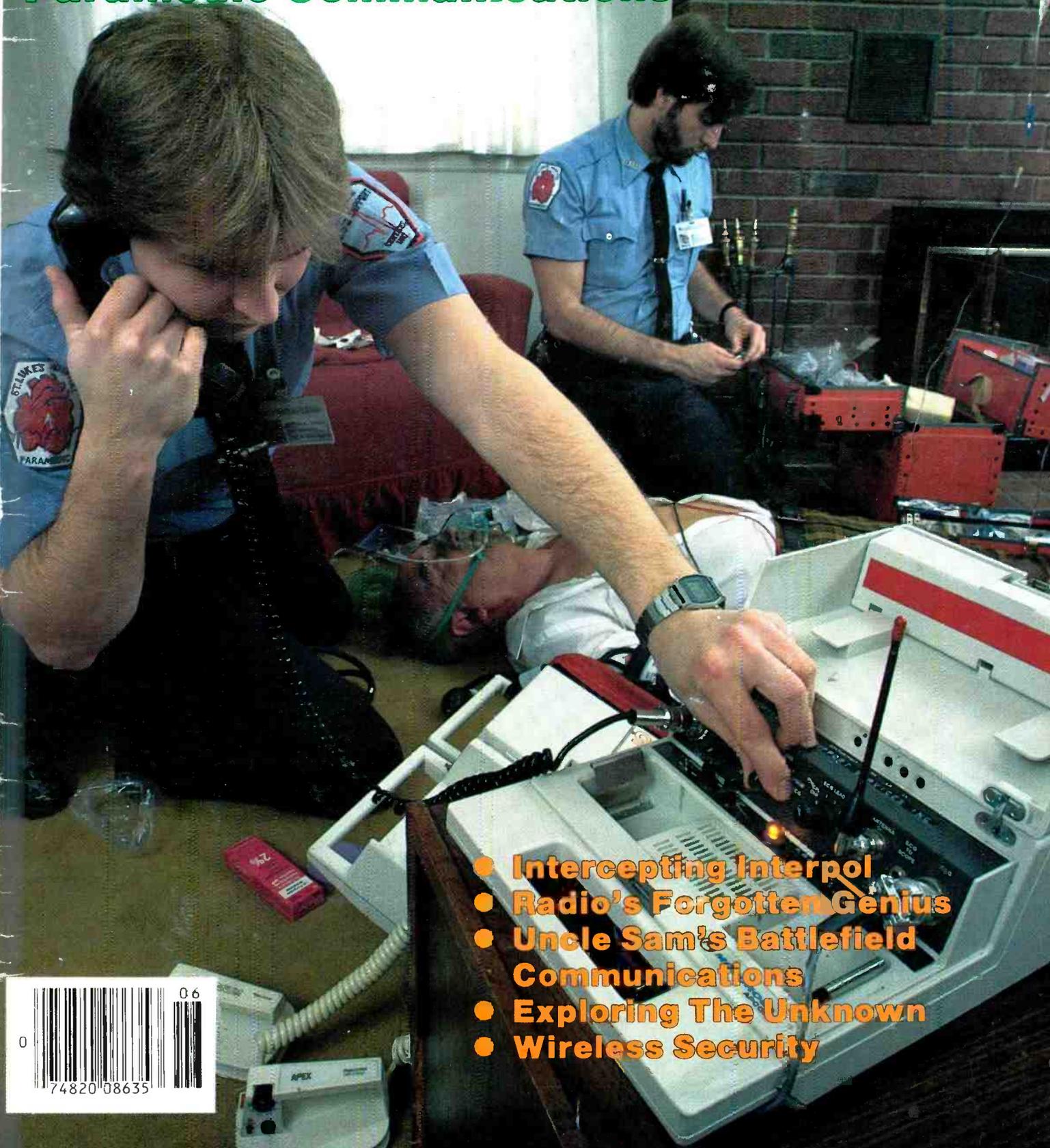


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*by R. L. Slattery**This month's cover: Paramedics Pat Osetek and Joel Orr (of Mobile Life Support Services, Inc., Newburgh, New York) offer aid to "victim" Ezio Galati in a practice drill. Photo by Larry Mulvehill, WP2ZPI.***DEPARTMENTS**

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CIRCLE 40 ON READER SERVICE CARD

BEAMING IN

BY TOM KNEITEL, K2AES

AN EDITORIAL

The Subject Was Scanners

An interesting and long overdue evolutionary stage has been reached in the scanner field. Unlike the area of general short-wave (HF) monitoring, which has had local, regional, and national user organizations since the 1920's, the scanner club field has been quite different.

Regular SWL clubs, strangely, never really took any interest in branching out in order to attract scanner owners, even though you'd have thought that they would have immediately seen the potentials in doing so. For a while, VHF monitoring enthusiasts just stood around and waited for someone to organize a group, but nothing much happened. Eventually, some folks in California got together and started up a monitoring association that seems to have originally not had any aspirations to do more than be local in nature, although in the approximately 10 or 12 years since he got started it did cover more territory.

Probably because there were no other scanner groups around, the California group began attracting members from distant areas. Oddly enough, for a long time the group remained California-oriented (and many feel it never fully escaped that image). Things went reasonably well until about 3 or 4 years ago. In 1981 there were perhaps 200 or more new members per month entering the group's membership rolls. With the exception of a few snags and glitches, the club had a pretty good 10-year roll and was filling a need.

Personally, I think that the problems began when many members began making a louder than usual noise about lack of sufficient say in the operation of the group by those located outside of southern California. Elections were held and control of the association and its newsletter were taken from the hands of the group's original founders. The new power structure couldn't hack it. It turned into a 3-ring circus!

Columnists in the club's newsletter suddenly found their efforts crudely censored like letters from a penitentiary, while other columnists were given the green light to issue vicious attacks upon people and companies they didn't like. The president either resigned or was kicked out under mysterious circumstances which were never explained to the membership; later it was decided to suspend all elections. The club's financial status and situation has never been revealed to the membership. Most recently (and without mentioning it to its members), the group had to pay a \$100 "fee" to an angry book author whose material they had appropriated (without permission) in their newslet-

ter. These things, and the generally high-handed attitude that they've taken of late, has taken its toll.

First it was a large number of members in Florida who resigned en-masse as a protest against the group's policies. Next, there were rumors of a Texas-originated petition to recall certain of the officers and hold elections. By one means or another, they managed to alienate a surprisingly large number of scanner users and members of the industry. The fact that for many months the club seems to have attracted only about 20 new members per month (as opposed to the 200 they once attracted) attests to the sorry state of affairs.

Needless to say, many people (including yours truly) have been less than pleased to see what has happened (and is still happening); a once-vital and worthwhile organization is now under the control of a small group of die-hard wimps interested primarily in seeing how many enemies they can make. Sad to say, a few months ago I let my own membership lapse.

All is not lost! It may be just a coincidence, but it certainly looks like the rapid downhill slide of the earlier pseudo-national association may have inspired or given impetus to what looks to be a new approach.

Filling in the holes being left open as the earlier group begins to shrivel are several interesting groups. The All Ohio Scanner Club (AOSC), which has been active for a couple of years, just announced that they are actively seeking new members in Indiana, Kentucky, Michigan, Pennsylvania, Tennessee, West Virginia, and Ontario. AOSC's President, Dave Marshall, says that "there is a need for these states to be covered in the same manner AOSC covers Ohio." And how right Dave is! If the AOSC is able to maintain the good reputation it has racked up for the past few years, it will reap a windfall of former and disgruntled members of the earlier group.

Similarly, we have received a well-done newsletter from IDEX, which describes itself as "Idaho's Communications and Communications Newsletter." While it covers AM/FM DX and even computers, it seems to be taking aim at scanners and my guess is that IDEX's Frank Aden, Jr., is hoping to gather up some of those who are seeking a scanner-oriented group.

Likewise, I've picked up bits and pieces of information that would indicate there may be other organizations in the early stages of

(Continued on page 73)

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.

Brew-Hoo

At a radio swap-meet and flea market last summer I got a good price on a homebrew communications receiver. This was a nice looking piece of equipment that cost me only \$35. When I got it home, I plugged it in and turned it on. It didn't do anything at all in the AM position, the CW position, or in USB or LSB modes. I couldn't even get it to light up or receive a signal on any frequency. No communications dealer will even take it in to check it and, furthermore, I have no schematic for the set. Where do I go from here with this lemon?

B. N. Waters
Gainesville, FL

Go back to the next swap-meet or flea market you can find to dump it the same way its previous owner handled the situation. It is possible to catch some bargains at a radio flea market, but you've got to see the gizmo working before you plunk down the cash. As many have learned, homebrew gear offered at these gatherings is usually many generations away from its original designer/builder, has no paperwork, and functions like it's supposed to only when it's in the "off" position. —Editor.

Don't Know Weather You Can Hear These

A recent TV documentary on weather data collection showed a floating weather buoy that automatically transmits weather information. Apparently these are placed at various ocean locations and they're quite numerous. I was surprised that I've never seen their schedules and frequencies in POP'COMM. Please publish this information sometime soon.

W. W. Montgomery
Boise, ID

I think you've gotten the impression that the transmissions from the floating buoys (which are used to collect oceanographic as well as weather data) are voice broadcasts intended for reception by the general public. They collect data and store it for several hours. At some scheduled time a ship or coast station sends a coded signal, which includes the identification number of a specific buoy. When that happens, the buoy unloads all of its stored info in a data burst and the coastal station or ship then feeds the information into a computer that analyzes and combines it with data from other buoys in order to obtain an overview of tidal or weather conditions in a large area. To the casual listener, none of this is going to mean

much, however if you'd like to hear what all of these communications sound like just out of curiosity, they take place as follows: 4162.5 to 4166 kHz, 6244.5 to 6248 kHz, 8328 to 8331.5 kHz, 12483 kHz, 16636.5 to 16640 kHz, and 22160.5 to 22192 kHz. —Editor

We're Flyin' High With Him

Just loved the story on WCC and the Radio Vatican story was great, too. And let's not forget Alice's look back into radio's past! As you can see, I really like POP'COMM. Radio is my life. I'm a radio technician in the USAF and a ham. Once again, I think you have an awesome (totally) magazine. Keep up the good work.

John J. Parrish, Jr., KA8DYT
Malmstrom AFB, MT

Tapping In

With reference to your inquiry (Feb. issue) about the current status of the publication TAP, the letters stood for "Technical Assistance Program" and the address you mentioned was valid at least until the summer of 1983. At some point, someone affiliated with TAP did something to someone else that wasn't nice. We aren't sure what the "something" was, but the end result was a case of arson. TAP was not only tapped out, it was burned out, too. Subsequently, TAP's affairs were taken over by a new editor and it began publication again, but it again hit the skids. My last issue was dated Jan./Feb. '84 and since then not a word. In earlier days there were many interesting articles, but now it's all just a memory.

Richard Haskey, N7FPW
Apache Junction, AZ

TAP hasn't been published since January of 1984 because of a "fire" which destroyed their facilities about 18 months ago, as well as some organizational problems they were having. I would like to bring to your attention our own publication, 2600, which is published monthly. Most of our subscribers have been learning about us entirely by word-of-mouth or over modem.

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Former TAP fans and all others interested in hacking, wiretapping, and the in's/out's of 'phone phreaking will find 2600 to be brimming over with information on their favorite topics. While TAP had a "homebrew" look, 2600 is professional in appearance and contains a lot more worthwhile information. A subscription is \$10 per year or \$5 for six months. —Editor

Snuggling Up

What is the meaning of the term "black propaganda" as it applies to broadcasting?

I've seen it used several times in POP'COMM.

Paul deBassinot
Balrothery, Rep. of Ireland

Generally, it means a clandestine broadcaster that is masquerading as the "voice" of one side or another during a war or civil war. In actuality, the station is being operated by someone other than as represented over the air in order to present disinformation for the purpose of causing confusion amongst the local citizens. Sometimes the "black propaganda" station can be a whole-cloth fabrication, while other times it may be a counterfeit version of an actual government broadcasting station. Either type of station falls into the realm of psychological warfare, and has proven highly effective. Many nations have engaged in this type of "psywar," and within the American CIA, the practice of setting up such a station on a frequency adjacent to one of an actual official broadcasting station in order to fool listeners is known by the slang term "snuggling." —Editor

I Ain't Got No Body (Mike)

I read in a newspaper how federal agents recently conducted a raid on an extensive undercover operation. Body mikes were used. How can I find out what frequency these units utilize?

W. Blond
Baton Rouge, LA

Any number of different frequencies might have been used, although I understand that 166.46 MHz is quite popular. You might try listening there. These transmitters seem to have a range of only a 1/4-mile, so that would limit your ability to hear one unless it was too close for comfort. —Editor

Shifty But Speedy

I've noticed in the radioteletype listings you run that they are specified something like 425/67 or 170/50. I understand that the first series of numbers relates to the Hz spacing between "mark" and "space." I'm not clear as to the significance of the second series of numbers.

Peter Harris
Anoka, WI

Those numbers relate to the speed of the transmission. Standard speeds for RTTY transmissions are 60, 66/67, 75, 100, and 132 words per minute. Sometimes, instead of wpm, the transmission speed is given in terms of the baud (Baudot code) rate equivalent, 45, 50, 57, 74, and 100 respectively. In the specific examples you mentioned, 425/67 represents 67 wpm (50 baud) and 170/50 means 50 baud (67 wpm). In other words, they are both the same transmission speed but stated differently. The main difference is that one transmission has a shift of 425 Hz and the other of 170 Hz. —Editor

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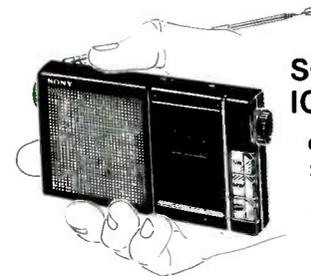
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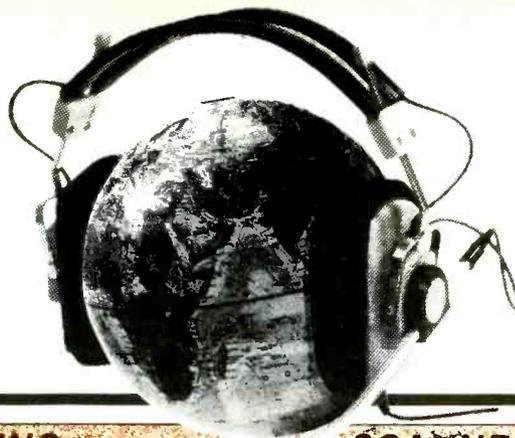
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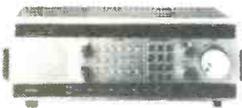
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Intercepting Interpol



This International Police Organization, With A Complex Communications Network, Is Much More (And Less) Than You Think It is!

BY TOM KNEITEL, K2AES, EDITOR

Most likely, if you're like most people, you have a mental image of Interpol as an international police agency with operatives deployed across the world tracking down jewel thieves, terrorists, smugglers, war criminals, and con artists. This is the picture presented in popular fiction, in movies, and on TV. For the most part, it is almost none of these things—and those things that it has been, and is now, will probably surprise you. It's both more and less than you think it is!

For starters, the International Criminal Police Organization (Interpol is its popular name, based upon its cable address) is not a law enforcement agency, nor does it operate under the jurisdiction of any nation. It has no enforcement powers and not a single agent or operative.

Interpol is a completely private organization and quite distant from the exotic group known in current popular mythology. Moreover, its past is about as bizarre as you could ever imagine and seems to have managed to become lost between the cracks of time. Even some of its present policies have caused a combination of raised eyebrows and suspicion.

If you've got a communications receiver, however, you have the ability to intercept Interpol's interesting communications and ascertain for yourself what this mysterious organization is all about.

Essentially, it is an international information exchange, and that's the best and worst of Interpol. And that's where the story of Interpol lies.

Interpol's present headquarters are just outside of Paris, France, in the suburb of St. Cloud. More than 100 nations' national police forces are dues-paying members. Since the organization exists solely because of the support it receives from police agencies, it has generated the impression that it is, itself, an international law enforcement agency.

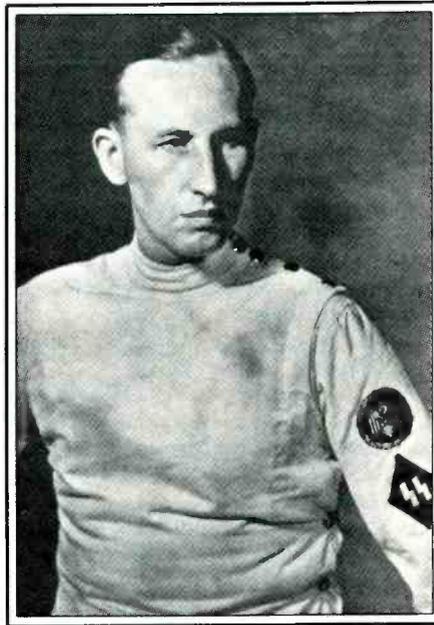


S.S. Oberstgruppenfuhrer and Generaloberst der Polizei Kurt Daluge, Deputy Reich Protector in Bohemia and Moravia. Even before the outbreak of WWII, the Nazi government had managed to get him elected to the second banana spot at Interpol.

Since Interpol accepts memberships from national law enforcement agencies, the United States is connected to the organization via our Treasury Department.

The U.S. membership in Interpol means that the computers of the National Crime Information Center (NCIC), under the direction of the FBI, as well as the files of local and state police, may be accessed by Interpol's members.

The ability for national police organizations from some 100 nations to sift through and add or subtract information from these files, courtesy of their membership in a private organization, has not taken place without some amount of criticism. The ever-expanding data in law enforcement computers covers businesses, individuals, clubs, immigration information, and other materials that can be accessed almost at will via Interpol's members. When one considers that the



S.S. Oberstgruppenfuhrer Reinhard Heydrich was top dog at Interpol during the Hitler era. Ultimately he was done in by his own pompous vanity. Czech partisans concocted a simple ploy to get him to stand still and salute them while they unleashed a hail of gunfire at him.

national police forces of many (shall we say "controversial") nations belong to Interpol, the ramifications become all the more ominous. Some of the members include Warsaw Pact nations as well as Chile, Haiti, Iran, Iraq, Jordan, Lebanon, Libya, Syria, and Turkey.

Let's Start At The Beginning

When Interpol was formed in 1924, the permanent headquarters was established in Vienna, Austria. The Articles of Constitution provided that the head of Interpol would be whomever was Chief of the Austrian Federal Police, a fact which did not eventually escape the notice of the German government in Berlin. In fact, the Germans were very enthusiastic about Interpol and were one of the few nations to participate in the 1930's Interpol radio network.

By 1937, the Germans had even managed

to get their own man elected to the post of Interpol's Vice President. That would be none other than S.S. Oberstgruppenfuhrer and Generaloberst der Polizei Kurt Daluege, who held the military rank of General.

FBI Director J. Edgar Hoover was also exploring the possibilities of joining Interpol and had begun a correspondence with Oscar Dressler, the Secretary General of Interpol. H.D. Lester, Assistant Director of the FBI, went to the 1937 Interpol Congress and returned to suggest to Hoover that this country should become a member. Less than one month before the Nazis marched into Austria, Homer Cummings, U.S. Attorney General, backed by Hoover and also Secretary of State Cordell Hull, made a formal request to Congress that the U.S.A. join Interpol. For less than \$2,000, on June 8th, 1938, the U.S.A. became a member of Interpol. By the way, it might be pointed out that inasmuch as the Nazis had invaded Austria on March 13, 1938, and taken over the government as well as Interpol, the U.S.A. had joined an organization which was operated by the Nazis!

Hitler, of course, felt that Austria had always been a part of Germany, so all he was doing was bringing back that which was Germany's in the first place. Therefore, the 1939 Interpol meeting took place in Berlin under the watchful eye of Heinrich Himmler, head of the German Police.

With the world on the edge of World War II, the U.S. mulled over whether the meeting in Berlin should be attended, finally deciding to pass it up. War broke out three weeks later.

The Chief of the Security Police and General in the Police Force, S.S. Obergruppenfuhrer Reinhard Heydrich, was made the Chief of Interpol, announcing that under its new German leadership, Interpol "will be a real center of criminal police." Along with the Gestapo, Interpol was moved to its new Headquarters just outside of Berlin, and incorporated into Reinhard Heydrich's Security Police or Sicherheitsdienst (SD). One of the SD staff members was an SS officer, Paul Dickopf, who was later to emerge after the war as head of Interpol between the years 1968 and 1972!

On a morning in June of 1942, Heydrich was taking his daily drive to the Prague Castle in Czechoslovakia when he was assassinated by Czech partisans disguised as road laborers. Every morning when his car drove by a certain bend in the road, they would salute him and he would order his driver to stop so he could return the salute. One morning they saluted him and when he returned their salute they found it an opportune time to unleash a fusillade of gunfire in his general direction. So much for S.S. Obergruppenfuhrer Heydrich.

Months went by until Himmler picked a new leader for Interpol and the Gestapo. Finally, Ernst Kaltenbrunner was selected and he vowed to "continue the strictly nonpolitical character" of Interpol.

By the time Nazi Germany began to unravel, Interpol was doing likewise. The Nazis had spent a full six years filling Interpol's files



Some nations (such as the U.S.) utilize satellites to communicate with Interpol.

with data, and it's reasonable to expect that they had sorted through and collected police information from throughout Europe—on political radicals, intellectuals, thieves, forgers, black marketeers, gangsters, counterfeiters, homosexuals, informers, prostitutes, the clergy, agitators, politicians, business people and average citizens. Interpol claimed that these files didn't survive the massive Allied bombing raids, but there is some speculation that they did. Files such as those would be worth their weight in gold and could be used for blackmail, for achieving political power, or even for legitimate police work.

There is information that many of the most important files were removed from Berlin by Carlos Zindel, head of the Nazi Criminal Investigation Department when he fled shortly before the collapse of the 3rd Reich. His car packed tightly with as much as would fit, it is thought that he headed toward Switzerland where, in Zurich, he would be able to make contact with the Odessa Brotherhood that was helping fleeing Nazis get out of Europe with their documents, cash, art treasures, and families.

He never made it past Stuttgart; that's where he encountered the French military. When he appeared at French headquarters to try to negotiate with them they treated him harshly and told him to come back later. Possibly he felt trapped or that there was no dignified way out of his situation. In any event, he promptly swallowed a poison capsule. The files fell into possession of the French and within a year, Interpol opened for business again, with headquarters in Paris!

Among the leading staff members of the reborn Interpol was Harry Soderman, a Swedish police officer who had been with Interpol from the time it began in 1924. Also on the staff was Florent Louwage, a member of the Belgian Political Police, also a long-time Interpol employee who had worked



In 1946, the FBI's powerful director, J. Edgar Hoover, defied the State Department to participate in Interpol. A few years later he quit Interpol when he found out that the Czechs had begun using its facilities for tracking down defectors who had slipped across the Czech border into the West.

with Ernst Kaltenbrunner. Acting through the facilities of Belgian embassies throughout the world, Louwage made overtures to previous member nations to gather in Brussels in order to "constitute" Interpol, choose its headquarters and appoint new directors.

The United States notified Louwage on 15 May 1946 that the Justice Department hadn't yet made a decision about attending, but requested additional information on the proposal. Within days, Louwage responded that N.R. Telford had a meeting with "interested Belgian police" in order to prepare a full report for the FBI. Neither side brought up anything about Interpol's Nazi connection.

One week later, on 21 May, Attorney General Tom Clark recommended against any representative of the United States Government attending the meeting in Brussels. The State Department told Louwage that none of its people would attend, wording the message with a loophole just big enough for J. Edgar Hoover to squeeze through. Hoover wasn't a member of the State Department. Two days later he was voted in as Interpol's Vice President. The powerful Hoover obviously felt that the FBI had a need for membership in Interpol that surpassed the State Department's diplomatic considerations.

Although Louwage was the president of the new Interpol, technically Ernst Kaltenbrunner was also still the top executive officer of the organization since he had never actually been removed from office. That situation came to a definite end in October of 1946, when he was hanged by the Allies as a war criminal. Louwage was elected for a ten year term. One of the men on the Louwage team was Jean Nepote (in 1963 he became Interpol's Secretary General), who came as the representative of the French Surete. While the war was on, he was employed in France's Nazi-backed Vichy regime.

N.R. Telford, who had the meeting with "interested" Belgian police, became a delegate to Interpol representing Hoover, and

Callsign	Location	kHz	Mode
AYA	BUENOS AIRES, ARG.	9200	CW
AYA	BUENOS AIRES, ARG.	14817.5	ARQ
AYA26	BUENOS AIRES, ARG.	15738	CW
AYA27	BUENOS AIRES, ARG.	19360	
AYA28	BUENOS AIRES, ARG.	21785	CW
AYA29	BUENOS AIRES, ARG.	24110	ARQ
AYA47	BUENOS AIRES, ARG.	10390	CW
AYA48	BUENOS AIRES, ARG.	14817.5	ARQ
AYA49	BUENOS AIRES, ARG.	19130	
AYA501	BUENOS AIRES, ARG.	15502.5	CW
CNP	RABAT, MOROCCO	10390	CW
CNT	RABAT, MOROCCO	3593	
CNT	RABAT, MOROCCO	4632.5	CW
CNT	RABAT, MOROCCO	6792	CW
CNT	RABAT, MOROCCO	7532	
CNT	RABAT, MOROCCO	9200	
CNT	RABAT, MOROCCO	14817.5	
CSI60	LISBON, PORTUGAL	3593	
CSI61	LISBON, PORTUGAL	4632.5	
CSI62	LISBON, PORTUGAL	6792	CW
CSI63	LISBON, PORTUGAL	2840	
CSI64	LISBON, PORTUGAL	14817.5	
CSI65	LISBON, PORTUGAL	7532	
CSI66	LISBON, PORTUGAL	9200	
CSJ23	LISBON, PORTUGAL	7401	425/67N
CSJ24	LISBON, PORTUGAL	8038	425/67N
CSJ24	LISBON, PORTUGAL	8045	425/67N
CSJ24	LISBON, PORTUGAL	8097.5	425/67N
CSJ25	LISBON, PORTUGAL	10295	170/67N
CSJ26	LISBON, PORTUGAL	10390	CW
CSJ26	LISBON, PORTUGAL	11538	850/67N
CSJ26	LISBON, PORTUGAL	12224.5	ARQ
CSJ26	LISBON, PORTUGAL	13520	CW
CSJ26	LISBON, PORTUGAL	13820	170/67N
CSJ27	LISBON, PORTUGAL	14817.5	CW
CSJ27	LISBON, PORTUGAL	15502.5	(RTTY)
CSJ27	LISBON, PORTUGAL	15592	170/67N
CSJ27	LISBON, PORTUGAL	18190	170/67N
CSJ28	LISBON, PORTUGAL	24070	CW
DEB	WIESBADEN, W. GERM.	2840	
DEB	WIESBADEN, W. GERM.	3593	
DEB	WIESBADEN, W. GERM.	4632.5	170/67N
DEB	WIESBADEN, W. GERM.	4837.5	425/67N
DEB	WIESBADEN, W. GERM.	5208	425/67N
DEB	WIESBADEN, W. GERM.	5305.5	425/67N
DEB	WIESBADEN, W. GERM.	6792	170/67N
DEB	WIESBADEN, W. GERM.	6905	ARQ
DEB	WIESBADEN, W. GERM.	7401	170/67N
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DEB	WIESBADEN, W. GERM.	8038	ARQ
DEB	WIESBADEN, W. GERM.	8045	170/67N
DEB	WIESBADEN, W. GERM.	8097.5	170/67N
DEB	WIESBADEN, W. GERM.	9200	ARQ
DEB	WIESBADEN, W. GERM.	10390	170/67N
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DEB	WIESBADEN, W. GERM.	18380	170/67N
DEB	WIESBADEN, W. GERM.	19130	170/67N
DEB	WIESBADEN, W. GERM.	19360	170/67N
DUN356	MANILA, PHILIPPINES	9285	425/67N
DUN356	MANILA, PHILIPPINES	18087	170/67N
EEQ	MADRID, SPAIN	3593	
EEQ	MADRID, SPAIN	4632.5	
EEQ	MADRID, SPAIN	4837.5	ARQ
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EEQ	MADRID, SPAIN	6792	CW

