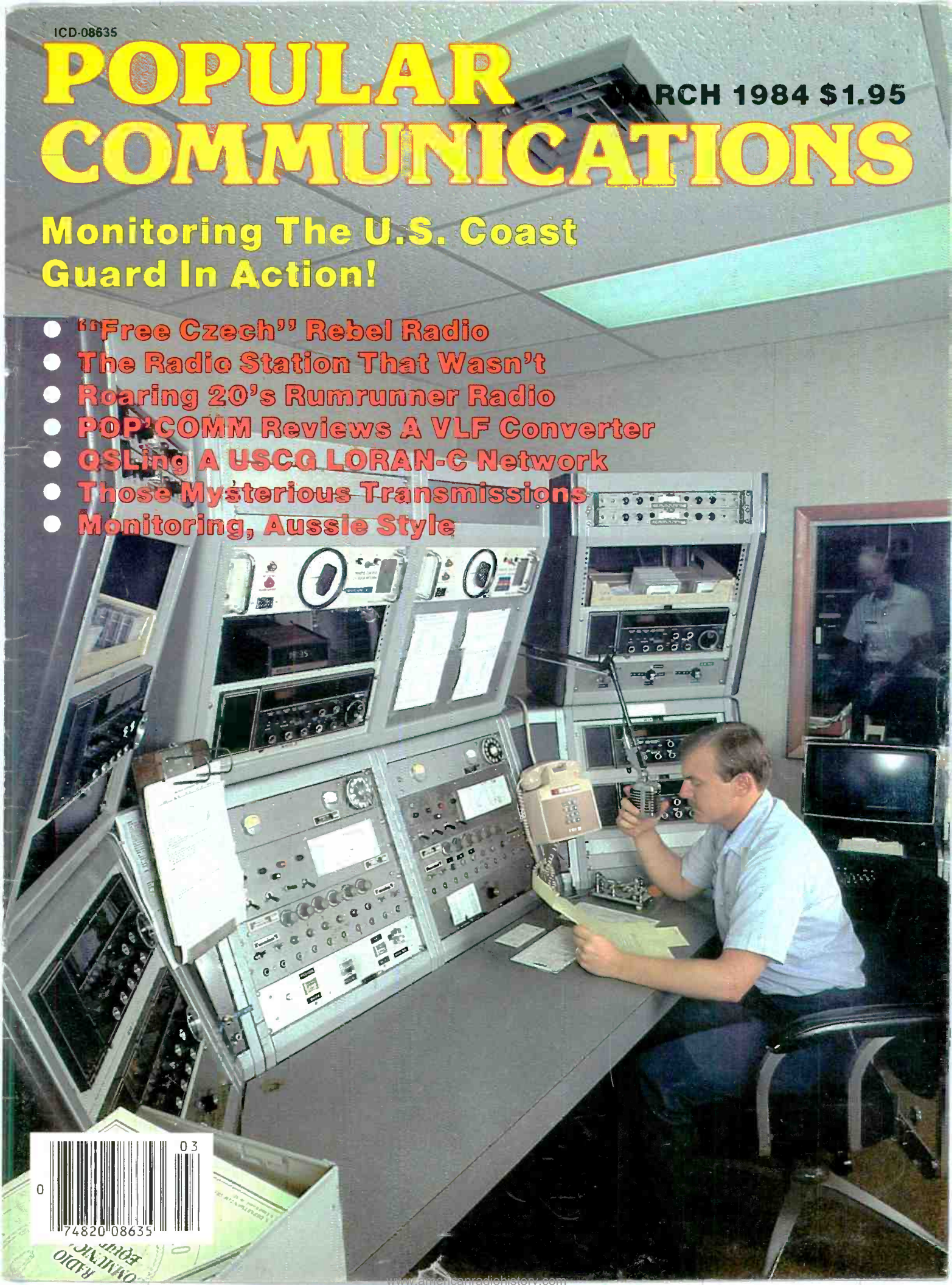


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MARCH 1984 \$1.95

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- "Free Czech" Rebel Radio
- The Radio Station That Wasn't
- Roaring 20's Rumrunner Radio
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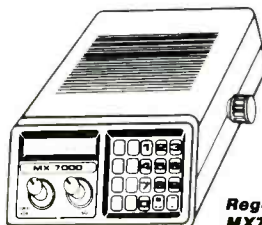
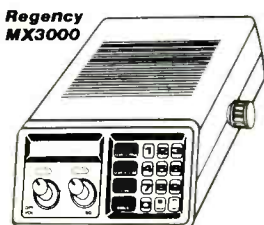
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Pardon My Frequency

Reader Al Quaglieri recently sent along a packet of interesting correspondence that he's had with various offices and agencies of the government. I found it interesting and I think that you will too.

At his monitoring station in Albany, New York, Al was tuning across one of the international shortwave broadcast bands when he hit 17865 kHz, the frequency of Radio France International. Directly atop RFI's signal were other signals—two-way transmissions that he says, "consisted mostly of childish arguing and bumbled messages." Believing them to be bootleggers deliberately usurping RFI's frequency, he contacted the FCC monitoring station in Belfast, Maine, and asked them to obtain a bearing on the stations. A few days later the FCC monitors got back to Al and informed him that the transmissions were not bootleggers at all; instead, they seemed to be coming from a military base in Virginia and were part of a military training program in radio communications.

A few months later, Al again heard the same network on yet another frequency. This time it was 11933 kHz, only 2 kHz lower than a frequency used by RFI, Radio Moscow, and Radio Peking! The military network was using the tactical ID's A6O02, I0505, and X6T01; they were noted at 1550 GMT.

This time, instead of checking with the FCC, Al sat down at his typewriter and fired off a letter to the Department of Defense. He pointed out that since the network he monitored appeared to be part of a course in communications training, proper frequency selection should be part of the information given to the trainees. He noted that international shortwave bands are already overcrowded and there seems to be no pressing need for the military to be using such frequencies. Al finished up by hoping that the DOD would check into this situation and take whatever steps might be necessary to avoid this problem in the future.

A few weeks later he received a reply from Col. John W. Nolan, U.S. Army, of the Military Communication-Electronics Board in Washington. Col. Nolan advised Al that the USMCEB handles military frequency management matters and that they would look into the situation.

More than three months later, Al again heard from Col. Nolan of the USMCEB. His answer was an eye-opener! Al was informed that, "The policies regarding the use of telecommunications and therefore use of radio frequencies is set forth in the Manual of Reg-



*You could be hearing military maneuvers right on top of the BBC, Deutsche Welle, or HCJB!
(Photo courtesy U.S. Army)*

ulations and Procedures for Federal Radio Frequency Management which is promulgated by the National Telecommunications and Information Administration (NTIA). Article 7.15.2 of the Manual authorizes low power use of certain frequency bands, including those allocated for international broadcasting, by military services for tactical and training requirements within the United States and Possessions."

The Colonel went on to explain, "The military services share your concern, but they too are operating in a band which is overcrowded. With U.S. forces deployed throughout the world, there is an ever increasing demand for long-haul communication over a media which is severely limited. U.S. military requirements must be coordinated internationally because other nations also have requirements to communicate in the same limited band. The result is that the government services band is entirely filled. Since operational communication must operate at authorized power levels, the military has taken advantage of the authorization to use International Broadcast frequencies at low power to meet training requirements. The services have agreed to monitor the

training more closely to insure that only low power is utilized and that communication discipline is observed. We regret that some interference may result."

So there you have it. Things have become so overcrowded in the military bands that the training communications have now begun to spill over into the shortwave broadcasting bands—and with full authorization and approval of all concerned! I suppose it was inevitable, what with so much going on in the world these days. And, of course, our military services have long been deployed with a myriad of different radios (such as AN/GRC-106A, AN/GRC-206, AN/MRC-138, AN/PRC-15, AN/PRC-74, etc.) that have always been able to operate with these broadcasting bands—and didn't require any modifications to do so!

I guess if we could get used to the "Russian Woodpecker" tap-tap-tapping away in these bands, we can survive our own training programs. Anyway, if you unexpectedly hear military traffic chattering away atop some DX broadcaster you're trying to copy, be aware that it's the result of the blossoming out of tactical military communications requirements.

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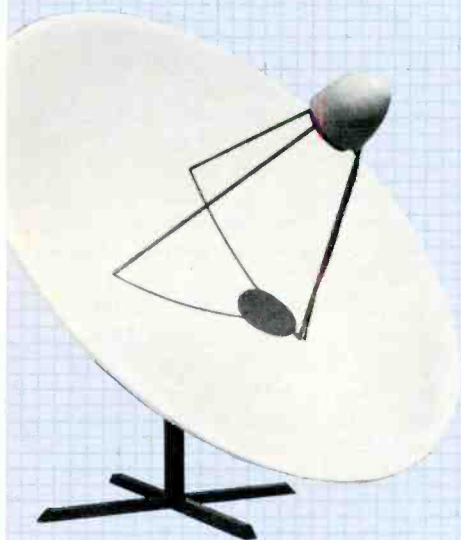
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SPACE

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.

Dexter – Our Main Man

I caught the DXing bug about 16 years ago and have found it impossible to shake. I wanted to say that the work of Gerry Dexter in the pages of POP'COMM is the best I've ever seen in a commercial publication . . . ever. That includes the Bennett columns in the old PE, Boord columns in Radio News, and all the rest. Dexter creates an atmosphere of hobby comradery, as if you were sitting by his side in the shack, chatting DX and sipping a few cool ones. At the same time, besides the ambience, there is a considerable amount of valuable data provided every month. As far as providing usable DX tuning information, his monthly column is unsurpassed in any newsstand radio publication, past or present. His November "Clandestine Communique" was awesome; in my opinion the finest piece of work your magazine has yet presented. I hope you can publish this since Dexter deserves all the plaudits and praise his readers can bestow upon him.

Ralph W. Perry
Euless, TX

Dexter is definitely a heavyweight in his chosen field and we feel that his efforts on behalf of the magazine have been invaluable in the success we have had since we commenced publication in September of 1982. Gerry is presently writing a book on clandestine broadcasters and we will be letting our readers know about it in detail when it's completed and ready for publication. If Dexter put you up to writing this letter, Ralph, I'll never let him live it down. — Editor

Between The Lines

Wouldn't it be possible to conceal messages to espionage agents within the programming of international shortwave broadcasters? This could be done by sub-audible tones or even by using certain pre-arranged words or musical pieces woven into the fabric of news and other programs. Wouldn't this be easier than using the complex "numbers" transmissions?

H.U. Waka
Ewa Beach, Hawaii

Sure it's possible and it's not a new concept. During WWII the BBC conveyed coded messages to various underground resistance movements in Europe. And during that same period, there was even a movie (Sherlock Holmes and The Voice of Terror) about the use of a certain progression of musical notes in a particular piece of music which (according to the film) could be used

by the enemy broadcasting station to automatically detonate explosives which had been placed around London.

Perhaps the most blatant use of an international broadcast station for sending messages to agents was the case of Radio Swan during the 1961 invasion of Cuba's Bay of Pigs. The CIA owned/operated station had long denied any connection with that agency, however just before the invasion commenced RS came out of the closet with all sorts of oddball messages which seemed to be intended for operatives in Cuba. One actual message was, "Alert, alert! Look well at the rainbow. The fish will rise very soon. The sky is blue. The fish is red. Look well at the rainbow."

Some speculated that such messages were more in the way of psychological warfare than anything else. However, there are those who have spent some years carefully studying certain peculiarities of the programming of specific broadcasters just to look for possible hidden messages. The messages might be on the basis of a specific piece of music played (or not played) at a particular time, or the use of certain unusual words or phrases, and several other bits of telltale programming. It's quite subtle and intended to pass unnoticed, however there is evidence to suspect that such practices have been ongoing for more than 40 years now. As to whether such messages are easier to pass than via "numbers" stations, it does seem that both approaches have their own unique applications and do not conflict with one another. It is worth speculating upon whether this could be at least one of the reasons why the Soviets devote so much effort to jamming broadcasts from the west. — Editor

Broadcast Band Alarm

Several farms in this area are installing a security system called the ATR (All Terrain Radio) System. Somehow it detects movement placed near sensors and transmits this information by radio up to three miles away. How can I find out the frequency used by the ATR System?

B.B. Gibson
Salina, KS

The ATR System is made by S.A. Clark & Associates of Marion, IA. The remote transmitter sends out a continuous signal, and as long as the signal is "normal," the sensing receiver remains quiet. Probes at the remote transmitter site(s) is/are buried in the ground; any movement of a metallic object near those probes offers a temporary disruption of the earth's magnetic field and causes a disturbance in the transmitter signal. When this happens, the receiver at the central control point senses the disturbance and activates an intruder alarm. The signal is such that it can penetrate buildings and terrain obstacles and can therefore be placed in areas

separated by hills, etc. The ATR operates between 1400 and 1600 kHz and because it is certified under FCC Part 15, it does not need to be licensed by its users.

A Matter Of Technique

Being a recent entrant into the monitoring hobby, I am seeking a bit of advice. When tuning for DX stations, is it best to tune randomly across the various bands, or are you supposed to look for specific stations on established frequencies?

Dave Koordz
Bellingham, WA

Being new at the hobby, your best bet would be to get the "feel" of using your equipment and a sense of how stations are tuned by selecting specific stations you want to hear and then trying to bring 'em in on your receiver. By knowing in advance which stations you expect to hear, you'll probably find it easier than just tuning around at random. However, by no means limit yourself to the one technique. As you get some experience in the hobby you'll probably split your time 50/50 between looking for specific stations and exploring at random across several bands that interest you most. Until you get a bit of savvy, random exploring will probably not offer you very much in the way of the interesting, unusual, or rare. Good hunting! — Editor

Nice Words Dept.

I have found POP'COMM to be excellent in that it covers all aspects of radio while not becoming too technical. I greatly appreciate this. All of your features are fascinating and I can honestly say that I enjoy every article and it's not often that one can say that about a magazine. I'm a 19-year-old student of politics and would be glad to correspond with DXers interested in South Africa. Enclosed is my subscription.

Daniel Silke
216 Ocean View Drive
Sea Point, Cape Town
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POP'COMM really knocks me out! I eagerly look forward to every issue and the only suggestion I could offer to make the magazine better would be to bring it out twice a month or every week. Your story on drug smuggler communications in the December issue contained so much information that it was easily worth the price of a two year subscription. I've been buying my copies on the newsstand, but when I went to buy my January copy, all of the local newsstands were sold out! I did not enjoy driving around for two hours in order to locate a copy of the January issue. That's why my two year subscription is enclosed.

"Buck" Johnson
Hialeah, FL

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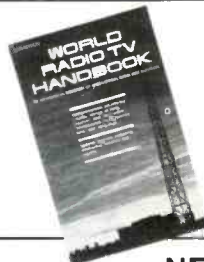


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World Radio TV Handbook

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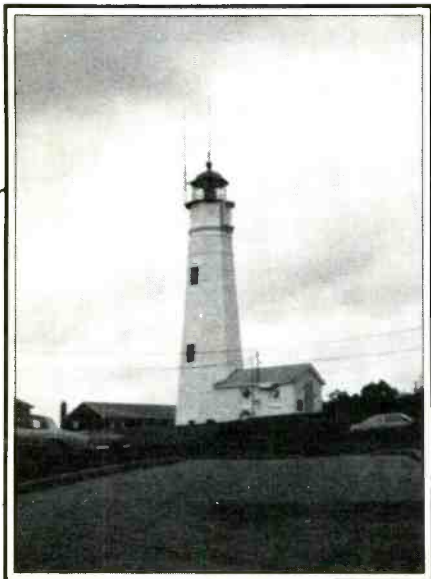
CIRCLE 51 ON READER SERVICE CARD

Monitoring The:

U.S. Coast Guard

An Exciting World Awaits You – Here's How!

Coast Guard light stations are among those facilities to be heard on the VHF bands.



Coast Guard radio beacon "EIN" operates on 311 kHz from Long Island, New York.



Major Coast Guard shore stations such as this one at Shinnecock, New York, can be heard operating on HF as well as VHF.

BY SAL LA ROSA, KTX5LW

Chances are that if you've got a scanner or communications receiver, you've monitored one or more communications stations of the United States Coast Guard (USCG); they utilize frequencies over an amazingly wide spectrum. The Omega navigation stations (10.2 to 13.6 kHz) are operated by the USCG, however USCG stations also operate well into the UHF bands.

The USCG was established in 1915 and became a part of the Dept. of Transportation in 1967. The USCG is a branch of the Armed Forces at all times and is a service within the Dept. of Transportation except when operating as a part of the Navy in time of war (or when the President directs). Prior to its creation as the USCG, the service was known as "The Revenue Marine" and had been in operation since 1790.

Amongst the duties performed by the modern-day USCG are: search and rescue (SAR) operations, maritime law enforcement, commercial vessel safety, regulation of pilotage on the Great Lakes, maritime environmental protection, port safety and security, establishment and maintenance of aids to navigation (light-houses, lightships, buoys, beacons, fog signals, marine radio beacons, racons, LORAN, etc.), bridge administration, deepwater ports administration, boating safety operations, and icebreaking operations. The USCG maintains a constant state of military readiness to function as a specialized service in the Navy in time of war.

The Coast Guard Reserve is an arm of the USCG which provides individuals and trained units for active USCG duty in time of war or national emergency (or at other times, as required). The Reserve also augments the active service in the performance of peacetime missions at certain times.

The Coast Guard Auxiliary activities include boating education programs, participating in SAR missions, patrolling marine regattas, etc.

Included in the USCG's more-publicized peacetime missions is the work the service has performed in conjunction with the apprehension of vessels used for smuggling narcotics and other illicit goods into the United States.

The wide-ranging operations of the USCG are not only evident in the coastal waters surrounding the United States and its possessions, but also on navigable waterways and lakes. This requires a large fleet of vessels, aircraft, helicopters, and even mobile units in the field. Land facilities of the USCG include light stations, air sta-

A type HH52A Sikorsky "SeaGuard" search and rescue helicopter as used by the Coast Guard.



The communications equipment aboard the USCG cutter Point Bridge (callsign NLDW). This 82-foot vessel is stationed at Marina Del Rey, California. In addition to operating on CB and VHF marine frequencies, this vessel operates on the following HF SSB: 2182, 2638, 2670, 2694, 2710, and 3382 kHz. UHF AM: 243.0, 277.8, 282.8, 381.7, 381.8, and 383.9 MHz.

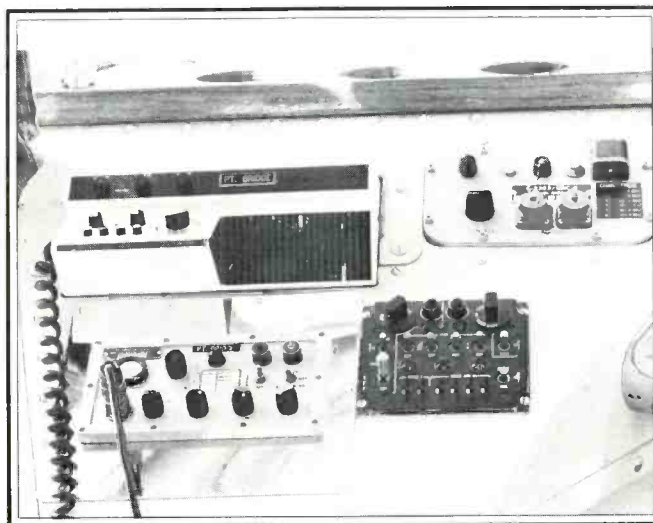


Table 1
Selected U.S. Coast Guard
Voice Frequencies

General Usage

(In kHz)	(In kHz)	(In MHz)
2082.5	6218.6	156.30
2093	6221.6	156.55
2638	6226	156.60
2667	6521.9	156.70
2670	8291.1	157.05
2738	8294.2	157.075
2830	12429.2	157.15
4143.6	12435.4	
4175.5	16587.1	
4419.4	16593.3	
5422.5		

Search & Rescue

(In kHz)	(In MHz)
3023	123.1
5680	282.8

Distress & Emergency

(In kHz)	(In kHz)	(In MHz)
2182	7528.6	156.80
3208.1	11434.6	157.10
4125	11513.6	243.0
5680	18196.1	
6215.5	18721.1	

Marine Information Broadcasts

(In kHz)	(In kHz)	(In MHz)
2638	8765.4	157.10
2670	13113.2	
4125	17307.3	
6506.4		

***Aeronautical Operations**

(In kHz)	(In kHz)	(In MHz)
2261	11195	123.05
3120	11198	126.4
3123	11201	164.30
5692	12887.5	237.9
5696	15081	277.8
8980	15084	381.7
8984		381.8
		383.9

***Enforcement Operations**

(In kHz)	(In kHz)	(In MHz)
4376	12222	353.9
4500	13150.4	
6512.6	14371	
7527	14686	
8768.5	18666	
9802	23403	
11076		

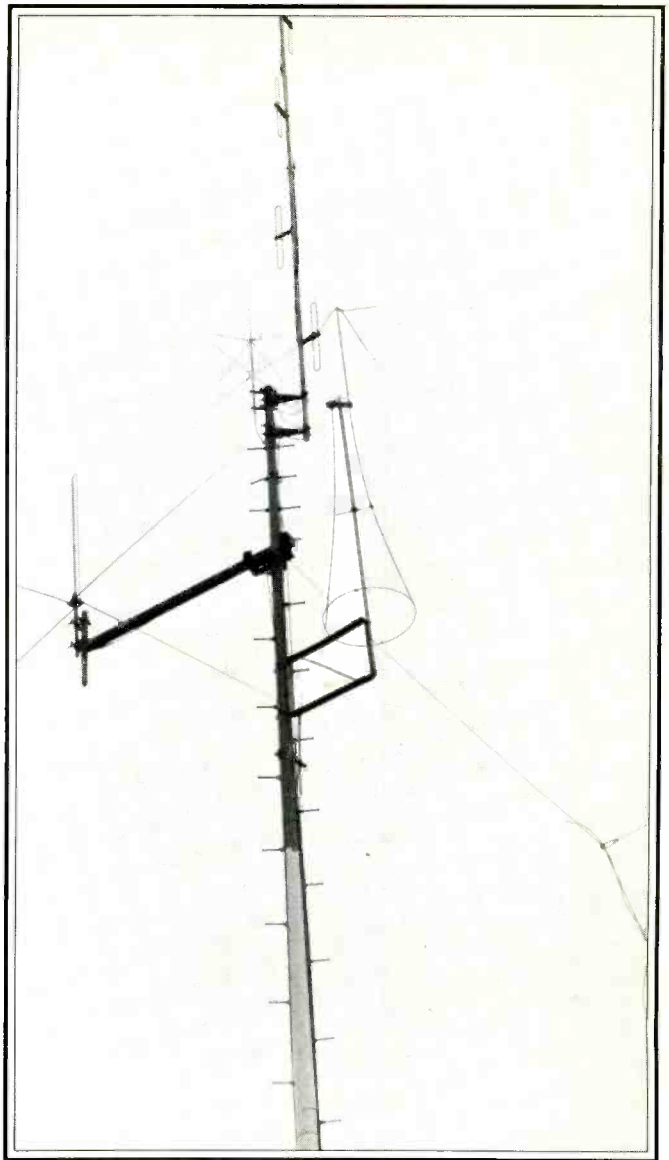
***Base Security Guards**

(In MHz)	(In MHz)
165.2625	407.625
165.3125	415.625
165.3375	415.825

***Intelligence Division**

(In MHz)	(In MHz)
165.0125	171.3375
171.325	171.3625

*These frequencies are subject to change from time to time.



The maze of antennas atop a Coast Guard shore station in California.

tions, Port Captain stations, and USCG bases. As you can easily see, radio communications of all types (voice and non-voice) are required to operate and coordinate USCG operations, which also include marine information broadcasts.

For many years communications monitors have actively listened to the operations of the USCG, for CG communications are seldom less than exciting—sometimes more so than others!

The most exhaustive and highly detailed break down of USCG HF communications operations that can be obtained by the general public is contained in the recently-released *SPEEDX Reference Guide To The Utilities*, published by SPEEDX, P.O. Box E, Lake Elsinore, CA 92330. The book describes the networks involved, lists all vessels, offers a roster of CG helicopters, and gives the call-signs, frequencies, and even mailing addresses of all shore stations operating below 30 MHz. This book (which contains many other things in addition to the USCG) is available from SPEEDX for \$12.00 Book Rate or \$14.00 First Class.

As an aid to those who wish to sample the fascinating communications of the USCG, we list (in Table 1) some of the popularly reported voice frequencies you may encounter. Those operations below 30 MHz are SSB (upper sideband); 156 to 157 MHz communications are FM; above 225 MHz they're AM. The USCG uses many more frequencies than are shown in Table 1. This is intended only to direct you to the communications that are in general widespread use by many shore and portable units (vessels, aircraft, and helicopters).

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**How Booze Smugglers Put Radio
Communications To Work – To Their Sorrow!**

ROARING 20'S RUMRUNNER RADIO

BY TOM KNEITEL, K2AES, EDITOR

In January of 1920, they pulled the plug on legal booze in the United States and for almost 14 years the only way most citizens could obtain an alcoholic beverage was by making it themselves (usually in a bathtub), patronizing a bootlegger, or by gaining admission to an illegal speakeasy. In New York City alone, where there had at one time been 15,000 legal saloons, the Prohibition law (a/k/a The Volstead Act, or the 18th Amendment to the Constitution) had generated 32,000 speakeasies. Rumrunning ran rampant!

The Prohibition era is recalled by Hollywood, TV, novels, and in popular memory as an era of high-speed boats used by the rumrunners (liquor smugglers), machine guns, and federal agents the likes of Elliott Ness, Moe Smith, and Izzy Einstein. President Herbert Hoover estimated that at least 250,000 federal agents would have been needed to enforce the Volstead Act. When the law went into effect there were only 1,500; later on they added another 1,500, but a great many agents proved to be as crooked as corkscrews. By 1926 they had fired 875 Prohibition Agents for taking bribes, blackmailing, conspiracy, embezzlement, and filing phony reports.

Insofar as the rumrunners themselves were concerned, they were making plenty of money. Looking back on their activities it does seem that there were many similarities between rumrunning of old and today's illicit drug smuggling. We do, however, tend to think of modern day smugglers as having the benefits of technology and think of the rumrunners as being quaintly primitive by comparison.

For instance, one of the modern tools of the trade used by drug smugglers is radio (as described in the December '83 *POP COMM*). In the Prohibition era, radio was not a tool available to rumrunners—or was it? While it took about nine years of Prohibition to cause the imagination of the rumrunners to connect with communications technology, digging through musty and long-forgotten documents reveals that at least one rumrunning ring did use it—and in much the same way as their modern-day counterparts. Here is the strange story of that undercover rumrunner communications station—how it was used and how the



feds finally shut it down 55 years ago. It was the first time that radio was used for large-scale smuggling operations, and the first time it was used by the government for catching smugglers!

On The Air

Atop Beacon Hill between Highlands and Atlantic Highlands, New Jersey stood the imposing mansion. It was there that the radio station, with the operator at the key, was found. The three-storied house contained 20 rooms and was built in the American rococo style popular in the 1880's. It had formerly been the home of famed impresario Oscar Hammerstein I. Perched on its hilltop, it was right at the entrance to New York Harbor.

To the average person it was an ugly, lone house, left abandoned since the beginning of WWI in 1914. It had never been "officially" occupied again, and that single wire, emerging from a window and running to a 30-foot pole on the estate, might have been anything, including an antenna for receiving broadcast programs. Although the house was plainly visible from the open road that approached it, there was no apparent evidence that had been placed in use for an undercover radio station. When government agents got right up to the old mansion and watched the operator at the key, they knew from the information provided by the Radio Service of the Department of Commerce (predecessor of the present-day FCC) that this was the station they had been seeking. When they finally reached the radio room (so quietly that the operator on watch was undisturbed), it looked essentially like a typical ham station of the era.

Months of patient monitoring of this station revealed that it was unlicensed and undercover. The transmitter was homemade, panel mounted, and built with a considerable degree of competence. Another transmitter was in the process of being built at the time the station was discovered. Also found in the mansion were several receivers, test equipment, code books, official government documents, frequency lists, and a meticulously-kept operating log which showed that, during "off hours," the operator worked a bit of DX with legitimate hams throughout the world.

The frequencies used by this station were in the 40 and 80 meter ham bands, although specific frequencies were shifted from time to time. The operating codes were also changed frequently.

They Did Themselves In

Undoubtedly, the rumrunners' own cleverness eventually lead to their capture. Radio had not been previously noted in use by smugglers but any signals which were suspicious in nature were (and still are) usually reported by hams when they appear within the limits of ham bands. It wasn't surprising that hams in the Second and Third Radio Districts noticed and reported to the government Radio Inspector strange signals they were hearing, especially since the ham call-



Headquarters for the rumrunners' radio station was in the mansion once owned by Oscar Hammerstein I, theatrical personality.

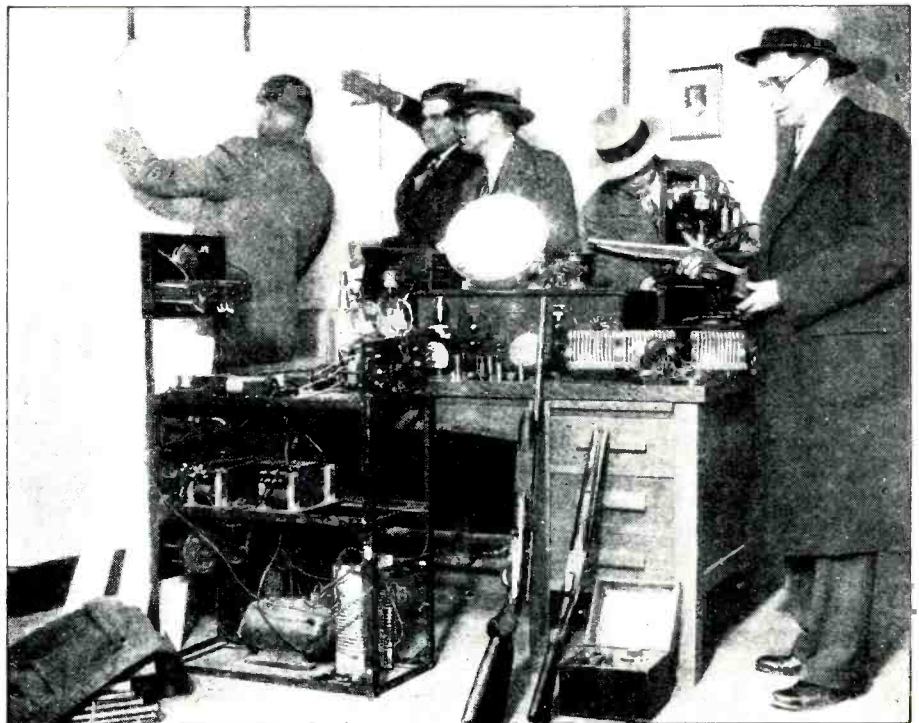
sign used by the station didn't show up in the *Callbook*. Although the hams couldn't pinpoint the exact location of the station, the odd tactics of this station (which they felt might be Amateur in nature), suggested that something was wrong somewhere. The complaints were lodged. An investigation was launched.

For months, Radio Inspector Redfern of the Second District's staff monitored the signals. The callsign was confirmed as being a phony. In addition, Redfern noted that the station would operate for hours at a stretch, at one time boldly remaining on for a solid eighteen hours.

Yes, direction finders (DF) were used in those days, but due to the frequency variations and the use of shortwave, the DF sets

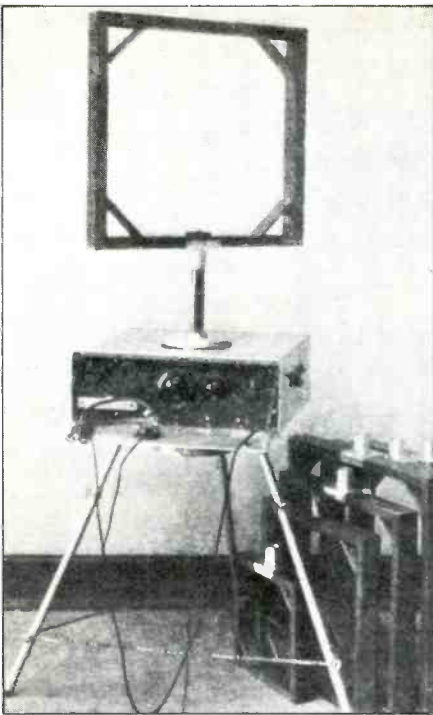
(which were designed for lower frequencies) wouldn't produce accurate results. More accurate DF sets were obtained and directional bearings were made from many points throughout the New York and New Jersey area. After weeks of work, federal agents had been brought to within a mile or so of the transmitting site. Even then they didn't know the purpose of the station. They were seeking it primarily because it wasn't licensed. That was their job.

Monitoring had determined that the mystery station was busiest with non-ham activities at times when federal agents were awaiting the arrival of vessels carrying bootleg liquor. Redfern intercepted many messages, and even though they were sometimes difficult to copy, the transcripts were sent to

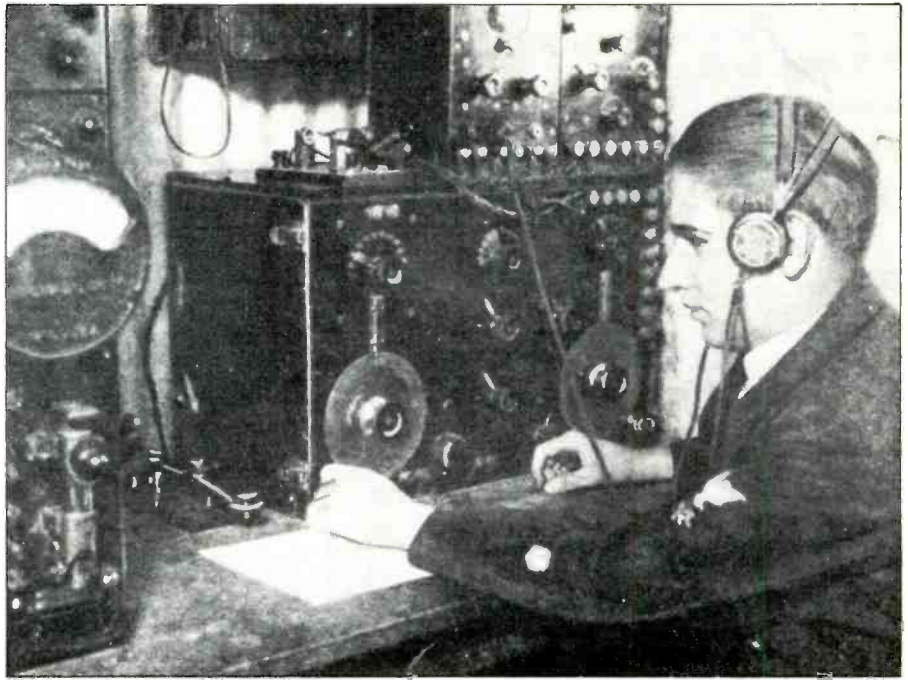


Federal agents check out the bounty of their raid. Note the radio equipment on the floor and atop the desk, also the shotguns leaning on the desk!

Typical 1929 Coast Guard radio station.



Special shortwave direction finder used to track down the station.



