Goodland 172.125 172.15 172.225 172.925 172.95 172.975 408.825 MHz
Hill City 172.925 408.825 MHz
Hutchinson KLG77 3353 4055 5860 7475 8125 13626 kHz 27.625 172.15 172.225 172.95 172.975 MHz
Manhattan 172.975 MHz
Larned 172.975 MHz
Liberal 172.975 MHz
Oakley 172.95 MHz
Olathe KKA82 3353 4055 7475 8125 13626 16280 MHz 165.6375 172.225 172.925 172.975 408.825 409.825 MHz
Pratt 172.975 MHz
Russell 172.95 MHz
Salina 27.625 172.125 172.15 172.225 172.975 172.95 172.975 MHz
Stilwell 27.625 MHz
Topeka KKY50 3353 4055 5860 7475 8125 13626 kHz 27.625 172.15 172.225 172.95 172.975 MHz
Wichita KKZ68 3353 4055 5860 7475 8125 13626 kHz 27.625 172.125 172.925 kHz

Kentucky

Covington KUX58 4055 5860 6870 7475 8125 13626 16280 kHz
Lexington KUX86
London KNH47 4055 6870 7475 8125 13626 kHz
Louisville KUW42 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz
Lynch KEF63 4055 6870 7475 8125 13626 16280 kHz

Louisiana

Baton Rouge KAO31 3331 4055 5860 6870 8125 13626 kHz
Houma KEB66
Lafayette KCK47 3331 4055 5860 5870 8125 13626 kHz
Lake Charles KCA29 3331 4055 5860 6870 8125 13626 kHz
New Orleans WEK71 3331 4055 5860 6870 8125 13626 kHz 39.50 39.62 165.75 166.175 MHz
Shreveport KOB92 3331 4055 5860 6870 8125 13626 kHz

Maine

Augusta KKU70 3331 3353 4055 5860 7475 8120 8125 13626 16280 kHz 27.625 MHz
Bangor KKU80 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 kHz 27.625 MHz
Houlton KKU56 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 MHz 27.625 MHz
Portland KKU54 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 kHz 27.625 MHz

Maryland

Andrews AFB 165.6125 172.95 MHz
Baltimore KKY94
Hagerstown KLM94 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.625 MHz

Massachusetts

Boston 41.59 164.05 165.6375 MHz
Burlington WHX45 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz 165.6125 MHz

Cambridge 27.575 27.585 41.39 165.6375 170.40 171.00 MHz
Nantucket KLH72 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 kHz
Worcester 169.325 MHz

Michigan

Detroit KLE80 3353 7475 8125 13626 kHz 27.625 172.175 172.875 172.925 172.975 MHz
Grand Rapids KLD27 3331 4055 7475 8125 13626 kHz 27.625 MHz
Lansing KAE21 3353 4055 7475 8125 13626 kHz 27.625 MHz

Minnesota

Farmington KCJ20 3353 4055 7475 8125 13626 kHz
Minneapolis KLD73 3353 7475 8125 13626 kHz 27.625 172.175 172.925 172.975 MHz
St. Paul KGJ42 3353 4055 7475 8125 13626 kHz 27.625 MHz

Mississippi

Greenville 162.275 MHz
Greenwood KKY54 4055 5860 6870 7475 8125 13626 kHz 27.625 165.75 166.175 MHz
Gulfport KEG95 3331 4055 6870 7475 kHz 408.825 MHz
Hattiesburg KUR87 4055 6870 7475 8125 13626 16280 kHz
Jackson KVA94 4055 6870 7475 8125 13626 16280 kHz
McComb KLA23 4055 5860 6870 7475 13626 kHz 27.625 MHz
Meridian KDM51 4055 6870 7475 kHz

Missouri

Butler 172.925 MHz
Cape Girardeau 172.125 172.15 172.225 172.925 172.95 172.975 MHz
Chesterfield 165.75 166.175 172.15 172.95 MHz
Chillicothe 172.975 MHz
Columbia WHX58 3353 4055 5860 7475 8125 13626 kHz 27.625 172.15 172.225 172.95 172.975 408.825 MHz
Cracker 172.95 MHz
Farmington 172.975 MHz
Grant City 172.95 MHz
Joplin 27.625 172.15 172.225 172.95 172.975 408.825 MHz
Kansas City KKU40 KLA20 4055 5860 7475 13626 20852 kHz 27.625 164.05 165.6125 165.75 166.175 172.125 172.15 172.925 172.95 409.45 410.30 MHz
Macon 172.95 MHz
Malden 172.95 MHz
St. Joseph KLF29 27.625 172.125 172.225 172.925 172.975 MHz
St. Louis KKY51 3353 4055 5860 7475 8125 13626 16280 kHz 27.625 165.75 166.175 172.125 172.925 409.45 410.30 MHz
Springfield KKZ26 3353 4055 5860 7475 8125 13626 kHz 27.625 172.125 172.15 172.225 172.925 172.95 172.975 MHz
Vichy 27.625 408.825 MHz
Warrensburg 172.95 MHz
Wentzville 172.95 MHz
Willow Springs 172.925 MHz

Montana

Billings KIM33 7475 8120 kHz
Bozeman 165.3375 166.175 MHz
Butte KKV33 7475 8120 kHz 165.3375 166.175 MHz
Dillon 165.3375 MHz
Drummond 166.175 MHz
Glasgow 166.175 MHz
Great Falls KIN80 3353 4053 4060 7475 8120 13626 kHz
Helena 166.175 MHz
Judith Mountain 166.175 MHz
Lewistown 165.3375 MHz
Livingston 165.3375 MHz
Miles City KKX67 7475 8120 kHz 166.175 MHz
Missoula KPG44 8120 kHz
University Mountain 166.175 MHz

Nebrasko

Ainsworth 172.925 MHz
Beatrice 172.975 MHz
Broken Bow 172.95 MHz
Chadron 172.95 MHz
Columbus 172.925 MHz
Grand Island 41.59 41.69 172.125 172.15 172.225 172.925 172.95 172.975 MHz
Hayes Center 408.825 MHz
Lincoln 27.625 172.125 172.15 172.175 172.225 172.925 172.95 172.975 MHz
McCook 27.625 41.59 41.69 172.975 MHz
No. Platte KCA20 3353 4055 5860 7475 8125 13626 kHz 27.625 41.59 41.69 172.125 172.15 172.225 172.925 172.95 172.975 408.825 MHz
Omaha KKY44 3353 4055 5860 7475 8125 13626 kHz 27.625 172.15 172.225 172.95 172.975 MHz
O'Neill 41.59 41.69 172.975 MHz
Scottsbluff KLF74 3353 4055 5860 7475 8125 13626 kHz 27.625 41.59 41.69 172.125 172.15 172.225 172.925 172.95 172.975 408.825 MHz
Sidney 172.975 MHz
Superior 172.95 MHz
Wayne 172.95 MHz

Nevada

Angel Peak 172.925 MHz
Las Vegas KKV20 172.125 172.925 MHz
Lovelock 172.15 172.95 MHz
Mt. Wilson 172.975 MHz
Peavine 172.975 MHz
Pequop Mountains 172.975 MHz
Reno KKU84 172.15 172.175 172.95 172.975 MHz
Tonopah KLW57 172.15 172.95 MHz
Wells 172.175 172.975 MHz
Winnemucca 172.15 172.95 MHz

New Hampshire

Candia 167.175 MHz
Lebanon 172.175 MHz
Nashua KJK81 KLD71 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz 27.575 MHz

New Jersey

Atlantic City KLN80 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz 165.75 166.10 166.175 172.125 172.1875 172.725 172.8125 172.85 172.9125 172.95 MHz
Newark KLC46 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 MHz

New Mexico

Abiquiu 169.225 MHz
Albuquerque KGH23 KEA37 3331 4055 5860 6870 7475 8125 13626 20852 kHz 165.5375 165.7375 166.175 MHz
Carlsbad 164.05 165.3375 165.6125 165.7375 165.7625 166.175 169.225 MHz
Farmington KGA46 3331 4055 6870 kHz 166.175 MHz
Meso Rica KDM44 3331 4055 6870 kHz
Sandia Mtn. 165.5375 MHz
Santa Fe KBY33 3331 4055 6870 kHz
Silver City KDP37
Taos KCD20
Truth or Consequences 166.175 MHz
Tucumcari KAB34 3331 4055 6870 kHz 166.175 MHz
Zuni KEA82 165.5375 166.175 MHz

New York

Albany KKY71 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 MHz
Buffalo KKZ75 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 MHz
Douglaston 164.05 165.75 166.175 413.60 MHz
Dunkirk 172.95 173.9875 MHz
Elmira 164.05 166.175 MHz
Hamburg 172.95 173.9875 MHz
Islip KCD73 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz 164.05 166.175 419.025 MHz

Ithaca 164.05 166.175 MHz
Jamaica KEK41 KJK82 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz 164.05 166.175 407.175 408.825 410.30 410.90 MHz
Jamestown 172.95 173.9875 MHz
Malone 172.875 173.9875 MHz
Massena 172.90 173.9875 MHz
Niagara Falls 172.95 173.9875 MHz
Ogdensburg 172.90 173.9875 MHz
Plattaburgh 172.875 173.9875 MHz
Potsdam 172.90 173.9875 MHz
Rochester 166.175 172.95 173.9875 MHz
Ronkonkoma KJK76 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz
Sayville WSY70 162.80 MHz
Starr Hill KLM94 3331 3335 3395 4055 5860 7475 8120 8125 kHz
Syracuse 172.95 173.9875 MHz
Utica 164.05 MHz
Watertown 172.95 173.9875 MHz

North Carolina

Asheville KKW51 4055 5860 6870 7475 8125 13626 kHz 27.625 MHz
Charlotte 27.265 408.825 MHz
Cofield KBH85 408.825 MHz
Elizabeth City KAO28 4055 6870 7475 kHz
Fayetteville KLJ61 27.6265 MHz
Greensboro KUY73
Hickory 408.825 MHz
New Bern KUR66 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz
Raleigh KCA58 4055 5860 6870 7475 8125 13626 kHz
Wilmington KOQ21 4055 6870 7475 kHz 408.825 MHz

North Dakota

Bismarck KKU50 4055 4060 5860 7475 8120 8125 13626 13905 kHz 166.175 MHz
Dickinson 165.3375 166.175 MHz
Fargo KOM46 7475 8120 kHz 166.175 MHz
Grand Forks KEA20 7475 8120 kHz 165.3375 166.175 MHz
Jamestown 165.3375 166.175 MHz
Minot KGC28 7475 8120 kHz 165.3375 166.175 MHz
Watford City 166.175 MHz
Woodworth 166.175 MHz

Ohio

Cleveland KLD69 3353 4055 7475 8125 13626 kHz 27.625 172.175 172.875 172.925 172.975 MHz
Columbus KLB79 3353 4055 7475 8125 13626 kHz 27.625 MHz
Dayton 164.025 MHz
No. Canton KLF21 3353 4055 7475 8125 13626 kHz 27.625 MHz
Oberlin KLA25 4055 7475 8125 13626 kHz
Vandalia KLA21 3353 4055 7475 8125 13626 kHz 27.625 MHz

Oklahoma

Chickasha KOS41 3331 4055 5860 6870 8125 13626 kHz
Oklahoma City KIA21 3331 4055 5860 6870 7475 8125 13626 16280 20852 kHz 27.585 27.625 162.25 162.35 164.05 165.5375 165.6125 165.6375 165.7375 165.75 166.175 169.2125 169.225 169.25 169.3125 MHz

Oregon

Eugene WHX25 3353 4055 7475 kHz 165.4375 MHz
Hillsboro 166.175 408.825 409.025 MHz
Horton 166.175 MHz
Kimberley 166.175 172.875 MHz
King Mountain 166.175 MHz
Klamath Falls WHX36 4055 7475 kHz 165.4375 166.175 MHz
Lakeview 165.4375 166.175 MHz
Laurelton 166.175 MHz
Medford WHX26 4055 7475 kHz 165.4375 MHz
Monroe 165.4375 MHz
Newburg 166.175 MHz
No. Bend 165.4375 MHz
Pendleton 166.175 408.825 MHz
Portland WHX40 4055 7475 kHz 166.175 408.825 409.025 MHz
Redmond WHX27 7475 kHz 165.4375 166.175 172.875 MHz
Sheridan 166.175 MHz
The Dalles 165.4375 166.175 MHz

Pennsylvania

Bradford 165.05 166.175 MHz
Dubois KLC41 3331 3353 3395 4055 5860 7475 8120 8125 kHz
Erie 172.95 173.9875 MHz
Philadelphia 3331 3353 3395 4055 5860 7475 8120 8125 kHz 164.05 166.175 408.825 410.90 MHz
Pittsburgh KKW22 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.625 164.05 166.175 408.825 410.90 416.875 MHz
Wilkes-Barre KLD81 3331 3353 3395 4055 5860 7475 8120 8125 kHz
Williamsport KQF21 27.625 MHz

South Carolina

Anderson 408.825 MHz
Charleston KUR64 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz
Columbia KUZ31 4055 5860 6870 8125 13626 16280 kHz 408.825 MHz
Florence KUS79 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz
Greenville 408.825 MHz
Greer KBZ80 4055 5860 6870 8125 13626 kHz 408.825 MHz
Myrtle Beach KUR65 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz

South Dakota

Aberdeen 166.175 MHz
Huron KBR27 7475 8120 kHz 166.175 MHz
Pierre KKU51 7475 8120 8125 13905 kHz 165.3375 166.175 MHz
Rapid City KCE24 7475 8120 kHz 165.3375 166.175 MHz
Sioux Falls KBC28 7475 8120 kHz 165.3375 166.175 MHz
Turkey Ridge 166.175 MHz
Yankton 165.3375 MHz

Tennessee

Bristol KKW23 4055 6870 5860 7475 8125 13626 kHz 27.625 41.04 MHz
Chattanooga KAN34 4055 6870 7475 kHz
Crossville KKX70 4055 5860 6870 7475 8125 13626 kHz 27.625 MHz
Erin 164.025 166.175 MHz
Jackson 408.825 MHz
Knoxville KFC87 4055 5860 6870 7475 8125 13626 kHz 27.625 408.825 MHz
Memphis KDM52 KLE86 4055 5860 6870 7475 8125 13626 16280 20852 kHz 166.175 MHz
Nashville KUV70 7475 8125 13626 16280 kHz 27.625 408.825 MHz

Texas

Beaumont KED67 3331 4055 5860 6870 8125 13626 kHz 164.05 166.175 MHz
Brownsville KCA37 3331 4055 5860 6870 8125 13626 kHz
Corpus Christi KJB35 3331 4055 5860 6870 8125 13626 kHz
Dallas (DFW Apt.) KLJ26 3331 4055 5860 6870 8125 13626 kHz 166.175 MHz
Denton KKD50 3331 4055 5860 6870 8125 13626 kHz
Dyess AFB (Abilene) 172.975 MHz
Ft. Worth KDM47 KBQ25 3331 4055 5860 7475 6870 8125 13626 16280 20852 kHz
Guadelupe Poss 166.175 MHz
Houston KIC30 KMU31 3331 4055 5860 6870 7475 8125 13626 16280 20852 kHz 164.05 165.5375 165.6125 165.7375 165.7625 166.175 169.225 413.60 MHz
Lometa KDC55
Lubbock 165.3375 165.7625 166.175 MHz
Midland KAP24 3331 4055 5860 6870 8125 13626 kHz
Mineral Wells 3331 4055 5860 6870 8125 13626 kHz
Mt. Franklin 166.175 MHz
Palacios KGC36 3331 4055 5860 5870 8125 13626 kHz
San Antonio KIA48 3331 4055 5860 6870 8125 13626 kHz 164.025 166.175 MHz
Waco 165.3375 166.175 MHz
Wichita Falls KPA54 3331 4055 5860 6870 8125 13626 kHz

Utah

Bryce Canyon 166.175 kHz
Cedar City KAX36 7475 8120 kHz 165.3375 166.175 MHz
Delle 165.3375 MHz
Fairfield 165.3375 MHz
Monticello 166.175 172.975 MHz
Ogden 165.3375 166.175 MHz
Provo 165.3375 MHz
St. Francis Peak 166.175 MHz
Salt Lake City KDC20 4055 4060 7475 8120 13626 13905 kHz 165.3375 MHz

Virginia

Bedford KKZ27 3353 5860 kHz 27.6265 166.175 MHz
Charlottesville 164.05 MHz
Leesburg KJK80 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 20852 kHz
Linden KLM93 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 MHz
Newport News 166.175 MHz
Norfolk KLD46 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 164.05 166.175 MHz
Richmond 164.05 166.175 MHz
Roanoke KLD57 3331 3353 3395 4055 5860 7475 8120 8125 kHz 27.6265 164.05 166.175 MHz
Tysons Corners 169.2625 MHz

Vermont

Burlington KKZ69 3331 3353 3395 4055 5860 7475 8120 8125 13626 16280 kHz 27.625 MHz

Washington

Auburn KCJ70 4055 7475 8125 13626 16280 20852 kHz 408.825 MHz
Bellingham 165.4375 166.125 413.60 MHz
Ellensburg 166.175 MHz
Everett 165.4375 166.175 172.125 MHz
Ft. Lawton 165.4375 166.175 MHz
Grass Mountain 166.175 MHz
Larch Mountain 166.175 MHz
Mica Peak 166.175 MHz
Miller Peak 166.125 MHz
Moses Lake 4055 7475 kHz 166.175 MHz
Mt. Constitution 410.25 MHz
Olympia WHX30 3353 4055 7475 kHz 165.4375 166.175 MHz
Omak 165.4375 166.175 MHz
Pasco WHX33 4055 7475 kHz
Pt. Angeles 165.4375 166.125 MHz
Seattle WHX20 3353 4055 7475 8125 13626 16280 20852 kHz 164.05 165.4375 165.7375 408.825 MHz
Spokane WHX42 3353 4055 5860 6870 7475 kHz 165.4375 166.175 MHz
Stampede Pass 166.175 MHz
Tatoosh Island 165.4375 166.125 MHz
Walla Walla 166.175 MHz
Yakima 166.175 MHz

Wisconsin

Green Bay KEB24 3353 4055 7475 8125 13626 kHz 27.625 MHz
Milwaukee KKY53 3353 4055 7475 8125 13626 kHz 27.625 MHz
Oshkosh 172.125 MHz

West Virginia

Charlestan KLB78
Clarksburg 164.05 166.175 MHz
Martinsburg KIT88 4055 6870 7475 8125 13626 16280 20852 kHz

Wyoming

Boysen Peak 166.175 MHz
Boysen Reservoir 166.175 MHz
Casper KAI82 7475 8120 kHz 165.3375 166.175 MHz
Cheyenne 165.3375 MHz
Douglas 166.175 MHz
Evanston 166.175 MHz
Jackson KKW27 7475 8120 kHz
Laramie 166.175 MHz
Lovell 166.175 MHz
Lusk 166.175 MHz
Rock Springs KKW90 7475 8120 kHz 165.3375 166.175 MHz
Sheridan 165.3375 166.175 MHz
Worland 165.3375 166.175 MHz

American Samoa

Olotele 172.15 MHz
Pago Pago KDM48 6874 14464 20480 kHz 27.6265 171.2625 MHz
Tafuna 27.625 MHz

Puerto Rico

San Juan KDM45 4055 5860 6870 7475 7508.5 8125 13626 16280 20852 kHz 172.95 408.825 MHz

Virgin Islands

St. Croix KUU97 4055 6870 7475 8125 13626 16280 kHz 408.825 MHz
St. Thomas KSB53 4055 6870 7475 8125 13626 16280 kHz

Bahamas (West Indies)

Bimini KUV50 4055 7475 8125 13626 16280 kHz 162.30 172.10 408.825 MHz

All Areas of The U.S.

3353 4055 5860 6870 7475 8125 13626 kHz 27.575 27.585 27.625 27.665 164.025 165.6375 165.75 165.7625 166.175 172.125 172.15 172.175 172.825 172.875 172.925 172.95 172.975 408.825 MHz

FAA Aircraft Roster

N2	Cessna 550 Citation
N5	Beech King 90C
N5RB	Beech Bonanzo 35VB
N16	Beech King 90C
N17	Beech King 90C
N19	Beech King 90C
N20	Beech King 90C
N29	Douglas DC-9-15
N38	Sikorsky S-76
N40	Boeing 727-25C
N51	Rockwell Sabre 75A
N55	Rockwell Sabre 75A
N59	Rockwell Sabre 75A
N60	Rockwell Sabre 75A
N61	Rockwell Sabre 75A
N62	Rockwell Sabre 75A
N64	Rockwell Sabre 75A
N65	Rockwell Sabre 75A
N1121A	Fairchild 27

F.A.A.- Some Voice Networks

2758 kHz	Weather (Alaska)
3253 kHz	Weather (Alaska)
	Emergency (Pacific Region)
3331 kHz	Disaster (Gulf of Mexico area)
	Emergency (East, Northeast, Southwest Reg.)
	Service Net (New Mexico)
3353 kHz	Emergency (Central, East, Northeast, & West Regions)
3395 kHz	Emergency (East & Northeast Regions)
4055 kHz	Emergency (All regions)
	Service Net (New Mexico)
	Weather (Alaska)
4060 kHz	Emergency (Rocky Mtn. & West Regions)
4139.5 kHz	Maritime Mobile (Alaska)
5357.5 kHz	Weather (Alaska)
5860 kHz	Emergency (East, Northeast, Southwest Reg.)
6870 kHz	Emergency (Pacific, South, Southwest Reg.)
	Service Net (New Mexico)
6874 kHz	Accident Investigation (Pacific)
7475 kHz	Emergency (All regions)
7508.5 kHz	Hurricane Net (Caribbean)
8120 kHz	Emergency (Central, East, Northeast Reg.)
8125 kHz	Emergency (All regions)
13626 kHz	Emergency (All regions)
13903.5 kHz	Emergency (West Region)
14464 kHz	Accident Investigation (Pacific)
16280 kHz	Emergency (Northeast & Inter-Region)
20480 kHz	Accident Investigation (Pacific)
20852 kHz	Emergency (Inter-Region)
27.2625 MHz	Accident Investigation (CB Ch. 26-LSB)

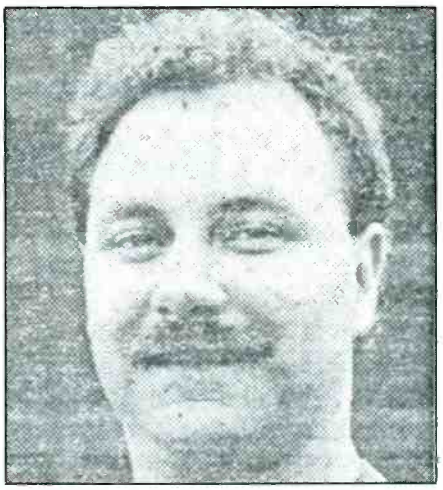
PC

New York Expressway Rescue

Rush hour on a busy New York City expressway may not be the ideal time or place to help someone in trouble, but that didn't stop Firefighter Richard Gimbl.

Gimbl was driving west on the Long Island Expressway in Queens, New York, when he saw a car in eastbound traffic hit a barrier east of Utopia Parkway about 8:00 a.m. Gimbl told the New York Daily News that he acted instinctively after he saw the car flip over, hit the center divider and burst into flames.

SCAN PUBLIC SERVICE AWARD



Firefighter Richard Gimbl. (N.Y. Daily News photo.)

"I couldn't even think, I just pulled him out," Gimbl told the *Daily News*. According to authorities, 24-year-old Ronald DeCicco of Island Park, New York, was rescued. He was taken to Booth Memorial Hospital in Flushing, New York where he was later listed in stable condition.

Gimbl reported that Thomas Salerno of Corona, Queens, helped in the rescue.

The firefighter said that he and Salerno dragged DeCicco to safety. Then he ran back to his car for a fire extinguisher and first aid kit. While Salerno tried to put out the fire in DeCicco's car, Gimbl tried to stem the bleeding.

"I jammed on my brakes to avoid a collision," the 35-year-old firefighter told the *Daily News*. "It (DeCicco's car) hit the wall and burst into flames."

Gimbl was on his way to work in Maspeth, Queens. He is assigned to the Fire Department's hazardous materials unit.

Capt. Michael Cahill of Engine Co. 299 said he would recommend Gimbl for a departmental commendation.

For his quick action, Firefighter Gimbl will receive the SCAN Public Service Award, which consists of a special commendation plaque and a cash prize. For making the nomination, Joe Singer of Jamaica, New York will also receive a plaque.

Congratulations to both of you. SCAN

SCAN PHOTO CONTEST WINNERS

Best Equipped

We usually use photographs of "radio shacks" only, but this time we received a couple of interesting shots with the people who use all that gear.

The first one came from Paul F. MacDonald of Nasua, New Hampshire. Paul says that he has been reading Popular Communications *for some months and especially enjoys the SCAN photo contest. He uses a Bearcat 201 scanner, ICOM IC-751 HF transceiver and general coverage receiver, ICOM IC-271A VHF transceiver, ICOM IC-471A UHF transceiver, Commodore 64 and 128 computers, AEA computer patch interface and MBATOR software, Heathkit HD-4040 terminal node controller, and various assorted amplifiers, handi-talkies, computer accessories and antennas.*

As you can probably tell from this equipment list, Paul enjoys amateur radio (his call is WA1OMM) and reports that he was one of a handful of radio amateurs to work the European Spacelab (DP0SL) on the space shuttle Columbia last year. He is also an avid shortwave listener, amateur satellite enthusiast and user of digital communications such as AMTOR, RTTY and "Packet."

Best Appearing

R. Frederick Evans of Morpeth, Ontario, writes that he enjoys Popular Communications *and SCAN. He keeps his equipment in what he calls his "Radcom Room" (radio communications room) in his home.*

Frederick uses a Realistic PRO-2020 scanner as a base station, along with a Racal RA-6790 receiver, Ket-Tech dual cassette recorder, Realistic CB base station, and a Sony TC-500A reel-to-reel recorder. This set-up also includes a Radio Shack TRS-80 color computer, DMP 105 printer from Tandy, Tandy FD 500 disk drive, Tandy DCM-3 modem and a Zenith ZVM 1200 monochrome video monitor.

Retired from the Canadian Armed Forces, Frederick says that he thoroughly enjoys the hobbies of scanning and shortwave listening. He is happy that more attention is being paid to scanner fans, and spends many hours listening to police, fire and emergency calls and even transmissions from the fishing boats going after salmon in nearby Lake Erie.

Winners in the Photo Contest this month receive the BMI "NiteLogger" tape recorder activator. Plugged into a cassette recorder and a scanner, it gives a complete record of all communications with no "dead time" on the tape. If you would like to enter the contest, just send a sharp black/white print to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558. SCAN

Marching Into Radio's Past

We're Ankle-Deep In Facts, Figures and Fantastic Photos!

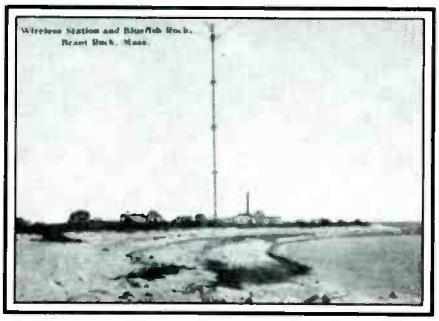
BY ALICE BRANNIGAN

March is the month when the last of winter's icy winds howl through the antenna wires. If you listen carefully, sometimes you can hear the echoes of history in their mournful sound. If you put on the headphones and close the door of the radio shack to silence the sound of the TV in the other room, you might be able to hear the sounds of the first radio broadcast. It took place just over eighty years ago.

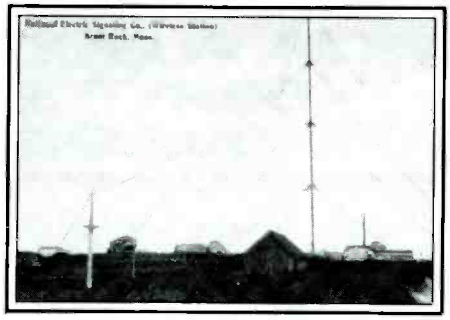
Thanks to radio historian Robert Fraser of Cohasset, MA we are reminded of that broadcast. It took place on December 24th, 1906. Instead of the usual 167 kHz CW transmissions from coastal station BO at Brant Rock (on Cape Cod), MA ship operators were treated to the sounds of a man's voice and music. The man who was responsible for this transmission of Handel's *Largo* was Canadian-born Prof. Reginald A. Fessenden (1866-1932). This startling transmission was hardly an accident, Fessenden had been experimenting for many years and had succeeded in transmitting the human voice via rado as early as November of 1900 (although the voice was highly distorted). The 1900 test was sent from the wireless station on Cobb Island, near Cape Charles, VA. It was received more than a mile away.

In 1902, the National Electric Signalling Co. (NES) was formed to compete with the American Marconi Company. NES' idea was to utilize several of Fessenden's wireless inventions. Towards this end, in 1905, a 420-foot hollow metal tube mast was erected at Brant Rock, MA not far from Marconi's station on Cape Cod. NES constructed a duplicate station at Machrihanish, Mull of Kintyre (yes, the place named in the song), Scotland. The equipment consisted of a 15-kW spark gap alternator on 1 kHz, and Fessenden's "Liquid Barretter," a glass vacuum tube containing a platinum wire that touched a nitric acid solution in order to serve as a detector. The first trans-Atlantic transmission came from the station at Scotland on January 3rd, 1906.

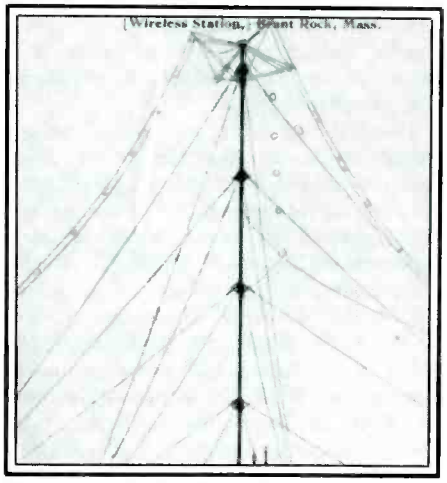
Voice experiments continued, but the existing equipment was too crude to produce acceptable results. Fessenden then asked General Electric to build a 100-kHz alternator. G.E.'s resident expert, F.W. Alexanderson, was able to build the device, but not easily. This device offered the results that Fessenden had sought and the pioneer broadcast of December 24th was the direct result. A second broadcast was made exactly a week later.



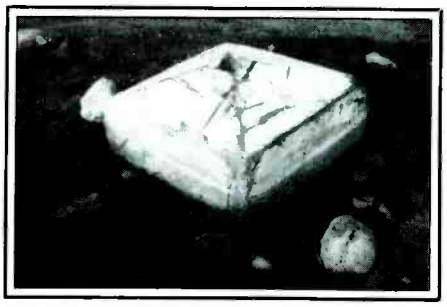
A distant wide-angle view of station BO at Brant Rock, MA. The mast shows, but all of the guy wires and the antenna itself were airbrushed out to improve the looks of the photo. Such airbrushing was common on old photos and is still practiced today.



A closer view of the Brant Rock station offers a better look at the mast and its guy wires. The antenna wires don't appear here.



The whole deal at Brant Rock shows up in this close view, antenna mast, guy wires, and even the antenna.



All that presently remains of the old Brant Rock station is this concrete footing reputed to be the base of the tower. Most likely it is actually an anchor for one of the guy wires. (Courtesy Robert Fraser.)