Callsign	Location	kHz	Mode
EEQ	MADRID, SPAIN	7532	
EEQ	MADRID, SPAIN	9200	
EEQ	MADRID, SPAIN	10390	170/67N
EEQ	MADRID, SPAIN	11538	170/67N
EEQ	MADRID, SPAIN	12224.5	170/67N
EEQ	MADRID, SPAIN	14817.5	170/67N
EEQ0	MADRID, SPAIN	10390	170/67N
EEQ1	BARCELONA, SPAIN	10390	170/67N
EEQ2	ZARAGOZA, SPAIN	10390	170/67N
EEQ3	CEUTA, SPAIN	10390	170/67N
EEQ4	LA CORUNA, SPAIN	10390	170/67N
EEQ5	CADIZ, SPAIN	10390	170/67N
EEQ6	BILBAO, SPAIN	10390	170/67N
EEQ8	JACA, SPAIN	10390	170/67N
EEQ9	PALMA, MAJORCA I.	10390	170/67N
EEQ10	LAS PALMAS, CANARY I.	10390	170/67N
EEQ11	SEVILLE, SPAIN	10390	170/67N
EEQ12	STA. CRUZ, CANARY I.	10390	170/67N
EEQ13	VALENCIA, SPAIN	10390	170/67N
EEQ14	MURICA, SPAIN	10390	170/67N
EEQ15	CASTELLON, SPAIN	10390	170/67N
EEQ16	SAN SEBASTION, SPAIN	10390	170/67N
EEQ17	GRANADA, SPAIN	10390	170/67N
EEQ18	LEON, SPAIN	10390	170/67N
EEQ19	OVEIDO, SPAIN	10390	170/67N
EP5X	TEHERAN, IRAN	10390	CW
EP5X	TEHERAN, IRAN	19360	CW
FSB	PARIS, FRANCE	4837.5	425/67N
FSB	PARIS, FRANCE	5208	ARQ
FSB	PARIS, FRANCE	5305.5	ARQ
FSB	PARIS, FRANCE	6905	425/67N
FSB	PARIS, FRANCE	7401	170/67N
FSB	PARIS, FRANCE	8038	ARQ — FEC
FSB	PARIS, FRANCE	11538	170/67N
FSB	PARIS, FRANCE	12224.5	170/67N
FSB	PARIS, FRANCE	15684	ARQ
FSB51	PARIS, FRANCE	2840	
FSB52	PARIS, FRANCE	3593	
FSB53	PARIS, FRANCE	4632.5	CW
FSB54	PARIS, FRANCE	6792	CW
FSB55	PARIS, FRANCE	7532	170/67N
FSB56	PARIS, FRANCE	9200	170/67N
FSB56	PARIS, FRANCE	9200	425/67N
FSB57	PARIS, FRANCE	13090	CW
FSB57	PARIS, FRANCE	13090	170/67N
FSB58	PARIS, FRANCE	14817.5	170/67N
FSB59	PARIS, FRANCE	18190	170/67N
FSB61	PARIS, FRANCE	19130	170/67N
FSB62	PARIS, FRANCE	19360	170/67N
FSB63	PARIS, FRANCE	19405	ARQ
FSB64	PARIS, FRANCE	24072	170/67N
FSB65	PARIS, FRANCE	24110	ARQ
FSB66	PARIS, FRANCE	21785	CW
FSB67	PARIS, FRANCE	21807.5	170/67N
FSB69	PARIS, FRANCE	7832	CW
FSB70	PARIS, FRANCE	7906	CW
FSB71	PARIS, FRANCE	10295	ARQ
FSB71	PARIS, FRANCE	10295	170/67N
FSB72	PARIS, FRANCE	13520	170/67N
FSB73	PARIS, FRANCE	15502.5	FEC
FSB74	PARIS, FRANCE	13820	170/67N
FSB75	PARIS, FRANCE	15592	170/67N
GMP	W. WICKHAM, U.K.	2840	
GMP	W. WICKHAM, U.K.	3593	
GMP	W. WICKHAM, U.K.	4632.5	
GMP	W. WICKHAM, U.K.	4837.5	425/67N
GMP	W. WICKHAM, U.K.	5208	425/67N
GMP	W. WICKHAM, U.K.	5305.5	425/67N

Callsign	Location	kHz	Mode	Callsign	Location	kHz	Mode
GMP	W. WICKHAM, U.K.	6792	CW	JPA60	KOMAKI, JAPAN	9200	CW
GMP	W. WICKHAM, U.K.	6905	425/67N	JPA61	KOMAKI, JAPAN	13520	170/67N
GMP	W. WICKHAM, U.K.	7401	170/67N	JPA62	KOMAKI, JAPAN	15684	170/67N
GMP	W. WICKHAM, U.K.	8045	170/67N	LJP	OSLO, NORWAY	10295	ARQ
GMP	W. WICKHAM, U.K.	9200	CW	LJP20	OSLO, NORWAY	4632.5	CW
GMP	W. WICKHAM, U.K.	10295	170/67N	LJP20	OSLO, NORWAY	10390	CW
GMP	W. WICKHAM, U.K.	10390	CW	LJP22	OSLO, NORWAY	2840	
GMP	W. WICKHAM, U.K.	11538	170/67N	LJP24	OSLO, NORWAY	4632.5	CW
GMP	W. WICKHAM, U.K.	1222.4	170/67N	LJP26	OSLO, NORWAY	6792	CW
GMP	W. WICKHAM, U.K.	14817.5		LJP26	OSLO, NORWAY	7532	CW
HEP	WALTIKON, SWITZ.	2480		LJP27	OSLO, NORWAY	7532	CW
HEP	WALTIKON, SWITZ.	3593		LJP29	OSLO, NORWAY	9200	CW
HEP	WALTIKON, SWITZ.	6792		LJP33	OSLO, NORWAY	3593	
HEP	WALTIKON, SWITZ.	7532		LJP34	OSLO, NORWAY	14817.5	
HEP	WALTIKON, SWITZ.	14817.5		LXF50	LUXEMBOURG, LUX.	2840	
HEP25	WALTIKON, SWITZ.	12224.5	170/67N	LXF50	LUXEMBOURG, LUX.	3593	
HEP26	WALTIKON, SWITZ.	6905	425/67N	LXF50	LUXEMBOURG, LUX.	4632.5	
HEP27	WALTIKON, SWITZ.	13520	170/67N	LXF50	LUXEMBOURG, LUX.	4837.5	425/67N
HEP39	WALTIKON, SWITZ.	10390	CW	LXF50	LUXEMBOURG, LUX.	5208	425/67N
HEP46	WALTIKON, SWITZ.	4632.5	CW	LXF50	LUXEMBOURG, LUX.	5305.5	425/67N
HEP47	WALTIKON, SWITZ.	4837.5	425/67N	LXF50	LUXEMBOURG, LUX.	6792	CW
HEP52	WALTIKON, SWITZ.	5208	CW	LXF50	LUXEMBOURG, LUX.	6905	425/67N
HEP53	WALTIKON, SWITZ.	5305.5	425/67N	LXF50	LUXEMBOURG, LUX.	7401	425/67N
HEP58	WALTIKON, SWITZ.	11538	170/67N	LXF50	LUXEMBOURG, LUX.	7532	
HEP74	WALTIKON, SWITZ.	7401	ARQ	LXF50	LUXEMBOURG, LUX.	10390	CW
HEP81	WALTIKON, SWITZ.	18190	CW	LXF50	LUXEMBOURG, LUX.	12224.5	170/67N
HEP83	WALTIKON, SWITZ.	18380	170/67N	LXF50	LUXEMBOURG, LUX.	14817.5	CW
HEP85	WALTIKON, SWITZ.	8045	170/67N	LZH7	SOFIA, BULGARIA	3593	
HEP88	WALTIKON, SWITZ.	8038	CW	OAV86	LIMA, PERU	15738	CW
HEP92	WALTIKON, SWITZ.	9200	CW	ODW21	BEIRUT, LEBANON	6792	CW
HEP95	WALTIKON, SWITZ.	10295	170/67N	ODW22	BEIRUT, LEBANON	10390	CW
HK3M	BOGOTA, COLOMBIA	15738	CW	ODW23	BEIRUT, LEBANON	14817.5	
HKV0	BOGOTA, COLOMBIA	15738	CW	OEQ	VIENNA, AUSTRIA	2840	
HMA22	SEOUL, S. KOREA	9200	CW	OEQ	VIENNA, AUSTRIA	3593	
HMA22	SEOUL, S. KOREA	9285	425/67N	OEQ	VIENNA, AUSTRIA	4632.5	CW
HMA22	SEOUL, S. KOREA	14607.5	CW	OEQ	VIENNA, AUSTRIA	6792	CW
HMA22	SEOUL, S. KOREA	15684	CW	OEQ	VIENNA, AUSTRIA	7532	CW
HMA22	SEOUL, S. KOREA	18087	170/67N	OEQ	VIENNA, AUSTRIA	10390	CW
HSQ	BANGKOK, THAILAND	9285	425/67N	OEQ	VIENNA, AUSTRIA	14817.5	
HSQ	BANGKOK, THAILAND	14607.5	170/67N	OEQ	VIENNA, AUSTRIA	19130	
HSQ	BANGKOK, THAILAND	14623.5	170/67N	OEQ35	VIENNA, AUSTRIA	4837.5	425/67N
HSQ	BANGKOK, THAILAND	14707.5	170/67N	OEQ36	VIENNA, AUSTRIA	5208	(RTTY)
HSQ	BANGKOK, THAILAND	18087	170/67N	OEQ37	VIENNA, AUSTRIA	5305.5	425/67N
IUV81	ROME, ITALY	3593		OEQ38	VIENNA, AUSTRIA	6905	170/67N
IUV81	ROME, ITALY	4632.5		OEQ39	VIENNA, AUSTRIA	7401	170/67N
IUV81	ROME, ITALY	6792	CW	OEQ41	VIENNA, AUSTRIA	8038	170/67N
IUV81	ROME, ITALY	6905	ARQ	OEQ42	VIENNA, AUSTRIA	8045	ARQ
IUV81	ROME, ITALY	7532		OEQ43	VIENNA, AUSTRIA	8097.5	170/67N
IUV81	ROME, ITALY	8038	ARQ	OEQ44	VIENNA, AUSTRIA	10295	425/67N
IUV81	ROME, ITALY	9200		OEQ45	VIENNA, AUSTRIA	11538	CW
IUV81	ROME, ITALY	10295	170/67N	OGX	HELSINKI, FINLAND	2840	
IUV81	ROME, ITALY	10390	CW	OGX	HELSINKI, FINLAND	3593	
IUV81	ROME, ITALY	11538	ARQ	OGX	HELSINKI, FINLAND	4632.5	
IUV81	ROME, ITALY	14817.1		OGX	HELSINKI, FINLAND	4837.5	170/67N
IUV81	ROME, ITALY	19130		OGX	HELSINKI, FINLAND	6305.5	425/67N
IUV81	ROME, ITALY	19360	CW	OGX	HELSINKI, FINLAND	6792	CW
JPA23	TOKYO, JAPAN	14607.5	170/67N	OGX	HELSINKI, FINLAND	7532	CW
JPA24	TOKYO, JAPAN	18087	170/67N	OGX	HELSINKI, FINLAND	8038	170/67N
JPA33	TOKYO, JAPAN	9285	425/67N	OGX	HELSINKI, FINLAND	8045	170/67N
JPA34	TOKYO, JAPAN	14623.5	170/67N	OGX	HELSINKI, FINLAND	8097.5	170/67N
JPA35	TOKYO, JAPAN	14707	170/67N	OGX	HELSINKI, FINLAND	10295	170/67N
JPA51	KOMAKI, JAPAN	14817.5	170/67N	OGX	HELSINKI, FINLAND	10390	CW
JPA55	KOMAKI, JAPAN	7532	425/67N	OGX	HELSINKI, FINLAND	11538	170/67N
JPA55	KOMAKI, JAPAN	8006.5	170/67N	OGX	HELSINKI, FINLAND	12224.5	170/67N
JPA56	KOMAKI, JAPAN	10390	170/67N	OGX	HELSINKI, FINLAND	13520	CW
JPA57	KOMAKI, JAPAN	19360	170/67N	OGX	HELSINKI, FINLAND	13820	170/67N
JPA58	KOMAKI, JAPAN	13820	170/67N	OGX	HELSINKI, FINLAND	14817.5	
JPA59	KOMAKI, JAPAN	19130	170/67N	OGX	HELSINKI, FINLAND	15502.5	170/67N

Callsign	Location	kHz	Mode
OGX	HELSINKI, FINLAND	18190	170/67N
OGX	HELSINKI, FINLAND	18380	170/67N
OGX	HELSINKI, FINLAND	19130	CW
OGX	HELSINKI, FINLAND	19360	CW
OGX	HELSINKI, FINLAND	19405	170/67N
ONA20	BRUSSELS, BELGIUM	2830	
ONA20	BRUSSELS, BELGIUM	3593	
ONA20	BRUSSELS, BELGIUM	4632.5	425/67N
ONA20	BRUSSELS, BELGIUM	4837.5	425/67N
ONA20	BRUSSELS, BELGIUM	5208	425/67N
ONA20	BRUSSELS, BELGIUM	5305.5	425/67N
ONA20	BRUSSELS, BELGIUM	6792	170/67N
ONA20	BRUSSELS, BELGIUM	6905	425/67N
ONA20	BRUSSELS, BELGIUM	7401	170/67N
ONA20	BRUSSELS, BELGIUM	7532	
ONA20	BRUSSELS, BELGIUM	8038	170/67N
ONA20	BRUSSELS, BELGIUM	8045	170/67N
ONA20	BRUSSELS, BELGIUM	8097.5	170.67N
ONA20	BRUSSELS, BELGIUM	9200	170/67N
ONA20	BRUSSELS, BELGIUM	10295	170/67N
ONA20	BRUSSELS, BELGIUM	10390	170/67N
ONA20	BRUSSELS, BELGIUM	11538	170/67N
ONA20	BRUSSELS, BELGIUM	12224.5	170/67N
ONA20	BRUSSELS, BELGIUM	14817.5	170/67N
OWS	COPENHAGEN, DENMARK	2840	
OWS	COPENHAGEN, DENMARK	3593	
OWS	COPENHAGEN, DENMARK	4632.5	
OWS	COPENHAGEN, DENMARK	7532	
OWS	COPENHAGEN, DENMARK	11538	170/67N
OWS	COPENHAGEN, DENMARK	14817.5	
OWS	COPENHAGEN, DENMARK	24110	CW
OWS3	COPENHAGEN, DENMARK	4837.5	425/67N
OWS3	COPENHAGEN, DENMARK	5208	425/67N
OWS3	COPENHAGEN, DENMARK	5305.5	425/67N
OWS3	COPENHAGEN, DENMARK	6792	CW
OWS3	COPENHAGEN, DENMARK	6905	425/67N
OWS3	COPENHAGEN, DENMARK	7832	170/67N
OWS3	COPENHAGEN, DENMARK	8045	170/67N
OWS3	COPENHAGEN, DENMARK	10295	170/67N
OWS3	COPENHAGEN, DENMARK	12224.5	ARQ
OWS3	COPENHAGEN, DENMARK	13520	CW
OWS3	COPENHAGEN, DENMARK	13820	CW
OWS4	COPENHAGEN, DENMARK	10390	CW
PDB2	BILTHOVEN, HOLLAND	2840	
PDB2	BILTHOVEN, HOLLAND	3593	
PDB2	BILTHOVEN, HOLLAND	4632.5	
PDB2	BILTHOVEN, HOLLAND	4837.5	425/67N
PDB2	BILTHOVEN, HOLLAND	5305.5	425/67N
PDB2	BILTHOVEN, HOLLAND	6792	CW
PDB2	BILTHOVEN, HOLLAND	6905	425/67N
PDB2	BILTHOVEN, HOLLAND	7401	ARQ
PDB2	BILTHOVEN, HOLLAND	8045	170/67N
PDB2	BILTHOVEN, HOLLAND	9200	CW
PDB2	BILTHOVEN, HOLLAND	10295	170/67N
PDB2	BILTHOVEN, HOLLAND	10390	CW
PDB2	BILTHOVEN, HOLLAND	11538	170/67N
PDB2	BILTHOVEN, HOLLAND	14817.5	CW
PDB2	BILTHOVEN, HOLLAND	18190	CW
PPC	BRASILIA, BRAZIL	15502.5	CW
PPC	BRASILIA, BRAZIL	15738	CW
SHX	STOCKHOLM, SWEDEN	3593	
SHX	STOCKHOLM, SWEDEN	4632.5	CW
SHX	STOCKHOLM, SWEDEN	4837.5	425/67N
SHX	STOCKHOLM, SWEDEN	6905	425/67N
SHX	STOCKHOLM, SWEDEN	6792	CW
SHX	STOCKHOLM, SWEDEN	7401	170/67N
SHX	STOCKHOLM, SWEDEN	7532	CW
SHX	STOCKHOLM, SWEDEN	7969	170/67N

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CIRCLE 38 ON READER SERVICE CARD

Callsign	Location	kHz	Mode	Callsign	Location	kHz	Mode
SHX	STOCKHOLM, SWEDEN	8038	170/67N	3VA	TUNIS, TUNISIA	10390	CW
SHX	STOCKHOLM, SWEDEN	8045	170/67N	3VA	RUNIS, TUNISIA	19360	CW
SHX	STOCKHOLM, SWEDEN	9200	CW	4NX7	BELGRADE, YUGOSLAVIA	4837.5	850/67N
SHX	STOCKHOLM, SWEDEN	10295	170/67N	4NX7	BELGRADE, YUGOSLAVIA	6905	850/67N
SHX	STOCKHOLM, SWEDEN	10390	CW	4NX7	BELGRADE, YUGOSLAVIA	8045	170/67N
SHX	STOCKHOLM, SWEDEN	11538	170/67N	4NX7	BELGRADE, YUGOSLAVIA	10295	850/67N
SHX	STOCKHOLM, SWEDEN	12224.5	170/67N	4NX7	BELGRADE, YUGOSLAVIA	10390	CW
SHX	STOCKHOLM, SWEDEN	13820	170/67N	4NX7	BELGRADE, YUGOSLAVIA	11538	850/67N
SHX	STOCKHOLM, SWEDEN	14817.5		4XP40	TEL AVIV, ISRAEL	6792	CW
SHX	STOCKHOLM, SWEDEN	15502.5	170/67N	4XP41	TEL AVIV, ISRAEL	10390	CW
SHX	STOCKHOLM, SWEDEN	15592	170/67N	4XP63	JERUSALEM, ISRAEL	3593	
SHX	STOCKHOLM, SWEDEN	18190	170/67N	4XP64	TEL AVIV, ISRAEL	14817.5	
SHX	STOCKHOLM, SWEDEN	18380	170/67N	4XP66	TEL AVIV, ISRAEL	7532	
SHX	STOCKHOLM, SWEDEN	19405	170/67N	5BP2	NICOSIA, CYPRUS	19360	CW
SOG279	WARSAW, POLAND	6792	425/67R	5BP3	NICOSIA, CYPRUS	4632.5	CW
SUA81	CAIRO, EGYPT	3593		5BP5	NICOSIA, CYPRUS	9200	CW
SXP	ATHENS, GREECE	3593		5BP5	NICOSIA, CYPRUS	10390	CW
SYZ	ATHENS, GREECE	10390	CW	50P25	LAGOS, NIGERIA	6792	CW
SYZ	ATHENS, GREECE	19360	CW	50P25	LAGOS, NIGERIA	9200	CW
TCC2	ANKARA, TURKEY	10390	CW	50P25	LAGOS, NIGERIA	21807.5	CW
TCC2	ANKARA, TURKEY	14817.5		5TP25	NOUAKCHOTT, MAURET.	19360	CW
TCC2	ANKARA, TURKEY	19130		5UF	NIAMEY, NIGER	14827	CW
TCC2	ANKARA, TURKEY	19405	CW	5YG	NAIROBI, KENYA	19360	CW
TLQ	BANGUI, C.A.R.	14827	CW	6WZ	DAKAR, SENEGAL	14827	CW
TRS	LIBREVILLE, GABON	14827	CW	7RA20	ALGIERS, ALGERIA	2840	
TUW210	ABIDJAN, IVORY COAST	19360	CW	7RA20	ALGIERS, ALGERIA	3593	
TUW210	ABIDJAN, IVORY COAST	19405	CW	7RA20	ALGIERS, ALGERIA	4632.5	
TUW210	ABIDJAN, IVORY COAST	21807.5	CW	7RA20	ALGIERS, ALGERIA	6792	CW
TUW220	ABIDJAN, IVORY COAST	14827	CW	7RA20	ALGIERS, ALGERIA	10390	CW
TUW220	ABIDJAN, IVORY COAST	19487	CW	7RA20	ALGIERS, ALGERIA	14817.5	
TTR103	N'DJAMENA, CHAD	10390	CW	8UF75	NEW DELHI, INDIA	6792	CW
TZP	BAMAKO, MALI	14827	CW	8UF75	NEW DELHI, INDIA	7532	CW
VRD	HONG KONG	9285	425/67N	8UF75	NEW DELHI, INDIA	8006.5	CW
XJD48	ALMONTE, ONTARIO	9105	CW	8UF75	NEW DELHI, INDIA	9285	CW
XJD48	ALMONTE, ONTARIO	14817.5		8UF75	NEW DELHI, INDIA	10390	CW
XJE57	ALMONTE, ONTARIO	6792	CW	8UF75	NEW DELHI, INDIA	13520	CW
XJE57	ALMONTE, ONTARIO	10390	CW	8UF75	NEW DELHI, INDIA	13820	CW
XJE57	ALMONTE, ONTARIO	19130	CW	8UF75	NEW DELHI, INDIA	14607.5	CW
XJE57	ALMONTE, ONTARIO	19360		8UF75	NEW DELHI, INDIA	14817.5	CW
XJE57	ALMONTE, ONTARIO	21785	CW	8UF75	NEW DELHI, INDIA	15684	CW
XJE57	ALMONTE, ONTARIO	21807.5		8UF75	NEW DELHI, INDIA	18087	CW
XJE57	ALMONTE, ONTARIO	24110	CW	8UF75	NEW DELHI, INDIA	19120	CW
YOV28	BUCHAREST, RUMANIA	10390	CW	8UF75	NEW DELHI, INDIA	21785	CW
YOV28	BUCHAREST, RUMANIA	21807.5		8UF75	NEW DELHI, INDIA	21804	CW
YVZ3	CARACAS, VENEZUELA	15502.5	CW	8UF75	NEW DELHI, INDIA	24110	CW
YVZ3	CARACAS, VENEZUELA	15738	CW	9TK21	KINASHA, ZAIRE	10390	CW
ZPZ	ASUNCION, PARAGUAY	15738	CW	9TK21	KINASHA, ZAIRE	14827	CW

Hoover was most supportive of the organization. His support hit a snag and ended in 1950 when Interpol member Czechoslovakia utilized the facilities of the group to hunt for defectors who had slipped into the West across the Czech border. He announced to Louwage that he was resigning his position as vice president and removing the FBI from membership. Sensing that this was a serious loss of prestige to Interpol, Louwage personally went to Washington to implore Hoover to change his mind. Hoover was intransigent and that was the end of Hoover's direct participation in Interpol.

In 1958, a full eight years after the Hoover incident, the Treasury Department decided that it wanted the United States to re-establish ties with Interpol. Hoover did not raise any objections and Congress forked over the \$25,000 required to join.

One of the continuing controversies surrounding Interpol concerns Article 3 of its Constitution. This Article states that Interpol can't become involved in racial, political, espionage, or religious cases. It was the Czech violation of this Article that caused Hoover to drop out in 1950. This Article is cited by Interpol as the reason why it will not permit its facilities to be used to track down Nazi war criminals who, Interpol says, aren't within its jurisdiction. The primary thrust of Interpol's activities, since 1961, and under the prodding of the U.S. Treasury Department, has been related to international drug smuggling. The rapid rise in illegal drug traffic since 1961 does not speak highly of Interpol's effectiveness in such matters.

More than 20 years after the end of World War II, the Nazi connection had faded to the point where ex-S.S. officer Dickopf could

serve as head of Interpol. Dickopf had rebuilt the German police after the war and by the end of his 4-year tenure as Interpol's chief, the organization had a new headquarters building, about 100 acres of land, and 2-billion Swiss francs in its bank account.

The squeaky clean and affluent image, nevertheless, still had tarnish around its edges in the eyes of many. The new headquarters building and fancy bank account couldn't hide some annoying reports. It came out after the Portuguese revolution of April 25, 1974, that the feared federal police had been heavy into torture and assorted brutality. The head of that police department was none other than Interpol's man in Portugal, Col. Fernando D. da Silver Pais.

Interpol also revealed that, in Northern Ireland, it had cooperated with authorities in gathering data about terrorists, on the sur-

LATE 1930's INTERPOL ROSTER

DOW2	KOENIGS WUSTERHAUSEN, GERM.	3490 kHz
DOW2	KOENIGS WUSTERHAUSEN, GERM.	4157.4
DOW2	KOENIGS WUSTERHAUSEN, GERM.	4165
DOW2	KOENIGS WUSTERHAUSEN, GERM.	6792
HAP	BUDAPEST, HUNGARY	3490
HAP2	BUDAPEST, HUNGARY	4165
HAP3	BUDAPEST, HUNGARY	6792
OEQ	VIENNA, AUSTRIA	6792
OEQ1	VIENNA, AUSTRIA	4165
OEQ2	VIENNA, AUSTRIA	3490
SOC	KIELCE, POLAND	4157.4
SOD	LUBLIN, POLAND	4157.4
SOF	TARNOPOL, POLAND	4157.4
SOG	GOTENHAVEN, POLAND	4157.4
SOH	STANISLAV, POLAND	4157.4
SOI	POSEN, POLAND	4157.4
SOJ	LITZMANNSTADT, POLAND	4157.4
SOK	THORN, POLAND	4157.4
SOL	LOUTSK, POLAND	4157.4
SOM	BREST, POLAND	4157.4
SOU	KRAKAU, POLAND	4157.4
SOW	BELOSTOK, POLAND	4157.4
SOY	LVOV, POLAND	4157.4
SOZ	WARSAW, POLAND	3000
SOZ	WARSAW, POLAND	4157.4
SOZ	WARSAW, POLAND	6792

Here's the Interpol radio network just before and into WWII. Communications were by CW and voice (AM). Of course, not long after the outbreak of hostilities, these stations were in German-occupied territory (with the exception of some stations in Poland, which were in areas occupied by the Russians).



While it's mostly CW, RTTY, and data transmission on these frequencies, some monitors do note occasional voice traffic.

face a noble effort but out of kilter with their much-discussed Article 3—the same article that has prohibited Interpol from becoming involved in the search for Nazi war criminals, and also for the PLO terrorists who participated in the 1972 Munich massacre.

The road has continued to be rocky and strewn with detracting questions. For at least the past ten years, Interpol has received as many harsh observations from its own members as it has from outsiders.

Suspicion about Interpol has, according to one law enforcement official, reduced re-

liance upon the organization considerably. He said that only about 10% of inquiries are channeled through Interpol, with the remainder being sent directly to the nations themselves.

And yet, Interpol maintains a world-spanning communications network, one which utilizes a myriad of daytime and nighttime frequencies. One can monitor these frequencies and, at times, find them quite active with bulletins and two-way communications.

Communications include data on wanted persons, movements of various persons or drug shipments, information on major thefts, requests for information as well as bulletins and routine administrative traffic. One interesting communication noted by monitor Robert Margolis of Illinois took place during Pope John Paul's recent visit to Canada. Station XJE57, using CW on 14817.5, sent IUW81 (Rome) a list of the names of news media personnel assigned to cover the visit.

Individual nations seem to call their own shots as to the operating modes they will use. Prior to the 1950's both voice (AM) and CW were utilized. Today you can hear an occasional voice transmission, but it's mostly CW and RTTY. Primary frequencies such as 6792 and 10390 kHz are still mostly CW, and India uses CW on all frequencies. The remainder of Interpol systems are a wild conglomeration of modes including RTTY of various specifications, CW, plus direct printing TOR modes such as ARQ and FEC.

Presented here is the most comprehen-

sive roster of the Interpol networks yet compiled, including many listings never before published anywhere. It shows all known active stations and frequencies along with the transmission mode most likely to be encountered for each listing.

Note that while roughly 100 nations belong to Interpol, the accompanying list doesn't cover that many nations (including the United States). This is because not all member nations participate in the HF communications networks, relying upon other communications systems such as cable, satellite, and even the mails.

There are communications networks and there are communications networks. Chances are you'll never tune in on any which traversed the eerie route of Interpol and its networks. **PC**

Interpol Frequencies (kHz)

2840	8097.5	15502.5
3593	9105	15592
4632.5	9200	15684
4837.5	9285	15738
5208	10295	18087
5305.5	10390	18190
6792	11538	18380
6905	12224.5	19130
7401	13520	19360
7532	13820	19405
7906	14607.5	19487
7969	14623.5	21785
8006.5	14707	21807.5
8038	14817.5	24072
8045	14827	24110

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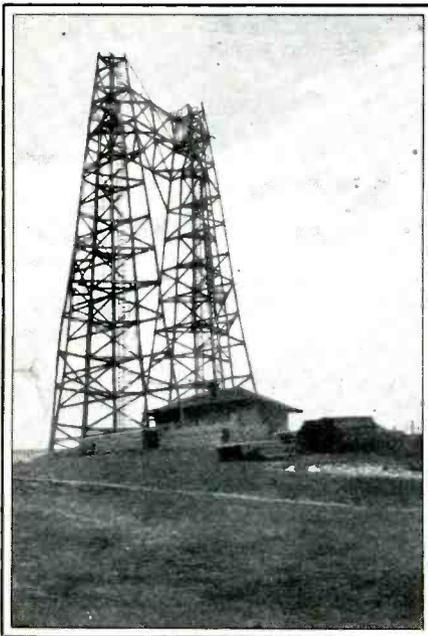
Father Murgas: Radio's Forgotten Genius



Father. Joseph Murgas (1864-1929).

Somehow, The Contributions To Early Wireless By Rev. Joseph Murgas Have Gotten Lost In The Shuffle. He May Well Deserve More Credit Than Marconi!

BY ALICE BRANNIGAN



The picture postcard that ran last December in POP'COMM actually shows the towers in a partially completed state. The tops had not yet been added.

In the December issue of *POP'COMM*, there appeared a very old picture postcard bearing the caption: "Father Murgas Wireless Telegraph Station." In researching the card, we checked the usual data sources and drew a total blank.

Yet, there was no doubt about the fact that the station did exist; those two large wireless towers couldn't be denied. But where was the station, what was the station, and who was Father Murgas? That's what we asked our readers to tell us when we ran the postcard.

Readers told us; did they ever tell us! Even though we hadn't been able to locate information on Father Murgas in a huge stack of reference books on early wireless, we came to learn that the station on the postcard was most historic and the man who designed and built it was a brilliant inventor whose many accomplishments are, today, little known outside of Wilkes-Barre, Pennsylvania.