Washington for decoding by Army experts. The Army said that it was a code that made use of long words instead of short ones, and vice versa. The coded messages, they reported, were certainly related to rum-running operations. At that point, Redfern was assigned to work with the Treasury Department to oversee the investigation.

When the mystery station was raided, it was immediately seen that the operator possessed government documents that had enabled him to pass all of the government's plans to the incoming vessels so that they could easily avoid getting caught. It turned out that these documents were regularly sold to the rumrunners by various crooked Prohibition Agents!

The Jig Was Up

Once federal agents located the transmitter and had enough information to make their move, they acted swiftly. At 35 different points, including Atlantic City, New York's Greenwich Village, The Bronx section of New York, and at locations all along the south shore of Long Island (known as "Rum Row"), agents closed in at the appointed zero hour (4:30 p.m.). The smugglers were astonished that their operations had been discovered; they had been under the impression that radio would be their key to never getting caught! By 6 p.m. that night the job was completed and 32 bootleggers were in federal custody. In addition to the bootleggers themselves, also seized were cases of illegal liquor, pistols, sawed-off shotguns, Thompson machine guns, vehicles, sales records, boats, and radio equipment. At that point the federal agents sent out coded messages on the captured radio station in an attempt to lure any incoming rumrunning vessels to traps where Coast

Guard vessels would be lying in wait. That trick didn't work because a warning signal was sent out from yet another secret radio station which had been unknown to the agents. That station was never located, nor was it ever heard again!

Nevertheless, with the discovery of the main station of the rumrunners, the agents were able to put a severe crimp in their operations. The large communications network included a fleet of six ocean-going vessels operating between St. Pierre (off the coast of Canada) and Bermuda, plus a swarm of ten speedboats which did the unloading and rapid-ferry work. After the main station was shut down it seemed that what was left of the rumrunning ring apparently decided that radio was probably not something they'd like to use in the future.

The government handed down an indictment against the radio operator, a fellow

named in the document as Malcolm MacMasters of 33 Shrewsbury Avenue, Highlands, NJ. MacMasters was held on \$30,000 bail, not only for establishing the rumrunners' station on March 30th, 1929, but also for violation of the Volstead Act and for transmission without either a station or operator's license. According to *Radio News Magazine*^{*}, it was the first time that Radio Act penalties were ever applied to such an offender.

So ended the curious saga of the world's first known use of radio communications for the purposes of aiding a smuggling operation. An experiment, to be sure. Whether that experiment is viewed in retrospect as noble or ignoble, it nevertheless set the stage for the extensive use of radio communications by smugglers of the 1980's.

^{*}Radio News, January, 1930.



There were so many crooked Prohibition Agents that it became a national joke. This ad for 1920's novelty badges revealed that Prohibition Agents were perceived by the public on a par with "Garter Inspectors."

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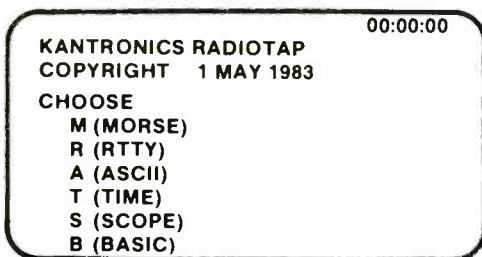
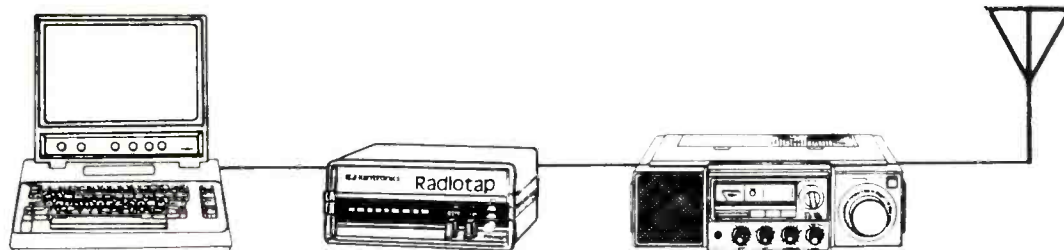
The RADIOTAP system is easy to set up. Simply connect the external speaker output of your receiver to the RADIOTAP tuning unit and connect the tuning unit to the computer. Then plug the RADIOTAP software cartridge into the computer and turn



on the power. All necessary cables are provided, and we have included the CONFIDENTIAL FREQUENCY LIST to help you find coded signal frequencies.

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Radiotap™ System Diagram



Main Menu

computer monitor to measure the timing of signals, and then change the baud rate to capture unusual speed signals.

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CIRCLE 15 ON READER SERVICE CARD

FREE CZECH RADIO



Free Czech Radio's efforts were directed from headquarters in secret locations near Prague.

Undercover Broadcasting During The 1968 Anti-Communist Uprising

BY GERRY L. DEXTER

They called it "the Prague Spring." A glorious time when, if you lived in Czechoslovakia, you seemed to be walking on air. New liberties had sprung up. Buds of hope were appearing everywhere.

It was 1968 and the government of Alexander Dubcek had taken a liberal turn. Communism took on what seemed to be a human face. The populace reacted as though breathing fresh air for the first time in two decades.

Back in January of '68, Dubcek and a number of other liberals had ousted the hard line government of Antonin Novotny. Gifts such as freedom of the press, the lifting of restrictions on travel and the lessening or abolishment of other measures were showered on the people of Czechoslovakia like a fresh April rain.

There was an underlying nervousness of course. Moscow was not sitting idly by. A propaganda campaign had been mounted against what was happening in Czechoslovakia. The KGB's disinformation and dirty tricks squads were put to work to try and make it seem the situation was out of hand and that Dubcek no longer had control of the situation.

Citizens of Czechoslovakia tried not to wonder about the buildup of Warsaw Pact forces near their borders, ostensibly for war game purposes. Only mild curiosity resulted from the appearance of so many Russian "tourists" who did not look the part.

On the evening of Tuesday, August 20, 1968, things were normal in the Czech capital. People went about their chores and enjoyments. Young people danced in the nightclubs and talked over coffee in cafes.

Then Russian MIG jets appeared, soon followed by Russian transport planes carrying tanks and troops into Prague's two airports. Russian, Hungarian, and East German troops crossed the border in large numbers.

Church bells began to peel all over the city. Taxi cabs raced around with horns blaring out the warning, some with improvised speakers shouting news of the invasion.

At Radio Prague on Vinohradská Street, word of the invasion was broadcast over Czech medium wave channels just after midnight. Listeners to Radio Prague on shortwave heard no mention of anything amiss. Normal programming continued.

Hundreds of young people who had been asleep or out enjoying the city's nightlife

rushed to the radio station and began to build barricades.

Off duty broadcasters rushed back to work. Inside there was confusion. People jammed the hallways asking how such a thing could have happened.

Fresh news items poured into the newsroom and were broadcast immediately. Statements from labor unions, writers' groups, and other organizations denouncing the invasion were read on the air.

The young people did what they could to slow down the tanks advancing toward the radio building. Two or three tanks were set on fire. Whatever junk that was handy, from mattresses to garbage cans to bricks, was thrown at the tanks. Some fought still wearing their pajamas. Several were gunned down. One was crushed under tank treads.

"They've surrounded the building! They're in the courtyard! Listen..." said a Radio Prague announcer and the windows were opened so the audience could hear the sound of the battle going on outside.

According to former Czech radio commentator Slava Volony, who was on the air during those first hours, bullets were whipping through the open windows and people had to flatten themselves against the walls to avoid being struck.

Joseph Wechsberg, a journalist who was in Prague that week and spent the time glued to his radio, noted an announcement near the end of the fight for the building. "We are still here but when you hear the national anthem you will know it is over."

It took about eight hours but the radio building finally fell. Nearby buildings had been burned out and Radio Prague's building showed the scars of battle.

Then came the Czech national anthem. Men with machine guns burst into the studios and those inside were arrested. Radio Prague fell silent.

The Czech news agency was also occupied and sent out its last message over the teletype "...just been occupied by foreign troops. If further news is transmitted it will no longer be..."

The news agency was in the hands of the occupiers. So was Radio Prague, but its silence lasted only an hour or so.

Soviet forces had occupied only the first two floors of the building. They didn't know there was a studio on the third floor, complete with direct phone lines and teletype service. For some reason, they didn't even bother to check out the third floor.

A number of announcers, news people, and producers had slipped away just as the building was about to be occupied.

And thus, Free Czech Radio went on the air under the noses (or over the heads) of the occupiers. Third floor windows were blacked out and only lighting absolutely necessary for operating was used.

Broadcasts from the third floor of the broadcasting building continued all day Wednesday and into the night.

Eventually a collaborator gave the secret away. The broadcasters barely had time to get away through a side entrance. When the

enemy burst into the studio they found it empty, equipment still warm from use.

The third floor broadcasters broke into smaller operational groups and scattered into the Prague night. They already knew what to do.

It wasn't long before broadcasting resumed again, this time from two other buildings owned by Radio Prague.

Again the enemy found them and again the broadcasters escaped. The Russians found one building with only a skeleton staff on hand, and they were told by the director that the staff had been sent home since they had nothing to do. The Russians checked, found nothing, and left. The broadcasters who had just escaped returned to resume their work.

The situation could not last. One by one local medium wave outlets around the country were taken and put off the air until all 22 had fallen and were silent.

Now the real Free Czech Radio effort began. Secret transmitters were ready and waiting to take up the slack.

A network of mobile transmitters had been purchased earlier by the Czech government. Ironically, this move had been at the insistence of the Russians who wanted a better civil defense capability on hand in the event of a NATO invasion!

Secret broadcasting sites seemed to be everywhere—in mobile units, hidden away in factories and houses. Some were operated by Czech Army personnel.

For the next several days, Free Czech Radio was on the air 24 hours a day on medi-

um wave giving instructions, calling for passive resistance. By the end of the crisis the radio stations were practically running the country.

People were urged not to scrawl obscenities or swastikas since that might be used against them as propaganda coming from Moscow.

The management of Czech radio had gathered at a house in downtown Prague where the network was coordinated and regular contact was maintained with all elements of the government so that radio would be available when needed.

The radio called on the citizens to rally to their leaders who had led them to their new found freedoms. Broadcasts included news items, comments from listeners, questions, and requests for information about friends and relatives—much of it going out in the form of live phone calls.

The radio effort had more volunteers than it could use. Some of the overflow were put to work producing a daily, Free Czech newspaper.

People cooperating with the invaders were denounced by name on the air. License numbers of secret police cars were read on the air to aid citizens in spotting them and evading arrest.

The broadcasts gave instructions to get rid of road maps and street signs. Such items disappeared from bookstores and hotels almost immediately. Street signs were pulled down or pointed in the wrong direction so that only a citizen of Prague could find his way around.

At one point the radio asked to have something done about a Russian train that was on its way bringing in jamming equipment. The train was promptly "lost" on a siding. Later its electric locomotive received an "accidental" current overdose. The train was delayed several days.

The Prague studio ran the show. Many of the Radio Prague commentators and writers stayed home, doing their work in their living rooms. Couriers were used to bring the material to the secret studios where the announcers read the commentaries.

Young people held transistor sets up to tank operators so they could hear the free radio for themselves.

By Thursday, Radio Prague had returned to shortwave. It, too, was in the hands of the resistance, calling for a general strike, a free government, secret Presidium meetings.

Reception was poor and spotty, with broadcasts of about ten minutes, followed by ten minute gaps. The regular 7.345 MHz channel of Radio Prague was used.

By Friday, the shortwave signal had improved and the station was identifying itself variously as "the legal transmitter of Radio Prague," "the legal transmitter of the Czech Republic," "the free transmitter of Czech broadcasting," and "Prague Number One."

Transmissions had also appeared on another regular Prague frequency, 11.990 MHz and, by now, at much better strength. The station announced that it was "broadcasting from occupied Czechoslovakia" and announced the use of 6.055 MHz as well, although that was not heard in the U.S.



Radio Prague's QSL verifying reception during the days of "Radio Free Prague."

PRAGUE — TYN CHURCH : 817
WITH ITS BEAUTIFUL GOTHIC TYMPANUM

RADIO PRAHA
Prague 2, Czechoslovakia

Dear Radio Friend,

Thank you for your communication reporting reception of our transmission on Aug. 23, 1968

at 00:32 GMT.

We have checked your data with our log and take pleasure in verifying our programme heard on 7,345 kcs.
11,990 kcs.

Good Listening and 73!

ISSUED TO:
Gerry L. Dexter
Lake Geneva, Wisc.
U. S. A.

RADIO PRAHA * RADIO PRAHA * RADIO PRAHA * RADIO PRAHA * RADIO PRAHA

Prague said that it was broadcasting continuously in English, French, and German. By Sunday it was airing programs in Italian, Spanish, and Russian as well.

At one point there were some 18 secret medium wave transmitters on the air, plus the shortwave and, believe it or not, three TV stations. There were 53 locations throughout Prague equipped as TV studios. The Russians had occupied only three!

Three days after the invasion there were still a dozen secret medium wave outlets in operation.

The occupiers had difficulty in tracking down the transmitters because the Prague central broadcaster aired number codes periodically. Each code was an identifier assigned to a particular transmitter. The code, when aired, indicated that a particular transmitter should take over airing the broadcast. Thus the source of the Free Radio's signals was constantly being shifted, foiling direction-finding efforts by the Soviets.

This technique, too, had come from the Russians and was now being used against them. The Russians had trained a special Czech Army group in the use of this round-robin broadcast method.

Not surprisingly, Radio Moscow vilified the Free Radio's efforts, claiming at one point that a secret transmitter had been found in a foreign embassy in Prague, broadcasting a "torrent of lies." The Russian radio said that the groups operating the

CZECHOSLOVAKIA RADIO PRAGUE

Nov. 26/68

Gerry L. Dexter
Lake Geneva, Wisc.
U.S.A.

Dear Listener:

Thank you very much for your letter of Nov. 3, 1968. Because of the recent upsurge in correspondence in response to our broadcasts to North America, we must, at least for the time being, answer most of our mail in this way.

- I am happy to acknowledge your reception report as correct. A Radio Prague QSL Card is being sent to you.
- Your reception report is the towards membership in renewal of the Radio Prague Monitors' Club. If you are an overseas listener and have sent in total of seven, you have become a member, and your Certificate of Membership will shortly be sent to you by registered surface mail. European listeners must submit 15 reports for membership.
- Regulations for membership in Radio Prague Monitors' Club are being sent separately.
- I regret that your reception report does not qualify for our QSL Card as it omitted to indicate:
- | | |
|-----------------------------|--|
| date of broadcast reported; | reception conditions; |
| hour of broadcast reported; | a few words describing what you heard to identify program; |
| frequency or wavelength; | |
- please see P. 5, below.
- Your question about will be answered in the Listeners Club on (your date). The concern-of-the-month will be mailed to you the following month.
- Your question for Listeners Club is being considered and you will be informed later as to the date of the answer.
- Your musical request will be played in our program (your date).
- A checklist and order form for documentation on Czechoslovakia available in English is being sent separately.
- The documentation you requested is on its way by surface mail.
- Your answers to the Slump Quiz in our program of are correct; the First Day Cover(s) will be sent you by registered surface mail.
- This will confirm with thanks receipt of International Reply Coupons to the value of 2 IRCs enclosed with your letter.

With best wishes for continued good listening!

Vladimír KUCERA, Editor,
North American Broadcast

P.S. Radio Prague studios are located in various parts of Prague and our broadcasts during the August days went out from several of these studios. Other broadcasts on medium waves went out from studios all over our Republic. Thank you for your good wishes. Pleasant Listening!

This QSL from Radio Prague was received some months after the crisis. Note P.S. at bottom.

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CIRCLE 71 ON READER SERVICE CARD

transmitters had gotten them, complete with training in their use, well before the invasion. Moscow's implication was that Western elements were responsible.

Volnoy believes the Russians simply found themselves the victims of poor intelligence. He speculates that the Soviets had expected a total collapse of government with a new, hard-line government taking power immediately. This new government would take control of the media at once. But that didn't happen and the Russian didn't know what to do. They had to wait for further orders from Moscow.

The Prague Spring had lasted into late summer, but time was running out.

Czech President Svoboda had gone to Moscow to try and work out an agreement. Dubcek followed. Negotiations were difficult, to say the least. The Russians would give no quarter. The pressure on the Czech

leaders was immense, to the point even of non-violent torture.

On Tuesday, a week after it all began, the Czech leaders returned to Prague beaten men. Dubcek gave a speech to the nation. His shaking, exhausted voice gave some hint of what he had been through. Dubcek said there was no way out. The only means available to accomplish the removal of the occupying forces was capitulation. It was that or slaughter in the streets.

Some had clung to hope, daring to believe that a compromise would be worked out more in their favor. But after Dubcek's speech to the nation, most people realized there was no hope. One by one, the freedom radios began to go silent.

By Thursday, August 29, only one was left. It did not last out the day.

Free Czech Radio fell silent. The Prague Spring had ended.

The MFJ VLF Converter

Tune 10 to 500 kHz On Your Receiver!

I don't know about you, but it's especially annoying to me when I suspect that things are taking place over the air and I can't tune in on them. That's the way it has been in regard to the Very Low Frequency (VLF) portion of the spectrum—my receiver doesn't tune down to 10 kHz and curiosity about what I'm missing has eventually gotten to me. True, there are receivers that will tune down to those frequencies, but mine isn't one of them. Short of going out and buying an entirely new replacement receiver, there seemed only one way to go—getting a converter that would add these capabilities to my existing receiver. For less than \$80, I could expand my monitoring horizons into this frequency range.

Was I really interested in hearing these frequencies? Yes! Not only on the basis of "I want to hear them because they are there," but because there are supposed to be all sorts of new stations operating on these frequencies—military stations, stations sending out standard time signals, experimental stations, and more. While some receivers don't tune below the standard broadcasting band (the low frequency end of which is 540 kHz), mine did tune to 100 kHz so I had already been exposed to the radiobeacons and marine communications to be found between 200 and 540 kHz.

That made me decide to check into the MFJ converters for VLF. MFJ Enterprises Inc. (P.O. Box 494, Mississippi State, MS 39762) offers no less than two VLF converters. Their Model MFJ-331 converts the 10 to 500 kHz VLF band so that it can be tuned at 28.01 to 28.50 MHz on a communications receiver. The Model MFJ-332 converts the VLF band for reception at 4010 to 4500 kHz. I selected the MFJ-331, although (other than the frequency output) both units are essentially the same in design.

The MFJ-331 is small in size (only a little larger than a pack of smokes), and is designed around two 2N3904 transistors and an MC-1496P integrated circuit ("chip"). The unit requires external power, nominally 12 VDC, but it will operate between 9 and 18 VDC. The power is connected through a 2.5 mm subminiature jack on the back of the converter. A power supply that can run this is inexpensive and can be obtained from MFJ if you don't already have one on hand.

Connecting the power supply completes half of the "work" involved in putting the converter into action. The other half of the job consists of placing the unit into the an-



The MFJ-331 and 332 VLF converters are identical in external appearance.

tenna lead-in of your receiver. This is done by disconnecting the antenna from the receiver and placing it on the rear of the converter, then running a jumper cable from the converter to the receiver. The total elapsed time from sealed carton to "on the air" with the MFJ-331 is perhaps 120 seconds with no tools or skills required.

In Operation

With the unit thus installed, when you turn on your receiver it's business as usual. You won't hear anything new, just those stations that you would have heard before you installed the converter. This is good. You haven't switched the converter "on" yet, and you've discovered that with the unit "off" the normal operation of your receiver is undisturbed by the insertion of the unit.

The converter is inserted into the receiving system by simply depressing the push-button on the front of the converter, at which point a red LED on the converter lights up to show you that it's doing its job. Now things are different as your receiver is set up to receive only signals in the VLF band. The way this is put to use with the Model MFJ-331 is by tuning the communications receiver to 28.010 MHz and then realizing that you are actually listening to signals on 10 kHz. As the receiver is then tuned upwards in frequency to read out between 28.010 and 28.500, simply ignore the "28" in the frequency readout and that's the frequency (in kHz) to which you are tuned. For instance, if your receiver reads out 28.037

MHz, you are listening to 37 kHz.

Inasmuch as my Kenwood R-2000 communications receiver already had the ability to receive frequencies upwards of 100 kHz, it gave me the ability to compare the sensitivity of the MFJ-331 converter versus the R-2000 on any specific frequencies above 100 kHz. What I did was use the converter to tune in radiobeacon "HKF" on 239 kHz. This beacon is located in Middletown, Ohio and is many miles from my home. HKF was running an S-3 on my meter as copied on the converter. I then shut off the converter and retuned my receiver to pick up 239 kHz directly without the converter. By direct reception it again came in at S-3 on the meter. Random tests with several other radiobeacons in different areas and over different points between 200 and 400 kHz brought similar results: the converter was pulling in the stations with approximately the same vigor as the receiver. Moreover, I disconnected (removed) the converter from the antenna lead-in and again tuned in these radiobeacons to check to see how the signal strengths looked. If there had been any improvement in the meter readings at that point I would have indicated that the converter's mere presence in the antenna system was reducing my receiver's efficiency, even when the converter was shut off and in the mode where it was bypassed. Again, signal strengths remained roughly the same. I was satisfied that it was doing what it was supposed to be doing!

Although the MFJ instruction sheet does

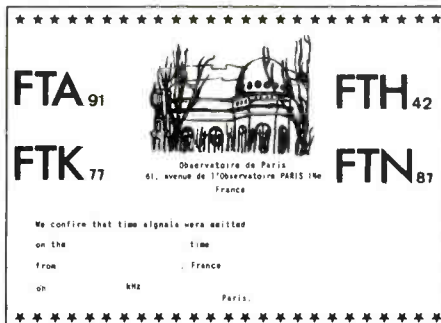
not offer any suggestions as to the type of antenna to use for best reception, my own experiments revealed that a 300 to 400 foot long wire (elevated above the ground as high as possible) gave excellent results on all frequencies below 500 kHz. Two things further improved reception; the first was the addition of a VLF antenna tuner such as the Grove Minituner #TUN-3. Another aid to better reception was grounding the converter to the receiver with a short length of copper wire (my receiver itself is grounded to an outside water pipe). The grounding trick seems to cut down on noise.

Rock Bottom Radio

Of course, I was mostly interested in what I couldn't already tune in on my radio—that is to say, those signals below 100 kHz. These are the eerie frequencies which offer 'round the clock worldwide reception and therefore can even be used for communications with submarines while they are submerged. The VLF signals behave differently than broadcast band or shortwave signals and that's why they are used for special communications applications such as the Omega navigational system (13 kHz) and LORAN (100 kHz). There is no use of voice on VLF, and even RTTY and CW must be sent at speeds slower than are encountered on shortwave. Indeed, the lower the frequency, the slower the speed at which messages may be sent. The VLF band has many military applications and the ground stations used for such purposes require massive antennas and very high transmitter powers in order to be effective.

Naval Radio Station NAA in Cutler, Maine and its sister station NLK in Jim Creek, Washington are two high-powered VLF military stations, each requiring highly complex antenna systems and massive antenna tuning devices. Another vital part of the military communications system is the \$80-million VLF installation the U.S. Navy maintains in Exmouth, Australia. The megawatt-class transmitter in Exmouth feeds into 100 web-like steel towers by means of concentric circles of tall frames rigged out with cables. One tower is 1,271 feet in height and is the tallest man-made structure in the Southern Hemisphere. In all, the Exmouth station occupies 29 square miles! Exmouth, Cutler, and Jim Creek are only three of the seven stations the USN maintains for VLF communications with submarines; each station runs one million watts or more. These transmitters are so potent that receiving equipment associated with their operation is usually located a considerable distance away from them. In Exmouth, the receivers are 30 miles south of the transmitters to avoid interference.

On the other hand, the U.S. Air Force's Strategic Air Command operates on VLF with its Project #487-L Survivable Low Frequency Communications system. Sources say that the system might well be the only one functioning in North America after a nuclear attack. The system requires two towers, each about 1,200 feet tall. Other com-



The Paris Observatory in St. Assise, France, sends out this QSL for station FTA91 on 91.15 kHz. Here's a QSL to try for with the VLF converter!

ponents include 200 receivers at Minute-man and Titan missile sites and other locations. Signals noted on 29.7 and 37.2 (67 wpm 50 Hz shift FSK reverse) appear to be sent out by the SAC and are encrypted.

The SAC's AABCP (Advanced Airborne Command Post) aircraft (an E-4B modified Boeing 747) is tied into VLF operations and could also be used to transmit emergency action commands to U.S. strategic forces in the event that the ground stations failed. The antenna system used in the AABCP consists of two wire cable antennas which can be unreeled from the rear of the aircraft—one of these antennas is five miles in length. These antennas can be used on frequencies between 17 and 60 kHz. Even though a five mile antenna would seem to be of extraordinary length, remember that the lower the frequency, the longer the length of the radio wave. On a frequency of 20 kHz, the wavelength is 14,991 meters (9.3 miles) long. Even at five miles, the trailing antenna is only a half-wavelength long!

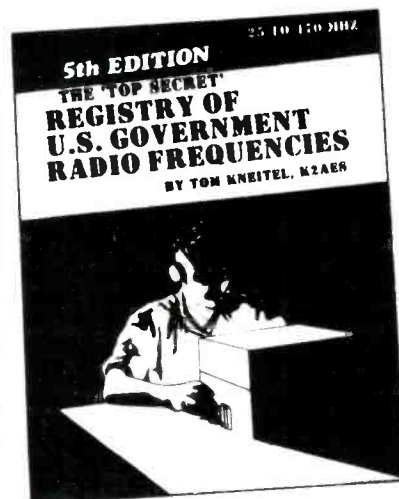
Putting the MFJ converter into action on these VLF frequencies, I noted the 13.6 kHz Omega signals and WWVB's 60 kHz time signals, as well as time signals from FTA83 in Lyon, France on 83.8 kHz and also FTA91 of the Paris Observatory on 91.15 kHz (FTA91 transmissions are at 0852, 0952, 1022, 1352, 2052, 2152, and 2311 GMT). RTTY and FSK signals were noted on 15.1, 16.8, 17.8, 18.5, 19.6, 21.4, 22.3, and many other frequencies. I was quite surprised at the large amount of activity on VLF, and the MFJ converter handled the task of bringing these signals through with ease.

Monitoring on frequencies below 500 kHz can be made especially rewarding by joining the Longwave Club of America (\$10 annual dues), 45 Wildflower Rd., Levittown, PA 19057. The LWCA publishes a neat monthly newsletter called *The Lowdown*, which contains a great wealth of frequency/station/skeds data for stations operating below 500 kHz.

I think if you're looking for new worlds to conquer, you might well consider checking out VLF, especially since it can be accessed so easily and inexpensively. It appears to be a portion of the frequency spectrum that may well be the last word (no pun intended) in strategic military communications.

Reviewed by Wally Chan, KOH8PZ

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Monitoring And QSLing

The U.S. Coast Guard Northwest Pacific LORAN-C Network

BY GILBERT CARRATONE

The United States Coast Guard maintains a worldwide long wave navigation network known as LORAN-C. This system involves the transmission of precise duration pulses, sent at specific time intervals, in a wide bandspread frequency range from 90 to 110 kHz.

All LOC (LORAN-C) stations, except for certain CONUS and Alaskan locations, use HF frequencies for voice coordination of their LOC activities. During the mid 1970's, these HF frequencies were utilized by several LORAN A/C networks as an informal means to chit-chat back and forth. Since that time, the USCG has restricted communications to official business. During the early 1980's, all USCG LORAN-A sites were closed down, leaving active only the LOC stations.

USCG LOC stations operate within individual networks and confine their communications to their respective nets only. The current networks are:

- North Atlantic/Norwegian Sea
- Mediterranean
- Hawaiian/Central Pacific
- Aleutian
- CONUS/Alaska (landline links—no HF)
- Northwest Pacific

The Northwest Pacific LORAN-C network is sought after by DXers and QSL buffs because of the exotic locations of several net stations. The current stations in the NWPACLOC net are:

- NRT—Yokota Monitor, Japan (Master LORAN Station)
- NRT2—Gesashi, Okinawa, Japan
- NRT3—Iwo Jima, Volcano Islands, Japan
- NRT9—Hokkaido, Japan
- NRV6—Marcus Island
- NRV7—Yap Island, Caroline Islands
- NRV—USCG Radio Station, Guam (not a direct participant in LOC operations, but as the main USCG communications station for the west pacific, NRV can often be heard on NWPACLOC frequencies)

In addition, there are two USAF LORAN stations located in South Korea that interface with the NWPACLOC net. Their ID is:

- Hampyong LORAN
- Pohang LORAN

From a historical standpoint, NWPACLOC mid-1970's stations included several additional locations. All are now closed down. They were:

- NRT—was at Totsaka, Japan and ID'ed as Kami Seya Monitor
 - NRV1—Orote Point, Guam
 - NRV2—Saipan, Mariana Islands
 - NRV4—Angaur, Palau, Caroline Islands
- Yokota Monitor is the current

NWPACLOC master station, located at Yokota Air Force Base, Japan. As it is the net coordinator, normal practice is for all other NWPACLOC stations to work Yokota. Communications between individual stations occur, but this is not the normal procedure. When Yokota Monitor is unable to complete net coordinating duties, Yap LORAN assumes the task.

All LOC stations ID by location name, fol-



For those who collect utility QSLs, here is what you can obtain from the Northwest Pacific LORAN-C network.

lowed by the word "LORAN." Yokota IDs as indicated. The assigned call letters are never used in voice comms.

When To Monitor

Although the NWPACLOC net can be heard year 'round, the best time for east coast U.S. monitors is from the fall through the spring months. The ideal time for North American utility monitors to seek out the NWPACLOC net is from 0600 through 1300 GMT for ECUSA, 1600 GMT for WCUSA. Of course, this time span is dependent upon your location, actual time frame, month of the year, and frequencies selected for primary usage. Once your local sunrise occurs, there will be a steady and progressive decrease in QSA levels. All LOCs run an average of 500 to 1,000 watts output power. Yokota Monitor's output is roughly double these figures. As such, you will still be able to read Yokota when the other LOCs are QSA-1. Normally 45 to 120 minutes after your local sunrise, first 3 MHz, then 7 MHz will fade out. It should be remembered that as we in North America enter daylight conditions, the NWPACLOC net is switching to their lower HF assigned nighttime voice frequencies. West coast monitors will have the best chances, but east coast DXers should do equally well. By the way, do not believe it requires sophisticated receivers and exotic antennas to monitor this net. An ancient Radio Shack DX-160 and a 45 foot indoor long wire proved very capable.

Frequencies To Monitor

There are currently four standard voice frequencies in use during the typical 24 hour operational period.

15922.0 kHz Daytime primary frequency. Distance factors dramatically limit 15 MHz from successfully propagating into the USA during the time it is the primary frequency. The best time frame to try for is between 2200 to 0500 hours GMT. On the average, don't expect high level QSAs, although for limited time periods, comms can suddenly jump up to 5 by 5.

10523.6 kHz Often used during NWPACLOC sunset/evening transition periods. Audible after 0400 GMT through local sunrise.

7836.6 kHz Evening primary frequency. This is THE frequency to check out from 0600 through 1600 GMT. Primary roughly from 0800 to 1400 GMT, at which time 7 MHz propagates beautifully into North America. On any given day, comms are good and readable for ALL NWPACLOC/ROK net stations.

3786.1 kHz This is a nighttime primary frequency. You can expect average comm levels to be only 50% of the Q levels heard on 7 MHz. Three MHz is in the 80 meter amateur radio band and can be QRMed by LSB voice ARO traffic.

Below is a list of HF voice frequencies assigned for NWPACLOC usage. In practice, they are usually ID'ed over the air simply by their Megahertz designation. ALL are Carri-

er frequencies. For the USB side, add 1.4 kHz to these frequencies. Those DXers using digital readout receivers would, for example, tune to an indicated frequency of 7838.0 for the 7 MHz USB transmissions. Those with offset carrier capability tune the indicated carrier frequencies.

(2 MHz) 2660.0	(10 MHz) 10523.6
(3 MHz) 3786.1	(11 MHz) 11606.0
(4 MHz) 4550.1	(13 MHz) 13608.6
(5 MHz) 5315.5	(15 MHz) 15922.0
(7 MHz) 7836.6	(17 MHz) 17488.6
(8 MHz) 8063.6	(19 MHz) 19297.1
(9 MHz) 9223.6	

There is one *important* aspect to remember. Yokota Monitor SIMILKEYS on all three frequencies (primary, secondary, tertiary). The other LOC net stations TRANSMIT ONLY on the PRIMARY frequency. If you hear an LOC working Yokota, then that is the Primary frequency. If not, stay on frequency, for Yokota has a habit of giving the frequency status during communications. If you decide to monitor after 0600 GMT, then tune to 7836.6/7838.0 USB and wait for communications. Primary frequency is SIMPLEX (same xmit/receive freq).

Although the NWPACLOC net is easy to hear, utility monitors are often frustrated in their initial attempts. There is a very good reason for this. When the long wave LORAN-C system is transmitting within prescribed parameters, there is very little HF voice activity. Under such conditions, it is common to hear nothing on the voice frequencies for periods of 60 minutes or more. This can mean that the utility monitor may have to check out the frequencies two, four, even seven days or more before obtaining more than a few scattered radio checks and multi-tone watchcall/selcall tests. Since LORAN-C transmissions have very precise operating parameters, any station falling off the mark means a disruption of those navigation services. When this occurs, voice communications will be plentiful. Other instances when comms are more than usual is during primary frequency changeovers, when QSB or QRM forces a change in primary, and for RTTY coordination.

As stated, it may take upwards of a week of monitoring before you luck out and hear multiple communications. So be patient and don't jump the gun and attempt to QSL off of a single radio check.

All USCG LOC are excellent verifiers, as is the USAF South Korean LORANS. When you QSL, include a prepared reply card/letter, for none of these stations have their own QSL cards. Because you are using the military APO/FPO address routing, your envelope postage is simply one First Class stamp. Likewise, only 13¢ is required for postcard PFC (or 20¢ if you don't have it or are including a form letter).

As with reporting to any utility type station, you cannot relate any specific details of the actual communication. Simply indicate radio check with ---, working ---, and so on.

Mailing addresses for the NWPACLOC/USAF ROK net are:

(NRT—Yokota Monitor)
USCG LORMONSTA Yokota
APO San Francisco, CA 96328

(NRT2—Gesashi)
USCG LORAN-C Station NRT2
Box CG
FPO Seattle, WA 98770

(NRT3—Iwo Jima)
USCG LORAN-C Station NRT3
FPO Seattle, WA 98781

(NRT9—Hokkaido)
USCG LORAN-C Station NRT9
FPO Seattle, WA 98763

(NRV6—Marcus)
USCG LORAN-C Station NRV6
FPO Seattle, WA 98782

(NRV7—Yap)
USCG LORAN-C Station NRV7
Pacific Islands Trust Territory
Yap, Western Caroline Islands 96943

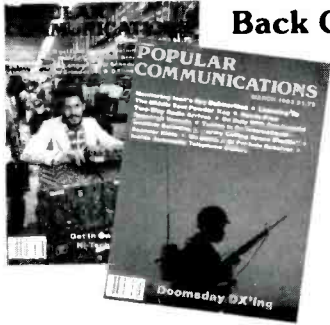
(Hampyong)
Hampyong LORAN
c/o
OL-E 2146 Comm Gp
APO San Francisco, CA 96324

(Pohang)
Pohang LORAN
c/o
OL-F 2146 Comm Gp
APO San Francisco, CA 96218

(NRV—USCG Guam)
USCG Radio Station Guam
FPO San Francisco, CA 96630

If you have never heard nor QSLed any of the NWPACLOC stations, now is the time to fire up your rig. To illustrate what can happen: when a recent LOC net failure occurred, I obtained multiple loggings on all of these stations during a two hour period. You can do the same. All it requires is patience, a little luck, and good propagation conditions.