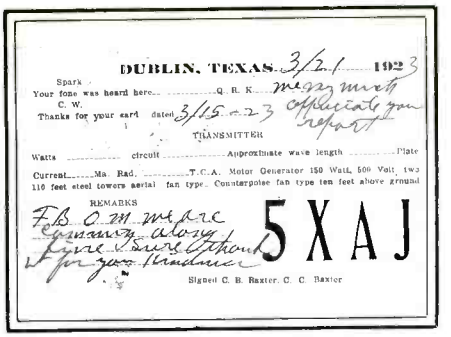
The first broadcast was picked up as far away as Norfolk. The second program was heard in the West Indies. The station in Scotland missed out on all of the excitement because their tower had toppled a few weeks earlier during a gale. They had, however, clearly heard brief tests that had been made in November of 1906.

Additional tests were made and a two-way voice contact was made between Brant Rock and Jamaica, New York City, in mid-1907. Brant Rock's signals were also being reported as received by a station in Denver.

NES, nevertheless, was not a successful business venture and could never compete effectively with Marconi. In 1911, during one of many internal corporate traumas, Fessenden left Brant Rock. NES sold out their rights to Marconi in 1914 and the NES transmitting site at Brant Rock was sold to the International Radio Telegraph Company. Shortly after the U.S. entered WWI, the Brant Rock station was shut down and dismantled.

Fessenden, during his lifetime, held more than 500 radio patents, including the heterodyne receiver (1905). None of his inventions provided him with a steady income,

A letter from the duPont Company reports that the antennas atop this building were erected in 1909 for telegraph station DW on 810 kHz.



The callisgn 5XAJ was used by the operators of broadcast station KFPL, late of Dublin, Texas.

WSLM, of Indiana, looked like this when it went on the air in 1953—as shown previously in our July issue last year.

most involved him in litigation with other inventors. Although he received several awards from the scientific community during the 1920's, today Fessenden's name and work is little remembered, except by the *Guinness Book of World Records* which acknowledges his first radio broadcast.

The only relic of the Brant Rock station is a concrete base (probably a guy wire anchor rather than the base of the mast itself). A plaque to mark the site was made by the Marshfield Historical Commission but is not left on-site. In 1981, Dave Riley (AA1A) held a commemorative Ham radio gathering at Brant Rock. Station WATD-FM once offered a reenactment of the first broadcast but, for the most part, residents in the area of the transmitter site never heard of the station.

We do have some photographic memories of the station and while history may not have been kind to Brant Rock, at least *POP'COMM* readers can see what it looked like. Unfortunately, some of the available photos show only the mast itself; the guy wires and antennas were painted out to make the photos look less cluttered. We do have, however, one old photo that shows the entire antenna system.

The Wilmington Mystery

Now to the matter of the continuing mystery of the early wireless station once located at the duPont Hotel, Wilmington, DE. Several times we have run the photo of this station without being able to get a good identification from readers. Now comes a letter on an official E.I. duPont de Nemours and Company letterhead, signed by John T. M. Lyles, Research Engineer, Engineering Physics Laboratory. Can't get much more authoritative than that, I'd say!

The early station at the old duPont Hotel (also known as the duPont Building) was erected in 1909 and was a spark wireless outfit operated by the United Wireless Company of New York. Operating on 810 kHz, the station used a huge flattop array that was placed in service on March 22nd, 1909 and messages were directed to UWC stations in Washington, Baltimore, Philadelphia, New York and elsewhere. The transmitting equipment was enclosed in a house on the roof of the building, according to reports in several March 1909 editions of a Wilmington newspaper called *Every Evening*.

The callsign of this station was DW, and early operations revealed that it had a daytime range of 500 miles, 2,000 miles at night. The newspaper noted that, "wind no matter what velocity or direction it is blowing, does not affect the wave sounds in any respect." There seems to be no information available as to when the towers were torn down. They don't show up in photos of the late 1920's, but this could mean only that they might have been airbrushed out of the photos because they detracted from the appearance of the building.

During 1924 to '25, Wilmington's first commercial broadcast station, WHAV (833 kHz) briefly had studios in this same building, but the transmitting plant was several blocks away atop the Mullins Building. WHAVE developed into today's station WDEL.

So ends our Wilmington mystery, and we appreciate the help in clearing up all of the speculation. Our 1919 photo shows the building after it had been substantially enlarged (lengthwise). Other photos of the building show cross beams atop the antenna masts, between which are strung an antenna system consisting of at least sixteen wires.

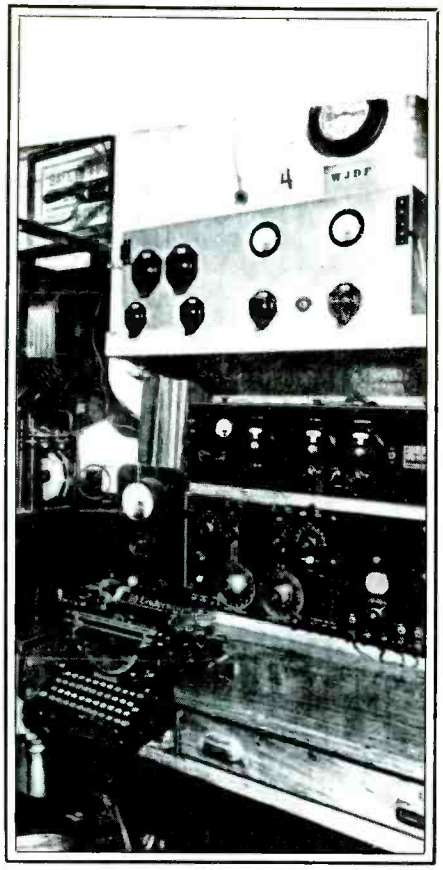
A Texas Experimental Station

In 1923, Ham operator C.C. Baxter (5NR) and a relative, C.B. Baxter, took out a license for an experimental and broadcasting station that was issued the callsigns 5XAJ and KFPL. The station had two 110-foot steel towers supporting a fan type antenna above a similarly shaped counterpoise located ten feet above the ground. As an experimental station, 5XAJ ran both spark and voice. As a broadcasting station, KFPL commenced broadcasting with 15 watts on 1240 kHz. Everything was located at the Baxter homestead at 205 Grafton Street, Dublin, TX.

As time passed, changes took place. Control of the station went to C.B. Baxter (who eventually became a licensed Ham with the callsign 5AFF), and KFPL shifted frequencies to 1190 in 1926, and to 1310 by 1929. In 1930, the power was increased to 100 watts days and 25 watts at night. In 1942, KFPL was on 1340 kHz but it was pretty much the end of the road. Listings for

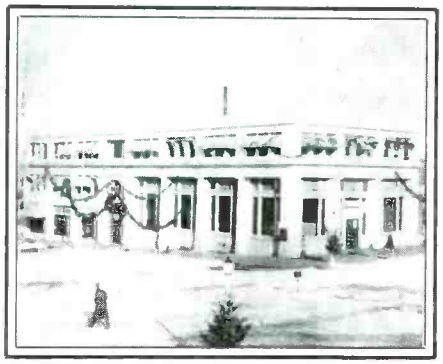
This is how WSLM looks at the present, the main differences being larger shrubs and the satellite dishes. (Courtesy Robert Rowe.)

The 1931 broadcaster at Brownsville's Hotel El Jardin was probably tongue-twister KWWY that later moved to Port Arthur and became KPAC. (Courtesy Robert Bedford.)



The radio shack at WJDF aboard the luxury schooner Migrant *about 1930. (Courtesy Will Jensby, W0EOM/6).*

This modern building houses the TV station in Cairo, Egypt. (Courtesy Jerry Rappel, KA0BLE.)



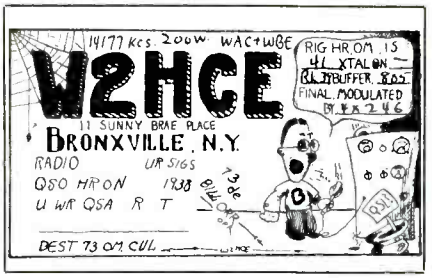
The Jerome National Bank building in 1930 with the (hard to see) KFXD towers on the roof. The building is now the First Security Bank of Idaho. (Courtesy Frank Aden, Jr.)

Historic Ham QSL's

Any night you tune across the 40 meter Ham band you're bowled over by powerhouse signals from shortwave broadcasters. I wonder how many Hams have thought it would be an interesting experiment to attempt to engage Deutsche Welle, the BBC, VOA, Warsaw, or one of the many other SWBC stations in a QSO. Just imagine, on the 80 meter Band you could call the Falkland Islands Broadcasting Service right on their own frequency of 3958 kHz and explain in detail how badly you needed their QSL!

Fifty years ago, something like this happened to DXpert Bill Orr, W6SAI. Regular *POP'COMM* readers (in fact, readers of many communications publications), as well as all active DX-chasing Hams will quickly recognize Bill's famous name and callsign. In 1937, when he was W2HCE and operating from Bronxville, NY he was on the 20 Meter band and had the rare opportunity to have a two-way contact with shortwave broadcaster HCJB in Quito, Ecuador!

Bill tells us that he was one of the very few Hams to work HCJB. Seems that HCJB's chief operator, Clarence Jones decided to say hello to some Hams. He did this by tuning up HCJB's 200-watt 8950-kHz transmitter on the 14 MHz. Yes, in those days HCJB ran only 200 watts. Signing the callsign HC1JB, Clarence made a couple of contacts and QSL'd them with a regular HCJB QSL card (with the numeral "1" hand written between the letters "C" and "J"). Bill happily surprised us by sending a copy of his unique QSL confirming HCJB's Ham contact.



As a return surprise for Bill, I was able to locate a copy of another Historic Ham QSL, one of Bill's original 1937 W2HCE cards! In those days, W2HCE ran a 41-crystal oscillator on 7088 kHz, an RK39 doubler to 14176 kHz, link coupled to an 805 in the class "C" amp, running 200 watts input. The speech amp ran a 57 pentode, 57 triode, p-p 56's, with p-p 45's as drivers. The modulators were four 46's in p-p parallel. The receiver was homebrew. The antenna was a beam. Pretty nifty station for a teenager!

Bill probably didn't realize that any W2HCE QSL's still existed!

1944 don't show the station in existence at that time. Still, it was a twenty-year career for KFPL and that's not bad!

Even rarer than a QSL from KFPL itself would be a QSL from its experimental aspect, and that's what we have to share with you. Our 5XAJ QSL card is dated March of 1923 and verifies a report sent in by an SWL in the Northeast. The card is marked, "We very much appreciate your report" and also "FB OM we are coming along fine . . . sure thank you for your kindness."

Follow-up To WSLM

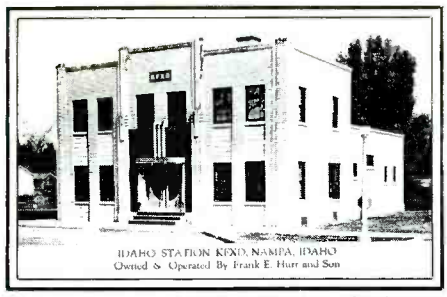
A few issues back down the line we ran a 1953 photo of station WSLM in Salem, IN (5 kW on 1220 kHz). That brought in a letter from *POP'COMM* reader Robert Rowe of Corpus Christi, TX. Bob's family hails from Salem and his second cousin, Don Martin, is the founder and present owner of WSLM. Bob heads towards Salem every year and he thoughtfully sent us a photo of the way WSLM looks at present. As Bob says, "As you can see from the newer photo, WSLM hasn't changed much since the 1950's. Take away the dish antennas and it's about the same." Bob reports that Salem is a wonderful town and located in some of the most scenic country in Indiana. Thanks, Bob!

Texas, Again?

Robert Bedford, Brooklyn, NY says that he's an SWL and a former history major so he doubly enjoys the historic radio scribblings in *POP'COMM*. Bob sent along a 1931 picture postcard showing an antenna tower on the roof of the Hotel El Jardin in Brownsville, TX and asks if we can figure out what station was there. The card itself was found at a flea market!

Although it's difficult to make out, under magnification the photo reveals two antenna towers. There's a transparent screen of some sort hanging down from the top of the tower in the foreground. It practically obscures both towers.

In 1931, there was only one broadcasting station in Brownsville, so that's probably the station in the photo. That was station KWWY, 500 watts on 1260 kHz, operated by the Brownsville Herald Publishng Co., formerly owned by the Brownsville Chamber of Commerce.



KFXD as it looked at Nampa, Idaho in 1944. (Courtesy Jerry Rappel, KA0BLE.)

"Tube bad" we couldn't run this in color so you could see the guy's bright red schnozzola. My face was the same color when I learned that I didn't do my homework on station YI2AM that I discussed a few issues ago. (Courtesy Jerry Rappel, KA0BLE.)

In August of 1933, KWWG changed its location to Port Arthur, TX and its callsign to KPAC. The new owners at that time became Port Arthur College.

All At Sea

From Will Jensby, W0EOM/6, of Sunnyvale, CA we received a great maritime radio photo of the radio equipment aboard a fabulous early-1930's schooner called the *Migrant*. This vessel was 220 feet in length, carried a crew of 33, and was owned by a gent named Carl Tucker.

Using the callsign WJDF, the station operated on 143, 151, 153, 160, 375, 400, 425, 468, 500, 8290, 8330, 8450, 11050, 11110, 11230, 13240, 16580, 16660, and 16860 kHz.

In our photo of WJDF, the equipment at the top of the stack is a Leutz shortwave receiver. In the center is an RCA unit, and at the bottom you can see an IP-501A transmitter. Elsewhere in this luxurious vessel was a special Leutz console broadcast receiver that ran six loudspeakers located throughout the ship. All of the electronics aboard the *Migrant* were what passed for deluxe state-of-the-art in 1930.

From Cairo

Jerry Rappel, KA0BLE, of Davenport, IA sent in an undated photo of the skyline of Cairo, Egypt. The photo shows the Nile River flowing past the TV Building at Cornish El-Nil. The antenna mounted on the roof of the building sends out horizontally polarized signals on Egyptian TV Channels 5 and 9 using the SECAM B-System for transmissions. Egypt has not standardized TV signal polarization, so some stations send out vertical signals while others transmit horizontally polarized signals! Good planning, right?

Idaho Broadcaster

Thanks to Jerry Rappel (who supplied the Cairo TV photo) and to Frank Aden, Boise, ID we have some interesting insights into a colorful broadcaster having a varied career. That's station KFXD, which began its career on 1460 kHz with 10 watts from Logan, UT. That was in early 1926 when its owner was L.H. Strong of East Center Street. Shortly after the station commenced operating, ownership was turned over to the Service Radio Co. Less than three years later, the Service Radio Co. and KFXD moved to Jerome, ID where the station ran 15 watts on 1420 kHz. By 1932 the station had been sold to Frank E. Hurt, whereupon it was moved to Nampa, ID and increased its power to 100 watts. In the mid-1930's KFXD switched frequencies to 1200 kHz, then just before WWII it moved to 1230 kHz. In 1946, KFXD moved to 580 kHz with 1 kW; the power was increased to 5 kW several years later. KFXD still runs 5 kW on 580 kHz.

As an interesting sidelight, in 1953 KFXD placed Idaho's first TV station on the air, KFXD-TV on Channel 6. The station commenced operation in June and left the air in August, less than two months later!

We have two views of KFXD, one from about 1930 when the station was located in the old Jerome National Bank Building. The other photo is from 1944 after the station had moved to Nampa, ID.

Alice In Blunderland

Dolt that I am, when I ran the YI2AM (Iraq) "Historic Ham QSL Card" a few issues back, I didn't realize just how historic it was! This was quickly pointed out to me by Bill Orr, W6SAI, and by Joe Schroeder, W9JUV. They told me that YI2AM, in the late-1940's, was operated by Armin H. ("Hank") Meyer, W3ACE. In those years, Hank was our nation's Ambassador to Iraq and operated YI2AM from within the U.S. Embassy. Station YI2AM was not actually given an official license, according to my information, but was operated with "unofficial permission from the highest authorities" in Iraq. Hank also operated from our embassy in Afghanistan, using the call YA1AM. Presently, Hank is retired, after a long and very distinguished diplomatic career, and is still a very active Ham (W3ACE on 20 meters SSB) from his Washington home. Glad we got that little matter straightened out!

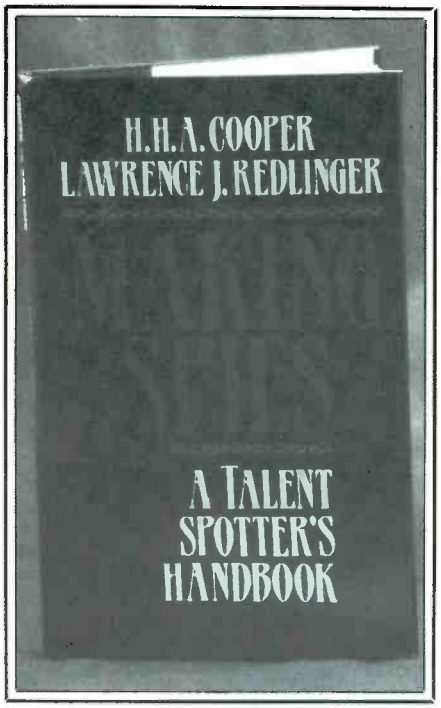
Tube Bad!

After revealing to the world that I was a dim bulb when it came to YI2AM, what can I do in parting this month that would surpass the 1920's radio cartoon sent in by Jerry Rappel, KA0BLE. The guy in the card looks like one of my fellow sox fans watching the last inning of game seven of the '86 World Series! Jerry's bright card did light up my life!

Thanks to all of my readers for the continuing support shown. More next month. PC

BOOKS YOU'LL LIKE!

BY R.L. SLATTERY



Making Spies

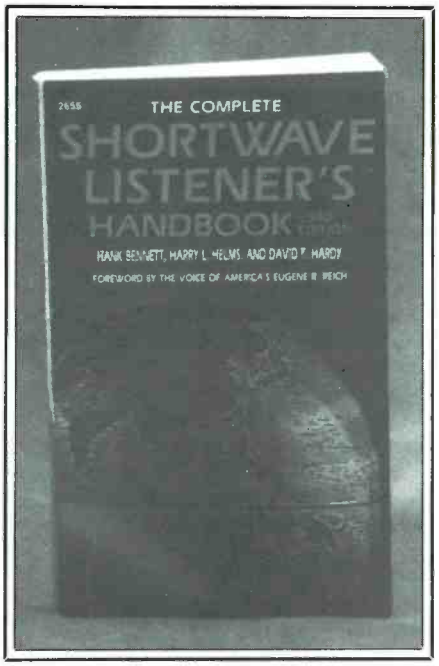
A Bulgarian spy on Wall Street. An Israeli highly placed in the Syrian government. Soviets in British MI-6. A Jewish Israeli in Iraq posing as a former Nazi. Is this for real? Absolutely. These are real spies—those who seek or have access to information otherwise unobtainable, and plan to secretly steal or buy the information for some higher authority. Secrets exist at all levels of society, and throughout the world, spies are employed to ferret out the most potent of secrets from government and industry.

Any person who thinks they have unique access to information and is willing to offer it to the highest bidder should think again, for once the deal is made, it's the start of a mandatory lifelong career.

Soviets in Nicaragua and Silicon Valley; Americans in the USSR, China, Libya; Czechs in Washington; French agents in New Zealand. Where does it all begin, how does it end? What kind of people are recruited as spies, and how is it accomplished? The book, *Making Spies, A Talent Spotter's Handbook*, by H.H.A. Cooper and L.J. Redlinger, answers these and many other questions in their authoritative study of the highly delicate and precise science and art of international espionage.

It explains the process of locating prospective agents, and then being able to maintain them for a lifetime. But there are as many variables as there are people involved. Though it's the nature of the business that nobody will ever know all there is to know, we can still learn much from these authors who are people with much information to impart.

This is a 280-page hardcover book, complete with an extensive bibliography. The book is available at $16.95 (plus $3 postage/handling) from Paladin Press, P.O. Box 1307-PC, Boulder, CO 80306.



New SWL/DX Handbook

For more than a decade, the classic handbook for DX chasers has been *The Complete Shortwave Listener's Handbook*, by Hank Bennett and Harry L. Helms, KR2H. Now, accompanied by Dave Hardy, the authors have completely revised the book and produced a large, updated 194-page Third Edition. This expanded new edition includes the latest on equipment, stations, procedures, and operating techniques.

Whether you've been DX'ing for decades or are just beginning to explore the potentials of a hobby in which something exciting is taking place every minute of every day, year round, this new edition is overflowing with the latest information, opinions and advice that will let you enjoy monitoring to the maximum. The book delves into international broadcast monitoring, two-way traffic, emergency communications, ship/shore calls, pirate stations, public service stations, space communications, radioteletype, Hams, FM/RV broadcasts, military, even Air Force 1.

All of the basics are brought up-to-date: SWL lingo and terminology, receivers, antennas, DX propagation, Q-codes, keeping logbooks, preparing/sending reception reports that bring back QSL's. There is much new material on low frequency monitoring, how to identify stations you hear, DX clubs, better performance from your equipment, card swapping, DX programs, awards and lots more.

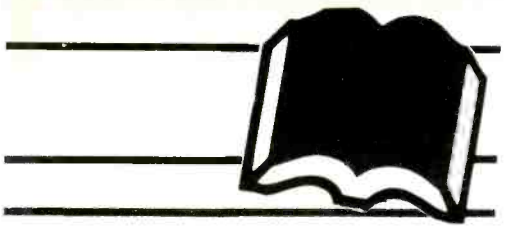
Written in a very chatty, straightforward style, this new Third Edition is, essentially, a totally new book from front-to-back. An interesting and well-done Foreward by the VOA's Eugene R. Reich adds measurably to the overall enjoyment and usefulness of the book. An outstanding book in every respect, it does well by the reputation racked up by the two earlier editions.

The Complete Shortwave Listener's Handbook, Third Edition, is available at $16.95 per copy (plus $1 postage/handling to addresses in USA/Canada/APO/FPO) from CRB Research, P.O. Box 56, Commack, NY 11725.

Dishing It Out

With all of the interest today in satellite communications, satellite weather information, satellite TV, and radio astronomy (all of which require a parabolic dish antenna), Gordon Williams' (W5ITI) new book, *Build Your Own Satellite Dish Antenna* arrives to meet a waiting audience.

Williams' 44-page fully illustrated (photos, diagrams) provides easy step-by-step instructions, measurements, and construction tips towards building a 10.5-foot dish antenna. Building this antenna costs about $350, a fraction of the cost of purchasing a commercially made antenna of comparable specs and performance capabilities. This antenna can be used between 220 MHz and



10 GHz, with pertinent info provided in the book. Charts in the book give valuable information for antennas with a focal distance of .4, .45 and .5 in 10.5, 20, and 30-foot dish sizes.

Much information is in this book, and it's sufficiently explained so that anybody can build one with a minimum of anxiety. The book even tells you where to buy the less commonly available ingredients.

This book is $12 from Power Gain Systems, P.O. Box 2955, West Monroe, Louisiana 71294.

In Addition . . .

Long-time *FM Atlas* publisher Dr. Bruce F. Elving announces the launching of a newsletter for people in the media, as well as anybody else with a hobby interest in stereo, high-fidelity broadcasting or traveling with an FM radio. The newsletter, entitled *FMedia!* is devoted to both official and unofficial happenings in the world of FM radio.

FM, now the dominant form of radio broadcasting, languished for decades in the shadow of the older AM system. Through the years of struggle there were numerous magazines and guides concerned with FM. These included *U.S. FM, FM Guide*, and groups like the National Association of FM Broadcasters. Today, FM is commonly regarded as "just another form of radio." Elving points out that this trend is wrong—FM has unique problems and opportunities that demand it be treated differently. His newsletter plans to keep watch on trends in FM programming, the proliferation of translators and development of "low power FM," AM stereo (and how FM might thus be affected), new technical developments (such as CBS' FMX system of FM stereo broadcasting), and FM subcarriers. His publication will have a certain amount of "spice" (media criticism), and will be embellished by historical notes.

Besides publishing the *FM Atlas* since 1971, Elving has over 10 years' experience doing a monthly "FCC-FM" column for the Worldwide TV-FM DX Association. For news, he'll rely on FCC news releases mailed weekly, as well as the contributions of several hundred reporters who are in regular contact. Elving was named by the Association of North American Radio Clubs at its 1986 convention in Montreal "Specialty Band DX'er of the Year" for his publishing and listening contributions to the medium of FM. He began listening to FM in 1948.

For a sample of Elving's newsletter and subscribing information, send one dollar to *FM Atlas Publishing*, Box 24, Adolph, MN 55701-0024. Tell 'em you read about it in *POP'COMM*!

PC

Radio Reloj

The Radio Raider That Triggered Castro's Revolution

BY DON JENSEN

Revolutions, it seems, oft times go awry.

History is replete with governments born in revolutionary idealism that ended up being just plain revolting. When the smoke clears, yesterday's heroes, too often, wind up wearing the black hats.

Take Fidel Castro, for instance. Once upon a time, 30 years ago, many Americans were sympathetic to the cause of the idealistic young attorney who was trying to overthrow the corrupt Cuban dictatorship of Fulgencio Batista.

In the wild and rugged mountains of Cuba's Sierra Maestra, Castro and a ragtag band of guerrillas were trying to spark a popular revolution, to light a fire under the Cuban people to rise against the Batista regime.

In Cuba, there were other liberal groups, too, such as the student Federacion Estudiantes Universidad, which allied with Castro's Movimento Revolucionario 26 de Julio in the attempt to overthrow the Havana government.

With Castro's band pinned down in the mountains by Army forces, FEU's militant leadership came to the conclusion that the urban guerrillas could trigger a general revolt by assassinating Batista in his presidential palace. Plans were made—the date was set for March 13, 1957.

Young Jose Antonio Echevarria, head of the FEU, knew that for the venture to be successful, word of the attack on Batista's personal stronghold had to reach the people of Havana quickly.

That meant that simultaneous to the assasination, the raiders had to capture the Cuban capital's most important radio station and broadcast their revolutionary message.

Two small assault teams were chosen. One would attack the presidential palace. The other team's target was Radio Reloj in the Havana suburb of Vedado. The mediumwave station on1330 kHz was the city's 24-hour-a-day radio clock, broadcasting non-stop time announcements and news.

Echevarria, heading the second team, was to broadcast a bulletin over the temporarily captured transmitter announcing that the palace had fallen and Batista was dead. Volunteers were asked to assemble at the university, where they would be given weapons and further instructions.

The palace assault group launched its attack early on the afternoon of the 13th. It seemed suicidal, but the FEU students had the element of surprise on their side. Catching Batista's guards off guard, four young raiders fought their way into the presidential building.

Through an entryway, firing as they went, they made it up a broad staircase, then to the second floor, just down the hall from the study where Batista was working.

Just when it seemed that the assassination attempt might, against all odds, succeed, more troops rushed up. Unable to advance, unwilling to retreat, the attacking students were cut down by the soldiers.

Meanwhile, across town, several carloads of armed students had approached the suburban studios of CMCB, Radio Reloj. It was an ordinary commercial broadcasting station; there were no guards and no resistance. While part of the group established defenses outside, three of the young men—Echevarria, Jose Westbrook, the FEU's propaganda secretary, and Fructoso Rodriquez—entered the station.

One of the CMCB staffers was not surprised when they burst in. He was the on-the-air announcer, Floreal Chaumont, brother of an FEU member, Faure Chaumont. He willingly turned the microphone over to one of the intruders.

"Radio Reloj reporting . . . Radio Reloj reporting!" the new voice said. "At this moment, armed civilians are attacking the presidential palace! Radio Reloj reporting . . . President Batista has been struck down by bullets in the presidential palace!"

Following the station's regular format, the raider gave the time: 3:25 p.m. Then he hit the button for CMCB's familiar sound effect, the clatter of a telegraph key that punctuated the dramatic bulletin-style of the time-and-news station.

Across Havana, the broadcast was heard. A shiver of apprehension went through the startled audience. Traffic slowed on the broad Malacon, as drivers reached to turn up the volume of their car radios. Chatter died in the bars and restaurants along the Prado. Police precinct commanders sprung to life; pulses quickened in aging army staff officers at Camp Columbia.

A second student raider took the mike. The Army's chief of staff, General Francisco Tabernilla, the student announced, had been arrested and relieved of his command, as had the other high ranking members of the Batista regime.

It was untrue, of course, but it was what the guerrilla broadcasters hoped *would* happen soon enough if the revolution actually got off the ground.

Echevarria's was the next voice heard, beginning the formal proclamation by the FEU:

"People of Havana! The revolution is in progress! The presidential palace has been taken by our forces and the dictator has been executed in his den . . . ."

His voice was abruptly cut off. Silence. At the remote rural transmitter site of Radio Reloj, an engineer had been ordered by government authorities to shut down the station. All the assault team could do then was to hope that the Habaneros had heard the abbreviated broadcast and would take to the streets in support.

They fired a fusillade of pistol shots into the studio console, wrecking it and guaranteeing that the government could not soon return Radio Reloj to the air to counter the revolutionary message. They left the building, marching the regular announcer, Floreal Chaumont ahead of them at gunpoint, an apparent hostage.

Chaumont, in fact, had not been a party to the plot, but he had some inkling of it from his brother. The raiders felt that for his own safety, he should be out of the station when police arrived and so, for the benefit of other witnesses, staged the hostage masquerade.

They gave the announcer a shove down the sidewalk, telling him to "keep walking." Then the trio jumped into one of the waiting cars.

Chaumont walked off and went into hiding. Two months later, he was able to take refuge in the Embassy of El Salvador in Havana. Since he had not been part of the raid, eventually he was granted safe conduct out of Cuba.

The two getaway cars sped off, headed toward Havana University, just as the first of the police squads came into sight. The patrol car forced one of the raiders' autos to the curb. The student-commandos scattered on foot. There was a long burst of submachine gun fire!

Westbrook and Rodriguez escaped, surviving the day's events only to be gunned down by Batista's police a week later.

Echevarria had kept the pact he had signed the year before in Mexico City to actively support Castro's war. But for him, the revolution was over. He lay dead in the gutter.

Ruthlessly, the Cuban government tracked down the student revolutionaries of the FEU. It is estimated that between 75 and 80 of them died during the days and weeks that followed.

The assassination try had failed. There was, at the time, little public response to the revolutionary broadcast over Radio Reloj. The Batista regime survived—but only for a time. The FEU coup attempt added momentum to Castro's efforts. Twenty-two months later, Batista was forced to flee Cuba.

The rest is well known: How Castro embraced communism, how Cuba emerged as a satellite of the Soviet Union and how the bearded one in combat fatigues became a dictator in his own right.

In the U.S., for nearly three decades, Cuban exiles have dreamed and plotted Castro's overthrow as fervently as did Echevarria oppose his predecessor. They, too, broadcast to Cuban radio listeners, hoping to foment dissent and, perhaps one day, revolution.

One exile group, Cuba Independiente y Democratica (CID) operates a series of clandestine shortwave transmitters beaming anti-Castro programs to their homeland.

For a time, several years ago, CID gave names to each of its stations, names of those the exile group considered Cuban heroes.

One of the staions in the CID network was called Radio Jose Antonio Echevarria!

Echevarria, who died in the street outside Radio Reloj while aiding the Castro rebellion, today is a hero to Cuban exiles who so vehemently oppose Fidel.

Some of yesterday's heroes still wear white hats! PC

The Computerized Monitoring Station

A Guide To Nationwide Radio Bulletin Boards

BY DR. MARK WEIGAND

Most shortwave radio and VHF/UHF scanner users are aware of the valuable information which is available to them from books, logs, magazines, club newsletters and so on. In recent years, computer bulletin board systems (BBS) devoted to radio interests have grown as the use of personal computers among radio enthusiasts has increased. If you already own a personal computer there are BBS's in most cities which can provide you with frequency lists, news bulletins, reports and relevant articles, transcriptions of actual shortwave broadcasts, log reports, QSL information, technical topics, buy-sell-trade listings, bibliographies, etc. Most of them will also allow you to post messages (electronic mail) for others to see and respond to your questions and comments about radio and computer topics.