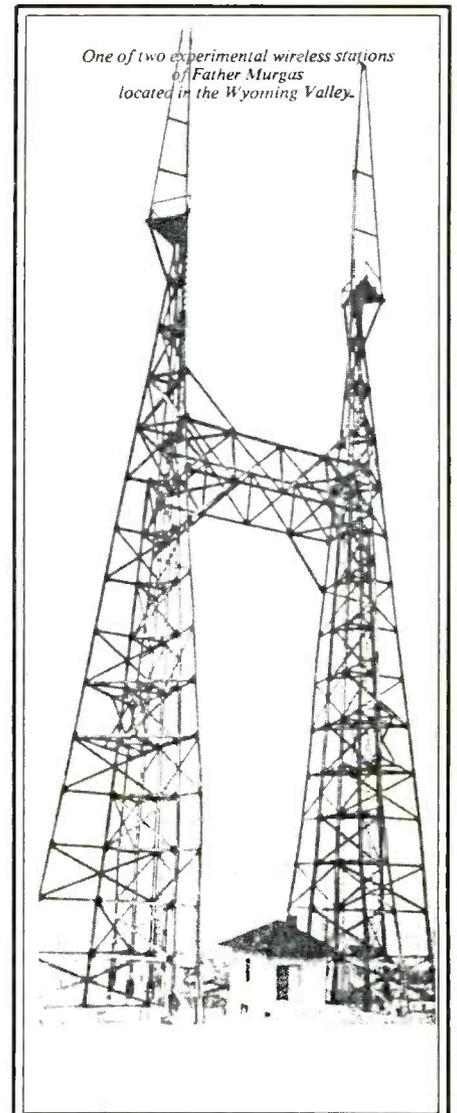
From our vantage point here at the tail end of the 20th century, and after all of the many advances in the field of telecommunications, we tend to overlook all but a few of the very highest profile wireless pioneers whose efforts were directly linked to the successful commercial development of communications, men such as Marconi and DeForest.

But in the opening years of the century, there were other experimenters whose efforts were no less outstanding than those whose names fill the history books. Rev. Joseph Murgas, for one, drew the eyes of the communications world to Wilkes-Barre, where he served for almost 35 years (until his death in 1929) as pastor of Sacred Heart Slovak Church.

Beginnings

Murgas was born February 17, 1864, in Tajov (Jabrikova), Zvolen County, Slovakia. At the age of 18 he decided to study for the priesthood and entered the seminary at Bratislava. Two years later, in 1884, he transferred to the seminary at Ostrihom where, in addition to his theological studies, he began his first electrical and wireless experiments. In addition to these efforts, he was also studying French, German, advanced physics, and astronomy. Furthermore, he was enrolled at the celebrated Academy of Arts in Munich.

Ordained in 1888, Murgas continued



One of two experimental wireless stations of Father Murgas located in the Wyoming Valley.

This is the way the completed towers looked.

with his art studies in Munich and later graduated with honors and awards as an accomplished painter. He continued with his electrical and wireless experiments and even enrolled at the Electrical College of Vienna as an advanced student.

Murgas also had a number of very strong political opinions, and he was an ardent patriot and student of the lives of the many Slovak figures who fought for freedom from the clutches of Hungary for almost 1,000 years. This topic was the focus of many of his most famous paintings.

Because of his wide recognition in the arts, Murgas was asked by the Hungarian government to evaluate a contemporary painting which was to be displayed in the Hungarian Parliament. This painting depicted the occupation of ancient Slovakia by the Magyars in the year 907, obviously a sore point with the intensely nationalistic Murgas. He felt that the painting failed to depict the event with honesty and promptly characterized the scene as a "tragic misrepresentation," further denouncing it as unworthy of art.

It was not what the Hungarian government wanted to hear. He was charged with disloyalty and also of having proven himself as having anti-government tendencies. Under Hungarian law, he was obligated to leave the country, and thereupon departed for the United States, arriving April 6, 1896.

It wasn't long before he was assigned to a church in Wilkes-Barre, which was newly constructed. He became the driving force in expanding the influence and services of this church, established several Slovak-American organizations, and still found time for painting, fishing, collecting butterflies and moths, botany, and, of course, his experiments with wireless.

Wireless Experiments

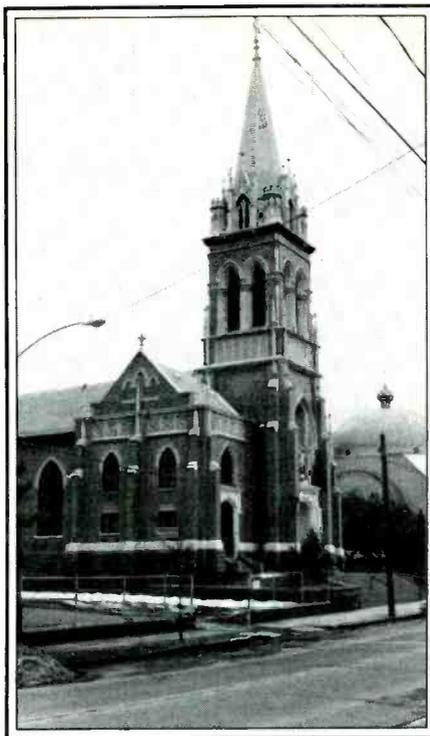
In 1898 Murgas built a small laboratory in the parish house and developed a system of communication based upon two high-frequency tones (tones of different pitch), one tone representing (and in common with) the Morse code "dot" and the other the "dash."

This permitted faster transmission speeds than the Marconi system. Murgas transmitted his signals via rotary spark, with the signals fed into a single pole antenna with a distributing arm at the top, from which wires extended.

In 1904 Murgas had obtained U.S. Patent #759,825 ("Wireless Telegraphy Apparatus") and #759,826 ("Method of Communicating Intelligence by Wireless"). These patents were sold to the Universal Aether Company of Philadelphia.

The Murgas Tone System was eventually covered by no less than 17 patents. The Universal Aether Company was actually a group of financiers who wanted to market the Murgas invention. This syndicate spent about \$25,000 for 200-foot transmission towers in North Wilkes-Barre and ones 19 miles away in Scranton. Nothing like these towers had ever before been constructed.

The towers were first tested on April 27 of



The Sacred Heart Church in Wilkes-Barre. (Photo by Ed Shedlock)



In front of the Sacred Heart Church is a plaque dedicated to Father Murgas. The plaque reads, in part, "... in the early days of radio communication, he created and developed to practical use a major advancement in the air that opened the way to improved and dependable radio transmission over great distances."

1905. Several prominent community leaders, as well as a representative of the U.S. Navy, were present. The first official test and public demonstration was offered on November 23, 1905. It was an event that received national media coverage because it attracted members of the scientific community, the government, and many residents of the area.

The results were stunning. For one thing, they proved the practicality of wireless transmission at long distances over land; they also introduced Murgas' superior method of telegraphy. The tests went without a hitch and Murgas was able to send his traffic at 50 wpm (the Marconi system ran at 15 wpm).

Lt. Cmdr. Samuel S. Robinson, USN, witnessed the tests and reported them "most satisfactory," noting that Murgas had the best system of wireless transmission—one which threatened to revolutionize world communications.

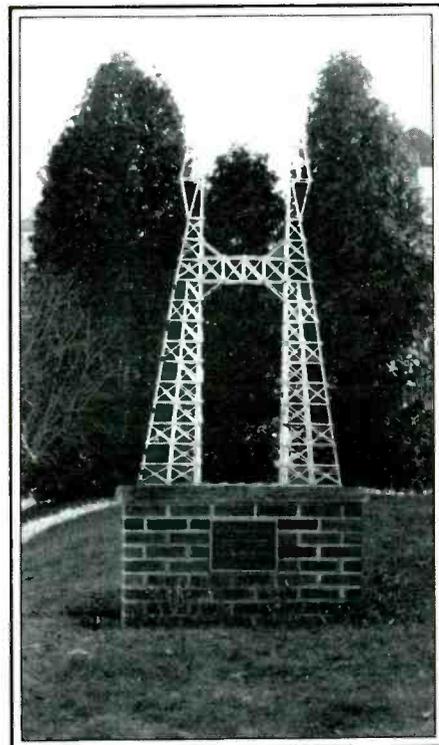
The problem here was that our government had already entered into contracts with Marconi (as did other governments) and had purchased millions of dollars' worth of Marconi equipment.

Adoption of the Murgas system would cause a lot of money spent on Marconi apparatus to be considered as "wasted." The question was would international financiers allow this to take place. The Universal Aether people felt that they could do battle with those forces only if they could match their wealth. That was a major obstacle.

In the meantime, Murgas journeyed to New York to meet with other wireless pioneers. This included Marconi and his associate, Fessenden. Marconi was so impressed with Murgas' inventions that he went to Wilkes-Barre to see them.

Gordon Shook, of Wilkes-Barre, recalls that he was 16 years old at the time and had become interested in wireless. He was also curious about the Murgas station, so he paid the inventor a visit. Murgas invited him in and asked Shook to describe his own station. He then took young Gordon on a tour of the station and explained the importance of his ground system (it consisted of six buried steel containers filled with water connected to his wireless apparatus).

Murgas also took Gordon into an underground laboratory he had built in order to conduct an experiment for General Electric. This experiment was to develop an auto-



Model of Father Murgas radio towers which stands near the site of the original station. (Photo by Ed Shedlock)

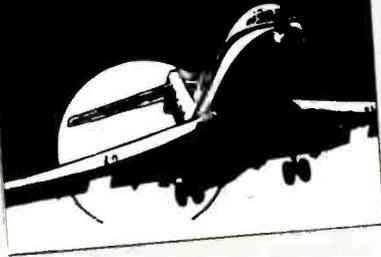
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Murgas Messages Reenactment Slated

One of the more unique events on the calendar of activities of the Luzerne County Bicentennial Commission is planned for late November. One of the more unique the original Murgas messages. David Watkins will supervise the transmission from Wilkes-Barre.

A separate transmission and reception center will be set up at the Sheraton Hotel, Scranton.

Under the leadership of Murgas Amateur Radio Club, a reenactment of one of the first transmission and receipt of messages by wireless communication overland will be held Sunday, Nov. 23 at 2 p.m. at the Sacred Heart Church, 601 N. Main St.

The event will mark the 70th anniversary of the initial transmission by Father Joseph Murgas, a pioneer in the field of wireless communications. As outlined by the Murgas Commemorative Committee under the direction of David Watkins, the Nov. 23 event will faithfully duplicate the actual event by including message transmission by the mayors of Wilkes-Barre and Scranton, the pastor of Sacred Heart Church and the Bishop of Scranton, as well as other local and national dignitaries. The messages transmitted will be sent in English, Slovak, Polish and Latin as were the original Murgas messages.

Murgas Radio Message Will Be Transmitted

One of the more unique events in the calendar of activities of the County Bicentennial Commission is now being planned. Under the leadership of the Murgas Amateur Radio Club, a reenactment of one of the first transmission and receipt of messages by wireless communication overland will be held Sunday, Nov. 23, 1975. The reenactment will be held at Sacred Heart Church, 601 North Main Street, Wilkes-Barre. As the original event, it will be held at 2 p.m. in the school auditorium. This will mark the 70th anniversary of the initial transmission by Father Joseph Murgas, a pioneer in the field of wireless communications. As outlined by the Murgas Commemorative Committee under the direction of David Watkins, the Nov. 23 event will faithfully duplicate the actual event by including message transmission by the mayors of Wilkes-Barre and Scranton, the pastor of Sacred Heart Church and the Bishop of Scranton, as well as other local and national dignitaries. The messages transmitted will be sent in English, Slovak, Polish and Latin as were the original Murgas messages.

As a faithful duplication of the 1905 event, a separate transmission and reception center will be set up in Scranton at the Sheraton Hotel. Stanley Gritsevich, cochairman of the Commemorative Committee, will man the Scranton station. The Sheraton Hotel is located on the former site of a radio tower used in the 1905 event.

Following the message transmission and the presentation of several commemorative plaques, and address will be given by Commander Jerald A. Copple, USN, representing the Chief of Naval Operations (who was present at the original transmission). A social hour will conclude the event at the Sacred Heart School.

The coordinator of this event for the County Bicentennial Commission is Miss Mary Barrett, Chairman of Heritage '76 Committee. She has been assisted by Watkins, Gritsevich, and Reverend Charles J. Hooker Jr., President of the Murgas Amateur Radio Club.

In 1976, Murgas' early transmissions were impressively recreated during the Bicentennial celebrations.

matic switching system for trains and street cars and consisted of a large generator running about 100 light bulbs.

Gordon recalls that the next day Marconi showed up for his visit and Murgas introduced Gordon as his "2nd hand Secondary Engineer." Marconi told Murgas that his experiments in Europe were successful with messages going across water but that he was not very successful with signal propagation over land. Murgas seemed dumbfounded since he had no problems at all with sending signals over land and had been communicating this way for months!

Marconi stayed a few days and then returned to Europe.

Gordon's station was able to communicate with Father Murgas' station, and their network was soon expanded when "Pop"

Stenger from South Wilkes-Barre got on the air. Pop and his son erected two poles with an antenna wire strung across and became active on the air. The government had installed a carbon-arc transmitter at Murgas' station and experiments continued.

Problems

The original problem of making all of this a marketable product still loomed over Murgas and the Universal Aether people. By 1907, Murgas had been able to send speech over his station by modification of his tone system. These experiments were witnessed by a number of people. Unfortunately, Universal Aether did not have the resources available to finance any extensions in speech transmission. The company was al-



The Murgas Amateur Radio Club honors the memory of the cherished priest, scientist, and inventor.

ready dissolution by the domination of Marconi's enterprises in the field of wireless.

Fate also participated in the matters at hand. The Scranton station was destroyed by a storm. Not only that, two of the most important backers of Universal Aether suddenly died. These factors contributed to Universal Aether's abandonment of Murgas.

Marconi and Fessenden, of course, had known of Murgas and his experiments before they came to America. In fact, Marconi came up with what he called "improvements" to Murgas methods and termed it the "Sonorous System." Fessenden's version was called "The Tuned System."

Murgas, for his part, continued his efforts on a much reduced scale.

Long after Murgas' original work on the high frequencies required for producing the tone effects, both Marconi and Fessenden entered the commercial market with their respective systems. Thereupon followed a complex chain of lawsuits between Marconi and Fessenden over who had invented the tone method based upon high-spark frequency. The usual case was for Fessenden to sue Marconi and the cases bounced back and forth through many courts for a number of years. Eventually the U.S. District Court (Southern District of New York) ruled that neither one of the two had invented the high-spark-frequency required in tone transmission. Murgas was named as the originator of the invention, which was being claimed by both.

Father Murgas died on May 11, 1929. His life and work did not go without recognition. In 1939, on the tenth anniversary of his death, the Independent Slovak Republic named its only broadcasting station after him and also issued two postage stamps in his honor. The stamps depicted his Wilkes-Barre radio towers and called him a pioneer in wireless science. During WWII an American Liberty ship was named after him. Even before his death he was not forgotten: President Coolidge appointed Murgas as a member of the National Radio Commission.

Today, he is still remembered fondly by the people of Wilkes-Barre. The Murgas Amateur Radio Club (established in 1975)

exists in Wilkes-Barre. Bob Nygren of the club advises that during the 1976 Bicentennial Celebration, members of the group recreated the famed 1905 experiment.

A plaque and monument (consisting of a miniature reproduction of Father Murgas' station) stands near the original site of the Wilkes-Barre towers. Furthermore, King's College in Wilkes-Barre maintains a considerable amount of Father Murgas memorabilia and the institution also offers The Reverend Joseph Murgas Program In Communications Studies.

In Retrospect

Here, in 1985, Father Murgas' inventions are still regarded as brilliant and ahead of their time. It was a peculiar set of circumstances that prevented the Universal Aether Company from evolving into RCA or AT&T.

And what contributed to the eventual obscurity of Murgas himself outside of his adopted hometown? Fate? Misfortune? Misadventure? Certainly his work, as well as the man himself, deserves a prominent place in telecommunications history.

The author wishes to sincerely thank the following persons for their information and advice in the preparation of this remembrance of Father Murgas: Ed Shedlock, Wilkes-Barre, PA; Gordon Shook, W3SZ, Wilkes-Barre, PA; Father Tom Carten, K1PZU, King's College, Wilkes-Barre, PA; Leo Kalinosky, KB3SK, Pt. Matilda, PA; Bob Nygren, WA3YON, Wilkes-Barre, PA.

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Exploring The Unknown

Unshackle Yourself From Broadcast And Two-Way Voice Communication DX—There's Lots More To Hear, Like SITOR, RTTY, TOR/FEC!

BY E.R. HOWARD, KNJ2MX

Many of us "grew up" in shortwave monitoring the two basics—international broadcast DX and two-way communications stations in services such as aeronautical, maritime, overseas telephone. Some of us expanded our horizons into the next logical area, code (CW) DXing.

Trouble is that a great many monitoring enthusiasts haven't kept up with the communications explosion. As a result, they are still devoting the lion's share of their commu-

nications tuning this same limited group of stations while simultaneously ignoring stations using more sophisticated operating techniques.

Fact is that many of the old two-way communications reliables just aren't around anymore, having been replaced by satellite technology and other more rapid, reliable, and error-free modes. That's what happened to the glut of "voice mirror" stations you could hear from all over the world a few

years back down the line. Many CW stations have also vanished from the airwaves, victims to satellite technologies and to data transmission systems.

As I mentioned, if you, as a monitoring enthusiast, haven't made some effort to expand your options so that you can follow the communications parade, then you're in the same fix as those DXers who were still monitoring with AM receivers long after most voice communications switched over to

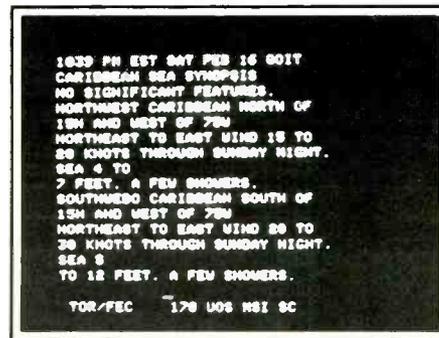
The Info-Tech M-600 opens up a whole new world of DX.



Close-up of the M-600's operating panel.



This is a TOR/FEC transmission of a weather forecast.



SSB. Today, when we see old reliable denizens of the airwaves sadly closing up shop (such as coastal telegraph station WSL, which was on the air for decades), it becomes all too apparent that utility DXing has changed to the point where a "barefoot" communications receiver will still bring you plenty to enjoy—but also a myriad of strange sounding signals that can't be understood without some additional hardware.

If you've done any amount of tuning, surely you've heard strange *blip-blip* signals, or the one that sounds like a squeaking wheel constantly turning 'round and 'round. Any true-blue "ute" monitor is sure to wonder what kind of information is being sent out by these stations; and there may well be some puzzlement about how one might tap into that information.

The Squeaky Wheel

The signal, for instance, that sounds like a squeaky wheel is most likely radiofacsimile, better known simply as FAX. This is a method of sending something graphic by means of radio. The graphic item could be a news photo or a weather map, or even a document containing a chart. For making sense out of such a signal, you're going to want a FAX recorder.

The Alden Electronics' Weather Chart Recorder kit not only records FAX weather maps, but also weather satellite cloud cover pictures as transmitted by numerous FAX services.

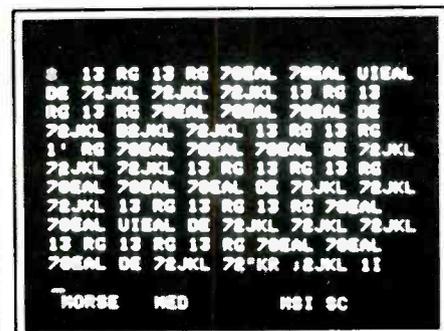
With a FAX recorder plugged into your receiver, you get to see what they're sending out from juicy DX stations such as BAF36, Peking, PRC (8120 kHz); SUU2, Cairo, Egypt (10123 kHz); RDD78, Moscow, USSR (10980 kHz); and JMJ4, Tokyo, Japan (14692.5 kHz). Actually, there are hundreds of FAX stations in operation and it's becoming one of the new-breed DXing specialties.

The address of Alden Electronics is Washington Street, Westborough, MA 01581.

CW Reception

The most basic form of non-voice message exchange is by Morse code—CW to those in the know. While it's true that most hams and many SWLs can copy CW, and that the number of non-ham CW stations

Here's the M-600's readout of a CW transmission from mystery station 7ZJKL.



Alden Electronics offers this FAX receiver providing 120 scan-per-second reception of weather maps.

just isn't what it used to be (with the possible exception of the maritime frequencies), one problem is that most ops can't wrestle with the transmission speeds often encountered. It's one thing to copy 15 words-per-minute, but quite another to try to make sense out of 50 or 120 wpm machine speeds, and that's what you might encounter on shortwave.

One way of addressing one's self to these stations is with a receiver accessory designed to translate all of the *di's* and *dah's* into something you can understand. For the most part, CW reading capabilities are included in the design of various equipment produced for the purpose of reading radioteletype.

RTTY

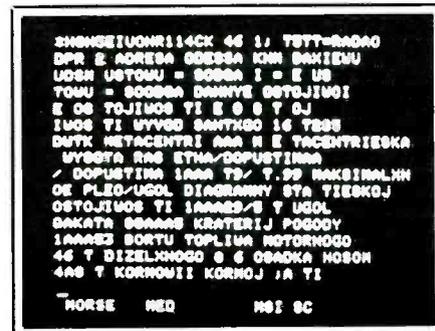
Those *bleep-bleep-bleep* sounds you hear are probably radioteletype, commonly known as RTTY (pronounced "ritty"). RTTY is, in a very general way, similar to CW. That's to say that it's a non-voice method of sending text, but faster than with CW, and you can't copy the messages without some sort of a receiver accessory.

RTTY stations are plentiful on the short-wave frequencies and they include military, weather, press, diplomatic, spy, federal, aeronautical, maritime, and many others. While many stations transmit encrypted messages that you'll never be able to comprehend, you should be able to understand the transmissions of about half the stations you'll pick up.

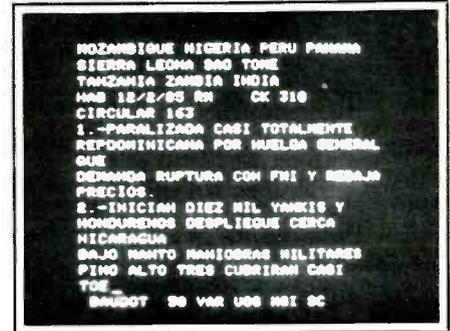
Most RTTY stations utilize a transmission format (code) known as *Baudot*, a system that calls for each character to be made up of various combinations of so-called *mark* or *space* bits, 5 to the character. The transmission speed can vary from station to station, usually (but not necessarily) at standardized speeds of 60, 66, 75, 100, and 132 wpm (in RTTY terminology, this translates to 45, 50, 57, 75, and 100 baud).

Another RTTY transmission variable consists of the bandwidth of the carrier (signal)—that is, the frequency space between the *mark* and the *space*. This bandwidth is known as the *shift* frequency. Standard shifts encountered are 170, 425, and 850 Hz. Sometimes the *mark* signal is allocated the high-frequency end of the shift (with the

CW message from a Soviet ship.



RTTY bulletin from Havana.



space at the low-frequency spot), but some stations are set up for the *mark* and *space* in the opposite positions. Virtually all RTTY "machines" or readers have a switch marked "normal" and "reverse" to permit the user to receive RTTY sent in either phase.

One quickly learns that while stations transmitting RTTY have available for their use a wide assortment of baud rate, shift, and phase combinations, stations in certain categories stick within preferred formats.

For instance, hams use a 170 Hz shift combined with 45 baud. Press stations prefer 425 Hz shift with 50 baud for sending their news texts. Weather broadcasts are usually sent at 850 Hz shift, 75 baud.

Press stations are especially interesting to monitor, presenting all manner of official and unofficial news stories (often in English) at least a day ahead of local newspapers. Best of all, these stories are often so packed with wall-to-wall propaganda (invariably edited out by the American news media) that they become hilariously funny. An especially good contender along these lines is the TASS news from Moscow, sent out in English at 1300 GMT on 14928 kHz at 425 Hz shift, 50 baud, normal phase.

RTTY Hardware

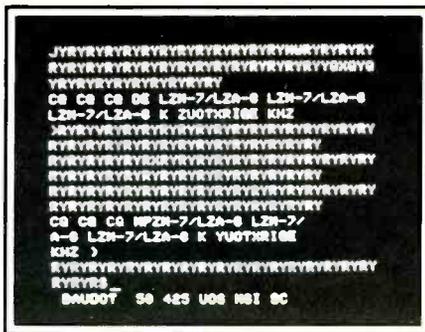
The array of equipment offered to monitors in order to pick up RTTY and CW transmissions and turn them into visual matter is most impressive and covers a wide range of prices and sophistication. All of these units attach to a receiver right at the audio output jack or terminals and none require any special skills, tools, or knowledge of electronics. The only real requirement is that the receiver be stable (drift free), able to switch to USB/LSB/CW modes, and of reasonably good quality. A broadcast-type receiver not intended for communications use won't produce suitable results.

The most basic units are called "readers." These are self-contained devices that display the RTTY or CW text in a moving billboard LED format containing 6, 8, or 32 characters.

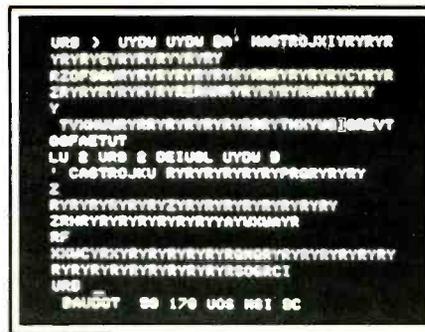
There are now RTTY/CW computer interface devices that permit the monitoring enthusiast to feed the receiver audio into all popular home computers (with the aid of the proper software).

Finally, there are so-called *dedicated units*, which are self-contained devices that display the received texts on a video monitor and may be able to work into a printer in order to produce a hard-copy printout. They can also be used to feed into a computer for text storage and/or analysis. These are the most sophisticated of the various units and at least one such unit can also permit reception of a number of transmission modes other than CW or regular RTTY.

All of the various RTTY reception units can be set up for reception of various CW speeds as well as RTTY reception at the standard shifts and baud rates. Many can also permit reception of ASCII transmissions, although (with the exception of some use on the ham bands), it is thusfar in only



Station LZM7/LZA8 in Bulgaria sending a test slip via RTTY.



A Soviet ship calls coastal station URB2 using RTTY.

very limited use. ASCII is a 7-bit format with baud rates between 75 and 1200.

For further information on various types of CW/RTTY receiving accessories to use with communications receivers, check with your shortwave equipment dealers, or contact the following: Microlog Corp., 18713 Mooney Drive, Gaithersburg, MD 20879; HAL Communications Corp., Box 365, Urbana, IL 61801; Universal Shortwave, 1280 Aida Dr., Reynoldsburg, OH 43068; Kantronics, 1202 East 23rd St., Lawrence, KS 66044; Advanced Electronic Applications, P.O. Box 2160, Lynnwood, WA 98036; and Microcraft Corp., P.O. Box 5130, Thiensville, WI 53092.

Still More Unusual Signals

Transmissions you'll monitor other than regular CW and RTTY are also to be encountered on shortwave these days, although their reception is generally not addressed by the majority of equipment on the monitoring marketplace. One commercially available unit, the Info-Tech M-600 Multi-Mode Decoder (distributed by Universal Shortwave in Ohio) is a dedicated unit capable of a truly heroic range of achievements.

The M-600 will let you copy CW being sent as fast as 120 wpm, as well as ASCII, plus RTTY at all standard baud rates and shifts. More than that, it can be set to receive non-standard shifts lying anywhere between 85 and 1200 Hz.

That's not all it can do.

One of the types of RTTY signals that can't normally be unravelled with standard units is known as *bit inversion*. This is a transmission mode intended to offer a measure of privacy to the users of the system. Such transmissions read out as *garbage* on a standard RTTY unit. This is because out of the 5 bits that comprise each Baudot character, one or two of the bits are phase inverted (a/k/a *upside down*). There are 32 possible combinations of bits to achieve this type of privacy. Among those utilizing bit inversion in their RTTY communications is the FCC. The M-600 can unravel bit inversion transmissions, and it will analyze the incoming signal by scanning each of the 32 possible combinations until it finds the correct key.

Bit inversion traffic has been noted on the following frequencies: 2295, 5133,

5372.5, 7603.5, 10655, 10902, 13493, 13830, 13990, 18050, 19230, 22964, and 23055 kHz, among others.

Another type of signal the M-600 will unravel is called TOR, which comes in two varieties. TOR stands for *Teletyping Over Radio*, and the TOR/ARQ variety offers *Automatic ReQuest for repetition*. These signals are the strange ones that sound like an endless series of CW *dah's*, sometimes noted with an echo-like ping.

I had heard these odd *blips* for years, but never knew what they were until I let the M-600 have a go at them. Mostly (on the bands specified above), these are telegrams and telexes going to and from ships at sea—cruise liners, freighters, tankers, oil drilling rigs, etc.

These messages consist of business and personal telexes to and from officers, crew, and passengers. Possibly the cruise line is bawling out a cruise liner Captain for serving too much free champagne at a particular social gathering, or maybe it's the Head Chef complaining to the ship's owners about problems with the food (too little, "funny tasting," or opening a container only to find the incorrect item). One time a cruise ship was trying to get instructions on where to disembark the remains of a passenger who

4170 to 4180 kHz	Ship
4219 to 4357	Coast
6256 to 6269	Ship
6325 to 6506	Coast
8297 to 8300	Ship
8343 to 8358	Ship
8435 to 8718	Coast
12491 to 12527	Ship
12652 to 13100	Coast
16660 to 16705	Ship
16859 to 17232	Coast
22192 to 22227	Ship
22310 to 22594	Coast
25090 to 25760	Ship

Although RTTY, TOR/ARQ, and FEC traffic can be found in many areas of the shortwave spectrum, the maritime frequencies carry an especially heavy load. The above chart shows maritime frequencies, which reveal considerable activity in these modes.

```

BAUD = 90
EL ESINO NO SE OVE ESTA ENTRE
CAMAGUY Y LOS FONDISTAS **
EL REJON ...
COMO OMO NO ...
MABLE CON ...
BIEN Y ...
OKK
JAJAJA ...
ESTE DE J ...
MAY
LINO
BUENO ...
Y LA ...
Y ...
BAUDOT 50 423 UOS HSI SC

```

A Cuban RTTY operator sending a personal message.

```

50 ALEXANDER ULKHOMU LNE...
126 UI UVA IPPV
LEHNINGRAD 513 ZAMEVSKIJ 59 KU
S WALDINGJ.
499.7)X0 ZUMHIL SUBBOTU SNEADACATK
PRINDOIN ROTTERDAN UOSKRESEHKE
LEHNINGRAD UIDING 84 THE(1)38
BOLKES' UOEN PRISTY SKOROJ
METREKS KREPKO ELU4.
0-8- UOLDO8
50 ALEXANDER ULKHOMU...
178 UR SUPV IPPV
3.0.64-0 237 SEVRCYJ 63/2 KU
50 AZAMASK(9)
-372.499.-1 ZANTRA PRINOK
RD
BAUDOT 50 170 UOS HSI SC

```

An RTTY message from a Soviet ship.

```

A CAMPAIGN, BUT SAID MILITANT
ROMAN CATHOLIC PRIESTS ARE VICIOUSLY
ATTACKING THE COMMUNIST
SYSTEM AND FACE POSSIBLE LEGAL
SANCTIONS. JERZY URSINI TOLD
HIS
WEEKLY NEWS CONFERENCE THOSE
PRIESTS RIGHT FACE LEGAL ACTION.
WASHINGTON -- SENATOR BARRY
GOLDWATER, CHAIRMAN OF THE SENATE
ARMED SERVICES COMMITTEE, HAS
PROPOSED CUTTING PRESIDENT REAGAN
DEFENSE BUILDUP BY 33 BILLION
DOLLAR OVER THREE YEARS AS PART
OF
TOR/ARQ 170 UOS HSI SC

```

A news broadcast in TOR/ARQ mode.

had suddenly passed away "in the midst of our masquerade party." There is no shortage of very strange messages to sort through in this mode!