Back Copies



At present we have copies of all of our back issues available, commencing with the first issue (September '82). These can be ordered by mail at \$1.75 each from Popular Communications, 76 North Broadway, Hicksville, NY 11801. Be sure to specify which issues you want to order.

How About

Those Mysterious Transmissions?

Where Do They Come From? What Do They Mean? Who Is Sending Them?

BY TOM KNEITEL, K2AES, EDITOR

Seated at his communications receiver, a monitor tunes across the 6 MHz portion of the spectrum. At 6995 kHz he pauses to listen to a CW signal and copy it down—“78 DE OAZBOR AA.” An orthodox interpretation of that message would be that a station with the callsign OAZBOR, located in Peru (according to the callsign), is calling a station with the callsign “78.” Of course, nothing could be further from the truth. OAZBOR is probably not in Peru; it is doubtful that its callsign was ever assigned by any government. It is a mystery station; its location, message, operator, and purpose can only be guessed at. Is it operated for the benefit of a spy ring? Smugglers? Commercial purposes? Is it a military station?

This message is odd, it's true, but it isn't at all unusual because for the past couple of years the shortwave spectrum has been teeming with strange and unusual signals which have tantalized and baffled listeners while also drawing the attention of the various signal analysis departments of the military as well as civilian agencies of the government. Those messages which appear to be coded are being subjected to investigation, and direction finding bearings are being taken as communications interests attempt to unravel the mystery transmissions which pervade the spectrum between 1600 kHz and 28 MHz using voice, CW, RTTY, control tones, or other modes of operation.

Whether it's a “numbers” station, or some other unorthodox and “unlisted” transmission, somewhere in the world there are those who know why it's on the air, where it is, and the meaning of its messages. Someone, somewhere, built the station and staffs it. Yet, strange as it seems, despite hundreds upon hundreds of mystery stations which have been monitored, nobody has come forward to say that they have been connected with the construction or operation of any of these stations. Why? The media is pervaded by “confession” type stories of those who were maids and butlers to celebrities or royalty, or those who were on WWI spy missions, or those who worked in the inner circles of government. Why hasn't someone come forward to say, “Yes, I worked at the Spanish language numbers station on 9075

ALPHABET			
A	•—	N	—••
B	—•••	O	—•—•
C	—••••	P	—••••
D	—•••	Q	—•••••
E	•	R	—•••
F	••—•	S	•••
G	—•••	T	—•
H	••••	U	—•••
I	••	V	••••
J	•••••	W	—•••
K	—•••	X	—••••
L	•••••	Y	—•••••
M	—••	Z	—•••••

NUMERALS			
1	•••••	6	—••••
2	•••••	7	—••••
3	•••••	8	—•••••
4	•••••	9	—•••••
5	•••••	0	—•••••

This should help you to copy some of the slower CW traffic.

kHz, and I'll tell you all about it from A-to-Z.

The purpose of this report is not to make any pronouncements to the effect that these mysteries have been solved. The purpose is to give you an overview of some of the more baffling of these stations, tell you how you might hear them, and offer some of the thoughts on them as set forth by serious researchers who have devoted considerable time and thought to these stations. Actually, we will not even attempt to cover every type of mystery signal (there isn't room here for that), but will try to fill you in on some of those categories of stations which are presently drawing the most attention (other than “numbers” stations).

Single Letter Beacons

For close to 20 years now, monitors have been pondering stations which have be-

come popularly known as *single letter beacons* (SLB's). They aren't thought of by monitors as beacons in the sense that they are intended for being homed-in on, such as navigational beacons. Mostly these beacons consist of a single letter, sent over and over in Morse code (CW). Some have been noted at times offering data burst or RTTY transmissions in addition to the single letter transmission.

Those stations which have been noted on a wide variety of frequencies have been monitored operating simultaneously on several frequencies.

Perry Ferrell, in the 5th Edition of his *Confidential Frequency List*, points out that there are minor variations in the repetition rate of the identification letter of the SLB, noting that while some are sent with a two or three second delay between letters, at other times there may be a longer silent interval lasting as long as six or seven seconds. There are also, he observes, slight frequency variations. In fact, Ferrell puts forth the interesting proposition that by deliberately varying the silent interval between letters, plus slightly varying the frequency or changing the identification letter itself, a considerable amount of information can be sent out by those who operate these stations.

Mike Chabak, in the new *Speedx Reference Guide to The Utilities (SRGU)*, presents a highly detailed and deeply probing ten page discussion of SLB's. Chabak, and others with whom he has worked on SLB's, noted (for instance) that some of these stations are not only being heard on their regular “family” of frequencies, but can also be heard on the harmonics of those frequencies. (For instance, the K beacon on 4521.5 kHz has also been monitored on harmonics of that frequency, 9043 and 18086 kHz.)

Bob Grove, in his *Shortwave Frequency Directory*, points out that in addition to the letter identifications sent, some SLB's broadcast weather information in the form of 5-digit codes (Cyrillic code). He also reports that the FCC confirms that some SLB's are located in the Soviet Union.

Direction finding bearings reported by Chabak have at least one of the beacon signals coming from the Asian portion of the

Single Letter Beacons

"A"	4271, 6770, 7512, 7538, 7657, 7865, 7895, 9016, 11745, 14371, 19214, 20760 kHz (Note: The "A" and "N" beacons are sometimes noted simultaneously on frequencies separated by 500 to 800 Hz.)
"B"	17885 kHz
"C"	5305, 8656, 13636, 17016, 20992 kHz (Note: Monitored with 20-second cycle, 7 for beacon and 13 for data burst.)
"D"	5305, 6801, 8647, 8656, 10644, 17016 kHz
"F"	5305, 8647, 11201, 11230, 13095, 13635, 17017 kHz
"K"	4006, 4251.5, 5180, 5795, 5890, 5919, 8146, 8656, 8959, 9043, 10570, 10638, 10645, 11158, 12151, 14477, 14967, 17017, 18086, 18348 kHz
"N"	4271, 6970, 7512, 7657, 7865, 9016, 14371, 19214, 20760 kHz
"O"	5307, 5350, 6804, 7557, 20991 kHz
"P"	4312, 6972 kHz
"Q"	11256 kHz
"S"	6226 kHz
"T"	13245 kHz
"U"	5350, 6245, 6506, 7557, 8136, 8671, 9057, 10212, 12185, 12327, 13329, 15655, 15700 kHz (Note: A message monitored on this station was "UUU 00613 34336 87513 67928" as reported in <i>SPEEDX</i> .)
"W"	7655, 10699 kHz
"X"	18947 kHz

Table 1. All frequencies should be considered ± 3 kHz.

Phonetic Alphabet Stations

BAC2	4560, 5230 kHz
CID2	8925 kHz
CIE2	8925 kHz
CIF2	8930 kHz
CIO	8930 kHz
CIO1	8925, 17965 kHz
CIO1F	13150 kHz
CIO2	6804, 6840, 8917, 13150, 17968 kHz (45 min. past the hour)
CIOC	8925 kHz
COF2	8925 kHz
EZ12	17412 kHz
KDA2	12415 kHz
KPA2	7445, 8924, 12145, 12315, 13150 kHz (15 min. past the hour). This station also noted using CW with ID J3R on 8829 and 8920 kHz.
KPO2	7445 kHz
KYN2	5642 kHz
MID2	12747 kHz
MIW2	5670, 8460, 12747, 17170 kHz
NCJ2	3415, 5435 kHz
PCD2	3150 kHz
RCH	5085 kHz
SMN2	8425 kHz
SVN2	5642, 8425 kHz
SYN2	5642, 8425, 8925 kHz
ULX	3930 kHz
ULX2	3930, 5230 kHz
VAC2	7919 kHz
VIB2	4670, 8925, 12950, 13150 kHz
VKV2	7605 kHz
VLB1	7605 kHz
VLB2	4670, 7605, 12950, 17595 kHz (45 min. past the hour)

Table 2. All frequencies should be considered ± 3 kHz.

USSR near (or in) the city of Khabarovsk. This city contains a naval shipyard and possibly also a military communications facility. Khabarovsk is about 600 miles west of the location where Soviet fighters shot down a Korean airliner last year. Chabak suggests other locations for various SLB's might be Cuba and various overseas military facilities.

Ferrell suggests possible locations in the Australasia and Far East, based upon the way they are being heard.

Chabak feels that these stations are possibly connected with Soviet nuclear submarine operations. I second this opinion because there is reason to believe that the SLB's may be providing information for the benefit of Soviet nuclear submarines which permits them to better utilize the communications facilities of Soviet satellites. Moreover, he sets forth as possible locations of some of these stations Soviet diplomatic facilities in various Pacific nations.

In the meantime, the SLB's continue on a myriad of frequencies while many listeners try to figure out what they're monitoring. A listing of those recently reported by North American listeners is shown in Table 1. This was compiled from my own observations and also from recent reports in the ASWLC publication and Mike Chabak's column in *SPEEDX*.

If you wish to pursue SLB's mysteries, your best bet is to listen to them in operation and then read more about them in *SRGU*, the *Confidential Frequency List*, and also *The Shortwave Frequency Directory*. These publications also contain listings of SLB fre-

quencies and identifications. Chabak's discussion of SLB's is especially valuable.

Phonetic Alphabet Stations

Within the realm of voice transmissions, none is quite as effective as the family of phonetic alphabet stations (PAS). Various using AM and SSB (USB), a woman's voice repeats identification letters over and over in the international phonetic alphabet. These ID letters usually consist of 3 letters, more often than not followed by the number 2, as in "Kilo Papa Alpha 2" or "Charlie India Oscar 2."

Are these letters the identification of the station which is transmitting? Are they the identification letters of the person or station being called? Are they complete messages?

An English listener, Geoff Halligey, and Rhode Island listener Bob Horvitz have observed these stations at length and found some interesting factors. For one thing, while sometimes these stations transmit 4 and 5 digit letter-group messages, they usually transmit no messages at all at times when the numeral "2" is used in the "call-sign." The numeral "2" may then mean that there are no messages.

Some stations, they note, may well be the same transmitter sending different "call-signs" at different times. Also, several simultaneous transmissions on different frequencies have been noted using different call-signs on each frequency, but since they go off the air at the same time the possibility arises that these stations may all essentially be the same station operating from only one

or two locations. A story in *Monitoring Times* suggested the possibility that the transmissions come from an Eastern European embassy in Canada.

Halligey and Horvitz note that the station(s) transmit(s) at certain specified times past the hour, although they may well operate these schedules on a 'round the clock basis.

A listing of the frequencies of some of the recently monitored PAS is given in Table 2. These stations have been around for a long time, KPA2 on 8926 kHz being first noted about 20 years ago. KPA2 is also noted on CW using the identification "J3R."

Cut Numbers CW Stations

There seems to be little point in using the available space here to delve into the whole confusion regarding the so-called "spy numbers" voice transmissions since they have been covered in many previous issues and will undoubtedly be discussed at length in the future.

What is interesting to note is that sometimes, in addition to the messages being coded, the digits used in the transmissions may themselves be coded. This takes place in many "spy numbers" transmissions sent via CW and has been misinterpreted by many listeners thinking number-groups are letter-groups when they are in fact number-groups. A typical example of this was on page 62 of the September *POP'COMM*. A reader reported noting a CW station continuously sending the message "NDD ANT" on 4897 kHz. In actuality this message was in-

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2 = U	7 = B
3 = V	8 = D
4 = 4	9 = N
5 = E	0 = T

Noted in use on 3060, 3090, 4847 kHz:

1 = A	6 = R
2 = N	7 = I
3 = D	8 = G
4 = U	9 = M
5 = W	0 = T

Reported in use on 4100 kHz:

1 = A	6 = R
2 = U	7 = G
3 = W	8 = D
4 = M	9 = N
5 = I	0 = T

Possibly used on 5148 kHz:

1 = A	6 = N
2 = U	7 = G
3 = W	8 = D
4 = ?	9 = M
5 = I	0 = T

Table 3. Here are some examples of "cut CW" numbers.

tended to read "233 120," which was probably the ID of the person or station being called ("233") followed by information relating to the message groups or text ("120").

The "NDD ANT" was, in fact, a message which was sent in so-called "cut CW." There's nothing especially mysterious about "cut CW;" it's been around for years—hams use it, military stations use it, commercial

stations use it. Essentially, it's a shorthand form of CW used to save time during the transmission. The problem arises in that there are several systems for doing it (like Gregg and Pitman shorthand are different systems of written shorthand), and, of course, the fact that many listeners aren't aware that they're hearing numbers instead of letters being sent in abbreviated form. For instance, in one form of CW "cut numbers," the digit "6" is sent like the letter "R." Let's face it, the numeral "1" (in CW it is di-dah-dah-dah-dah) is not even remotely related to "R" (di-dah-dit). So, it's a question of realizing that what you're hearing is intended to be numbers instead of letters, and then you must try to ascertain which "cut-numbers" method is in use. And, of course, there's still the problem of attempting to decode what the numbers mean once you know them, and that's another story altogether!

From information I have collected on various "cut numbers" methods presently in use around the bands, I have compiled the information on some of these systems, which is shown in Table 3. Obviously there are other systems in use; if readers have information on them they should be sent to POP'COMM and we will run them here.

Miscellaneous Stations

Actually there are all sorts of mystery stations you can find on voice or CW. Some of them are shown in Table 4 to give you some idea as to the wide variety of such transmissions. If you can figure out what they're all about—well, you're good. If you even try to figure out what you're hearing, you'll be in good company. Many others are wrestling with the shortwave mystery stations!

Miscellaneous CW Mysteries

5733 kHz	0400 GMT	"WP IWTUE UTUTET YQWUTEIU PEITIW PEIWT" repeated in CW. Note constant use of certain letters and vague similarity to 10319, 11606, and 15893 kHz.
6643 kHz	2351 GMT	"FW2W DE 6NKP" then into 5-digit numbers.
6682 kHz	0210 GMT	"F20" and "F22" repeated in CW.
6995 kHz	0338 GMT	"78 DE OA ZBO R AA" repeated in CW then into messages. Note similarity to 13496 kHz.
8926 kHz	2250 GMT	"TANGO PAPA" AM mode, man with Spanish accent.
9217 kHz	0246 GMT	"QJHI" running a repeating marker in RTTY.
9959 kHz	1733 GMT	"6DEE TAEU A4D4" in CW.
10102 kHz	1300 GMT	"LOG8" repeating in CW.
10319 kHz	0818 GMT	"VUDUD66T" repeating in CW.
10500 kHz	1300 GMT	"BQC" repeating in CW.
11606 kHz	0335 GMT	"UTAA DBD4 UE6N" repeating in CW.
13496 kHz	1146 GMT	"72 DE OAZBOA AA" repeating in CW.
14367 kHz	0835 GMT	Random numbers in CW.
14441 kHz	0300 GMT	"U4U" in CW sending 83 sets of 4-digit groups.
14470 kHz	1445 GMT	"ND EAEVT6" repeating in CW.
14964 kHz	2144 GMT	"36M" repeating in CW and sending "VVV."
15893 kHz	1530 GMT	"UDE ADA4E" repeating in CW.
17125 kHz	1758 GMT	"QLP" repeating in CW.
19345 kHz	1122 GMT	"44B" similar transmission to 14964 kHz.
20129 kHz	1232 GMT	"UEV U4N NB6 U6D" repeating in CW.
20468 kHz	1520 GMT	"BPA" repeating in CW.

Table 4. There are hundreds of mystery transmissions to be heard every day. Here is a random sampling of recently reported stations. Chances are some of the letters transmitted are actually "cut numbers" as shown in Table 3, especially 5733, 9959, 14470, 20129 kHz.

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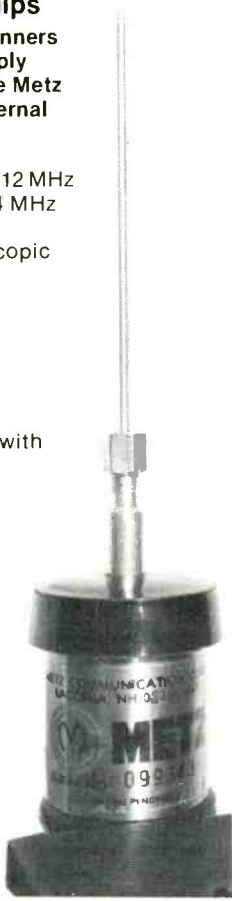
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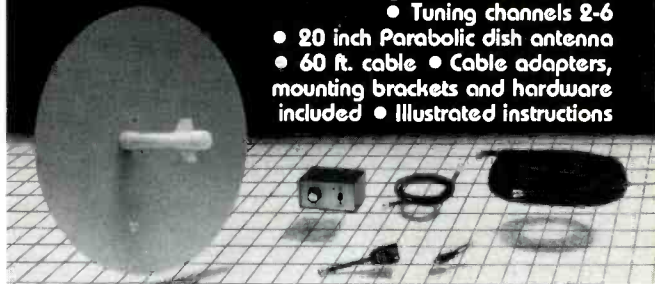
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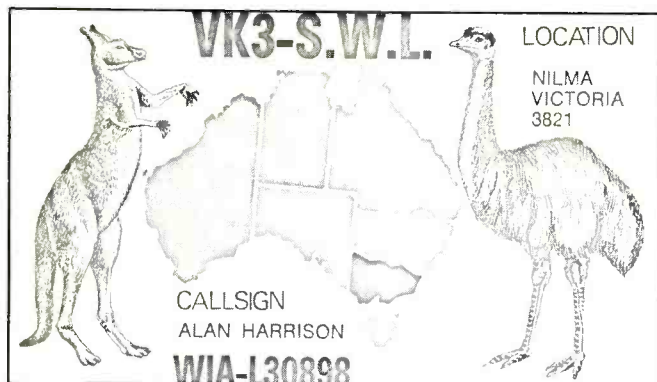


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BY ART McTAGGART



SWLing is as popular in Australia as it is in North America.

I thought it might be of interest to North American listeners to see some of the DX stations being tuned in by monitors in Australia (eastern part) since it seems that the DXing "down under" offers two-way traffic which has not been reported in *POP'COMM*, including dispatchers and military stations from all sorts of interesting places. Perhaps, once listeners in North America have been made aware of some of the frequencies involved, they can tune them to see if these stations are making the trip across the Pacific.

What I've done is jot down some of the frequencies my friends have been noting as active within the approximate frequency range of 23 to 30 MHz, also listing the general times we have copied these signals. Naturally, propagation conditions would call for listening at different times if there is any chance at all of hearing any of these stations in North America. All times shown are GMT (UTC).

These listings have been carefully screened to exclude any and all CB and Amateur operations, even though many of the stations shown are actually located within the frequency limits of the 11 meter CB band and the 10 meter Amateur band. The fact is that there seems to be a considerable amount of use of these frequencies by stations which have no actual right to be operating on the frequencies they're using. I've also included several Russian jammers heard in eastern Australia.

kHz Mode GMT Comments

23445	CW	0240	Russian jammer "UA"
23935	CW	0240	Russian jammer "ZT"
24905	AM	0425	Chinese two-way
24965	AM	0600	Chinese two-way
24980	AM	0720	Chinese two-way
25105	AM	var.	Indonesian taxi dispatchers
25175	FM	0700	Russian two-way
25260	CW	1245	OXZ, Denmark
25555	AM	var.	Indonesian taxi dispatchers
25690	CW	0345	Russian jammer "FL"
25900	RTTY	0510	Unidentified
26005	RTTY	0510	Unidentified
26100	RTTY	0040	Unidentified
26145	SSB	1040	Unidentified (military?)
26165		0745	Radio control tones
26425	FM	0935	Cordless telephones
26675	FM	0745	Russian two-way (weather information)
26755	AM	0500	Indonesian two-way
26775	SSB	0955	Australian military
26860	RTTY	0415	Unidentified
26890	FM	0415	Cordless telephones
26895	FM	1115	Cordless telephones

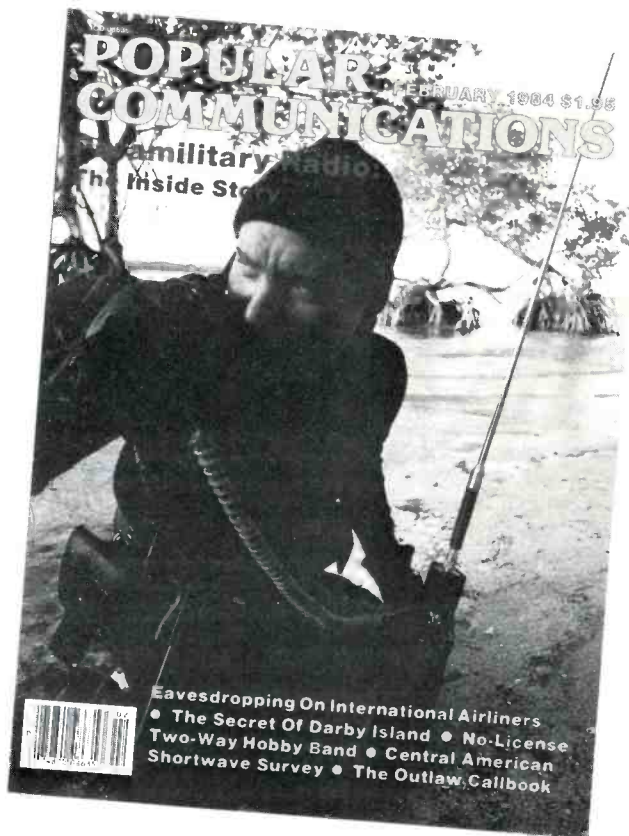
kHz Mode GMT Comments

26930	CW	1330	USN stations NAO/NAR
26975	AM	var.	Sydney (Australia) hospital paging
27015	RTTY	0930	Unidentified
27025	CW	1000	"OUT" followed by numbers
27045	FM	var.	Cordless telephones
27540	CW	0430	Russian network
27550	CW	0140	Automatic beacon transmitters with the following IDs: AV1, H1, A3, R3, I9, T1, X7
27650	CW	1345	Automatic beacon transmitters with the following IDs: V0, IZ1, Y3
27660	CW	1300	Automatic beacon transmitters with the following IDs: N16, K62, B82, K22, N62, M99
27740	CW	1200	Automatic beacon transmitters with the following IDs: I61, K19, G61
27860	AM		Australian maritime frequency
27870	CW	1345	High speed transmission
27880	AM		Australian small boat emergency frequency VH7WG Tasmania VH7WH Margate Base, Qsld. VJ3ND Victoria VJ4YN Yeppoon, Qsld. VM6FN Western Australia VN4PQ Manly Boat Harbour, Qsld.
27890	AM		Australian maritime frequency
27900	AM		Australian maritime frequency
27910	AM		Australian maritime frequency
27940	AM		Australian maritime frequency
27960	AM		Australian maritime frequency
27990	AM		Australian maritime frequency
28000	AM	0600	Russian two-way
	AM	0700	Japanese two-way
28005	AM	0500	Japanese two-way
28015	AM	0700	Japanese two-way
28022	AM	0600	Asian two-way
28045	AM	0300	Asian language & some two-way English taxi dispatching
28070	AM	0500	Japanese two-way
28080	FM	0500	Japanese two-way
28160	FM	0400	Japanese two-way
28200	FM	0700	Japanese two-way
28210	FM	0300	Chinese two-way
28235	USB	1445	Unidentified language two-way (VOX controlled)
28370	AM	0420	Chinese radio telephone (1/2 of duplex circuit)
28375	AM	0700	Japanese two-way
28400	AM	0700	Japanese two-way
28445	AM	0300	Unidentified Asian language two-way
28500	FM	0300	Russian two-way
	FM	0700	Japanese two-way
28560	CW	0300	Russian jammer "UN" (harmonic?)
28895	AM	0955	Chinese two-way
28953	CW	var.	"K" beacon every 4 seconds
28980	CW	0300	Russian jammer "SF" (harmonic?)
28985	AM	0300	Japanese two-way
29000	AM	0300	Japanese two-way
29075	AM	0300	Asian language two-way
29665	AM	1320	Unidentified language two-way
29750		var.	Radio control tones
29835	AM	0810	Asian language two-way

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SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 512 MHz "ACTION" BANDS

You've probably heard of the trunked radios operating in the 800 MHz band, but trying to understand how they work might send you packing. We'll attempt to explain their operation this month.

As many of you are more than aware, business band channels on VHF high band and UHF are very crowded, more so in urban areas and even in rural areas. It's virtually impossible to find a quiet radio channel to operate on any more. Many businesses that utilize community repeaters on UHF (repeaters with more than one user) often have to wait for other users to clear the channel before they can operate on the system. That can provide a real headache when your call is urgent. The manufacturers of trunked radio systems know that all too well and are using the argument as the strong selling point for their radios.

A trunked radio system usually offers from 5 to 20 channels to its users, which makes it a little easier to find an available channel. But the interesting aspect of trunked radio systems is the fact that you don't have to locate the available channel—the radio does it for you.

For instance, on a 5-channel trunked system, one of the 5 channels is allocated as a data channel. In some systems, this channel might change every 24 hours. In any event, each of the users on the system automatically receives this data channel. Microprocessor-controlled circuits and switching systems at the repeater site send out coded signals on this data channel. The signals assign mobile users to one of the other available channels each time the microphone button is depressed. It also automatically switches all other units of a particular user—called a fleet—to the same channel automatically. The radio automatically switches to the channel; the user need do nothing.

In busier, urban areas, some systems use up to 20 channels for trunked communications. Although most systems switch channels each time the transmitter is keyed, one system manufactured by General Electric keeps the user assigned to a particular channel until all communications are complete. Because of the channel-hopping logic used in most trunked systems, you'll have to get your scanner hopping from channel to channel to keep up with the activity. You'll find it isn't easy to do.

Trunked systems generally operate in the 861-866 MHz band. The inputs utilized by the mobiles is 45 MHz lower in the 816-821 MHz band. If you have access to FCC license microfiche or files, you'll notice that the company providing the trunked service usually is licensed on the output frequency, while the individual users are all licensed for



This model 8700 Clearchannel LTR trunked radio is manufactured by E.F. Johnson Co. Its compact size makes it easy to mount in almost any vehicle.



This MARC VICS trunked radio is manufactured by General Electric and comes complete with a telephone handset and Touch-Tone pad to interface with the telephone network through a trunked repeater system.

mobiles on the input frequencies. In a 5-channel trunked system, each of the channels is 1 MHz apart. One example would be 861.1875, 862.1875, 863.1875, 864.1875, and 865.1875. If the system were to offer a 10, 15, or 20-channel trunked network, there would be additional blocks of five frequencies within the same band, with each frequency spaced 1 MHz apart. Imagine trying to monitor a conversation on a 20-channel trunked system as the radios hopped from channel to channel!

Each of the manufacturers offer their own set of gadgets and goodies with their systems. Some may include features such as a busy signal if all the channels are busy when the microphone is keyed on an out-of-range

signal to let you know when you no longer can communicate through the trunked repeater system. If the radio can't hear the dedicated data channel, it won't let you transmit.

Perhaps the more popular selling aspect of trunked radio is that the FCC now has allowed telephone interconnects on such systems. What does all this mean? It means that users of trunked systems can place telephone calls with their radios if the system is set up to handle it. Because of the ever-growing shortage of mobile telephone air time on standard mobile phone and radio common carrier channels, trunked radio offers the mobile phone without the waiting list. With a special telephone handset hooked into the mobile unit, not only does it serve as a mobile radio, but also as a mobile telephone unit. Many of the license applications the FCC is receiving for trunked systems lately is from an individual for one mobile unit—quite obviously to be used mainly as a mobile telephone rather than for business radio.

Mailbag

John D'Attomo of Chicago, Illinois, writes in to say he has purchased a Bearcat 20/20 scanner and connected it to a Hustler DCX discone antenna 10 feet off the roof of his house. However, he notes, reception is no better than with the telescopic antenna supplied for the back of the set. He wonders what problems he might be having.

Well, John, it's hard to diagnose problems long distance, but here's a stab. Check all of the connectors on your coaxial cable to start. Are all the solder connections clean? Make sure you don't have a short from the center conductor to the braid on either end of the cable. Also, if you're using RG-58U cable, make sure you aren't running more than 50 feet from the antenna to the radio. Even at that length you will experience signal loss in the cable. If you need to run a long length of cable, it is probably best to use low-loss cable such as RG-8U. Also, make sure your antenna itself is not touching the mast you have it mounted on and isn't being blocked or interfered with by another antenna right next to it.

That's a start to check out your antenna problems. If you're still having problems, you might just be in a bad area for reception. John also asks what frequencies he can hear helicopters on. According to Tom Kneitel's useful *Air-Scan* directory, 123.025 is used for air-to-air communications between helicopters and 123.05 and 123.075 are used by helicopters to talk to heliports. In the Chicago area, you might also want to check out 166.250, which is used by WGN-AM's traf-

fic helicopter to relay traffic reports back to the studio. You can also hear Shadow Traffic's helicopter in Chicago on 462.550 and Traffic Radio in Chicago on 462.600, 455.550, and 161.760.

Bruce Sumter of Ramona, Oklahoma, says he can trick his Bearcat 210XL to scan the aircraft band, but is unable to hear anything there. The answer really is quite simple. The Bearcat 210XL can monitor only FM communications. Aircraft communications in the 108-136 MHz band all are AM. It's possible to hear AM communications on an FM receiver, but it will sound very distorted. And even though the scanner is registering frequencies on its display out of band, it doesn't necessarily mean the receiver is actually operating at those frequencies.

Glenn A. Wright of Long Beach, California, took notice of the Olympics frequencies we listed in the September issue and says the Los Angeles Olympic Organizing Committee is authorized to use 929.7875 MHz. We checked a little further and found out the committee is using this frequency for an extensive paging network in the Los Angeles area. The callsigns for the various transmitter sites on the frequency are: KNEE813, Sierra Peak; KNEE814, headquarters office in Los Angeles; KNEE815, Oat Mountain in Chatsworth; KNEE816, Mount Wilson, and KNEE817, Los Angeles. The 929-930 MHz band is used exclusively for paging by private radio users.

Glenn also says that the Queen Mary in Long Beach operates on 464.775 MHz using two tactical callsigns: "Sam" is used to ID the ship and "George" is used to ID the Spruce Goose, a giant flying craft on display next to the ship.

In addition, Glenn passes along some frequencies for the Long Beach Naval Station, which is the home port of the battleship *USS New Jersey*.

F1	140.975	Shore Patrol
F2	141.975	Shore Patrol
F3	140.025	Defense Department Police
F4	140.325	Fire and ambulance
	162.375	Naval Investigative Service
	328.200	Command Early Warning Net

For ships entering or leaving the port, Glenn says they use marine Channel 6 (156.300), Channel 12 (156.600), and Channel 13 (156.650). Thanks for the great report, Glenn!

Cough 'Em Up

C'mon now, it's your turn. We need your input to keep this column plugging along. What frequencies do you listen to? What kind of odd things have you heard on your scanner lately? And you know what we'd really like—a picture of your shack, preferably with you at the gear tuning in that elusive station. We're also looking for pictures of transmitter sites and dispatching consoles. Every one else surely would like to see what you have to offer. You can send your photos and lists to: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 N. Broadway, Hicksville, NY 11801.



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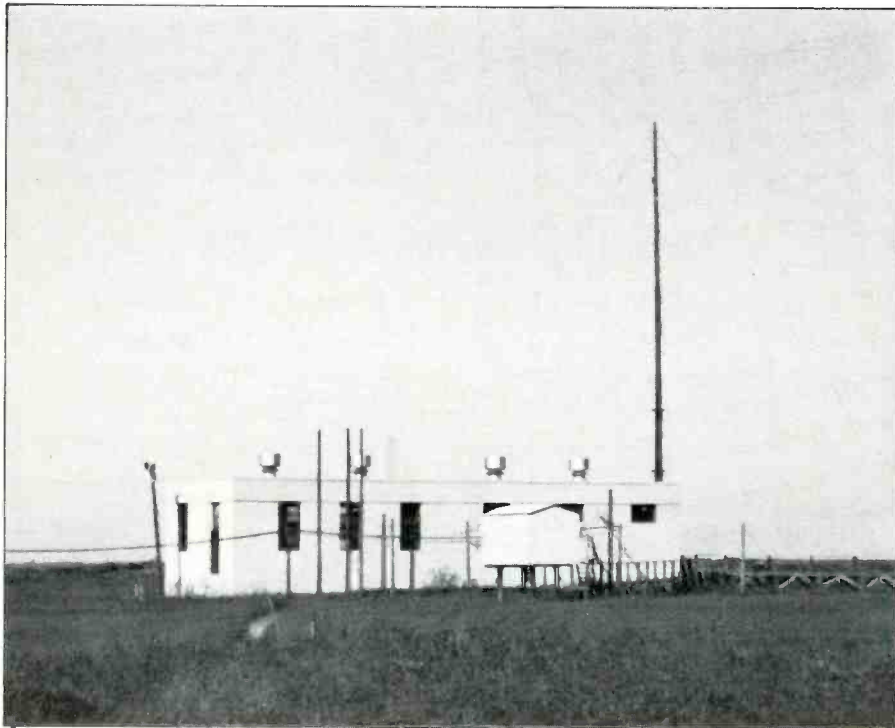
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CIRCLE 37 ON READER SERVICE CARD

The Station That Wasn't

And Now It Almost Isn't! BY TONY EARLL, KNY2AE



The WSL transmitter building at the Napeague site.

One of the most well-known long-time American residents of the communications bands appears to be getting ready to go QRT—in radio lingo that means it's about to pull the big switch for the last time! Yes, after well over a half-century of worldwide communications with ocean-going ships, coastal telegraph station WSL has been slated for extinction by its owners, ITT World Communications (ITTWORLDCOM). The FCC has been asked for its permission to shut down the facility.

Utility listeners throughout the world have long been familiar with WSL, Amagansett, New York and its familiar CW signals. It seems to be on the air constantly, either calling CQ, sending lengthy traffic lists, or communicating with ships. What listeners don't know is that the station isn't actually in Amagansett, New York. It never was, it isn't now, and pretty soon it won't be anywhere!

WSL first showed up on the air in the late 1920's and it was listed as being in Sayville, New York and operated by Mackay Radio Telegraph Co. It was operating on 16 different frequencies ranging from 100 kHz to 22700 kHz.