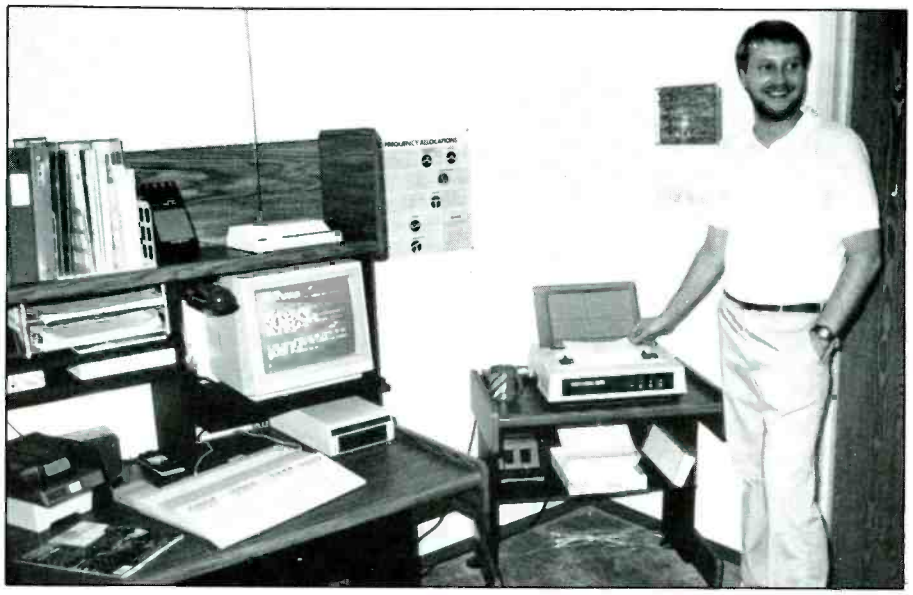
These BBS's are usually free of charge and vary in their quality and services. Some are privately owned, others are sponsored by radio-electronics dealers or nationwide radio clubs such as the Association of North American Radio Clubs (ANARC). Still others are owned by Amateur radio clubs in numerous cities and states within the U.S. and in other countries as well. These organizations rarely advertise their bulletin boards and information about them is often by word of mouth. In this article I have gathered some facts about the services available provided the information you will need to access or get "on-line" to radio bulletin board systems.

Needless to say, my telephone bill increased during the time I was calling BBS's from across the U.S. and Canada! Armed with this information you should be able to choose a BBS which is of interest to you. BBS'ing can provide a valuable addition to your arsenal of radio monitoring resources.

BBS Basics

For those not familiar with bulletin board systems, a few words about getting started. At your location you will have a computer, telephone modem and a program which enables you to use the computer as a terminal to send and receive information. Usually, modems come packaged with such terminal software and are becoming quite inexpensive (about $30 and up).

The terminal program will allow you to change the operating parameters or "protocol" of your system in order to communicate with other computers. There are a number of protocols, but among BBS users a "standard" protocol has developed. Without discussing this protocol, all you need in order to use most BBS systems is to set your system's options to communicate with 8-bit words, no parity, 300 baud, full-duplex, one stop bit, and standard ASCII. If this sounds complicated, choosing these set-



Printing out info from a radio oriented computer bulletin board.

Figure 1. SAMPLE BBS MAIN MENU

```
A - Information and help
B - System news
C - Survey questionaire
D - Chat with sysop
E - Read bulletins
F - Post a bulletin
G - Electronic mailbox
H - Leave feedback to sysop
I - Upload/download
J - Buy and sell
K - Computer corner
L - Library
M - Technical topics
N - Goodbye (log off)

Enter letter of choice:
```

Figure 2. BBS CATEGORIES AND USES FROM SEVERAL SYSTEMS

- RCI's weekend program previews
- Radio Netherland's programme news
- RSI's Sweeden Calling DXers
- North American frequency database
- Log reports: 2000 - 4899 khz, 4900 - 6199 khz, 6200 - 11699 khz, 11700 and above
- QSL reports
- Terminal programs
- DXer's guide to computers
- Other radio BBS's
- NOAA weekly solar forecast
- Space shuttle rebroadcasts on HF
- 10 meter beacon list
- Frequency allocation poster
- Amateur radio examination information
- Ham library
- SWL DX tips
- User list and biography
- Product review
- AARL bulletins
- AMSAT news
- New band allocations
- Introduction to packet radio
- Solar and propagation forecasts
- Computer and software news

tings is easily accomplished in most terminal programs by a simple menu which lists these items and then prompts you to choose among them. The terminal protocol is "hardware independent," which means that as long as these particular settings are in use, any brand of computer can communicate with any other brand or type. Because of this, virtually any computer which can use a modem will work.

Once you configure your terminal, just dial the telephone number of a BBS to log-on and begin communicating. Some modems and software even allow you to auto-dial and auto-log-on to other computers using a single keystroke. Most BBS's are fully automated so you will not be conversing with a person at the other end, although with many BBS's you can page the system operator or "sysop" if needed. A majority of BBS's can be used free of charge except for the possible cost of a long distance telephone call. Normally you are not charged extra to use a telephone modem in your home—local calls are still "free" and the long distance rates will be the same as for "voice" calls.

A very beneficial aspect of calling a BBS is that the information which you receive (called downloading) can be saved on tape or disk, or printed out for easy reference. This often includes free computer programs and text information. For example, I have seen RTTY and CW receive/transmit programs available for downloading on several systems, as well as reprints of pending legislation which would concern anyone interested in radio monitoring. You may also send information to the other computers (uploading). A single BBS may have many sub-boards for those with special skills and interests. These sub-sections can include club event calendars, technical topics, the system's library of text and program files, and instructions for using the BBS.

A typical BBS will have "menus" to help you use the system effectively. A menu is simply a list of choices which allows you to go directly to the section of the board which is most interesting to you. Choosing one option from the menu will frequently take you to another menu of choices (called branching). For example, from the main menu of alternatives let's say you choose one called "library." The BBS may then display another menu which includes all of the items available under the heading of "library," and so on. Figure 1 is a sample main menu from a radio BBS. Usually, a list of commands is also given which allows you to move around within the system, change menus, exit the BBS, get help, etc. A wide variety of topics may be found on radio

Figure 3. SELECTED BULLETIN BOARDS DEVOTED TO RADIO INTERESTS

BBS NAME	TELEPHONE	LOCATION
ACE	(913) 677-1288	Kansas City, Kansas
ANARC	(507) 289-7903	Rochester, Minnesota
ARCC	(612) 431-1149	Minneapolis, Minnesota
BALD HILL TECH GRP	(516) 736-2208	Long Island, New York
BULLETIN BOARD	(205) 758-5017	Tuscaloosa, Alabama
DATANET	(215) 563-9211	Allentown, Pennsylvania
HAMNET	(206) 285-3040	Seattle, Washington
HBBS	(614) 457-4227	Columbus, Ohio
KING'S MARKET	(303) 665-6091	Denver, Colorado
MASSHAM	(617) 923-7605	Boston, Massachusetts
ODXA	(416) 598-1934	Toronto, Canada
PHOTO TECH	(303) 781-1079	Denver, Colorado
UBIX	(614) 866-4392	Columbus, Ohio
UNIV. OF MARLBORO	(301) 350-1299	Marlboro, Maryland
SUPER BOARD	(813) 968-6722	Tampa, Florida
W3INK	(301) 670-9621	Gaithersburg, Maryland
RBBS	(818) 998-0319	Chatsworth, California

monitoring BBS's. Figure 2 lists some actual topics from a number of different radio bulletin boards.

Some BBS's such as the Association of North American Radio Clubs' system are rather sophisticated but still easy to use. For example, the "North American Database" refers to a list of English broadcasts to North America. Choosing this option leads to another menu which allows you to search for broadcasts using the following methods: current UTC, other UTC, station name, station name and current UTC, station name and other UTC. The BBS computer does the actual selection based on the information supplied by you and then displays a list suitable for printing out or saving to disk or tape. This could become your "target list" of frequencies and stations to monitor.

Most larger cities have at least one BBS devoted to radio interests or included as a sub-board on a more general BBS. Figure 3 lists some radio bulletin board systems in the U.S. and Canada. It is not unusual for one BBS to have a frequently updated list of similar boards from throughout the U.S.

Using a bulletin board system provides a varied source of radio monitoring information which can be easily accessed by anyone without a major investment in equipment or time. About the only procedure which you may be asked to follow is to "register" by providing your name, address and telephone number for their records and to verify your request for access. Sometimes you will be assigned a password to use whenever contacting the BBS. This saves time and helps prevent misuse of the system. Although most larger boards are available for use on a 24-hour basis, some have a daily or weekly operating schedule. Like many radio enthusiasts, BBS "sysops" devote considerable time and expense to keep their equipment up and running, so it pays to be courteous and to use your time efficiently when calling a BBS. In some cases a nominal fee for the system's maintenance and upkeep is required. Most bulletin boards enthusiastically support the concept of information-sharing and mutual assistance for those with similar interests. Bulletin board systems are another way to use your own computerized monitoring station to its fullest. PC

What's New In:

Fiber-Optic Communications

The U.S. Army Explores This Technology

Tobyhanna Army Depot personnel recently completed their first production of fiber-optics cables and connections, effectively demonstrating a high-tech capability under development here for the last 18 months.

The work was part of a depot-supported upgrade of the Army's Corps Theater ADP Service Center (CTASC). The upgrade adds a communications subsystem to the center's central processing unit (CPU) van, providing new capabilities for the powerful, mobile data processing systems used by the army in the United States and Germany.

The subsystem employs fiber-optics technology instead of the standard copper wire cables, says Jerry Tucky of Moscow, an electrical engineer with the project. Fiber-optics technology transmits information by light pulses over minute glass fibers, rather than by electronic signal over copper wires. Such technology offers many advantages, including substantially greater capacity, lower weight and smaller size, and increased communicatiuons security.

"We eliminated hundreds of cables per system because of the fiber-optics," explains Paul Dougher of Moosic, the project coordinator at the depot.

"One fiber-optics cable can carry as much information as 900 copper wires," Tucky adds. "Fiber optics also is much more secure; it's virtually impossible to tap into it."

Despite its glass composition, fiber-optic cables also are extremely rugged since they are protected by a wrapping of Kevlar, a tough synthetic material.

For this project, technicians in the depot's Shelter Facilities and TMDE-Optics Sections placed connectors on fiber-optics cables for use within the center's CPU vans and also for external communications purposes, Dougher says.

Such work requires near-surgical skills, including the use of surgical scissors, microscopes and diamond-tipped cutters. A key step in the process is the methodical and repetitive polishing of cable ends to insure proper connections.

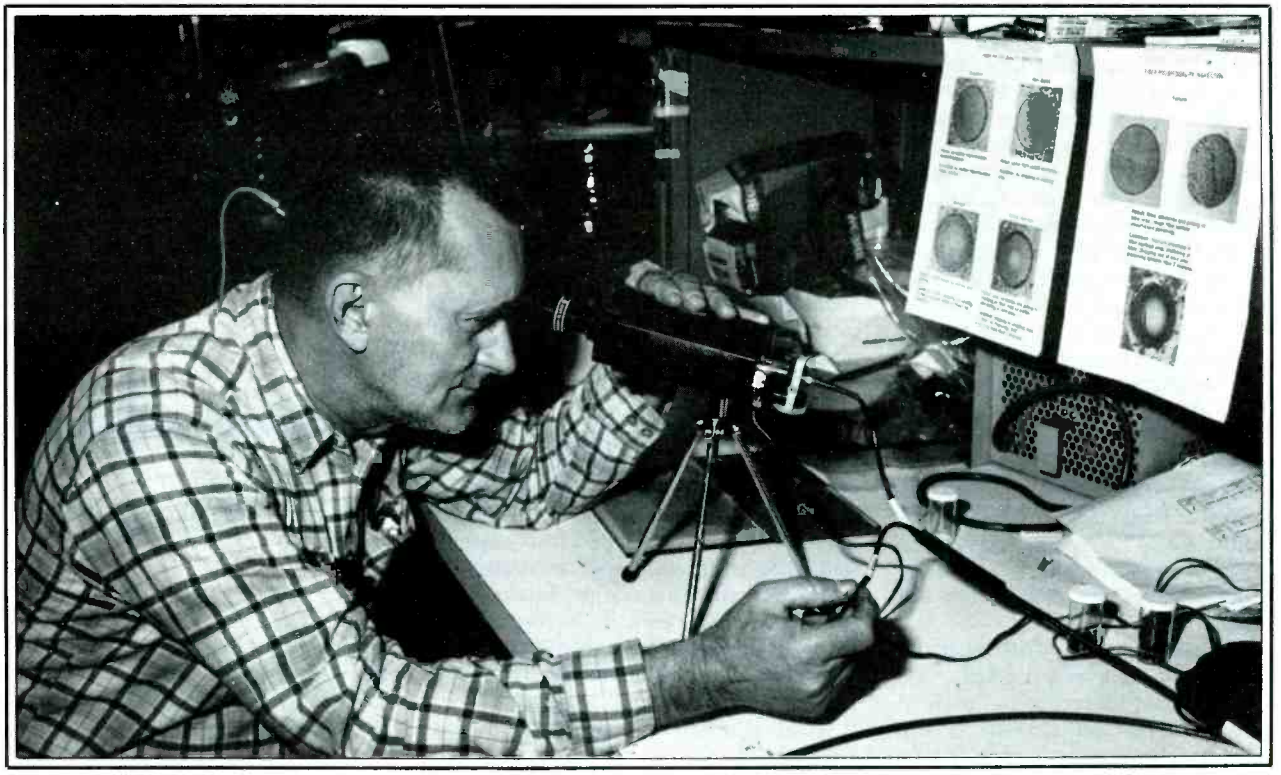
Following the fabrication work at the depot, teams of Tobyhanna personnel installed the communications subsystem, including protective equipment and fiber-optics modems and cables, into CTASCs in Boston and Los Angeles.

Cables also have been shipped to Germany, where another depot team will perform multiple installations in November.

Along with equipment installation and acceptance testing at the sites, Tobyhanna personnel train the center's soldiers in the use of the maintenance kit that accompanies the fiber-optics gear.

"The installations have gone well," Tucky says. "This could mean a substantial workload for the depot in the future, because we have now shown we have the capabilities and the personnel to work with this advanced technology. All of the armed services are looking at fiber optics because of its many advantages."

The depot is poised for this potential workload growth after spending more than $100,000 to purchase fiber-optics equipment and obtaining formal training in the sophisticated technology for several personnel.



Tobyhanna Army Depot technician Joseph Bronack, peers into a microscope to inspect the polished end of a fiber-optics cable. Tobyhanna personnel recently completed the depot's first production of fiber-optics gear. It was the first practical demonstration of the depot's capabilities with fiber-optics technology, which offers several advantages over standard electrical cables. (U.S. Army photo.)

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

This time it's for real. The long awaited High Adventure Ministries station KVOH began test broadcasts in mid-October on 17775. The 50-kW transmitter in the Simi Valley, near Los Angeles, has this schedule for regular programming through the first of March: 0600-0800 on 6005, 0300-0600 and 1400-1600 on 9852.5, 2300-0300 on 11930 and 1600-2300 on 17775. Programs will be about 60% Spanish and the rest will be in English. Station identification announcements will likely include Los Angeles as a location, with references to High Adventure and the "Voice of Hope for the Americas." Reception reports go to P.O. Box 93937, Los Angeles, CA 90093.

Reader Roy E. Waite in Tokyo, Japan, whose letterhead credits and affiliations mention KYOI, confirms the sale of the "Super Rock" station to the Christian Science Monitor. Bob Berger of Marcom Associates, which owned KYOI, will continue as a consultant. As of mid-November it wasn't certain when the sale would take effect or how soon the new owners would begin programming KYOI. If things have gone according to schedule, the headquarters station in Maine may well be on the air by now and we'd expect the Saipan facility to be in step with that.

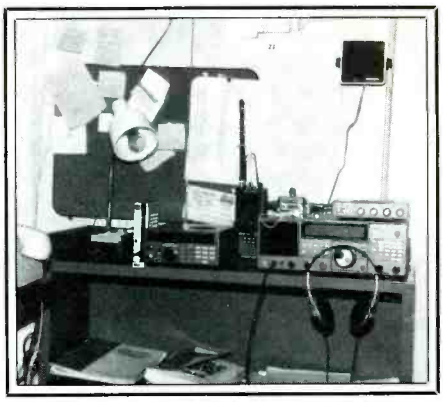
It looks as if Voice of America "feeder" stations may be a thing of the past in a few more years. An item in *Network World* says that Comsat has been awarded a five-year, $8 million contract to design and install a new satellite-based system which would replace the leased satellite circuits now in use along with single sideband shortwave transmissions used to feed a broadcast signal to a relay station. All this is part of the $1.3 billion VOA modernization program which got underway a couple of years back. Log 'em while they're still operating!

Finland should be testing new 500-kilowatt transmitters any time. Three of them, along with one 250- and one 100-kW unit are installed at the main Pori transmitter site. Watch for tests to take place during the regular schedule of Radio Finland International.

Adventist World Radio's new station on Guam has been slowed by heavy rains. The target date for this one is now late this spring.

Pass The Letter Opener: Tom Hartley in Chillicothe, Ohio says he got a QSL card from Radio Beijing for reception last August 17th on 9535 and wants to know how to tell if this was China or the French Guiana relay. Well, the relay agreement with France was broken prior to the date of your reception Tom, so the card undoubtedly confirms China.

Ed Turner's shack includes (far left) a Realistic Pro 2020, Hallicrafters SX-62A and SX101A. Right, from bottom, Hallicrafters SX-11 (1937), S-22R and S-19-R "Sky Buddy."



Ed Needham DX's from this set-up in Sanger, CA. The shack includes a FRG-8800 and FRG-9600.

Donna Dunlop of Grand Rapids, Michigan is a relative newcomer to DX and SWL'ing and recently moved from Northern Michigan where, she says, listening was much better. We've no idea on your mystery station, Donna. If it was on 1400 kHz it was probably a legit BCB station running various religious programs.

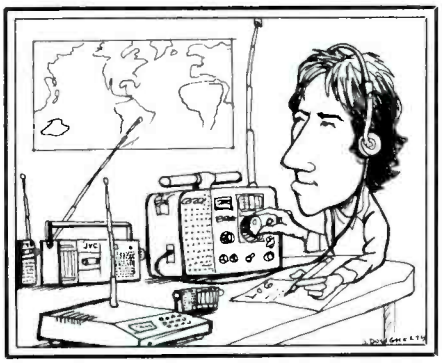
Why don't we include SINPO reports in loggings, asks Charles Rende of Warren, MI. If a signal was unusually weak, or especially good when it wouldn't normally be expected, we often mention that. But we don't feel SINPO's on logs add that much, since reception varies so much from one receiving installation or one day or one location to the next.

A nice photo was sent by Ed Turner in Youngstown, Ohio. Ed's been a *POP'COMM* subscriber from the first. He collects older receivers, as you can see from the photo. That SX-62A used to be a "dream receiver" in our house.

Tim Magrann of Cerritos, California wants to know about the Registered Monitor ID letters he sees listed by many people's names in *POP'COMM*. CRB Research, P.O. Box 56, Commack, NY 11725 issues these Tim, they're $5, and each comes inscribed on an attractive wall certificate.

Roy Brown in Beausejour, Manitoba asks about C.M. Stanbury II, a controversial shortwave writer and personality for many years. Mr. Stanbury passed away last year.

Another shack "photo" comes from John P. Dougherty of Ridley Park, Pennsylvania, although J.P. didn't bother using a camera! Equipment shown includes a Panasonic RF-2200, JVC RC-5229, Sony 4910, Realistic Pro 2009 scanner and PYE Audio TR-0120 air band receiver.



John Dougherty's shack "photo," which he took himself.

This attractive wall-certificate is inscribed with Monitor Registor Station ID letters, see text for details.

Let's hear from you next month! Your loggings (by country with your last name and state abbreviation after each and some room between each logging) are welcome. Logs which are hard to work with or are of more commonly heard stations may have to be cut due to space limitations. And remember, your shack photos, QSL copies (or originals if you have spares), shortwave news, questions, comments and what-have-you

are always welcome. We look forward to hearing from you!

Curtain calls for: Roman Dementiuk, Brooklyn, NY; Garth Carman, Edmonton, ALB; Pat McDonough, Pittsburgh, PA; Robert C. Ross, London, ONT; Roy Brown, Beausejour, MAN; Ed Needham, Sanger, CA; William Moser, Pittsburgh, PA; Bruce R. Gilson, Silver Spring, MD; Carol Kirk, Waterford, CT; George R. Neff, Niles, OH; Mark A. Northrup, Ann Arbor, MI; Tim Magrann, Cerritos, CA; David R. Alpert, New York, NY; Alexander Durant, Albany, NY; S. Lyster, Keremeos, BC; David Patton, Signal Mountain, TN; Warren L. Gilbert, Sherman Oaks, CA; R.C. Watts, Louisville, KY; Jim Brooks, Bardstown, KY; Robert A. Manalan, Salem, MA; Charles Rende, Warren, MI; Allen R. Linville, Edmonton, ALB; Darwin Hanson, Rowan, IA and Tom Hartley, Chillicothe, OH.

Until next month, good listening!

Abbreviations Used In Listening Post

AA	Arabic
BC	Broadcast/ing
CC	Chinese
EE	English
FF	French
GG	German
ID	Identification
IS	Interval Signal
JJ	Japanese
mx	Music
NA	North America/n
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

Shortwave Broadcast Loggings
(All Times Are UTC)

AFGHANISTAN: R. Afghanistan (via USSR xmtr) w/EE at 1900 on 9665 (Dementiuk, NY).

ALBANIA- R. Tirana, 6202 (nominal 6200) at 2340 in EE (Monahan, MA); 0014 in EE on 7065 (Moser, PA); 0337 in EE on 7300 w/commentary (Dementiuk, NY).

ANTARCTICA: AFRS Network, McMurdo Sound, tentative on 6012 at 0609, OM announcer, very weak (Brown, MAN).

ANTIGUA: Deutsche Welle Relay at 0105 on 6040 (Brown, MAN); 0500 in EE on 6120 (Magrann, CA); 15410 at 2158 s/on in GG (Gilson, MD)

ARGENTINA: RAE on 9690 w/EE at 0200 (Hartley, OH; Brooks, KY; Moser, PA); SS at 0317 (Kirk, CT); R. Nacional, 6060 at 0111 in SS w/mx (Brown, MAN).

ASCENSION ISLAND: BBC Relay, 6005 in EE, badly QRM'd (Dementiuk, NY).

AUSTRALIA: R. Australia, 5995 blocked by WHRI to 1258; 6060 w/IS at 1220, into //9580 & 9710 at 1129 (Alpert, NY); 1220 w/"Australia Tonight" on 7215 (Northrup, MI); 1428 on 9580 (Moser, PA); 15160 at 2335 in EE (Lyster, BC); 15320 at 0044, nx at 0100 (Brooks, KY); 17795 at 0200 (Kirk, CT).

VNG, time station, 7500 at 0604 (Needham, CA).

AUSTRIA: R. Austria International, 6155 at 0430 w/EE, off 0453 (Magrann, CA); 0347 in EE but w/QRM (Lyster, BC).

BELGIUM: BRT on 5910 w/"Brussels Calling," 0031 & 0042 (Moser, PA; Dementiuk, NY); 15590 at 1330 in EE (Huntley, OH).

BENIN: ORTB in FF on 4870 w/blues mx (Durant, NY). ID, anthem & off at 2303 (Dementiuk, NY); at 0539 (Huntley, OH).

BOLIVIA: R. Mamore, Guayarmerin, 4740 in SS at 1225 (Northrup, MI).

R. Illimani, LaPaz, 6025 in SS w/ID, mx at 2327 (Ross, ONT).

BOTSWANA: R. Botswana, 4820, good w/usual IS before 0400 s/on (Watts, KY); 0349-0435 w/IS, freqs & mx, better than on //7255 (Moser, PA); 7255 w/IS to 0358, freq announcemenis in EE & Setswana, anthem, mx to 0430 then nx (Gilbert, CA).

BRAZIL: R. Liberal, Belem, in PP at 0045, talks, mentions of "Liberal," ID's & jingles on 3325, but QRM from nearby CHU time pips (Ross, ONT).

R. Clube Marilia, 0027 w/SS mx, ID at 0031 (Brown, MAN).

Radiodifusora Amazonas, Manaus, 4805 in PP at 0112 (Dementiuk, NY).

R. Nacional Amazonia, 9760 in PP at 0112 (Dementiuk, NY).

RadioBras, 11745 w/EE pgm, s/on 0200 & noted various times within the hour (Dementiuk, NY; Patton, TN; Lyster, BC; Martley, OH; Neff, OH).

BULGARIA: R. Sofia, 2237 in EE on 7115 (Moser, PA); 9700 in EE at 2300 (Carman, ALB); at 0018 (Hartley, OH).

BURKINA FASO: R. Burkina, 4815 in FF at 0602 w/numerous ID's to 0622 fade out (Dementiuk).

CAMEROON: R. Cameroon, Yaounde, 4850 at 2200 in FF w/mx, ID at 2213. Better than Douala on 4795 (Moser, PA).

R. Garoua, 5010 at 0508 on 5010 (Hartley, OH).

CANADA: R. Canada International, 5935 at 0010, 5960/9755 at 0016, 9755 at 2000 (Gilson, MD); 0516 on 9750 (McDonough, PA).

CBC Northern Quebec Service, 9625 at 0100 w/nx (Brooks, KY); 1206 w/nx (Gilson, MD); 11720 at 1457 in Inuit (Lyster, BC); 2203-2231 (Neff, OH); 6195 at 0259 s/off (Lyster, BC).

R. Japan (Via Sackville), 6120 at 1130 (Alpert)

CHU time station, 3330 at 0420 (Carman, ALB); 14670 at 1941 (Needham, CA).

CKFX, Vancouver on 6080 at 0118, barely audible w/country-western (Brown, MAN).

CFRX, Toronto, 6070 at 1531 w/call-in, ads (Neff, OH), 0116 w/mx (Brown, MAN).

CENTRAL AFRICAN REP.: R. Centrafrique, 5035 at 0507, weak but ID copied & into African mx (Dementiuk, NY).

CHILE: R. Sistema Nacional, 15140 at 1947 w/sports (Dementiuk, NY); Various mx types, SS announcer at 2342 (Gilson, MD); at 2020 (Carman, ALB); at 2335 (Gilbert, CA).

CHINA: R. Bejing, 7120 at 1418 in CC (Lyster, BC); 1215 on 9535 in EE (Gilson, MD); 11600, presumed w/U.N. Radio pgm, very weak at 1202, gone or faded at 1210 (Alpert, NY); 15180 in EE at 0000 (Brooks, KY); 15445 at 0019 (Hartley, OH).

COLOMBIA: R. Cinco, Villavicencio, 5040 at 0157 w/ID & mx in SS (Brown, MAN).

Caracol Neiva, 4945 at 0805 in SS (Hartley).

R. Sutatenza, Bogota, 5095 at 0058 in SS w/nx, ID, ads (Durant, NY).

Ondas del Meta, Villavicencio, 4885 at 1048 in SS w/mx & talk (Kirk, CT).

COSTA RICA: R. Reloj, 4832 at 0725 (Hartley, OH); 6006 at 0610 w/ID's, freq, time checks (Neff, OH).

CUBA: R. Havana Cuba, 6000 at 0557 in SS, off 0600 (Brown, MAN); 6090 at 0000 in EE (Moser, PA); 6095 w/EE at 0214 (Magrann, CA); 6100 in EE at 0400 (Neff, OH); 7165 tentative at 0302 in EE (Lyster, BC); 9730//9770 at 1230 (Gilson, MD); 9740 at 0300 (Carman, ALB); 11725 at 1157 & 2316; 11760 at 1216 in SS; 11815 at 2333 in SS (Gilson, MD); 0200 in EE on 11970 (Carman, ALB).

R. Moscow relay 4765 in RR at 0058 (Brown, MAN).

R. Rebelde, 5024 (nominal 5025-- Ed.) at 0104 in SS w/mx & ID's (Durant, NY).

CYPRUS: BBC Mediterranean relay, 7160 at 0518 w/World Service (Neff, OH); 9590 at 0210 in EE (Moser, PA).

CZECHOSLOVAKIA: R. Prague, 5930 at 0047 in Czech, into EE at 0100; also 6055 at 0200 s/pn (Gilson, MD); 0300 on 7345//9630//11990 (Carman, ALB).

DENMARK: R. Denmark, 15165 at 1515 IS w/ID's in Danish & EE, into Danish pgm (Gilbert, CA)

DJIBOUTI: R. Television Djibouti, 4780 at 0626 in FF & AA w/mx, talks, possible commercials (Dementiuk, NY).

DOMINICAN REP.: R. Clarin, 11700 at 1327 w/ID's, mx, talks in SS (Neff, OH).

EAST GERMANY: R. Berlin International, 6040 at 1327 at 0015 in SS (Gilson, MD); 0400 on 9560 (Carman, ALB).

ECUADOR: HCJB, 3220 at 0023 (Brown, MAN); In Quechua at 0950 (Kirk, CT); 6205 in GG at 0645 (Carman, ALB); 6230 at 0431 in EE (McDonough, PA); 1209 on 11745, 1413 an 11910 in SS, 1321 on 15115 (Gilson, MD); 15270 at 1900 in EE (Neff, OH); 17790 at 2136 (Gilson, MD).

R. Zaracay, Santo Domingo de los Colorados, 3395 at 1013 in SS (Kirk, CT); 0041 in SS (Brown).

R. Cosmopolita, Ambato, 0321 in SS, heavy RTTY QRM (Brown, MAN) Did you get a firm ID? Believed inactive for several years-- Ed.

CRE, Guayaquil, 4762 at 0449 in SS to s/off at 0503 (Ross, ONT).

R. Quito, 4920 at 0325 w/Latin mx (Carman)

HI2IOA time station, 7600 at 0240 (Carman, ALB).

R. Rio Amazonas, Macuma, 0355 in SS, s/off begins at 0356, off at 0358 (Ross, ONT).

R. Splendit, Cuenca, 5025 at 0123 mx & talk (Brown, MAN) ID?-- Ed.

La V. del Upano, 5038.9 in SS at 0118, full ID 0140 (Ross, ONT).

EGYPT: R. Cairo, 9475 at 0038 in AA (Hartley).

ENGLAND: BBC, 5975 at 0225 (Northrup, MI); 6005 at 0009 *Gilson, MD); 6110 in SS at 0400 (Carman, ALB); 6120 at 0030, 6175 at 2220 (Gilson, MD); 7325 at 0320 (Kirk, CT); 9590 at 0250 (Carman, ALB); 9510 at 1215, 9515 at 0255, 9615 at 0235 (Northrup, MI); 1217 on 11775 (Gilson, MD); 12095 at 1745 (McDonough, PA). Some are non-England sites-- Ed.

EQUATORIAL GUINEA: R. Nocional, 5005 at 0534 in SS w/ID, QRM from WWV (Dementiuk, NY).

FALKLAND ISLANDS: FIBS, 2380 at 0311-0533 w/rock show, DJ w/ID's, time checks. Finally hearf after 10 years of trying! (Ross, ONT) Congrats, Ed!! Heard an 3958 at 0500 w/BBC nx (Patton, TN).

FINLAND: R. Finland, 15400 w/nx, ID at 1404 (Neff, OH).

FRANCE: RFI at 2203 in FF on 15315 (Needham, CA); 15365 in FF at 1354 (Hartley, OH); 21685 at 2021 in FF (Dementiuk, NY).

FRENCH GUIANA: RFO, Cayenne, 5055 in FF at 0157 but QRM'd from R. Catolica, Ecuador. Off at 0202 (Dementiuk, NY).

GABON: Africa #1, 11940 at 0630 in FF w/mx, YL announcer (Magrann, CA); 15200//15475 w/older Top-4- from 2000 (Carman, ALB; Watts, KY).