Another TOR variety that the M-600 tackles is called *Forward Error Correction* (TOR/FEC). This is a steady stream of data (as opposed to the *dah-dah-dah* pulsed sound of ARQ). It has a different sound than RTTY and once you come across one of these signals, you'll immediately notice the difference. It's quite unique. While TOR/ARQ is generally used for two-way communications, TOR/FEC is most often used for one-way broadcasts such as news and weather directed at ships on the high seas.

On Sunday evenings around 0000 GMT, there are a number of TOR/FEC signals in the 8705 to 8718 kHz region. One transmission comes from WLO in Alabama and consists of numerous news items as well as sports scores. It even has Wall Street prices, precious metals prices, plus worldwide city-by-city weather information. Essentially, it's a complete newspaper!

Soviet Stuff

The M-600 is able to copy RTTY signals from Soviet stations even though they are often sending in a system known as 3rd-register Cyrillic. Of course, the language is Russian, but your view screen displays it in the Latin alphabet so you can read (even though not comprehend) the texts.

There are loads of coastal stations and ships using this system, mostly at 170 Hz shift, 50 baud, normal phase. Typical stations being copied using this system include Moscow on 6270 kHz (meteorological data around 0130 GMT), and Kaliningrad on 16696 kHz (noted with traffic at 1340 GMT). The Soviet freighter *BOIEVAIA SLAVA* (callsign UGNK) was copied today sending meteo data in RTTY on 8300 kHz at 0230 GMT.

As you can see, there are many layers of pristine DX out there just waiting to be explored. Regardless of the receiver accessories and code-breakers you can get, you're not going to be able to attack and conquer each and every unusual non-voice transmission you encounter while wandering through the kHz. I'm still watching some of the elusive mystery sounds that have

thusfar defied all attempts to crack their messages. Some of those I've been watching with a suspicious eye include those on 2226.6 kHz (3 *di*'s and a *dah*) around 0300 GMT; 4707 kHz around 0200 GMT (pulses); 7471 kHz around 0445 GMT (a buzz); 8080 kHz around 0000 GMT (a warble); 8100.5 kHz around 0000 GMT (pulses); 11261 kHz around 2145 GMT

(data pulses); 11482.5 kHz around 2145 GMT (type of multiplex).

Oh well, maybe in a few years we'll be able to copy *everything*. For now, however, the equipment is available to peer into the communications traffic coming from plenty of newly found stations—certainly enough to keep me out of trouble for quite a while. Hope you'll join me!

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Wireless Security Is Coming Of Age

BY DAVID GOTTLIEB

Radio communication is becoming an increasingly popular tool in the security business. On yes, there have been wireless security systems for quite a while; but not those that approach or equal the quality of a traditional hard-wire system.

Since the beginning of the 20th Century, alarm systems have been installed in millions of residential homes. The majority and best of these are hard-wire systems. This means that wires must be snaked through the walls of the house. A typical installation of this type could cost \$2,000 to \$4,000, mostly due to installation labor costs. Quite a lot of money, and apparently enough to discourage the majority of homeowners from purchasing one.

Now with recent technological innovations and FCC frequency allocations, the wireless residential security system can equal the safety that a hard-wire system can provide. And it can do that at half the cost. An installation that formerly took three days with a wired system can be completed in one day with a wireless system.

A wireless security system uses virtually the same detecting components that a hard-wire system would have. The major difference is that these components all include low-power radio transmitters. Each of these devices (transmitters) are responsible for protecting a specific area or door/window. Every one of these transmitters contain a battery that will last approximately one year.

A planned combination of these detective transmitters placed strategically in your home will provide you with some hefty protection. This protection can include door or window transmitters, PIR (Passive Infrared) motion detectors, smoke detectors, gas detectors, and a hand-held panic button. You can even have a wireless portable console to operate most of the functions of the system.

Where there are transmitters, of course, there is a receiver. This is a bulky cabinet hung in a closet near the entranceway, and it is usually wired to a device called the security console. The security console contains the keypad that allows you to arm/disarm (turn on and off) the system, as well as perform the rest of the functions. It also reads out the information you need to operate the system. The receiver/security console connection and the siren are usually the only wiring necessary.

The system I have described above is basically an outline of the Alert II from the Alarm



Alert II Wireless Security System from Alarm Device Manufacturing Company (ADEMCO).

Device Manufacturing Company (ADEMCO) of Syosset, New York. Additional advanced wireless systems are produced by other security companies, who like ADEMCO only sell to their professional security dealers. A system like the Alert II has greatly simplified installation, but it is still primarily installed by alarm professionals. It could probably be installed by a handy homeowner, but these

companies prefer to have dealers do it—and rightly so, because an improperly installed alarm system can provide a false sense of security.

Wireless security should not be used in all situations. Although the vast majority of homes are acceptable for wireless, there are those exceptions. With ADEMCO's Alert II, the installer can test a home before any in-

The premises being protected need this equipment for long range radio alarm communication—a transmitter, antenna, and an interface between the security system control unit and the transmitter.





The transmitter/receiver console for a central station.

stallation has begun. An "installation aid" allows a transmitter to send a field-strength signal to a portable FM radio. This allows instant testing of transmitter locations, and will indicate the home's acceptability to radio propagation. Inches can mean all the difference in the world for transmitter location. The transmitters must be kept away from large metal objects and devices that radiate EMI (Electro-Magnetic Interference). Partially for these reasons, a wireless system is not recommended for commercial applications.

What advantage does this type of system have over the low-cost, do-it-yourself wireless devices that are sold in electronic stores and discount shops? The most important advantage is a feature called "Supervision." Supervision is communication at regularly timed intervals between each transmitter and the receiver. If there is a fault or low battery in a specific transmitter, the security console will tell you before long, and pinpoint the exact location of the trouble. The security console will even let you know if a window or door is left open, and which one(s). Any system without the supervision feature is considered "a toy" by alarm professionals. There has to be a way to tell if something is not functioning, or else your system, and of course your premises, are vulnerable.

These transmitters operate in the range of 300-400 MHz. For example, the ADEMCO Alert II operates on 345 MHz. Let's take a look at the various messages that are transmitted over these frequencies.

House I.D. This message identifies itself as being part of your system as a whole. Each transmitter must be set to the same house code, and at one in which the receiver is adjusted to accept. Of course, this makes it highly unlikely that a neighbor's system will erroneously communicate with yours.

Transmitter I.D Because this is a supervised system, each transmitter must have its own code and send a message that distinguishes it from the other transmitters.

Channel I.D. This message will inform the receiver of the specific transmitter's purpose. Does it protect against fire, emergency, break-in at the main entrance (entry/exit), perimeter or interior alarm? The type of alarm that is generated will affect the kind of response initiated.

Low Battery Each transmitter sends a message that will inform the user of a low battery a few weeks before it is too weak to operate.

Supervisory And Alarm Transmissions Each transmitter is designed to report its status periodically. It will also send the message when an alarm device is triggered.

All of the data that is transmitted to the receiver can be nothing more than a series of 20 binary digits on a carrier wave. The receiver must be able to interpret these rapid pulses into meaningful information. It does this with a PROM Microprocessor, which has been custom programmed for the residence.

After the installation plan is known, the installer can use an ADEMCO 690 PROM Programmer to design a custom chip. Every aspect of the installation is programmed, including the "Master Access Code"—the series of numbers the resident punches in to gain access. With this information stored permanently on the chip, it can readily interpret the codes that it receives, and report "Trouble" when it does not receive.

The following are just some additional important features of an advanced wireless alarm system.

- **A Babysitter Code:** A code that can be given to household employees and visitors. It can be changed or eliminated at any time. The Master Access Code's secrecy is never violated.
- **Ambush Digit:** A pre-programmed special digit that can be entered with the Master Access Code. It will send a silent alarm to a Central Station. It is used in cases of duress.
- **Home/Away Feature:** This allows the system to cancel interior protection (motion detection) when you are home. In the away mode, all forms of protection are on.
- **Alarm Memory:** The alarm message will be stored in memory until you arrive home and can attend to it. If a false alarm occurs, it can be easily traced.

That is how short-range communication is being utilized in the security industry. But recent events have reinvigorated long range radio (LRR) as a viable means of communication between the home or business and the monitoring central station.

To date, the primary method of establishing communication between the alarm system and the central station has been by phone line. If a homeowner chose to be monitored by a central station, a device called a "Digital Communicator" could be hooked up inside your receiver/control unit. Remember, that's the bulky cabinet that hangs inside your closet. Or, a tape

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460.925*	460.9125	456.925*	465.9125
460.950*	460.9375	465.950*	465.9375
460.975**	460.9625	465.975**	465.9625
461.000**	460.9875	466.000**	465.9875
	461.0125		466.0125

Frequencies in Megahertz

Remote Transmit	Master Transmit	Master or Remote
928.0125	952.0125	956.2625
928.0375	952.0375	956.2875
928.0625	952.0625	956.3125
928.0875	952.0875	956.3375
928.1125	952.1125	956.3625
928.1375	952.1375	956.3875
928.1625	952.1625	956.4125
928.1875	952.1875	956.4375
928.2125	952.2125	
928.2375	952.2375	
928.2625	952.2625	
928.2875	952.2875	
928.3125	952.3125	
928.3375	952.3375	

* Available to listed central stations only within urbanized areas of 200,000 or more population.

** Available to listed central stations only nationwide.

Frequency allocations for long range radio alarm transmissions.

dialer could be used. Either way, they both are reliant on dedicated, leased lines from the telephone company.

The use of telephone lines has generally served very well, but not without any disadvantages. High cost is a major disadvantage that is getting worse all the time. The cost of leasing these telephone lines has become expensive, and consequently alarm people

want to cut their reliance on the telephone company. Studies show that less than 2% of intruders cut telephone lines, and even then the central station should be able to detect the line cut. Despite this, many people would like a back-up protection to the telephone, especially in critical situations. It is also not feasible to have these telephone lines in some locations.

For the past decade, a perennially cluttered frequency spectrum has kept LRR from fulfilling its promise. And now, just recently, the FCC has allocated fourteen exclusive pairs of frequencies in the 900 MHz band. This allows the central station to have an exclusive frequency for 70 miles in every direction from the antenna tower. The transmission/reception range is 25 to 30 miles. FCC regulations as to power output and antenna height/placement have been drastically reduced.

To date, most LRR transmissions appear from 138-174 MHz and 450-470 MHz. Primarily, these are one-way systems and essentially non-supervised. A small transmitter located in the subscriber's premises activates when the receiver/control has an alarm condition. These transmissions can go directly to the central station or indirectly by repeater station.

With the 900 MHz exclusive frequency assignments, supervised two-way systems are close to being reality. It will operate with a "polling" technology. This means that the central station sends out a signal that periodically interrogates a subscriber's alarm system. Of course, the subscriber must now have a transceiver. This polling might take place every 60 to 90 seconds—often enough to receive fairly quick notification of an alarm. With some systems, an immediate signal is transmitted when an alarm occurs. In this case, the polling would not have to be as frequent.

It appears possible that as many as 5,000 subscribers (two way) can be monitored on a channel. That can mean a nice amount of revenue for a central station owner.

As you can imagine, these frequencies are becoming increasingly difficult to get assignments for. This is true especially in larger metropolitan areas. If the past is any indication of the future, telephone line rate increases will continue and long range radio equipment costs will come down. If this does happen, long range radio may increasingly become a viable, if not preferred, alternative.



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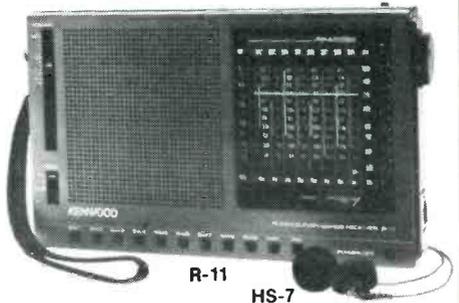
SP-100

R-1000

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PRODUCTS

REVIEW OF NEW AND INTERESTING PRODUCTS



Monitor Station Registry

For the past 15 years, CRB Research has been providing a registry service for communications monitoring equipment users. Registered monitors are assigned an individual monitoring registration that is useful in using on QSL cards, in monitoring reports, and correspondence to publications, manufacturers, and communications or broadcasting stations. At this point, thousands of such monitoring identifications have been issued to monitoring enthusiasts in the United States and Canada, as well as throughout the world.

The registry identifications contain information relating to the user's location. For instance, a typical registration for California might be KCA6PV, or if for Texas might be KTX5KE, etc. Used in correspondence, they quickly identify the writer as a serious and active user of professional communications equipment, and instantly identify the user with the large and rapidly growing corps of those participating in monitoring.

Registrants all receive a handsome certificate suitable for framing and displaying. This is a newly designed large (8½" × 11") fancy border document printed on buff-colored stock, with monitoring ID, issue date, and name beautifully hand-inscribed by a professional calligrapher. These certificates are sent flat (unfolded) by First Class Mail. By the way, the newly designed certificate is larger (twice the size) than the green certificates that had been issued in the past.

Registration is available in the USA and Canada (also APO/FPO) for a \$5 fee, which includes postage. In all other areas, the registration fee is \$10. Canadians and all others outside USA/FPO/APO, please submit payment by Postal Money Order drawn in U.S. funds. Persons who have been previously registered with CRB Research can receive one of the newly designed certificates for a \$3 fee—please include information about date and registry identification letters previously assigned (no need to return the certificate itself); those who are already registered and don't want the new certificate will remain registered as before.

Registry applicants send the fee, plus name, address, and station information to CRB Research, Box 56-MR, Commack, NY 11725.



Four Information-Band Portable Radios

Panasonic offers a quartet of information band and shortwave, international band radios to bring a world of listening pleasure closer to home.

Each unit is backed by Panasonic's two-year limited warranty.

Model RF-B50

Panasonic's compact FM/MW/SW₁₋₈ portable radio, Model RF-B50, relies on a dual conversion, superheterodyne receiver system (SW₂₋₈) for excellent sensitivity and selectivity. This dual superhet system also helps stabilization, while reducing primary and secondary interference, to help provide clear reception.

The RF-B50 also features full FM/MW and shortwave frequencies, from 2.3-21.75 MHz in eight bands; a four-LED Band Indicator to pinpoint the FM/MW/SW₁/SW₂₋₈ frequency in use; a convenient LED tuning indicator which lights up whenever the strongest signal for a particular station is received; a wide/narrow bandwidth selector as well as volume and tone controls, and a slide-rule tuning dial.

Operating on four "AA" size batteries (not included), the RF-B50 is also equipped with a three-inch PM dynamic speaker; FM/MW antenna and earth terminals; a built-in, six-volt DC-in jack and an earphone/extension speaker jack.

The Panasonic RF-B50 compact information-band radio is currently available for a suggested retail price of \$129.95.

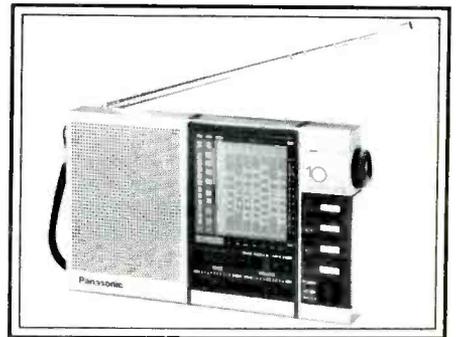
Model RF-B300

A member of the popular Panasonic Command Series of international band radios, the Model RF-B300 AC/Battery, FM/MW/SW₁₋₄ band portable radio is equipped with an LCD frequency display function providing consumers with price frequency readings to 1 kHz for all shortwave bands, AM and FM radio frequencies are also displayed in LCD.

Capable of receiving SW frequencies from 1.6 to 30 MHz in four bands, the RF-B300 also features Panasonic's double superheterodyne system and variable Slow/Fast, two-speed tuning. Incorporating an LSB/USB/AM mode selector, the unit also includes a Wide/Narrow bandwidth switch, dial light switch for easy night-time operation, an RF gain control for AM/SW frequencies, and a four-inch PM dynamic speaker. A meter and LCD frequency display light assist operations monitoring.

Other features include volume and tone controls, a record out jack, FM/AM antenna terminals, as well as AC-in and earphone/external speaker inputs. Dual voltage capable, the RF-B300 operates on six "C" size batteries (not included).

The Panasonic Model RF-B300 Command Series international band radio is available for a retail price of \$229.95.



Model RF-3100

Stepping up Panasonic's line of Command Series international band radios, Model RF-3100 is an AC/Battery-powered, FM/MW/SW, 31-band portable radio with PLL Quartz-Synthesized Tuning.

The quartz phase-locked loop (PLL) circuitry of the Panasonic PLL Synthesizer Digital Tuner "locks" the tuned-in shortwave station onto a quartz crystal oscillator reference frequency.

Covering shortwave frequencies from 1.6 to 30 MHz in bands, the RF-3100 features an all-band five-digit frequency readout. Its horizontal design boasts front-mounted controls for BFO Pitch, RF Gain, separate bass and treble as well as a Wide/Narrow bandwidth selector for easy shoulder-strap operation. Panasonic's double superheterodyne facilities clean SW reception.

Equipped with a meter for monitoring tuning and battery strength, the RF-3100 also features an LED operation indicator, meter light switch, a 3½" PM dynamic speaker, built-in AC power cord and the following jacks and terminals: FM/MW antenna, ground, earphone/external speaker, re-

cord out, and headphone. Packaged with a detachable shoulder strap, the system runs on eight "D" size batteries (not included).

The Panasonic Model RF-3100 Command Series international band radio is available for a retail price of \$329.95.

Model RF-B600

A micro-processor-controlled preset tuner lets you find up to nine different stations on Panasonic's Model RF-B600 PLL Synthesizer, portable digital frequency communications receiver. Ten-key direct access tuning makes finding a station as easy as pressing the numbered buttons corresponding to the desired frequency's number. To tune to 95.7 on the FM band, for example, just press the "9," "5," decimal point, and "7" buttons. The nine memory scan/seek function stops at every station in either frequency direction for approximately five seconds before continuing. The seek function automatically searches for the strong signal stations, remaining there until the function's button is pressed again.

Shortwave band Zone Auto Tuning brings extra channel clarity to the RF-B600's reception. After using the manual or direct access tuning key to set in a desired frequency range, 9,650 for example, this Panasonic feature helps ensure clarity to stations within the limits of 9,650 kHz and 150 kHz.

Other RF-B600 features include a five-digit fluorescent digital readout, RF gain control, Panasonic's PLL quart-synthesized digital tuner and double superheterodyne, a 3½" PM dynamic speaker, universal voltage adaptor, and AC power cord. The system operates on eight "D" size batteries (not included) and three "AA" size batteries (not included) for memory back-up.

The Panasonic Model RF-B600 Command Series micro-computer/multi-tuning system is available now for a suggested retail price of \$549.95.



The Out-A-Sight Radio

American Technology Corporation announces the Out-a-Sight Radio. This thimble-sized radio fits securely in the car using no wires or headphones. Its power source is a common watch battery (Eveready 392),

and it has the total AM band. This little radio is designed to be used primarily outdoors. Since it has no wires, you are free to pursue all of your regular outdoor activities while still enjoying news, sports, and music. The Out-a-Sight Radio also works well in most homes. Instead of an annoying pillow speaker, the Out-a-Sight Radio will allow you to listen to your favorite nighttime program in privacy and without disturbing anyone else. This little radio comes complete with battery, extra ear cushion, carrying case, and complete instructions. To order an Out-a-Sight Radio, send \$9.95 plus \$1.50 for shipping and handling to: AMTEK, 420 Chipeta Way, Suite 100, Salt Lake City, Utah 84108.



Keyboard HF-SSB Radio

Modar Electronics, Inc., a subsidiary of Motorola, Inc. announces the TRITON·X front panel programmable HF-SSB radio. This radio features 120 user programmable channels, 10 of which may be scanned. Some of its unique features include: *Dual Microprocessors*—One to control the synthesizer and one to control the front panel; *Analog Clarifier*—Permits the operator to precisely tune the receiver to the incoming transmit frequency; *Multiple I.F. Shift*—Allows the operator to select the best I.F. to eliminate normal synthesizer generated receiver interference; *Bar Graph VSWR Meter*—Displays both forward and reflected power simultaneously in transmit; *Security Key Lock*—Permits only an authorized person to alter the channel frequency programming; *ITU Channels*—176 public coast station ITU frequencies are factory pro-

grammed and accessed by keying in the ITU designators.

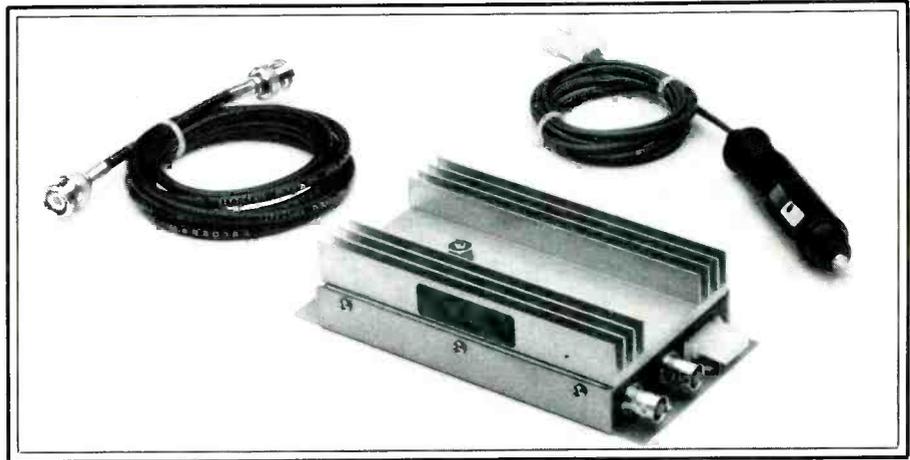
All functions and modes of operation for the current channel are displayed on an LCD. For night operation, both the LCD and keyboard are back lighted. The radio is available in two frequency ranges of 2-18 MHz and 2-30 MHz. At 674 cubic inches, it is one of the most compact 125 watt HF-SSB radios available.

Additional information about the TRITON·X HF-SSB radio, its features and capabilities, is available from Motorola, Inc., Public Relations Department, 1301 E. Algonquin Road, Schaumburg, IL 60196.

Power Amplifier Available

Communications Specialists announces the availability of a new 10-watt power amplifier. The new CS-10 increases the transmitter power of the TR-720 Hand-held Transceiver from 1 watt to 10 watts (30 watts PEP). The CS-10 Power Amplifier is designed to be connected in series between the TR-720 Transceiver and an outside quarter-wave antenna on aircraft or ground vehicles. Field tests have resulted in 5 x 5 communications over 150 miles at 10,000 feet using a stock TR-720 into an outside antenna through a CS-10 amplifier. The CS-10 requires a 11-15 volt DC power source and draws only 2.2 Amps.

In case of a DC power failure, the TR-720 will function normally "straight through" for emergency back-up. The amplifier is furnished complete with a 5-foot power cord and a fused cigarette lighter plug. A 5-foot RG-58 A/U coaxial cable with two BNC connectors is supplied for connecting the TR-720 antenna jack to the antenna input on the CS-10. The external antenna is connected to the antenna output on the amplifier. The CS-10 measures only 5.9" x 3.0" x 1.5" and weighs 12 ounces. Complete hook-up and maintenance instructions are included and FCC Type Acceptance has been granted for use with the TR-720 handheld. The CS-10 Power Amplifier is priced at \$199.95 and is available for immediate shipment from factory stock. For more information contact: Communications Specialists, Inc., 426 West Taft Avenue, Orange, California 92665.



Vietnam Voices

More Than A Decade After The War, This Troubled Nation Is Still To Be Heard

BY GERRY L. DEXTER

The Socialist Republic of Vietnam represents Southeast Asia's most challenging and frustrating DXing target. It's not only hard to log (aside from the overseas service), it's hard to verify and maddening to try and keep track of from an information standpoint. Broadcasters are on a never-ending march across the dial. What's even worse, they don't even do the DXer the courtesy of staying in rank.

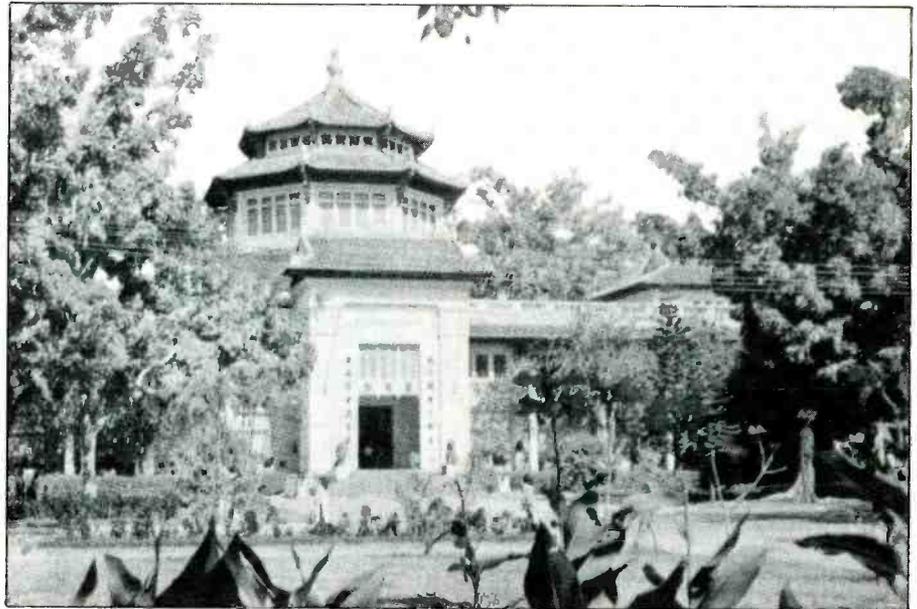
Vietnam's recorded history dates back to the beginnings of Christianity. The country was eventually made up of three areas: Tonkin in the north, Annam in the center, and Cochin China in the south. Tonkin was conquered by the Chinese Han Dynasty in 111 A.D. and Vietnam (then known as Nam-Viet) didn't free itself from the Chinese for 800 years. The Vietnamese have continued to feel the breath of the Chinese dragon on their necks off and on ever since. Annam was conquered by the Vietnamese by the end of the 15th century, and Cochin China by the start of the 19th century.

The north-south split can be traced as far back as 1858, when Napoleon III sent an expedition to avenge the deaths of French missionaries. The result, a few years later, was the ceding of part of Cochin China to the French. Various maneuvers and treaties led to French dominance over Annam and Tonkin in the years to come.

When the Japanese arrived in 1940, Ho Chi Minh formed alliances with various nationalist groups, creating the Vietminh (Independence League) which sought to throw out all foreign domination. Vietnam was one entity briefly after the Japanese left, but the French shortly re-established control in Cochin China and later in the North. The French defeat in 1954 essentially left Vietnam in two parts, North and South, and the United States moved in to fill the vacuum and try to help the south maintain its independence from the north.

The Viet Cong had the opposite in mind. The rest of the story is painfully familiar. With the U.S. pullout, the Socialist Republic of Vietnam was declared on July 2, 1976.

The Voice of Vietnam traces its history to September, 1945, five days after Ho Chi Minh declared Vietnam a separate nation. The station was shortly moved to Viet Bac province, headquarters of the resistance to the French. It broadcast from there, an-



nouncing as "broadcasting from an area near the Hanoi capital," until 1954 when Ho took Hanoi.

During U.S. involvement, the Voice of Vietnam took a B-52 bombing raid in stride, losing only nine minutes of airtime. The station aired recorded Christmas and New Year's greetings from captured U.S. pilots.

During the war for the south, the Voice of Vietnam worked with a partner of sorts—the quasi-clandestine Radio Liberation or Liberation Radio. That station began in 1962 as the Voice of the National Front for the Liberation of South Vietnam and ended up as the Voice of the Provisional Government of South Vietnam. Broadcasts were transmitted from sites in South Vietnam, Cambodia, and over Hanoi's broadcast facilities. The latter site was confirmed when some frequencies of Liberation Radio went off the air following the U.S. bombing raid against Voice of Vietnam transmitting facilities.