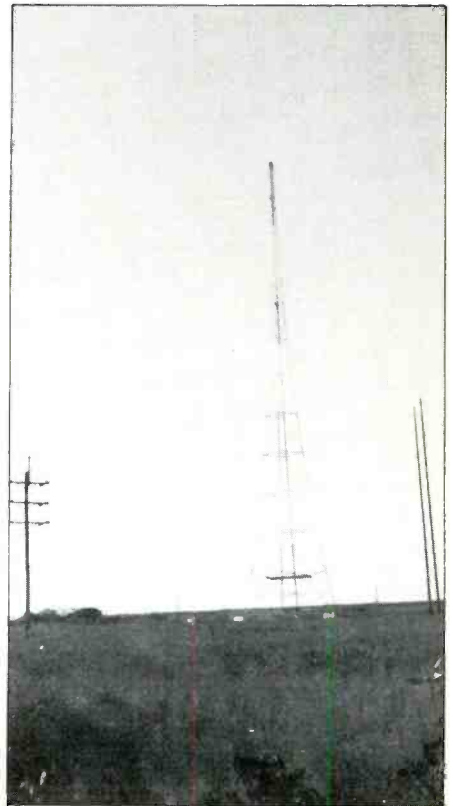
Many years later it evolved into a part of the large ITT World Communications network and its location was generally given as Amagansett, New York. Amagansett is a picturesque community located on Long Island 16 miles west of the island's eastern tip (Montauk Point). It's more than 30 miles east of Sayville. That's where things begin to get complicated.

FCC records show that WSL is licensed to operate on 17 frequencies, with transmitting facilities for each of those frequencies in Brentwood, New York and Amagansett, New York, and that the license is ITT World Communications, 67 Broad Street, New York, NY 10004.

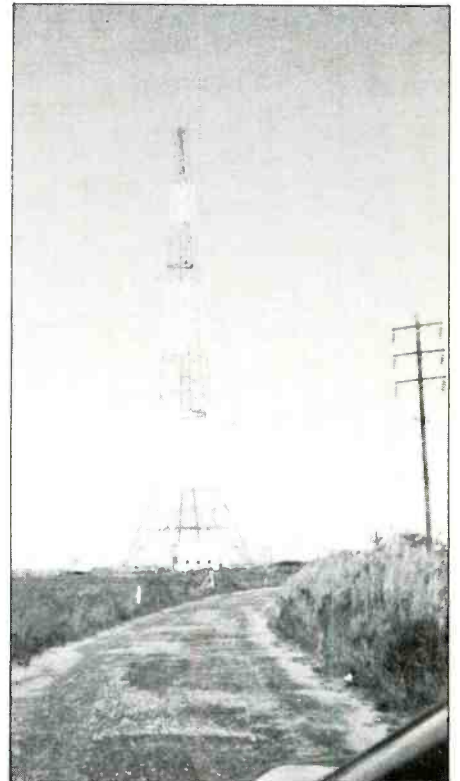
In truth, the station's low frequency transmitter (operating on 418, 476, and 500 kHz) is located in the tiny hamlet of Napeague, New York, a desolate stretch of beach five miles east of Amagansett. Besides the rundown beach shacks and the two clam bars which cater to tourists on the main highway to Montauk Point, about the only other thing in Napeague is WSL—and it's a most imposing presence! You can't miss it.

Rising from the dunes and tall grasses, and right on the shores of Napeague Harbor, are two gigantic transmitting towers. These are old-style towers like they used to build in the early days of radio. Each tower is (curiously) different from the other, and both are a bit on the weather beaten side and look like they could use a new coat of paint. A taut wire antenna stretches between these towers, several lead-in wires extending down to a large transmitter building which appears to be locked and devoid of human occupation. The transmitters are probably remotely controlled from another location. There aren't any shortwave antennas at the Napeague site. There is no post office in Napeague.

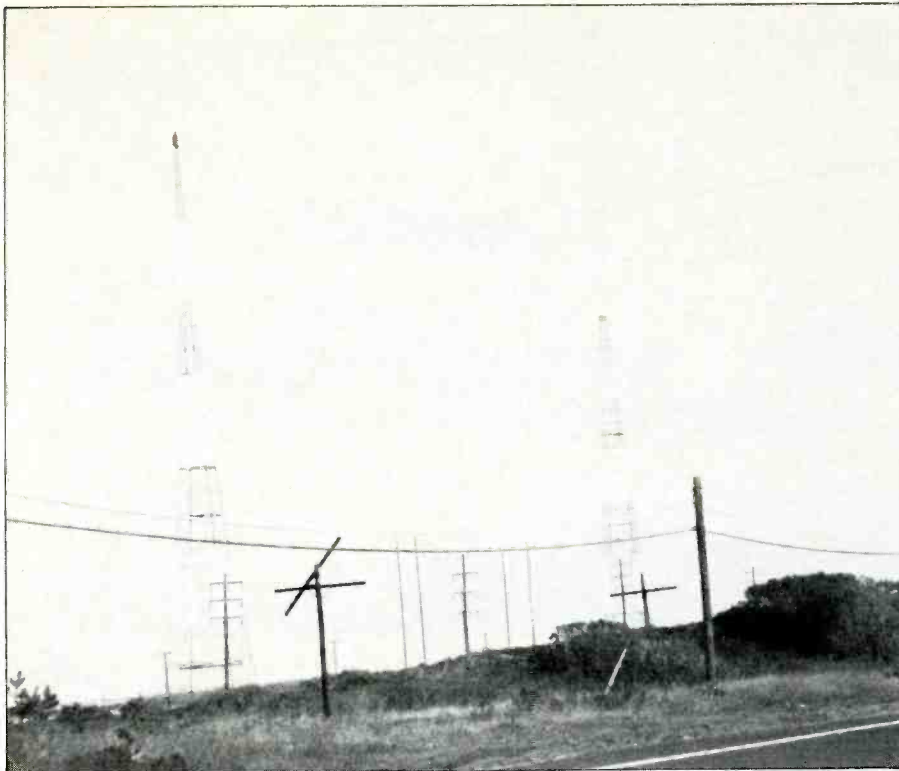
The shortwave operations of WSL, the ones which are shown in the FCC's records as being in Brentwood and Amagansett,



The western-most transmitting tower used at the LF station. It doesn't look very tall in this photo, but it must be about 200 feet.



The eastern-most of the pair of LF towers.



A view of the LF transmitting towers as seen from the main highway.



The overall view of the ITT World Communications site at Hauppauge, New York. This is the origin of the WSL signals.



The transmitter building for WSL's short-wave operation.

New York aren't in either of those locations. Brentwood is about 65 miles west of Amagansett and is a community within the Town of Islip. ITT WORLD COM's transmitting facilities, which includes the shortwave operations of WSL, are located at 150 Adams Street, Hauppauge, NY 11788. Hauppauge is a community near Brentwood and is in the Town of Smithtown. The ITT facilities are located at the edge of the sprawling Hauppauge Industrial Park, one of the largest industrial parks in the United States. Up until about ten years ago, the site upon which the industrial park is now located was a huge "antenna farm" for worldwide communications. For many years this area was owned by Mackay Radio Telegraph and had been generally known in radio circles as the "Brentwood site," although it was never in Brentwood. Indeed, listeners still like to refer to this as ITT-Brentwood, as does the FCC, even though there does not appear to be any logic to the use of Brentwood's name to refer to that location. Actually, the ITT World Communications facility at Hauppauge (a/k/a Brentwood) is home to a great many overseas communications stations operated by that company.

Okay, so the true location of WSL has been revealed at long last and it's not where you thought it was or where the FCC says it is. That's all fine and well, except that the station will probably be going off the air in short order. The station has been known to QSL (if you send a prepared reply card), so if you have the ability to copy WSL's signals, now might be the right time to try to get yourself a verification.

The address ITT World Communications gave in their request to the FCC for discontinuing WSL's operations was Box MM, Southampton, NY 11968. You can try that address for sending the station a report, or you can try 150 Adams St., Hauppauge, NY 11788.

WSL
 MACKAY RADIO AND TELEGRAPH CO., INC.
 AMAGANSETT, NEW YORK

This will confirm your reception of c.w. radio station WSL on 8 mc/s at 1730 GMT on 19, 19 55. Power: 500 watts. Antenna: 100 ft. tower

Remarks: on 8 MHz signal

WSL has QSLed in the past. Here's a prepared QSL card from 1955 for reception of their 8 MHz signal.

AMAGANSETT, N.Y.

THIS WILL CONFIRM YOUR RECEPTION OF
 RADIO STATION WSL ON 112.85 KCS. AT
 GMT ON 19

POWER: 500 WATTS. ANTENNA 100 ft. tower

REMARKS: 78

Signed: J. C. [Signature]

At one time, WSL operated on the strange frequency of 112.85 kHz. This is a QSL for that frequency.

WSL Frequencies (CW)

418 kHz	8514 kHz
476	8658
500	12660
2060	12997.5
4342.7	13024.9
6414.5	13094.5
6416	16997.6
6418	17021.6
	22485



Here is the Big Crow, the Army's flying electronics lab. (Photo courtesy U.S. Army)

Flying The "Big Crow"

Electronics Warfare Takes To The Air

BY SFC VICTOR LEWIS, U.S. ARMY

Riddle: Name an airborne team that doesn't jump out of airplanes.

Answer: A small team of soldiers and civilians stationed with the Office of Missile Electronic Warfare (OMEW) in New Mexico, who man "Big Crow," the Army Airborne Electronic Warfare Laboratory.

True, they don't go to jump school. But they spend a lot of time in the air in their extensively modified Air Force NKC-135A (a Boeing 717, close cousin of the 707). And they have a tough job.

They are not Airborne troops, but "You'd be amazed how many visitors, people who don't know what we do, come here the first time expecting to see us in 'chutes,'" says one team member.

Actually, their work is often as exciting as jumping. It's more demanding and diverse in the skills, training, and experience it requires. And, because the team is unique, its members belong to a much more select group than even the elite paratroopers.

A part of the U.S. Army Electronics Research and Development Command's Electronic Warfare Laboratory, the Office of Missile Electronic Warfare's "Big Crow" provides the Army an airborne EW platform for conducting research and development experimentation. Originally, the Army conceived, designed, and funded the modifications to the aircraft to fulfill testing requirements for the Patriot Missile Program. Because it is flexible and quickly reconfigured,

however, Big Crow's broad applicability as a test platform has brought it an expanded, DoD-wide role.

Inside, Big Crow is packed with computers; high power transmitters; receivers; tape recorders; communications equipment; and test, measurement, and diagnostic devices. Outside, special radomes have been added to its fuselage to house a variety of antennas and other equipment.

With these facilities, electronics countermeasures environments can be created to permit susceptibility and vulnerability analyses of weapons and communications-electronics systems under development.

It's the job of the Big Crow team to install this equipment (which must be done in compliance with strict Air Force regulations), operate it, and repair it when it breaks. This is highly specialized and challenging work for the small group, comprised of Army avionics equipment maintenance personnel, calibration specialists, a strategic microwave repairer, a computer programmer-analyst, and a material control and accounting sergeant. A civilian electronics technician and a secretary round out the team.

This crew works in a fast-paced world of constantly changing schedules and equipment configurations. In a typical mission, it may take up to a week to install or reconfigure equipment required for a scheduled series of tests.

"That may sound like a lot of time, but it's really not," says another team member. "Because of Big Crow's special modifications, some equipment changes can be made in as little as 45 minutes. We call it a 'quick change

artist.' We've installed systems on this aircraft in a week that contractors have bid a year to complete in normal aircraft."

If unfamiliar equipment is involved, the team must learn its operation and maintenance quickly, before tests begin. Then part or all of the team boards the aircraft and heads for the test site, which could be almost anywhere in the continental U.S., as well as Alaska or Europe.

This often means prolonged separations from their families, as a series of tests might take two to three months to complete.

Big Crow is flown and maintained by the Air Forces' 4950th Test Wing, Detachment 2, at an Air Force base chosen for its long runway and proximity to OMEW and other EW activities in the southwest. To increase its range and time aloft, it is to be fitted next year with aerial refueling equipment.

The plane has carried the team and its equipment to support everything from the Patriot Missile System in New Mexico to the Air Force AWACS (Airborne Warning and Control System) in Washington and Florida. They have also provided recent test support for the Office of the Secretary of Defense's Data Link Vulnerability Project, the Air Force Test and Evaluation Center, NATO, and NORAD (The North American Air Defense Command), among other agencies.

Says their boss, Colonel Robert C. Ed, commander of OMEW, "They are real professionals doing a super job in a precise, technical R&D environment." (Note: The author is the NOCIC of the Big Crow Army Airborne EW Detachment.)

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- WITH DATA INTERFACE (OPTIONAL), COMPUTER CONTROLLED • MEMORY CHANNEL EXPANSION, • 20 CH HIGH-SPEED REPROGRAMMING • RECORDING OF FREQUENCY, VOICE AND TIME • AND ALL FUNCTIONS REMOTE CONTROLLABLE
- BUILT-IN ANL (AUTOMATIC NOISE LIMITER) EFFECTIVELY SUPPRESSES AM-PULSE-TYPE NOISE
- HI-FI RECEPTION OF FM/TV BROADCASTS BY NARROW/WIDE SWITCHING OF FM IF FILTER BANDWIDTH
- CONTINUOUS SEEKING WITHOUT INTERRUPTIONS BY BIRDIES
- STOP MODE CHANGE SWITCH ENABLES SCANNING AND SEEKING FOR MODULATED SIGNALS
- AC Adaptor (optional)

SPECIFICATIONS (SX-400)

- **Frequency Range:** 26-520MHz
- **Channel Space:** VHF 5KHz or 6.25KHz, UHF 10KHz or 12.5KHz
- **Sensitivity:** VHF FM 0.5µV 12dB S/N, AM 1.0µV 10dB S/N, UHF FM 0.5µV 12dB S/N, AM 2.0µV 10dB S/N
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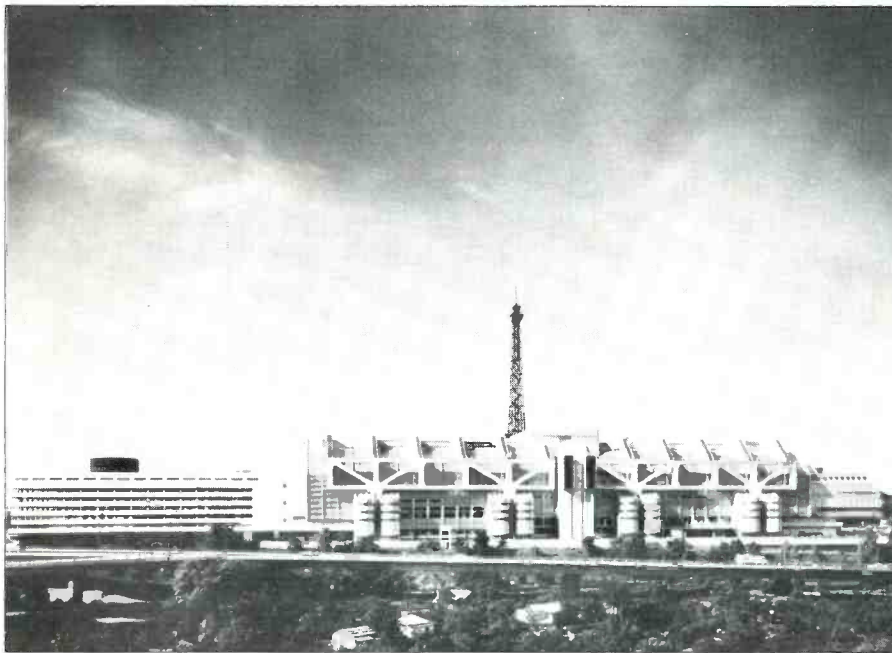
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CIRCLE 18 ON READER SERVICE CARD

World's Largest Electronics Show: A Special Report

BY NILS SCHIFFHAUER, DCØBQ



In Berlin. Internationale Funkausstellung took place. This photo shows the International Congress Center, one of the largest in the world. In the background can be seen the FUNK-TURM, which was used as an antenna for the very first public broadcast in Germany exactly 60 years ago.

It happens every two years—the world's largest consumer electronics show. Perhaps you haven't heard of it. In West Germany (where it's held) they call it *Funkausstellung*, which translates as International Audio and Video Fair. The show, which took place this past September, occupied 12,000 square feet and encompassed a total of 356 exhibitors and 409 represented companies from 27 nations. Some of the things covered included stereo TV, 3-D TV, satellite TV, VCR's, home computers, teletext, videotext, communications receivers, and stereo.

The biggest disappointment at the show was a technical problem, one that somehow caused most of the videotext computers to fail to become operational, including the computer brought to the show by IBM! One of the biggest hits of the show was the prototype of a future digital radio receiver in full

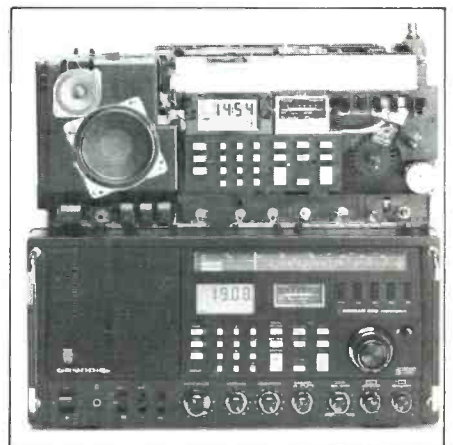
operation. Picking up 16 radio programs sent from Oberpfaffenhofen/Bavaria in the form of a bundle of digital signals and then transmitted to the show in Berlin via satellite. Development is projected at using an antenna 40 cm. in diameter which will pick up signals from the first West German broadcast satellite (scheduled to start in early 1986).

Receivers

Insofar as portable receivers went, there were many seen which appeared to take their inspiration from SONY's revolutionary ICF-2001, although SONY had a more sophisticated version of the ICF-2001 which they called the ICF-7600D (in West Germany) and the ICF-2002 (model number in the U.S. and Canada). This unit has the same tuning system as the ICF-2001 so that the user can select from direct keyboard entry, memory, or scanning. There is no longer an antenna adjustment because of the use of electronic impedance matching of the tel-



Grundig's top receiver. Satellite 600, went to Funkausstellung '83.



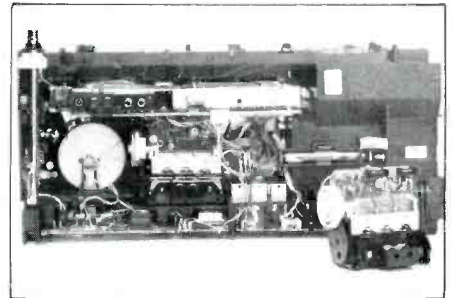
Having a look at the S600: outside and inside (above). There you can see the two loudspeakers (left) as well as the optical tuning device (right).



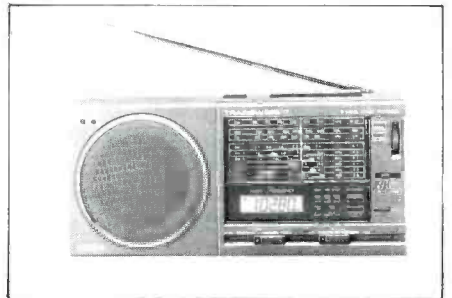
SONY shows space age technology with their brand new ICF-2002 (also known as ICF-7600D).



A prototype satellite receiver gained much interest.



Inside the back of Grundig's S600. On the right is the built out preselector.



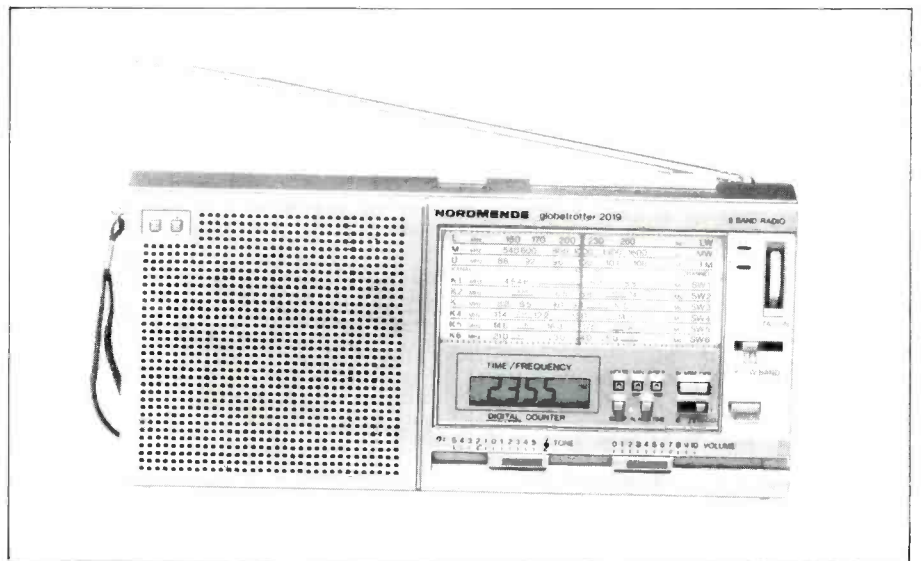
Saba's Transworld receiver with digital read-out of time and frequency.

escoping antenna (the principle of an active antenna). An analog tuning arrangement for receiving SSB (and fine tuning in AM mode) was an important plus for this new receiver. Although the ICF-2002 is no larger than a paperback book, within its attractive case is a rather complex system for processing the incoming signals.

All ICF-2002 frequencies are derived from a quartz driven oscillator with a stability of 10 ppm. Via PLL tuning, the first IF frequency (55.845 MHz) is produced. This is a relatively high frequency and not at all a compromise (like 10.7 MHz such as is used in many receivers for the 1st IF). A monolithic filter (16 kHz bandwidth at -6 dB, 100 kHz at -60 dB) reduces the likelihood of intermod problems and "ghost" stations. At the 2nd IF of 450 kHz is a 6-latter ceramic filter in use. This makes for excellent reception of all modes of reception, especially SSB.

A peek inside the ICF-2002 reveals a double sided PC board covered "wall to wall" with a myriad of components, including a custom designed VLSI chip (IC) which permits superior reception to be achieved in a receiver no larger than the palm of one's hand. SONY hopes that this new receiver will be as big a success as the ICF-2001. Jens von Coburs, SONY's marketing chief in Cologne, told me, "We sold more than 20,000 ICF-2001's in Germany and we think that the ICF-2002 will do even better." The tremendous response to this receiver at the show could turn Coburs' words into reality.

I want to add that this new ICF-2002 is *not* the long rumored successor to or replacement for the ICF-2001 since both units are to be marketed simultaneously. SONY reports that a larger and even more sophisticated version of the ICF-2002 is in the works and is intended to replace the somewhat



Looking like Transworld's twin: Nordmende Globetroter 2019.

old-fashioned and big CRF-320(A)—but that probably won't be marketed until the end of 1984.

Grundig, the Bavarian firm which won a high reputation over the last 18 years with its Satellite series of receivers, is still on the move. They're saying *adios* to more or less antique band switching by means of revolving drums. Their new entry is microprocessor controlled. The top model now is the Satellite 600, a large and sophisticated double superhet. With its formidable length of 50 cm. (that's almost 20 inches, in case you were wondering), it looks more like a desktop unit rather than the portable it actually is. This set uses direct entry to 1 kHz resolution

via a touch-tone type keyboard, and it offers no less than 60 memories (32 of them on SW), also a quasi-analog VFO.

An interesting feature of the S-600 is that when you rotate the tuning knob at different speeds, the set changes frequencies at different speeds.

A clever innovation is the motor-driven preselector which, until now, has been found primarily on expensive maritime communications equipment. The motor automatically tunes a circuit consisting of capacitors and coils—for the best L/C ratio, both are driven to the receiving frequency by the central microprocessor. The preselector forms a sharp HF filter before the signals get

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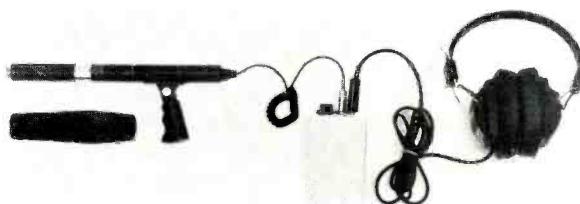
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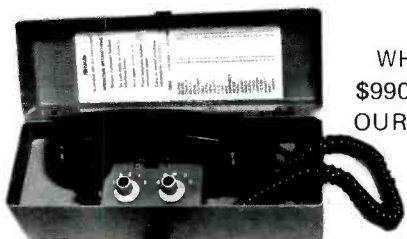


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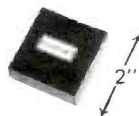


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SATELLITE VIEW

BY JEFFREY KEATING, WB4KDH

INSIDE THE WORLD OF TVRO EARTH STATIONS

Block Downconversion

It doesn't take too long for the private dish owner to realize the limitations of having a single receiver earth station. Your family can only watch one program at a time. Ideally it would be best if the kids could view one program in their room while you are free to watch different channels elsewhere.

New low-cost UHF block downconversion systems are making it easy to hook up additional receivers to your dish. Because of its many advantages over alternative methods of multiple receiver installations, "block downconversion" is becoming increasingly popular.

Many manufacturers now offer or have switched completely to this system. These include Birdview, Avcom, Dexcel, Locom, Janeil, DX, Scientific Atlanta, and Gensat. Many people profess that block downconversion may soon become the industry standard for home earth stations.

Unlike conventional downconverters which send a single satellite channel at a time into the receiver, block downconverters convert the whole satellite band down to a block of UHF frequencies that can be efficiently distributed throughout the home. This is an economical way to obtain multiple access to your satellite dish.

Multiple reception can be provided by conventional downconversion systems, but each additional receiver within the system requires its own downconverter and cabling. The microwave signal from the LNA must be divided and fed to each downconverter in the system. With single conversion receivers, isolators must also be used between each downconverter and the splitter.



The satellite receiver with block downconverter. (Photo courtesy Gensat Communications Corp.)

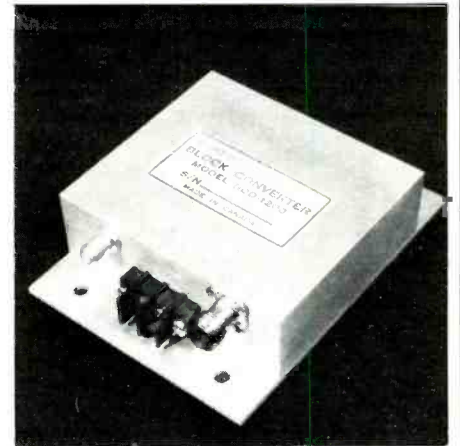
This keeps the downconverters from interfering with each other. Block downconversion also provides multiple access, but without the need for all the additional hardware and electronics.

Regardless of the method of downconversion used, any multiple access system will require two LNAs: one for each polarity. A switching method will also have to be incorporated, so that each location can select the appropriate polarity for the desired program. Conventional downconverter systems will require switching before the downconverters, while the signal is still at microwave frequencies. Block downconversion systems will allow the switching to take place at much lower UHF frequencies. The switching unit can also be located right at the receiver, eliminating the need for an extra control cable to be run out to the dish.

No matter how many receivers are added to a block downconversion system, only

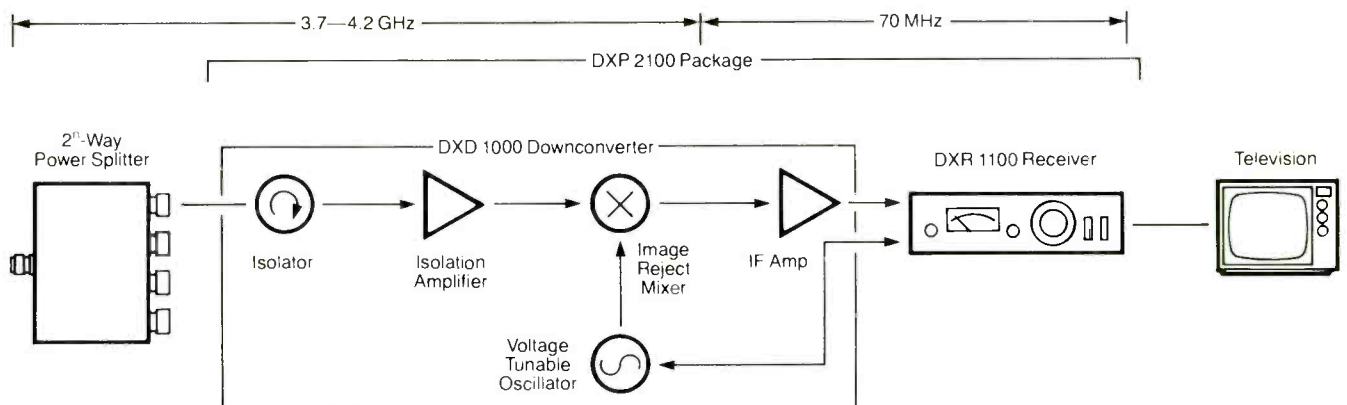
one downconverter is necessary for each polarity. The block downconverter, usually located near the LNA, amplifies the incoming 4 GHz signal and mixes it with a fixed-frequency local oscillator. The intermediate frequency produced is a 500-MHz-wide block of frequencies that contains all 12 channels of the given polarity.

While no industrial standard has been set for where this 500-MHz-wide block of frequencies will lie, most manufacturers have settled on one of two areas. One lies between 400-900 MHz, which overlaps the UHF TV and cellular radio bands, and the other runs from 950 to 1450 MHz. (A couple of systems start as low as 270 MHz, which also overlaps the UHF TV band.)

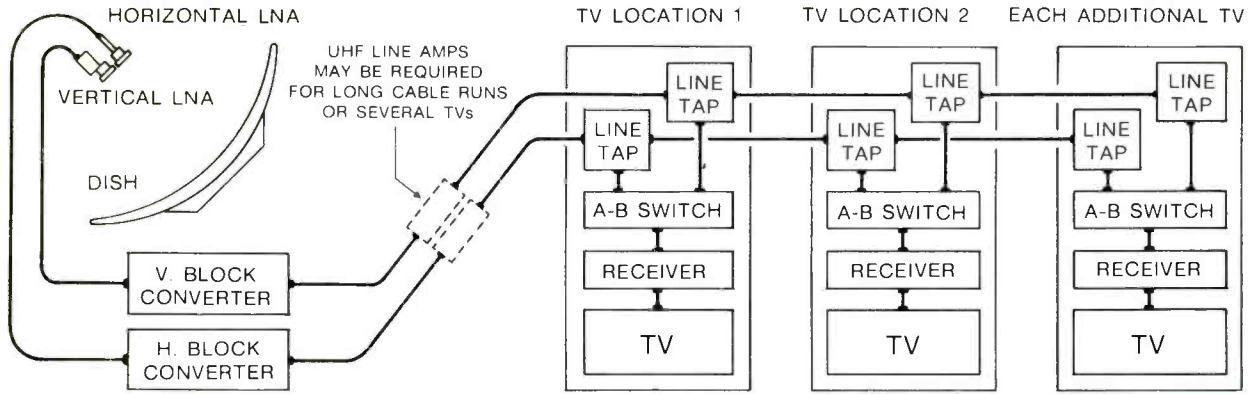


Block converter made by Gensat Communications Corp. of Canada. (Photo courtesy Gensat Communications Corp.)

A block diagram Dexcel DXP 2100. (Illustration courtesy Dexcel, Inc.)



BLOCK DOWNCONVERSION



Some new receivers come with input and output taps and A/B polarity switches built in.

The advantages of using the UHF band are many. UHF technology is well-developed and UHF parts and accessories are commonly available. This keeps the unit price of each receiver down as well as making it simple and inexpensive to add on to your system. All one needs to do to add another TV into the distribution system is to buy a couple of UHF splitters and another receiver, which typically costs under \$300.

Of course it is a legitimate concern to wonder if you might be troubled with interference from local UHF TV stations. I asked Steve Duschane, Executive Vice President of Janeil, about this potential: "We suggest using a Belden 9248 cable which is 100% shielded and 100% sweep tested for these frequencies. Using that cable, making sure all the connections are tight and whatnot, we haven't experienced any problems as of yet, and we put in about 3000 of these units a month."

If UHF interference is a real threat, it will mostly be around urban areas where most UHF TV stations are located. This leaves a very large part of the country where a low-cost block downconversion system will be desirable.

On the other hand, most commercial SMATV systems are located around urban areas where there may be an abundance of UHF TV stations. Using the higher 950-1450 MHz band eliminates any chance of potential UHF interference.

Block downconversion systems which use the 950-1450 MHz band of frequencies are becoming accepted by manufacturers who will be providing Ku-Band receiving systems in the near future. If eventual dual-band reception is being contemplated, it would be desirable to use a receiver that easily accommodated it. If the dish antenna for any system is constructed well enough to operate efficiently on the 11-12 GHz frequencies, the same receiver could conceivably be used to receive both the 4 & 12 GHz programming.

Seavey Engineering already manufactures a dual band 4/12 GHz feedhorn. This

feed has one opening for the 12 GHz LNC and another for the 4 GHz LNA. Signals from both bands can be conducted into the home, where a switching network can be activated to select the desired band. The SATVRN block downconversion receiver system—engineered by Stephen Birkill, England's innovative satellite TV pioneer—has been specially designed to provide dual band capabilities. With the impending onslaught of K-band birds within the next few

years, there will be an increasing demand for systems that can access the spectrum of television programming that should become available on both bands.

If you would like to learn more about satellite television, *The World of Satellite Television* by Jeffrey Keating and Mark Long is available from: Solar Electronics International, 156 Drakes Lane, Summertown, Tennessee 38483. Price: \$9.95 plus \$1.00 for postage and handling.

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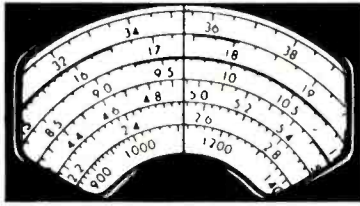
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COMMUNICATIONS CONFIDENTIAL

BY HARRY HELMS, KR2H

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS



A listening post located at Grose Pointe Farms, Michigan operated by a monitor named Jim.

Not all information of interest to DXers is found in *POP'COMM* or DX club bulletins. Sometimes DX information shows up in unlikely places . . . like *The New York Times*. For example, *The Times* contributed some fascinating items regarding the Grenada invasion. One item told how U.S. authorities were alerted to the possibility of retaliatory attacks on U.S. facilities in Latin America by Cuban-supplied terrorists through intercepted Cuban radio traffic! (Sadly, no further details on the supposed Cuban transmissions were given.) Another item told how U.S. military radio operators were intercepting radio traffic directed at Havana from the remaining Cuban soldiers hiding out on the island.

The Times also ran a story about the Cuban diplomatic personnel in Grenada and the plans for their departure. The Cuban ambassador said that he was " . . . in constant daily contact with Havana through the Cuban embassy's radio station."

The ham radio magazine *QST* carried an account of an interesting ham band "intruder" in the November 1983 issue. It seems that in June, 1983 a station was noted on 7002 kHz almost every evening from 10 p.m. to 2 a.m. The station was so strong that it rendered 7000-7005 kHz useless. The signals were RTTY (more precisely, frequency shift keying) but could not be copied in ASCII or Baudot. The station was reported to the FCC monitoring station in Belfast, Maine. An amateur just north of New York City did direction-finding on the signal and obtained a sharp null to the northeast. When the amateur contacted the FCC again about the station, he was told that his direction-

finding bearing was "pretty close" and that the station would probably not return.

There is an interesting additional detail. The Federal Communications Commission said they had identified the station, but could not tell the amateur who it was.

Why not???

Tuning In The "Lowfers"

"Lower" is pronounced "loafer," but lowfers certainly don't! As noted in the February '84 *POP'COMM*, they're among the most pioneering of radio hobbyists around! In case you missed the February issue, "Lower" comes from "low frequency," and refers to those hobbyists who operate—legally and without a license—in the 160-190 kHz frequency range (That's right . . . long wave territory). The FCC allows unlicensed operation in that frequency range as long as the transmitter power is limited to 1 watt and the antenna is no more than 50 feet. Usually the antenna will be a loaded vertical similar to those used by long wave beacons.