R. France via Africa #1, 7160 in FF at 2145 (Moser, PA).

R. Japan via Africa #1, 9645 at 2300, EE w/xmttr site ID (Neff, OH; Ross, ONT).

GHANA: GBC, 3366 w/nx in EE (Rende, MI) Time?-- Ed. At 0507 w/nx & ID on 4915 (Dementiuk, NY); ID & nx at 0600 (Neff, OH).

GREECE: V. of Greece, 7430 at 0043, Greek mx (Gilson, MD); 0345 w/nx in EE (Dementiuk, NY); 9420//11595 at 0120 w/EE nx (Linville, ALB); 15630 at 1340 in Greek (Hartley, OH).

Thessalonika regional, 9460 at 0623 (Needham).

VOA Kavala relay, 5995 at 0205 w/nx (Brown).

GUAM: KTWR, 9870 to EE s/off at 1415 & promos for Guam as a vacation place (Watts, KY).

GUATEMALA: R. Cultural, TGNA, 3300 at 0439 in SS (Kirk, CT); 0420 (Carman, ALB); 0035 w/EE at 0300)Rende, MI); 0036 in SS (Brown).

HAITI: 4VEH on 4930 at 1112 in FF or Creole, mx & ID (Durant, NY).

HONDURAS: Sani Radio, HRRI, Puerto Lempira, 4755 at 0014-0100 in (presumed) Miskito, mx, mnentions of Puerto Lempira (Ross, ONT); to 0200 w/mentions of Honduras (Durant, NY) Your un-ID-- Ed. At 1159-1208 w/ID, mx, anthem, talk over "Summer Place" (Neff, OH).

La V. Evangelica, 4820 w/EE rx pgm at 0320 on a Sunday (Durant, NY); 1035 in SS (Kirk, CT).

La V. Junco, Santa Barbara, 6075 in SS at 0225, Latin pops, ID on hour (Ross, ONT).

R. Luz y Vida, San Luis, 3250 at 0207 in SS w/nx, ID (Patton, TN).

HUNGARY: R. Budapest, nx in EE at 0304 on 6025 (Magrann, CA); 0225 on 9520 in EE (Hartley, OH); 9835 at 0300 w/nx, mx (Patton)

INDIA: AIR (tentative), 15335 at 1427 w/Indian mx, no talk (Neff, OH).

IRAN: VOIRI, 15084 w/EE at 1129, ending 1131 (Dementiuk, NY); 1123-1207 in EE (Monahan, MA).

ISRAEL:7410 in EE at 0120 (Brooks, KY); 0220 in EE on 7465, 9435 at 0113 in EE (Lyster, BC).

ITALY: RAI, 9575 in EE into II 0120 (Hartley, OH).

IVORY COAST: Rdf. Ivoirienne, 9620 at 2016 in FF (Gilson, MD); 11920 at 2210 in FF (Durant, NY); At 1820-1901 w/African mx, FF announcers (Moser, PA). New hi-power international service-- Ed.

JAPAN: R. Japan, 9505 at 1930 s/off in EE. Also 5990 at 1411 (Lyster, BC); 9575 at 0501 in EE (Hartley, OH); 15230 in EE at 2350 w/nx (Dementiuk, NY).

KUWAIT: R. Kuwait, 11675 at 2011 in EE (Neff, OH); 15505 at 1345 (Hartley, OH).

LIBERIA: ELBC, 3255 at 2307 w/nx in EE, ID, promos, time check (Ross, ONT).

NORTHERN MARIANAS: KYOI, Saipan, pops w/Japanese DJ at 1610 on 9665 (Linville, ALB).

NORWAY: R. Norway International, bilingual

ID at 1256, into EE at 1300 on 15310 (announces 15305) Alpert, NY).

PAKISTAN: R. Pakistan (tentative), 12005 at 1730 (McDonough, PA) Not Tunisia, Pat?-- Ed.

PAPUA NEW GUINEA: NBC Port Moresby, 4890 at 0848 w/mx & BBC pgm about Pres. JFK (Dementiuk, NY); 1125 in EE, DJ (Ross, ONT); 1136 (Hartley, OH).

PERU: R. Estrello del Sur, Canate, 0310 in SS (Brown, MAN). An ID on this, Roy?-- Ed.

R. Atlantida, Iquitos, 4790 at 0930 w/rooster crow, mx & talk (Kirk, CT).

PHILIPPINES: FEBC R. International, 9670 at 1538 s/off in EE (Gilbert, CA).

LITHUANIAN SSR: V. Vilnius, 6035 (via R. Moscow)at 2300 on in EE w/nx (Alpert, NY); 15180 at 2315 in EE to 2328 (Gilbert, CA).

MALTA: Deutsche Welle relay, 9545 at 0150 in EE (Hartley, OH).

MAURITANIA: ORTM, 4845 at 0637, weak, ID at 0652 (Dementiuk, NY); 0734 in FF (Moser)

MEXICO: R. Mexico Internotional, 9705 w/mariachi mx at 0045 (Dementiuk, NY).

MOROCCO: RTM, 17595 in AA at 1618 (Dementiuk)

NETHERLANDS: R. Netherlands, 9715 at 2110 w/rock. Off 2125 (Gilson, MD); 17605 at 2219 w/nx in Dutch (Needham, CA).

NETHERLANDS ANTILLES: R. Netherlands Bonaire relay, 6020 at 1120 in EE (Magrann, CA); 1020 (Northrup, MI); 9590 at 0238 (Brooks, KY); 11715 w/2330 s/on in SS (Lyster, BC).

TWR Bonaire, 9535 at 0316 in EE (Lyster, BC); 11815 at 1230 w/children's rx pgm (Gilson, MD); 1132 w/nx, time, ID, Caribbean nx (Neff, OH).

NEW ZEALAND: R. New Zealand, 1152 in EE, nx at 1200 on 9620 (Gilson, MD); 0608 w/ID's for R. New Zealand & National R. (Dementiuk, NY), 11780 at 0405 (Hartley, OH).

NICARAGUA: V. of Nicaragua, 6015 after 0100 in EE (Moser, PA; Hartley, OH; Patton, TN).

NIGER: ORTN, 5020 in FF at 2050 w/African mx (Durant, NY).

NIGERIA: R. Nigeria, Lagos, 7255 at 0507 (Hartley, OH).

R. Nigeria, Kaduna, 4770 at 0500 w/nx in EE (Dementiuk, NY); 0546-0605 (Neff, OH).

PORTUGAL: R. Portugal, EE at 0040 on 9680 w/announcement that station is off Sat/Sun (Dementiuk, NY); nx, ID, freq change onnct at 0047 (Brooks, KY); 15250 at 1736 in EE (Neff)

ROMANIA: R. Bucharest, 9570 at 0204 in EE (Moser, PA); 9685 in EE at 0207 (Hartley, OH).

SENEGAL: ORTS on 4890 at 2308 & 0309 in FF (Dementiuk, NY).

SOUTH AFRICA (REP. OF): R. RSA, 3230 at 0325 in EE (Brown, MAN); 4810 at 2134 in EE (Durant, NY); 4990 at 0308 (Hartley, OH); 6015 at 0202 to NA (Neff, OH; Brooks, KY; Lyster, BC); 7270 at 0427 w/IS, EE/FF ID's for FF service (Alpert, NY); 9615 at 0200 to NA (Brooks, KY; Hartley, OH); 11775 in EE at 2100 (Carmon, ALB).

SABC, 4880 at 0420 w/pops (Dementiuk, NY; 0415 in EE (Kirk, CT).

R. Orion Service, 3215 at 0426 w/pops & country-western, EE & Afrikaans (Ross, ONT).

SOUTH KOREA: 15575, in EE at 0015 (Brooks, KY); 0015 (Hartley, OH).

SPAIN: Sponish Foreign R., 6055 at 0022 w/travelogue & Panoroma (Gilson, MD); 9360 at 0029 (Hartley, OH); 9630 w/EE 0000-0100 (Brooks, KY; Moser, PA; Neff, OH).

SWEDEN: R. Sweden Internationol, 1405 on 11785 w/Nordic News in EE (Gilbert, CA); 15345 at 1422 in EE (Moser, PA); 1411 w/commentary (Gilson, MD).

SWITZERLAND: Swiss R. International, 6135 in EE at 0411 (Dementiuk, NY); 11955 in EE at 2105, 12030 at 1303 in EE (Neff, OH).

International Committee of the Red Cross, 6135//9725//9885 in EE 0310-0327 (Ross, ONT).

SYRIA: R. Damascus, 12085 at 1955 in FF into EE at 2005 (Dementiuk, NY); EE at 2048 (Ross, ONT); 2020-2100 (Neff, OH).

TAIWAN: VOFC at 0200 in EE (Hartley, OH); 0245 w/CC lessons (Northrup, MI); 0316 in EE (Lyster, BC) via WYFR-- Ed.; 9680 at 0215 (Carman, ALB) via WYFR-- Ed.; 17845 at 2215 (Gilson, MD) also via WYFR-- Ed.

TURKEY: V. of Turkey, 9560 at 2300 in EE (Monahan, MA); 2317-2349 (Neff, OH); 2306 w/nx (Moser, PA); 0320 (Patton, TN).

TOGO: RTT, FF & vernaculars on 5047 at 0554 (Dementiuk, NY).

UKRAINIAN SSR: R. Kiev, EE at 0313 on 7165 (Brooks, KY); 0030 on 7205 to 0058 close (Gilbert, CA); 15180 at 2300 (Hartley, OH).

UNITED ARAB EMIRATES: UAE R., Dubai 11955 in EE at 1605 (Carmon, ALB); ot 1615 (Dementiuk, NY); 15320 at 1632 (Moser, PA).

UNITED STATES: VOA, 5995//6130 at 0015 (Gilson, MD); 6035 at 0320, 6110 at 1220, 7355 at 0325, 9455 at 0240 (Northrup, MI); 9650 at 0300 (Corman, ALB); 11582.5 at 0215 (McDonough, PA); 11760 at 1930 (Neff, OH); 15205 at 0002, 15410 at 2140, 15445 at 2203 (Gilson, MD); 15600 at 1625 (Neff, OH); 17785 at 1725 (Neff, OH); 17795 at 2114, 17800 at 2210 (Gilson, MD).

WHRI, 7355 at 0303 w/R. Earth (Neff, OH); 7400 at 0520 (Linville, ALB); 9620 w/ID at 0651 (Alpert, NY).

KCBI at 1730 on 11735 w/"Dallas Today" (Neff)

WYFR, 6065 at 0155; 7385 at 2228; 9535 at 1954; 11725 at 1207 in SS; 11830 at 1231 in FF; 11875 at 1412; 17750 at 2105 in II; 17845 at 2300 w/VOFC relay (Gilson, MD).

WINB, 15400 at 1830 w/rx pgm (Patton, PA).

Org. of American States, via VOA, 15160 in SS at 0145 (Durant, NY).

R. Marti, SS on 9525 at 2323; 11930 at 1452 (Gilson, MD).

WMLK, 9455, 0400-0700 (Hansen, IA); 1710 w/the "Sacred Name Broadcast" (Ross, ONT).

KGEI, 7365 at 0500 in RR (Carman, ALB).

AFRTS, 6030 at 1215; 6125 at 1210 (Northrup, MI); 9700 at 1500//15330 at 1400; 17765 at 2300 (Carman, ALB).

WRNO, 9650 at 2232 (Neff, OH); 9715 at 1207; 11965 at 1500 s/on (Gilson, MD); 15420 at 2000 (Carman, ALB).

USSR: R. Moscow, 5920 at 0300 in EE (Carman, ALB); 5940 at 0104 (Gilson, MD); 7115 at 0230 (Northrup, MI); 7185 at 0042 (Lyster, BC); 7195 at 0230; 7125 at 0230 (Northrup, MI); 7400 at 2327 (Gilson, MD); 7420 in SS at 0200 (Carman, ALB); 9600 (via Havana-- Ed.) at 1157 (Gilson, MD); 9605 in RR at 0525 (McDonough, PA); 9765 at 2314 (Gilson, MD); 11705 at 0700 (Carman, ALB); 11840 (via Havana-- Ed.) at 1640 (Neff, OH); 12000//12010//12020//12060//12070//12205 at 1159 in RR (Alpert, NY); 15175 at 1417, & 15225 at 1400 (Gilson, MD); 17590 at 0025; 17850 at 0030 (Hartley, OH).

UZBEK SSR: R. Tashkent, 9600 at 1206 in EE, ID's & talks (Durant, NY).

VATICAN: Vatican R., 6030 into EE at 0050, IS & close at 0109 (Alpert, NY); 6185 from 0600 in EE, right after WRNO signs off (Hansen, IA); 15120 at 1551 w/African service in EE (Moser, PA).

VENEZUELA: Ecos del Torbes, San Cristobal, 4980 in SS at 0920 (Kirk, CT); 0114 (Durant, NY); 0320 (Carman, ALB); 0150 (Hartley, OH).

R. Rumbos, Caracas, 9660 at 0343 w/nx in SS (Dementiuk, NY); 1131 w/mx (Magrann, OH).

R. Nacional, Caracas, 5050 at 0533 w/mx (Dementiuk, NY); 0455 (Durant, NY); 11695 at 0002 (Hartley, OH).

R. Capital, Caracas, 4850 at 1045 w/mx & talk in SS (Kirk, CT); 0924 w/US pops (Durant, NY).

R. Occidente, Tovar, 3225 at 1010 in SS w/mx (Kirk, CT).

La V. del Carabobo, Valencia, 4780 at 1025 SS w/mx (Kirk, CT).

R. Tachira, San Cristobal, 4830 at 0245 w/mx & ads in SS (Durant, NY); 0015 Latin pops, ID's (Ross, ONT); 0052 mx (Brown, MAN).

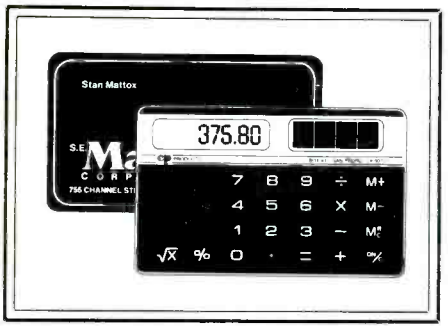
WEST GERMANY: Deutsche Welle, 3995 from Julich at 0120 in GG (Durant, NY); EE on 6010 at 0315 (Brooks, NY); 6045 at 0258 w/EE s/on at 0300 (Lyster, BC); 0119 on 6040 also 6075 at 2335 in GG, 6085 at 0112; 11705//15105 at 0028 (Gilson, MD); 15135 at 1530 in EE to Africa (Moser, PA); 15275 at 1339 in GG (Gilson, MD); Many of these are relays-- Ed.

YEMEN ARAB REPUBLIC: R. Sana'a on 9780 at 1634 in AA (Dementiuk, NY).

ZAMBIA: R. Zambia, 4910 at 0335 w/fish eagle IS (Moser, PA). PC

PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



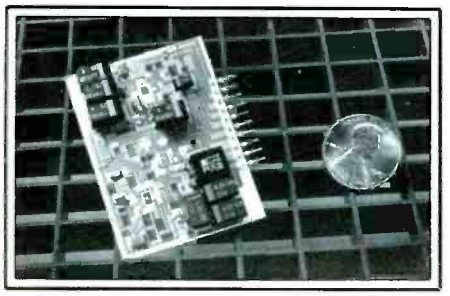
A Business Card With A Brain

Your business card won't be a dis-card, thanks to C P Products, a California-based developer of business support systems and sales tools. They've combined space-age technology with down-to-earth good business sense, and devised a new improved method to convert almost any regular business card to an elegant, practical keepsake that *really counts*.

You supply your own business card (most standard-size cards can be converted). It's impregnated with clear plastic and bonded to the back of a wafer-thin, solar-powered, six-function (with memory) electronic calculator.

C P's "business card with a brain" is the perfect way for sales professionals to express their appreciation to special customers—or to impress select new prospects. It weighs less than an ounce and there are no batteries to wear out.

To order, simply provide C P Products with one business card for each card/calculator desired. (Please include two extra cards per order for formatting and sizing.) Pricing is as follows: $15/each (quantities of 1-9), $12.50/each (10-24) and $10/each (25 or more). Prices include delivery; California residents add 6% sales tax. Send orders to: C P Products, Box 431, San Pedro, CA 90733, or circle number 101 on the reader service card.



SSB Voice Operated Squelch

Naval Electronics announced a new commercial grade "voice-operated squelch" to upgrade solid state SSB receivers and transceivers.

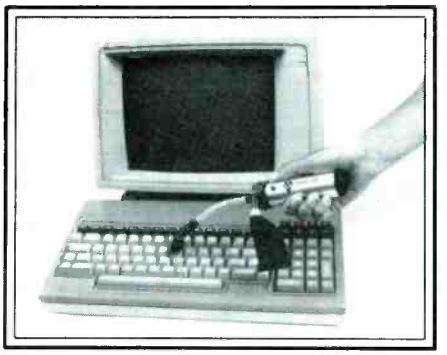
The tiny 11-pin module utilizes the latest state-of-the-art in surface mount and thick film hybrid circuit technology. It easily installs in most modern receivers and transceivers to provide commercial communications grade squelch operation that is immune to noise, static crashes, heterodynes and steady tones.

The circuit incorporates a sylobic rate detector which provides for superior squelch operation compared to the AGC type squelch supplied with most modern receivers.

The circuit looks for signal changes similar to the changes that normally occur in human speech. When speech is recognized, the VOS switches the speaker audio on, otherwise the receiver is kept quiet. An on/off switch is provided.

Conventional versions of the VOS have been in commercial, military, and marine service with more than two years of reliable, efficient service. The VOS is most helpful where a single channel must be monitored on a continuous basis as it greatly reduces operator fatigue.

For further information, contact Naval Electronics Inc., 5417 Jetview Circle, Tampa, FL 33634, or phone (813) 885-6091, or circle reader service card number 104.



Miniature Vacuum

A powerful new cleaning product for use in hard-to-reach places has been introduced by Mini-Vac, Inc. The Mini-Vac is a handheld, personal size, powerful vacuum that is designed to remove dust, debris and dirt from inside printers, typewriters, keyboards and other hard-to-clean office and home products.

Unlike compressed air cans that simply blow the dust and dirt around, the Mini-Vac features a powerful motor to vacuum up dirt/dust quickly and completely. It comes with two precision vacuum extension wands for hard to reach places, two ultra soft "pony hair" lens quality brushes for use with touch sensitive items, a reusable cloth vacuum bag, and it operates on a standard 9 volt battery for easy use anywhere (optional AC adapter available).

A full one-year warranty is part of the package. Shippable via UPS, Mini-Vacs are in stock and ready for immediate delivery.

Mini-Vac is represented nationally by Gunning Associates, Inc., a national sales company that provides complete sales and marketing management coverage into all channels of distribution in the United States. Contact Gunning Associates, Inc., 1720 Peachtree St., N.W., Suite 1029 North Tower, Atlanta, GA 30309 or circle reader service card number 108.

New C.B. Radio Line

Fanon/Courier announced its re-entry into the C.B. market.

A full line of AM, single side band and handheld C.B. transceivers will be available and will be marketed under the "Courier" brand name. Courier radios have been on the market since the middle 1960s and have always been known for their high quality design and excellent performance.

The first model available is Courier Classic IV, a sleek, deluxe AM C.B. mobile transceiver, designed for those who demand optimum performance and reliability. Its phase lock loop circuitry assures precision control of 40 channel frequencies and maximum power output with exceptional high quality voice reproduction. Its many state-of-the-art features include a digital 40-channel LED indicator, and a special LED meter for displaying percent modulation, receive and RF signal strength. Convenience features are Channel 9 and 19 priority switches, squelch control, automatic noise limiter and P.A. capability. Cabinet colors are black with white appointments. The Dealer Resale price is $54.95.

The Courier line will be marketed through communication equipment specialists, electronic specialty and C.B. radio distributors. Fanon/Courier also manufactures a broad range of communications and commercial sound products, including FM scanning monitor receivers, P.A. amplifier systems, intercoms and megaphones. Circle number 107 on the reader service card for more information.

PIRATES DEN

FOCUS ON FREE RADIO BROADCASTING

BY EDWARD TEACH

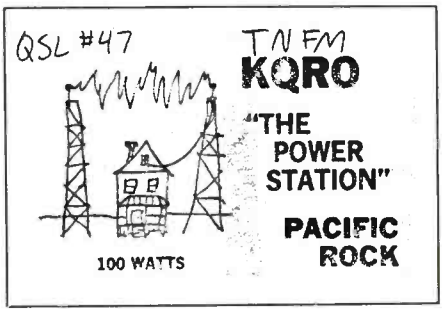
The widely heard Canadian pirate station **TNFM**, which had been one of the more active pirates during the last half of 1986, is no more. The station was shut down by the Canadian Department of Communications in early October. TNFM was located at Saltspring, British Columbia and operated from basement studios in the home of 24-year-old Allan White, a school custodian.

According to press reports forwarded by several readers, TNFM had been operating on weekend evenings on 103.8 FM, running a power of 15 watts and not even reaching all of the Saltsprings community. Shortwave, which used various frequencies in the 7400 to 7500 range, was listed for 60 watts. The shortwave broadcasts were monitored by both U.S. and Canadian broadcast authorities who weren't aware of the FM's existance until the station was located.

The station had been active off and on since 1982 and White, who had been shutdown once previously, was reported to be determined to find some way to continue his broadcast efforts, if only on FM. White had some $10,000 invested in studio equipment.

Loggings: Two letters this month are addressed to radio station **KG49** in care of this column. Is this station suggesting reports be sent to the Pirate's Den? I hope you realize that we CANNOT verify reports on behalf of any station, pirate or other. Anyway, Gene Brodsky in Oregon heard the station on 6240, also announcing a 9 MHz frequency. Personalities on the broadcast included Dr. Demento, the Mad Aussie, Dr. Dipole, 240 Gordie and The Engineer. Gene doesn't pass along the date or time of reception but he says it was a good, solid signal for more than two hours. Ruth Giler in Vancouver heard the station, too (it was her first pirate, in fact). Ruth's log was also on 6240, on October 6, but she doesn't mention the time either.

Radio Clandestine was heard by Paul Johnson in Arizona on 27 October at 0436-0500 UTC on 7373, with host R.F. Burns playing rock music and claiming to be broadcasting from a ship somewhere off the coast of North America. This long-running pirate can be reached via P.O. Box 982, Battle Creek, MI 49016.



Canada's TNFM, now closed down, used the call KQRO when it first went on the air.

Secret Mountain Laboratory, another one logged by Paul Johnson, this on November 1 at 0114-0134 on 7411. Announced as a "pirate relay" and playing country/western music. Also announced as "serving North America and Canada on the 19, 31 and 41 meter bands." The address given was the usual Box 5074, Hilo, HI 96720.

Paul also heard **KFAT** on 1 November from 0355-0455 on 7434 with country/western music and possible Hawaii mail drop address.

An unidentified was noted by Paul on 2 November on 7412 from 0127-0136, too weak to copy more than one song by Jethro Tull. Still in progress after 0145.

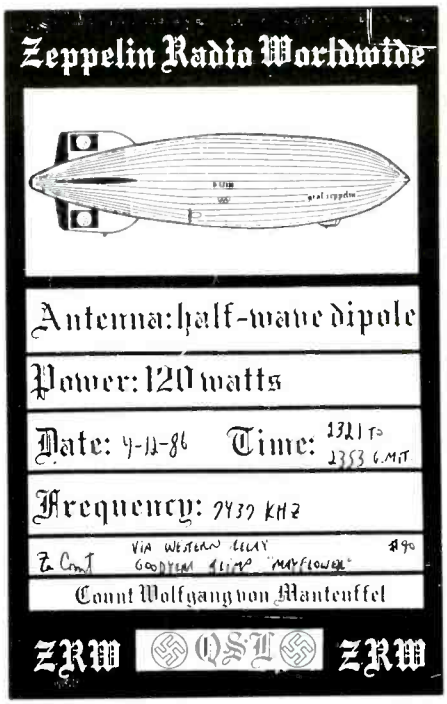
WMTV was heard on October 4 from 0300-0406 on 7422 by Phil Bekkala in Michigan. Rock music was featured along with requests for listener call-ins. When Phil called in he was told the station was running 35 watts. The station tried to put Phil on the air but was unsuccessful.

The Voice of Communism was heard by Bekkala on October 9 from 0038-0045 on 7485 with a talk about the station and a few songs, such as "Popeye the Sailor Man." Phil notes that this was a weekday logging.

The **Gold Coast Ghost** was heard by Lisa Handon in South Dakota on 25 October "near 28 MHz" in single sideband. It's likely this was a very localized reception. Lisa notes the broadcast was very professional sounding.

A letter from A. Nonymous, Bridgeport, CT reports reception on 1620 kHz of **WROX 16-Rocks**, announcing simulcasting with **WLIQ Super-Q 92** (91.5 MHz) at many times around 0300 to 0400. The DJ is Screaming Scotty playing lots of music and taking telephone calls. Has signed off as late as 0700; very professional sound. Announced an address of WROX, Twilight Radio Company, P.O. Box 641, Sag Harbor, NY 11963.

Other stations which have been active re-



Zeppelin Radio Worldwide provides a QSL card and a bookmark.

cently include WKUE at around 7435, Voice of the Golden Eagle on 7439, Radio North Coast International on 7440, Radio Deadman on 7439, One-O Radio on 7438 and Canadian Club Radio on 7440.

A couple of notes from the mail—Joe Wosik in Illinois notes that in four years of listening he has logged 48 pirate stations and verified 28 of them, including "first QSL's" from Radio Free Insanity and KXRG. Joe says this past summer was about the worst for pirate activity that he's experienced but he thinks things are improving now.

Arnold Feldman in Maryland is still looking for his first pirate logging. Arnold says he'd like to see more pictures of pirate stations in this column (so would I!) and wonders about the youngest and oldest people engaged in pirate broadcasting, past or present.

Information wanted: This column seeks your pirate station loggings and other information about pirate broadcasting, whether press reports or actual "inside stuff" from station operators. Shack photos, pirate station QSL's or other literature and anything else having to do with pirate radio is welcome and very much appreciated. Send your correspondence to me at *POP'COMM*, 76 North Broadway, Hicksville, NY 11801.

Your input will be a valuable contribution toward helping Pirate's Den cover the pirate scene each month. I look forward to hearing from you!

PC

BY GORDON WEST, WB6NOA

Loading Mobile Antennas At High Frequency

You have all seen the old nine-foot CB whip antenna on the back of vehicles for 27 MHz operation. That gleaming stainless steel whip sways in the breeze and is exactly one-quarter wavelength long and uses the car body as its one-quarter wavelength counterpoise. It was indeed a good performer. For CB'ers who want the best signal ever, this nine-foot stainless steel whip is almost your best choice.

As we go lower in frequency, our quarter wavelength whips get longer. Here are some typical whip lengths for the popular high frequency Ham radio bands. These lengths are very close to popular shortwave frequencies near these high frequency Ham bands, too:

Band:	*Whip Length:*
10 Meters—28 MHz	8′
15 Meters—21 MHz	11′
20 Meters—14 MHz	16′
40 Meters—7 MHz	32′
75 Meters—3.9 MHz	64′
160 Meters—1.9 MHz	128′

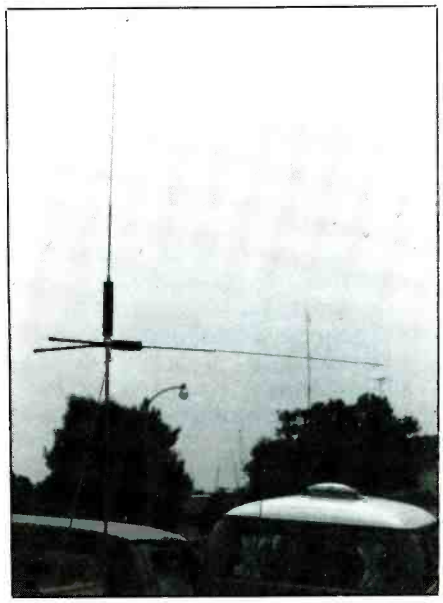
These one-quarter wavelength whips will use the metal frame of the vehicle as their mirror-image counterpoise. Most vehicles offer enough surface area counterpoise for the whips to work all the way down to 160 meters.

Let's face it, any whip longer than a CB whip is going to look really strange on your vehicle when you're driving down the road. There are also highway height limits that you can't exceed—if you operate below 15 meters, you're going to be in trouble with a 32-foot whip on the back of your station wagon!

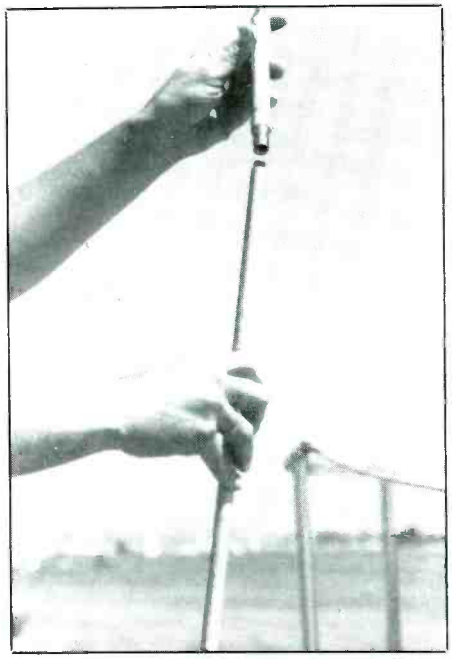
The solution is obvious—load the whip to make it shorter. But then arises the question: Which is best—top loading, center loading, base loading, or helical loading? Manufacturers offer all sorts of different combinations. Here's just a sample:

Hustler (Nutronics)	Center coil loading
Hy-Gain	Base coil loading
Spider	Multi-band top loading
Radio Mark (Anixter-Mark)	Helican top loading
Valor	Multi-band top loading
Wintenna	Helical center loading

Each of these loading techniques allows the whip to resonate precisely on the frequency of your choice at a much shorter length than its unloaded one-quarter wavelength electrical characteristics. This means that you can pack a quarter wavelength, 32-foot, 40-meter whip into a slim package shorter than 7 feet. Same thing with a 64-foot, 75-meter whip—it may also be compressed all the way down to 8 feet through some sort of loading scheme.



"These multi-band antennas work great for anyone who doesn't care what their vehicle looks like going down the road."



Center loading coil change.

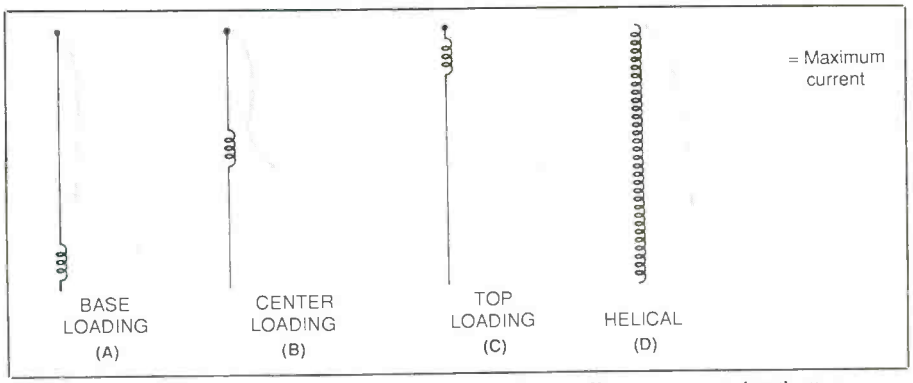
Fact 1: The Shorter The Loaded Antenna, The Higher The Losses and Diminished Radiation.

During the CB days, you could watch that nine-foot stainless steel whip get electrically loaded and shortened all the way down to a tiny one-foot whip. The only problem was that the shorter the antenna got, the less it was able to reach out on transmit or receive. It also became quite sensitive to channel changes as it was electrically loaded shorter.