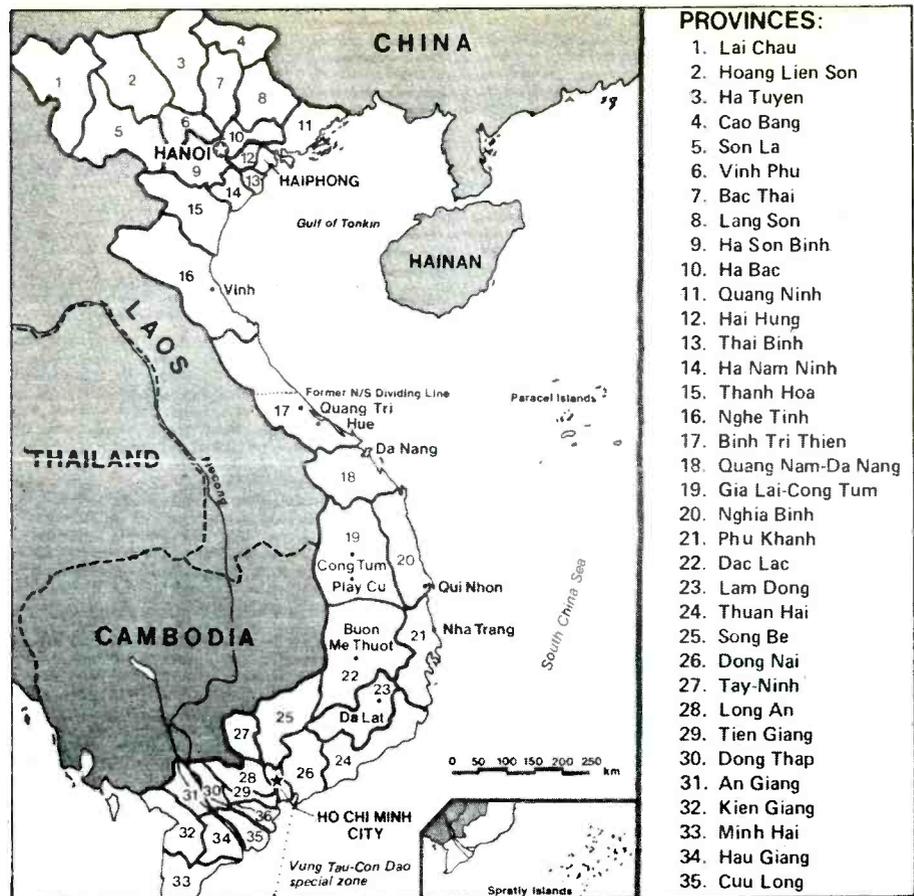
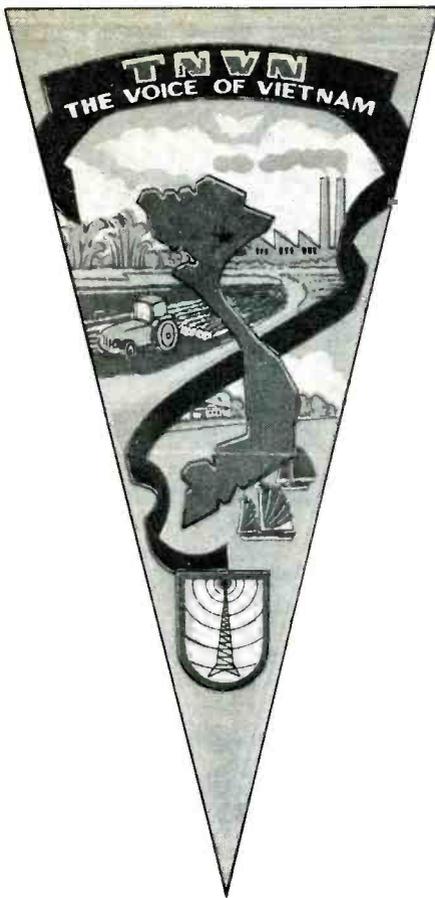
The North's clandestine efforts were met with a chorus of voices from the south, many of which were operated by U.S. psychological warfare teams. These are believed to have included the likes of the Voice of the Destiny of the Fatherland, Mother of Vietnam and the Voice of the Patriotic Militiamen's Front. Some were operated as "black" clandestines—pretending to be

aligned with neither the official views of the North or the South.

Radio in Vietnam today is a strata with unclear lines. At its most basic level it really isn't radio broadcasting at all in the technical sense. Heavy use is made of rediffusion or "wired radio," with thousands and thousands of miles of wire girding the country. In Quang Dam Danang Province alone there are reported to be 241 radio "relay stations" that are apparently the equivalent of a monitoring post that picks up broadcasts from the nearest government transmitter and relays them over loudspeakers. There are said to be 20,000 such loudspeakers in Quang Dam Danang province, 50,000 in the Hanoi area alone!

Many state offices, cooperatives, schools, and factories operate their own wired stations, producing and transmitting programs for their own co-workers. These "stations" also pick up and relay programs from the Voice of Vietnam. The Voice of Vietnam says there are some 6,000 of these wired radio stations in the country.

Medium wave and VHF (FM) are also used to reach citizens, although these stations are run by the state. The Voice of Vietnam says there are 40 stations operating at provincial or municipal levels and 400 operating at the district level. We know of no station listings



with numbers anywhere near this high. The 1985 *World Radio TV Handbook*, for example, shows only 13 medium wave stations in the entire country. Information is either sadly incomplete or stations of the rediffusion type are considered over-the-air broadcasters by the Vietnamese. Maybe both.

The Vietnamese use shortwave to cover larger territories and there are over a dozen of these regional shortwave outlets in the country (see chart). But, as noted earlier, the schedules change, the transmitters run rampant over tens of kiloHertz and even go off the air for long periods of time. Much of this may be due to antiquated equipment or poor maintenance practices. It is an unending effort to keep track of who is where this week or, indeed, if a particular station is anywhere at all.

The years following reunification have brought significant changes in the make-up and naming of various Vietnamese political divisions. Provinces, districts, and municipalities have been shuffled about, so it is hard to tell what is where or to find it on a map! Regional stations can often be traced only to the province in which they are located, city locations only guessed about.

The USSR has supplied no little technical assistance to the Vietnamese and their radio system. The regional station at Cao Bang, destroyed by "Chinese reactionaries," has been rebuilt and is probably one of the more modern installations in the country. More recently, new shortwave installations were announced for Long Phu District and Can Tho City and Xian Loc District and Bien Hoa City. Broadcasts on shortwave from

these areas have not been traced, at least to our knowledge. The Vietnamese have made a concerted effort to cover the country with radio in one form or another and they continue to do so.

The Voice of Vietnam's overseas service airs 22 hours of programming per day in 13 languages. English is used four hours per day and, while not directed to listeners in North America, it can be heard here, though generally at less than perfect clarity. The English segments run in half hour blocks:

- 1000-1030 to Southeast Asia on 9.840 and 12.035
- 1100-1130 to Southeast Asia on 9.840 and 12.035
- 1330-1400 to Southeast Asia on 10.040 and 12.020
- 1600-1630 to Africa on 10.040 and 12.020
- 1800-1830 to Europe on 10.040 and 12.020
- 1900-1930 to Europe on 10.040 and 12.020
- 2030-2100 to Europe on 10.040 and 12.020
- 2330-0000 to Southeast Asia on 9.840 and 12.035

Times are in GMT. In the summer months 12.020 may be replaced by 15.010.

English language programs deal with the progress the country is making and an emphasis on rebuilding the country. There are interviews with foreign visitors and the interest of listeners in Vietnam is acknowledged on such programs as "Thanks for Listening And Writing" and "The Sunday Show." Broadcasts are still heavy with anti-

U.S. propaganda, but are balanced by considerable doses of Vietnamese music.

The English language schedule begins each transmission with news and commentary, followed by the main feature:

- Mondays—Our Country
- Tuesdays—Vietnam Today, Let's Speak Vietnamese
- Wednesdays—Thanks For Listening and Writing
- Thursdays—Our Country
- Fridays—Thanks For Listening and Writing, Here and There in Vietnam
- Saturdays—Review of the Major Events of the Week, The Music Programme
- Sundays—Music From Vietnam, The Sunday Show

Domestic programs from Hanoi can also be heard on shortwave, in Vietnamese. The domestic service is carried from 2200-0200, 0400-0630, and 0900-1630 (Sundays 2200-0630 and 0800-1630) on 5.920, 6.450, 7.418, and 10.060. Programs deal with agriculture, industry, reviews of what's in the newspapers, introductions to "friendly and fraternal countries." There are also programs on science and others designed to keep the citizens on their guard—vigilance and security for the fatherland. Programs designed for Vietnamese abroad are also part of the domestic service schedule. There is also a special service for those in the Vietnamese People's Army. The latter includes dictation speed news in Vietnamese at 0100 on 6.450 and 10.060. Special programs, in Chinese, are aimed at the Chinese People's Liberation Army, although whether any Chinese conscripts tune it in or not is an

THE VOICE OF VIETNAM
58 Quan Su Street — Ha Noi
Democratic Republic of Vietnam

To Harol B. Frodge Date Sep. 7

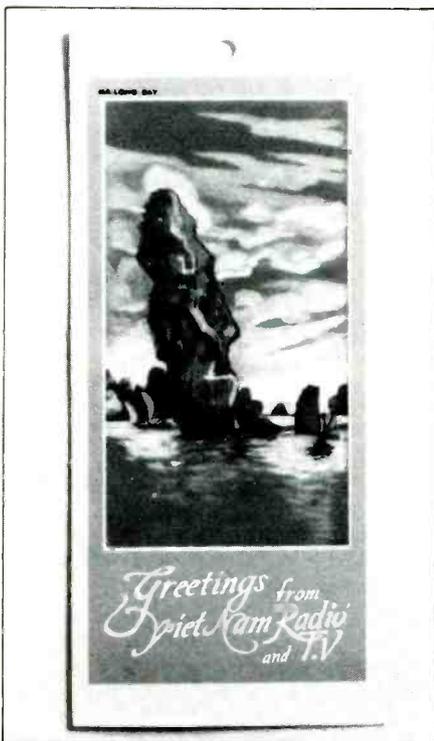
VERIFICATION

Thank you for your report of reception
at 18.00 GMT on August 6th
on 15.012 KHz.

All details check with our log.
Regular reception reports with detailed remarks and suggestions on programming
and technical matters are highly appreciated.

Enclosed are: prog. schedule
post card.

Yours faithfully
THE VOICE OF VIETNAM
FOREIGN LANGUAGES TRANSMISSIONS



Vietnamese Regional Shortwave Stations

Station	Frequency	Schedule (GMT)
Bac Thai	6.605	1130-1330
Hanoi	6.450, 7.418	1030-1330
Cao Bang	6.510	1200-1400
Lang Son	6.510 ⁽¹⁾	1130-1330
Bin Tri Thien	4.671, 6.571	1145-1300
Lai Chau	6.588	1145-1330
Son La	4.771, 6.332	1200-1400
Nghia Binh	5.120 ⁽²⁾	1130-1300
Gai Lai-Kon Tum	4.701	1030-1200
Hoang Lien Son	5.596, 6.720	1000-1030, 1145-1300
Phu Khan	5.140	1030-1230
Than Hoa	4.885	1030-1100
Ha Tuyen	4.822	1230-1400
Lam Dong	4.805	unknown

(1) Last known frequency. Has apparently moved since Cao Bang occupied this spot.

(2) Nominal 5.080

Note: All frequencies and times are available. Additionally, most regional stations also maintain schedules in the 2300 and 0300-0500 range, but are not included in this listing since reception in North America is virtually impossible at those periods.

open question. About 50 hours per day are carried on the domestic networks.

Vietnam is still the target of clandestine broadcasters. Pol Pot's Khmer Rouge forces are the nominal operators of the Voice of Democratic Kampuchea, believed to be operating from China. This station broadcasts in Cambodian daily from 2330-0030 on 6.185, 8.345, and 9.440; 0400-0500 on 11.725 and 15.400; 0900-1000 on 11.870, 15.115, and 17.533; and 1300-1400 on 11.675 and 15.165.

The Voice of the National Army of Democratic Kampuchea supports the coalition Khmer resistance groups and uses 5.199 from 1000-1300 and 2300-0000 in Cambodian. Both of these stations can occasionally be heard in the United States.

More recently, Vietnamese Resistance Radio took the air with the backing of expatriot Vietnamese who left the country with the fall of Saigon. This station is operated by

a group calling itself the National Front For the Liberation of Vietnam and is on the air in Vietnamese from 0200-0300, 0500-0600, 0900-1000, 1500-1600, and 2200-2300 on 7.355. There are no known loggings of the station in the United States, nor has its location been determined.

Hearing Vietnamese stations beyond the overseas service is a tough task, particularly outside the western part of the United States. The information problem alone is a major hurdle to jump. Those who want to take on the challenge should join an Asian-based club that provides regular coverage of the Vietnamese broadcasting scene. Recommended are: The Far Eastern DX Review, Japanese Association of DX'ers, CPO Box 1766, Tokyo 100-91, Japan and DX Front Line, c/o Isao Ugusa, 1-3 10 Mikageyamate, Higashinada, Kobe 658, Japan. Include two or three International Reply Coupons to cover the cost of return postage.

One must display the patience of the Orient when seeking QSLs from Vietnam. Replies from the Voice of Vietnam for its overseas service can take interminable lengths of time. QSL'ing the regionals is a much stickier question. While Hanoi does, on occasion, issue QSLs for regional stations, it is not the normal practice even though the Vietnamese were much more accommodating during the war. However, some cracks have appeared in the policy of late, but whether they are widening or not only time and continued reporting will tell. Reports for both overseas and regional services can be sent to the Voice of Vietnam, 58 Quan Su Street, Hanoi, Socialist Republic of Vietnam.

Long distances, low powers, varying frequencies, an unfamiliar language, and a lack of stable information add up to rather high odds against successful DX'ing of Vietnam. It can be done, of course, but it is certainly one of the longer and tougher rows to hoe in the field of DX'ing.

PC



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CIRCLE 11 ON READER SERVICE CARD

SCANNER SCENE

BY CHUCK GYSI, N2DUP

MONITORING THE 30 TO 900 MHz "ACTION" BANDS

Let's take a look at the mailbag this month.

From Jim Hughey of the Bronx, New York, comes a report that the new 49th Precinct is now open and is operating on the 8th radio zone frequency of 476.9125 MHz. Last year the new 115th Precinct in Queens was opened and placed on Zone 17's frequency of 476.8125 MHz.

Jim also reports that the New York City Police Department has equipped most transit police officers working elevated stations with NYPD division portables. Also, the New York City Fire Department's experimental use of 800 MHz apparently isn't going as well as hoped.

Some professional users of scanners are the New York City Emergency Medical Services fleet. Jim says that the ambulances ("buses" on the radio) have been equipped with mobile programmable scanners to allow crews to monitor NYPD, FDNY, transit, and other communications.

For those monitors interested in listening in on gypsy cabs in New York, Jim recommends checking all the business band channels on VHF low and high bands and UHF, not to mention the frequencies assigned for taxi use.

A reader up in the Great White North, M. Hertz of Toronto, Ontario, sends along a listing of frequencies for the Toronto area.

Police:

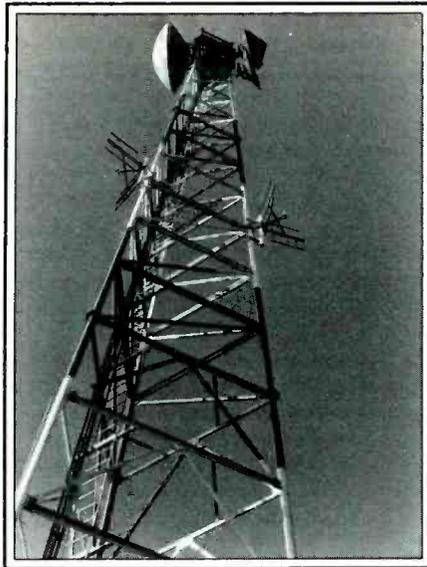
- 148.490R—2 traffic hand-helds, Etobicoke
- 142.905R—21, 22, 23 division cars, Etobicoke
- 155.400R—5 traffic hand-helds, downtown
- 142.995R—52 Division cars, downtown
- 413.2875R—RCMP at Toronto International Airport
- 42.06—Ontario Provincial Police base
- 42.22—Ontario Provincial Police mobiles

Fire:

- 411.9875R—Toronto City Control
- 414.7625—Toronto City alert dispatch
- 154.430—Scarborough
- 153.770—East York
- 153.830—North York
- 154.890—York
- 154.325—Etobicoke
- 154.070—Ontario Fire Marshal and Provincial Channel 5

Ambulance:

- 152.375R—Tach Channel 1
- 151.820R—Channel 2
- 149.605R—Paramedics to hospital, ALS Channel 2
- 148.360R—Paramedic dispatch control, Channel 7
- 150.530R—Toronto West
- 148.165R—Toronto East
- 150.095—Provincial channel



The Pennsylvania Turnpike recently replaced its radio tower in Willow Grove, Pennsylvania, with this taller tower to improve communications along the toll road. The microwave antennas at the top of the tower relay communications between other towers and the directional antennas receive and transmit actual communications along the length of the turnpike. The Pennsylvania Turnpike operates repeaters on 159.075 and 159.045 MHz for maintenance and state police patrols. (Photo by Chuck Gysi)

Transit:

- 412.0375R—Toronto Transit Commission, control
- 412.0675R—Toronto Transit Commission, Channel 2
- 412.1125R—Toronto Transit Commission, Channel 3
- 412.5875R—Toronto Transit Commission, Scarborough light rail vehicle monorail control
- 411.6125R—Mississauga Transit

Also of note is the fact that many police departments in Canada use frequencies between 140 and 141 MHz for their surveillance activity.

Every once in a while we get letters about those strange tones on 154.465 MHz. Well, the actual frequency is 154.46375 MHz and, according to an article in a recent newsletter of the All Ohio Scanner Club, the tones are an energy-saving device that are used on this and other frequencies on an exclusive basis. It works like this:

With the advent of energy saving, many industries, large offices, and other commercial buildings are installing what they call radio remote control load management systems. With these systems, the local power

company can monitor the amount of power being used by a particular building at intervals of 5 to 30 minutes. These monitoring systems also can be used to monitor power requirements at substations and tell the power company when to activate demand-load diesel-powered generators called "peakers" during heavy loads that would overload their generators.

At the customer's location, a control unit is interfaced with the electric meter. The control unit has a 2- to 5-watt transmitter that transmits a binary code via a Yagi directional antenna to the power company's nearest office, which is equipped with an omni-directional receiving antenna that is interfaced to the company's computer.

The All Ohio Scanner Club reports that most power companies in the Buckeye State are using this system. By monitoring the amount of power being used at a given time, the utilities can operate their generators more efficiently.

An interesting tip for ham radio operators comes from Brian Greer, WD6DMY, of North Hollywood, California. Brian says that he took his MFJ Enterprises 313 converter that attached to 2-meter hand-helds to convert the 144-148 MHz ham band to monitor 154-158 and 160-164 MHz and tried it on his 440 MHz hand-held. He found that he could monitor the 450-466 MHz band on his UHF HT with the MFJ-313 converter. The MFJ converter steps up the receiving frequency 10 MHz and 16 MHz with a switch. Since I already had one of the MFJ converters, I tried this out on my 440 MHz HT and it sure did work. Brian reported no degradation of UHF signal strength; however, I had some problems hearing some local signals. I'm going to try some experiments with this little converter and hope to have more to report.

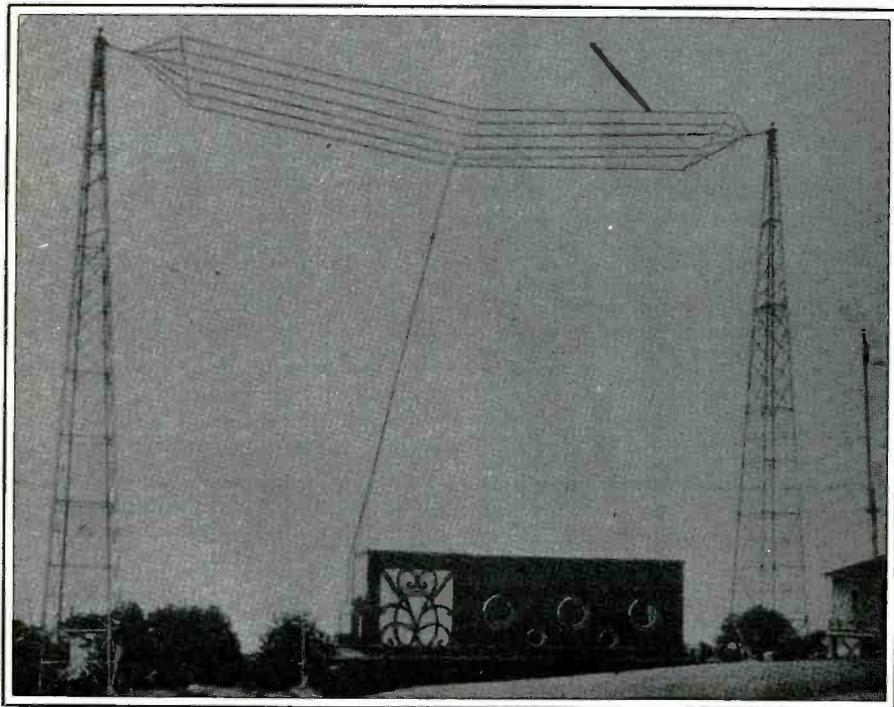
The new cellular telephone technology has taken a two-fold approach with cabbies. In some major cities now, taxis have equipped their back seats with cellular mobile phones to allow passengers to make phone calls while they are en route to their destinations. In addition, some cab drivers are using the cellular phones, which operate in the 800 MHz band, to drum up business by advertising the phone number of their mobile phones. Thus, potential patrons only need call up the cab directly, eliminating the need to go through a dispatcher.

What are you listening to this summer? Have you had the camera out taking photos of radio installations or towers? We'd like to hear from you here at POP'COMM. Write: Chuck Gysi, N2DUP, Scanner Scene, Popular Communications, 76 North Broadway, Hicksville, NY 11801-2909. **PC**

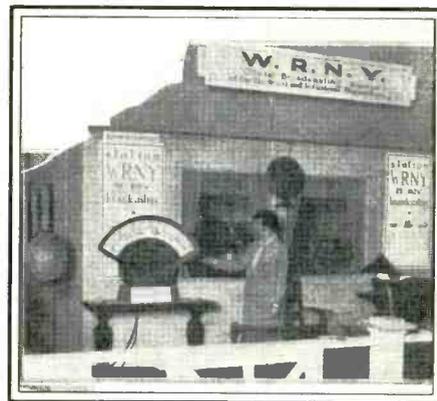
Do You Remember When?

Try These Stations On Your Memory!

BY ALICE BRANNIGAN



Is this a poster? WPAP in its guise as an overblown radio receiver. In this 1926 photo, the antenna system looks to be a "T" type.



When WPAP moved to 1010 kHz, one of the other stations on frequency was WRNY (shown here at the 1928 Grand Central Electrical Show). In the photo, the giant milliammeter (at the left) was connected to the modulation circuits of the WRNY transmitter so that it would deflect with each sound transmitted. Crowds really seemed to love the demonstration.

In our quest for memory bending old time radio stations, last month we came up with KTNT—the station with the ice cream stand inside its antenna tower. This month we have a couple of other interesting stations to share with you.

One I especially like was most definitely an eye-catcher. That's station WPAP, formerly of Palisades Amusement Park in Cliffside, New Jersey. When WPAP went on the air around the summer of 1926 (on 830 kHz), it presented itself to the world as a gigantic walk-in radio receiver. That is to say, the studio-transmitter building was designed to be a huge replica of a receiver, complete with tuning dials and speaker grille. Its unusual design earned it a lot of publicity. The station's broadcasting career and history were no less unusual.

Old records show that the licensee of the station was Palisades Amusement Park, with business offices at 135 West 70th Street, New York City. The 250 watt station shared time on 830 kHz with another station, 250 watt WQAO, owned by the Calvary Baptist Church (123 West 57th St., New York City). The WQAO transmitter was also listed as being in Cliffside, New Jersey (which is just across the Hudson River from New York City). This would

seem to indicate that WQAO and WPAP possibly used the same transmitting facilities (no problem since they were on the air at different times).

Supporting this theory is the fact that when WPAP moved to 1010 kHz (about 1930), WQAO also moved to 1010 kHz. In any event, it was a move that appears to have led to the eventual demise of the picturesque little radio station. The 1010 kHz spot was very crowded.

When WPAP and WQAO switched to 1010 kHz, they had to share hours with two additional broadcasters, WRNY (owned by the Experimenter Publishing Co.) and WHN (owned by the Marcus Loew Booking Agency). WRNY was not a major station, but WHN ("The Voice of The Great White Way") had a lot of clout and was located right in New York's Times Square and operated by a famous Broadway theatrical agency (located at 1540 Broadway).

Records show that by 1932, the church owners of WQAO had bought out the license of WPAP, although the station remained on the air. It looks, however, like the owners of WHN became unhappy about the merry-go-round of four local stations crammed into one small frequency.

Records of mid-1933 indicate that WHN's

owners had purchased the licenses of not only WPAP and WQAO, but also WRNY (by that time WRNY had already been sold by the Experimenter Publishing Co. to Aviation Radio Stations, Inc.).

Broadcast station listings of September, 1933, curiously show all four broadcasters still active on 1010 kHz, but *all* owned by the Marcus Loew Booking Agency! Indeed, a very unusual situation. It was no surprise to note what the early-1934 station listings revealed—they showed that Marcus Loew's Booking Agency has amalgamated all of their 1010 kHz holdings in the New York City area into one single identity. You got it! WHN stood alone. WPAP, WQAO, and WRNY slipped off into history and became incorporated into WHN.

WHN continued on the air and eventually switched to 1050 kHz. For a while the station used the callsign WMGM, but later returned to the use of the original WHN callsign. Today, WHN is still on 1050 kHz. Now it runs 50 kW and is New York City's only country and western music station.

WPAP would have been better off had it remained on 830 kHz!

Palisades Amusement Park was later to be the site of the WBAM-FM (later known as WOR-FM) transmitting tower, and also (for



Station WHN, owned by a major New York talent agency, was the dominant station on 1010 kHz, which it shared with WPAP/WQAO/WRNY. Station WRNY attempted to fight back with live talent programs. Unfortunately for WRNY, WHN had Broadway stars, WRNY didn't. This photo shows the valiant WRNY studio ensemble awaiting the arrival of singer Josepha Chekova, one of the WRNY stars. Her regular program of "Songs of Old Bohemia" must have been a real winner. No wonder WHN eventually bought out WRNY, WPAP, and WQAO and put them all off the air.

a short time) the site of the WOR-TV (Channel 9) transmitter. The amusement park was demolished about 15 years ago to make way for a luxury condo complex.

Next, another station with interesting roots. That would be station KFJR, 5 hefty watts on 1160 kHz from lovely Stevensville, Montana. What was especially interesting about KFJR was that it was as homebrew as a radio station could be. In fact, KFJR was essentially a ham station that had received federal authorization to operate on the broadcast band.

This station, operated by Ashley C. Dixon (Amateur 7ACP) and his son, Ashley Jr. (Amateur 7IT), was located in a remote valley which (in 1924) had no commercially available electric power. A 12-volt storage battery drove a 500-volt, 100-watt dynamotor, which furnished the pep for the 10-watt ham CW operations and 5-watt broadcast station. Don't laugh; the ham station was received in England when it was running only 5-watts!

Stevensville, Montana, even today, is quite small (population 1027). Sixty years ago it was probably much smaller. It's located 25 miles south of Missoula on State Route 93—a scenic road today's tourists take to visit the Bitterroot National Forest and the Lee Metcall National Wildlife Refuge, both in the Stevensville area. But, let's face facts. By the time the Dixons decided that broadcasting was here to stay, they must have also come to the conclusion that a 5-watter in remote western Montana (where folks had to generate their own electricity) was not going to put them atop any wave of success for a ride to fame and financial security. I mean, even if their 1-lung signal made it down the road to their neighbors in Victor (present population 450) and also Florence (present population not shown in

most atlases), it still didn't offer much encouragement for the eventual commercial success of KFJR. What they had was a back-room low power ham station in *Nouheresville*. Even the catchy callsign, KFJR (stood for *Father and Jr*) didn't mean much in the boonies. But they did have that broadcast band license, and that gave them an idea.

By 1930 the Dixons had packed up their hopes, dreams, and broadcasting license and moved KFJR some 400 miles west to Portland, Oregon. There, they opened up

Here's the studio and transmitter of broadcaster KFJR when it was in its early days at Stevensville, Montana. The 5-watt battery powered transmitter did double duty as a ham rig. A few years after this 1924 photo was taken, KFJR's owner packed up and moved KFJR to greener fields in Portland, Oregon, where the station operated until 1937 when it went out of business.



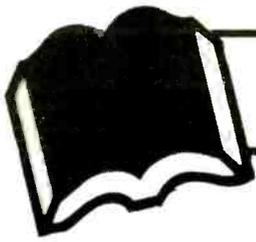
for business at 95 Fifth Street, with a 100-watt signal on 1140 kHz. It wasn't long before they switched over to 1300 kHz with a 500-watt signal. They continued in operation for several years, sharing time on 1300 kHz with broadcaster KALE. A few years later they moved their office to 622 Lumberman's building.

The station remained in operation in this status until the spring of 1937 when, for reasons not obvious at this point, it was quietly dropped from broadcast station lists—leaving KALE alone on the frequency in Portland. Okay, it wasn't forever, but it looks like they sure gave KFJR the old team try, and they probably never regretted leaving Stevensville.

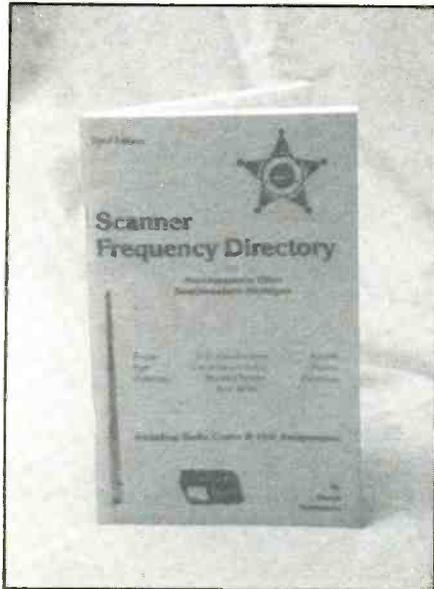
Our photo of KFJR shows it in Stevensville before the move to the big city. Note the sign on the wall showing all three callsigns, that of the broadcast license and the two ham calls. The photo was taken in the early part of 1924.