Most lowfers run their own beacon transmitting their initials in Morse code. Some of these lower beacons get out quite well. This month we received several loggings from reader John Ramsey, N1AKB, of West Hartford, Connecticut. He reports that he can hear lower beacon "SD" in East Haven, Connecticut (operated by Sal DeFrancesco) on 186.67 kHz and "VP" in Suffern, New York (operated by frequency *POP'COMM* contributor Vince Pinto) on 186.37 kHz.

The latest information about which lower beacons are on the air can be found in *THE LOWDOWN*, the publication of the Long-wave Club of America (45 Wildflower Road, Levittown, PA 19057). Receiving techniques, equipment, and propagation for the lower range and the entire long wave spectrum is contained in *The Low And Medium Frequency Radio Scrapbook* by Ken Cornell, W2IMB. If you're seriously interested in long wave, a current copy is absolutely essential. It's available for \$10.00 from Ken Cornell, 225 Baltimore Ave., Pt. Pleasant, NJ 08742.

When ordering or writing for further information, be sure to tell them *POP'COMM* sent you!

More On The Numbers Stations

The subject of the various numbers stations generates more mail each month than any of the other topics we cover in this column. This month was no exception.

I received a letter from a person who re-

REGION 037 ZONE 15 RIGA LATVIA USSR					
UK2GKW					
CALL	DATE	GMT	MC	2 WAY	RST
	10-1-7/1989	21	CW	59	
QSL: PSE (S) P.O. BOX 88 MOSCOW TXN QSO 73! Alex. Tip: CQdx 1276 4837-6 5000					

QSL from the relatively rare Soviet Latvian Republic.

Grenada, West Indies								
KA2ORK/J3								
QSO WITH	DATE			UTC	MHZ	RST	2 WAY	
Ero	18	NOV	83			I-BALL		
Mark B. Baretella St. George's University School of Medicine P.O. Box 7 Grand Anse Campus Grenada, West Indies						AT RADIO CLUB OF AMERICA AWARDS DIVISION 73, <i>[Signature]</i>		
Pse QSL	Tnx							
QSL	MGR	N2DRA						

Here's a QSL given out in person by Mark Baretella, the American operator on Grenada who kept the communication lines open during the American landing. (QSL received by Ero Erickson, KA9DYS, via Alex Vrenios, KX9I)

requested that his name and city not be used in this column. The reader was writing in response to an item in the November, 1983 column from "Banshee 5," commenting on the logging of a mystery CW station on 4100 kHz. Our reader said the key given by "Banshee 5" to decode the message was incorrect, and should have been:

A = 1	R = 6
N = 2	I = 7
D = 3	G = 8
U = 4	M = 9
W = 5	T = 0

Our reader also wrote, "This station is definitely the same station responsible for the YL five-digit Spanish broadcasts and is found on the same frequencies used for the YL Spanish five-digit AM broadcasts." Our reader further stated that he was a Ph.D. in mathematics and had tried to decode some of the numbers transmissions but had been unsuccessful. However, analysis of the messages tended to support the use of the one-time pad method.

Our reader also had the following to say about other numbers transmissions: "Also, the five-digit German broadcasts (which

some hear as 3/2) originate from East Germany. (This station also transmits in English.) This information is via a U.S. government official agency that I do not wish to reveal here."

We thank this reader for sharing this information with us. I would like to hear from others with such information to share, and will gladly withhold names, cities, and other identifying details upon request.

Clues such as those supplied by this reader are valuable, but they are partial and the final answer won't be found without coordinated monitoring and direction-finding activities by many DXers. If you are interested in participating in such efforts, please contact me at the address given in the heading for Listening Reports.

Radio And Grenada

Amateur radio got quite a bit of publicity during the U.S. invasion of Grenada. The action centered on 14250 kHz, where a student at St. George's Medical School supplied what for a long time was the only information available about the invasion. This station was featured on many network newscasts and was heard by reader Tom Lewandowski of New York. Tom also heard U.S. Navy activity relative to the invasion on 4373 kHz in SSB around 0415 GMT. Among the stations he heard were "3 Sierra Papa," "Hotel 0 Charlie," and "Uniform 8 Golf." Traffic concerned MEDEVAC helicopters and patients being airlifted out. The helicopters gave their positions over the air.

From The Mailbag

Mark Chinsky of New York wrote regarding several items which recently appeared in this column. Regarding the several U.S. government stations listed for 7880 kHz, Mark feels they may be operated by the Department of the Interior. However, he has no data on their purpose. Mark has also monitored two-way voice traffic near the frequencies of some numbers stations—something those of you who monitor numbers stations should be on the lookout for. Finally, Mark reports the "bootlegger" frequency of 6600 kHz is also used in England and Italy in addition to America. Thanks for the letter, Mark! (By the way, Mark is a well-known expert on the types of DX we cover in this column each month.)

Dwight Brown of Louisiana reported hearing a station on 29452 kHz, sending CW, which drifted down in frequency and was heard for about twenty minutes. The transmission was repeated and included "RS 5 MK 81" as part of the message. Dwight, you heard one of the Soviet "Radio Sport" (RS) series of amateur satellites. The time period you could hear the station corresponds to the time period that a satellite is within range of a ground station; the apparent drop in frequency is caused by the effects of Doppler shift. A signal from an orbiting space vehicle will seem to continuously drop in frequency. A frequency that remains stable must be coming from a terrestrial station. John Kapinos of Massachusetts writes

that Mrs. Stepanova of Radio Moscow (the lady who sends out Radio Moscow QSLs) has stated that Soviet non-broadcast stations do not verify reception reports as a matter of government policy. Thanks for the information, John; I would add that Mrs. Stepanova's remark shouldn't be taken as the final word. After all, verification policies do change (a recent example was the sudden decision of Chinese regionals to begin verifying). And even if the policy doesn't change, there are always "goofs" and a verification may be issued by mistake. The key is to keep trying and don't give up! Tom Kneitel has been trying since 1956 (see copy of a letter he received 28 years ago in which he was refused a ute QSL).

Good Reading

Tom Harrington of Universal Electronics has sent along the latest edition of his well-known *World Press Services Frequency List And Manual*. This new fourth edition is packed with all the information you need to tune in the world of RTTY. It has information on antennas, receivers, terminal units, monitors, and RTTY codes. Special information is given on using your personal computer to receive RTTY. The "meat" of the

book is its large list of RTTY stations and frequencies. If you're interested in RTTY, this book is a must! It's available for \$8.95 plus \$1.50 postage from Universal Electronics, 4555 Groves Rd., Suite 3, Columbus, OH 43227. Be sure to tell them POP'COMM sent you!

Keeping In Touch

To keep up to date with the subjects we cover in this column each month, membership in a radio club is highly recommended. Two I can heartily endorse are the American Shortwave Listeners Club (16182 Ballad Lane, Huntington Beach, CA 92649) and the Association of Clandestine Enthusiasts (P.O. Box 13225, D.T. Station, Minneapolis, MN 55414). ASWLC covers shortwave broadcast, utilities, the AM and FM broadcast bands, along with a QSL column. ACE is devoted exclusively to pirate and underground radio along with numbers stations. For a sample copy of their bulletins, drop them each one dollar to cover costs. Be sure to tell them POP'COMM sent you!

Listening Reports

Here are this month's listening reports. All times are in GMT (that's Eastern standard

Moscow, USSR
July 24, 1988

Dear Mr. Kneitel,

We received your letter of May 21st and wish to inform you that the stations you heard were not broadcasting to North America. They were stations belonging to different Soviet Ministries and functioning for their inner operational needs. QSL cards are not filled out for these stations. But we will appreciate it very much if you send us QSL card for our broadcast to North America and in order that you may do so we are sending you a schedule of our broadcast.

Hoping to hear from you again, we are

Sincerely yours,

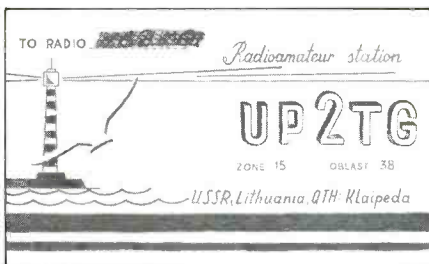
(Vladimir Afonin)

RADIO MOSCOW
North American Service

The reluctance of the Soviets to QSL their utility stations goes back many years. Here's a letter written almost 28 years ago to Tom Kneitel refusing to verify reception of station RKA79 on 10105 kHz. As an interesting postscript, this letter was signed by Vladimir Afonin, who is still on the staff of Radio Moscow.

time minus five hours). We'd like to see your reports; submit them in the format used here. Please include enough information to make your report interesting and useful to other POP'COMM readers—that means including the time, language, sex of announcer, number of digits in a grouping, etc. Send your reports to Harry Helms, P. O. Box 157, Rockefeller Center Station, New York, NY 10185. And now to this month's loggings...

- 116:** Dashes in groups of four, with the second and fourth dashes longer than the others, ten seconds on and then ten seconds off at 0232. (John Ramsey, CT)
224: MNW, Mount Snow, VT, CW beacon 1548. (John Ramsey, CT)
259: YLP, Minigan, PQ, Canada, CW beacon 0244. (John Ramsey, CT)
278: NM, Matagami, PQ, Canada, CW beacon 0234. (John Ramsey, CT)
295: SH, Scituate Harbor, MA, CW beacon 0236. (John Ramsey, CT)
296: B, Beaver Island, NS, Canada, CW beacon 0246. (John Ramsey, CT)
350: LI, Burtons, NB, Canada, CW beacon 0054. (John Ramsey, CT)
356: TIM, Timehri, Guayana, CW beacon 0419. (John Ramsey, CT)
362: AK, Akron, OH, CW beacon 0339. (John Ramsey, CT)
369: ZDX, Coolidge, Antigua, CW beacon 0415. (John Ramsey, CT)
370: DXT, Dalton, MA, CW beacon 1610. (John Ramsey, CT)
372: CQD, from Erie, PA, CW beacon at 0335. (John Ramsey, CT)
394: PS, Pinehurst, NS, Canada, CW beacon 0321. (John Ramsey, CT)
407: RV, Reedsville, PA, CW beacon 0322. (John Ramsey, CT)
412: CTZ, Clinton, NC, CW beacon 0044. (John Ramsey, CT)



The changing face of DX. The QSL from LY1J dates from 1939 when Lithuania was an independent republic. A few months later, Soviet forces occupied Lithuania and made it a constituent republic of the USSR. The QSL from UP2TG is from the current Lithuanian Soviet Socialist Republic. A rare DX country in both cases!

- 414:** CSS, Washington, OH, CW beacon 0044. (John Ramsey, CT)
417: "5QT." Coats, NC, CW beacon 0127: faulty identifier, should be "HQT." (John Ramsey, CT)
515: OS, Columbus, OH, CW beacon 0035. (John Ramsey, CT)
524: UOC, Iowa City, IA, CW beacon 0357. (John Ramsey, CT)

2272: Odd military net operating USB several evenings after 2300. Callsigns similar to USN tactical, such as 2QP, AOU, H5V, W4V, 1KZ, F5J, J8H. Units are mostly aircraft, some located 500 miles distant from one another. Station 1KZ is designated as "Acting Missile Firing Unit," messages include references such as "Ready to commence run." Unusual thing about the net is that accents of operators are not only American, but Canadian, British, European. Possibly some sort of NATO maneuvers. (Tom Kneitel, NY)

- 3638:** "U" beacon in CW each night around 0130. (George Primavera, NJ)
4056: WJG, Memphis, TN, working barges along Ohio River in SSB 0816. (Victor Vickers, GA)
4107: Five-letter CW traffic, no calls heard, at 0415: probably Soviet since AA, IM, OE, and OT characters heard. (Don Schimmel, VA)
4125: Four-digit Spanish numbers station with female announcer 0235. (Glenn Finerman, NY)
4243: 4XZ, Haifa, Israel, transmitting five-letter groups in CW 0426. (Don Schimmel, VA) Don's logging reminds us of an important point: not all number or letter groups you hear come from numbers stations. Many military and diplomatic stations also transmit encoded traffic. (Editor)
4559: "AB01" and "AB02" testing secure voice communications from vehicles 0120-0145 in SSB. (Ralph Fellows, TX) Military communications. (Editor)
4616: IDR2, Rome, Italy, VVV marker in CW 0240. (Dwight Brown, LA)
4670: Four-digit Spanish numbers station with female announcer 0245. (Dwight Brown, LA)
5160: Five-letter groups being sent in CW at 0356. (Tom Kneitel, NY)
5733: The mystery CW station first reported here by POP'COMM editor Tom Kneitel continues to be heard, as this report shows. (Editor) First at 0113, three second dash followed by seven seconds of silence, repeated over and over. Later at 0330, the same was heard but with what seemed like high speed CW between the dashes. At 0403, "KCA KCA KCA" was sent and then the pattern resumed. (Alex Vrenios, IL) Thanks for the report. Alex, Alex wonders if this station transmits the dashes to hold the frequency for quickly transmitted messages. Anyone have additional ideas? "KCA" is a call assigned to United States allocations, but I can find no listing for a CW station with that call. Also, "KCA" has been used by other mystery CW stations in the past. (Editor)
5870: Five-letter groups being sent in CW at 0410. Pauses from time to time and another station on frequency replies. (Tom Kneitel, NY)
5917: Five-letter groups sent in CW at 0420. (Tom Kneitel, NY)
6048: "EPRUO CWENC TMRUO DJBZX OJGNR" repeated in slow CW 0720. (Nek Nomis, FL) This is in the 49-meter international broadcast band. (Editor)
6236: Five-digit Spanish numbers station with female announcer 2340-2350. (Dennis Rutowski, CT)
6875: Four-digit English numbers station with female announcer 2230. (W. J. Clarkson, NY)
6995.7: "Torre de America, cambio" and "Primavera de America, cambio" by male Spanish voice 0201; continued calling. (Don Schimmel, VA) As regular readers of this column know, the frequencies just above and below the ham bands are excellent places to look for unusual radio activity. (Editor)
7345: Five-digit Spanish numbers station with female announcer 0630-0640. (Dick Hull, WA)
7435: "A" beacon in CW 0512. (Nek Nomis, FL) Anyone out there have a theory as to what the purpose of these single letter CW beacons is? (Editor)
7600: HD210A, Guayaquil, Ecuador, time signals 0405. (Nek Nomis, FL) Also heard at 0215. (Dennis Rutowski, CT)
7621: Overseas Radiotelephone Station, Moscow, USSR, English voice marker read by woman repeated in SSB 0236. (Mark Currin, TN)
7625: "Victor Una Bravo Two" repeated by female until it left the air 0150. (Nek Nomis, CA)
7645: KWS78, U.S. Embassy, Athens, Greece, QRA marker 2249. (W. J. Clarkson, NY)
7645: "28 DE OA ZBOOAR" repeated until 0010, then into four-digit groups. (W. J. Clarkson, NY) This is similar to the traffic Don Schimmel has been reporting in this column for the past several months. (Editor)
7651.5: "DE KWT94" repeated in CW 0020. (W. J. Clarkson, NY) This call is from U.S. allocations but I can't find this listed anywhere. Clues, readers? (Editor)
7652: KKN44, U.S. Embassy, Monrovia, Liberia, QRA marker 2255. (W. J. Clarkson, NY) There is also a report

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this one is on 17426 kHz at 2033, (Tom Kneitel, NY)
7720: "3/2" English numbers station with female announcer 1620. (Ernie Rice, OH) The time of this reception is very interesting. (Editor)
7724: KRH50, U.S. Embassy, London, England, QRA marker 2245. (W.J. Clarkson, NY)
7754: "QTT DE IMCOM NY" repeated in CW 0530. (Nek Nomis, FL) Most likely "IMCOM" is actually "ITTCOM," located in "Brentwood" (actually Hauppauge) NY. (Editor)
7910: AFE71, "Cape Radio," Cape Canaveral, FL, noted working "AGAR 24" (an EC-315 aircraft) in SSB from 1530. Several countdowns noted, one ending exactly at 1700. This was not the day of a launch. (Tom Lewandowski, NY)
8125: Four-digit English numbers station with female announcer 0300; count from 1 to 10 and "932" repeated. (David Bush, OH)
8172: Five-digit German numbers station with female announcer in SSB 0414. (Nek Nomis, FL)
8335: Four-digit Spanish numbers station with female announcer 0330. (Terry Harisell, TX)
8567.9: FUV, Djibouti, V marker in CW 0200. (John Kapinos, MA)
8578: SUH3, Alexandria, Egypt, V marker in CW 0035. (John Kapinos, MA)
8601.5: CWA, Cerrito Radio, Uruguay, calling CQ in CW at 0350. (Tom Kneitel, NY)
8605: ZRH, Fisantekraal, RSA (Navy), calling CQ in CW at 0352. (Tom Kneitel, NY)
8625.2: GYU, Gibraltar, "DE GYU" CW marker 0125. (John Kapinos, MA)
8630: PPR, Rio Radio, Brazil, sending VVV in CW at 0358. (Tom Kneitel, NY)
8713.4: ZSD, Durban RSA, "Ships Telex" marker in CW at 0412. (Tom Kneitel, NY)
8777: CCS, Santiago Naval Radio, Chile, VVV in CW at 0238. (Tom Kneitel, NY)
8840: Five-digit Spanish numbers station with female announcer 0206. (Rodney Grussling, KS)
8991: "34 Foxtrot Yankee" working McClellan AFB 0020 in SSB. (Peter Herman, IN)
9070: 6VU, Dakar Senegal, RTTY station sending RY's, 425/67N at 0340. (Tom Kneitel, NY)
9075: Four-digit Spanish numbers station with female announcer 0315. (Terry Harisell, TX) Same heard at 0024 on 9074 kHz. (Rodney Grussling, KS)
9885: Five-digit English numbers station with female announcer 0212; heavy accent. (Ernie Rice, OH)
10005: "Big Apple" and six other stations in SSB 2200-2215 transmitting coded messages; apparently military exercises of some sort. (Bob Syphax, CA)
11110: Five-digit German numbers station 1802, opened with musical tones and "Alpha November." (George Osier, NY)
11116: "Andrews 682" and "Command Post" exchanging traffic 1901 in SSB, mentions of "the Secretary" and "security at the airport." One of the speakers wondered out loud if anyone was listening in on the channel! (George Osier, NY)
11396: WSY70, New York Aeradio, NY, uses this channel for in-flight communications with airplanes heading to Europe. (Peter Herman, IN)
11530: Four-digit Spanish numbers station with female announcer beginning the transmission at 0010. (Jack Woods, OR)
11550: Four-digit Spanish numbers station with female announcer 0023. (Steven Phipps, MO)
12720: SVD, Athens, Greece, "DE SVD" CW marker 0235. (John Kapinos, MA)
12748: IRM8, Rome, Italy, V marker in CW 1735. (Tom Lewandowski, NY)
12844: XFC, Cozumel, Mexico, calling CQ in CW at 2023. (Tom Kneitel, NY)
12994: VIP4, Perth, Australia, calling CQ in CW, 2221 GMT. (Tom Kneitel, NY)
13050: UDK2, Murmansk, USSR calling "4LS" in CW at 2225. (Tom Kneitel, NY)
13366.5: 5YD, Nairobi Aeradio, Kenya, sending RY's in RTTY (425/67N) at 2055. (Tom Kneitel, NY)
13382: MLU, RAF Gibraltar, sending "KKK" in CW at 2100. (Tom Kneitel, NY)
13420-13450: Carrier covering this range 1230; would stop at various intervals so it could be zero beat. Extremely strong signal. (Don Schimmel, VA)
13440: Five-letter CW groups 2039, probably Soviet in origin since CW characters AA, IM, OE, and OT used. (Don Schimmel, VA)
13444.6: "00" and "11" trying to contact each other in


CW 2156; neither station could apparently hear each other. (Don Schimmel, VA)
13500: "310 310 310 310" sent continuously in CW 2052, 0 sent "cut" at T. (Don Schimmel, VA)
13576.7: A4I, "QRA/QSX" CW marker 1308. (Don Schimmel, VA) This call is part of the block allocated to Oman and indeed the call is assigned to an aeronautical radio station in Oman. However, this CW "A4I" has been heard for several years and is not believed to be in Oman or even the Middle East. Anyone have a clue as to its actual location? (Editor)
14392: "ODF" working "7D" in CW 1315; then shifted to 13504 kHz. (Don Schimmel, VA)
14441: "A6N" beginning transmission of four-character CW groups 1932; numbers 4 and 6 sent normally and others seem to be A=1, U=2, V=3, E=5, B=7, D=8, N=9, and T=0. (Don Schimmel, VA)
14476: "K" beacon in CW 1312, then abruptly sent "KK K 27720 K K 99827 444 444 444 444 BT" This was repeated and then the "K" beacon resumed. (Don Schimmel, VA) Single-letter beacons such as this logging have been heard for several years now and are just as big a mystery as ever. Bits of CW and RTTY have been heard at times between the repeated transmission of a single letter. Anyone have any ideas? (Editor)
14492: "NR 593 23 1 152193 BT FOR UGN FMSZ6H BT" in CW 1248. (Don Schimmel, VA)
14515: "011 011 444 444 444 444 444 BT" repeated in CW 1941. (Don Schimmel, VA)
14638: WFK54, New York NY, English news in RTTY (425/100N) at 2127. (Tom Kneitel, NY)
15020: The words "Grand Kajman" repeated in CW several times at 25 wpm, followed by a long string of letters and numbers concluded by "CC OK QSY 88." began transmission at 1530 and ended at 1536. (Dan Nicholson, MO) Very interesting, Dan! The most common "normal" CW communications near this frequency originate from Soviet Aeroflot flights. However, I wonder if "Grand Kajman" is really "Grand Cayman," the largest of the Cayman Islands. The Caymans are noteworthy for some of the most spectacular diving in the world and numerous banks with hush-hush bank accounts (the Caymans are sometimes known as the Switzerland of the Caribbean). It's total speculation on my part, but could this transmission be related to some secret bank or currency transaction of some sort? (Editor)
15040: SAC "Skyking" broadcast in SSB to bombers aloft 2100. (Ken Dillson, CA)
16097.5: U.S. military network, "Missionary," "Ego 2" etc. on LSB and RTTY at 1454. (Tom Kneitel, NY)
16106.5: FPQ, Paris, France, English news in RTTY

(425/67N) at 2148. (Tom Kneitel, NY)
16137: CML47, Havana, Cuba, in contact with WFD76 (16212.5) via RTTY (425/67R); exchanging personal telegrams from customers at 1500. (Tom Kneitel, NY)
16348: CLN530, Havana, Cuba RTTY "foxes" (425/67R) at 2157. (Tom Kneitel, NY)
16524: Russian language traffic, apparently between "fishing trawlers" 2204. (Bob Syphax, CA)
16668: No calls heard, but seemed to be Spanish press items in CW 1545. (Don Schimmel, VA)
16877.5: JDB, Nagasaki, Japan, CQ marker in CW 0100. (John Kapinos, MA)
16962: ZRQ6, Cape Naval Radio, RSA, sending VVV in CW at 1542. (Tom Kneitel, NY)
17108: RFLIF, Ft. de France, Martinique (Navy) in RTTY (850/100N) "ZNR UUU CHARLIE YANKEE" and "NNNN" at 1555. At 1600 went into encrypted traffic. (Tom Kneitel, NY)
17170: PPL, Belem, Brazil, VVV in CW at 2023. (Tom Kneitel, NY)
17175.2: CLS, Industria Pesquera, Havana, Cuba, calling CQ in CW at 2027. (Tom Kneitel, NY)
17189: D3E51/61/71/81, Luanda Radio, Angola, calling CQ in CW at 2030. (Tom Kneitel, NY)
17236.5: KMI, San Francisco, CA, handling ship-to-shore traffic in SSB from 0045. (Bob Syphax, CA)
17487: RTTY transmission consisting of five-letter groups 1450. Opened with "GR 66" and continued until it left the air 1455. Five days later, a CW transmission began on this frequency until 1437 and continued until 1440 when RTTY at 67 wpm started with "NR 06 GR 118" and into five-letter groups. (Dan Nicholson, MO) Good reception, Dan. Format of this is very similar to that used by many CW numbers stations. (Editor)
17995: "Trenton Military," Canada, in USB contact with aircraft "Military 262," then switching over to 11233 kHz at 1927. (Tom Kneitel, NY)
18004: "Deputy Dog" and five other stations in SSB beginning at 2215; messages were coded and apparently military exercise of some sort. (Bob Syphax, CA)
23338: "AIRCY3GRAD1615003MFB6HQ14M-CLOW" heard from 16481747 in SSB with alternating male and female announcers, each repetition was followed by telephone dialing tones. Each repetition was identical. This frequency is very active with this type of transmission. (James Biglane, MI)


Thanks again for another month of great support! See you again next month here in POP'COMM!

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KUWAITI PARLIAMENTARY LEADER ACCUSES U.S.
SEOUL, MUHARRAM 3, OCT 9, JAMAHIRIYAH NEWS AGENCY//

THE CHAIRMAN OF THE KUWAITI PARLIAMENT'S FOREIGN AFFAIRS COMMITTEE ACCUSED WESTERN IMPERIALISTS, LED BY THE U.S., OF SUPPORTING THE RACIST ENTITIES IN ISRAEL AND SOUTH AFRICA.

IN A SPEECH TO THE WORLD PARLIAMENTARY CONFERENCE IN SEOUL, HE SAID DESPITE THE PASSAGE OF 34 YEARS AFTER THE SIGNING OF THE HUMAN RIGHTS CONVENTION, REMNANTS OF COLONIALISM UNFORTUNATELY REMAIN IN VARIOUS REGIONS. HE ADDED THAT NEW COLONIALIST ENTITIES HAVE MADE THEIR APPEARANCE. THESE ENTITIES, HE SAID, ARE UGLIER THAN CONVENTIONAL COLONIALISM AND ARE CHARACTERISED BY RACIAL SEGREGATION, THE USURPATION OF LAND BELONGING TO THE INDIGENOUS POPULATION AND THEIR EXPULSION AND PERSECUTION. HE SAID THIS IN FACT IS WHAT THE RACIST ENTITIES IN ISRAEL AND SOUTH AFRICA HAVE DONE.

THE KUWAITI PARLIAMENTARY LEADER SAID THE INTERNATIONAL COMMUNITY IS NOW AWARE OF THE ZIONISTS' COLONIALIST-EXPANSIONIST NATURE FOLLOWING THE MASSACRES IT COMMITTED AGAINST THE INDIGENOUS POPULATION, THE DESTRUCTION OF HOMES, THE BURNING OF MOSQUES, THE DESECRATION OF HOLY SHRINES AND THE ESTABLISHMENT OF COLONIALIST SETTLEMENTS IN THE OCCUPIED ARAB TERRITORIES.

HE SAID THE WORLD KNOWS THAT WESTERN IMPERIALISM, LED BY THE UNITED STATES, STANDS BEHIND THESE TWO RACIST ENTITIES IN A BID TO CONTROL THE ARAB REGION AND AFRICA. HE ADDED THAT THE U.S. ADMINISTRATION TOTALLY SUPPORTS ISRAEL'S EFFORTS TO ENTRENCH ZIONIST OCCUPATION OF ARAB LANDS, POINTING OUT THAT ISRAEL RECEIVES THE LION'S SHARE OF U.S. AID AND ASSISTANCE IN THE MILITARY, ECONOMIC AND POLITICAL SPHERES. ON THE OTHER HAND, HE SAID U.S. INVESTMENTS IN SOUTH AFRICA ARE CURRENTLY IN EXCESS OF 10 BILLION DOLLARS.

ON THE PRESENCE OF FOREIGN FORCES IN VARIOUS PARTS OF THE WORLD, THE KUWAITI PARLIAMENTARY LEADER SAID THE PRESENCE OF THE MILITARY BASES AND FORCES OF ONE COUNTRY OVER THE TERRITORIES OF ANOTHER IS A VIOLATION OF NATIONAL INDEPENDENCE AND SOVEREIGNTY AND A REMINDER THAT COLONIALISM IS STILL ALIVE. AT THE END OF HIS SPEECH, HE CALLED FOR THE WITHDRAWAL OF ALL FOREIGN BASES, ESPECIALLY FROM EUROPE. HE SAID THE PRESENCE OF THESE BASES POSES A DIRECT THREAT TO ARAB COUNTRIES...

Figure 3

ably (S6-S9) by the author. Other frequencies also used for English transmission have been logged at 19515.0 kHz, 19172.0 kHz, 18696.0 kHz, 18225.0 kHz, 18221.0 kHz, 17556.0 kHz, and 14574.4 kHz using 50 baud normal shift. Figure 1 is the current frequency list but we should also monitor the above frequencies.

Figure 2 captures the RTTY signals logged from Algerie Presse Service or APS. Two frequencies have been monitored—14932.0 kHz and 15480.0 kHz with 50 baud normal shift. English is read at 1300-1400 GMT. Location address is Boulevard Ernesto Che Guevara, Alger, Algeria. Operations were started in 1962 and controlled by the Ministry of Information in 1967. Alternate time schedules allow both English and French to be transmitted—one hour of English then one hour of French. Like most of the Arabic press services, control by a central Ministry of Information allows biased and censored news to be relayed to sister news services. For example, APS has an exchange agreement with TAP, JANA, MENA, SANA, PL, AFP, ANSA, BTA, CELEKA, INA, KCNA, PAP, REUTER, TASS, and VNA. Of course, this exchange allows exchanging propaganda (with the exception of Reuters and AFP, most are quite biased and extremist) and lies. By the way, if you would like to send APS a telex message, please use Telex num-

bers 52252 or 52864 for quick response.

Figure 3 is a printout of JANA, the Jamahiriyah News Agency located in Tripoli, Libya. By the way, in 1977, the country's name Libya was changed to the Socialist

People's Libyan Arab Jamahiriyah. This was coincident when Moammar Khadafy published his *Green Book* on revolution. Khadafy is known for his radical views on Israel and the U.S. As usual, the Ministry of Information controls and regulates all posted news bulletins. Full-time correspondents are based in Great Britain, Spain, France, and Sweden while monitoring AP, UPI, and Reuters. The loggings displayed were received on 20560.0 kHz at 1615-1730 GMT using a JRC NRD 515 receiver and a home brew demodulator coupled to a Vector computer. The reception is normally quite good, probably due to four log periodics (average gain of 13 DBD each) aimed toward North America! Other antennas include verticals and simple horizontal dipoles. Power output to this antenna form is 30 KW. Earlier in the day, you should try 15462.0 kHz (800-1000 GMT) and 12186.0 kHz (1415-1515 GMT), but my success has been at 20560.0 kHz. A word of warning though—strong anti-U.S. comments abound in a typical newscast. Also, be aware of different weekend schedules and Friday is considered a silent day in the Arab world. The best time to monitor the Arabic press is early in the morning Monday through Thursday.

The Tunisia press is known as Tunis Afrique Presse or TAP. Diplomatic and international news bulletins have been received during 1300 and 1700 GMT in French and English at 20154.7 kHz and 13610.5 kHz. TAP is considered a cornerstone of the non-aligned countries and agreements exist with AFP, ANSA, DPA, INA, TANJUNG, AP, Reuters, and UPI. Most of the TAP RTTY press is sent via land lines and various direct cables. Local and European RTTY transmissions are sent by HF.

Most of the Arabic news agencies lack a certain objectivity when compared to the Reuters and AP services. Keep me informed of any interesting Arabic loggings.

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LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS



Chris Huntley at his shack in Albion, PA.

It seems that lately we no sooner feature a QSL card in these pages than the whole situation changes. We showed you Radio Finland's card and they stopped issuing cards. We ran a QSL from Radio Free Grenada and the station disappeared in the U.S. rescue/invasion.

Shortwave monitors weren't much better off than the general public from an informational standpoint during the Grenada crisis.

Radio Free Grenada wasn't even operating on shortwave at the time. It went off the higher bands prior to the mid-October overthrow of Maurice Bishop. So, what would have made for fascinating listening for SWL's simply wasn't there.

Radio Free Grenada was operating on its medium wave channels at the time of the U.S. landing and was heard by monitors in the Caribbean calling the Grenadian people to arms. The station was bombed by U.S. forces apparently early on in the affair and disappeared from the airwaves entirely.

A station called "Occupation Forces Radio" was broadcasting from the very first day and was operated by the U.S. Army.

The only radio activity from the island itself on shortwave was provided by two amateur operators—J3AE and a U.S. medical student, Mark Baretella, KA2ORK/J3 based at the medical school.

A "Grenada Emergency Net" operated first on 14.140 and later on 14.351, frequencies outside the legal boundaries of the U.S. amateur bands. Special authorization was given by the FCC to a few selected hams to operate the net which maintained contact with KA2/RK.

At one point Mark relayed the intriguing message "The water flows in the canyon" which must have been good news judging from the response of the U.S. based net control station.

Operations of this emergency network lasted until about 2015 GMT on October 26th, when the network was terminated following the rescue of the students.

"Occupation Forces Radio" soon was renamed "Spice Island Radio" operated by the Army's Psychological Operations Section from a mobile studio and relay antenna at Point Salines airport.

The station is presently on the air five hours per day with a staff of 12, plus two Grenadians. "Spice Islands Radio" is on the air five hours daily on 990 kilohertz only, a frequency formerly occupied by Radio Free Grenada.

So far, there has been no return to shortwave of any radio broadcasting from Grenada. And, it may be a while before we hear Grenada on shortwave again.

More shortwave activity in the U.S. Another new station is on the way! The Assemblies of Yahweh, headquartered near Bethel, Pennsylvania are readying a 50 kilowatt transmitter housed in a converted gas station. Test broadcasts are expected this spring with regular programming hoped for by summer, beginning with an 8 hour a day schedule.

Engineers are converting a medium wave transmitter for shortwave use. Antennas will be three 120 foot towers and one 45 foot tower. A worldwide audience for the group's religious programs is being sought.

Our thanks to Ken Maus who forwarded a clipping from the *Reading Eagle*. We'll try to keep you updated on the progress of this station.

How about a visit to Ecuador? HCJB's 1984 tour schedule, which features visits to the station and Ecuador, has been announced. Trips are scheduled for March 10-24, July 14-28, and September 22-October 6. For information about the tours, write "Tours", P.O. Box 553000, Opa Locka (Miami), Florida 33055-0401.

Mailbag

We've had a flood of mail this month so let's look at some of it.

Ron Trotto of St. Cloud, Florida provides some further details on a question from back in October about "WLKN" being heard on Radio Luxembourg's frequency. Ron says he's heard this too and that Radio Luxembourg often uses callsigns of American medium wave stations. That's nice to know. If you hear something like that on 15.350, don't let it throw you.

Ron also tells us he's been DXing for a decade now and currently uses a Realistic DX-100, DX-55, Hammarlund HQ-200, and Hallicrafters SX-96 and has logged 122 countries so far this year!

Al Rogalski of Lorain, Ohio is having problems choosing an antenna for his DX-200 and wants tips on that subject. Like receivers, antenna recommendations are difficult to make. The classic theme in antennas has always been to get it as high as you can, as long as you can, and as free as possible of power lines and such. But many people manage very successfully with a lot less and you'll find most antennas will work reasonably well throughout the shortwave spectrum. Taking a look at the reports and letters on hand this month we find everything from longwires to 8-foot verticals, to "slinky" toys, "L" types, even one who has his room walls papered with aluminum foil and uses that as an antenna!