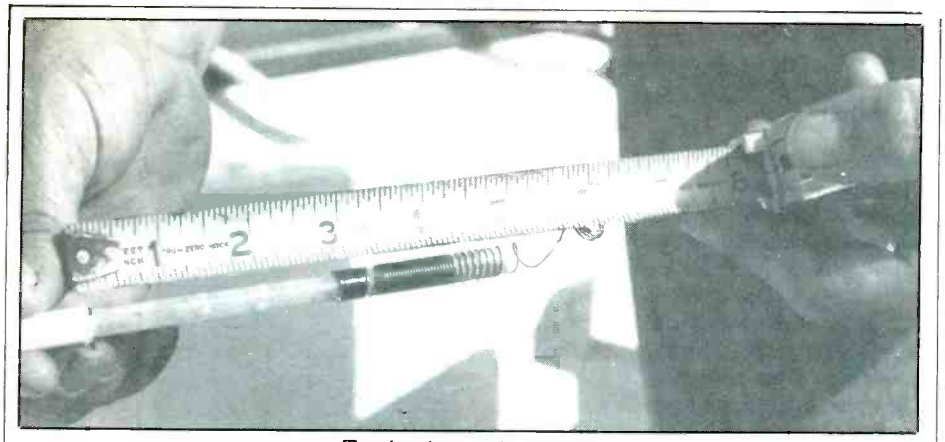
Most manufacturers have adopted the six-foot whip for the 10, 15, 20, and 40 meter Ham bands. For 80 and 160 meters, the whip may be as long as eight feet in a loaded configuration.

Fact 2: All Coils Will Exhibit Losses.

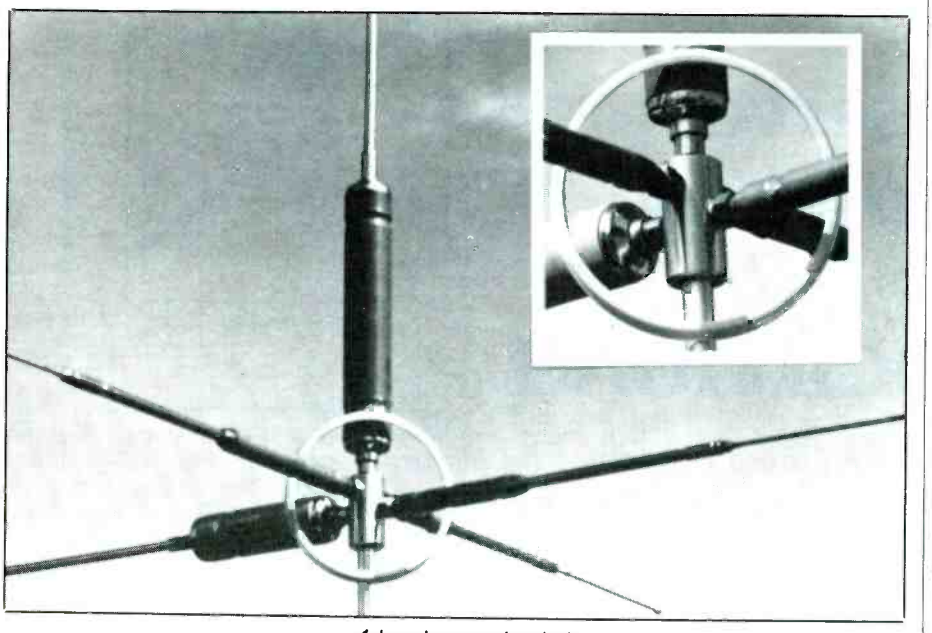
Any time we insert a coil in a one-quarter wavelength antenna system, some losses will occur. The amount of loss will be determined by the characteristics of the coil, the



Base, center and top loaded antennas all have different current distributions.



Top loading coil exposed.



4-band center loaded.

type and size of wire used, and where that coil is placed in the loading pattern—bottom, center, or top.

Coil losses are proportional to the amount of current flowing through the coil, squared, and multiplied by the resistance of the coil (I^2R).

Fact 3: Base, Center and Top Loaded Antennas All Have Different Current Distributions:

Base loading has the greatest amount of current flowing through the coil that will lead to significant power loss. This is why base-loaded antennas for high frequency use are rarely chosen.

The current distribution in the center-loaded antenna is significantly less which allows for greater efficiency. In top-loaded antennas (Figure C), the current is almost minimum through the coil, resulting in almost no losses. The top-loaded antenna would therefore be most efficient.

Fact 4: Less Reflections From a Ground Plane Will Occur With Top Loading.

We would like our main lobe of radiation as close to the surface of the earth as possible for long-distance groundwave coverage as well as long-range skywave coverage. The lower the angle of radiation, the further the skip.

In top loading, the coil is as far away from the metal vehicle body as possible, giving us a much more predictable ground plane pattern. Most top-loaded antennas are so predictable that there is no tuning adjustment to compensate for an abnormal ground plane.

Center-loaded antennas require the whip length to be adjusted for different types of ground planes. Base-loaded antennas always require significant adjustment to cancel the effect of ground plane anomalies (for instances such as mounting the coil near the trunk of your vehicle where the trunk acts as a reflector).

Center loading and top loading also give you an approximate impedance of 50 ohms. This should match your transceiver perfectly so no further impedance matching is necessary. On base-loaded antennas, it is sometimes necessary to add tiny disc capa-

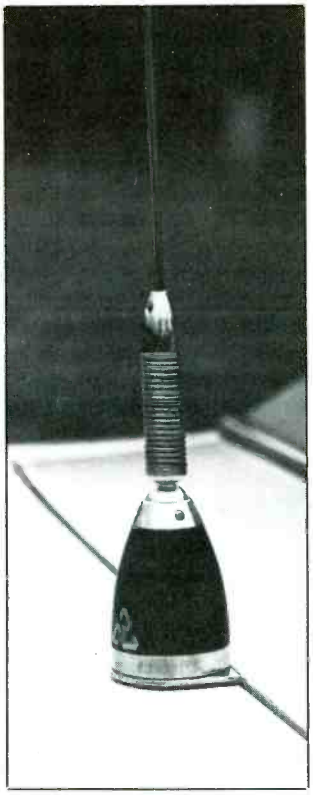
citors in order to bring the impedance up to 50 ohms. These capacitors are sometimes built into the coil on the base-loaded antenna assembly.

Fact 5: Top-Loaded and Center-Loaded Antennas May Look "Funny."

Nothing beats the look of a base-loaded antenna with that shiny stainless steel stinger jutting up from your vehicle. High frequency antennas with those big loading coils in the center indeed look awkward. High frequency mobile antennas using multi-band top-loaded whips look downright ugly—but nonetheless, those individual top-loaded whips will allow you to change up to four different bands without ever having to stop the vehicle to screw on a different loading coil. These multi-band antennas work great for anyone who doesn't care what their vehicle looks like going down the road.

Fact 6: Consider The Helical.

Helical loading may be either center loading or top loading. A center-loaded helical antenna is characterized by a fiberglass shaft with small wire wound around it. As the wire is brought up close to the center of the antenna, the turns become more frequent and are closely spaced. The fiberglass then terminates into an adjustable stainless steel whip that may be tuned to the exact frequency of operation. These antennas work out well, and don't have that bulky external coil to contend with.



Base loading.

Helical.

The all-fiberglass, top-loaded helical antenna usually uses a slightly larger diameter fiberglass body to give it additional support. You can see the coil windings get tighter and tighter as they go up the hollow fiberglass shaft. By inspecting the amount of loading, you can actually determine the approximate frequency range of the top-loaded, fiberglass, helical antenna.

A helical winding within an antenna slightly broadens out the resonant point of the antenna. This means that you can cover a few more kiloHertz as you go from one frequency to another within a certain band. A center loading coil tends to be much more selective, and base loading is very selective as to its frequency of operation.

An all-fiberglass helical antenna is also a much safer antenna around the general public. There is nothing conductive on the outside of the antenna to create a painful RF burn at the 100-watt level. However, on top-loaded helical antennas, you may notice that tremendous voltage exists at the tip end of the antenna; and during long periods of tune-up, the tip might even begin to glow!

So which loading technique is best? It all depends on how much height you have available, the band or bands of desirable operation with or without a whip change, and what you expect your vehicle to look like with a certain type of antenna on it. The most efficent type of loading is no loading where you can use an electrical quarter wavelength whip with absolutely no coil. Unless you only work at 10 or 11 meters, you're going to need some sort of loading, so choose an antenna system that fits your requirements. **PC**

RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE

Is This Virginia Hospitality?

Has southern hospitality dried up along with the Southeast's lakes and streams? Just ask John Park of Tiffin, Ohio. As a farmer, Park understood how farmers in the Southeast suffered during the worst drought in recent memory. Park and his neighbor, John Hoover, decided to help out. They drove about a thousand bales of hay to Harmony, NC. Seneca County (Ohio) busineses paid for their permits, tolls, and motel costs.

As Park drove into Virginia, he saw signs advising that using a radar detector is illegal there. So he disconnected his Fuzzbuster, but left it on the dashboard. John Park thought he was complying with the law. At the first weighing station, he learned differently. K. D. Sexton asked if he had a detector. Parks said he did, but it wasn't plugged in. According to Sexton that did not matter, possession was illegal. Then Sexton handed Good Samaritan Park a ticket for over $40. Hoover, who also had a detector in his truck, did not receive a ticket.

Park was just plain angry. As he said, "I was so angry, I had to stop down the road at a truck stop for a cup of coffee. At the truck stop they had a whole display case full of CBs and radar detectors for sale."

When the Radio Association Defending Airwave Rights, Inc. (RADAR), read about Park's ticket, they offered to help. RADAR is the trade association of the radar detector industry. With RADAR's backing, Park is going to court. His trial is scheduled in Bland, Virginia. Archibald Campbell, of Wytheville, Virginia, is Park's attorney.

Earlier, Virginia State Police Superintendent Colonel Robert Suthard was asked to forgive Park's ticket. Even though interstate trucking regulations have been waived for hay truck drivers in Virginia, Suthard refused to excuse a detector ticket. While expressing regret that it happened, Suthard defended the law. According to Suthard, persons who own radar detectors are speeders and reckless drivers. Park does not seem to fit this description. He says, "My old truck doesn't have too much power. We never traveled in the state over 45 miles an hour. We weren't worried about speeding. I got that (Fuzzbuster) in my truck for small towns."

When Park and Hoover reached Harmony, North Carolina they received a royal welcome. So much so that Park wanted to take another load of hay to Harmony. How he's reconsidered. Park isn't sure it's worth the hassle he got in Virginia during his first mission of mercy.

RADAR Invites Motorists To Join

The Radio Assocation Defending Airwave Rights, Inc. (RADAR), is inviting motorists who value their radar detectors, as well as dealers who sell detectors, to join RADAR. As the watchdog organization for the radar detector industry, RADAR has several purposes. One is trying to keep the traffic radar industry honest.

Perhaps RADAR's most important purpose is monitoring state legislatures and representing motorists' interests there. Since 1984 RADAR has successfully defended radar detectors before thirteen state legislatures. It has also supplied expert witnesses to testify before legislative committees.

RADAR believes it will be defending detectors more frequently in the future. As motorists continue to disregard the national speed limit, more and more state officials are clammering for radar detector bans. They claim that such bans will slow traffic, enabling states to continue receiving federal highway funds. Since only one out of about thirty drivers owns a detector, such bans are a waste of taxpayers' money.

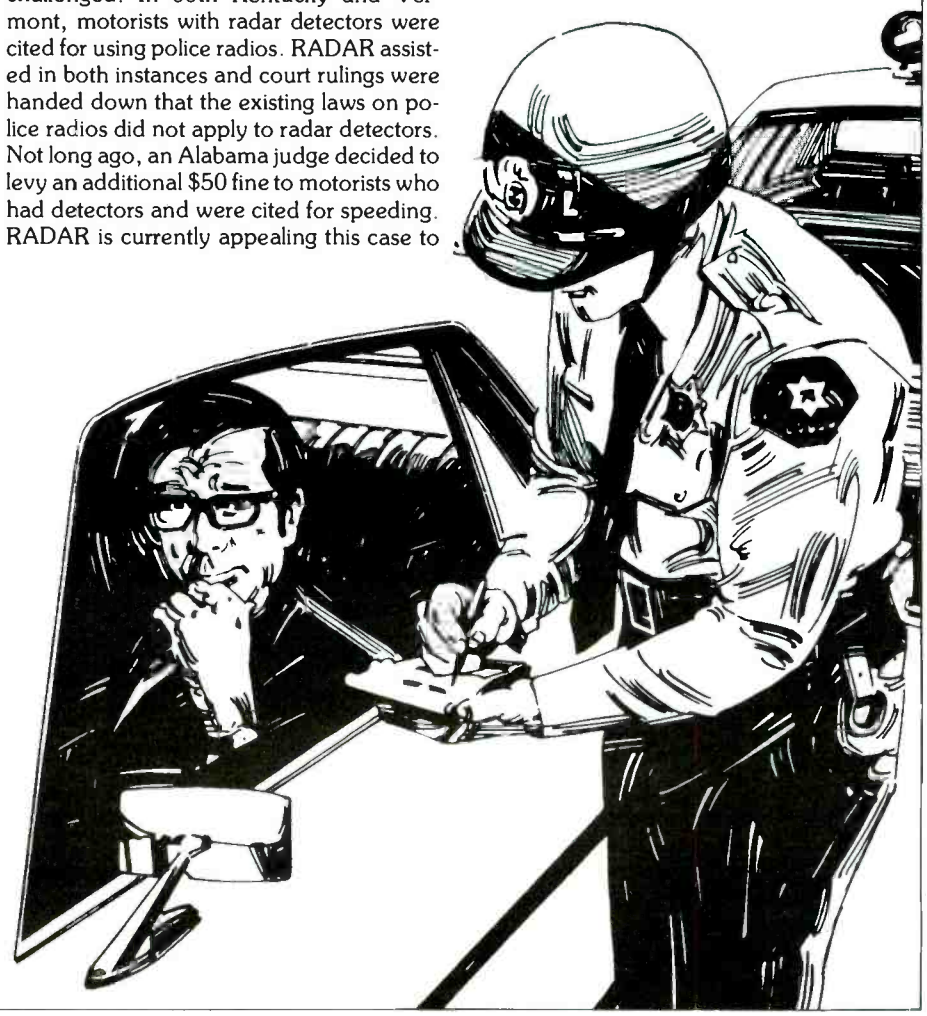
In addition, RADAR has been defending motorists' rights to use radar detectors whenever and wherever their rights are challenged. In both Kentucky and Vermont, motorists with radar detectors were cited for using police radios. RADAR assisted in both instances and court rulings were handed down that the existing laws on police radios did not apply to radar detectors. Not long ago, an Alabama judge decided to levy an additional $50 fine to motorists who had detectors and were cited for speeding. RADAR is currently appealing this case to the Alabama Supreme Court. If we obtain a victory, thousands of motorists can expect their additional fines returned.

In addition, RADAR publicizes any private or federal studies, court decisions, and the activities of regulatory agencies that affect radar detector owners. RADAR also prepares educational materials concerning traffic radar and radar detectors. Recently RADAR produced *Radar on Trial*, a video designed to help drivers defend themselves against error-prone traffic radar. In addition to describing some of the flaws of traffic radar, the video also shows an entire court case involving a radar-based speeding ticket.

Associate members will receive: "Strategy for Dealing with a Radar-Backed Speeding Citation," an eight-page booklet; a discount on the video, *Radar on Trial*; access to a legal referral service; and periodic updates highlighting efforts to suppress the use of radar detectors and detailing new developments in traffic radar. To become an associate member, send $15 to: RADAR, 4949-PC S. 25A, Tipp City, OH 45371.

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

PC



ON THE LINE

NEW AND EXCITING TELEPHONE TECHNOLOGY

BY JULIAN MACASSEY, N6ARE

Wiring In Your Own Jacks

There is nothing more frustrating than having phones in the wrong place. You remodel the den and then find the phone jack is not beside the sofa anymore. Now it is behind the TV and the phone will not reach the coffee table. The fast and easy solution is either to move the jack or add another one where you want it.

It is easier to add jacks than move them. If you leave an old jack in position, you can use the screw terminals on the jack on which you can connect the extra wire. You can't really go wrong wiring in an extra jack. If you wire it incorrectly, the phone plugged into that jack won't work. If you do it right, it will. The best illustration of how to do the job is to look at a currently installed working jack and copy what you see.

The first jacks installed by the phone company were conversions of hard-wired terminal blocks into jacks. The correct name for the standard phone jack used with regular phones is a "Miniature 6-position jack." Beneath the jack is the old terminal block; it is a square piece of black plastic with four screws on it. These are inconvenient to work on, but the knack can be acquired. Many modern jacks sold are clones of these early jacks. What you get is the terminal block and jack cover. The terminal block is screwed to the wall with two screws and the cover fixes with one screw.

Now on the market are some easy-to-install jacks. Some come with double sticky tape so they can be stuck on the wall rather than screwed on. Jacks are sold by supermarkets, hardware stores, phone stores and telephone equipment wholesalers. The best quality jacks are made by Suttle and AT&T. There are many cheap imported jacks for sale; some are okay, but many are poorly made and may have poorly inserted pins and fragile plastic. Also, some of the cheap jacks have minimal gold plating on the pins. Remember that an installed jack will be in use for decades and should be reliable.

The phone company and FCC refer to jacks with "RJ" numbers. The full name is Universal Service Ordering Code (USOC) RJnn. The manufacturers refer to them with part numbers. Besides the official RJ series there are specialized jacks that have no RJ number. The number not only describes the basic physical shape of the jack, but also its application. The FCC rules and regulations Part 68, section 68.500 covers the physical requirements of jacks. Some of these are pretty esoteric. Many Electronic Key Systems use miniature 6-position jacks in which pins 2 and 5 often carry the system control signals. There are no RJ numbers for jacks used in this application.

The most common jack found in the home is the RJ11C. This is a single jack for a single-line phone. The line is connected to the two centermost pins which have red and green wires on them. The standard phone wire color code is used. Green is Tip and red is Ring. When a jack is for a wall mount phone, it has s W on the end of the number. So a single-line jack for a wall phone is a RJ11W.

Most jacks come fitted with four prongs and four wires. The other two wires are yellow and black. A few jacks can be found with six prongs and the other two wires are blue and white.

What the black and yellow wires are attached to determines the RJ number. Usually in a house, the black and yellow wires are used when they carry a second line. A jack wired for two lines is called an RJ14C or RJ14W if it is a wall mount phone jack. See Table 1 for a description of the applications of jacks and their numbers.

There is one jack seen in some homes that is usually used with alarm systems and some automatic dialers. This is the RJ31X. It is a jack that takes an eight-pin plug. Inside the jack are some shorting bars. When the plug is removed, the phone line is connected straight through. When a plug is inserted, the phone line is routed out through the eight pin plug and back again. Alarm equipment uses this to disconnect the house phones while the alarm equipment dials the phone. By isolating the house phones, it prevent someone lifting a house phone to defeat the automatic dialer. See Fig. 1 for a schematic of an RJ31X.

Some modems use the RJ31X-type jack with an eight-pin plug. In the jack is a resis-

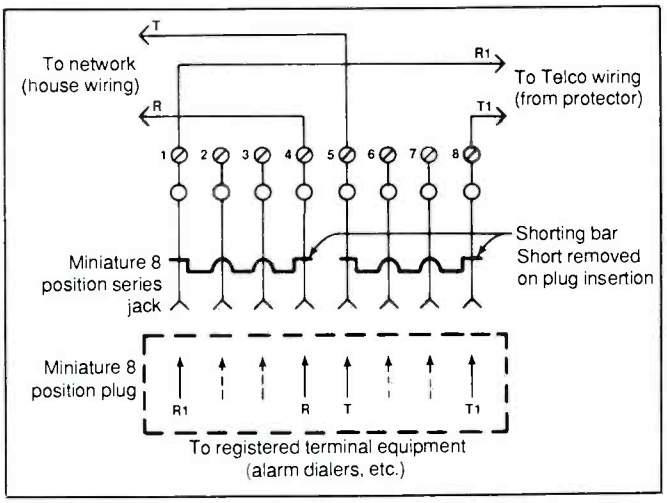


Figure 1: RJ31X schematic.

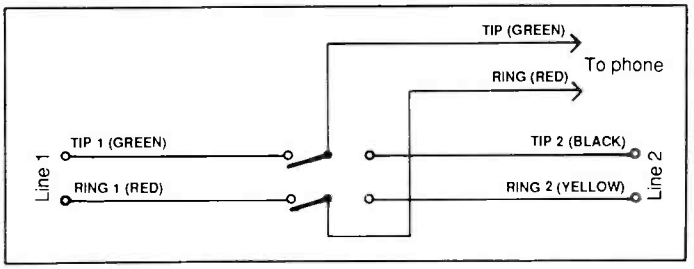
Figure 2: Using a DPDT switch to switch two lines to a single line phone. Switch may be in jack or inside phone.

Table 1

Wire Colors	**White**	**Black**	**Red**	**Green**	**Yellow**	**Blue**
Pin Numbers	1	2	3	4	5	6
RJ11C(W)	—	—	Ring	Tip	—	—
RJ12C(W)	—	A Lead	Ring	Tip	A1 Lead	*
RJ13C(W)	—	A Lead	Ring	Tip	A1 Lead	*
RJ14C(W)	—	Tip 2	Ring 1	Tip 1	Ring 2	—

**An RJ12 jack has the Tip and Ring connected to the jack before the KSU (Key System Unit). An RJ13 jack has Tip and Ring connected after the Key System Unit.*

Various configurations of the RJ11 type jack.



tive pad. When used with a pad and a modem, it is called an RJ41S or RJ45S depending on how it is wired. Depending on how the RJ31X is wired or used, it can be called an RJ32X, RJ33X, RJ34X, RJ35X, RJ36X or RJ37X. But like the RJ11C, when ordering, it is described as an RJ31X; how you wire it decides what number it has.

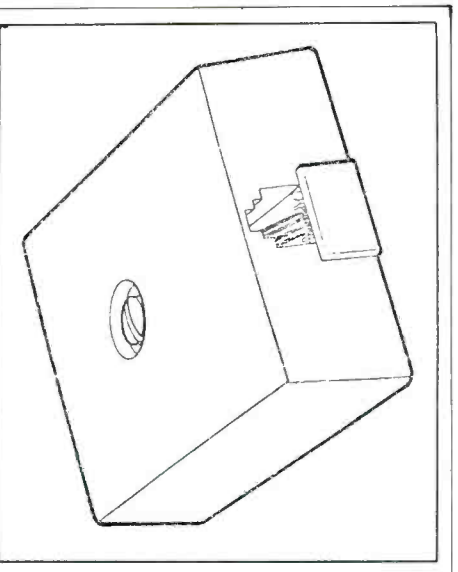
For outdoor use, such as a phone jack by the pool, an RJ11 type jack in weatherproof housing is usually installed. This is convenient because any modular phone will plug into it. There is a special three-pin weatherproof jack. A standard modular phone will not plug into it. It is really designed for use in marinas. This device is called USOC RJ15C. It can only be wired for a single line.

Referring to last month's article on phone wire, wiring a jack is easy. Most of the time, the line will be on the red and green wires. Just connect these red and green wires to the red and green wires on the jack. Plug in the phone and it should work. If you have a second line in the house, often this will be on the black and yellow pair. If it is not on the black and yellow pair but is on a separate run of wire, it can be brought onto the black and yellow pair somewhere in the wire run. The best place to do this is at the protector.

If you have the second line on the second pair, you can wire the second pair on the black and yellow wires on the jack for a two-line phone; this is now an RJ14C or RJ14W. If you have a single-line phone but want to wire it for the second line, connect the black and yellow phone wires to the red and green wires on the jack. You may also use a double pole double throw (DPDT) in the phone or in the jack—if you use a small enough switch. Then you can switch between lines. See Fig. 2. You can, of course, buy two line phones. Two-line phones have a hold button on them so you can put one line on hold to answer the other when it rings.

Now you can fill the house with jacks. The next question is how many phones can a line have on it at one time. The phone company will ring five phones with an REN (Ringer Equivalence Number) of one. So, it will ring ten phones with an REN of 0.05. If your ringers exceed the total REN of five, some phones may cease to ring, some phones will ring weakly. All the phones may cease to ring. The solution to this is to disconnect the ringers, until the REN is below 5. You may have as many phones as you wish on the line as long as the REN is not exceeded. A phone with a disconnected ringer has an REN of zero.

If you use standard phones, such as the 2500 set from Northern Telecom, ITT, Comdial or AT&T, no less than three phones can be off hook at the same time. This is convenient for family reunions on the phone. Many cheapo phones cannot be used in parallel with other phones. The reason for this is that as each phone is taken off hook, the line voltage drops. Cheapo phones are voltage sensitive so some of them will cease to work when the line voltage drops below five volts or so.



This six-position jack can be wired as RJ11C, RJ12C, RJ13C, or RJ14C.

Legally, you can now have as many phones as you want on your phone line. You can put jacks wherever you want on your property. Getting the supplies easy. Doing the work requires simple tools. Putting in jacks is an excellent way to return a favor for the neighbors. PC

BROADCAST TOPIX

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

BY MARK MANUCY, W3GMG

The first thing this month is a mini-review of the Sony ICF-2010 (ICF-2001D) portable radio. It is tempting to call the 2010 a receiver because of its completeness and obvious quality above many receivers, however, if one is sticking with the definition that a receiver does not have built-in antennas, the 2010 will not qualify. Putting a dollar value to the break point between radio and receiver it would also qualify as a receiver for being in the $300 price range, plus or minus. I paid minus and the list price is close to $330.

As a portable, it is top-notch AM/FM without question. It has retained the best qualities of the 2001 and improved upon the weak areas. Needless to say, I haven't spent much time on the SW bands as yet since I am still discovering nuances of the AM band. The 2010 instruction booklet is complete in the description of the operation of the controls, though, it does not include a schematic, a block diagram or even complete specifications of the set. The specs are excellent based on my experience with other quality receivers and there have been only a few problems that I've noticed in reception, some of which would not be present if my residence was away from the city.

Nonetheless, let's mention some of the best features first. The ICF-2010 is certainly a grand step up for DX'ing in the field. The AM sensitivity is excellent. The new Canadian station on 530 kHz (250 watts) brings the 'S' meter to half scale in Baltimore at night! My daytime checkpoint of 540 kHz in Pocomoke City, MD is also half scale and easy listening. Most other portables need an external loop to boost the 540 signal to listenable levels. There is a DX/local switch and a full-range RF gain control. Inside the WBAL/WIYY/WBAL-TV building on TV hill, no one has ever brought in a radio that has been able to receive all the AM signals in Baltimore. We can get WBAL (50 kW) and usually one of the other 5-kW signals and a nearby local channel station. The other seven signals cannot be heard. The 2010 pulled in all AM stations and at night I was able to pull in some clear channels like WBZ, CKLW, and WWKB. This was in the AM Master Control which is in th center of the third floor (no outside windows).

On the FM side the reception is a lot better than previous Sony FM sets I've checked out. The 2010 still suffers from strong signal intermod but not nearly to the same degree. This example will show the signal pulling power on FM: Again standing in Master Control, the 98 Rock antenna is about 950 feet over our heads and the transmitter several rooms away. The 2010 pulled in Washington's 97.1 well enough for an ID. 98 is on 97.9 with almost 11 kW ERP, 5 kW of transmitter power. Other Washington stations, such as 95.5, were better. Then again, to receive any station other than a Baltimore one is a feat worth mentioning. As great as this may seem, I find the FM bandwidth quite wide at home and DX'ing made difficult because of it. The FM doesn't have any DX/local or gain control which might improve this situation. FM reception is mono. There are no other FM features other than the scanning and memories.

By contrast the 2010 abounds in AM features. The RF gain controls have been mentioned and adding to the versatility is a wide/narrow IF switch which helps in digging out those in-between channel stations like 825 kHz and 1555 kHz. The narrow is narrow enough to separate AM without losing the intelligence (about 4 kHz) and the wide is very wide affording "hi-fi" reception. The tone control switch helps in an unusual

It's hard to visualize just how large a metro TV station is. These two photos show about half of the video tape area at WBAL-TV. If you look beyond the desk in the center of the left photo you see the window and doors leading to the control room seen in the film Diner. *The big brutes with the ovals in the center (right photo) are TV cartridge machines. To the right are many cassette machines used, among other duties, to play the cut-ins on newscasts. The station has about 20 tape machines in this area.*

WBAL broadcasting from Baltimore's Inner Harbor during Preakness week. Note the sign above the windshield. This is where the Clipper Ship Pride of Baltimore *docked before its ill-fated journey last May. Baltimore is building another* Pride *next year!*

way for DX'ing. The top position is flat response, the center position cuts the treble, the bottom position cuts the treble even more as well as cutting the bass response (very handy in eliminating the low frequencies growls associated with DX'ing). There is an upper and lower SSB detector which works well with the 100 Hz tuning on the main tuning knob.

Also on AM is a synchronous detector that I've been anxious to try and have found to be very useful in some rather unexpected ways. Normally, the sync detector is associated with lower distortion AM reception. In the wide-band IF there is clearer reception with the sync than the normal detector if the station has good audio, however, with a limited audio amp in the 2010 this feature is really mute. Broadcast engineers will like the fact that it is now simple to check one side band against the other with the 2010. There are two front panel LEDs which show upper or lower sideband reception in the sync position. The switching is accomplished by moving the main tuning 100 Hz one way or the other from center frequency. I have found quite a few stations with unequal sidebands which may explain some distortion with the conventional detectors.

Another neat DX'ing trick with the sync detector is finding the frequency a station is on (within 100 Hz) and finding a station on an odd frequency. For example, if a DX station is on 691 kHz and you have a strong station on 680, 690 or 700 kHz, it is difficult to determine if there is a signal on 691. Not any longer with the sync detector! Switch in the narrow filter and set the dial to 691. If it's there, one of the upper/lower LEDs will light. Now all you have to do is try to hear the station. The overlapping stations still present problems, but not like a conventional detector. The sync detector hears only what it's locked on to.

For AM (and FM, but not as useful) are the 10, yes 10 LEDs for an 'S' meter and they are controlled by the RF gain controls so that a good indication of comparison signal strengths is displayed. If the meter is pinned (all lamps lighted), reducing the RF gain also reduces the number of lamps lighted. I never felt that five LEDs were really enough to get a good comparison but this group of 10 is almost as good as the good old meter, plus they can be seen in the dark. The LCD dial is illuminated by a green background lamp.

Well, I'm almost ready to wrap up at this point—I could go on and on—except to mention the memories. There are 32 memories which are quite handy in storing DX frequencies and in checking the band for activity. The memory remembers the band and frequency so AM and FM may be mixed. There are two scan modes and all popular bands are preset for instant band switching at the touch of a button. Also mentionable are the multi-function clocks, sleep options, timer options, scanning options, keypad entry and many other fine features. The 2010 accepts external AM and FM antennas and provides the plugs for connection. A power pack for AC operation is included; the three big "D" cells are supposed to last 30 hours on AM and 40 hours on FM operation with the memory batteries (2 AA cells) lasting upwards of a year. I'll continue the review at a later time.

I received a nice care package from Bruce Portzer, President of the IRCA, that included their Almanac. The IRCA (International Radio Club of America) is a broadcast band only DX club that among other things produces a 24- to 36-page bulletin 34 times a year with the latest DX happenings. This is something that just can't be done in a magazine since the lead time is so long. IRCA also gives a lot of information (such as type of format, network affiliation and how the station ID is given) about individual stations which will help in getting the ID of the station. I found the Almanac full of interesting information. Almost two hundred pages of fantastic stuff—sunrise/sunset maps, which network each U. S. station is a member of (including a listing of the Larry King stations), a listing of the satellite networks stations and even the national football and baseball network station listings. This Almanac is a worthwhile addition to any DX'er's library.