By the way, if any readers wish to submit photos of stations (past or present) for use in this column, we welcome them! Please be sure to include sufficient information to permit identification and research.

Before I sign off, I wanted to thank the many Detroit area readers who were thoughtful enough to write concerning the card we ran showing the tower atop the Cadillac Hotel in Detroit. These correspondents tell me that the tower only looks like it was located on the roof of the hotel. Actually, the tower was mounted on the sidewalk and was only one of many. These were not wireless towers at all. Instead they were part of Detroit's first turn-of-the-century street-light system! Well, it sure looked like a wireless tower! **PC**



BOOKS YOU'LL LIKE!



Ohio-Michigan Frequencies

The 3rd Edition of Darryl Symington's (N8EBR) *Northwestern Ohio and South-eastern Michigan Scanner Frequency Directory* has recently been issued. The book's coverage area includes nine Ohio counties (Defiance, Erie, Fulton, Henry, Lucas, Ottawa, Sandusky, Williams, and Wood) as well as seven Michigan counties (Hillsdale, Lewanee, Monroe, Washentaw, Wayne, as well as portions of Macomb and Oakland counties).

The book provides frequency data on police, fire, business radio, local government, maritime, hospitals, and other communications services, plus radio codes, channel designations, and unit assignments.

It's a pretty nice job all-around and if this area is your stomping grounds, you'll be a lot happier with this book than with some others we've seen. Darryl's book is 84 pages and sells for \$7.95. It's available from Midwest Software Services, P. O. Box 399, Holland, OH 43528.

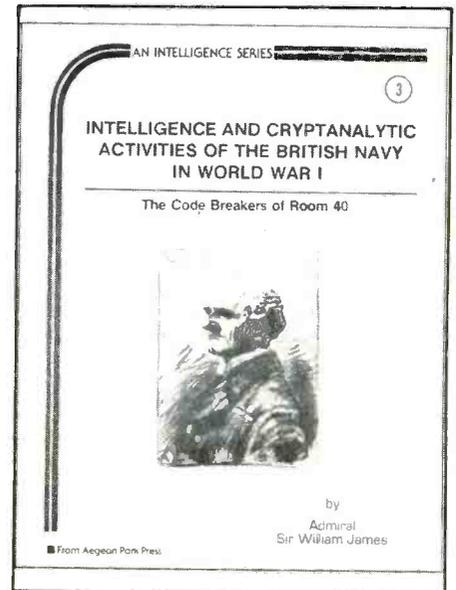
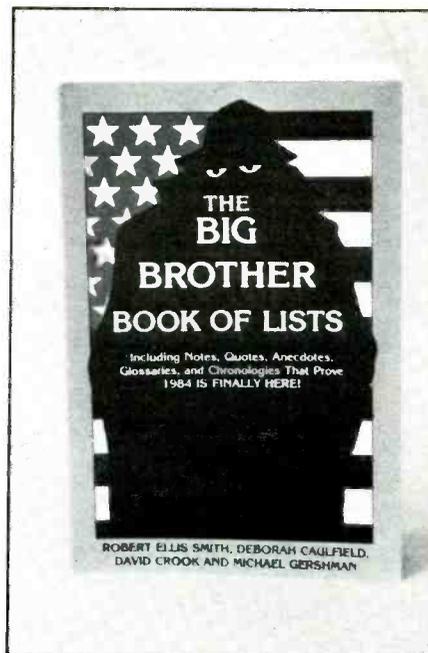
Inside Big Brother

Those who follow the in's and out's of the "Intelligence Community" will want to eyeball a copy of *The Big Brother Book of Lists*. This is an ingenious 246-page book that provides an enormous amount of absolutely fascinating data and trivia on CIA, FBI, NSA, and other similarly-oriented agencies, with information on wiretapping, bugging, and all sorts of snooping—as well as those doing the snooping and their techniques. It

even has information on corporations into intelligence gathering and "monitoring" their corporate telephone calls.

A random flip through the book reveals tidbits such as a former CIA Director's list of 11 criteria for a good spy; the CIA's eight worst bumbles; 3 spook ideas for assassinating Castro suggested by Ian Fleming (007's author), which the CIA seriously considered; CIA and FBI dictionaries; 23 professions in constant demand at the National Security Agency; wiretaps authorized by Robert Kennedy; 19 federal agencies that use electronic espionage methods on U.S. citizens; 26 dangerous drugs and toxins developed or stockpiled by the CIA; 11 steps for intercepting telephone calls without breaking and entering; 14 companies that sell personal information; military Separation Program Designator (SPD) codes the government (may) give out about veterans to large employers; great moments in electronic surveillance (1934-1982); 10 American broadcasters our government "took over" in 1961; 9 ways FBI agents get into trouble; 11 categories of persons in FBI fingerprint files; the \$8-million Voice of America debacle; and a huge bibliography.

This is only a very small random sampling of what's in the book. You probably won't be able to put it down. The book is \$6.95 (plus \$1 postage to USA/Canada/APO/FPO addresses) from CRB Research, P. O. Box 56, Commack, NY 11725.



Crypto Stuff In The Great War

A 212-page book called *Intelligence and Cryptanalytic Activities Of The British Navy In World War I* is the story of Sir William R. ("Blinker") Hall, the greatest of all Directors of British Naval Intelligence. Hall was a man who recognized the immense intelligence value of cryptanalysis, so much so that he made it into Britain's "secret weapon."

This is the story of how the small group of code breakers grew into the famous "Room 40" with 14 radio intercept stations staffed by crypto experts drawn from academic life, business, and even the clergy.

The Germans thought their codes were unbreakable; they never changed the keys and they broadcast them far and wide over the airwaves, giving the British an enormous amount of information on U-boat movements. All of this seemed secondary when Room 40 intercepted the now-historic Zimmerman Telegram—this was one of the key ingredients in influencing the United States to enter the war. Room 40 went on to track the movements of the German High Seas Fleet, it broke coded radiograms to Zeppelins preparing to bomb England, and uncovered diplomatic and espionage plots.

This exciting book tells of a brilliant chapter in the use of cryptanalysis in connection with radio monitoring.

The book is \$19.80 (including postage within the U.S.) from Aegean Park Press, P.O. Box 2837, Laguna Hills, CA 92654. For shipments outside the U.S.A., add \$1 (payment in U.S. Dollars with payment against a U.S. bank).

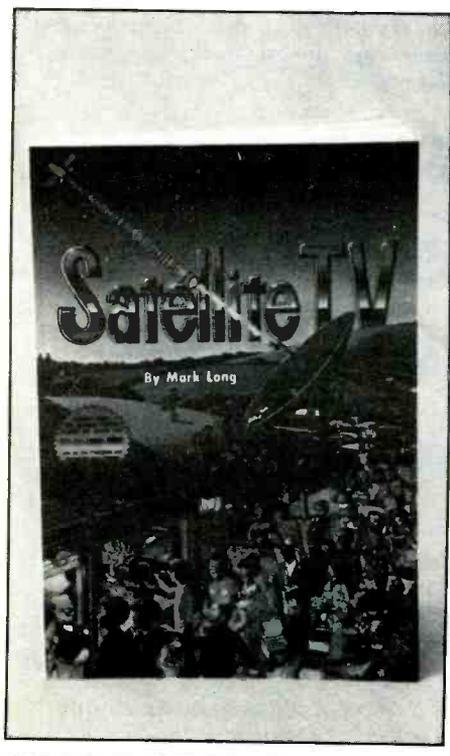
Satellite TV

The Down To Earth Guide To Satellite TV, by Mark Long, is a new illustrated 160-page book that offers the reader a very basic and colorful overview of its topic. With very little trouble and a lot less expense than you might imagine, it's possible to receive 150 TV channels from outer space. One of the problems has been the often confusing barrage of hi-tech information one has to sort through in order to figure out how to go about receiving these channels.

Long's new book wipes away all of the mumbo-jumbo and impressive sounding hi-tech malarkey and simply tells it all to you in language you can easily understand. He's illustrated his remarks with clever (and often very funny) graphics and you end up with a book that's not only informative and useful, but also good reading.

If you've been gun shy about getting into home satellite TV reception because you were the victim of hi-tech overkill, Long's book will give you a whole new perspective on all aspects of the subject, explaining what's on the air, how to buy equipment, how to install it, and how to use it.

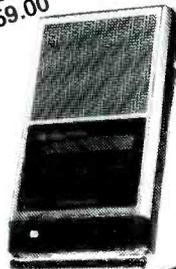
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CIRCLE 24 ON READER SERVICE CARD

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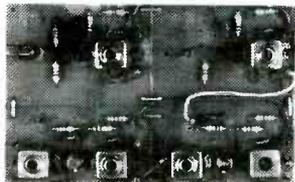
(Similar to unit described in July issue)



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Uncle Sam's Communications For The Modern Battlefield

What You Should Know About SINGGARS!

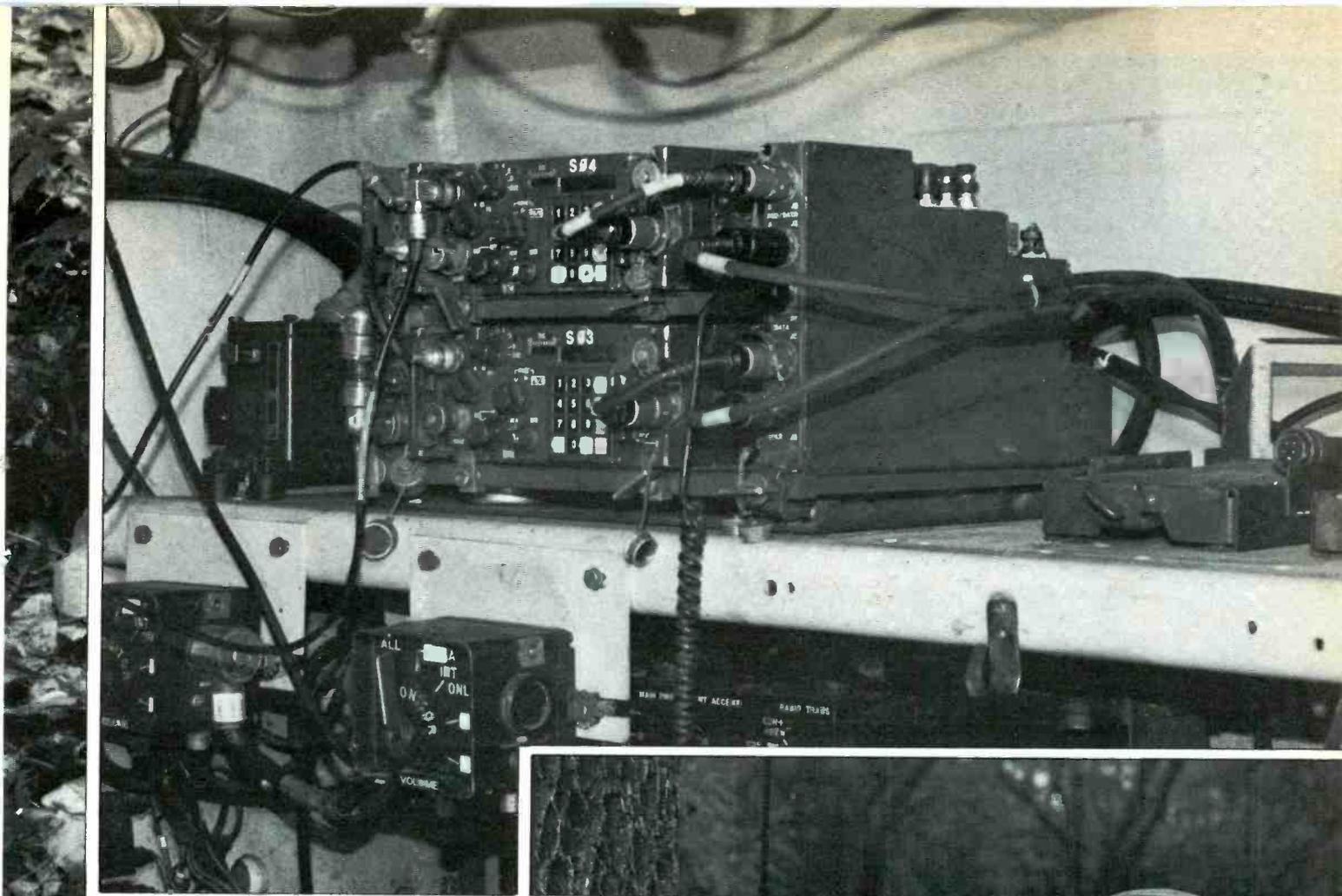
BY MAJ. CARL E. SCHELL, U.S. ARMY

As the Army moves toward a more technologically sophisticated battlefield, so do our potential adversaries. For our commanders to be successful in this environment, command and control communications must become more reliable, more flexible, and less susceptible to enemy electronic

countermeasures. Currently, the primary means of communications on the battlefield will remain the VHF-FM combat net radio. To meet this challenge and provide the battlefield commander with the capability to communicate in a modern threat environment, the Army has developed the Single

Channel Ground and Airborne Radio Subsystem (SINGGARS).

As early as 1964, the Army began looking for a replacement for the AN/VRC-12 family of radios. Early goals were optimistic and consisted of developing a single radio that would be used as a building block for both



FM and AM communications. This would be accompanied through a series of plug-in modules that could be changed to provide a variety of capabilities. This radio would also be small, lightweight, and reliable. As requirements changed and technology advanced, it became evident that more was needed in a combat net radio. It needed to be able to pass data, it had to have more usable channels, and it had to be able to

counter the advances that were being made in the field of communication jamming. As a result, the Army began the development of SINCGARS in 1974.

Besides those early requirements to produce a radio that was smaller, lighter, and more reliable, SINCGARS also had to have other capabilities. The radio had to be capable of supporting all of the Army's current and future command, fire control, and data

systems, and it had to do it in a secure mode. It had to provide more usable channels to support increased information flow. It had to counter communications degradation anticipated by the enemy use of electronic countermeasures, and it had to do all of this while reducing maintenance requirements and life cycle cost. The radio that does all this is just around the corner. The SINCGARS family of radios is undergoing its final stages



SINCARS can handle both voice and data. It has a built-in capability to handle data at a rate of 16 kilobits. With the available data rate adaptor, it can also handle standard data rates from 75 to 4800 baud. (US Army photo)

of operational assessment, and the first production set for it. It is much smaller than the current AN/VRC-12 series of radios. In fact, two SINCARS radios can fit in the same amount of space taken by one AN/VRC-46. It is also much lighter. The man-packed SINCARS radio with secure equipment weighs only 22 pounds as compared to 60 pounds for a comparably equipped AN/PRC-77. This savings in both size and weight allows SINCARS to give the battlefield commander increased capabilities without reducing the limited amount of usable space in combat and tactical vehicles or loading down his soldiers with an additional burden when used in the man-packed configuration.

SINCARS also provides more usable channels to support the constantly increasing

flow of information on the battlefield. This is accomplished in two ways. First, the SINCARS radio operates in a slightly expanded frequency range of 30-88 MHz as compared to the 30-76 MHz for the AN/VRC-12. The second method is to reduce channel spacing from 50 kHz to 25 kHz.

Together, these methods provide 2320 available communications channels as compared to the 920 channels we now have. The operator also has the capability of pre-setting six channels into the radio, so that he can change from one radio net to another with the push of a button in much the same manner as he would a car radio or home stereo. These six channels can also be scanned simultaneously to allow the operator to monitor all six nets.

Besides the capability to handle the increased flow of information on the battlefield by increasing the number of available channels, SINCARS also has the capability to

handle both voice and data. The SINCARS radio has a built-in capability to handle data at a rate of 16 kilobits. With the available data rate adaptor, the SINCARS radio is also capable of handling all standard data rates from 75 to 4800 baud. This data rate adaptor also has the capability to convert analogue data to low rate digital data for error control. It can also identify data vs voice traffic in order to provide mode control for ancillary devices. This data capability helps open a new world of information possibilities to the small unit commander.

One of the more interesting unique capabilities of SINCARS is its built-in capability to provide electronic counter countermeasures (ECCM) across the battlefield. This is done through a method known as frequency hopping. When operating in the frequency hopping mode, the SINCARS radio hops on any designated number of channels up to 2320 at a rate of approximately 100



radio has three power output levels built into it: low, medium, and high with planning ranges of 300 meters, four kilometers and eight kilometers respectively. When mounted on a vehicle, a power amplifier can be added to provide a planning range of 35 kilometers. The radio is also equipped with a transmit/receive signal strength indicator so that the operator can insure he is obtaining the maximum desired signal strength. When used in the single channel mode, the radio has the additional capability of offset tuning which allows the operator to fine tune the radio plus or minus five or 10 kHz for better operation. The radio also comes equipped with a battery life indicator to prevent disruption in communications due to a dead battery. When silence is important, the radio can be operated in the "whisper" mode, which allows the operator to speak quietly into the handset and still be received with maximum volume at the distant station. And of course, the SINCGARS radio is compatible with the AN/VRC-12 equipment when operated in the single channel mode. All of this plus uniformity of design make SINCGARS a valuable tool in support of modern battlefield operations.

SINCGARS gives the commander on the battlefield of today and tomorrow a secure, reliable, and flexible means of both data and voice communications which will allow him to make maximum use of the modern technology during combat, combat support, and combat service support operations. **PC**

Maj. Schell is assigned to the Office of TRADOC Systems Manager for SINCGARS. We wish to thank the Army Communicator for permission to publish this material.

hops per second. This hopping, or rapid frequency changing, is accomplished simultaneously by all of the radios in a net without any loss of traffic information. The hopping sequence is random in order to provide security from enemy jamming or monitoring. The information required to place the radio in the frequency hopping mode can be placed in the radio by the operator or can be transmitted to the radio electronically from another radio in the net. This allows outside stations to enter a radio net at the discretion of the net control station even though they may not have all of the necessary net information to place their radio in the frequency hopping mode. As SINCGARS is fielded, frequency hopping will become the standard method of operation with radios only rarely operating in the single channel mode.

Besides improved operations on the modern battlefield, the SINCGARS radio has been designed to be easier to maintain. It re-

places the current family of radios using a single RT unit, which is slightly smaller than the current RT-841 used in the PRC-77. From this basic RT unit, the SINCGARS comes in seven configurations, all using common components. This allows components to be readily available.

Unit maintenance will consist of fault-isolation to the Line Replaceable Unit (LRU) (RT, power amplifier, antenna, for example). Once the faulty LRU is identified, it is returned to the Intermediate Forward level of maintenance. Here the Shop Replaceable Unit (SRU) is identified and replaced. The LRU is then returned to operation, and the faulty SRU is evacuated to Intermediate Rear where selected SRUs are repaired and others are returned for depot level maintenance. The entire SINCGARS system was designed to provide rapid fault isolation and repair.

SINCGARS has even more to offer. The

SATELLITE VIEW

INSIDE THE WORLD OF TVRO EARTH STATIONS

New Satellite Receiver Boasts Advanced Features, Easy Use

Regency Electronics, Inc., now offers an advanced satellite television receiver in the under-\$500 price class. The Regency SR-1000 Satellite TV Receiver is available for \$499 (suggested U.S. resale) at participating Regency Satellite Systems dealers.

The SR-1000 continues Regency's tradition of handsome "living-room-look" satellite TV equipment while adding some much-wanted features. As an aid to tuning, there are separate variable controls for video and audio tuning, dual threshold extension switches, and an LED "climbing" bar-graph tuning meter. A front-mounted Chapparral Polarotor™ control helps optimize reception for the desired satellite, and helps reject interference from adjacent satellites.

A composite baseband output provides optimum signal quality for equipment capable of using it (including upcoming stereo decoders); for use with standard television sets, a built-in modulator puts the signal on Channel 3 or 4.

With Regency's SA-9000 Polaris Satellite Antenna (\$595 suggested U.S. resale) and LNA-95 Low Noise Amplifier (\$499 suggested U.S. resale), the SR-1000 completes a capable, inexpensive, one-brand satellite TV system.

For additional information contact Regency Electronics, Inc., 7707 Records St., Indianapolis, IN 46226, (317) 545-4281.

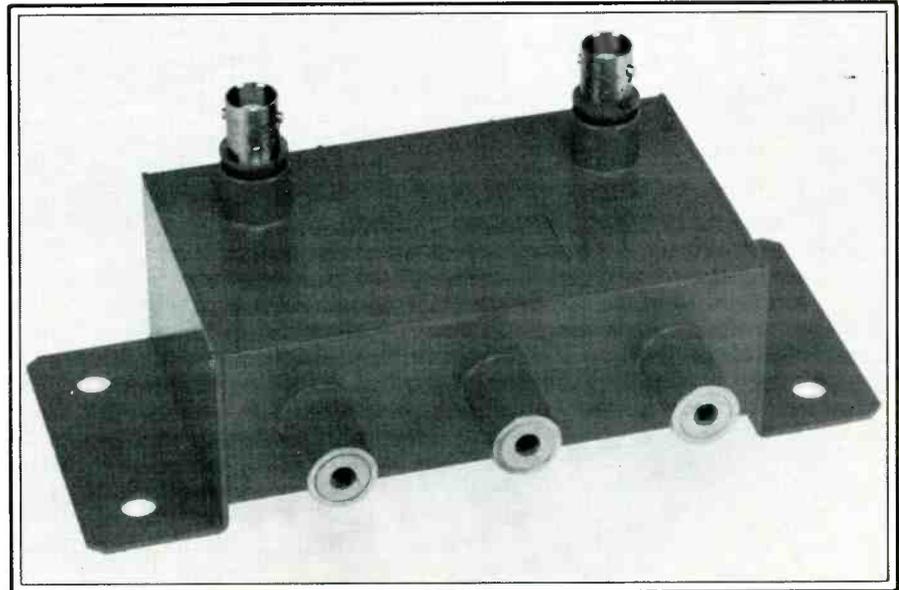
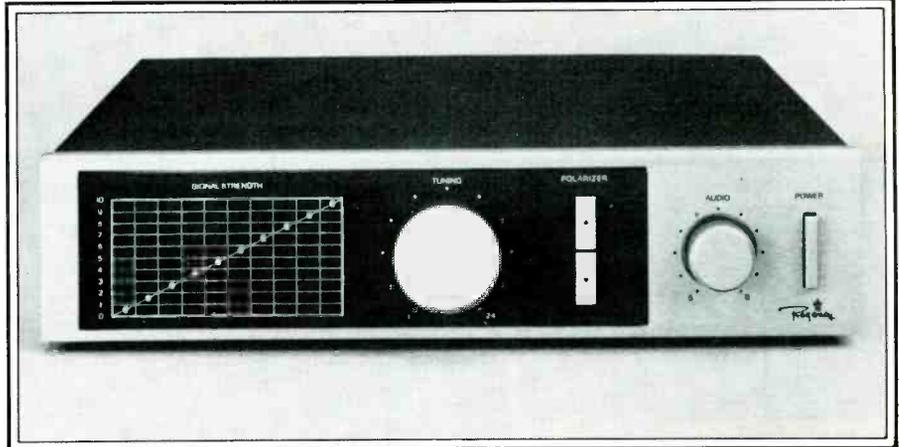
BPF Measures DBS Signal Levels

Model 4503 bandpass filters are designed to pass a 20 MHz wide band for use in measuring available signal levels in DBS signal level testing. This unit can also be used for other bandpass applications in the 950-1450 MHz IF band.

The filter selectively passes a desired transponder ($F_0 \pm 10$) while rejecting adjacent signals by at least 10 dB. This provides a quick and effective method of measuring relative signal levels.

The 4503 is factory tuned to any transponder desired in the 950-1450 MHz range. With proper equipment, nominal field tuning is $\pm 2\%$. 3 dB bandwidth is greater than 20 MHz and 10 dB bandwidth is less than 40 MHz. Insertion loss at center frequency is 0.7 dB (max.). Rejection in passband is greater than 16 dB. Standard connectors are BNC, with all other connectors available upon request for a nominal charge. Unit size is $3\frac{1}{4} \times 3 \times 6$ (max.).

Price and delivery are \$690 and 10 days, respectively. For more information, contact



Microwave Filter Company, Inc., 6743 Kinne St., East Syracuse, NY 13057. Call: US toll free 1-800-448-1666.

New Family Of Equipment

Space Age Video Distributors announces that they have released their family of satellite TV, cable, and M.D.S. encoding, decoding, and receiving equipment. The low cost S.A.V.E.—2 encryption system protects both the audio and video via satellite, or M.D.S., transmission. Currently, the system is being used by the Fantasy Unrestricted Network D.B.S. The Space Age command center V.C.C.-2000, is an addressable complete TV tuner with user programmable event control on M.D.S., midband, satellite, or standard UHF/VHF channels. The command center is tier addressable and is programmed by customer remote control or P.P.V. command.

Space Age also announced their broad

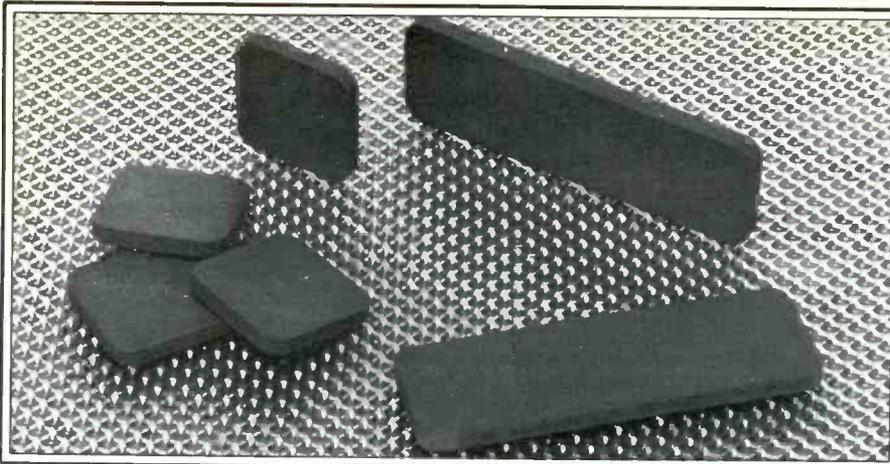
band 1.6 GHz-2.8GHz parabolic receivers. Range up to 100 miles can be achieved with the 30-inch dish version. For information contact, Space Age, at (408) 559-8812.

Absorbers Flatten LNA Gain

Type 4527 microwave absorber slugs, mounted on the lids of C-Band TVRO low noise amplifiers (LNA), absorb spurious feedback and preserve flatness in the gain-versus-frequency curve.

Most LNA's are housed in a casting which can act as a waveguide transmission line to conduct unwanted feedback from the high gain output to the amplifier input. The result is a ripple in the gain-versus-frequency curve. The absorber slugs, mounted in the path of this unwanted feedback, absorb it.

Slugs are supplied ready-to-bond to the LNA lids. A two part absorber mix is also available for customer production of special slug sizes.



For more information, contact Microwave Filter Company, Inc., 6743 Kinne Street, East Syracuse, NY 13057. Call: US Toll Free 1-800-448-1666.

Four-Foot Do-It-Yourself Satellite "Personal Dish" Offers Instant Satellite Access Anywhere

They laughed when inventor Richard Eye announced his 4-foot satellite dish last May. At 1984's two largest satellite earth station shows, with certified test results in, they were not laughing.

The 55-inch antenna will deliver studio quality video from GALAXY I anywhere within the continental United States. The

QuadraLite™ PDT™ Personal Dish™ antenna, weighing in at only 45 pounds, has been designed to be assembled—from out of the box to perfect reception—in under an hour, even by a novice with no previous experience in "earth-station" assembly. Assembly of the entire QuadraLite system requires only a single crescent wrench.

Unlike conventional dishes, the QuadraLite requires no complicated assembly, concrete pouring, or complex adjustments. "You can mount it on just about anything—a flat surface, a sloped roof, even vertically against a wall. To get a picture, you look up a number in a table for your city, adjust a single bar to that number, and rotate the dish until you see a picture. It's that easy," says Eye. Usually measuring ten feet or more in di-

ameter, conventional satellite dishes require heavy, expensive mounts, highly trained installation crews working for days, elaborate alignment procedures by experts, and costly motor systems. The QuadraLite makes all of this unnecessary, Eye says.

According to QuadraLite Vice President, Advanced Special Projects Ken Schaffer, who implemented the Mt. Everest live satellite TV for ABC-TV's *Nightline* in 1982, "The QuadraLite PD goes anywhere. It's perfect for everything from backyard barbecues to camping trips, SMATV apartment and hotel installations, site surveys, and especially for locations where large dishes are impossible." According to Schaffer, "The QuadraLite PD system demystifies the whole earth station field. Instead of 'satellite earth terminals' and 'TVROs' it becomes nothing more than a bit TV antenna."

Over 2000 QuadraLite Personal Dishes have already been sold through a network of national distributors. The company also offers a low-cost complete Personal Dish system, with QuadraLite antenna, LOCOM Block downconverter receiver, 100-degree LNA, and Chaparral Polarotor® II feed horn. This system, available for immediate delivery, allows for studio-quality reception of 24 channels from GALAXY I.

For further information, contact QuadraLite, Inc., 114 W. Corsicana St., Athens, Texas 75751, (800) 527-7130 or (214) 675-1436; or its East Coast office, Penthouse 21 W. 58 St., NY, NY 10019, (212) 371-2335.