Larry Fravel of Clarksburg, West Virginia reports he's using a Realistic DX-302 along with a Panasonic RF-2200 and keeps his log on a computer.

A new DX-400 receiver sits in the shack of Sheryl Paszkiewicz of Manitowoc, Wisconsin, although she says she hasn't had much time to use it yet.

David A. Stevenson of Laurel, Montana has an unfulfilled wish to listen to radio from Scotland. We're afraid your wish will have to



This listening post belongs to Mrs. Bob Neal of Keller, Texas.



This is the DXing set-up used by Carlos Alberto T.V. Franco of Osasco, Brazil.

stay just a wish. Aside from sporadic tests to North America by a few very low-power pirates, there's no shortwave from Scotland. Wish there were!

SWL cards are the subject of a letter from Andrew Wertheimer of Golden Valley, Minnesota who wonders if there isn't some way we could design a card for photo copying after it appeared in *POP'COMM*, thus saving on printing costs. We think you're better off with your own, individually designed card, Andrew. The sample you sent looks fine.

Chris Huntley of Albion, Pennsylvania is a ham (KXØY/3) who modified his receiver so it would pick up the 25 and 31 meter bands. His best catch was the Solomon Islands heard on a World War II vintage BC-348 receiver.

Daniel Tomasevich of Berwyn, Illinois uses a line-up of receivers and antennas. He's "stumped" by the fact that he heard and sent a report to "Radio Holland International" and got a QSL back from Radio Netherlands. Well, you've stumped us too. We aren't aware that Radio Netherlands ever announced as Radio Holland International. You were probably listening to Radio Netherlands.

Tahiti QSLs are getting to be a problem for *POP'COMM*'s Military Consultant, Harold Ort, Jr. of Staten Island, New York. He's twice received someone else's QSL in response to his reception reports. This happens to most everyone eventually with one station or another, although twice in a row from the same station is, indeed, unique.

Try them again. The third time's a charm!

Peter Werner checks in from London, England. He uses a British Sait marine communications receiver with a 160 foot random wire antenna and is interested in all aspects of DXing—SWBC, RTTY, CW, VHF. He welcomes correspondence at 4 Dulwich Road, London, SE24 OPA.

Questions about locating station addresses and getting information on writing reception reports came in from Harry J. Lookabill of Kansas City, Missouri and Thomas Havrilak of Kingston, Pennsylvania.

That provides a perfect opportunity to get in another plug for your editor's *QSL Address Book*. The 4th edition should be available now (or very soon!) for \$6.95 from Gilfer Associates, P.O. Box 239, Park Ridge, NJ 07656. The book contains a complete course in reception report writing as well as addresses for over 800 shortwave stations. It should answer your questions.

Carlos Alberto T.V. Fazano of Osasco, Sao Paulo, Brazil checks in and notes that DXing in Brazil is difficult since it is hard to get good equipment. But, Carlos says Brazilian DXers share a common problem with DXers everywhere—the difficulty in getting replies out of some stations.

Carlos has written a booklet (in Portuguese) about the DXing hobby. If you'd like a copy, you can write him at C.P. 25, 06000 Osasco, Brazil.

This is certainly international month in the Listening Post. Friday I. Okoloise writes from Kano, Nigeria to tell us that he's starting

up a club called the African DX Association. Good luck with it and let us know when it's fully organized and operating.

Dave Bush of Sebring, Ohio is just back from a trip overseas. He was allowed to visit the cockpit of the plane he flew in and found the pilots enjoyed listening to the Voice of America during flights.

Brian Avery is a U.S. Air Force weatherman stationed in Guam and a member of the "typhoon chasers." He carries a Toshiba RP-F11 receiver along on his travels and says DXing in the Pacific is very different from listening in the U.S. So we've heard Brian but, unfortunately, have never learned it first hand!

We hope to be reading a letter from you next month! Remember, we welcome your comments, questions, shortwave news, loggings, shack photos (black and white or color) and good photocopies of your more interesting QSLs.

Listening Reports

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

Afghanistan Radio Afghanistan heard at 1900 on 11.960 with English news and commentary. Transmitter probably in the USSR. (Slawson, PA)

Alaska KNLS on 11 820 from 1129 sign on to 1159 sign off, in Russian with religious program. Signs on with ID in English. (Hickerson, AK)

Albania Radio Gjirokaster. 5.020 at 0457 to 0518 with news and music and what sounded like an exercise program. (Fravel, WV)

Angola Radio Nacional de Angola at 0405 on 11.955 with Portuguese sign on, ID, and music. (Ort, NY)

Antarctica Radio Nacional Archangel San Gabriel heard on 15.476 from 2337 to 0029 sign off. Music, man and woman announcers and ID at 0025. (Fravel, WV)

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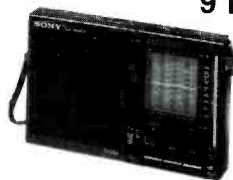
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This impressive layout belongs to Peter Werner, a reader in London, England.

Argentina Radio Nacional at Mendoza on 6.180 at 0755. weak with extensive identification in Spanish, then music program to 0830, news and more music at 0835. (Mathieu, TX)

Radio Nacional Buenos Aires on 6.060, fair to good in the 0700 to 1000 period. (Mathieu, TX) Radiodifusora Argentina al Exterior, English to South, Central and North America on 11.710 from 0430 to 0500. (Sonner, CA) At 0112 with English program, ID, and "Sports Review." (Ort, NY)

Australia Time station VNG heard on 12.000 at 2300. Man announcer giving time and station ID. (Brossell, WI)

ABC Brisbane on 4.920 at 0930 to 1100 with varied programming. (Mathieu, TX)

Radio Australia at Lyndhurst on 6.045 from 1105 to 1125 in English. (Fravel, WV)

ABC Brisbane on 9.660 at 1210 with music request show. (Slawson, PA) It is also on from 1215 to 1229 with news, weather, and classical music til lost to VOA in Chinese. (Fravel, WV)

ABC Perth on 9.610 at 1114 with news and music. (Slawson, PA) At 1320 with English and big band music. (Pasziewicz, WI) 1302 to 1415 with news and program called "Background Briefings." (Fravel, WV)

Radio Australia at 1042 to 1100 on 7.205 with top 10 records. world news in English. (Fravel, WV) On 9.580 with "Waltzing Matilda" and Kookabura bird IS, music, news, commentary, weather, stock exchange reports. (Mann, NC) 1235 with news and on 9.640 at 1400 with world news in English. (Ort, NY)

Bangladesh Radio Bangladesh on 21.670 in English from 1230 sign on with interval signal, ID by woman, news to fade out at 1236. (Hickerson, AK)

Bolivia Radio Ilimani, La Paz, usually heard on 6.025, noted lately also on 4.945 at 1000 over Radio Colosal in Colombia. Program in Quechua or Aymara. IDs in Spanish. (Mathieu, TX)

Brazil Radio Bandeirantes at Sao Paulo on 6.185 at 0830 with music and commercials. (Mathieu, TX)

Radio Cultura da Bahia at Salvador on 6.155 at 0900, in parallel with 4.895. (Mathieu, TX)

Radio Gaucha. Porto Alegre on 6.135 at 0930 with music. (Mathieu, TX)

Radio Nacional Amazonas, Brasilia on 15.455. Sign on at 0030 and into Portuguese music. (Fravel, WV)

Radio Nacional at Porto Velho on 4.945 at 0903 to 1005. good level, mixing with Colombia. Variety of music, news at 1000. ID as "Radio Nacional de Porto Velho em ondas tropicais." Power supposed to be 50 kw. Address is Rua Municipal de Belmont s/n, Barrio Milagres II, Porto Velho. RO 78900. (Lazarus, LA)

Bulgaria Radio Sofia on 11.720 at 2140 to 2200, world news and sports roundup including events in Europe and Bulgaria. (Janco, IN)

Cameroon Radio Douala on 4.795 at 2232 to 2307 sign off. Program of African and some U.S. music with announcements in French by man, news in English at 2301, back into French at 2302, final announcements 2305, National Anthem and off. One ID simply as "Radio Douala" another as "Ici Douala." (Lazarus, LA)

Canada CFRX, Toronto on 6.070. some of the best reception ever here from this station lately, between 0700 and 0900. But HCJB sign on at 0900 wipes them out when it begins Quechua service to South America. (Mathieu, TX)

CBC on 9.625 at 1205 in English, switched to an unknown language at 1212. Excellent strength. (Fay, NJ)

CKZN St. John's, Newfoundland on 6.160 with local news, music, talk on the "Morning Show" 0900 to 0930 (Pastrick, PA) At 1300 with news, weather, local programs. (Ort, NY)

CBC Northern Service on 11.720 with news at 1600. (Bush, OH)

Chad Radio Moundou on 5.286.9 at 0505 sign on with interval signal, announcement in French, very weak. (Hickerson, AK)

China Fujian Front Station (People's Liberation Army, Ed) found on 4.380 at 1050. male and female singers interrupted at times by female announcer in Chinese. Some interference from a utility. (Osier, NY)

Radio Beijing's latest English schedule to Eastern North America is 0000 and 0100 on 11.945 and 9.860, 0200 on 9.860, 1100 on 9.820, and 1200 on 11.650 and 9.820. (McKeon, IN) English to North America heard at 1105 on 15.520 with news and language lessons. (Pastrick, PA) 9.820 at 1240 in English to sign off at 1253 with time and frequency announcements to North America. (Ort, NY)

Xinjiang People's Broadcasting Station, Lhasa, Tibet at 1144 to 1158. ID presumed Oriental music, two short announcements by woman in Chinese. (Lazarus, LA)

Clandestine Radio Free Surinam (Frei Suriname) from 0056 to 0128 sign off. Sign on with drums and ID by woman, several talks by men in language, several music interludes. Surprised to hear, in middle of talk in Dutch, Lincoln's "you can fool some of the people some of the time," etc. in perfect English. Very strong. (Lazarus, LA)

Radio Venceremos on 6.830 at 0506-0520 with music and political talk. (Fravel, WV)

Radio Frank Pais of the Cuba Independiente y Democratica network heard at 0300 on 7.412. (Trott, MD)

Radio Antonio Maceo, CID network, on 4.980 with poor sound quality at 0135. (Trott, MD) (This CID program is carried by Ecos del Torbes in Venezuela on this frequency. Ed)

Radio Antonio Guiteras on 7.352, all Spanish with commentary, music, 2001 theme. (also CID net, Ed)

Colombia La Voz del Cinaruco on 4.865 at 0900 with music. (Mathieu, TX)

La Voz del Caqueta, Floriencia, tentative on 5.035 at 0945. Only poor. (Mathieu, TX)

Emisora Nueva Granada from Bogota on 6.160 at 0830 to 0930 with a variety of music and commercials. (Mathieu, TX)

Radio Bucaramanga, 4.845 at 1015 to 1030 with music and Spanish. (Fravel, WV)

La Voz del Norte at Cucuta on 4.875 at 1035 to 1100 with music and Spanish. (Fravel, WV)

Ecos del Combeima, Ibaque on 4.785 at 0517 to 0530 in Spanish with music and frequent IDs. (Fravel, WV)

Radio Sutatenza, 5.095 at 1115 in Spanish with ID. (Bush, OH)

Cook Islands Radio Cook Islands heard at 0643 to 0742 on 11.760. (Fravel, WV)

Costa Rica Radio Impacto, 6.150 at San Jose, all night with music program and short news blurbs, commercials, frequent IDs. (Mathieu, TX) Strong in Spanish

with music and announcements. Is this what WRTH lists as "ABC Radio?" (Behrendt, NE) (Don't know if it's the same ownership but Impacto definitely the one here. Ed) Heard 0703 to 0722. (Fravel, WV)

TIFC, Faro del Caribe, San Jose on 5.055 and 6.175 at 1045 with ranchero music. The 49-meter band outlet not noted nearly as often as the 60 mb frequency. (Mathieu, TX)

Radio Columbia, new in San Jose, on 4.825 from 0419 to 0447. Discussion of news events in Central America. Also noted at 1028 sign on into program "Buenos dias Campesinos." IDs heard as both "Radio Columbia" and "la gran cadena emisoras Columbia." (Lazarus, LA)

Djibouti Radio Djibouti, heard on 4.780 at 0300 sign on in French with talks by man and woman, along with singing to 0340. Frequency, normally covered, was clear. (Hickerson, AK)

East Germany Radio Berlin International at 0330 sign on in English to North America on 9.560.

Ecuador Radio Rio Amazonas, a missionary station at Shell with transmitter at Macuma, heard at 1000 with religious program in possible Jivaro language. religious music and song in dialect, also has Andean-type music at times. (Mathieu, TX)

Radio Pazy Bien, a Catholic outlet at Ambato heard on 4.820 at 1000 with religious program. (Mathieu, TX)

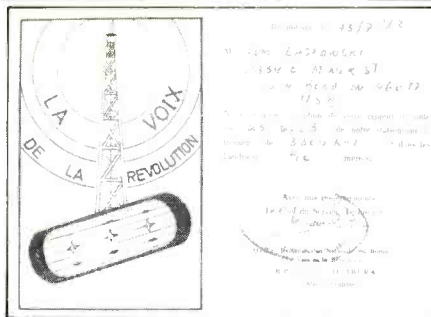
Radio Quito, 4.920 at 0439 to 0502 sign off in Spanish with music program. (Fravel, WV)

Radio Jesus del Gran Poder, Quito on 5.050 at 1040 to 1100 in Spanish with religious program. (Fravel, WV)

Radio Nacional Progreso, Loja on 5.060 at 0550 to 0600 with music. Spanish announcements. (Fravel, WV)

England BBC on 6.175 at 0400 with "Waveguide" program. (Tomasevich, IL) On 3.955 at 0423 to 0430 sign off with news in English. (Fravel, WV)

Finland Radio Finland to North America is scheduled Mondays through Saturdays from 1200 to 1225 on 15.400 and 15.275; 1200 to 1325 on 15.400 and 17.800; 1400 to 1425 on 15.400; 1500 to 1525 on 15.400 and 17.800; on Sundays only at 1330 to 1525 on 15.400 and 17.800. (Radio Finland) 17.800 at 1230 with classical music and local news. (Tomasevich, IL) English to North and South America on 15.400 at 1400 with regional news. (Ort, NY)



A top flight catch is La Voix de la Revolution from Burundi. Tom Laskowski got 'em and QSL'd 'em.

French Guyana RFO Cayenne, good on 5.055 and 6.170 at 0900 sign on which follows a guitar interval signal and "La Marseillaise." Female announcer and lengthy network ID. (Mathieu, TX)

France Radio France International on 17.720 at 1603 with "Paris Calling Africa." (Tomasevich, IL)

Gabon Africa #1, Libreville, on 4.810 at 0538 to 0556 with pop music and French announcements. (Fravel, WV) Strong from sign on at 0500. Does one get better results from RFI in Paris or direct for QSLs? (Behrendt, NE) (RFI will QSL their Gabon relay if you hear the broadcast; otherwise try direct. Ed)

Ghana Radio Ghana on 4.915 at 0559 with ID in English at 0600. Ghana news. (Fravel, WV) News in English at 0600 followed by news in several local languages at 0615. (Behrendt, NE)

Guatemala Radio Chorits, Jocotan, 3.380 at 0039 to 0307. music program in Spanish. Much better after 0230. (Fravel, WV)

Guinea Radiodiffusion Television Guineenne, 15.310 with speech and news in French at 2233. (Paszkiwicz, WI)

Guyana GBS, Georgetown, 5.950 from 0800 with varied programs including Indian music. (Mathieu, TX)

India All India Radio, 9.912 poor with news at 2000

(Bush, OH) It was also heard on 11.620 in English at 1900. (Rutowski, NY)

Iran Voice of the Islamic Republic of Iran, 15.084 at 2321-2334. (Fravel, WV) On 9.022 at 2200 in English. (Slawson, PA)

Israel Israel Radio to North America scheduled at 0100, 0200, 0300 on 11.655, 9.815, and 7.410. At 0600 on 15.585, 12.025, 11.655, and 9.815. (Israel Radio) 9.009 at 2000 to 2030 with news, "Calling All Listeners," and sports program. (Okoloise, Nigeria)

Ivory Coast Radiodiffusion Ivoirienne, from 0600 sign on through to 0800 in French on 4.940. Music, news, and commentary. (Behrendt, NE)

Japan NSB, Tokyo, 6.115 with English lesson at 0915, also on 6.055 at 0900 with different program. Also around this time are outlets on 3.925 and 3.945, both with different programs. 6.115 suffers interference from La Voz del Llano, Columbia. (Mathieu, TX)

Radio Japan on 17.827 (17.825? Ed) at 0125 ending "Crosscurrents" program, news in English at 0130 and sign off around 0140. (Bowen, NY)

Kiribati Radio Kiribati on 16.433 lower sideband from 0017 to 0130 sign off with island music, news at 0100. (Hickerson, AK)

Laos Radio National Lao, 6.130 at 1200 sign on with interval signal, announcement in Lao by man, news. Weak signal. (Hickerson, AK)

Lebanon Radio Lebanon noted from 0208 to 0231 on 11.955 in Arabic. English around 0230. (Aaraj, MA)

Libya Radio Jamahiriyah on 11.816 at 2344 with schedule of religious readings and QSLing info, requesting IRCs. (Huntley, PA)

Luxembourg Radio Luxembourg on 6.090, rock and English disc jockey, 0030 to 0056. (Fravel, WV)

Malta Radio Mediterranean heard from 2200 to 2230 on 6.110, all in French, many musical interludes. Interference from BBC on same frequency. (Brossell, WI) Heard from 2308 to 2327 sign off with pop music, in English. (Fravel, WV)

Mauritius Forest Side, 9.709.4 in English at 1115 with chants, ID by woman at 1127 and 1131. (Hickerson, AK)

Mongolia Radio Ulan Bator on 12.070 from 1201 to 1220 with English news and commentary. (Fravel, WV)

Nepal Radio Nepal, 9.590 at 1147 to 1152 with inter-

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val signal, sign on by man. music. In Nepali. KTWR QRM not as bad on this day. (Hickerson, AK)

New Caledonia Radio Noumea on 7.170 at 0840 to 0855 with music and French announcer. (Fravel, WV)

New Zealand Radio New Zealand, 9.620 at 1153 to 1218 sign off in English with 40's music, news at 1200, ID announcement for domestic service. (Hickerson, AK) 11.945 at 1000 in English. (Rutowski, NY)

Nicaragua Voice of Nicaragua on 5.950 variable at 0413 in English with news, music, commentary. Into Spanish at 0500. (Slawson, PA)

Nigeria Voice of Nigeria on 7.255 at 0455 sign on with drums, anthem, English ID, program preview. (Hickerson, AK)

Radio Nigeria from Kaduna, strong at 0500 to 0630 in English with news, commentary, and domestic political program titled "Democracy in Action" on 4.770. (Behrendt, NE)

North Korea Radio Pyongyang, 9.977 at 1140 to 1200 with political talk in English. (Fravel, WV)

Norway Radio Norway International on 9.675 in Norwegian at 2200, with English ID. (Bush, OH)

Pakistan Radio Pakistan with English from 1200 to 1230 on 9.650, music and poetry. Strongest signal from Pakistan noted in more than 20 years of listening. (Brossell, WI)

Papua New Guinea Port Moresby on 4.890 at 1140 in English, upbeat music, drums, and beeps on the hour. (Ort, NY)

Paraguay Radio Nacional Asuncion, 9.735 at 1000 sign on in Spanish. (Fravel, WV)

Peru Radio Tingo Maria, 4.760 at 0945 to 1030 with Andean music, commercials, various announcers, frequent time checks but infrequent IDs. (Mathieu, TX)

Radio Concordia on 9.579, new station, 0920 to 1012 with Peruvian music and announcements by woman, then news-type program which I think was called "La Voz del Pueblo." Several IDs including "Concordia... la mejor alternativa..." (Lazarus, LA)

6364 Radio Moderna, Moyabamba, new station, 1056 variable sign on with national anthem, opening announcement by man, program of Peruvian music. (Lazarus, LA)

La Voz de Huamanga, presumed, 6.200 with sign on

at 1028. Peruvian music, announcements by man. (Lazarus, LA)

5.955 Radio Huancayo. 0810 to 0845 surprisingly strong with almost non-stop Caribbean music, very few announcements, time checks, one ID at 0836, ad for a store in Huancayo. (Lazarus, LA)

Philippines FEBC Manila heard at 1230 in Chinese on 11.835 (Rutowski, NY) At 0300 on 15.300 in parallel with 21.515, religious programs. (Avery, Guam)

Poland Radio Polonia on 9.675 at 0640 in English. (Rutowski, NY)

Saipan KYOI, 11.900 with English at 1120. (Rutowski, NY) 9.670 at 1720 with rock, ID 1744 as "KYOI Super Rock," weak. (Tomasevich, IL) 11.900 at 1250. (Ort, NY)

Saudi Arabia Broadcasting Service of the Kingdom of Saudi Arabia has English at 1000 to 1300 on 11.855 and again from 1700 to 2100 on same frequency. (BSKSA via Ramos, NY)

Sierra Leone SLBS on 5.980 at 2337 with English, music, time check, religious program. (Paszkievich, WI)

Somalia Radio Mogadishu, 6.790 at 0307 in Somali talk, native music, drums, ID. (Hickerson, AK)

South Africa Radio RSA heard from 2130 to 2155 sign off on 9.585 with general service in English to Europe. (Fravel, WV)

South Korea Radio Korea on 9.750 at 1535 with man and woman in talks. (Bush, OH)

Spain Radio Espana Exterior on 15.375 at 2030 to 2100 with news in English and Spanish language lessons. (Tomasevich, IL)

Sri Lanka Sri Lanka Broadcasting Corporation, 11.835 in English at 1115. (Rutowski, NY)

Surinam SRS Paramaribo on 4.850 from sign on just after 0800 until as late as 1000 and at night but signal doesn't seem as strong as it used to be. (Mathieu, TX) Disident elements just destroyed the station so 4850 is off. Steve Reinstein in Florida reports SRS now using the old Radio Apinté transmitter on 5.005. (Ed.)

Sweden Radio Sweden International to North America in English at 0230 on 9.695 and 11.705; at 1400 on 17.860; at 2300 on 9.695 and 11.710. (Radio Sweden) Heard on 17.850 at 1405 with program about Swedish culture and cities, news and ID at 1428. (Tomasevich, IL)

11.710 with "Mailbag" at 2300, interference from a station on 11.705. (Ort, NY)

Tahiti Radio Tahiti, 6.135 with music and French announcements 0915 to 0930. (Fravel, WV) 11.825 at 0218 with rock and call-in program. (Ort, NY)

Thailand Radio Thailand on 11.905 at 1159 sign on with interval signal, anthem, announcement in English by man, opera-type music. Interference from Taiwan on the same frequency. (Hickerson, AK)

Turkey The Voice of Turkey heard in English from 2201 to 2231 on 9.515. (Fravel, WV)

Uganda Radio Uganda on 5.027 at 0410 to 0415 in English, man with news, ID. (Hickerson, AK) 0522 to 0545 with music and African language. (Fravel, WV)

United Arab Emirates English from UAE Radio, Dubai is scheduled at 0330 on 15.435 and 17.775; 0530 on 21.700 and 17.775 and 17.830; at 1030 on 12.695, 21.655, and 17.775 and at 1615 on 21.655, 15.320, and 15.300. (station via McKeon, IN)

United States UN Radio on 11.740 with English at 0825. (Rutowski, NY)

AFRTS on 11.790 from 2305 to 2327 with sports commentary. (Okoloise, Nigeria)

VOA in Ukrainian service at 1959 on 7.400, announcing address as P.O. Box 222, District of Columbia. (Bush, OH)

USSR Radio Peace and Progress on 11.940 at 1025 in Russian. (Rutowski, NY)

Radio Vilnius, English via USSR on 9.685 at 2200 to 2230 with "woodpecker" QRM and interference from Cuba. (Pastrick, PA)

Radio Moscow on 12.050 at 1520. (Tomasevich, IL)

Uzbek SSR Radio Tashkent on 11.785 in English at 1210. (Rutowski, NY)

Vanuatu Radio Vanuatu noted with strong and clear signals on 3.945 at 1000 to 1100 in Biscama (Pidgin English) featuring mentions of Malapoa and pop songs. (Brossell, WI)

Vatican Vatican Radio, 6.015 from 0050 to 0110 sign off with religious news in English. (Fravel, WV) 11.740 at 1610 with news in English followed by Spanish. (Ort, NY)

Venezuela Time Station YVTO on 6.100 with second beeps and time announcements each minute noted at 0845. (Pastrick, PA)

Ecos del Torbes heard with music 0945 to 1000 on 4.980. (Fravel, WV)

Radio Lara, Barquisimeto on 4.800; Radio Tachira, San Cristobal on 4.830; Radio Continente, Caracas on 5.030 all noted with music and Spanish between 1000 and 1100. (Fravel, WV)

Vietnam Voice of Vietnam heard on 15.010 at 1300 with news and commentary in English but weak and fading. (Brossell, WI) 1300 sign on and into French. (Ort, NY) At 1930 on 10.040 with news and commentary in English. (Bush, OH)

West Germany Deutsche Welle's African Service on 17.765 with English news and commentary at 1235. (Ort, NY) 3.995 at 0329 to 0344 with easy listening music, German announcements. (Fravel, WV)

Yugoslavia Radio Yugoslavia at 2122 on 9.620 in English with news and commentary. (Slawson, PA)

Our thanks to: Friday I. Okoloise, Kano, Nigeria; Brian A. Avery, Anderson Air Force Base, Guam; Harold Ort Jr., Staten Island, NY; Daniel Tomasevich, Berwyn, IL; Chris Huntley, Albion, PA; Sheryl Paszkiewicz, Manitowoc, WI; Larry R. Fravel, Clarksburg, WV; Cecil W. Mann, Hendersonville, NC; Jerry M. Janco, Munster, IN; Stephen C. Behrendt, Lincoln, NE; Jorge Ramos, Jackson Heights, NY; Henry Lazarus, New Orleans, LA; Robert A. Aaraj, Boston, MA; Dennis Slawson, Sykesville, PA; Robert E. Pastrick, Baden, PA; Steve Trott, Ft. Meade, MD; Dave Bush, Sebring OH; Dennis Rutowski, FPO, NY; Gary Hickerson, Ft. Smith, AK; Thomas J. McKeon, Indianapolis, IN; John F. Fay, Princeton, NJ; George Osier, Norfolk, NY; Paul Mathieu, San Angelo, TX; David Bowen, Batavia, NY; Joe Sonner III, Canoga Park, CA; Robert Brossell, Pewaukee, WI.
See you next month. Good listening!

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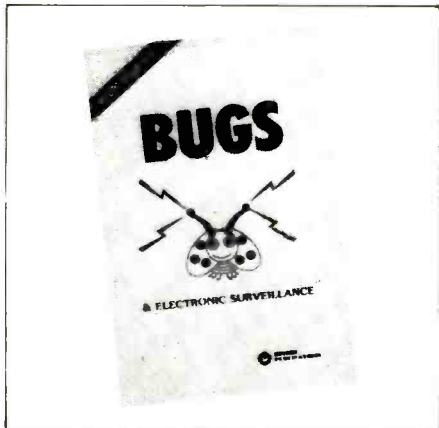
PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS

Something Bugging You?

Anyone who's interested in the current communications scene should be familiar with the practical aspects of electronic surveillance and countermeasures to use in order to secure privacy. Being familiar with the federal laws governing electronic spying and invasion of privacy by electronic probing is most definitely an asset in getting a grip on the total scene. This manual puts to rest a lot of misconceptions about "bugging" made popular in the news media, on TV programs, and in Hollywood films. On the other hand, it reveals that the techniques and equipment actually used for electronic surveillance are much more clever and sneaky than you've been led to believe. It shows the development and construction of hidden mikes, shotgun mikes, etc. Also shown are plans to build your own inexpensive bug detector from readily available components. For your legal reference, the complete text of Public Law 90-351 is given in this revised, expanded, and updated edition. The book is also fully illustrated.

The book *Bugs & Electronic Surveillance* is now available from CRB Research, P.O. Box 56, Commack, NY 11725. The price is \$7.95, plus \$1 for First Class Mailing.



Novice Class Mail-Order Course

Gordon West's Radio School announces a complete Novice class mail-order course to prepare students and their volunteer examiners for the Novice class test. Students will find the following items in their complete Radio School Novice Class Home Study Course:

- Four stereo code-learning tapes
- Two stereo 200 Q & A tapes
- Two vinyl cassette carrying cases
- Code oscillator set
- Novice 200 Q & A license manual
- FCC published 200 Novice test questions
- Typical Novice Class multiple choice examination



• FCC Form 610

This complete Novice course also includes a separate package for the volunteer instructor to administer the exam. The volunteer examiner's test package contains the following items:

- 5 wpm code test tape
- Twenty question theory test meeting FCC Novice Class requirements
- Details on filing out reverse side of Form 610
- Details on how to conduct the exam and where to send Form 610

The Federal Communications Commission notice of proposed rulemaking NPR Docket 83-27 outlines a volunteer examiner program where local hams will take over the responsibility of giving ham radio tests. Public law 97-259 amended the Communications Act of 1934, and that allowed the FCC to accept the voluntary services of licensed radio amateurs in preparing and administering the Amateur Radio Service exams.

No longer will exam questions be kept secret. The FCC is publishing all examination questions for all levels of amateur radio licenses. Similar to aircraft FAA exam procedures, publishing companies and Radio School, Inc. have developed multiple-choice-type answers for these questions, as well as a key giving the correct answer for each and every question. This allows the beginner student to know exactly what is required to pass the twenty question FCC Novice class test.

Radio School has been producing stereo code tapes for the last five years. Stereo code tapes allow students to learn the code while listening to instructions on one channel and the code on the other channel. Students can then turn down the voice channel to practice the code without help. Students can then turn down the code channel and practice sending the code letters after the voice channel commands. Radio School

has not only beginner code courses, but complete code courses for the General class license and the Extra class license.

Radio School theory tapes cover those questions to be asked on an Amateur Radio examination for a particular class of license. This allows students to practice their theory while driving in a car to make better use of their time while on the road. The theory tapes are also ideal for the visually impaired student who cannot read regular text books. Whenever possible, the theory tapes should also be used in conjunction with quality license and question-and-answer manuals for the Amateur Radio license exam.

The complete Novice course is offered mail order for \$60.00 plus tax and \$4.00 postage. Students can contact Gordon West personally on a hotline number for additional help on any questions on the exam.

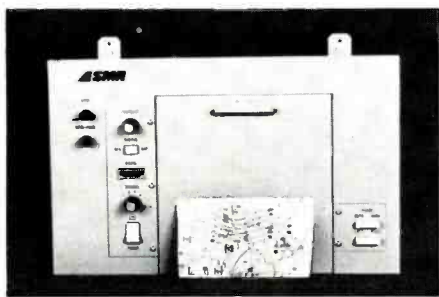
"Whenever possible, students should always attend a regular Amateur Radio class. This allows them to see ham radio equipment live, and to broaden their horizons about the amateur radio community that they are soon to enter. Each year, through our local college system, we train about 1,000 students to pass their Amateur Radio tests and become good Amateur Radio operators. However, throughout the country, there are many areas not served by an Amateur Radio instructor. We hope that our mail-order courses will help fill this bill. Our Novice class course also goes one step beyond and includes material for the volunteer examiner to give the student their beginner Amateur Radio Novice class test. With our experience in teaching, there is no other course like this one for the beginner," comments Gordon West, national radio columnist and three-time nominee for the coveted ARRL "Instructor of the Year" award.

For more information on new FCC testing policies, write Gordon West's Radio School, 2414 College Drive, Costa Mesa, CA 92626.

Weather Map/Satellite Photo Radio Receiver/Printer

Pilots, airline flight dispatchers, and anyone else who is interested can now receive free up-to-the-minute weather maps and satellite photos in their homes and offices with two economical, self-contained units being introduced by Southern Marine Research (SMR). Both models are complete HF radio receivers with built-in facsimile printers. They receive and print valuable maps and photos transmitted around the clock from 45 civilian and military stations in 25 countries. These signals are transmitted as a free service.

The SF-502 is a 12 channel receiver/printer powered by 110 or 24 volts. It records for 38 hours on a single roll of eight inch wide paper. This model is completely automatic, switching on each time a station transmits a map or photo.



The SF-505 is a compact version weighing 19 pounds. This six channel unit is powered by 12 volts and records up to 29 continuous hours on six inch wide paper.

Both units are shipped direct from the factory complete and ready to use with all necessary channels pre-tuned and antenna provided. For further information, contact SMR at 1401 N.W. 89 Ct., Miami, FL 33172 or circle 113 on the reader service card.

The RC-20 Satellite Receiver System

Amplica, Inc., a COMSAT Company, introduced their RC-20 Satellite Receiver System. The RC-20 is the first LNC satellite receiver system to have infra-red remote control, LED readout, and detent tuning.

Amplica joins their Low Noise Amplifier with a custom downconverter to accomplish amplification, frequency conversion, and channel selection in a single weatherproof package. Each RC-20 Satellite Receiver System is manufactured entirely by Ampli-



ca, and includes receiver, low noise converter, and cable assemblies to provide everything needed between antenna feed and TV set. In addition, the user gets the versatility afforded by Amplica's infra-red remote control unit.

Amplica, a COMSAT Company, designs and manufactures a complete line of satellite receiver systems and related TV receive-only hardware, sold worldwide by dealers and distributors. Amplica is the largest manufacturer of low noise amplifiers for use with small TVRO systems and cable TV equipment. COMSAT, the Communications Satellite Corporation, provides communications services through various international, domestic and maritime satellite systems. Through its subsidiaries, COMSAT also provides telecommunications products, consulting, and advanced research and development in the field of high technology communications.

For additional information, contact: Amplica, Inc., 950 Lawrence Drive, Newbury Park, CA 91320, or circle number 108 on the reader service card.



Low-Cost Dual-Band Radar Detector

Regency Electronics, Inc., announced the introduction of the RS One, a low-cost, two-band radar detector.

The RS One is a dual band XK radar detector that operates on both the new moving and hand-held "gun" radar systems. The Regency unit features an adjustable sensitivity control for city and open road driving. A loud buzzer sounds for radar alert warning.

The RS One also features a compact, non-glare case, a power LED, and mounting hardware for dashboard or sun-visor mounting. Suggested retail price has been set at \$89.95. For more information, contact Regency Electronics, 7707 Records St., Indianapolis, IN 46226, or circle number 116 on the reader service card.

Command Series Features A New FM/SW Radio

Panasonic introduced a new Command Series portable radio that can receive radio waves from across the world and deliver them clearly and cleanly with some very sophisticated electronic circuitry. Model RF-B600 has a PLL quartz-synthesized digital tuner with 10-key direct access tuning. This model has a Double Superheterodyne reception system.

Panasonic's new Model RF-B600 is quite small for a radio that performs so much so well. It features a micro-computer controlled pre-set tuner that lets the user find up to nine different stations immediately. On top of that, it has a 10-key direct access scan tuning and nine memory station scan tuning. The rotary tuning system can be switched to either fast or slow.