The IRCA and the NRC try to work with stations to provide test periods after midnight with stations (especially daytimers) for the DX'er to be able to log the station. One of the stations I do some work for recently showed me the brochure left by an IRCA member explaining to the station personnel what the IRCA was and how the test schedule might be of assistance to the station. Certainly, the IRCA is a club that is serious about the hobby of Broadcast Band DX'ing and if you'd like more information please drop a note to Bruce Portzer at 6546 19th Avenue NE, Seattle, WA 98115.

I'll do a complete review of the Almanac in a later column, after I've had time to digest everything that's in it. Thanks for the information, Bruce. Always glad to hear from others interested in BCB DX'ing. It's a lot of fun and something I never grow tired of doing each week!

In other mail this month I continue to get questions about the new Canadian station on 530 kHz. They are legal and are easily heard here in Baltimore as well as most of the Northeast. I haven't had any reports any farther away than Baltimore, but with the signal they have here I'm sure they are easy pickings at much greater distances. The station is CJFT and they operate with 250 watts from Ft. Erie, Ontario. At the other end of the band is the beacon on 1610 kHz from the Caribbean and they also are audible over much of the East Coast and beyond with their 50 kW. These are two clear channels that remain and that are easy to monitor . . . one can get the feel of what it sed to be like in the old days when a 250 watt station could be heard for hundreds of miles at night. In contrast, I turned on 1200 kHz last night and couldn't hear a thing for the roar! WBZ still dominates 1030 here at night . . . but for how much longer?

A few months ago there were five daytimers in and around Baltimore, now there is one. One station on a regional channel is operating with 500 watts using three towers near here while the others are the new low-power "peanut whistlers." The most recent is on a Mexican clear (1570) audible until an hour after sunset, then disappearing into the noise. Out driving the beltway at night one can see their tower but not have a clear signal from them. A letter from Jerry Felix describes the Chicago BC band as "Europe at night." Some of the Chicago stations that used to come in clearly at night sound like they are a thousand miles away! His question is, "Who's the dope at the FCC

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
WYNI	Monroeville, AL	930	5/0	NDA
WJMX	Florence, SC	970	5/3	DA-N
WHWB	Rutland, VT	970	1/0	NDA
WEIS	Centre, AL	990	1/0	NDA
WSJP	Murray, KY	1130	2.5/1	DA-2
WQSN	Kalamazoo, MI	1470	.5/1	DA-N
KNTR	Ferndale, WA	1550	50/10	DA-2
WKKD	Aurora, IL	1580	.25/.25	DA-2
WPSL	Port St. Lucie, FL	1590	5/0	NDA
FM				
WJHU	Baltimore, MD	88.1	10	426′
WHAB	Acton, MA	88.7	3	328′
WVEP	Martinsburg, WV	88.9	3.6	1624′
WUNY	Utica, NY	89.5	6.26	777′
KRNU	Lincoln, NE	90.3	.1	123′
WVSP	Warrenton, NC	90.9	100	500′
KADX	Castle Rock, CO	92.1	.822	620′
KSJO	San Jose, CA	92.3	50	369′
WAQT	Carrollton, AL	94.1	98.4	990′
WFBQ	Indianapolis, IN	94.3	47	891′
WICO-FM	Salisbury, MD	94.3	3	328′
WJST	Port St. Joe, FL	94.5	100	991′
WJYF	Nashville, GA	95.3	.45	797′
WHOK	Lancaster, OH	95.5	50	492′
KHUM	Ottawa, KS	95.7	100	981′
WBNE	Benton, PA	95.9	3	328′
KHLS	Blytheville, AR	96.3	100	351′
WEQR	Goldsboro, NC	96.9	99.5	984′
KRIT	Clarion, IA	96.9	100	568′
KAFM	Durant, OK	97.5	45	514′
WMVQ	Amsterdam, NY	97.7	3	328′
WAFL	Milford, DE	97.7	3	328′
WJSN-FM	Jackson, KY	97.7	.638	610′
WCNA	Clearwater, SC	98.3	1.4	484′
KISY	Tioga, LA	98.3	3	328′
KKMG	Pueblo, CO	98.9	100	1210′
WCTS-FM	Minneapolis, MN	100.3	92	1089′
KZLO	Pueblo, CO	100.7	63	1206′
KVNM	Taos, NM	101.7	3	−392′
WEZV	Fort Wayne, IN	101.7	3	328′
KSPK	Walsenburg, CO	102.3	2.2	377′
WAVE-FM	Sarasota, FL	102.5	100	1663′
WRFY-FM	Reading, PA	102.5	19.05	807′
WUSQ	Winchester, VA	102.5	28	669′
WFUR-FM	Grand Rapids, MI	102.9	48	510′
KHOM	Houma, LA	104.1	100	1944′
KLMO-FM	Longmont, CO	104.3	100	981′
KIVA	Santa Fe, NM	105.1	100	1936′
WMXQ	Moncks Corner, SC	105.5	2.04	384′
WQXA	York, PA	105.7	25.1	705′
WBLI	Patchogue, NY	106.1	10	492′
WEZX	Scranton, PA	107.1	.19	1270′
WPSK-FM	Pulaski, VA	107.1	.2	1212′
KCTT-FM	Corbin, KY	107.3	50	492′
KDLZ	Fort Worth, TX	107.5	25.1	1647′
KFMW	Waterloo, IA	107.9	76.54	1108′

Key: D = Daytime, N = Nighttime, DA = Directional Antenna, DA1 = Same Pattern Day & Night, DA2 = Different Pattern/Power Day/Night, NDA = Omni Antenna Day and/or Night, * = Special Operation or Critical Hours, N/C = No Change.

who dreamed up this mess?" He suggests we send the entire FCC to Europe some night . . . they'll change their tune real fast! As for a more up-to-date log book, Jerry, you might try the one put out by the NRC. It is probably the most current.

Carroll Weyrich sent some interesting QSL's, some appearing in this issue, and

has been DX'ing the BCB since 1925! He has received over 2200 stations from 60 countries since that time. Carroll is a supporter of radio clubs and contributes much of his success to being a member of the Newark News Club which is now defunct.

More comments about the Select-A-Tenna. Ed Skasko informs me there are two models. The one I described a couple of months ago is model 541. The model 541M has a jack on it to connect to a radio with an external antenna connector or to connect an external antenna to the loop. Of course, connecting an antenna to the loop defeats the purpose of the loop except to say it allows an external antenna to be inductively connected to a radio that has no external antenna connection. It cost $5.00 more than the 541. The 541 even boosts the ICF-2010 by two LEDs. Ed has built a board on which he's mounted his 541M so that it can be rotated separately from his receiver. I did it the lazy man's way, Ed, by using a "lazy susan" kitchen can holder—I put the loop and the radio on the lazy susan together and rotate them in that fashion. Ed is a member of the Ontario DX Association. Scott Nelson got his Select antenna from Edmund Scientific in New Jersey. He said it helped him pull in the old Herb Jepko Show from years ago. I wonder how old Herb is doing?

Thanks to Eddie Hauge and Bill Fritzinger who also contributed to this column.

More information about ARI (Automatic Radio Information). This system, developed by Blaupunkt allows the listener to enjoy whatever features he wants with his auto radio and to be updated automatically on traffic conditions by ARI. In October, KISS 108 in Boston became the most recent station added to the ARI network now giving coverage from Washington to Boston. WTIC-FM in Hartford is another, as well as WKLW-FM in Providence. Two Washington stations, WCLY and WASH, and Baltimore's WLIF provide ARI info. In addition to the East Coast corridor, stations are being added in Southern California, Dallas-Fort Worth, Detroit and Toronto. Other markets will be added next year. We will keep updated and have a special feature on ARI before long.

The latest from Motorola on AM stereo, "C-Quam is the marketplace choice!" There are over 350 C-Quam stations compared to less than a hundred for Kahn. There are over 7 million receivers to under 100,000 multisystem. Where Kahn can be received on less than 2% of the receivers, C-Quam can be received on 100%. Two, and soon four, manufacturers will be offering IC decoder chips for C-Quam while there are none for Kahn and, I might add, one cannot obtain a schematic from Kahn to build a decoder. C-Quam also claims to have had 12 stations switch from Kahn to C-Quam and lose none to Kahn, however, my records show at least two stations have switched from C-Quam to Kahn.

We must admit that Kahn has been saying since the spring of 1983 that multi-mode would be taking over the single system receivers, but I'm hard pressed to find any multi-mode receivers in any catalog much less in a store. If any AM stereo receiver is found in a store, it is not operating to the extent of being able to get a fair demonstration to compare with FM. In other words . . . Nobody cares about AM stereo! Nobody except Leonard Kahn, Chris Payne, Steve Kravitz and me. We are certainly not enough of a majority to swing it. But believe me folks, AM stereo sound great, when: (A) The station makes an effort to program stereo, and (B) The receiver being used is a quality unit designed to receive AM stereo *and* hi-fi AM. That's all it takes! I don't think we've gotten to first base yet—sad, sad. Funny thing is that it takes the same requirements for FM stereo and there are a lot of poor (A)'s and (B)'s out there. Nonetheless, I have available the most accurate listing of AM stereo stations in the U.S. and Canada and it can be purchased for $2.50 postpaid to the address at the end of the column.

Well, I've worked overtime this month. Loop antenna plans are $5.50 for box and $7.50 for ferrite with pre-amp. SASE for list of computer programs for C-64 and C-128. Requests and letters and photos to P. O. Box 5624, Baltimore, MD 21210. PC

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Often when you least desire it, TV audio pops up on your scanner while listening to a local channel or while doing a search. It can be quite annoying, you must admit.

While most of us buy scanners to monitor two-way radio services (and some one-way communications services such as paging—regardless of what those dumb new laws say), many of us discover the many other things we can listen to on our scanners if we so desire. One of those things we can tune in is TV audio, which is the sound portion of a TV channel.

Only one radio currently on the market for monitor enthusiasts, the ICOM IC-RC7000, is capable of tuning in every TV channel in use in the United States and Canada. One other, the Yaesu FRG-9600, is capable of tuning in every channel except Channel 2. Every other programmable scanner on the market is capable of tuning in at least some TV channels.

Well, what can you expect to hear when you tune in TV channels on your scanner? Exactly what you'd be hearing if you were watching the broadcast. The TV picture operates on a separate frequency from the audio portion of the broadcast so the two signals don't interfere with each other. The visual portion of the signal is transmitted at a frequency 4.5 MHz lower than the audio portion, but unless you like listening to a constant hum, there's no point to "listening" to the picture.

Tuning in a TV channel on your scanner may be helpful in various ways. If you don't have a TV in your shack and something big is going on, such as a large fire, you could tune in the TV audio of the evening news to check out the news reports. All that without running to the other end of the house to watch TV! If you want to catch the Game of the Week on TV, but the yard beckons to be mowed, strap the handheld scanner to your belt with an earphone and tune in the TV's audio portion and you're all set. If you're stuck in a massive traffic jam and the local radio station is more interested in belting out more Bruce Springsteen hits, you can tune in the evening news broadcast on your mobile scanner and, voila, there's the scoop. You could also catch your favorite TV shows while on the road, thus getting around the ban many states have on the installation of TV sets visible to the driver or front-seat occupants. (Imagine explaining that to a highway patrol officer, though, that you can hear the TV station, but can't see it. Sure, fella!)

However, there's another important aspect of monitoring TV signals. They're a true reporter of oncoming skip reception. If there isn't a Channel 2 broadcasting in your area, you may want to check the frequency periodically to see if you hear a Channel 2 signal coming in from another state. Catch the call letters when they identify on the hour and you'll know where they are located. You then might want to check out the 30-50 MHz band for any other skip from the area you're hearing the TV station. The same thing works for checking the 150-174 MHz band by checking on the signal on Channel 7's audio. You might even become interested in TV DX'ing as a result of this. Don't hesitate to write to the TV stations for QSL cards or letters; many have them specially printed up to send out to viewers (or "listeners").

You might be surprised to find out your scanner receives TV audio better than your TV itself. As I'm writing this article, I'm listening to the audio from a TV station on Channel 8 at least a hundred miles away on my Regency MX7000 with only its telescoping antenna. My TV, with its 8-foot boom antenna, can't even pull in that signal.

While there are plenty of domestic signals to be found on the TV bands, don't rule out catching some really far-out DX—like from overseas. Low band (30-50 MHz) DX'ers who like to listen for European stations know the "beacons" provided by overseas TV stations help let them know when the skip is rolling in from across the Atlantic. In the United Kingdom, the audio of TV Channel 1 over there is on 41.50 and Channel 2 is on 48.25 MHz. While TV audio is FM in the United States, it's AM over there. Another good catch is France's Channel 2, which is on 41.25, which also can be heard here in the United States. France also uses AM, rather than FM.

As we mentioned before, all scanners can receive at least some TV channels. In the nation's top 20 cities, TV Channels 14 to 20 are shared between broadcasters and two-way radio users. For instance, in Philadelphia, Channel 17 is used for broadcasting, while Channels 19 and 20 are split up into dozens of two-way radio channels. Each TV channel is 6 MHz wide; for instance, Channel 17 is 488-494 MHz with the picture on 489.24 MHz and the audio on 493.75 MHz.

Although they still put them on TV sets, Channels 70-83 are no longer used for broadcasting in the United States. Channels 70-73 and 77-80 are used for two-way radio, while Channels 73-76 and 80-83 are used for cellular mobile telephones. Tune from 59 to 88 MHz for TV Channels 2 through 6, from 179 to 216 for Channels 7 through 13; from 475 to 806 for Channels 14 to 69.

Here's the "spectrum shack" where Kevin Chedville of Port Sulphur, Louisiana does his listening. Kevin doesn't miss much of the action with his ICOM IC-R7000, Kenwood R-2000 with Grove Skywire and omni antenna, Bearcat 800XLT, President Washington CB, Johnson Mini-Scan handheld, Panasonic portable shortwave radio, Commodore 64 with the Microlog SWL program, Realistic DX-160 receiver, Midland handheld CB, and more.

Don't forget to use the wideband FM option of your scanner if you have the option. Give a listen, especially late at night when local stations may be signed off and stations farther away might be heard. Also while I'm writing this, I'm listening to a Channel 13 station 200 miles away while the local Channel 13 is signed off—all this again just with the whip on the back of the MX7000!

Full Spectrum

The latest buzz phrase in monitor hobbyists' vocabulary is "spectrum shack." What is a "spectrum shack?" Usually it's a receiving station that is capable of tuning from either 10 kHz or 100 kHz to as high as 2 GHz.

If a radio hobbyist has a radio receiver that allows him or her to listen to the lower 100 kHz to 30 MHz and another receiver allowing reception from 30 MHz to 1.3 or 2 GHz, that person might consider it full spectrum as it relates to the radio hobby. Although many communications are still carried out on microwave frequencies above 2 GHz, reception of such signals would require extremely sophisticated equipment. Thus, as far as the hobyist is concerned, he or she can monitor as much of the radio spectrum as possible with commercially available gear, and consider his or her monitor post a "spectrum shack." A good example of a spectrum shack would be the use of an ICOM IC-R71A to tune the 100 kHz to 30 MHz bands, and an ICOM IC-R7000 to tune in the 25 MHz to 2 GHz bands.

Input

We need your input here at *POP'COMM*. Do you have a "spectrum shack?" We'd like to receive a photograph of it. We welcome photographs of monitor stations, radio installations, dispatching consoles, antenna farms, etc. We also welcome your questions and frequency lists. Write to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. PC

RTTY

THE EXCITING WORLD OF RADIOTELETYPE MONITORING

A RTTY Crash Course

Much of the mail received by this column asks for information on getting started in radioteletype (RTTY) monitoring, and for hints and tips on getting the most from the hobby after the initial hardware is obtained. We thought that this would be as good a time as any to roll some of this information together and put it all in one place.

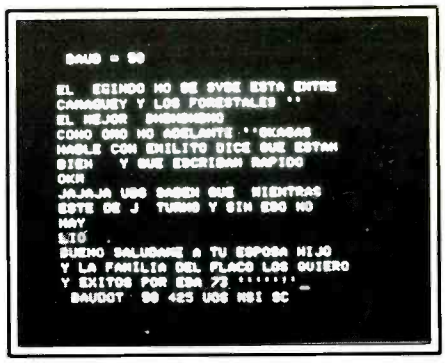
Contrary to what many prospective RTTY enthusiasts seem to think, RTTY monitoring takes no special technical expertise and very little more hardware than a reasonably good communications receiver that permits selection of USB/LSB modes. Mostly what's needed is an RTTY demodulator (or decoder) and there are many from which to select a wide range of prices and features, some even able to copy CW and other non-voice communication modes such as FEC and ARQ (also known as SITOR). You'll also need a viewer or monitor screen such as would be used with a home computer.

The RTTY demodulator connects to your receiver in seconds without any special tools or technical knowledge. All it requires in order to do its job is the audio output from your receiver—either from loudspeaker, headphone, or recorder output jacks. This opens the way for you to receive a whole new world of communications stations including military, diplomatic, press, Interpol, weather, spy, tactical, mystery, maritime, Ham, MARS, and other stations whose communications and perhaps very existence had not before been known to you.

There are a great many RTTY signals to be heard. If you tune across the shortwave spectrum with your receiver in the CW or SSB modes, you can recognize these signals as something that sounds like a steady stream of *blip-blip-blip* data. Some of it is deliberately encrypted and some is in modes, languages or alphabets that won't be of use to you or your equipment; perhaps half of the stations you'll pick up will not bring you information you can identify, use, or figure out. There are so many stations, however, that those stations you can understand will still be numerous and easily be worth the tuning. A listing of some RTTY and ARQ loggings made over a few days is given with this month's column.

RTTY stations transmit the same basic type of signal, but with individual variations from station to station. These differences relate to the speed at which the information is being sent (words per minute) and to the width of the signal; signals normally occupy bandwidths of 170, 425 or 850 Hz (although there are exceptions). The width of the signal is called its "shift." Most transmissions run at 66 or 100 words-per-minute, a few you'll encounter will be as slow as 60 wpm or as fast as 135 wpm (and, still, there are exceptions). The method of transmission (determined by the transmitting station) can either be with the letters and symbols sent in *normal* (N) or *reverse* (R) polarity. RTTY decoders are designed to permit you to adjust them to receive signals sent out at various shifts and speeds, and in either polarity.

At the bottom of this stack of equipment is an Info-Tech M-600 RTTY monitoring unit. Although superseded by a newer model, the M-6000, it remains a very popular RTTY decoder. Its only connection to the communications receiver above it is a plug taking the audio from the receiver's tape recorder output.



This RTTY transmission from a Cuban embassy is informal and personal in style.

RTTY station listings, ideally, list these settings for individual stations as reported by those who have sent in the loggings. So, if you see a RTTY station listed as 425/66N, you know that it had a 425 Hz shift, and was transmitting at 66 wpm with normal polarity. You don't really require this information, (you can figure it out for yourself), but it may help you in proper tuning of weaker signals.

There are commonly encountered shift/speed combinations. Most weather and military RTTY transmissions seem to use an 850/100 combo. Press stations appear to prefer 425/66. Ships using RTTY (most are Soviet flag vessels) are commonly monitored using 170/66N. Stations using ARQ, which includes most maritime and many diplomatic stations, use a standardized 170/135 format and so those figures are not normally given with each listing, likewise with FEC mode. Hams use 170/60 mode.

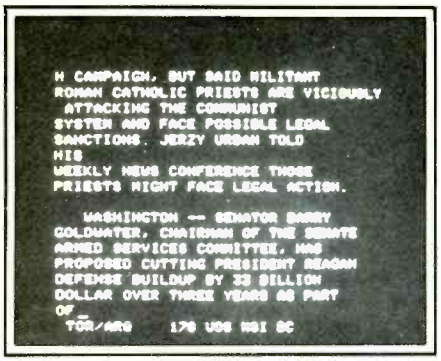
RTTY signals can turn up throughout the shortwave spectrum between 1.8 MHz to 25 MHz, although they are more highly concentrated in some frequency areas than others. Look for RTTY and ARQ signals from ships and coastal stations in the bands shown in Table 1. Signals from other types of RTTY and ARQ stations are plentiful in the bands indicated in Table 2, and don't forget that the CW portions of Ham bands produce RTTY and ARQ signals. You'll probably hear occasional RTTY signals causing interference to international broadcasting stations! An ARQ signal, by the way, is a pulsating sort of affair and sounds a bit like a cricket chirping.

Table 1
RTTY/ARQ Maritime Bands

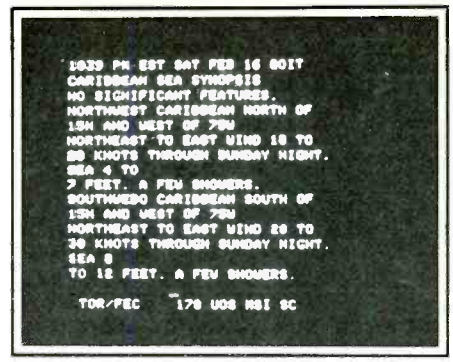
4170 to	4179 kHz (ships)
4350 to	4357 kHz (coastal stations)
6256 to	6270 kHz (ships)
6495 to	6505 kHz (coastal stations)
8297 to	8357 kHz (ships)
8705 to	8718 kHz (coastal stations)
12491 to	12527 kHz (ships)
13071 to	13100 kHz (coastal stations)
16660 to	16705 khz (ships)
17197 to	17231 kHz (coastal stations)
22192 to	22227 kHz (ships)
22561 to	22594 kHz (coastal stations)
25076 to	25090 kHz (ships)

Some of the more interesting and unusual stations often turn up inside or outside of the edges of the bands shown in Table 2, and on other frequencies where you wouldn't normally think to seek them out, such as in the bands set aside for international broadcasting. Look everywhere for RTTY signals and you'll often be pleasantly surprised!

Interpol's plaintext traffic is always interesting, Telexes to and from ships at sea are often either dramatic or amusing (or



ARQ mode is used by many maritime stations. This ARQ transmission was a complete newspaper being sent to ships at sea by a coastal station. It even contained sports scores and the latest Wall Street prices!



FEC mode is similar to RTTY and can be received over some RTTY decoders. This FEC transmission shows a weather forecast sent out by a maritime coastal station. (All photos courtesy E.R. Howard, KNJ2MX.)

Table 2
RTTY/ARQ "Best Bet" Bands

4000 to 4063 kHz	11975 to 12330 kHz
4438 to 4650 kHz	13360 to 14000 kHz
4750 to 5450 kHz	14350 to 14990 kHz
5730 to 5950 kHz	15450 to 16360 kHz
6765 to 7000 kHz	17360 to 17550 kHz
7300 to 8195 kHz	18030 to 21000 kHz
9040 to 9500 kHz	21750 to 21870 kHz
9775 to 9995 kHz	22720 to 23200 kHz
10150 to 11175 kHz	23350 to 24890 kHz
11400 to 11650 kHz	25010 to 25070 kHz

both), plaintext diplomatic traffic can provide things to think about, and the general mix of news transmissions, military traffic and mystery signals makes RTTY monitoring a never-ending source of DX and interesting/exciting listening fare.

RTTY stations are listed in popular frequency directories such as *The Confidential Frequency List*, by Perry Ferrell; the *Guide to Utility Stations*, by Klingenfuss; and the *Guide to Embassy and Espionage Communications*, by Tom Kneitel. These registries are available from leading communications book suppliers. The Klingenfuss book contains a massive amount of information but deliberately avoids listing any of the many mystery or tactical stations because the author, rather arrogantly, has decided that such stations are "nonsense" (his terminology). Also, be aware that the author of that registry seems to think that the world is waiting to rip off his directory and has therefore inserted the words "Klingenfuss copyright" throughout the book to the point of exhaustion; they are scattered copiously throughout the directory in the text, hidden in frequency listings, station locations, and everywhere else. It's a bit of a turn-off, but the directory itself is still worth having.

Ferrell's registry contains loads of listings, including hundreds omitted by Klingenfuss for one reason or another, including those dismissed as "nonsense." Kneitel's embassy/espionage guide is essential in following the diplomatic and espionage activities on the shortwave bands. Of course, each of these three books contain more than RTTY listings and are of invaluable use to those who monitor all non-broadcast communications using SSB, CW and AM modes in addition to RTTY and ARQ.

You'll probably also want to have a copy of Tom Harrington's directory, *World Press Services*, a frequency list and manual showing English language press transmissions. Listings are by time, frequency, and nation.

The hardware for RTTY monitoring comes from Info-Tech (sold through Universal Shortwave Radio), Kantronics, Microcraft, HAL, MFJ, AEA, Microlog and several others. There's a wide selection

from which to pick, including some equipment intended to be used in conjunction with home computers. This equipment is available from communications dealers and mail order suppliers. Don't hesitate to check with *POP'COMM* advertisers.

Many books have been filled with information about RTTY; all we have attempted here is to offer the most basic and capsulized crash course on the topic. If you have considered getting started in RTTY monitoring, this should give you the answers to many of your questions; if you're already into it and still have questions, this information will be of use too!

Readers are invited to share their RTTY/ARQ/FEC/FAX loggings with others who monitor these modes. Send your loggings in to this column!

RTTY Loggings
(All Times Are UTC)

2656: NNNOMQU, USN/USMC MARS sending telegrams from Marine Corps members to NNNOGAT at 2234, 170/100R.

4171.5: LENA, cruise ship SONG OF AMERICA w/Telexes in ARQ at 0356.

4607: 51DEL2/4, a unit of the Spanish Navy, w/RYRY & SGSG marker at 0138, 850/100R.

4891: FIT89, Auxerre Police, France in ARQ at 0147 running an "FZFZ" marker.

5187: ETD3, Addis Ababa Airadio, Ethiopia, at 0300, 85/66R w/RYRY & asking "How do you read?"

5442.5: 70C, Khormaksar Airadio, South Yemen, w/RYRY at 0312, 425/66R.

5814: EYAAYH, unknown station w/RYRY at 2328, coded wx at 2330, 850/66N.

6896: RYRY & foxes at 1235, no ID, 425/66N.

7657: YZD, Tanjug Belgrade, Yugoslavia, at 0014 w/nx in EE, 425/50R.

7756.2: WFB37, New York, w/SS & EE telegrams to Cuba at 0030, 850/66N.

7954.3: LRN85, Dyn Buenos Aires, Argentina, at 0040 w/SS nx, 850/100R.

7963: GXQ, Army, London, England, w/RYIRYI, foxes, & 1 to 0 count at 0045, 425/66R.

8032: AP instructions to AFRTS sports directors about getting latest up-to-the-minute game scores by using special unlisted AP telephone #'s. Monitored at 2055, followed by AP nx in EE. This in 85/66R FDM-mode, monitored on an Info-Tech M-600 which isn't supposed to receive FDM xmsns!

8070: Navcomcen, Capetown, RSA at 0050 w/coded tfc, 850/100R.

9330: "JYJY" marker, no ID given, noted at 2245, 425/66R.

10223: RYRY marker, no ID, at 0245, 300/66R.

11124.5: DPA nx in EE from West Germany, at 1845, 425/66R. Off at 1851.

11638: DDK8, Frankfurt Meteo, FRG w/coded ex at 1913, 425/66R.

12120: NAU, USN Roosevelt Roads, PR w/foxes at 1818, 850/100N.

12190: 5NK, Kano Meteo, Nigeria w/CQ & RYRY tape at 2122, 600/66N.

12500: YUFS, possible Yugoslavian flag ship, in FEC mode at 1740 to HEC. Stated location was Gulf of Mexico.

12510: XCTM, Mexican flag bulk carrier M/V TENOCH (824 ft. long) w/Telexes in ARQ at 1750; also UMFW, un-ID Soviet ship calling RNO at 1814, 170/66N.

12521: UKUX, Soviet cargo carrier MEJGORIE at 1826 calling UFB, 170/66N.

12523: UYUE, Soviet cargo ship NIKOLAY KREMLYANSKIY, at 1827 w/RYRY & calling UFB, 170/66N. Home port of ship: Odessa.

13400: LZG3, Sofia, Bulgaria at 1330 w/nx in EE, 425/66R.

13520: SYZ, INTERPOL in Athens, Greece w/police bulletins in EE, FF & encrypted. Very stilted EE translated right out of a dictionary included gems such as the gent wanted for " printing and uttering counterfeit currency," and also for "driving vehicles of doubtful origination." Noted at 1308.

13523: YIO71, INA Baghdad, Iraq w/nx in EE at 1340, 425/66R.

13526: DHJ51, Grengel Meteo, FRG at 1608, w/RYRY & CQ, followed by coded wx at 1610, 425/66N.

13530: RVW53, Moscow Meteo, USSR at 1322 w/coded wx, 900/66R.

13538: 5L groups at 1853, 425/66R.

13576.4: HBD44, Swiss Embassy, Stockholm, Sweden at 1330 w/mix 4L & 5L groups; also at 1913 w/tfc & idling, ARQ mode.

13585: HBD46, a Swiss Embassy somewhere, in ARQ at 1334 w/informal Ham-type operations & lingo.

13867.8: Probably MFA in Kinshasa, Zaire, idling in ARQ at 1935. No positive ID.

13954: CLP1, "Prensamin Rex," MFA Havana, Cuba w/nx in SS at 1955, 525/66N.

13966: FF tfc at 1635 in ARQ. ID'd as KLA then sent "TCRH" & "BETH" markers. Who/what?

13995: MFA Havana, Cuba w/5L groups to "Embacuba," Benin, at 1633, 525/50N.

14415: MFA, Minrex Havana, Cuba w/tfc to CLP65 (Cuban Embossy, Managua, Nicaragua) at 2103, 900/100N.

14451: Tfc. in Portuguese & marker reading TVVQTVVQ, at 1955, ARQ mode.

14638.5: 7L1 calling MIN4 in CW at 1310 then switched over to 525/100N RTTY & turned out to be MFA Havana to Prague, Czechoslovakia w/5L & mixed letter groups.

14795.7: FTO79A/81, Paris, Fronce, w/AFP nx in FF at 1258, 425/66N.

15710: RWN76, Moscow, USSR w/TASS nx in FF at 1330, 425/66R.

15897.5: OLS4, CETEKA Prague, Czechoslovakia, w/EE nx at 1540, 425/66N.

15950: CXR, Uruguay, calling NBA at 2020, 850/100R. Montivideo Naval Radio.

15966: Dutch Embassy tfc about Paramaribo, Suriname at 1840, ARQ mode.

16112: Polish language Telexes to, from, or about Rabat, Morocco, at 1343, 200/100N.

16190: RGW26, TASS Moscow, USSR at 1422 w/RYRY & FF nx, 425/50R. ID'd as REM57/RBX42/RED52/RGW26/RB178/RFD53/R1C71.

16194: NBA, USN Balboa, Panama at 2025 w/EE & SS tfc, 850/100R. Naval exercise tfc about "IAWG" to several South American navies.

16295//17024: Marker reading IYDIYP at 1400, ARQ mode.

16433: GXQ, British Army, London, England at 1412, w/RYIRYI & foxes, 170/66R.

18215: VOA Greenville, NC w/RYRY & "VOA calling - more to come - please standby," at 2100, 425/100N.

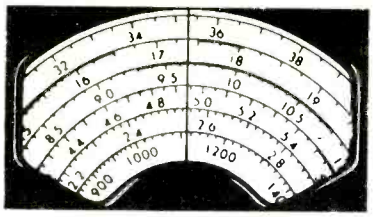
18697.7: DFS70L3, Hamburg, FRG, w/DPA nx in EE at 1510, 425/66N.

18785: FTS78, AFP Paris, France, at 1750 w/nx (listed as DIPLO nx), 425/66N.