PC

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BROADCAST TOPIK

BY MARK J. MANUCY, W3GMG

DX, NEWS AND VIEWS OF AM AND FM BROADCASTING

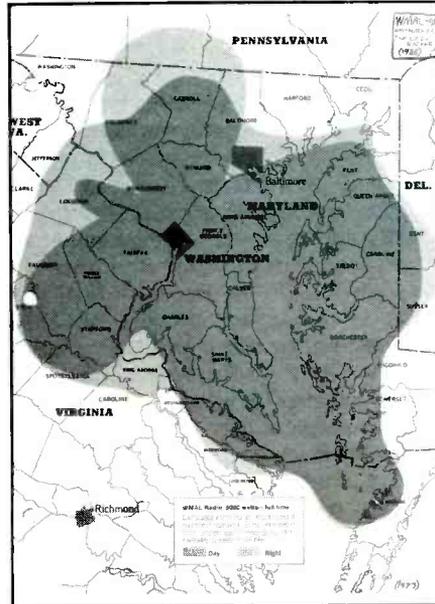
Each month there are questions about catching more stations when DXing. If you go back through some of the issues from last summer and fall, there were other tips on DXing. A lot of us, I'm sure, do not have access to a car radio while on vacation. One may not have control of the auto radio (Dad does), or the spouse (or Mom or Dad) is driven nuts by the constant "station hopping." "Why can't you settle on one clear station?" Even though they don't understand, I do. This month let's spend a little time trying to catch the stations we can with the radio we have.

I know what it's like to be "stuck" with a radio. When my grandmother died I got her multi-band table radio. I was eight or nine at the time and before too long the radio quit. My mom took it to the shop to be fixed and was told the only way it could be fixed was to remove the shortwave coils. She agreed and I had an AM band only radio. Well, I forgave her, but I've never said a good word about that shop since. At least I had AM and that may be why it's my first love today!

As a young fellow I probably spent as much time building different antennas as I did listening. From your letters I find a lot of you do the same. Today there are a lot more stations with a lot more power, which makes DXing easier and yet, at the same time, does create some other problems. Most of the problems are solved with the newer receivers, but if you don't have one, what do you do?

Here are some answers: The best answer is persevere. You have to hang in there, sometimes for long hours, waiting to hear a certain station. This separates the DXers from the listeners. I have found the best way to DX with an average radio is with a guide book. When I started as a kid back in the '40's, I used *White's Radio Log*. I never have kept a separate log, just underlined the station in the book. Today there are several inexpensive guides available, including *White's* and *Van Jones*. Several clubs issue guides as well. While I am speaking to AM DXing, bear in mind that most of these techniques apply to FM and SW as well.

With the guide in hand, one can determine the "general range" of one's radio by looking at the power listing of the different stations in the guide. For FM, not only the power but the antenna height is important. Unfortunately, both guide books mentioned above have stopped listing the antenna heights of FM stations. Here's why it is important. A 10 kW FM station with an antenna at 1000' will be heard a much greater distance than a 20 kW station whose antenna is only 200' high. Without the tower height listing it is difficult to determine which station is the more powerful. If you lived 100 to 150 miles from a city with stations like the



From the collection of Alan Corduff.

example, you would spend a good deal of time trying to hear the 20 kW one and may never hear it, wondering why the lower power station is so much stronger. Tower height goes hand in hand with power on FM.

The antenna "pattern" holds the same mystery on AM, however this is much more complicated than listing the height of a tower. Whether a station is DA-1 or DA-2 still doesn't tell you in which direction the power is going. It would be very difficult to describe the antenna pattern of the station in words.

What is needed is a mini-map showing each station. It would be very expensive to show every station on each channel! Wow! Maybe this is some of the mystique of BCB DXing! Years ago there was a company that sold this type of book and I would have almost given my right arm for one, but then it probably wouldn't have brought enough money to buy one. AM DXing is by hit and miss as far as knowledge of the stations' antenna pattern is concerned. If you have a book listing the operating parameters of the stations, all you will know is whether the station uses a DA or not. DA stands for directional antenna. The suffix 'N' means night only, '1' means same pattern day and night and '2' means different patterns and or powers day from night. The suffix 'D' means the daytime station is directional. However, there are a few stations that are directional during the day and non-directional at night. Knowing whether the station is directional might explain not hearing it.

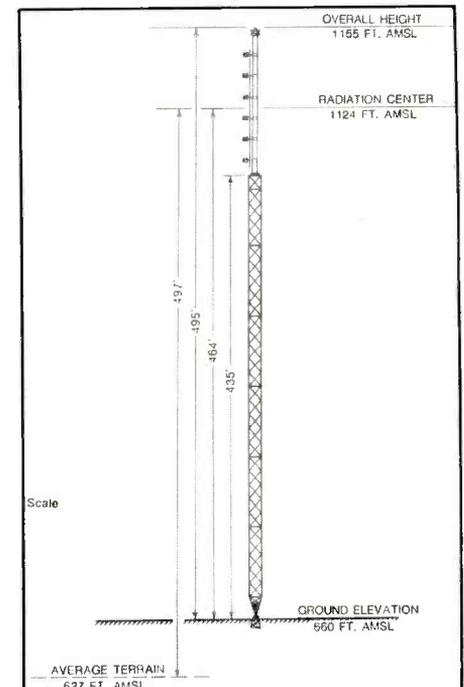
Once you have established the approximate "hearing range" of your radio, with a guide book in hand you will be able to know which stations you should be able to hear. The guide book also gives an edge on identi-

fying the station since you will know what the call letters are. Check with our update section for recent changes.

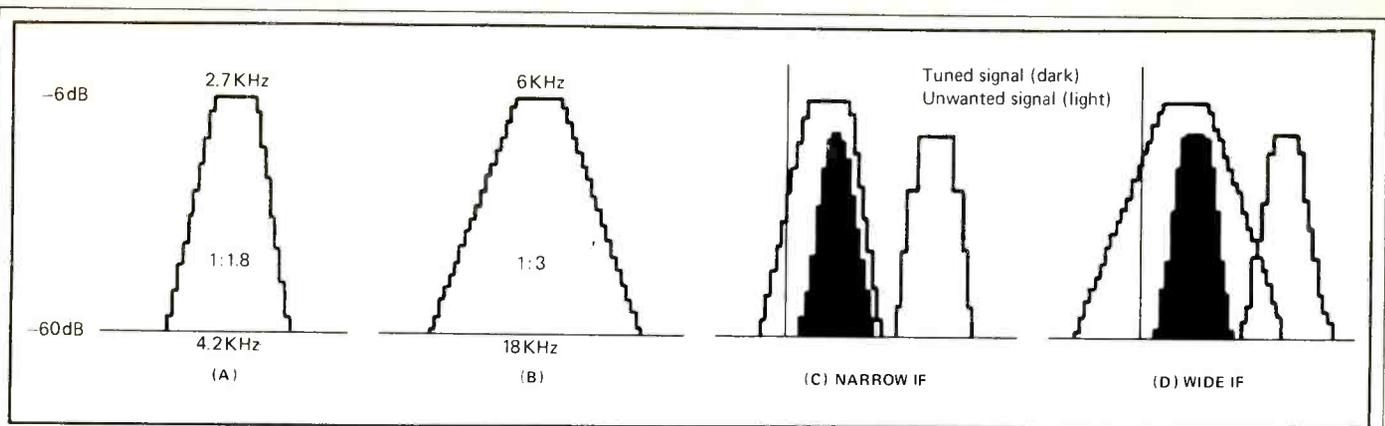
A big help in hearing stations is a pair of headphones. It is difficult to hold a radio to your ear and see the dial at the same time. The headphones also eliminate outside noises and allow better concentration on the job at hand. All portable radios of today have built-in loop antennas which are directional. In order to hear a station that is close to a stronger station, it is sometimes better to turn the radio so that the loop "nulls" the stronger station. If the desired station is in the same direction, then that won't work. Normally the loop is in the same plane as the long side of the radio. Stations off the ends of the radio will be favored and those to the front and back will be in the "null."



Radio Lighthouse, 1165 kHz, St. John's, Antigua was the catch of Michael Goetsch.



How an FM antenna is shown in an FCC presentation for a new or modified station.



Bandwidth as explained in the text.

The directional pattern of the loop is a figure "8" with the "X" centered on the radio. Picture laying the "8" on top of the radio with the two loops of the eight extending off the ends of the radio. The loops are the favored directions. Tune in a station and rotate the radio. You should hear the signal fade and get strong as the radio is turned. If you can make the signal fade completely, then leave the radio in this position and tune slightly either side of the station and see if you can find a station you haven't heard before. Try this trick on all your local stations. By moving the rod antenna on a portable FM radio to "null" the station, the same trick might be applied.

Receiver Specs

What makes one radio perform better than another? The "specs" are better. The specs (specifications) are the qualities of the receiver or radio. A radio is a general term to cover all receiving sets. A receiver is a quality radio designed to perform a specific function. Generally speaking, the more expensive the receiver the better the specs.

Sensitivity: The ability of the receiver to hear a signal. The lower the number, the better. A 5 μV rating is better than a 1.8 μV rating. The μV (microvolt) rating is the key, with a signal to noise figure usually 10 dB. In other words, a .5 μV signal will produce a 10 dB difference in the signal over the noise. The higher the dB for the lower the μV , the better the sensitivity.

Selectivity: The ability of the receiver to separate the signals. The sensitivity and the selectivity are the heart and soul of any receiver. The rest is extra. It is expressed in kHz bandwidth. My references are going to be to the R-70, since it is the one I own. The AM selectivity is 6 kHz at -6 dB and 18 kHz at -60 dB. Refer to the chart. The slope of the IF is how sharp the sides fall from the -6 point to the -60 point. As can be seen, the R-70 slope is the ratio of 6 and 18 or 1:3. If the -60 point was 36 kHz, the slope would be 1:6, not as good for DX. The SB response is 2.3 at -6 dB and 4.2 at -60 dB, a very sharp filter. The slope is 1:1.8. The smaller number indicates a better ability to separate adjacent stations with the ideal being reached at 1:1. However, it is necessary to point out that if the adjacent station is spill-

ing over due to excessive modulation or splatter, there is no filter that will make an improvement on the situation. A lot of DXing is done in the SB mode because of the better filters. This is done by zero-beating the carrier. If the signal is still too noisy, then switch to the other sideband and see if reception is better.

Referring to the chart, one can see graphically what I am explaining. Figure A is the SB filter, Figure B is the AM filter. This is what one sees when using a sweep generator with an oscilloscope. With this picture in mind, we will insert some signals in Figures C and D. Same two signals with the filter switched from SB(C) to AM(D) or narrow to wide. It is easy to see in the wide position the unwanted signal is now within the passband and can be heard. If the unwanted signal was much stronger, it would appear much higher on the chart and would even be heard with the narrow filter. If the unwanted signal was wider because of excessive modulation, its slope would be wider than the one shown and there would be no way to tune it out. Notice in (C) the receiver is tuned to the side away from the unwanted signal to avoid it as much as possible. If one has a super narrow filter with almost straight slopes (1:1), then it would be easier to separate signals close together. If the signals overlap each other, they cannot be separated. A receiver for AM DXing should have a wide and narrow filter for AM without having to use the SB mode.

The **IF Shift Tuning** allows one to shift the IF slightly to get away from interfering signals without moving the main tuning. Normally the signal is centered in the IF. Figure C shows the signal "shifted" slightly to tune away from the interference. This is fine if there is no interference on the other side. As shown in Figures C and D, there is other interference in the form of a heterodyne. With the IF shift, there is no getting away from interference in this case.

With **Pass Band Tuning**, one can narrow the IF from the 2.7 kHz, which would allow the heterodyne to disappear. From Figure D it is easy to see the heterodyne is very loud in our speaker; reduced somewhat in Figure C. With the passband tuning, it can be removed by reducing the bandwidth. The ICOM will reduce the 2.7 kHz to

about 800 Hz. At 800 Hz the speech will be difficult to understand because the bandwidth is too narrow to pass the voice.

The heterodyne can also be removed with a **Notch Filter**, which tunes right to the heterodyne and sucks it into a black hole! Notch filters tune very sharply, so they have to be tuned slowly. They will make the audio quite distorted if adjusted too close to the wanted signal.

Enough for now, we'll cover some other specs next month.

Time Signals

I have been getting mail about time signals in the BC band. There are quite a few in the past year or so. I noticed them two summers ago while in the Florida Keys. They apparently come from Cuba. Some of the other columns in *POP'COMM* have talked about these stations, so dig up your back issues.

Mail Call

From Kutztown University, William Mayer writes to tell how he squeezes in DXing between assignments and on weekends. Good way to take a break, do a little DXing!

Scott Fybus of upstate New York sent along some bumper stickers. At the age of 12, he is getting a good start on a BCB DXing career. He's heard WMAL at night with a headset radio. Read good, Scott! They beam SE, away from you. Always glad to have pictures, too.

Michael Goetsch of Berea, Ohio, sends a photo of the Caribbean Lighthouse, a 10 kW station on 1165 kHz from St. John's, Antigua.

Brude Bacon of Boise, Idaho, is another supporter of loop antennas (instead of LW's) and has logged a number of foreign stations with his 40" loop with a preamp. In January he logged Tahiti on 738 kHz and Kiribati on 846. He uses a Kenwood R-2000 and a Hammarlund SP-200 with a Uniden 2021 as backup!

Got a couple of notes from Bud Stacey this month in which he mentioned hearing an L.A. TV station audio on 26.19 MHz. This was probably an audio feed from the studio to a remote location for cuing purposes, Bud. Maybe they left it on longer

Call Letter Changes

Old	New	Location	Old	New	Location
AM Stations			FM Stations		
WIGL	WRLX	Tuscaloosa, AL	KWDE	KSTR-FM	Montrose, CO
new	WOOB	Leeds, AL	new	WWAV	Santa Rosa Bch, FL
WWAX	WBHY	Mobile, AL	new	WOZN	Key West, FL
WETU	WAPZ	Wetumpka, AL	WEZI	WHQT	Coral Gables, FL
KSML	KYOR	Globe, AZ	WOWD	WTHZ	Tallahassee, FL
KDIA	KFYI	Oakland, CA	new	WULF-FM	Alma, GA
KOGO	KLZZ	San Diego, CA	new	KWPR	Wailuku, HI
KNEF	KPRZ	San Marcos, CA	new	WLZR	Monticello, IN
KHSP	KVVQ	Hesperia, CA	WJET	WATI	Danville, IN
new	WGNZ	Titusville, FL	WGRT	WBVS	Prestonsburg, KY
new	KAHU	Hilo, HI	WPRT-FM	KHLA	Lake Charles, LA
WATI	WGRT	Indianapolis, IN	KLCL	WGGZ	Baton Rouge, LA
new	KTFR	Lyons, KS	WAFB-FM	WKKT	Boston, MA
new	WKLW	Paintsville, KY	WCOZ	WZJI	Fort Huron, MI
new	WBZE	Indian Head, MD	new	KWJC	Liberty, MO
WJOK	WMTG	Gaithersburg, MD	new	KGVM	Minden, NV
new	WFEN	Fenton, MI	WECM	WHDQ	Claremont, NH
new	KSLQ	Washington, MO	KAFF-FM	KKSS	Santa Fe, NM
WGGD	WCHP	Champlain, NY	WGRQ	WGR-FM	Buffalo, NY
new	WBZN	Wake Forest, NC	WSRQ	WWWI	Eden, NC
KSHR	KBEY	Coquille, OR	WUDD	WPAR	Claremont, NC
WRML	WWML	Portage, PA	WLVV	WLVK	Statesville, NC
WKOE	WREA	Dayton, TN	new	WWMZ	Fredericktown, OH
KYCS	KBRN	Boerne, TX	WAEZ	WONE-FM	Akron, OH
new	WGFC	Floyd, VA	KWVS	KBKN	Newport, OR
WANR	WUNI	Wheeling, WV	new	KWSO	Warm Springs, OR
			new	WYEF	Coudersport, PA
FM Stations			WKCD	WTPA-FM	Mechanicsburg, PA
new	KDAN-FM	Williams, AZ	WSTN	WJMX-FM	Florence, SC
KMCR-FM	KJZZ	Phoenix, AZ	WEZR	WBMW	Manassas, VA
KNPY	KTCN	Eureka Spgs, AR	KHQ-FM	KISC	Spokane, WA
KGHI	KPFM	Mountain Home, AR	WQAW	WXKX	Parkersburg, WV
KLZZ	KLZZ-FM	San Diego, CA	WUQU	WSCW-FM	S. Charleston, WV
new	KXBX	Lakeport, CA	WANJ	WZMM	Wheeling, WV
new	KRZQ-FM	Tahoe City, CA	KAWY	KATI-FM	Casper, WY
KVVQ	KVVQ-FM	Victorville, CA			



Nice photo of station WSBS, a 250 watt station on 860 kHz in Great Barrington, Massachusetts. Why not send us photos of AM/FM broadcasters in your area? (Photo courtesy Tony Earl!)

than was necessary. I might point out that this band is a good place to pick up goodies like this (remember KSL a few months back?). The range is 25.87 to 26.47 MHz and mostly in the FM mode.

Tunnel Radio

This may not be the first "under ground" radio, but it is legitimate! The Boston Tunnels (Callahan and Sumner) have a live radio broadcast just for the tunnel over the cable which carries AM radio into the tunnels. The "tunnelcasting" is a 24-hours-a-day and is to focus on good news rather than the "hard core" stuff of the above ground stations. A whole new approach to DXing! Let's see... Boston, New York, Baltimore...

oh, the new tunnel radio at Montreal! Thanks to VE7HL and Bud Stacey.

A letter from Keyser, West Virginia, Von Mosser, who does his DXing with a DX-160 from RS. We'll be sharing some of his QSLs over the next few months.

From University Heights, Ohio, comes word of another TIS. This one is 1610 kHz at Cleveland Hopkins Airport. This is in a

long letter from Dave Revay. A little more on TV DX asks Dave.

Dick Ipsen of Napa, California, says he used to DX with a car radio converted to AC. This might be an inexpensive way for most anyone to get into DXing, Dick. Auto radios can be cheap from a junk yard and they don't require much antenna to work very well.

Huson Wilken of Oswego, New York, asks when the FCC stopped issuing three letter calls. I'm not sure, Huson, but I think in the thirties when they ran out of them. They were also used with ships and ship-to-shore stations as well as broadcasters. Huson also collects call letters that stand for something, and although I don't have time this month, I will share some with you next month.

The DX prize this month is from Rauma, Finland, where Reijo Siivonen lives. He wrote asking about antenna amplifiers, which I answered by mail. Thanks for the letter, Reijo.

I also received a very nice letter from Leonard Kahn of New York who enjoyed reading about AM stereo. Thank you for the nice comments. Speaking of AM stereo...

AM Stereo

Sony has announced the release of two

Station Updates

Call	Location	Freq	Pwr	Ant
AM				
WPLP	Pinellas Park, FL	570	5/1	DA-2
WVAL	Sauk Rapids, MN	660	10/1	DA-2
WAIS	Buchtel, OH	770	1/0	O
WAIT	Chicago, IL	820	5/1	DA-2
WMIA	Arecibo, PR	1070	.5/2.5	O
KGFL	Clinton, AR	1110	5/0	O
KFHM	San Antonio, TX	1160	10/1	DA-2
WSDR	Sterling, IL	1240	1/1	O
KLLK	Willits, CA	1250	5/2.5	DA-2
WLEW	Bad Axe, MI	1340	1/1	O
WCHQ	Camuy, PR	1360	1/1	DA-2
WKIQ	Inverness, FL	1560	1/1	DA-N
FM				
WIRR	Virginia, MN	90.9	21	462'
KTXK	Texarkana, TX	91.5	2.8	N/C
WCCV	Cartersville, GA	91.7	.91	537'
KZHR	Toppenish, WA	92.7	.41	868'
WJSM-FM	Martinsburg, PA	92.7	58.2	606'
KBLQ-FM	Logan, UT	92.9	100	154'
WKKJ	Chillicothe, OH	93.3	22.1	N/C
KZBQ-FM	Pocatello, ID	93.7	N/C	976'
WAMX	Ashland, KY	93.7	50	590'
KFMX-FM	Lubbock, TX	94.5	N/C	564'
KKHI-FM	San Francisco, CA	95.7	6.9	1289'
WPTW-FM	Piqua, OH	95.7	50	476'
WHYT	Detroit, MI	96.3	20	786'
KDOG	N. Mankato, MN	96.7	46	744'
WLVV	Statesville, NC	96.9	100	1548'
WBNS-FM	Columbus, OH	97.1	20.5	N/C
WRUL	Carmi, IL	97.3	N/C	493'
KBCO	Boulder, CO	97.3	N/C	1541'
KWNZ	Carson City, NV	97.3	29.3	2186'
KNBQ	Tacoma, WA	97.3	N/C	1480'
WSIP-FM	Paintsville, KY	98.9	94	600'
KQPD	Payette, ID	100.1	100	475'
KZEN	Central City, NE	100.3	N/C	1845'
KICE	Bend, OR	100.7	100	599'
KINK	Portland, OR	101.9	N/C	1674'
WIMT	Lima, OH	102.1	11	1060'
LMNT	Centralia, WA	102.9	100	1057'
KXJX	Pella, IA	103.3	N/C	745'
WBLZ	Hamilton, OH	103.5	19.3	N/C
WRMG	Augusta, GA	105.7	100	1322'
KUIN-FM	Vernal, UT	105.9	100	1008'
WMJX	Boston, MA	106.7	15.5	900'
KESI	Terrell Wells, TX	106.7	100	1016'

KEY: D = Daytime N = Nighttime DA = Directional Antenna DA1 = Same Pattern Day & Night DA2 = Different Pattern/Power Day/Night O = Omni Antenna Day/Or Night.

chips that will decode all AM stereo systems. Kahn Communications is releasing a "secret" decoder which, when attached to existing C-Quam decoders, will receive the Kahn system as well. Both the Sony and Kahn will switch automatically to the system in use.

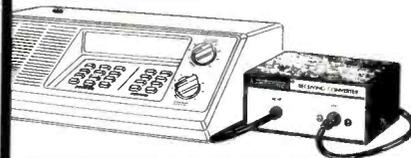
This year will see just about every auto and home system manufacturer selling products for AM stereo. Chrysler, Ford, Volkswagen, Mitsubishi, Volvo, Mercedes, Porsche, BMW, and AMC will all have C-Quam decoders built into about 30% of their auto radio line this year. The additional cost is expected to be about \$20 to \$40. General Motors expects the AM stereo radio they sell to be about \$60 less than last year's

model due to increased volume. Look for sets from Sherwood, Pioneer, Marantz, McIntosh, and possibly Fisher, which will feature C-Quam decoders. Sony and Sansui will be providing multi-mode decoders.

Well, that's a wrap for this month. Hope to see you again next month same time, same column! Address correspondence to P.O. Box 5624, Baltimore, MD 21210. Include postage if a response is indicated. I have additional information available on computer programs for the C-64 used with this column. Loop antennas and AM stereo stations listings are also available. Send an SASE for more information. I'd also like to have more pictures of shacks and stations.

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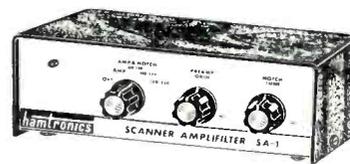
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PIRATES DEN

BY DARREN LENO, WDØEWJ

FOCUS ON FREE RADIO BROADCASTING

Federal officials in Canada have closed "Underground 90," a pirate station that was broadcasting from an apartment building in Burnaby, British Columbia. The raid on this pirate was led by Communications Canada inspector Tony Tamayose, and followed a series of complaints from listeners about some of the material that was broadcast.

The operators, Marty Young, 24, and Andy Hoffman, 29, began Underground 90 because they were unhappy with the type of programming that is available on commercial FM radio stations in Canada.

Underground 90 had been broadcasting from a vantage point on the 17th floor of an apartment building. The station's roots go back as far as 1979 to Delta, British Columbia and a one-watt transmitter that Hoffman built from surplus cable TV equipment.

When Communications Canada officials arrived earlier this year, they found a 50-watt transmitter, confiscated about \$5,000 worth of stereo equipment, and a new \$600 antenna that had just been installed on the balcony.

The two men took turns being deejays. Hoffman says that Underground 90's music policy was to play "everything and anything." Music ranging from the Doors and Culture Club to Hank Williams was not uncommon.

Plot Against Laser Uncovered

Legal broadcasters in Britain are so upset about the popularity of Laser 558 that they may be considering violent action to put this pirate ship off the air.

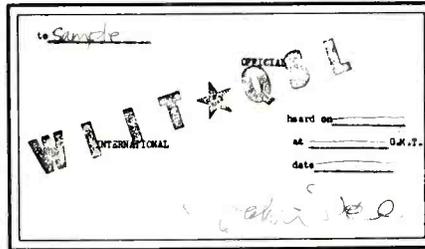
Laser 558 is anchored just outside of British waters in the North Sea. The ship is registered in Panama and supplied through Spain. Laser, along with another floating pirate, Radio Caroline, is eroding the British government's monopoly on broadcast programming.

A London tabloid, *The Daily Mail*, reported that a BBC radio executive discussed a plot that involved hiring mercenaries to attack the ship, overrun it, and destroy its transmitters.

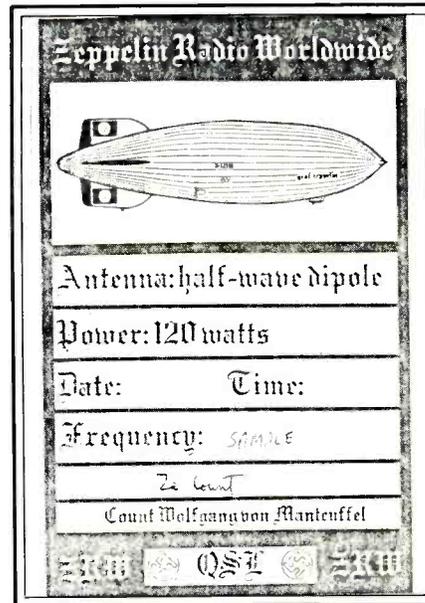
The Mail published excerpts of a 20-minute recording of a conversation between Eddie Blackwell, manager of Essex Radio, and a bar owner.

The tapes revealed that the bar owner said he could assemble an 8 to 10 man force that would capture Laser and destroy its transmitting equipment. Each man would receive about \$600.

Another plan involved cutting the ship's anchor and towing it into British waters, where it would no doubt be immediately seized by authorities.



WITT is new to the pirate radio scene.



DXers who successfully log Zeppelin Radio will be eligible to receive this sharp verification card.

Violence is not something that is new to European offshore broadcasting. During the 1960's and 70's, murder, bombings, arson, and shootouts between authorities, gangsters, and other pirates were the perils one had to live with to keep a pirate station afloat and on the air. It would be unfortunate to return to those days.

Across The Dial

KOLD was playing "Your favorites from the 50's and 60's" as Ted Fleischaker of Kentucky tuned in at 0212 GMT on 7425 kHz. The DJ said he would verify reception reports by "looking through the magazines."

KROK was playing old rock music and identifying itself regularly when Joel Rose of Ohio tuned in at 2230 GMT on 7403 kHz. Cary Widel in Illinois also heard this transmission, and says reports can go to PO Box 245, Moorhead, MN 56560. John Norfolk in Oklahoma caught KROK on 7400 kHz at 2158 GMT.

KRZY Ken Evans of South Carolina tuned in KRZY "Crazy Radio" on 7430 kHz from 0111 GMT. Frequencies of 1610 and 1630 kHz were mentioned, and the possibility of KRZY-FM was discussed. Out in Idaho, Rick Link heard this one on 7425 kHz at 0420 GMT. It was the first pirate he has heard, and hopes many more will follow. So do I, Rick!

Radio North Coast Int'l G. A. Hutchins in Texas heard RNCI "live" from their new transmitting facilities. Music was played by Yes, as well as Crosby, Stills, and Nash. Reception reports go to PO Box 245, Moorhead, MN 56560.

Radio Sound Wave This pirate was heard by Ken Evans on 7422 kHz after 0030 GMT. The address given was PO Box 393, East Moline, IL 61244.

Secret Mountain Laboratory was using 7432 kHz at 0330 until 0350 GMT. Michael Westphal of New York heard an announcement that "SML is a shortwave relay station."

Tangerine Radio Walt Sepaniac of Texas was treated to an "outbreak of anarchy on the shortwave bands" when he tuned in TR on 7427 kHz on upper-side band, from 0455 until 0701 GMT.

WKRU "The shortwave superstation." Walt Poppings in Indiana heard this pirate with its personalities Tim Longfellow, Sam Widebody, and E. Nick Vanocousi, on 7425 kHz at 2030 GMT. They are currently trying to arrange an interview with E. F. Johnson, the manufacturer of the E. F. Johnson amateur radio transmitters that are so popular with pirates.

WMAD This was Pat McDonough's first pirate. He tuned them in on 7443 kHz at 2130 GMT at his Pennsylvania home, and has already sent a reception report to WMAD, PO Box 5074, Hilo, HI 96720.

George Green in Georgia also heard WMAD, but on 7441 at 2120 GMT.

WMTV was playing rock music when Mike Limbert in Michigan tuned in 7425 kHz shortly after 0500 GMT. Their address for reception reports is PO Box 1945, Delray Beach, FL 33444. Throughout the show, they reported that their FM simulcast wasn't working out.

WWW "The radio station of the home for wayward girls." Larry Vogt in Virginia says this station was booming in on 1620 kHz at 0412 GMT on a Sunday night. WWW programmed an amusing mix of progressive music and old jingles. Reports go to PO Box 40554, Washington, DC 20016.

Zeppelin Radio Worldwide was claiming to be broadcasting from a Deutschland beer hall while Ken Evans listened at 0123 GMT on 7435 kHz.

Reception reports should be accom-

panied with three First Class stamps to PO Box 245, Moorhead, MN 56560.

WIIT Int'l

A new pirate calling itself WIIT writes to tell us they have begun broadcasting on 1610, 10040, 10080, or 26670 kHz. They say the WIIT transmitter has been installed within an automobile. During transmissions, the car will be in transit in an attempt to avoid the FCC.

Times to listen for WIIT include Friday and Saturday evenings, and Monday mornings. Listen for the sound of the typewriter. A QSL address will be announced on the air.

KABF Relay

I received this interesting letter from Randy Burch, WB5RLD, in Texas.