Model RF-B600 has a PLL synthesizer digital tuner in which the quartz phase-lock loop (PLL) circuitry "locks" the tuned-in shortwave station onto a virtually unwavering quartz crystal oscillator reference frequency. A Double Superheterodyne receiver system then eliminates most extraneous noises maximizing the quality of radio signals received from virtually anywhere in the world.

The shortwave band has zone auto tuning in manual, seek, and scan modes. FM, LW, MW, and SW bands can be received. Shortwave coverage is from 1.6 to 29,999 MHz and the 5-digit fluorescent digital readout is very easy to see.

Other features of Model RF-B600 are an RF gain control, AM band width, ANL, and meter light switches, and separate treble and bass tone controls. There are also tuning and battery strength meters and individual LED indicators for bands, power, and tuning lock.

The sound from Model RF-B600 comes through a powerful 3 1/2 inch PM Dynamic Speaker. There is a jack for a headphone set, as well as a record out jack.

Model RF-B600 operates on virtually any type of electric current. An AC cord is included. Power can also come from eight "D" batteries. A two year limited warranty covers the quality of this flexible radio.

Suggested retail price for Model RF-B600 is \$599.95.

For more information, circle number 102 on the reader service card.



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CIRCLE 78 ON READER SERVICE CARD



Compact FM/MW/SW 1-8 Radio With Double Superhet Circuit

Panasonic's all-new Model RF-B50 delivers clear, uncluttered radio signals from all over the world thanks to its sophisticated Double Superheterodyne circuit. This radio receives a full line of FM, MW, and SW frequencies through a sensitive FM/MW antenna and a ground terminal.

The Double Superheterodyne is a dual conversion receiver system for sensitivity and selectivity. This helps stabilization while reducing primary and secondary interference to provide reception without beats, whistles, and other extraneous noise.

Shortwave frequencies reach from 2.3-21.75 MHz in eight bands. There is an LED band indicator for easy frequency adjustment, and a narrow/wide bandwidth selector for more precise tuning.

Tone and volume controls are continuous

for exact adjustments. The tuning dial is of the slide-rule type. The power switch is separate.

A hefty 3-inch PM dynamic speaker reproduces a quality of sound worthy of this fine radio circuitry. An earphone/external speaker jack allows for personal or public listening. The earphone is included.

Model RF-B50 comes with a carry strap and carrying case. The four "AA" batteries that operate this radio are not included.

Suggested retail price for this radio is \$139.95.

For more information, circle number 103 on the reader service card.



New Superhet Radar Detector

Electrolert, Inc., Tipp City, Ohio, has introduced a new radar detector to its expanding line of Fuzzbuster products. The new unit, The Fuzzbuster Superhet, utilizes advanced technology that actually searches out all radar signals at greater distances and

even over hills and around curves and warns drivers well in advance to check their speed. Fuzzbuster Superhet is 100 times more sensitive than a conventional radar detector.

The new unit picks up all bands and types of radar, even low power and "pulse" radars. The Fuzzbuster Superhet senses only radar, virtually eliminating false signals.

The sophisticated circuitry is a double-conversion design utilizing a novel phase detection scheme and is housed in a handsome deep gray case trimmed in chrome.

The Fuzzbuster Superhet has such features as a Highway/City Selector that adjusts the unit to specific driving conditions.

A warning indicator light illuminates as initial contact with radar is made. A photoelectric sensor automatically adjusts the brightness of the warning indicator light from very bright for daytime driving to dimmed for night use.

An LED Alarm Panel indicates the driver's distance from the radar source by sequentially illuminating (left to right) as the vehicle nears the radar.

The Audio warning can be controlled at the desired level by simply turning the volume control knob.

The latest Fuzzbuster will be targeted at professional drivers and consumers who drive 30,000 plus miles annually.

For further information, write: Electrolert, Inc., 4949 South 25A, Tipp City, OH 45371, or circle number 105 on the reader service card.

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Quick Protection

In previous columns I've made reference to the advisability of securing some measure of protection for your communications equipment that will ward off the harmful effects of power surges. Such sudden power spikes can damage computers, scanners, transmitters, and communications receivers. These surges can be caused by lightning, certain types of electrical systems switching on, problems in the power source or power lines, etc.

A number of products are now on the market which permit you to shield your equipment from these damaging spikes, and this month we came across a new addition to this arsenal of devices. Dymarc Industries (21 Governor's Ct., Baltimore, MD 21207) calls their device the Clipper and it has a response time of 5 nanoseconds (millionths of a second) to stop both normal and common mode spikes. Easily plugged into any three pronged socket, the Clipper provides three outlets of protected power for electronics equipment. The advanced circuitry in the Clipper is listed with Underwriter's Laboratory under their standards for surge suppression: UL-1449. The design offers protection from dangerous electrical spikes of 6,000 volts or more.

The Clipper also has a failsafe audible beeper and an LED to indicate if, for any reason, the unit is not operating properly.

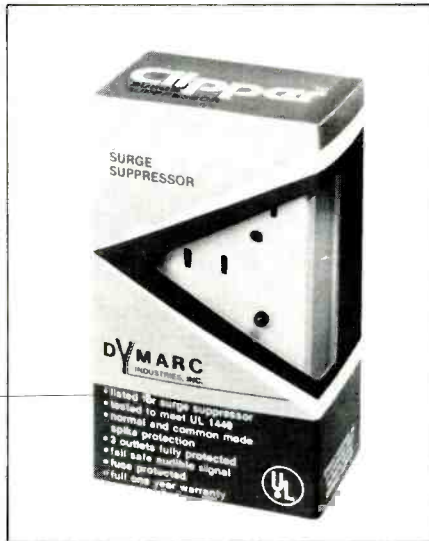
The Clipper is new and should be available from many dealers by the time you read this. The retail price is about \$50.

Another Protection

In addition to electrical surges which are "out to get" your electronics gear, there's always rust, mildew, and other by-products of dampness. Equipment which is stored in a basement, attic, garage, or shed seems particularly prone to damage from dampness, and in some areas, even equipment that is located indoors in a heated environment and in regular communications use can be adversely affected by dampness in the air. Once it gets a foothold in your gear it's rather insidious and could eventually put your electronics equipment totally out of commission — rotting the insulation, wiring, components, and corroding the cabinet.

Even if you're not familiar with the effects of corrosion upon electronics equipment, you may be aware of what corrosion does to guns or other precision-finished products. Once marred by corrosion — no oil, rust remover, coating, or other chemicals can ever restore the original appearance or value of the item.

Several issues back we suggested the possibilities of saving the little anti-dampness



Dymarc's surge suppressor.

packets that come with medicines, cameras, guns, etc. in order to pack in with stored electronics gear and even to place inside equipment you've got in operation. These silica gel packets create a protective shield of dry area within an enclosed area.

For those who can't locate a sufficient number of these small capsules or packets in order to do the job, reader Mike Castor, KFL4RB, of Florida, passes along the information that Hydrosorbent Company, Box 675, Rye, NY 10580, is a source for silica desiccant products. One unit they offer is a compact metal canister that protects 3 cubic feet of enclosed space (individual radios, camera cases, tackle boxes, gun boxes, etc.). Another larger side unit contains 350 grams and eliminates dampness and humidity in over 27 feet of enclosed space (small radio shacks, darkrooms, closets, storage areas, etc.). A large 2000 gram canister protects 144 square feet of enclosed space and

will protect campers, trailers, radio rooms, workshops.

These units do not require any power source in order to operate and when they need "reactivating" there is a built-in signal. To reactivate them, simply place the unit in an oven for a brief period. The price range is approximately \$5 to \$38 for the different size units and if you are interested, contact the manufacturer for additional details and current prices/availability.

The Day After

As I write this I am receiving heavy amounts of mail asking my opinions regarding the ABC-TV film *The Day After* which aired last November. Readers ask for my thoughts on communications in a "Day After" type of situation and if there are any relevant points to be considered as pointed out by that film.

Let me first state that the TV film was a rather inaccurate depiction of the events which one might expect to transpire. As frightening as they had hoped things would appear to their audience, in truth what they showed in the film was far too *mild* to come even remotely close to what would actually transpire. None of the mass panic and uncontrolled hysteria was present, nor did they properly estimate the amount of anarchy that would transpire in light of the collapse of local/county/federal governments. Vehicles were still shown in use, hampered only by temporary ignition failures as a result of electromagnetic pulse (EMP). They did not consider that vehicles might be useless because of the explosion of their fuel tanks, the destruction of their tires, and because many roadways would turn to mush, ignite, or crack/buckle from the searing flash of heat. The nation's already aging infrastructure (including bridges, tunnels, and overpasses/underpasses, as well as highway inter-



The delicate infrastructure would be a challenge to survivalists "the day after."

changes) would hardly be expected to withstand a real attack. Oh well, I don't want to get into a discussion of the failure of this film to be honest with its audience, except to note that what they depicted was less frightening than what ten years worth of TV news depicted was actually taking place in Southeast Asia. It was not even as frightening as what was shown as the aftermath of a world holocaust as shown in the films *Things To Come* (1936) or *On The Beach* (1959).

The TV film also implied that the average citizen, upon getting the news of an impending attack, would be able to trot down to the corner grocery store and stock up on some sufficient provisions to see them through for a while until the national situation stabilized. People were depicted cleaning out the store shelves and then waiting patiently on lines to pay for the stuff. Right? Believe that fairy tale and they'll tell you another one. The TV film ignored those persons who might have been making long-term preparations for the possible eventuality of a "Day After" situation, yet it certainly showed that such a course of action would have been a wise move, in retrospect.

This is true in the cases of food, clothing, water, medication, lighting and other necessities. It is also true in the instance of radio communications. Forget landline (telephone) communications—they would be wiped out for a long and indefinite period right from the start.

Insofar as radio goes, existing antennas would be rendered useless if they were located within the general area of a nuclear detonation. The heat and shock would destroy their usefulness if it left them standing at all. The idea would be to have antennas stored away which might be placed in use when it became safe to erect them.

Even then, communications would still hinge upon things such as damage done to transmitting/receiving equipment as a result of EMP or the blast itself, the existence of other stations with which to communicate, the possible disruption of the ionosphere, etc. There would also have to be some reason to communicate; some have postulated that by broadcasting your location to the world at large (in the hopes of re-establishing contact with other survivors), you might, in fact, be doing yourself no particular beneficial service—attracting to yourself elements of society who would do you more harm than good! For your troubles, you could possibly lose your radio, your provisions, or your life. A working radio transmitting/receiving station will most definitely be perceived as a valuable prize to be won, if not for communications use, then at least for bartering purposes. Such a station will be valued on a par with food, potable water, and medicine, certainly it will be something which money can't buy since there will be no stores to sell radios and cash money may well be of little interest to anybody.

One other point. It should be remembered that persons with a knowledge of radio communications (including operating, servicing, and installation) will have a very marketable skill to offer. Such a skill could be

bartered for goods or services and could be as much a part of community survival as the skills of a physician; probably far more of a valuable skill under such conditions than those of an attorney, a computer programmer, a banker, or a stock broker!

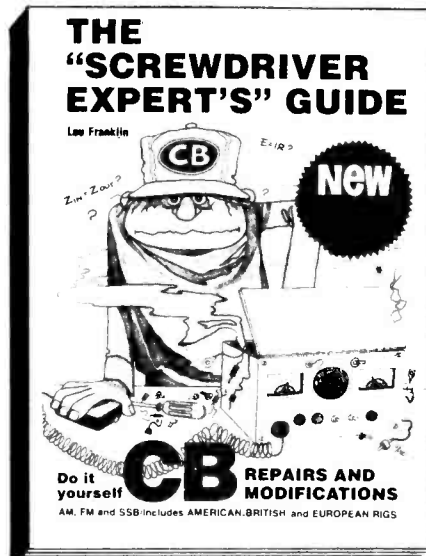
Of course, let's all hope that none of us ever has to find out if any of these speculations are true. There's no harm in being prepared "just in case." There are no guarantees one way or the other.

27 MHz Communications

Speaking of servicing communications gear, we recently received two new books which should be of value and interest to persons who have 27 MHz AM/SSB/FM communications systems. Both of these books were prepared by Lou Franklin, K6NH, a professional electronics tech with 20 years experience and an FCC First Class Commercial Radiotelephone license with Radar endorsement.

Lou's *Screwdriver Expert's Guide* (New International Edition) is the last word in peaking out and repairing 27 MHz gear. Some of the topics covered include methods of changing/adding channels for crystal and PLL radios, power/modulation adjustments, diagnosis of common antenna/SWR problems, mike-related problems, which are the best brands to buy, which accessories are worthless, and lots more. There are plenty of details here and perhaps the most frank and practical discussion we've ever seen on 27 MHz equipment, with plenty of illustrations and charts. This is a large format 97-page book. The price is \$14.95, plus \$1.50 postage.

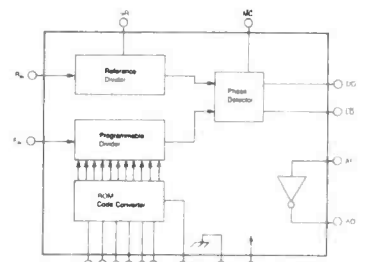
Lou's other book is *The CB PLL Data Book* (International Edition), which is a 108-page repair/modification reference covering American, British, and European AM/FM/SSB transceivers. This book unravels the mysteries of PLL frequency synthesizers and it's written in non-technical language. You'll learn how to understand PLL circuits, how to modify them for many more channels, for FM, for SSB "sliders," and other re-



The Screwdriver Expert's Guide is a new book for do-it-yourselfers.

THE CB PLL DATA BOOK

Lou Franklin



A Repair & Modification Reference
Includes American, British & European CB Radios
AM, FM & SSB Circuits

Lou Franklin's CB PLL Data Book.

lated projects. There is a pin-by-pin function description of nearly every PLL device ever used in 27 MHz equipment with over 50 specific IC's, including manufacturer's cross references, as well as specific lists of every known CB model using a particular PLL circuit. This book is \$14.95 plus \$1.50 postage. If both of Lou's books are purchased together as a set, the combination price is \$25 plus \$1.50 postage. These books may be ordered from CB City International, P.O. Box 31500, Phoenix, AZ 85046.

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CIRCLE 21 ON READER SERVICE CARD

PIRATES DEN

BY DARREN LENO, WDØEWJ

FOCUS ON FREE RADIO BROADCASTING

Several months ago, a station that has been termed one of America's first clandestine broadcasting stations unofficially took to the air. This station, known as the Voice of To-morrow, attracted a great deal of negative attention with their KKK-like racial editorials, and aroused the disapproval of a large percentage of the radio listening community.

During the first series of VOT transmissions, an address of PO Box 786, Bristol, VA 24203, was given for reception reports. Listeners were also asked to send their opinions regarding the programming the VOT was offering. It was stated that future transmissions from this station depended on the feedback received from its audience.

The VOT returned to the air with another flurry of transmissions recently. As before, the programs were professionally done and the signal the station put on the air was usually quite strong and of high quality.

Here are the frequencies and times that the VOT was last noted;

kHz	GMT
7410	0400
6240	0230 & 0130

The VOT was announcing other frequencies of 15040 kHz and 1616 kHz, but I have not seen them reported on these frequencies. A recent post card from VOT was mailed from Hartford, CT.

In other news, KPRC, a traditionally medium wave pirate in New York City, continues to be active on its new shortwave frequency of 6210 kHz as well as on 1616 kHz. Thanks to this additional frequency, listeners from around the country have had the chance to hear this well-known station, previously an East Coast exclusive.

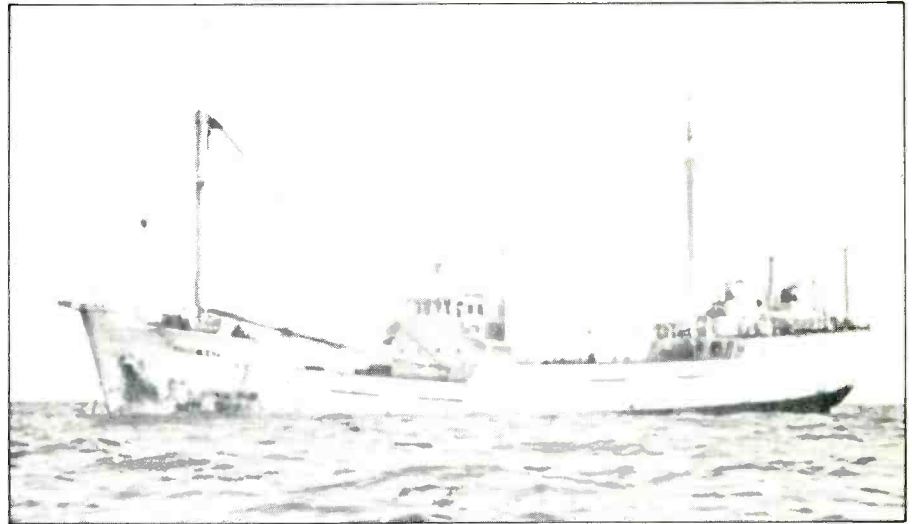
Alfred Spremo of New York tuned to a KPRC SW transmission and heard two guest DJs, Ed Armstrong and Marconi. Both of these gentlemen are also celebrities on New York City's FM pirate, Stereo Nine.

Alfred was able to tune in to Stereo Nine a few days after he heard KPRC. Stereo Nine sporadically transmits rock 'n' roll music on 92.0 MHz in the evenings.

Alfred Spremo must have really been keeping an eye on the FM band. A week after logging Stereo Nine, Al heard WHOT broadcasting on 91.5 MHz as they played musical hits from the 60's. The host of the show was Joe Nasium.

Getting back to SW, Fred Roberts of Ohio tuned in to New Wave Radio Int'l on 7399 kHz. Fred first noted NWRI around 0400 GMT and listened to the station until 1000 GMT. The musical format sported hits from popular new wave rock groups, including Devo and Duran Duran, among others. NWRI was claiming 150 watts of power and an inverted vee antenna.

Paul Walkendorf of Michigan tuned in to Radio Free Insanity on 6015 kHz, an unusu-



The France Radio Club printed postcards with pictures of off-shore pirate broadcasting vessels. Shown here is Radio Mi Amigo's ship, Magdalena.

al frequency for a pirate to be using. Paul listened to the program, which consisted of old rock music, and some "pops and squeals" on their carrier until the station signed off at 0018 GMT.

Radio Paradise Int'l is still active on 6225 kHz according to my friend Kirk Baxter of Kansas. RPI is usually noted on or near this frequency at 0400 GMT.

WTDT, a widely heard shortwave pirate, has decided to make it official that the station will never again be heard. WTDT was last heard over a year ago on January 16, 1983. The station had been presumed "dead" for quite some time because of its inactivity. Now that WTDT is officially history, chief operator T. Taylor decided it would be alright to tell us a little bit more about the station. WTDT operated from S.E. Michigan (honest!) and was heard all over the country with the help of a modest 40 watt amateur transmitter.

Even if one station leaves the air, it seems there is always another to take its place. The Fantasy Broadcasting Station has announced its intentions to take to the airwaves in the near future. According to the "Magic Man," chief operator, "The FBS has been on and off the air for five years so far! We've been on the 11, 22, and 44 meter bands with low-power units. Slowly we're getting more and better equipment, but it's a slow and costly task. I also (am planning) to start an FM Stereo station in Phoenix on 103.1 MHz."

The Magic Man has asked for assistance from anyone with knowledge of FM broadcasting. He asks that all correspondence be directed to the Fantasy Broadcasting Station, PO Box 23792, Phoenix, AZ 85063.

John Arthur, 15-2700 Kala St., Pahoa, HI 96778 is managing a "Free Radio Fund."



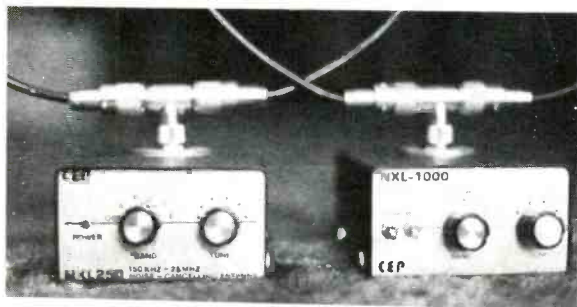
Scottish Scott of KST Arctic Radio, an Anchorage, Alaska based pirate.

If anyone you know is seeking to make a contribution to this fund that, I am told, will be used to help pay fines incurred by pirates for broadcasting illegally, send an SASE to the above address.

From the mail bag comes a letter from Scottish Scott of KST Arctic Radio. KST has left its 27 MHz frequency and moved to 7150 kHz. Although this new frequency lies at the edge of the Novice CW band, if the QRM isn't too severe, you may have a chance to hear the only Alaskan pirate station that I know of. Scottish Scott and DJ Outlaw Elias hope to entertain their audience with new dance music. If you hear this station, or if you'd like more information, write KST Arctic Radio, PO Box 852, Anchorage, AK 99506.

Radio USA continues to be heard on 7374 kHz on lower sideband (LSB) at 0300. Grant Lochmiller of Iowa notes hearing a poll about TV soundtracks and a gag ad for "Anacyde LSD." This station reports that they received quite a few reception reports

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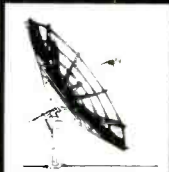
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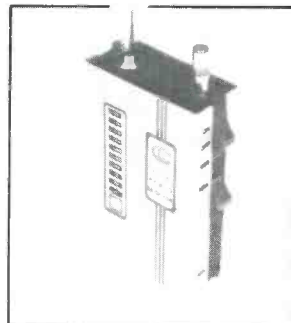
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**HOW TO SURVIVE
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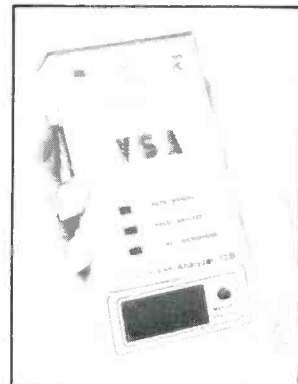
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from Europe recently, thanks to a program relay by Euro-pirate Radio Apollo.

Let's take a look at the European "Free Radio" scene, compliments of Podney Sixe, European Correspondent for the Association of Clandestine radio Enthusiasts.

Radio Enoch is Britain's one and only extreme right wing political clandestine station. They announce a nightly schedule at 1100 GMT on 7330 kHz.

Music Radio Holland is trying to maintain a first Sunday in the month schedule in the 41-meter band around 7315 kHz. If you're lucky enough to hear this one, a QSL can be had from MRH, Beumeesweg 151, 9661 AE, Alteveer, Holland.

Rado Victoria broadcasts in German every Saturday and Sunday until 1100 GMT on 7295 kHz, via the facilities of Radio Milano Int'l of Italy. QSL to PO Box 1214, D-6380 Bad Homburg, Federal Republic of Germany.

Mi Amigo Radio Int'l was heard on 6286 kHz, a frequency which replaces 6276 kHz. Times vary, but if you hear them you can write to North Street, Swords Co., Dublin, Ireland.

Radio Pacific Int'l is an operation run by DJ Richard Graham who has previously been heard on both Radio 49 and Radio Hexagon. He is hoping to have RPI relayed soon by Radio Ireland on 6294 kHz.

Radio Rainbow, a normally weak FM station on 104 MHz in suburban Dublin, Ireland, was relayed on 6294 kHz around 1000 GMT thanks to Radio Ireland.

One of the many things I enjoy most about writing this column for POP'COMM is the chance to meet some very interesting people through the letters they send me. Even though some readers feel that coverage of the underground radio spectrum is unworthy of attention in any publication, a great many more readers seem to find it very challenging DX.

I get many letters from people asking me for help with setting up a pirate station. However, I try to make it a rule to discourage potential pirates.

As you know, pirating is illegal. This means you may have to pay a large monetary fine, or even spend some time in prison if you are caught by the FCC. My job is to report to you the activities of underground broadcasters in an attempt to help make the time you spend listening to your receiver more interesting and enjoyable. I really don't have the desire to set people up in an illegal activity.

I hate to turn those of you who took the time to write me away empty handed, so I will make this suggestion. FCC rules Part 15 provides for a form of hobby broadcasting. As I understand it, it is legal to set up a hobby broadcasting station on certain frequencies without a license as long as the power and antenna is strictly limited.

Why don't you check on low-power broadcasting stations available in kit form from Radio Shack and other electronic shops. I'd also enjoy hearing from those of you more familiar than I am with Part 15.

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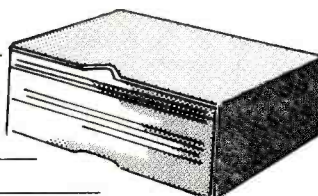
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Scanning The Montana Highway Patrol

Here's How The Agency's Communications Are Arranged

BY RICK MASLAU, KNY2GL

Dutch Meyer, Bureau Chief for Communications of the Montana Highway Patrol, was kind enough to share with *POP-COMM* readers the details of this agency's communications. He advises that there are 197 uniformed troopers and that they are identified on the air by their shield number, up to Shield Number 350. The Governor of Montana's ID is "1," the Lt. Governor is "2," and "AG3" is the Attorney General of Montana. Shield Number 100 is the Colonel of the Highway Patrol, 101 to 119 are Highway Patrol Captains and Lt. Colonels, 121 to 150 are Sergeants. The Highway Patrol network also accommodates several other agencies identified with distinctive numbers: 352 to 360 are numbers assigned to the Montana Highway Department; DS-700 to DS-754 are driver examiners; "FM-1" is the State Fire Marshal; "T-1" and "T-2" are Alcohol & Tobacco Tax units; "SS-1" and "SS-2" are the U.S. Secret Service; "FS"

Typical gear used inside the patrol cars include a Motorola low band repeater radio, a Johnson CB, Unitrol siren and red light control, and a General Electric high band, 8 channel repeater.

units are from the U.S. Forest Service; "AMS" units are from the Armed Motor Service; "CI" units are criminal investigators; "FG" units are Fish & Game.

State and counties have relayed on low band (39.82, 39.92, 39.86, and 39.88 MHz) for many years but are currently switching over to high band. Until all agencies are equipped for high band operation, the Highway Patrol units will be equipped for operation on high band and also low band. The high band frequencies are:

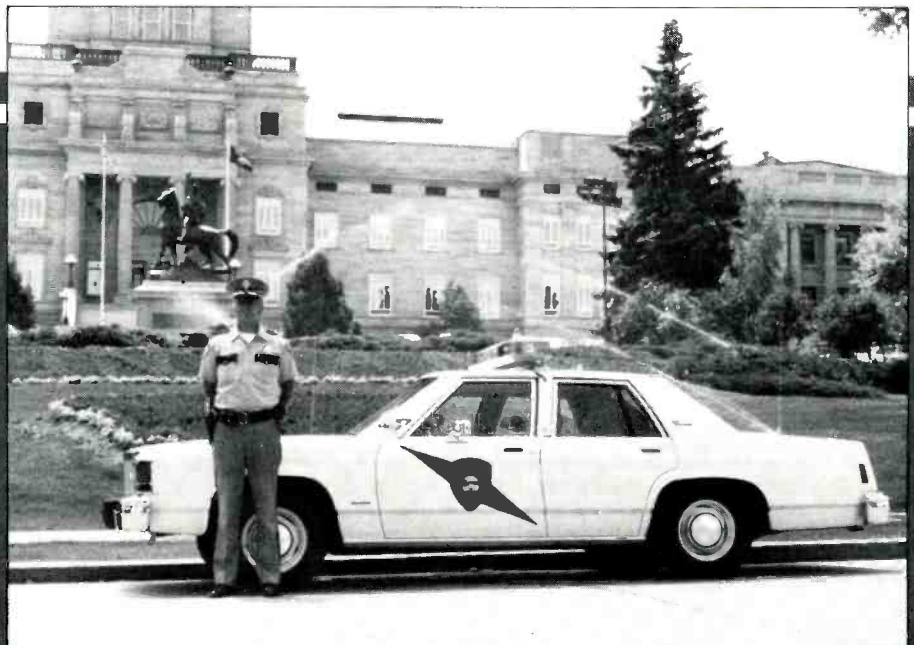
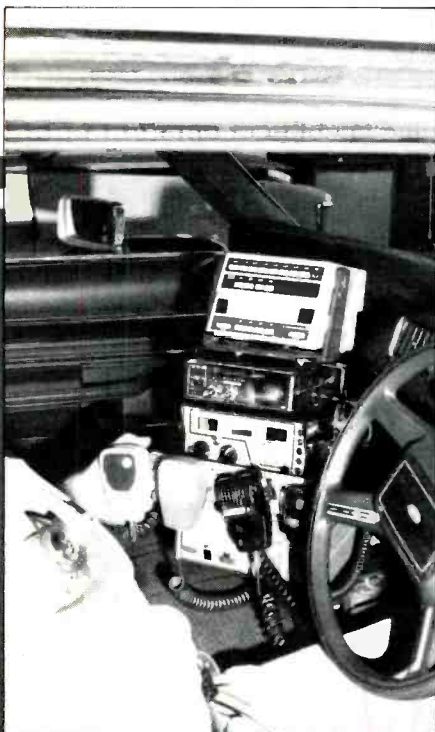
154.92 MHz Car-to-car and relay out
 155.55 MHz Relay input
 155.475 MHz Emergency
 153.905 MHz State Mutual Aid

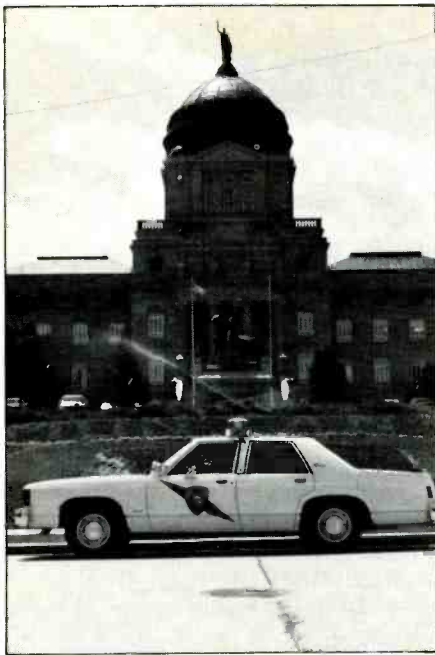
For most of the state at this time, the Highway Patrol units are dispatched through the local sheriffs in various areas on one of the 39 MHz channels. In larger cities, Highway Patrol units are dispatched from the local Patrol office on either the high or low band.

The following base stations are in communication with (or dispatch) mobile units of the Montana Highway Patrol:

Anaconda, Sheriff KOH370
 Anaconda Police KOB553
 Augusta, Sheriff KUY322
 Baker, Sheriff KOC493
 Big Sandy, Sheriff KUU490
 Big Timber, Sheriff KOB482

Billings Police/Sheriff KOE381
 Billings Police KOH637
 Billings Police KNA478
 Billings Hwy. Patrol KSS278
 Billings Immigration Svc. KOA771
 Boise (Idaho) Immigration KOA773
 Boulder, Sheriff KOE890
 Bozeman Police/Sheriff KVN704
 Bozeman Police KOA404
 Broadus, Sheriff KOH913
 Butte Police/Sheriff KOG907
 Butte Hwy. Patrol KSS280
 Chester, Sheriff KOB771
 Chinook, Sheriff KOE362
 Choteau, Sheriff KOK45/46
 Circle, Sheriff KOH262
 Columbus, Sheriff KOE414
 Conrad, Sheriff KOK64
 Craig, Sheriff KYI893
 Culbertson Police WBE486/488
 Cut Bank, Sheriff KYT214
 Decker, Sheriff WZR441
 Deer Lodge Police KYN927
 Deer Lodge Sheriff KOE204
 Dillon Police WAH92
 Dillon Sheriff KOE538
 Dixon Indian Agency KYI997
 Drummond Police/Sheriff KTQ253
 E. Helena Police KSZ771
 Ekalaka, Sheriff KOE301
 Fairview Police KBC423





Forsyth, Sheriff	KOE217	Livingston Police/Sheriff	KOB407
Ft. Benton Police	KNF597	Livingston Police	WAX513/4
Ft. Benton, Sheriff	KOA810	Livingston Police	WRL677/8
Ft. Benton, Sheriff	WRE77/78	Livingston Police	KNBN646
Glasgow Police	KOI722	Malta, Sheriff	KOA822
Glasgow, Sheriff	KOA565	Malta Police	KXA365
Glendive Police	KOB577	Malta, Sheriff	KTZ474
Glendive Hwy. Patrol	KSS281	Miles City Police/Sheriff	KOA722
Great Falls Immigration	KOA774	Missoula Hwy. Patrol	WBC515
Great Falls, Sheriff	KOA216	Phillipsburg, Sheriff	KOF476
Great Falls Hwy. Patrol	WAB514	Plains Police	KWL303
Hamilton, Sheriff	KOB651	Plentywood, Sheriff	KOF344
Hardin Police/Sheriff	KOD276	Polson, Sheriff	KOB568
Hardin Police	WZQ546	Poplar Indian Agency	KOD504
Hardin, Sheriff	KNCG424	Red Lodge, Sheriff	KOB697
Harlem Police	KOM816	Roundup, Sheriff	KOE542
Harlowton, Sheriff	KLY927	Ryegate, Sheriff	KOH855
Harlowton Police	KOE369	Scobey, Sheriff	KOF300
Havre Police	KOB849	Shelby, Sheriff	KOA580
Helena Hwy. Patrol	KOG622	Sidney Police	KOI648
Helena, Sheriff	KXZ67/68	Sidney, Sheriff	KOA998
Helena, Sheriff	KZB348	Stanford, Sheriff	KOA986
Helena Immigration Svc.	KOA775/6/7	Superior, Sheriff	KOA766
Hysham, Sheriff	KOI250	Terry, Sheriff	KOE804
Jordan, Sheriff	KOH552	Terry, Sheriff	KFG597
Kalispell Police	KOA999	Thompson Falls, Sheriff	KON46/7
Kalispell, Sheriff	KOA824	Townsend, Sheriff	KYU552
Lame Deer Indian Agency	KOD548	Virginia City, Sheriff	KOG381
Laurel Police	KOD382	Wallace (Idaho)	KOB282
Lewiston Police	KOE445	W. Yellowstone	KTX801
Lewiston, Sheriff	KUL910	Whitehall Police	KUN407
Lewiston Hwy. Patrol	WAB513	Wibaux	KOG933
Libby, Sheriff	KOB846	Wibaux Police	KNDD609
Lincoln, Sheriff	KUY323	West Point, Sheriff	WBE486/7

Montana Highway Patrol 10 Code

- | | |
|--|---|
| 10-1 Receiving poorly | 10-38 Station report satisfactory |
| 10-2 Receiving well | 10-39 Your _____ delivered to addressee |
| 10-3 Stop transmitting | 10-40 Advise if officer _____ is available for radio call |
| 10-4 O.K. | 10-41 Advise if party is a police officer |
| 10-5 Relay | 10-42 Officer _____ now at home |
| 10-6 Busy | 10-43 Officer _____ is available |
| 10-7 Out of service (during shift) | 10-44 Officer _____ is not available |
| 10-8 In service | 10-45 Advise if officer _____ is available for phone calls |
| 10-9 Repeat, unable to read message | 10-46 Pick up party at _____ |
| 10-10 Out of service (off shift) | 10-47 No traffic |
| 10-11 Dispatching too rapidly | 10-48 Major crime, establish roadblock at _____ |
| 10-12 Officials/visitors present | 10-49 Hurry, do not use light or siren |
| 10-13 Advise road/weather conditions | 10-50 Hurry, use red light and siren |
| 10-14 Convoy or escort | 10-51 Message for local delivery via public service |
| 10-15 We have prisoner in custody | 10-52 Message for assignment to written summary |
| 10-16 Procure prisoner at _____ | 10-53 Transmissions acknowledged by all stations involved (time O.K.) |
| 10-17 Procure papers at _____ | 10-54 Auto accident; property damage only, dispatch wrecker |
| 10-18 Complete present assignment as quickly as possible | 10-55 Auto accident; wrecker dispatched |
| 10-19 Return to station | 10-56 Auto accident; personal injuries dispatch ambulance/wrecker |
| 10-20 What is your location? | 10-57 Auto accident; ambulance/wrecker dispatched |
| 10-21 Call this station by telephone | 10-58 Auto accident; fatal, dispatcher coroner/ambulance/wrecker |
| 10-22 Take no further action last information | 10-59 Is wrecker on the way? |
| 10-23 Stand by | 10-60 Is ambulance on the way? |
| 10-24 Trouble at station; unwelcome visitors; all units this vicinity report at once | 10-61 D.W.I. |
| 10-25 Do you have contact with _____? | 10-62 Reckless driving |
| 10-26 Can you obtain auto data from _____? | 10-65 Clear for message assignment |
| 10-27 Any answer our number _____? | 10-67 Stations _____ carry this message |
| 10-28 Check registration info (license, motor, owner, etc.) | 10-68 Repeat dispatch |
| 10-29 Check for wanted | 10-81 Officer _____ will arrive at your station |
| 10-30 Does not conform to rules and regulations | 10-82 Reserve room (with/without) bath at _____ for _____ |
| 10-31 Check driver license information | 10-83 Have officer _____ call his sergeant |
| 10-32 Emergency; keep air clear | 10-84 Have officer _____ call his captain |
| 10-33 Emergency traffic at this station | 10-85 Officer number _____ left this station for _____ |
| 10-34 Clear for local dispatch? | 10-89 Request radio serviceman at this station or unit |
| 10-35 Confidential information | 10-90 Radioman will be there at _____ |
| 10-36 Correct time? | 10-97 Arrived at scene |
| 10-37 Operator on duty? | 10-98 Finished last assignment |
| | 11-99 Officer needs help |

WASHINGTON PULSE

FCC ACTIONS AFFECTING COMMUNICATIONS

Amplitude Compandored Sideband Testing Results Report Available

The Office of Science and Technology has issued a Technical Memorandum (FCC/OST TM 83-7) entitled "Amplitude Compandored Sideband Compared to Conventional Frequency Modulation for VHF Mobile Radio: Laboratory and Field Testing Results." The Technical Memorandum describes tests conducted by the FCC Laboratory relating to the feasibility of integrating a new communications technology, known as Amplitude Compandored Sideband (ACSB), into the existing Frequency Modulated (FM) two-way radio services.