20471.5: CXR, Montivideo Naval R., Uruguay, at 1526 w/RYRY, 850/100R. PC

Abbreviations Used In The RTTY Column

AA	Arabic
ARQ	SITOR mode
BC	Broadcast
EE	English
FEC	Forward Error Correction 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



COMMUNICATIONS CONFIDENTIAL

BY DON SCHIMMEL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

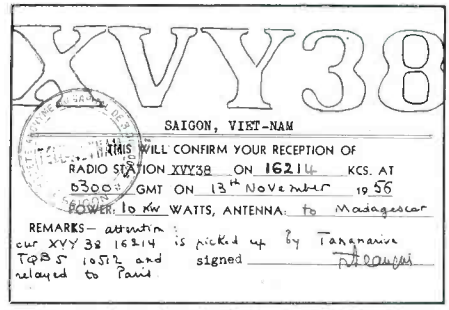
Many readers have expressed interest in contacting fellow SWL'ers in their respective areas. One way of accomplishing this is to check and see if there is a local or nearby SWL Club. Another way is to obtain a copy of the *DX'er's Directory* compiled by Fred Osterman. It is available from Universal Shortwave Radio, 1280 Aida Drive, Reynoldsburg, OH 43086. The Directory presents a listing of listeners by name and by geographic area thus facilitating locating someone with whom you can discuss aspects of the SWL hobby. The booklet also contains information on North American SWL Clubs as well as information on some Foreign Clubs. The Second Edition of the Directory is now available and costs $9.95 plus $1.55 for book rate postage.

Robert King, MN advises that, "The government is considering an installation of 'Over the Horizon Radar' (American Woodpecker?) in Windom, Minnesota, southwestern part of the State, which is about 120 miles west of my QTH. However, the farm community in that area is up in arms because prime farmland would have to be sacrificed." Robert went on to say the Governor is against the project also. (Ed. Note: The concern which immediately comes to mind is, will this OHR cause interference like that caused by the Russian OHR?)

Another newcomer to the utility field is Cliff Richey Jr., CA. He commented, "Well have I found something exciting on the HF's. I've spent the past 40 or 50 years just listening to International Broadcast Stations and Hams. This week I ventured out of my normal bands and hit the utility frequencies. I guess I just thought there was nothing on these frequencies. But boy, was I wrong! I have spent more time listening to these new frequencies than I ever did on the other bands. You've got me started on new horizons. I also want to get into RTTY and FAX."

Jerry Brumm, IL says he was back "on the air" after being out of action for almost three months due to receiver problems. He had sent out his R-390A for repairs of the IF module and when got it back several months later, it still had not been repaired. Jerry indicated he was using the receiver but without any AGC except on the strongest signals. He also advises his country count is growing; it's now up to 89 countries.

To all those readers who supplied loggings concerning the Presidential trip to and from Iceland, many thanks. Typical of the letters received with information on this subject was this note from Norm Metivier, MA.


XVY38

SAIGON, VIET-NAM

THIS WILL CONFIRM YOUR RECEPTION OF
RADIO STATION XVY38 ON 16214 KCS. AT
0300 GMT ON 13th November 1956
POWER: 10 KW WATTS, ANTENNA: to Madagascar
REMARKS— attention
our XVY 38 16214 is picked up by Tananarive
TQB5 10512 and signed
relayed to Paris

Not too many ute QSL's come through from Vietnam, but this prepared reply card was returned to Tom Kneitel back in 1956 from CW station XVY38 on 16214 kHz. Signals from XVY38 were picked up in Madagascar and relayed to Paris by TQB5 on 10512 kHz. (Courtesy Tom Kneitel.)

"I have spent today monitoring the activities of *Air Force 1* and CROWN. Activity started shortly after the Presidential plane left Iceland. Andrews 26,000 (Andy Twenty Six Thousand) was the call on a frequency of 6680 kHz on USB. My receiver was the Uniden CR 2021 using a long wire and 10 db pre-amp. Reception was excellent. Some interesting phone patches were heard including a long transmission from AF-One to the AP and UPI News Services. The article in the January 1984 *POP'COMM*, "How to Monitor the USAF Worldwide" by Harry Caul was extremely valuable to me for this most interesting monitoring."

Jeffrey Hall, WA writes that he took a break from DX'ing for about three weeks and went on a bit of a vacation up in Canada. While there he saw some very interesting antenna arrays in Victoria, British Columbia. Here is what he had to say about them.

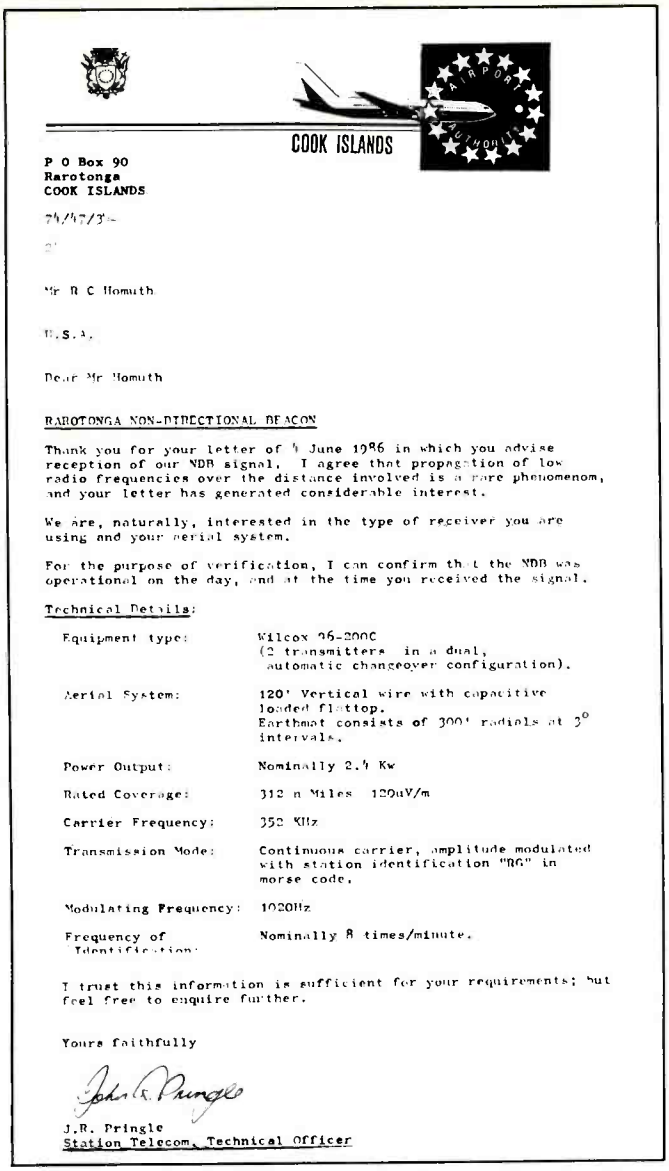
> One atop the Government Customs House looked as though it was designed for a complete SW/UHF/VHF rig. Another was atop the old Douglas Hotel, just across the street from where I was staying, which not only was fitted with several microwave intercepting cones, but also had several HF arrays. No idea who used this but several VHF antennas and a huge satellite dish were included in the same complex.
>
> I also picked up a book from the Canadian Coast Guard called *Radio Aids to Marine Navigation (Pacific), Telecommunications and Electronics Directorate*. The book is available by mail from the Canadian Government Publishing Center, Supply and Services Canada, Ottawa, Ontario, K1A 0S9, catalogue number T51-5/31-1/WE for $1.20. This book is chock full of useful information on frequencies, callsigns, procedures, Loran stations, with lots of maps and addresses and covers the west coast of Canada, the western Arctic area, the Athabasca-Mackkenzie watershead area as well as the Gulf of Alaska. In paperback, about 100 pages, it's a bargain. Assume there is also a volume for the Atlantic. The information is updated weekly in broadcast notices to shipping, or in the weekly publication notices to mariners.

Jeff, we appreciate the information.

Another great DX catch by Robert C. Homuth, AZ. He describes it in this note: "The Cook Islands are difficult enough to log on the SWBC and HF utility bands, but I was fortunate enough to log this station on longwave. Every 28 days, the sun rotates, and the low frequencies suddenly peak at this time. I picked up 'RG' just after sunrise on 352 kHz alone on the band, right during

The entrance to the world's most powerful station—NAA in Cutler, ME. The sign at the gate of this U.S. Navy site states the claim. This photo was snapped last summer by Alice Brannigan.

Here's QSL from Wilhelm ("Susu Kental") Johannes, YD2DKL and SSB-052 of Indonesia. A photo of the operator is combined with a drawing of a local scene to produce an attractive QSL.



COOK ISLANDS

P O Box 90
Rarotonga
COOK ISLANDS

7?/?7/3?

Mr R C Homuth

U.S.A.

Dear Mr Homuth

RAROTONGA NON-DIRECTIONAL BEACON

Thank you for your letter of ? June 1986 in which you advise reception of our NDB signal. I agree that propagation of low radio frequencies over the distance involved is a rare phenomenom, and your letter has generated considerable interest.

We are, naturally, interested in the type of receiver you are using and your aerial system.

For the purpose of verification, I can confirm that the NDB was operational on the day, and at the time you received the signal.

Technical Details:

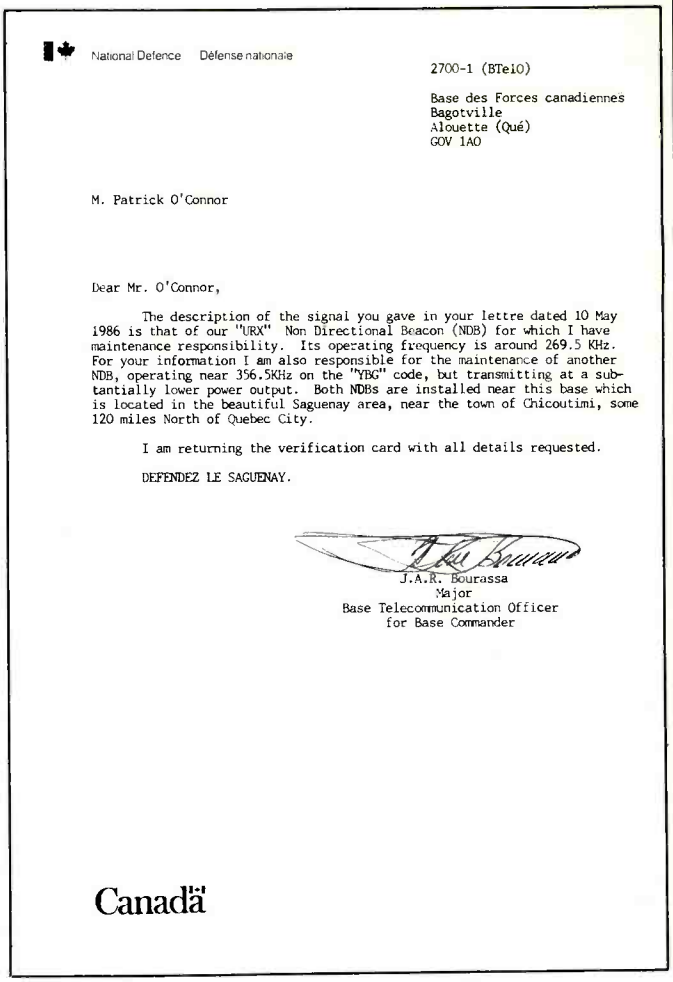
Equipment type:	Wilcox 96-2000 (2 transmitters in a dual, automatic changeover configuration).
Aerial System:	120' Vertical wire with capacitive loaded flattop. Earthmat consists of 300' radials at 3° intervals.
Power Output:	Nominally 2.? Kw
Rated Coverage:	312 n Miles 120uV/m
Carrier Frequency:	352 KHz
Transmission Mode:	Continuous carrier, amplitude modulated with station identification "RG" in morse code.
Modulating Frequency:	1020Hz
Frequency of Identification:	Nominally 8 times/minute.

I trust this information is sufficient for your requirements; but feel free to enquire further.

Yours faithfully

J.R. Pringle
Station Telecom, Technical Officer

A Cook Islands QSL received by Robert Homuth, AZ.



National Defence Défense nationale

2700-1 (BTe10)

Base des Forces canadiennes
Bagotville
Alouette (Qué)
G0V 1A0

M. Patrick O'Connor

Dear Mr. O'Connor,

The description of the signal you gave in your lettre dated 10 May 1986 is that of our "URX" Non Directional Beacon (NDB) for which I have maintenance responsibility. Its operating frequency is around 269.5 KHz. For your information I am also responsible for the maintenance of another NDB, operating near 356.5KHz on the "YBG" code, but transmitting at a substantially lower power output. Both NDBs are installed near this base which is located in the beautiful Saguenay area, near the town of Chicoutimi, some 120 miles North of Quebec City.

I am returning the verification card with all details requested.

DEFENDEZ LE SAGUENAY.

J.A.R. Bourassa
Major
Base Telecommunication Officer
for Base Commander

Canada

Beacon QSL received by Patrick O'Connor.

the middle of summertime. The signal was weak, but easy to copy. The station is easy to hear on the Pacific coastline, but it is rare inland. My receiver is a DX-400 connected to a two-foot loop made from scrap parts."

I have again received queries from some readers asking when they can expect to see their loggings in print. As explained in the past, there is a lag time (as is the case with any national monthly) between items received and the appearance of those items in the magazine. While I do try to choose entries from each person, some have to be eliminated because they had been received earlier from another submitter. Others are not used because they lack too many details or they are too closely spaced together and when I cut them apart some adjacent loggings become mutilated.

Mike Homer, PA sent in some interesting Search & Rescue missions he had monitored. His log read as follows: "15015 kHz at 1635 UTC in USB. Albrook AFB setting up phone patch for KING 30 to RCC Scott AFB. KING 30 stated they spotted a survivor in an orange raft 40 miles off Grand Turk at 1645. Stated they are sending two Jollies (Search & Rescue copters) in, and are circling the survivor. Stated in second phone patch to '23rd Operations' that they are going to escort the survivor and the two Jollies to Antigua and said the survivor does not speak English. Third phone patch was to Homestead AFB at 1700 for rescue operations. Stated two survivors were found and they dropped one 'PJ' into the water. Wanted clearance to go to Grand Turk if they want to land there. Also stated both survivors are in good condition."

I just received a request from a young lad asking that I transmit a plea for a receiver. His note stated his radio had just "died" and he was the 16-year-old son of a single parent. His only jobs are with a volunteer ambulance corps and the Law Enforcement Explorers. He is looking for a job, but says there are none locally thus far that will hire an inexperienced teenager. If someone has an old but working receiver they no longer need, his name is Don Pearce, 61-21A 223 Place, Bayside, NY 11364. How 'bout it gang?

Now let's get to some of the most interesting and exciting intercepts ever—and why haven't *you* sent in your "ute" station loggings to this column?

Intercepts
(All Times Are UTC)

227: SJY beacon, San Jacinto (Ryan-Hemet), CA at 1350 (Tim Magrann, CA).
236: RZT beacon, Chillicothe, OH at 0404 (Pat O'Connor, NH).
260: UFX beacon, St. Felix de Valois, PQ at 0235 (O'Connor, NH).
285: NE beacon, Newport Bay (West Jetty Light 3), CA at 0212 (Magrann, CA).
308: L beacon, periodically changing to "A" beacon, noted at 0400 (Magrann, CA). My refs indicate these are probaby 2 different stations, "L" of Bonilla Is., BC, on 308 kHz, & "A," the Richibucto Head Light, NB; or Cape Bonavista Light, NF, both on 310 kHz-- Ed.
348: APG beacon, Aberdeen Proving Ground, MD (Philips Army Airfield) at 0401 (O'Connor, NH).
360: RW beacon, Camp Springs (Andrews AFB- Kirby), MD at 1529 (Brown, MD).
372: CQD beacon, Erie, PA at 0414 (O'Connor).

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)

376: ZIN beacon, Gt. Inagua, Bahamas at 0420 (O'Connor, NH).

378: GFG beacon, Leesburg (Muni-Godfrey), VA at 1531 (Brown, MD); CPM beacon, Compton, CA at 0902 (Magrann, CA).

386: DB beacon, Dolbeau, PQ at 0328 (O'Connor).

397: A beacon, Hamilton, ONT at 0350 (Ross, ONT, Canada)

410: NZJ beacon, Santa Ana (El Toro MCAS), CA at 1007 (Magrann, CA).

414: BC beacon, Baie Comeau, PQ at 0335, also PCW beacon, Pt. Clinton (Keller Fld.), OH at 0335 Ross, ONT).

428: EEJ beacon, Sanford, NC at 0230 (O'Connor).

484: KLC, Galveston, TX with CW tfc list at 0330 (Ross, ONT).

1634: KA83329 apparent call of un-ID CW station at 0604 (Ross, ONT). My records show this call assigned to an 800 MHz business band station in UT-- Ed.

1675: IPEA beacon, possible ID was IPE with extra-long "dah" in the "A" (Carol Kirk, CT).

1685: MER beacon, Mercaderes, Colombia at 0850 (Kirk, CT).

2385.4: 58FGX calling 57UOP via taped msg in CW at 0308, also on 4234 kHz at 0618. Probable Spanish Navy (Jerry Brumm, IL).

2605: M9Y in CW at 0100 w/mil format tfc (Tom Kneitel, NY).

2696.7: GLD3, Lands End, England w/combo CW/ARQ marker at 2356 (Kneitel, NY).

2716: USS AFFRAY (a minesweeper) to Newport Port Control Radio (RI), USB at 2313 (O'Connar).

2812.2: GYA, Royal Navy, London w/CW call tape at 0113 (Kneitel, NY).

3170: Time pips from un-ID station at 0326; X beacon heard simultaneously in background from another station (Kneitel, NY).

3226: SS/YL in AM at 0441 w/5F gps (Kirk, CT).

4044.4: Un-ID station in CW at 0405 w/5L gps, ends w/AR AR AR VA VA VA (Anonymous, MO). Letter group interpreted as VA was actually SK-- same number/arrangement of di's and dah's, a common telegraph abbreviation meaning "signing off." AR means "end of message"-- Ed.

4054: FSF (France allocation) calling CQ in CW at 0855 (Magrann, CA).

4143.3: DELTA NOVEMBER calling BRAVO FOXTROT in USB at 0011 (Anonymous, MO).

4147: Arabic language net w/OM ops, no apparent ID's, noted at 0513 (Magrann, CA).

4349: CBV, Valparaiso, Chile w/CW call marker tape at 0713 (Brumm, IL).

4394: 'Phone patch in USB at 2355. The YL appeared to be in show business. Ship not ID'd (R. Kirg, MN).

4431: NMN, USCG Portsmouth, VA w/info on burning Soviet sub & asking all vessels to stay clear of area. Hi seas wx followed. In USB at 0030 (King, MN).

4541: 5L groups in CW at 1950 (Kneitel, NY).

4582: Illinois CAP net (REDFOX) in USB at 1530 w/earthquake drill (Anonymous, MO).

4623: Un-ID CW station at 0237 sending a continuous string of seemingly random letters (Kneitel, NY).

4630: 5F groups in CW at 0926 (Magrann).

4675: Scandanavian 902 (airliner) wkg Gander (NF) in USB at 0055 (Ross, ONT).

4725: EE/OM w/mil tfc in USB at 1302; phonetics & numbers (Magrann, CA).

4755: CYML, Canadian oil tanker IRVING OURS POLAIRE at 1145 in USB to XJP81 at St. Johns NB. Many other vessels also heard wkg XJP81 daily around 1100-1200 (Kneitel, NY).

5352: JAVELIN (net control) in USB wkg FREEMASON, ALLEY CAT, DRIVE-IN, & CONDOR, exchanging authenticators, then telling all to switch to "Charlie 3" freq w/RETAIL as net control (JAVELIN=RETAIL); noted at 2213 but couldn't locate Charlie 3 (Kneitel, NY).

5598: San Juan (PR) & Santa Maria (Azores) wkg airliners in USB at 0230 (Goubeaud, TN).

5696: Rescue Command Center in Juneau (AK), at 0340 in USB wkg Rescue 1707 on site above disabled vessel ALASKAN ENTERPRISE afire near St. Lawrence I. Other vessels to tow ship to Ditch Harbor. This via Kodiak Commsta w/much scrambler QRM. Action was in Bering Straits (J. Hall, WA). Also noted NMK, USCG AirSta at Cape May, NJ, USB at 0222 wkg 63 CAPE MAY off Diamond Beach investigating red flare sighting reports (Brumm, IL).

5815: OM/SS w/3F gps in USB at 0125 (Ross, ONT)

6218.6: WGK, St. Louis in USB at 1210 to a tug at La Grange Lock on Misssissippi River (Goubeaud, TN).

6228: SS/YL in AM mode at 0813 w/5F gps (Magrann, CA).

6283.3: 5F gps in CW at 1322, no ID used, hand sent. Ended when receiving station QSL'd (Anonymous, MO).

6388: CTP, Oeiras Naval R., Portugal in CW w/VVV marker at 0352 (Anonymous, MO).

6459.5: LSA, Boca, Argentina w/VVV tape in CW at 0405 (Anonymous, MO).

6697: 5GT in USB at 1100 on this USN freq asking any station for a radio check-- but no replies (Kneitel, NY).

6750: TEAL 03 in USB asking CUW (Lajes Field, Azores) for patch to Miami Monitor (NOAA) at 0412. Passed ex data (Homer, PA).

6803.3: SPW, Warsaw, Poland in CW w/data burst of call marker at 0342 (Kneitel, NY).

6910: S4C, X4Z and another station that couldn't get its ID straight, alternating between C4P, VKJ and CKJ at 2025. Switched over to 85/60 encrypted RTTY (Kneitel, NY).

7455: Warbling jammer covering Syrian Broadcasting Service at 0400 (Kneitel, NY).

7538: NMR, USCG San Juan, PR in CW at 0039 w/maritime notices & msg re aero bombing practice (Bob Margolis, IL).

7552: CTP, Oeiras Naval R., Portugal in CW w/VVV tape QSX 4 6 8 12 MHZ at 2330 (Kneitel, NY).

7723: 5L gps in CW at 0406 (Kneitel, NY).

7845: YL/SS in AM mode at 0708 w/#'s (Richey, CA).

7863.4: SPW, Warsaw, Poland at 2253 w/xmsn as listed for 6803.3 kHz (Kneitel, NY).

7887: OM/SS in AM mode at 0508 w/#'s (Richey, CA).

8110: Broadcast feeder in USB at 1235, Oriental language (Kneitel, NY).

8114.7: 5L gps at 2315 in CW (Kneitel, NY).

8158.3: K beacon (weak) in CW at 2018 (Kneitel, NY). At 0945 on 8147 kHz (Magrann, CA).

8160: 5L gps in CW at 0332 (Kneitel, NY).

8188.7: TBO/2 (Turkish allocation) w/VVV CW marker & "IZ IZ" at 2026 (Kneitel, NY).

8191: O beacon in CW at 2215 (Kneitel, NY).

8205: 3ERH2, the YICK ZAO, a Panamanian flag vessel sporting a Chinese name, sending Telexes in CW at 1655 (Hall, WA).

8241.5: Cruise ship LEONID BREZHNEV at 2104 w/patches through Portishead R., USB at 2104 (O'Connor, NH).

8249: OM/RR in USB at 0231 w/phonetics & RR tfc (Magrann, CA).

8300: YL/CC in AM mode w/2F gps, each figure X2 (Magrann, CA). Time?-- Ed.

8376: JOS, Nagasaki, Japan in CW at 0954, repeating callsign, hand keyed (Magrann, CA).

8390: COJD, Cuban stern trawler factory fishing vessel, the RIO ALMENDARES, w/Telexes in SS at 0541 in CW (Margolis, IL).

8366: 3EDO4, a Panamanian vessel working "CPS" in duplex CW then QSY'd (Hall, WA). CPS is a Bolivian allocation, but what is it?-- Ed.

8478: JCS, Chosi, Japan in CW at 0824 w/freq list (Magrann, CA).

8502: XSG, Shanghai, China in CW at 1731 w/call marker & QSX info (Hall, WA).

8521: VIS, Sydney, Australia w/VVV CW marker at 1134 (Kneitel, NY).

8548: DZF, Bacoor, Manila, Philippines in CWCW at 1742 w/call tape & annct of wx xmsn sked (Hall, WA).

8557.5: CCV6, Valparaiso Naval R., Chile in CW at 1439 relaying Telex from CBPR, CABO PILAR to KFS (on 8443.6) (Margolis, IL).

8627: FUM, Papeete Naval R., Tahiti in CW at 1036 (Magrann, CA).

8630: 9MB4, Penang Naval R., Malaysia in CW at 1814 w/marker. QRM'd by NOJ, USCG Kodiak on 8628, & XSW, Kaohsiung, Taiwan on 8631 (Hall, WA).

8825: New York Airadio to KLM 776 & other trans-Atlantic flights, USB at 0035 (Goubeaud, TN).

8830: Honalulu in SSB at 0536 w/aero wx (Linville, AB, Canada).

8964: GULL 20 asking AGA, Hickam AFB, HI, for patch to wx forecaster. Passed wx data, USB at 0343 (Homer, PA).

9022: Warbling jammer at 2150 covering broadcasts of the Voice of The Islamic Republic, Teheran, Iran (Kneitel, NY).

9055: IRONMAN calling OVERTIME in USB at 1440 (Magrann, CA).

9348: VOA feeder (unlisted) in LSB at 1220 (Kneitel, NY).

10000: BPM, Shaanxi (a/k/a Shanghai) Astronomical Observatory Time Station, China at 1339 w/CW ID thru severe WWVH QRM. WWV normally dominates but was very weak at the time (O'Cannor)

10033: Mexico City Airadio, Mexico in USB at 1500 to various aircraft (Margolis, IL).

10124: CIO2, presumed Mosssad (Israeli Intelligence Agency), YL/EE in USB at 2145, at 2150 she said CIO & abrupt s/off (Kirk, CT). Kneitel's Guide To Embassy & Espionage Communications book deals at length with (& lists) Mossad's stations-- Ed.

10284.4: U beacon in CW at 0106 (Brumm)

10780: AFE71, Cape Radio, Canoveral AFS, FL to "409" in USB at 1251 (Kneitel, NY).

11114: CMU967, Soviet Naval Base, Santiago, Cuba, in CW at 0304 w/VVV & tfc (Kneitel, NY).

11157: Familiar but still mysterious CW "OM" net w/duplex tfc at 1542. Using OM OM OM as call: OM OM R PKV C IMI then OK OK ZBR K as final. Nothing heard on 13555 kHz (Hall, WA).

11176: Albrook AFB Panama w/patch for GULL 01 to TEAL OPS & Miami Monitor. GULL 01 requested clearance thru dangerous areas Whiskey 92 & 602-- probably areas of severe weather (Homer, PA).

11182: CENTURY 56 wkg RAYMOND 24 (Tinker AFB) in USB at 1950 (Goubeaud, TN).

11454: LBA2/6/10, Norwegian Naval R., Stavanger, Norway in CW at 1903 w/VVV & the msg "QSX NO 120/123/126/127" (Kneitel, NY).

11470: Net of several stations, OM ops, in un-ID language, USB at 2245 (Kneitel, NY).

11533: YL/SS on LSB at 1418 w/4F gps (Magrann).

11715: Warbling jammer attacking VOA Philippines at 1402 (Kneitel, NY).

11885: MG (noise jammer), presumed Soviet, going after RFE at 2117 (Kneitel, NY).

12220.4: YL/EE in AM mode at 1709 w/5F gps X2 (Brumm, IL).

12225: S beacon in CW at 0240; S sent every 2 seconds in semi-slow CW. Never heard this before (Hall, WA).

12281.7: C3N (Andorra allacation) in CW at 1450 w/repeating tape reading "VVV C3N 077/388/300" (Kneitel, NY).

12429: Active USB maritime mobile channel around 1600 w/KHT, Collins Radio wkg KPKL, EXXON Benecia, KNJL the M.I. Hudson. The KHT op ID's as Exxon W. Coast Fleet Office. At 1715 noted KAO, Redwood City, CA to a research vessel re "Privilov Canyon." At 1731 heard KST, Tacoma to WNVW, the M/V BOSTON possible 11.5K-ton freighter out of Pt. Angeles, WA (Hall, WA).

12600: LZS, probably Sofia Naval R., Bulgaria in CW at 0413 w/VVV marker (Hall, WA).

12606: 3EAJ3, Panamanian dry cargo ship COLUMBIA GLORY in CW at 1530 w/Telex to Seoul, S. Korea (Margolis, IL).

12659: 9VH37, Singapore in CW at 1744 w/call marker (Hall, WA).

12670: UDH, Riga, Latvian SSR, at 1417 in CW w/call marker (Kneitel, NY).

12687: OFJ, Hensinki R., Finland, in CW at 1523 asking for QSX 12 MHz (Kneitel, NY).

12693: URD, Leningrad, USSR in CW at 1526 asking for QSX 6 8 12 & 16 MHz (Kneitel)

12702.3: XFL, Mazatlan, Mexico in CW at 2013 calling CQ (Anonymous, MO).

12708: VRT, Bermuda in CW at 1838 w/marker (Brown, MD).

12749.9: CWA, Cerrito, Uruguay in CW at 0035 calling CQ (Jackson, OK).

12794.8: PWZ33, Brazilian Navy, Rio de Janeiro, Brazil in CW at 2326 w/presumed PP language tfc (Jackson, OK).

12836: XDA, Mexico City, Mexico in CW at 1812 w/VVV marker (Brumm, IL).

12855: UBF2, Leningrad, USSR in CW at 1621 w/4F tfc (Brown, MD).

12880: SAG, Goteborg, Sweden in CW at 1617 w/marker (Brown, MD).

12907.5: VHP, Commsta Canberra, Australia in CW at 0331 w/VVV marker (Jackson, OK).

12949: UFB, Odessa, Georgian SSR in CW at 1603 to several vessels (Brown, MD).

13023.7: HEB, Berne, Switzerland calling CQ in CW at 2009 (Jackson, OK).

13046.3: PZN, Paramaribo, Sutiname in CW at 1637 w/call tape (Brown, MD).

13091: UAH, Tallinn, Estonian SSR in CW at 1544 w/call marker (Brown, MD).

13201: X beacon in CW at 1544 (O'Connor, NH).

13241: PATCHWORK in USB at 1546 w/coded tfc (O'Connor, NH).

13205: Mike Bravo Gulf to HEEG0, Berne, Switzerland LDOC in USB at 1733 saying ETA Seattle is 1730 local & #1 generator was disconnected. Switched freq to 10069, then 10327 (Homer, PA).

13378: YL/SS in AM mode w/5F gps at 1303 (Kneitel, NY).

13382: GFT, Bracknell, England, in CW at 1600 w/marker (Kneitel, NY).

13385: CW callup of 586 586 586 1 followed later at 1225 w/5F gps (Margolis, IL).

13387: KKN39, US Dept. of State, Washington, DC in CW at 2202 calling KAL71 & asking "QSY 122232" (Kneitel, NY).

13394: Rapid repeating control tones at 1536 (Kneitel, NY).

13420.1: CUA69, Lisbon, Portugal in CW at 1900 w/SS tfc (Kneitel, NY).

13442: EE/YL in USB at 2230, recorded voice repeating 383 383 383 & 1 to 0 count (Kneitel).

13445: SAM 972 to Andrews AFB ("Andy") in LSB at 1805 w/tfc regarding "the Secretary." Mentioned other voice comm freqs as 367-lower & 362-upper; also India Oscar freqs as 035 191 431 & 465 (Kneitel, NY).

13639: VOA feeder in USB at 1918 (Kneitel).

13775:GG/YL in USB at 1644 w/5F gps (Kneitel).

13937.5: ONY27, NATO, Rouveroy, Belgium in CW at 1945 calling ONY24 & passing coded tfc (Kneitel, NY).

13940: FDY, French Air Force, Orleans, France in CW at 1951 sending VVV (Kneitel, NY).

14395: SS/OM net in USB at 1655 (Kneitel, NY).

14467: NNN0COU, USS SARATOGA (aircraft carrier) w/USN MARS patches to NNN0NIK in FL, USB at 2030 (Kneitel, NY).

14520: T11 T11 then 4444 repeated 6 times followed by X in a continuous loop over & over in CW at 1933 (Kneitel, NY).

14613: OQW (Belgian allocation) in CW at 1615 w/VVV marker (Margolis, IL).

15015: RETRO 21 to Scott AFB w/patch in USB at 2313. RETRO 21 was an F-111 flying 142 miles west of Rickenbacker ANGB, OH, was requesting wx for Pease AFB, NH. Was flying at 29,000 ft (Homer, PA).

15215: XN (noise jammer), presumed Soviet, trying to cover RFE at 1709 (Kneitel, NY).

16450: Recorded YL voice repeating 3 words in un-ID language, sounded like "asung shadung noir." USB at 1415 tune-in to s/off 1420 (Kneitel).

16494: WTDK, NOAA vessel DAVID STARR JORDAN noted daily in USB at 1755 wkg WWD, National Marine Fisheries, Scripps Institute, La Jolla, CA. Gives morning reports, 'phone patches, crew matters. This is a 171 ft. vessel out of San Diego (Hall, WA).

16562.5: USB xmsn at 2057 that sounded like a tape played backwards (Anonymous, MO) Did it sound like "Paul is dead"?-- Ed.

16749: HNKQ, Iraqui oil tanker KHANAQUIN callin YIQ Basrah Control in CW at 1507 (Margolis).

16808: V9GU, the DENEB, a Singapore flag heavy lift cargo vessel wkg KFS in CW at 2103 (Hall, WA).

16918.8: VIX, Royal Australian Navy, Canberra, Australia in CW at 0130 w/VVV marker (Jackson).

16923.6: OFJ, Helsinki, Finland in CW at 1500 w/call marker (Brumm, IL).

16942.8: YUR, Rijeka R., Yugoslavia w/CW call marker at 1446 (Kneitel, NY).

17043.2: JCU, Choshi, Japan in CW at 2315 calling CQ (Jackson, OK).

17170.4: PJC, Willemstad, Curacao, Netherlands Antilles in CW at 1458 calling CQ & sending tfc list at 1500 (Jackson, OK).

18990: Radio Libra Grande, USA #2 & others in a rip-roaring Ham-style SS net, USB at 1956 (Kneitel, NY).

22330: D3E51, Luanda, Angola in CW at 1641 w/CQ tape. Callsign sent as D3E51/62/71/81 (Brown, MD).

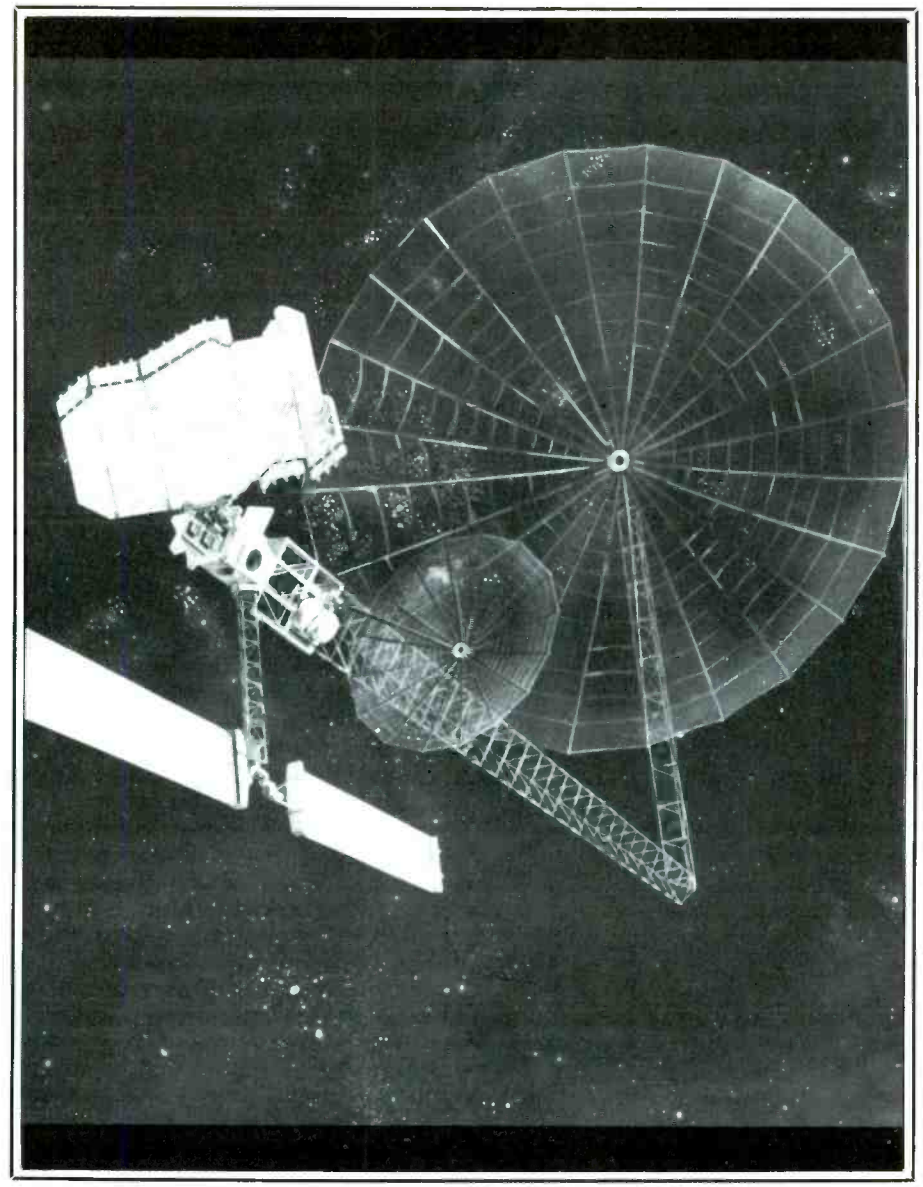
22418: LPD91/34, General Pachecho, Buenos Aires, Argentina in CW calling CQ at 1639 (Brown, MD).

22478: CUL7/22/24, Lisbon, Portugal in CW w/call marker at 1637 (Brown, MD). PC

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

BY DONALD E. DICKERSON



"Today, we support the soldier in the field; tomorrow, we will support the soldier in space," says John Lesniak, force modernization officer at Tobyhanna Army Depot, Tobyhanna, PA.

He was commenting on the recent designation of Tobyhanna as the Army's Center of Technical Excellence (CTX) for space communications. Maj. Gen. Henry H. Harper, commanding general of the U.S. Army Depot System Command (DESCOM), has chartered Tobyhanna for the role, assuring the depot of broad participation in Army space communications programs.

The CTX program is a DESCOM concept that provides depot support to the military development community. That concept commits depot personnel and resources throughout the life cycle of a system. Early involvement of depot personnel helps to insure efficient integrated logistics support and to control costs. Depot support is provided from the design and development phases through fielding, and continous through the maintenance overhaul and repair of the mature system. The space communications role is the 15th CTX assignment for Tobyhanna out of a total of 36 such designations within DESCOM.

The new assignment follows more than a decade of depot experience with space-related communications, primarily the strategic and tactical satellite communications systems of the U.S. Army Satellite Communications Agency (SATCOMA).

"This is an example of our past accomplishments leading to the promise of new workloads in the future," Lesniak says.

The depot's initial CTX involvement includes representation in the Army Space Technology Working Group. Lesniak attended a recent meeting of the group, which evaluates space technology developments that may support Army missions. The group is assessing 13 technological disciplines, including communications, guidance, navigation and control, radar, electro-optics and manufacturing.

"This is really a two-way process," Lesniak explains. "We're offering our capabilities to the Army's space effort and we also hope to reap the benefits of technology that may have application to our depot operations."

Tobyhanna's selection is a logical one, Lesniak notes, when one reviews the depot's past and present involvement in space-related communications. Systems supported by the depot include the Digital Communications Subsystem, the Defense Satellite Communications System Operational Control System, the AN/TSC-85 and AN/TSC-93 satellite communications terminals, AN/GSC-40 satellite command post, and the AN/MSC-64 satellite communications terminal.

Depot support has grown from three assigned engineers and a $2.5 million program in 1975 to 30 assigned engineering personnel and a $19 million program last year. It is expected to grow to 50 assigned engineers and $35 million for strategic systems and an additional $5 million for tactical systems by 1990.

Many other skilled electronics and support personnel are also assigned to depot satellite communications programs, which include fabrication, overhaul and fielding tasks.

The depot has developed unique capabilities to support these satellite communications programs. They include a prototype room for simulating problems and identifying solutions, and a staging room, where systems are configured exactly as they will be configured in the field, an extra step that helps insure a quality product.

Other specialized skills with space-communications application include depot capabilities in fiber-optics and printed circuit board repair, and the development and use of automatic test equipment and test program sets.

Current depot modernization plans also call for the construction of a Satellite Communications Mission Facility in the late 1980's and early 1990's. PC

CLANDESTINE COMMUNIQUÉ

WHAT'S NEW WITH THE CLANDESTINES

BY GERRY L. DEXTER

According to some news reports that appeared early in November, the anti-Sandinista Contras were to have a 50-kW mediumwave station on the air soon, perhaps by the time you read this. The new station, tentatively known as Radio Liberacion, is being put on the air to help the Contras build a larger base of support. The Reagan administration will provide technical assistance for the station but operational funds will apparently come from somewhere else besides the $100 million in aid which Congress authorized for the Contras last year.

The new station plans to try and establish itself as a reliable source for news. One administration official noted that the Contras' current shortwave broadcasts were, according to feedback coming out of Nicaragua, regarded as a joke within Nicaragua and that programming would have to be greatly improved on the mediumwave outlet. No operating frequency was mentioned. Thanks to David R. Alpert, New York for a copy of *The New York Times* story.

About three years ago a station called Vietnamese Resistance Radio went on the air with broadcasts in opposition to the ruling communist government of Vietnam. At last report, the station was operating a split schedule for a total of six hours per day on 7320 and had not, to our knowledge, been heard in North America. Nor is it likely to be heard anytime soon. According to a source with "connections" in Vietnam the station is not currently active and was only sporadically on the air when it was active. However, our contact believes the station may well return sometime in the future since opposition to the current regime seems on the upswing again.

Actually, there was a second anti-Vietnamese station which was due to have gone on the air in the spring of 1985, operated by a group calling itself the Vietnamese Freedom Front, based in Paris. Apparently this one never materialized at all.

The anti-Khadaffi National Front for the Salvation of Libya operates the Voice of the Libyan People with an all-Arabic broadcast at 1600-1800 and 0400-0700 on 11975, and 1900-2100 on 15195. After a long wait an address for this group has surfaced: National Front For the Salvation of Libya, AL-INQAD, 323 South Franklin, Box A-246, Chicago, IL 60606-7093. Unfortunately, there's been no reply to a reception report and inquiry sent to this address—at least not on the first attempt. Nor have we been able to locate a telephone number. Can any Chicago area reader shed any light?

Radio SPLA, which supports the Sudan People's Liberation Movement/Army from an Ethiopian government transmitter is reported to have moved to 9530 for its 1300-1400 broadcast in English, Arabic and Sudanese dialects. The station earlier used 9705 and, prior to that, 9600. Both frequencies are viable alternatives to check if you don't hear 9530. There is apparently an occasional jammer or station broadcasting counter-programming at the same time. Radio SPLA is occasionally heard in the United States. We are still trying to locate a mailing addess or telephone number for the SPLA so if you run across anything . . . .

A Contra patrol heads into Nicaragua.

Radio Caiman was heard on 7470 with U.S. Top 40 at 0200 by Garth Carman of Edmonton, Alberta. We noted it once recently making a reference to RAI in Rome! The FCC says they have observed this station on the air and say the broadcasts are coming from Central America. One congressman, in a reply to our query about Radio Caiman, confused the station with Radio Cayman in the first paragraph of his reply and with the U.S. government's Radio Marti broadcasts in the very next paragraph! Oh, well!

The Radio Free Afghanistan program over Radio Free Europe/Radio Liberty is now scheduled at 0300-0330 on 9660, 9715, 11770 and 11815 and at 1400-1430 on 11885, 15115, 15245 and 17725 from transmitters in West Germany and Portugal. The current schedule represents an increase to half hour broadcasts, now on a daily schedule.

La Voz del CID was heard by Roman Dementiuk of Brooklyn, NY at 0342 on 7380 with "Panorama Mundial" in Spanish.

Additional eyes and ears are needed to help follow the clandestine scene so, if you have an interest in the area of secret radio, we hope you'll help out by forwarding any loggings or information you may run across. Or, better yet, get busy and do a little sleuthing. News items, background information, loggings, illustrative material and so on are welcome at Clandestine Communique in care of *POP'COMM* Headquarters.

Thanks, and good hunting! **PC**

SCAN

Where Oh Where Do I Send . . .

There still is understandable confusion about what to send to SCAN and what to send to *Popular Communications*. Even we were confused at first, so don't feel alone! Here's a brief rundown you may want to save for reference.

Change of Address: If you're a SCAN member, your old mailing label and new address should be sent directly to: SCAN Address Change, P.O. Box 414, Western Springs, IL 60558. Sending it to *Popular Communications* will cause delays if you're a SCAN member. On the other hand, if you're *not* a SCAN member, address changes should go to *Popular Communications*.

Communications Shop Ads: These should go directly to: PC Communications Shop, 76 N. Broadway, Hicksville, NY 11801. Please, please type your ad or print very clearly.

Membership Renewal: Please send your SCAN membership renewal (which includes subscription to *Popular Communications*) only to SCAN, P.O. Box 414, Western Springs, IL 60558. *Popular Communications* subscribers who are not SCAN members should continue to send renewals to *Popular Communications*.

Photo Contest Entries: Send to SCAN Photo Contest, P.O. Box 414, Western Springs, IL 60558.

Public Service Award Nominations: Send to SCAN Public Service Award, P.O. Box 414, Western Springs, IL 60558.

Co-Op Service Orders: Send to SCAN Co-Op Service, P.O. Box 414, Western Springs, IL 60558.

SCAN Insurance Claims: Send directly to Hartford Insurance using the address shown on the policy.

Comments and Suggestions: Always welcome at either *Popular Communications* or SCAN (or both!)

BETTER SIGNALS

ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

BY ED NOLL, W3FQJ

Loading Coil For A Small-Lot Vertical

This column is a follow-up to the January 1986 Better Signals column, "An Easy-up Wideband Vertical For A Small Lot."

The loading coils and matcher of Fig. 1 can boost the low-frequency performance of the simple multi-band small-lot vertical described in January's column. A loading coil does not increase the signal pick-up by a short vertical antenna. Rather, it improves the matching of the antenna to the transmission line and whatever signal is picked up is then transferred from the antenna to the transmission line more efficiently. Thus, in the case of a quarterwave vertical, Fig. 2, the physical length of the antenna can be shortened a reasonable amount and, with a loading coil inserted, there is no drastic decline in the signal delivered to the receiver input. Actually, at lower frequencies there can be a substantial shortening of the vertical and the signal delivered to the receiver can be little different and often a lot better than that delivered by the usual status-quo and too short longwire used on the tropical bands.

A disadvantage of the loading coil is that it limits bandwidth and makes it necessary to use coil taps that must be changed whenever you wish to peak to the utmost a given tropical band. For general listening, though, you can set for resonance on 75 or 90 meters and do quite well on the other bands, too. You can also peak the system for the 30, 40, 80 and 160 meter Amateur bands, radio marine bands and other UTE frequencies over the range between 1.5 and 9 MHz with the loading coil taps. The basic short vertical as described in January provides good results from 9 to 20 MHz. In effect, with the addition of the loader, you do have an antenna that does very well from 1.5 to 20 MHz. All by itself the basic vertical does very well from 6 to 20 MHz and is mediocre from 1.5 to 6 MHz. In this latter case, of course, no loading coil or tap setting procedures are required.

The loading coil in use here and wound on PVC piping, Fig. 1, was described previously in a column on indoor antennas, (Oct. '86 issue). It was a part of the reference antenna we used to check out some indoor antennas. The top of the previous pipe was cut off and the entire loading coil and matcher assembly occupy a 2′ length of the 2″ PVC piping. This assembly is slipped over a short fence post and positioned near the vertical at the point where the antenna terminals are located.

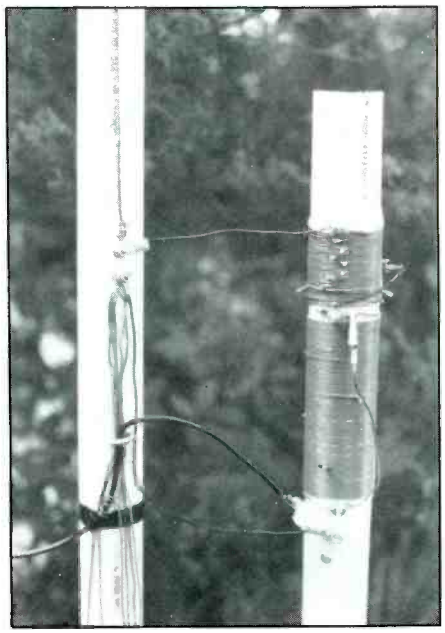


Figure 1: Close-up of loading coil. To its left is the basic multi-band vertical.

To be efficient, a loading coil must have a low loss and a high ratio of inductance to capacitance over a wide range of frequencies. Such conditions are obtained conveniently by using a large diameter coil wound on a low-loss form. PVC piping does the job. A tapped coil wound of #16 vinyl-covered wire is an economical and effective answer.

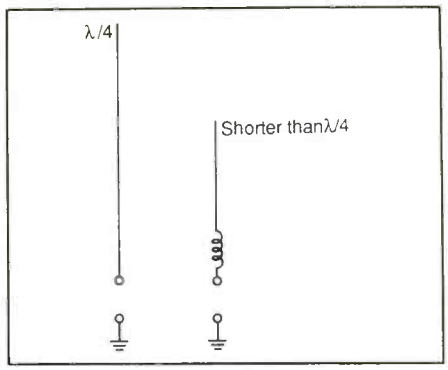


Figure 2: Loading coil permits use of a shorter antenna wire.

There are two separate windings, top and bottom. Both are close wound. The top coil was wound from a 20′ length of wire with taps spaced 1″ apart; the bottom coil a 50′ length of wire with taps separated by 10′. An appropriate piece of wire with clips is attached to the bottom of each coil with a length just sufficient to reach the furthermost tap and also to jump the individual coil completely. The total number of coil turns are 30 and 77 respectively.

When the loader is in operation the terminals of the antenna system are located beneath the coil. In Fig. 1 you can see the transmission line connected to these terminals.

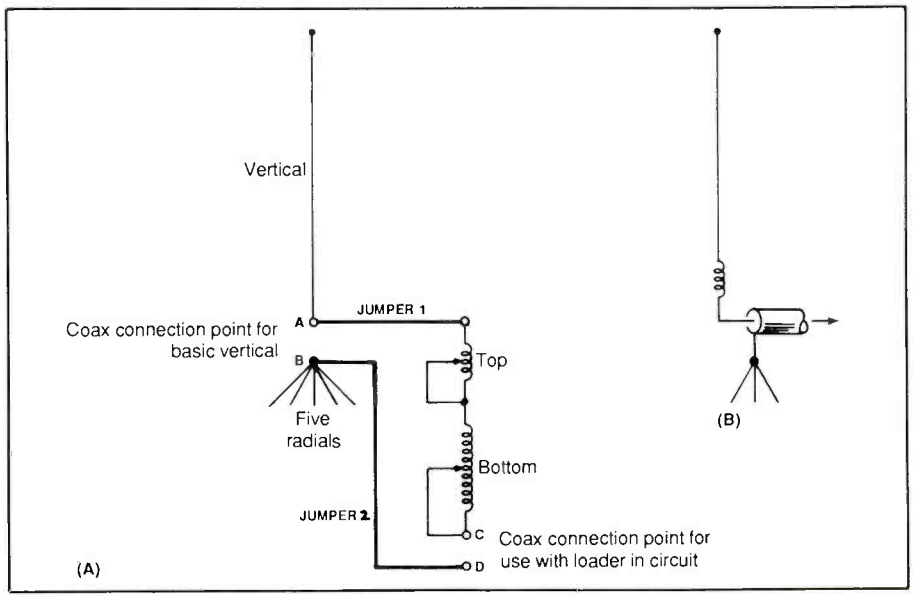


Figure 3: Connecting the loading coils.

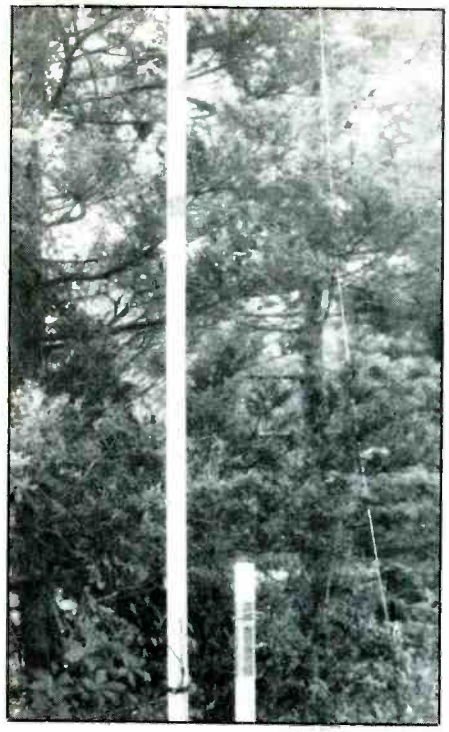


Figure 4: Basic small-lot vertical.

The diagram of Fig. 3 shows how the loading coils are connected into the circuit. Jumpers One and Two do the job. In fact, Jumper Two can be left in the circuit permanently. Jumper One connects the top of the loading coil to the vertical antenna terminal A. Jumper Two connects the radial system of the vertical antenna to terminal B at the bottom of the loading coil assembly. When the loading coil is to be placed into operation, connect Jumper One into the circuit. Connect the inner conductor of the coaxial transmission line to terminal C and the braid to terminal D. In effect, you have then connected the loading coil in series with the vertical antenna to the round radius as shown in Fig. 3B. A close look at Fig. 1 shows Jumper One at the top, the transmission line beneath it is connected across the two terminals C and D below the loading coil and, at the bottom, Jumper Three provides a path from D to the radial terminal on the basic vertical.

The loader is taken out of the circuit by disconnecting Jumper One. Also, the coaxial line must now be connected across the two antenna terminals A and B on the basic vertical. This restores the basic operation of the antenna system to that covered in January's column and repeated here in Fig. 4. Also visible in Fig. 1 is the alligator clip and lead that permits the selection of a proper tap on the bottom coil. As shown, the bottom coil has been shorted out. If you look closely you can also see the alligator clip and lead that is used to locate the proper tap on the top coil. It is these two taps that must be adjusted when you wish to obtain the very best performance on a given tropical band or other frequency segment between 1.5 and 9 MHz.

Loader Checks and Operation

The most precise way of finding an optimum tap position for a given band is to use an antenna meter such as the MFJ-204B connected across the antenna terminals at the bottom of the loading coil assembly. All you need do is start with the highest frequency bands, in this case, 31 meters because the least inductance is needed to resonate the 25 meter vertical on 31 meters. In our installation the antenna meter indicated 31 meter resonance with bottom coil L2 shorted and top coil L1 on the front tap One with numbering beginning at the top of the coil. Only a small amount of inductance was needed.

The next step is to locate a tap that adds a bit more inductance to resonate on the 41 meter band. Table 1 shows the right amount of added inductance was found on rear tap Three. Coil L2 remains shorted.

Table 1 shows the various tap positions for all the SWB bands 31 through 120 meters plus various Ham and marine bands. Your results, more than likely, will not be the same as mine but the table can give you a clue as to the vicinity of the two best possible taps. You can do a reasonable job of locating the precise taps by listening if you set up some kind of a comparison antenna. It is important that you prepare such a chart to avoid a repeat of the necessary procedure for locating good tap positions.

In addition to the various SWB signals you can use for testing, don't forget a number of very reliable 24-hour time signals that fall within or near to most of the low-frequency SWB bands—CHU on 3330 and 7335 (90 and 41 meters) plus WWV on 2500, 5000 and 10000 (120, 60 and 31 meters). On 49 meters, during the daytime doldrums, there are the Canadian stations on 6005 and 6070. A nighttime DW signal can be heard reliably on 3995 (75 meters) plus a lot of radio Hams on the same band. Have fun! PC

Table 1

	Coil L1	Coil L2
SWB Bands		
120	Open	T.2
90	T.8F	T.1
75	T.8F	Short
60	T.6F	Short
49	T.4R	Short
41	T.3R	Short
31	T.1F	Short
Ham Bands		
160 M	T.5F	Open
75 M	T.8F	Short
40 M	T.4R	Short
30 M	Short	Short
Marine Bands		
2.2 MHz	Open	3
4.2 MHz	T.7F	Short
6.3 MHz	T.4R	Short
8.4 MHz	T.2F	Short

F = Front of coil (L1). R = Rear of coil (L1). Higher frequency SWB, Ham and Marine bands best received with basic vertical and loading coils out of circuit (Jumper 1 open).

Table 1: Loading coil table for W3FQJ installation.

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Beaming In *(from page 4)*

tials when you match it up with the fact that when the Senatorial elections were held last November, 62.7% of the eligible voters didn't bother to show up at the polls. It was the lowest voter turnout since the wartime election of 1942—the smallest peacetime voter turnout since 1926! Taking into consideration all of the democracies of the world where citizens are permitted to vote to select their leaders and lawmakers, American voters are at the bottom of the list with the lowest voter participation.

The Director of the *Committee for the Study of the American Electorate*, Curtis B. Gans, commented on 1986 voter apathy by questioning the "moral fiber" of the candidates. He asked, "Can we—as voter turnout continues to decline and the political marketplace becomes increasingly dominated by the special interests who foot the bills for ever more expensive political campaigns—expect the type of sound governments that will rekindle faith in the political process and reverse the trend towards nonparticipation?"

Certainly, the almost two-thirds of the electorate who didn't bother to vote weren't all folks who were dismayed about the way the ECPA had been passed a week earlier. They were people who have become cynical about the ability of any individual or small group to offer significant input on the many different pieces of legislation that are routinely shoved through in a high-handed manner, rubber stamped with approvals through every step of the process despite all outside pleas for reason and logic.

To paraphrase Curtis B. Gans, *money talks*. So what else is new?

Many of us keep fighting anyway. Call it the *Quixote Factor* that generates the steam. *POP'COMM* reader Ed Jones (WB2DVL) of Somerset, NJ wrote to Congress to complain about the passage of the ECPA and received a ray of hope. In a letter from Rep. Jim Courter (NJ), he was told, "I can understand your frustration with this legislation. Cellular phones are a relatively new technology and many aspects of Cellular phone usage, such as the right to privacy and the shortage of airwave space, are still being explored and defined. I am sure that this issue will be raised again in the future."

My advice: don't despair; vote, write, ask, complain, keep the faith!

The way the ECPA was signed into existence, there were still some points that weren't clear, undoubtedly because the legislators who passed the law had but scant knowledge of what it was all about. In a nutshell, it seems that the ECPA doesn't allow the monitoring of signals that are not "readily accessible." That means signals that are encrypted or scrambled, or sent by spread-spectrum techniques, or signals that employ privacy techniques, or on subcarriers, or those sent out over common carriers (except paging tone signals). You aren't supposed to monitor communications from relay satellites, remote broadcast pickup stations, broadcast studio-to-transmitter links, TV remote pickup stations or studio-to-transmitter links, or private fixed microwave. Theoretically, someone would have to complain about a suspected violation.

You *are* allowed to monitor marine, aero, Ham, CB, GMRS, cordless telephone handsets, tone-only paging signals, interference signals (but only long enough to identify the interference—how totally idiotic!), civil defense, law enforcement, governmental, broadcast, land mobile, satellite "network feeds," and certain subcarriers that are not covered by Section 705(b) of the Communications Act. A Senate report on the ECPA that is forthcoming is intended to try to explain the ambiguity and mystery of the ECPA to the public.

As for penalties, assuming that anybody was ever actually caught monitoring any of the unencrypted communications protected by the ECPA, there is a criminal penalty of up to a year in jail and/or a fine of up to $100,000 for a first offense so long as the monitoring was not for a bad purpose. A "bad purpose" is a "tortious or illegal purpose or for purposes of direct or indirect commercial advantage or private commercial gain."

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Essentially, the law itself reflects the stupidity of those who conceived and supported it, and who rubber stamped it into being. An exercise in waste from start to finish—wasted time, money, and effort in order to create a hollow law that is ominous solely on the basis of what future laws will eventually be created in its aftermath. **PC**

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FOR SALE: UNIMETRICS Dolphone citizen band transceiver. 23-channel, excellent condition, telephone-style handset, designed for marine use. $25 plus shipping, Gary Anderson, 451 Lance Dr., Silver City, NM 88061, (505) 538-3280.

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USED RTTY and facsimile equip. from the estate of WA8PFG. Free to a good home. Contact John at P.O. Box 297,. Ronleverte, West Virginia 24970 or (304) 645-7128 after 6 p.m.

WANTED TO BUY or copy: service manual for signal generator measurements FM 560. Also want to buy driver NLD662A for Motorola MX340 155 MHz. D. Beaver, 904 San Felipe, Angleton, TX 77515.

WANTED: FREQUENCIES, CODES and any other information for Chicago and suburbs. All wanted, all needed, will exchange. Kurt Stoudt, 2625 North Forrest, Arlington Hts., IL 60004.

WOULD LIKE TO TRADE frequency info for upper Michigan. Contact J. Felton, 3635 Pinehurst, Boyne City, MI 49712.

RUSSCAN 10-channel, handheld scanner with charger and rubber antenna, (high-low) band, $50. J. Felton, 3635 Pinehurst, Boyne City, MI 49712.

WANTED: BEARCAT 250 scanners. Must be in good working order. No Canadian versions wanted. Top dollar paid. Call or write: Tom Ernst, 207 Milltown Rd., Springfield, NJ 07081. (201) 467-2128.

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VINTAGE RADIO TUBES. Send legal-size SASE for list. Joel Miller, 10635 SE Rex St., Portland, OR 97266.

Advertiser's Index

SCANNING TODAY

(from page 9)

about the ECPA that it jut might happen as a test case. The chances are that this law would be declared "flat out" unconstitutional! Any attorney volunteers out there?

"How Could You . . ."

Recently we received a letter from a member saying, "How could you not respond to my last letter when I took so much time to write it." An explanation is certainly in order. First, please remember that SCAN is a non-profit association with only a part-time staff. We cannot possibly answer every letter, although we try to answer as many as we can. If you are having a problem with your membership/subscription we always answer unless we know that the problem has already been solved and that your missing issue, for instance, is already on its way. As for other letters, some with thought provoking issues, please be assured that they *are* read. In fact, much of this column is made up of information we have received from member correspondence. We want you to keep them coming—especially your suggestions for improvements in your association and publications. Please be sure to send your letters to SCAN, P.O. Box 414, Western Springs, IL 60558. SCAN

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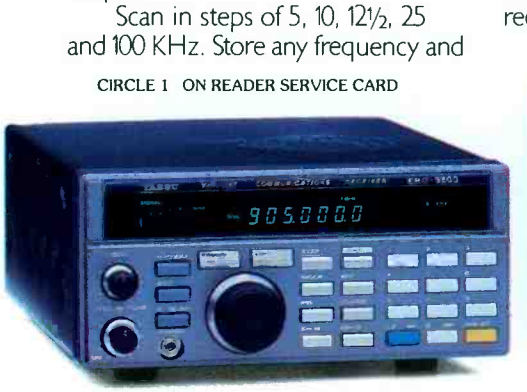

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