ACSB communications systems need only 5 or 6 kiloHertz of bandwidth to transmit information, as compared to the 25 or 30 kiloHertz needed by conventional FM two-way systems. Even though less bandwidth is needed for transmission, several questions needed to be answered regarding how ACSB might interfere with existing FM systems and the frequency reuse potential of ACSB as compared to FM. Answers to these questions could help in considering how new technologies, such as ACSB, might be introduced into the existing two-way VHF bands with a minimum impact on current radio users and a long-term improvement in spectrum utilization.

The report describes the testing program and provides a tabulation of the results. ACSB has been found to be a viable communications medium that can compare favorably to FM under most conditions. Although the study concluded that ACSB channels could not be intermixed with existing FM channels and remain inaudible on FM receivers, the study does provide guidance on how ACSB might be considered on a radio service by radio service basis.

Copies may be purchased through International Transcription Systems, Inc., FCC, 1919 M Street, N.W., Washington, DC 20554, Room 248, telephone (202) 296-7322.

Rules Amended To Implement Amendments To 1974 Solas Convention

The Commission has amended its rules to implement the remainder of the first set of amendments to the 1974 Safety of Life at Sea (SOLAS) Convention and to extend the VHF watch and radio log requirements to ships not subject to SOLAS but subject to Parts II and III, Title III, of the Communications Act.

Last April the Commission proposed to amend the rules to require vessels navigating outside ports and harbors to maintain a VHF

radio watch on Channel 16 (156.8 MHz); to require vessels to maintain a radio log concerning this watch; and to amend the rules concerning the ship reserve transmitter to conform to less stringent SOLAS requirements. It proposed to apply these rules to vessels subject to the Communications Act as well as to vessels subject to the SOLAS Convention (vessels on international voyages).

Based on its review of the comments filed, the Commission is adopting the rules substantially as proposed.

Use Of Self-Powered Vehicle Detectors

The FCC amended Part 90 of its rules to permit the use of self-powered vehicle detectors on 20 Highway Maintenance Radio Service frequencies in the 47.02-47.40 MHz band on a secondary, non-interference basis to land mobile operations.

(The detectors are used to control traffic signals and monitor traffic flow. Placed beneath the roadbed of a traffic lane, the detectors sense vehicles magnetically and send a signal to a receiver which routes it to a micro-computer which monitors the traffic flow.)

To minimize interference potential, the Commission adopted certain technical standards for the operation of the detectors. In addition, it noted there would be no need for separate licensing and frequency coordination, nor necessity to keep records on the number of units used on each frequency.

Unity Gain Omnidirectional Antennas In 450-470 MHz Band

The Commission amended its rules to allow, on a secondary operating basis, the use of unity gain omnidirectional antennas by fixed stations operating in the 450-470 MHz band that communicate with a minimum of three receiving locations encompassed in a sector of at least 160 degrees of azimuth.

This change was proposed in a rulemaking notice adopted May 12, 1983 in response to a request by the Central Committee on Telecommunications of the American Petroleum Institute. It contended that Petroleum and natural gas companies extensively use UHF operational-fixed stations for supervisory, control, telemetry, and voice operations and said the change would allow operation with omnidirectional antennas under the same conditions allowed for the 154 MHz "splinter" frequencies governed by Section 90.65(c)(16) of the rules.

The Central Committee said omnidirectional antennas were needed because the location of drilling rigs, whether onshore or offshore, was determined by the shape of a

given oil or gas field and that wells frequently were located in a circular or non-linear pattern. Telemetry information from each well would be sent to a "master" UHF fixed station using a polling procedure. Since the former rules required directional antennas for each fixed link, accessing each drilling rig required a separate system using different frequency pairs. The use of omnidirectional antennas allows polling of the remote sites by the master station using only a single frequency pair, thus, resulting in a more efficient use of the spectrum.

The Commission said that after analyzing all the comments and weighing the potential interference problems, it concluded that the new rules would be in the best interest of maximizing spectrum use, minimizing cost to licensees, and permitting operational compatibility between fixed and mobile systems operating in the 450-470 MHz band.

Uphold Grant Of Millicom PCPS Applications

The Commission upheld its Private Radio Bureau's grant of approximately 100 individual land station licenses to Millicom Corporate Digital Communications, Inc. and affirmed Millicom's authority to operate in the Private Land Mobile Radio Services as a nationwide Private Carrier Paging System (PCPS) on 929.9875 MHz.

Telocator Network of America had asked for reconsideration of the Bureau's action granting Millicom's applications, maintaining that Millicom's licenses had to be rescinded and its applications dismissed as inconsistent with the requirements of recent amendments to the Communications Act.

The Commission rejected Telocator's contentions and concluded the Millicom grants were consistent with the requirements of the Act and its own rules.

Change Method Of Assigning Frequencies To Public Coast Telegraph Stations

The FCC amended its rules to change the method of assigning and licensing narrow-band direct-printing (NB-DP) frequencies to public coast radiotelegraph stations (PCRT) in the Maritime Mobile Service.

The present method of assigning NB-DP frequencies to PCRT stations providing high-seas telegraphy service is reflected in Section 81.204(c) of the rules which assigns frequencies by series to specific PCRT stations at specific geographical locations. However, assigning frequencies this way has not been satisfactory because many of the stations listed either did not inaugurate teleprinter operations or ceased operations

altogether. To change frequency assignments it has been necessary to amend or waive the rule.

Under the new rule, the Commission would assign NB-DP frequencies by series only to PCRT stations on a first-come, first-served basis, with priority being given to those stations which have not provided the service previously. Also, the frequencies would have to be placed in operation within eight months or be forfeited and the station license modified accordingly. However, this rule change applies only to public coast stations and not limited coast stations, the Commission said, since it is not certain there are enough frequencies to go around and limited coast stations can be accommodated in other frequency bands.

FCC Rules Pamphlets Now Available

FCC Rules Pamphlets are now available from the Government Printing Office (GPO). The listing provides the price and stock number of, and the rule parts included in, each pamphlet. In conjunction with the listing, an order form is provided for your use.

Several rule parts that were originally contained in various volumes are now available as separate pamphlets. Further, rule parts previously contained in Volumes X and XI have been regrouped by subject matter into separate pamphlets. These changes have been instituted to allow those interested in one specific part to purchase only the segment needed.

Like the FCC Rules Volumes, the pamphlets are revised as of September 30, 1982, and produced using an automated system. The Commission anticipates reprinting each pamphlet each year or whenever the need arises. These pamphlets are not sold on a subscription basis but, rather, as separate publications.

Rules in these pamphlets are identical to the corresponding portions of Title 47 of the Code of Federal Regulations. It is not necessary to purchase both. In addition, it is possible that an updated set of pamphlets will be printed early in 1984, depending on the success of further refinements to the automated process.

Questions and comments may be directed to Callie Holder at 1919 M Street, N.W., Room 224, Washington, DC 20554, or by phone at (202) 632-4178.

Private Paging Rules At 900 MHz Clarified

The Commission clarified the legal foundation for the Private Carrier Paging System (PCPS) licensing approach and made clear that telephone services and facilities may not be resold in the private paging frequencies at 900 MHz. It has also determined that it will allow, at 900 MHz only, direct access paging from positions in the public switched telephone network.

In the first report and order in this proceeding, the Commission established new spectrum allocations for common carrier

and private paging systems in the 900 MHz band. In that same order the Commission established policies and procedures for the common carrier stations but deferred further consideration of private paging rules pending receipt of comments on a further rule-making notice.

On July 22, 1982, the Commission adopted a second report and order regarding the private paging issues in this proceeding.

On September 13, 1982, the Communications Act was amended, in part to clarify the distinction between private service, including paging, and common carriage. The next month the Telocator Network of America petitioned for Reconsideration and Clarification of portions of the second report and order in light of the new legislation.

Telocator argued that the FCC's legal rationale for sustaining the PCPS concept should be modified in several respects and suggested that the rules be amended to clarify the rights of private paging users to obtain interconnected service from a duly authorized carrier and to clarify the rights of carriers to provide interconnected service to private paging users.

The Commission said it had reviewed its second report and order, the parties' comments and the new legislation. In general, it concluded, the 900 MHz private paging rules were consistent with the new legislation and it affirmed the basic decisions.

In light of the new legislation, however, it clarified the basis under which PCPSs must operate and eliminated the earlier restriction against direct access paging from positions in the public switched telephone network at 900 MHz.

Volunteer Examiner Coordinators (VECs) Authorized For Amateur Radio

In a new program, examinations for amateur operator licenses above the Novice Class may be given by volunteer examiners drawn from the private sector. Previously, such examinations were conducted by FCC personnel.

The volunteer examiners will be coordinated by VECs. Any organization that is interested in acting as a VEC should apply, in writing, to the FCC. Approval of an organization to serve as a VEC will be in a written Memorandum of Agreement (MOA) to the signed jointly by the VEC and the FCC.

Detailed qualifications of a VEC are contained in Subpart I of the Amateur Radio Service Rules (see Federal Register of October 6, 1983, Volume 48, pages 45652-45661). In order to serve as a VEC, an entity must be organized, at least partially, for the purpose of furthering amateur radio, and agree not to accept any compensation from any source for its services.

Organizations engaged in the manufacture or distribution of equipment used in connection with amateur radio transmissions, or in the preparation or distribution of

any publication used in preparation for obtaining amateur radio station operator licenses, may be VECs only after submitting documentation to the FCC to show that preventive measures have been taken to preclude any possible conflict of interest.

A VEC must be capable of acting as a VEC in one or more of the 13 regions listed in Section 97.507 of the Commission's Rules (48 FR 45660, 45661).

One must not discriminate in accrediting volunteer examiners on the basis of race, sex, religion or national origin, or refuse to accredit a volunteer examiner on the basis of membership (or lack thereof) in an amateur radio organization.

A VEC should submit the standards that will be used to accredit volunteer examiners in the proposal to become a VEC.

Proposals to become a VEC should contain the proposed VEC's qualifications; a showing concerning prevention of conflict of interest; and a statement detailing how the examination program will be implemented in the region or regions for which the candidate is applying to become a VEC.

Proposals for authorization to be a VEC should be submitted to the Personal Radio Branch, Federal Communications Commission, Washington, DC 20554.

Rebroadcasts Of Amateur Radio Transmissions

Radio and television stations need not obtain prior authorization from the Federal Communications Commission before retransmitting Amateur (Ham) Radio transmissions. Broadcasters are free to air the amateur radio transmissions which they have monitored. They may broadcast such amateur radio transmissions on a live or delayed basis, with or without the approval of the amateur operators involved. Broadcasters are cautioned, however, that in covering amateur radio activity, they must not become actively involved in the amateur transmissions. That is to say, the broadcaster may not employ an amateur station as it would use a reporter or a translator in order to convey, directly or indirectly, questions or subject matter which the broadcast station desires to be addressed.

Broadcast stations are asked to advise the Secretary, Federal Communications Commission of the fact that retransmissions of amateur radio transmissions have occurred, indicating only the date and nature of the transmission which was covered.

Amateur Radio Operations From Grenada

At the request of the State Department on Tuesday, October 25, 1983, the FCC allowed Mark Baretella, a medical student in Grenada, and other amateur operators in the United States with whom he was communicating to operate voice communications on that section of the amateur band normally restricted for code use only. This was done to minimize interference to Mr. Baretella's transmission and to facilitate his

ability to relay information from Grenada. There were some half dozen amateur operators assisting Mr. Baretella in maintaining this information network.

During this period the FCC was receiving both requests for waiver of the rules from other amateur operators and requests for clarification of our rules from the news media. As to requests from amateurs not engaged in maintaining the information network, they were all denied to prevent any interference to this essential service.

As to requests from the news media, the FCC issued a Public Notice on October 26. It is a recapitulation of existing Commission rules and § 605 of the Communications Act. The Public Notice stated:

Radio and television stations need not obtain prior authorization from the Federal Communications Commission before retransmitting Amateur (Ham) Radio transmissions. Broadcasters are free to air the amateur radio transmissions which they have monitored. They may broadcast such amateur radio transmissions on a live or delayed basis, with or without the approval of the amateur operators involved. Broadcasters are cautioned, however, that in covering amateur radio activity, they must not become actively involved in the amateur transmissions. That is to say, the broadcaster may not employ an amateur station as it would use a reporter or a translator in order to convey, directly or indirectly, questions or subject matter which the broadcast station desires to be addressed.

At all times the paramount interest of this agency was the safety and welfare of the medical students on the Grenada campuses. Mr. Baretella and the amateur operators assisting him provided valuable services in relaying information as to the safety of the medical students and their families and as to the general situation existing at the Grenada station.

For further information contact William A. Russell, Jr., at (202) 254-7674.

Amateur Antenna Height Approval Form (FCC-854) Now Available - Rules To Become Effective

On January 8, 1981, the Commission by Order (FCC 81-4, Mimeo 28657) adopted changes in procedures for approval of proposed antenna structures in the Amateur Radio Service. Antenna data now collected on FCC Form 610 and 714 will be eliminated. Amateur radio operators will request and receive approval of the proposed radio antenna by filing FCC Form 854 in cases where the proposed antenna exceeds the maximum allowable standards. This action was published in the Federal Register, 46 Fed. Reg. 10915 (February 5, 1981).

The use of the Form and the implementation of the procedural Rules were contingent upon approval by the Office of Management and Budget (OMB). Approval has been re-

ceived and the form is now available for distribution to the public. Therefore, as of January 3, 1984, Parts 17 and 97 of Title 47, Code of Federal Regulations, are amended as set forth in the APPENDIX attached to the Memorandum Opinion and Order FCC 81-4, Mimeo 28657.

When required to be completed, the new form should be submitted to the Field Operations Bureau's Antenna Survey Branch, Washington, DC 20554.

Requests for quantities not exceeding three may be addressed to the FCC Consumer Assistance Branch, Gettysburg, PA 17325, or to any of our district offices. Requests for larger quantities of the form must be sent to the FCC Supply Section Room B-10, 1919 M Street, N.W., Washington, DC 20554.

FCC Declines Additional Amateur Repeater Frequencies

The Commission has decided not to allocate additional frequencies in the 10 meter band for repeater operations in the Amateur Radio Service, and has terminated its rule-making proceeding.

On May 12, 1983, it adopted a rulemaking notice on request of Beryl Gosney, Oak Harbor, Washington, proposing to amend the Amateur rules to authorize the frequencies between 29.0 and 29.5 MHz for repeater operation. Current frequencies in the 10 meter band available for repeater operation are between 29.5 and 29.7 MHz.

After considering comments on both sides of the issue of additional repeater frequencies, the Commission said it was persuaded that it should terminate the proceeding without adopting the proposed rules, for two reasons:

- Providing additional repeater frequencies in the 10 meter band would have an adverse effect on amateur satellite communications, including beacon transmissions, robot operations, telemetry signals, and transponder downlinks;
- There is no compelling need for repeater sub-band expansion in the 10 meter band at this time—congestion on repeater frequencies appears to represent local conditions. Interference to amateur satellite communications outweighs any frequency congestion that local repeaters may experience.

Texas Two-Way Denied Review of Ruling on Changing Construction Schedule for Specialized Mobile System

The Commission denied Texas Two-Way, Inc., licensee of Specialized Mobile Radio (SMR) System WQA-505, review of a staff ruling that its desired change in the construction schedule for a new 20 channel SMR system was not permitted.

Texas Two-Way was granted the license for the 20 channel system on September 4, 1980 and elected to construct its system in five channel stages. This meant that the first five channel stage had to be constructed by September 4, 1981, and the five channels had to be loaded to 70 percent of capacity one year later.

On June 24, 1982, Texas Two-Way wrote the Commission attempting to change its election and construct all 20 channels immediately. According to the rules, stations which construct all of their channels within one year have five years to load their systems to 70 percent of capacity.

The Chief, Private Radio Services Bureau, denied this request on August 11, 1982, and denied reconsideration of the decision on February 16, 1983.

The Commission said none of Texas Two-Way's arguments persuaded it to grant its application for review. It said its policy on the change of election issue had been consistent and is currently set forth in Section 90.366(d) of the rules.

It added that since Texas Two-Way's change of election request could only be viewed as an attempt to avoid the mobile loading requirements, it was clear that approving the request would not be in the public interest, noting that all SMRS licensees are bound to the loading and construction standards.

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RADAR REFLECTIONS

RADAR DETECTORS AND THEIR USE

BY JANICE LEE



Experts Refute Claims Of "Detector-Proof" Radar By Carolina's State Police

Spokesmen within the radar detector industry refute the claim recently made by both the North Carolina and South Carolina State Police forces concerning the acquisition of traffic radar which the troopers are claiming is "Fuzzbuster®-proof."

Electrolert, Inc., manufacturers of the Fuzzbuster®, took exception to the claims made by the patrols that their "new" radar is capable of "foiling" radar detection devices. "We are continually correcting the false impressions promoted by radar manufacturers that these devices are 'invisible' to detectors," says Dale Smith, inventor of the Fuzzbuster®. "At best, the manufacturers are misleading police officers by omitting the most telling details," Smith said.

The radar equipment to which Carolina law enforcement is applying this claim is the KR-10, which operates on the K-band frequency, the higher of two frequencies assigned by the Federal Communications Commission for police radar use. While the beam width of the K-band radars is narrower than the older X-band units, the officer must

still activate the unit to obtain a speed reading and in so doing the unit is emitting a "tell-tale" radar signal to all detector-equipped vehicles.

The longest running argument against radar is the unit's inability to discriminate between targets. Although the speed reading may be correct, the radar cannot assign that reading to the one vehicle among several which may be producing it. This is left up to the operator's judgment.

The KR-10's are equipped with a "hold-button" which keeps the continuous radar signal on low power when it is not in the process of clocking a vehicle's speed. The sole purpose of such a gadget, which cannot enhance the unit's performance in any way, is to thwart motorists using radar detectors.

While an officer has deactivated the radar unit by means of the "hold-button," no signal is being emitted to alert drivers with radar detectors that radar is ahead. But while it is deactivated, neither can the officer clock a vehicle. Once the officer releases the hold-button, the radar signal is being dispersed and every radar detector will pick up the signal within a range of five miles—a range far exceeding that of 1,000 feet used by the officer to clock a vehicle.

Critics of radar in general and the new "bells-and-whistles" models in particular, fear that the salesmanship of the manufacturers who cater to law enforcement's paranoia with radar detectors obscure greater dangers. Not only does the so-called invisible radar confuse its operators with many of its useless features, but at the same time it has proven to be prone to more errors, both technological and human.

For an officer to obtain a correct reading with the hold-button, he must activate the unit to full power so as to get a "tracking history" of a target vehicle. "Tracking history" simply means the verification of the speed reading on the radar with a visual observation of a vehicle. Unfortunately, most officers believe that immediate readings are possible when in fact they may be inaccurate. Rather than adequately train their officers on these units, the manufacturers prefer to stress features the law enforcement community might find more glamorous.

Inasmuch as no performance standards exist for radar units, authorities have long urged manufacturers to improve the electronic accuracy of the units and improve the training techniques for officers rather than invent new gadgetry which promotes a false

sense of security among officers who resent radar detectors.

Should The 55 MPH Speed Limit Be Junked?

President Reagan's nominee to the government's top highway safety job suggests state and local governments should have the final authority to decide whether to junk the 55 mph speed limit.

Diane Steed, picked to head the National Highway Traffic Safety Administration, stated in written testimony submitted to a congressional panel considering her nomination that the speed limit makes sense in densely populated areas.

"I can understand, however, that the 55 mph might be viewed as too low for areas less populated, especially in the West," she said. "As a general rule, I believe that state and local governments should have the authority to establish their own maximum speed limits."

Steed also said that if Congress decides to repeal the 55 mph law, enacted after the 1973 Arab oil embargo to save lives as well as energy, she would urge the states to carefully look at the issue.

The government has asked the National Academy of Sciences to conduct a comprehensive study on the 55 mph speed limit. Results of the study will be submitted to Congress this year.

Steed also told the Senate Committee on Commerce, Science and Transportation that she believes the administration would reverse itself and accept mandatory air bags for new cars if a case could be made.

Experts estimate 9,000 lives would be saved annually in the United States if all cars were equipped with the safety devices. The matter has been under study for 14 years.

Sen. John Danforth, chairman of the committee, said he is concerned that the Transportation Department's decision last month to postpone issuing the new safety regulations is intended as a delaying tactic.

New Jersey Speeders Beware!

Most of New Jersey's speeding drivers break the speed limit by 5 to 7 mph because they choose to gamble on the tolerance of state police, says Col. Clinton Pagano, superintendent of the New Jersey State Police.

"The so-called tolerance level has been discussed and discarded," he said. "As far as we're concerned, the posted speed limit will be strictly enforced."

Statistics show that more than 40 percent of expressway drivers broke the 55 mph national speed limit in New Jersey during the first half of 1983.

The statewide average for speeders is 34 percent but reaches 40 percent to 50 percent on expressways.

Nonetheless, the statewide figure for speeding among all drivers has declined since 1982, when it was 49.5 percent, officials said.

State police are also cracking down on speeding bus drivers and truckers.

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

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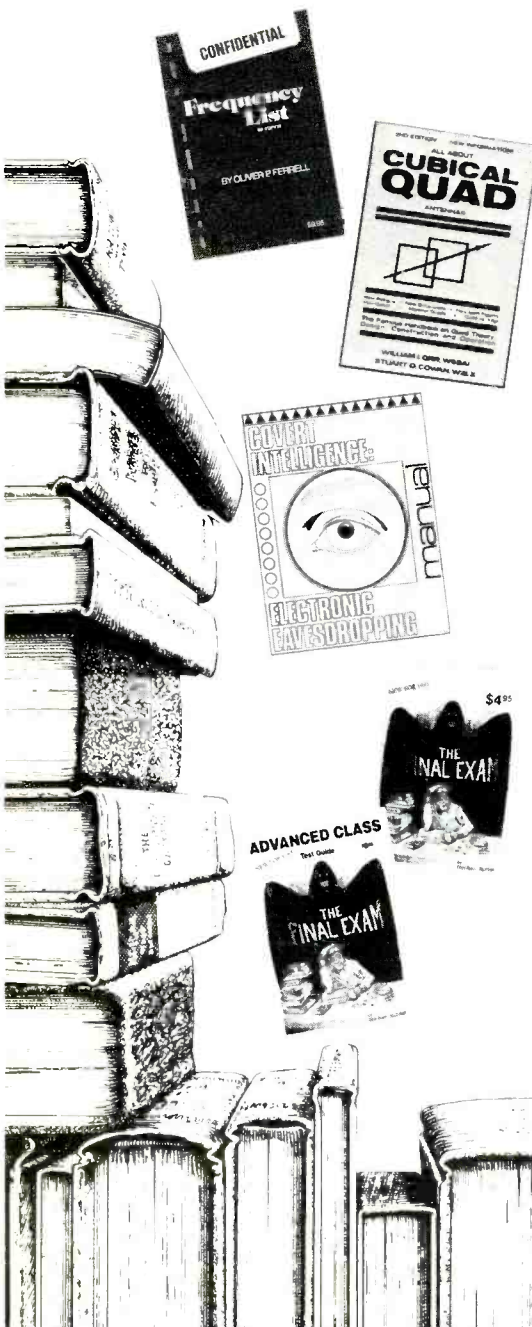
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A landslide of mail tells me that I am not the only one disturbed about long distance phone calls that end up in an echo chamber. Thanks to a clipping from Mr. W. E. Quigley of AT&T Long Lines, we now have an explanation for the nagging delay in certain long distance phone calls.

The echo is caused by our signals that are relayed via the telephone company satellites. This makes sense—at 300 million meters per second, it takes radio waves a little over a second to go all the way up to the stationary satellite and then come back down. Now amplify this situation by two (two people talking), and the delay seems like an eternity.

AT&T indicates that only about 4 percent of the long distance phone calls go through the satellite system. The further you call, the greater the chance that you're going to be routed through the satellite and have to put up with the nuisance of the phone call that echoes. Even if you switch over to one of those new, lower-cost, long distance telephone services, there is still a chance that your phone call might pass through the satellite and you will have to put up with that nagging delay problem.

The solution? The various phone companies indicate that their users will need to develop new speech patterns when making long distance phone calls through a satellite. Just like the old days! Just be sure and say “over” when you want the other person to talk. Don't even try to interrupt—it becomes too confusing and you will waste many valuable, expensive seconds in trying to take over the conversation.

Phone companies may like this—it gives them more units to tack onto your phone bill the next time you make a long distance call through the satellite.

How can you try to avoid this? I suggest that the next time you end up with someone on the other line that enters into the echo chamber and doesn't respond to your questions until seconds later, you terminate the phone call and immediately contact the operator. Simply tell her that you received a bad connection—or an unacceptable connection—and you wish to be reconnected with the long distance party you were calling and have the earlier phone call cancelled. If you discover, after she hooks you up, that you are once again on the satellite, tell her that this is again unacceptable, and you want a land line connection. Land line? Land line means that your call is transported across the country via microwave and hard wires with little detection of any appreciable loss in fidelity or time. Since the phone company claims that more than 90 percent of all



General Electric's new longer distance Personal Radio Communications service.

calls do not go through the satellite, insist that your call be one of those 90 percent! Tell them “No” the next time you get hooked up via the satellite.

More Goodies To Consider

Manufacturers of telephone add-on devices are really giving us some innovative products to consider for our single or multiple line home and office telephone system. Take (for instance) your single line home phone. Are you interested in having two incoming lines for those really busy days when it's important for one person to handle both telephone circuits? A relatively new device from Radio Shack called the “Duo Fone” 2-line controller makes this job simple. One telephone apparatus can be connected to this dual-line controller that allows you to pick up either line or place one line on “hold” as you are talking to the other line. Instead of having two phones sitting on your desk, each with a different number, now one apparatus will serve two incoming lines. Instead of holding your hand over one phone while talking on the other, you can put one phone call on hold while communicating on the other line. This device is a natural for anyone who does not have the more exotic telephone company provided computer switching phone system.

Another gadget that's quite handy for the two-line household is a device that will lull the party on hold to complacency by playing music to them. There are several manufacturers of “music on hold” devices that quickly add to any two-line system. I suppose you could even play them a prerecorded message while the party is patiently waiting for you to get off the other line. Whether it be a recorded message, “Rhapsody in Blue,” or the latest rock tunes, it gives the person on

hold something to do while waiting for you to pick up the circuit.

Automatic dialers are also getting smarter—they store more frequently called numbers; they can pause momentarily for dial tone access for those new, low cost, long distance services; and they will semi-faithfully hold their memory in case you should trip over the cord that has them plugged into AC. Sometimes, I don't think that telephone automatic dialer manufacturers know what it's like to program 60 numbers and then have the complete memory wiped out because you trip over the power cord and inadvertently pull the unit off the desk and dump the memory batteries out of their socket.

Dialer manufacturers, how about a memory that is permanently stored until erased without the use of batteries? They do it in scanners—why not automatic dialers? Also, how about alpha-numeric dialers that will allow you to store words beside the numbers—such as mom, doc, help, and the like. Once again, they can do it with scanners—why not automatic telephone dialers?

Speaking of dialers, can you imagine one that holds up to 180 different phone numbers? It's now available from Cal-Tel Systems, Inc., 2674 S. Grand Avenue, Santa Ana, CA 92705.



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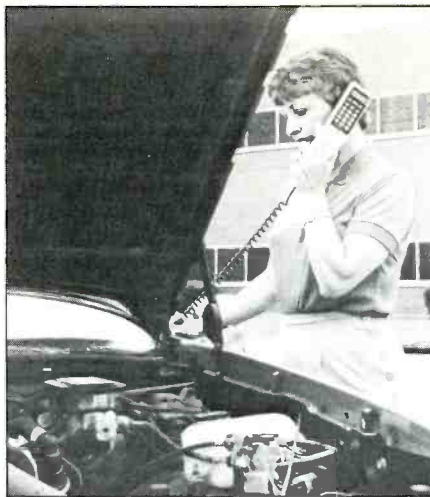
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Long Distance Cordless Phones

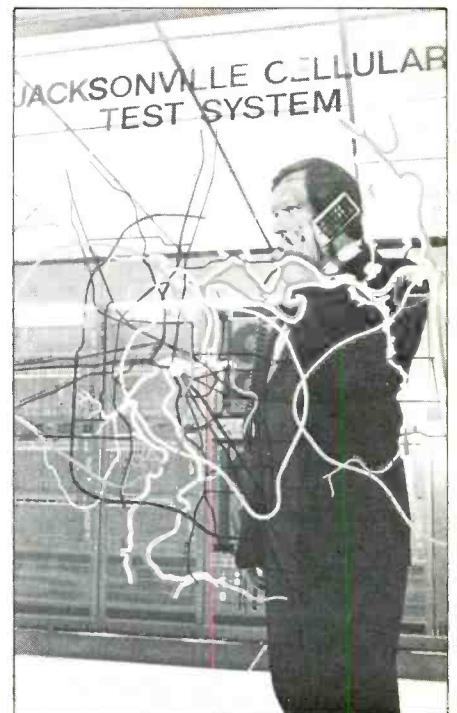
Still no word on when the General Electric proposal to the FCC will be accepted and give us a long distance cordless telephone that will operate 5 to 10 miles direct from your home to your car or hand set. These sets will operate at 900 MHz, and there are lengthy FCC proceedings on this type of system before it's allowed. I think it's only a matter of time—certainly everyone wants their own private telephone system that goes further than the next driveway down the street.

Cordless phones are still limited by their output power, and there is just no way

you're going to get one or two miles from any of today's cordless telephones. It simply won't happen. If you get a block, you're doing great. If you get half a block, that's average. If you're only getting one house down the street, try relocating your base transponder to a different location in the house. Above all, forget about any kind of amplifier that might increase the range—they're not available and the idea just won't work on small cordless telephone hand sets. Do enjoy the cord-free range that you now have and hope that the FCC will soon act on longer distance, personal telephone sets.

If you can't wait, consider mobile telephone service from professional business radio dealers. The new "cellular" radio telephone systems are popping up everywhere, and although the service can get expensive, you can drive throughout your hometown and make telephone calls as easy as picking up the hand set and pushing the memory number. You can also receive telephone calls that are directed to your mobile unit anywhere within your city. The range is generally up to 100 miles away, and the fidelity is crystal clear. Just be prepared to pay the price of this technology—several thousand dollars for purchased equipment, and a monthly phone charge of about \$80. It's super communications equipment for those of you who need car telephone coverage.

Finally, keep your connections clean and sanitary. Adding five different phone gadgets on your present telephone line—all in series—will probably lead to some bad connections. Those little add-on phone jacks are nice, but they are wobbly and many times will provide intermittent contacts. If you have a problem with loose connections, check each and every one of your plugs. Happy talking on your phone system.



Jacksonville, Florida was one of the first cities to get cellular telephone service.

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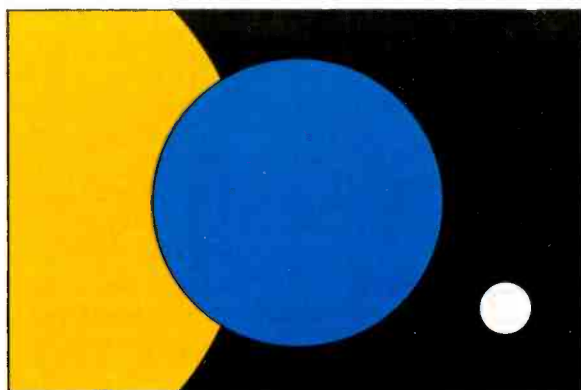
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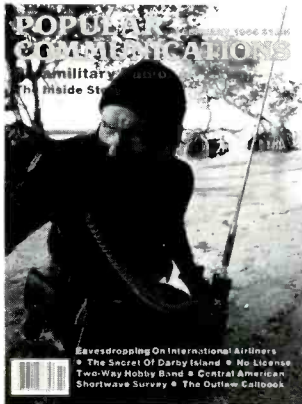
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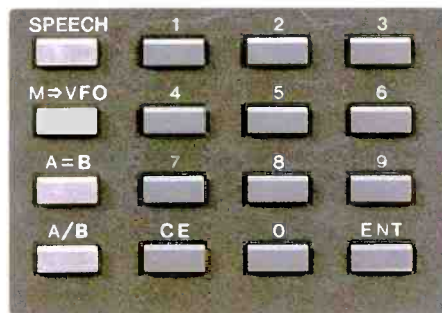
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