"Sometime about 0500 GMT I picked up a rock 'n' roll station on 7425 kHz. Suddenly a DJ came on and announced it was 'Station KABF, Little Rock, Arkansas, broadcasting on 88.3 MHz FM, and 7425 kHz shortwave.' A telephone number was given out for signal reports.

"The next day, I dialed the telephone number that had been announced. I talked with KABF program director Tom Davis who informed me that they were a legitimate FM station. He also told me that the night before, he had received phone calls from all over the country from shortwave listeners. One call even came from the FCC in Grand Island, Nebraska, who wanted to know what was going on.

"Mr. Davis seemed rather pleased when I told him that the pirates who were relaying their signal on SW had done a good technical job in re-broadcasting his station."

Evidently, the pirates are sneaking in their own ID's to include the shortwave frequency. KABF has joined other legal broadcast-

ers, like WLS, WAAF, and WLW, who have all been victims of this practical joke.

Radio Kristal

Peter Thompson of Great Britain recently received a verification card and some information from the Dutch pirate station Radio Kristal.

Radio Kristal is operated by a 23-year-old bricklayer who says he has been pirating for ten years. During that time, he has been closed by the police twice, but has twice managed to return to the air.

Transmissions usually take place on Saturday nights, from 0000 GMT until 0100 GMT on Sunday. Radio Kristal broadcasts on 1610 kHz with 200 watts and a dipole antenna about 70 feet above the ground.

In Conclusion . . .

Special thanks this month to the Canadian readers who contributed information about "Underground 90."

Computer hobbyists may find the Association of Clandestine radio Enthusiasts' remote computer bulletin board system interesting. It is on line 24-hours-a-day at 913-677-1288. Callers will find current pirate and clandestine loggings, as well as text files to view, and discussions to participate in. Remember, you must have a computer with a modem to use this service.

Readers are definitely invited to participate in The Pirates Den. Send your contributions (loggings, copies of QSL cards, newspaper clippings, etc.) to The Pirates Den, c/o Popular Communications, 76 N. Broadway, Hicksville, NY 11801.

Keep in mind that most pirates operate sporadically and on weekend evenings. Watch the frequencies mentioned in this column and report back what you've been hearing. Until next month, happy listening!

SPEEDX, 7738 East Hampton Street, Tucson, AZ 85715.

This group offers several grades of membership based upon the amount of participation in the organization's publication which, coincidentally, is called **SPEEDX!** The publication runs 60 pages per month and is chock full of news and information, frequency listings, skeds, and other information on shortwave stations, including utilities. The publication even includes a technical section. The group also offers a number of excellent reference publications and DX'ing aids. Annual membership is North America is \$18 (includes First Class Mailing of publication). A sample copy of **SPEEDX** is available from the group at \$1.50 (to anywhere in North America).

The Longwave Club of America, 45 Wildflower Rd., Levittown, PA 19057.

Here's a club for those rugged enthusiasts interested in knowing what's happening below 540 kHz! Their monthly publication, *The Lowdown*, not only covers listings of stations operating between 10 and 540 kHz, but also has interesting coverage of the 1750 Meter (no license) low power communications band as conducted by Ken Cornell (W2IMB—well known "Lowfer" authority. Membership includes mailing of the publication by First Class Mail and costs \$10 per year (anywhere in the world).

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THE EXCITING WORLD OF RADIOTELETYPE MONITORING

In past columns we have mentioned briefly frequency division multiplexing, or FDM for short (another acronym—it seems as if the communications profession has the most acronyms besides medicine).

The fact remains that using a voice-bandwidth channel for low-speed RTTY is a waste of available bandwidth. If we look at a standard voice channel of 300 to 3000 Hz, we can cram a multitude of low-speed RTTY signals in this bandwidth.

Microwave and coaxial circuits carry thousands of voice channels, waveguide point-to-point systems carry about 250,000 voice channels, while the lowly voice channel can actually carry 12 or 24 RTTY digital channels.

It is desirable to make the maximum use of this bandwidth by allowing as many signals as possible, thus not only increasing efficiency but lowering costs. Instead of installing separate transmitters or individual media lines, a technique known as multiplexing is used. FDM is one of the many multiplexing schemes used to conserve precious radio-frequency space. Multiplexing is simply a "packaging" of many voice or digital signals. When the FDM group signal is received, it is broken down into individual components.

We are not restricted to all RTTY data channels. For example, at 10531.5 kHz we find a 75 baud weather transmission, a 50 baud AP, 45 baud UPI, and a lower side-band voice! Two standards exist, however, as shown in Table 1 and Table 2. Table 1 is the international standard CCITT R.39 for FDM multiplexing. At 75 baud, we see at Channel 1 a center frequency of 420 Hz is

```

0025^@
OV681 2700N 06839W 0018 F310 M42 040060 TDV CHOP;^@
AA665 2700N 06839W 0015 F370 M56 360042 TB SMTH;^@
MAF600 5900N 05000W 2353 F290 M47 300/35;^@
FQ8001 5100N 03000W 2347 F310 M54 230/30;^@
SU347 4900N 04000W 2338 F310 M55 240/50;^@
NNNM^@
0026^@
    
```

Figure 1.

Table 1

CCITT R.39 Operating Frequencies For FDM Multiplexing

Channel Number	75 Baud	150 Baud	600 Baud
	Chan. Spacing 120 Hz FSK ± 30 Hz	Chan. Spacing 240 Hz FSK ± 60 Hz	Chan. Spacing 1440 Hz FSK ± 240 Hz
1	420	480	1080
2	540	720	2520
3	660	960	
4	780	1200	
5	900	1440	
6	1020	1680	
7	1140	1920	
8	1260	2160	
9	1380	2400	
10	1500	2640	
11	1620	2880	
12	1740	3120	
13	1860		
14	1980		
15	2100		
16	2220		
17	2340		
18	2460		
19	2580		
20	2700		
21	2820		
22	2940		
23	3060		
24	3180		

```

^@
SPORTS-3RD-ROUNDUP^@
-24-^@
(RECORD)^@
VILLANOVA SET A WORLD INDOOR RECORD TODAY IN THE WOMEN'S 800-METER^@
RELAY AT HAVERFORD, PENNSYLVANIA.^@
THE TEAM OF KELLY TOOLE, DEBBIE GRANT, JOANNE KEHS AND VERONICA^@
MCINTOSH SHATTERED THE PREVIOUS MARK BY MORE THAN FOUR SECONDS AT A^@
MID-ATLANTIC CONFERENCE OPEN MEET.^@
THE EIGHT-34 CLOCKING ERASED THE EIGHT-38-SIX SET BY THE SOVIET^@
UNION NATIONAL TEAM IN 1972. ^@
... AND THE SOMMER^@
NATIONAL COLLEGIATE INDOOR RECORD OF EIGHT-40-POINT 17 SET BY THE^@
UNIVERSITY OF TENNESSEE IN 1984.^@
UPI 02-23-85 QQCQQ AISM^@
R110^@
6992.9 MHZ^@
    
```

Figure 2.

Table 2

MIL STD-188B Operating Frequencies For FDM

Channel Number	110 Baud	200 Baud
	Chan. Spacing 170 Hz FSK ± 42.5 Hz	Chan. Spacing 340 Hz FSK ± 85 Hz
1	425	510
2	595	850
3	765	1190
4	935	1530
5	1105	1870
6	1275	2210
7	1445	2550
8	1615	2890
9	1785	
10	1955	
11	2125	
12	2295	
13	2465	
14	2635	
15	2805	
16	2975	
17	3145	
18	3315	

```

^@
AP-WX-02-23-85 QRQEEST^@
136YR^@
^@
WEATHER-TEMPERATURES^@
DOMESTIC TEMPERATURES AND WEATHER
CONDITIO QLS REPORTED BY THE^@

NATI^@
CAI WEATHER SERVICE AT 1 P-M, E-S-T...^@
^@
CITY           F   C WEATHER^@
ALBUQUERQUE   32  P  SNOW^@
ATLANTA        70  WQ  WINDY^@
BISMARCK      27  AE  SNOW^@
BOISE          37  E  PCLDY^@
BOSTON         49  O  RAIN^@
CHARLESTON, SC 70  WQ  CLDY^@
CHICAGO        47  I  RAIN^@
CINCINNATI     67  QQ  WINDY^@
DENVER         31  AQ  CLDY^@
DES MOINES     37  E  RAIN^@
DETROIT        48  O  RAIN^@
FAIRBANKS     -40 RP SLEET^@
FORT WORTH     62  QU  PCLDY^@
    
```

Figure 3.

shown while Channel 2 is at 540 Hz- 120 Hz separation. The binary RTTY shift is 60 Hz shift, ± 30 Hz around the center frequency. The channel spacing needs to be 120 Hz to avoid interference. We can also see that a faster data rate (150 baud or 600 baud) lowers the number of total channels and increasing the bandwidth required.

The data rates specified in Table 1 and Table 2 represent the maximum allowable baud rate. If 50 baud is required, any channel may be used. The CCITT R.39 has been used for some time and the U.S. military defined a different standard (as usual). The loud "buzzing" sound while tuning across the shortwave frequencies is a dead giveaway of FDM. Good luck in determining the baud rate or shift of an individual RTTY channel—it simply cannot be done. Let's see, when trying to obtain solid readable (plaintext) copy with normal (non-multiplexed) RTTY speed, shift and normal/reverse phase has to be determined. With FDM, additional parameters have to be taken into consideration—channel number and accurate tuning. If you think it's tough separating 170 Hz shift ham RTTY, try 85 Hz shift!

FDM is also extensively used in satellite work and the military uses shortwave as a backup media. A single modulator is used to transmit since each channel essentially operates as a subvoice grade FSK modem. Both 85 Hz shift and 60 Hz shift can be found on shortwave with 85 Hz the most popular. Two letters have been received from readers listening in to FDM signals by using low cost homebrew sharp (narrow) audio mark/space filters. I hope to publish circuit details for one stable switched filter design suitable for FDM modulation.

Table 3

Frequency	Time (GMT)	Shift	Baud Rate	Phase
4539.0 kHz	0600	85 Hz	50 baud	Normal
4902.0 kHz	0400	85 Hz	50 baud	Normal
6701.0 kHz	0400	85 Hz	50 baud	Normal
6990.0 kHz	0400	85 Hz	50 baud	Normal
8032.3 kHz	1600	85 Hz	50 baud	Normal
11049.0 kHz	1800	85 Hz	50 baud	Normal
12149.0 kHz	1200	85 Hz	50 baud	Normal
12174.5 kHz	0230	85 Hz	50 baud	Normal
14387.5 kHz	1830	85 Hz	75 baud	Reverse
14388.0 kHz	1830	85 Hz	50 baud	Reverse
16037.5 kHz	1900	85 Hz	45 baud	Reverse

Electrovalue Industrial has surplus Frederick model 1202RA (80 Hz) FDM demodulators and 1202RB (60 Hz shift) demodulators. Electrovalue can be found at P.O. Box 376-PC, Morris Plains, NJ 07950. If you have an Info-Tech M600A demodulator/display, an FDM demodulator option can now be purchased from Universal Shortwave, 1280 Aida Drive, Reynoldsburg, Ohio 43068 (614-866-4267). The M-605 option is advertised as not intended for use by the novice or casual RTTY SWL—probably due to the tricky operational skills required in order to get good results. Modes include FDM 120 Hz (separation) 24 channel, 170 Hz 16 channel, and 240 Hz 12 channel.

This equipment is also suitable for satellite DX'ing with the Very Narrow Shift (VNS) feature. Fred Osterman does not recommend using the M-605 demodulator on a consumer grade receiver. The letters written by FDM buff readers use the JRC NRD515, the R-71A, or other stable receivers success-

fully. My technique is to use a variable shift Frederick 1203 demodulator set to 85 Hz shift (the minimum shift achievable) and slowly tuning the delta-frequency control while watching the x-y (work-space) monitor scope to obtain a maximum crosshatch pattern. In 24 channels, usually one or two plaintext RTTY will be noted while the rest is usually secure encrypted military communication.

Figures 1, 2, and 3 represent plaintext RTTY found buried in FDM "packages." Typical weather (Figure 1) and news may be displayed.

The strongest, 59, FDM transmission can be found at 6992.9 kHz using 50 baud, normal phase, 85 Hz shift. Also, try 7923.0 kHz at 2245 GMT using similar conditions as outlined above. Many stations will appear, then disappear several weeks later depending upon a specific schedule based upon data "traffic control." Try the frequencies in Table 3.

Keep me posted as to RTTY loggings. **PC**

ESTABLISHING SURVIVALIST COMMUNICATIONS SYSTEMS

Scanning The Paramedics

Medical emergencies do happen; whether as a result of an accident, a natural disaster, or an illness, your scanner can put you in the midst of all the action. Unlike even police or fire communications (which contain a considerable amount of routine and administrative communications traffic), medical emergency channels contain a far greater percentage of high intensity emergency messages.

Modern medical emergency communications may include dispatching of ambulances as well as communications relating to the patient's medical condition and vital signs. Ambulances and paramedic teams have the ability to transmit (via telemetry equipment attached to the patient) information relating to pulse rate, blood pressure, and even an EKG or EEG, to a physician many miles away so that on-the-spot emergency life-saving steps may be taken until the arrival at a hospital.

The most widely known paramedic channels are the so-called "MED" frequency pairs. These are:

Name	Base (MHz)	Mobile (MHz)
MED-1	463.00	468.00
MED-2	463.025	468.025
MED-3	463.05	468.05
MED-4	463.075	468.075
MED-5	463.10	468.10
MED-6	463.125	468.125
MED-7	463.15	468.15
MED-8	463.175	468.175

These channels are active in most areas of the nation as ambulances (and portable paramedic units) communicate with their base stations for the exchange of medical data and the use of medical telemetric signals. But they aren't the only frequencies in use, not by any means.

Bio-telemetry can also be sent out on 155.325, 155.34, 458.025, 458.075, 458.125, and 458.175 MHz.

Dispatching of paramedic units can be monitored on frequency pairs: 460.525/465.525, 460.55/465.55, 462.95/467.95, and 462.975/467.975 MHz.

Medical paging takes place on: 35.64, 35.68, 43.68, 152.00, 155.45, 157.45, and 163.25 MHz.

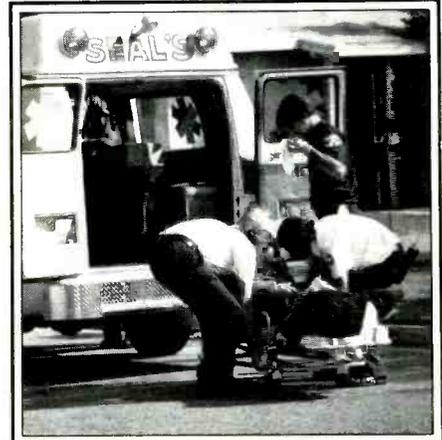
Low powered portable and mobile units operate on the following frequencies: 35.02, 150.775, and 150.79 MHz.

Numerous hospitals can be monitored on: 155.34 MHz.

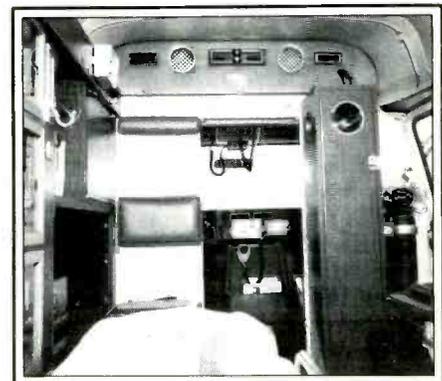
General two-way paramedic communications take place on: 33.02, 33.04, 33.06, 33.08, 33.10, 37.90, 37.94, 37.98, 45.92, 45.96, 46.00, 46.04, 47.46, 47.50, 47.58, 47.62, 47.66, 155.16, 155.175, 155.205, 155.22, 155.235,



Dispatching at an ambulance service often requires access to several frequencies.



Note the hand-held transceiver carried by the paramedic on the right.



Paramedics view of an ambulance, showing radio gear for operation in several different communications systems.

Paramedics affiliated with fire departments can also be monitored on Fire Radio Service frequencies. (Photo by Gordon West)

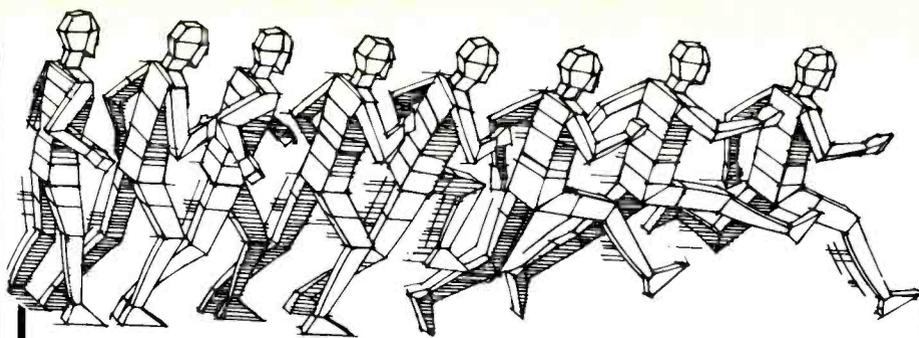


155.265, 155.28, 155.295, 155.325, 155.355, 155.385, 155.40, 462.95, and 462.975 MHz.

Recently added to the frequencies that may be utilized by paramedics are a whole series of so-called "offset" channels. These frequencies are available for use in certain metropolitan areas for limited-area coverage operations: 453.0125, 458.0375, 458.0625, 458.0875, 458.1125, 458.1375, 458.1625, 458.1875, 465.5125, 465.5375, 465.5625, 467.9375, 467.9625, 467.9875, 468.0125, 468.0375, 468.0625, 468.0875, 468.1125, 468.1375, 468.1625, and 468.1875 MHz.

Keep in mind several factors. For instance, many of the above listed frequencies may be shared with other emergency services, including school buses, private physicians, search/rescue teams and squads, beach patrols, veterinarians, certain schools, and the physically handicapped. Moreover, paramedics associated with fire departments will be found operating on Fire Radio Service frequencies in addition to (or instead of) those frequencies listed herein. Also note that some private ambulances are also licensed in the Business Radio Service in addition to the frequencies listed here.

If you're a person who feels inexorably drawn to TV programs such as *St. Elsewhere* and *Trapper John, MD*, and if you can't pass up even one single re-run of *Emergency*, then why not try the real thing? It's no further than your scanner! **PC**



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Sailing Radios With Telephone Capabilities

There is no need to miss an incoming phone call or not have the capability to place an outgoing telephone call next time you set sail on your lake, river, or ocean in your cabin cruiser or sailboat. Hundreds of telephone companies throughout the United States offer VHF telephone service to mariners at sea, on the lake, and up and down the rivers. This telephone service is part of the VHF-FM marine radio band.

The Federal Communications Commission will authorize you a marine radio station license for ship-to-ship, ship-to-shore, and ship-to-telephone shore station transmissions. You don't necessarily need to own a boat in order to qualify for the marine radio license. The FCC will assign you a set of call letters consisting of three letters and four numbers that you must use each time you operate your marine VHF transceiver, whether it be a regular 25-watt mobile unit, or one of those tricky 5-watt hand-held sets.

If you want the license, but lack the boat, you still may be eligible for call letters. FCC Form 506 is the form you fill out for obtaining a marine radio station license.

If you don't own a boat, you simply insert the word "portable" in the form block #4 and #6 that asks for the vessel name and registration number. You will need to attach a letter indicating that you plan to operate a portable piece of VHF equipment aboard many different vessels for ship-to-ship and ship-to-shore communication. Your letter should further state that you don't own your own boat, but have many friends who invite you aboard their boats. Since none of them have VHF communications, you want to bring along your own VHF marine radio for safety as well as telephone calls to shore.

It takes about 30 days to receive call letters, and you must use those call letters when you're out there on the water making phone calls or calling other ships. You are not permitted to take your hand-held ashore and use it ashore to make phone calls.

Yes, the Commission specifically disallows the use of VHF equipment to be used on shore to communicate through your local telephone company. I imagine the system would work out well, and I doubt that the telephone company is really interested as to whether or not your authorized ship station is indeed out on the water or actually traveling down the interstate highway. But nonetheless, using your equipment for shoreside phone calls could get you into some very hot water with the Federal Communications Commission if they should happen upon your signal and make the effort to try and figure out where you're transmitting from. You'll probably never get

DESIGNATOR FCC	FREQUENCY SHIP	MHZ COAST	POINTS OF COMMUNICATION	AUTHORIZED COMMUNICATIONS
06	156.300		INTERSHIP ONLY	SAFETY
07	156.350	156.350	INTERSHIP & SHIP-COAST	COMMERCIAL
08	156.400		INTERSHIP	COMMERCIAL
09	156.450	156.450	INTERSHIP & SHIP-COAST	COMMERCIAL & NON-COMMERCIAL
10	156.500	156.500	INTERSHIP & SHIP-COAST	COMMERCIAL
11	156.550	156.550	INTERSHIP & SHIP-COAST	COMMERCIAL
12	156.600	156.600	INTERSHIP & SHIP-COAST	PORT OPERATIONS
13	156.650	156.650	INTERSHIP & SHIP-COAST	NAVIGATIONAL
14	156.700	156.700	INTERSHIP & SHIP-COAST	PORT OPERATIONS
15		156.750	COAST TO SHIP	ENVIRONMENTAL
16	156.800	156.800	INTERSHIP & SHIP-COAST	DISTRESS, SAFETY & CALLING
17	156.850	156.850	SHIP TO COAST	STATE CONTROL
18	156.900	156.900	INTERSHIP & SHIP-COAST	COMMERCIAL
19	156.950	156.950	INTERSHIP & SHIP-COAST	COMMERCIAL
20	157.000	161.600	INTERSHIP & SHIP-COAST	PORT OPERATIONS
21B		161.650	CANADA SHORE STATIONS	WEATHER
22	157.100	161.700	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
22A	157.100	157.100	SHIP TO COAST GUARD	COAST GUARD LIAISON
23	157.150	161.750	SHIP TO COAST	PUBLIC CORRESPONDENCE
23A	157.175	157.175	COAST GUARD	COAST GUARD AUXILIARY
24	157.200	161.800	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
25	157.250	161.850	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
26	157.300	161.900	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
27	157.350	161.950	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
28	157.400	162.000	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
65	156.275	156.275	INTERSHIP & SHIP-COAST	PORT OPERATIONS
66	156.325	156.325	INTERSHIP & SHIP-COAST	PORT OPERATIONS
67	156.375		INTERSHIP	COMMERCIAL
68	156.425	156.425	INTERSHIP & SHIP-COAST	NON-COMMERCIAL
69	156.475	156.475	SHIP TO COAST	NON-COMMERCIAL
70	156.525		INTERSHIP	BUSINESS & OPERATIONAL
71	156.575	156.575	SHIP TO COAST	NON-COMMERCIAL
72	156.625		INTERSHIP	NON-COMMERCIAL
73	156.675	156.675	INTERSHIP & SHIP-COAST	PORT OPERATIONS
74	156.725	156.725	INTERSHIP & SHIP-COAST	PORT OPERATIONS
77	156.875		INTERSHIP	COMMERCIAL
78	156.925	156.925	SHIP TO COAST	NON-COMMERCIAL
79	156.975	156.975	INTERSHIP & SHIP-COAST	COMMERCIAL
80	157.025	157.025	INTERSHIP & SHIP-COAST	COMMERCIAL
84	157.225	161.825	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
85	157.275	161.875	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
86	157.325	161.925	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
87	157.375	161.975	SHIP TO PUBLIC COAST	PUBLIC CORRESPONDENCE
88	157.425		INTERSHIP	COMMERCIAL
WX-1		162.55	WEATHER CHANNEL 1	
WX-2		162.40	WEATHER CHANNEL 2	

Figure 1: VHF Maritime Radiotelephone Frequencies.

caught, but a word to the wise about not trying this trick should be sufficient.

Besides phone calls, the marine radio service is not only a fascinating service to take advantage of when you're on the water, but also is just as interesting to listen to if you own a scanner monitor receiver.

The VHF marine radio band is an international group of frequencies standardized throughout the world. If you cruise to Europe, they use the same frequencies and the same type of equipment we do. If you go to Canada, or down to Mexico, VHF frequencies are the same. By international agreement by the World Administrative Radio Conference (WARC), all countries will use the same type of VHF system for marine pleasure boat and commercial boat communications. Before any other marine radio can be added to your vessel, you must first have a VHF transceiver onboard.

The VHF marine band encompasses approximately seventy-eight 25 kHz channels that start from 156.050 MHz (Channel 1) and go to 157.425 MHz (Channel 88) for ship transmitting, and certain shore stations

will also use frequencies from 161.800 MHz (Channel 24 receive) to 162.025 MHz (Channel 88 receive). The VHF band also includes several national weather transmitting frequencies centered around 162.550 MHz (weather Channel 1 receive).

Those frequencies between the ship transmit and shore receive channels are allocated to other radio services (157.450 MHz to 161.595 MHz).

A complete chart of marine VHF frequencies is included for you to see the entire VHF marine channel allocations (See Fig. 1).

The actual number of channels that we might be able to use in the United States is no greater than 55, although you might count as many as 78 channels allocated to the international marine VHF band. Some channels are grouped differently with shore-side channels for international use, and we don't have access to these channels when cruising within the United States. Examples are VHF marine Channels 23A and 88A. The letter "A" after any VHF channel indicates that the channel has split capabilities. In the United States, we would use the channel for simplex

(same frequency) transmitting and receiving. Channel 23A might be used by Coast Guard auxiliary members with special permission from local Coast Guard units to intercommunicate with Coast Guard vessels. Channel 88 is used in almost all areas of the United States as a ship-to-ship simplex channel for commercial communications as well as fish spotting by aircraft.

In foreign countries, such as Canada, Channel 23 (without the "A" designator) is used for communications to the marine telephone service where the transmit and receive frequencies are different (a duplex split of 4.6 MHz). In the Great Lakes, mariners will use Channel 88 (no "A") in the duplex mode to place telephone calls with shore stations that transmit on a different frequency (4.6 MHz higher) than the ship stations.

Except for those channels with the letter "A" after them, modern VHF sets automatically know when and where to transmit simplex and when to automatically switch to duplex (different receive) when they are switched to marine telephone channels. It's only on those "A" channels that you might have an option. U.S.-made sets usually indicate the "A" option as "United States" or domestic mode, as opposed to "Foreign" transmit and receive.

No matter where you cruise throughout the world, all VHF channels are the same.

The most important channel of them all is 156.800 MHz, Channel 16. This is the international distress and national calling frequency, and every VHF radio made must have this channel installed in it. This channel is also monitored by orbiting search and rescue satellites that will retransmit the distinctive sounds of an emergency position indicating radio beacon signal, along with its approximate location, if one is received.

Channel 16 must be monitored at all times when your station is turned on. You are relieved of monitoring this channel if your set is turned off, or if you are operating your set on another channel. The United States Coast Guard monitors this channel

throughout the country, and worldwide rescue agencies monitor this channel, 24 hours a day, no matter where you cruise within 50 miles of shore. Local harbor patrols guard this channel. Lakes and rivers use rangers who monitor this channel. This channel must only be used for distress calls, or establishing communications with another vessel before switching to a working channel.

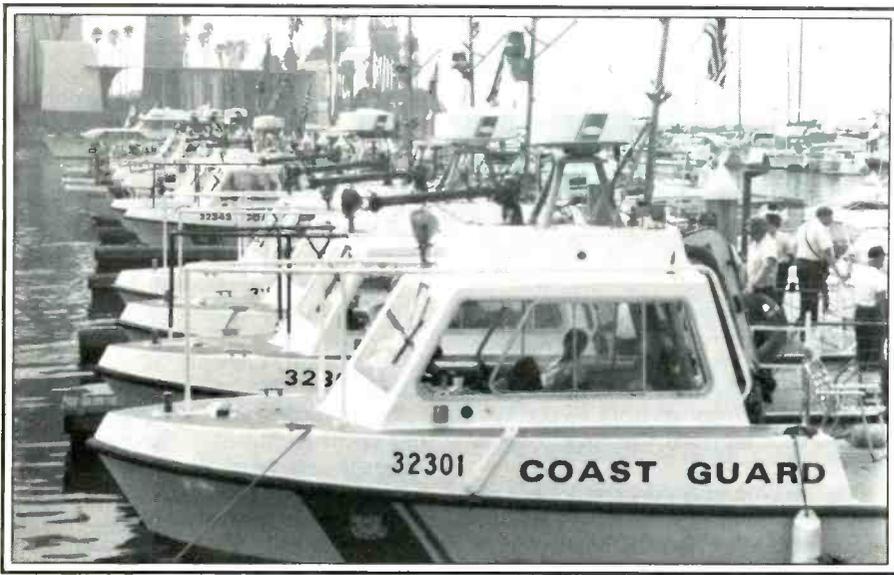
The United States Coast Guard does not allow radio checks to their stations on VHF Channel 16. You could receive a citation from the Federal Communications Commission for calling a Coast Guard station for a radio check. There are much better ways to check out your installation, and we'll give you the details later in this chapter.

The United States Coast Guard monitors Channel 16 up to 20 miles to sea if you are using nothing more than a 1-watt hand-held and a little rubber antenna. With a regular 25-watt marine VHF set, you should have no problem raising the Coast Guard up to 75 miles at sea. Coast Guard helicopters possess direction-finding equipment to home in on your signal on VHF Channel 16. Coast Guard auxiliary members also use VHF direction-finding systems to locate a vessel in distress.

Everyone should monitor Channel 16. This allows marine telephone operators to place calls to you on Channel 16, and then switch over to one of their working channels. It allows other vessels to call you, and then make arrangements to switch to another channel. If everyone listens on VHF Channel 16, there is no chance of missing a call for help—no matter how weak it is. You are not allowed to talk more than 59 seconds on VHF Channel 16 unless it's an actual emergency communication.

VHF Channel 6 is the safety channel to be used for inter-ship communications relating directly to the safety of another vessel. You would use this channel to communicate priority or urgent traffic to another vessel. Every VHF set is required to have Channel 6 installed in it, and it should never be used for

The Coast Guard carefully monitors VHF Channel 16.



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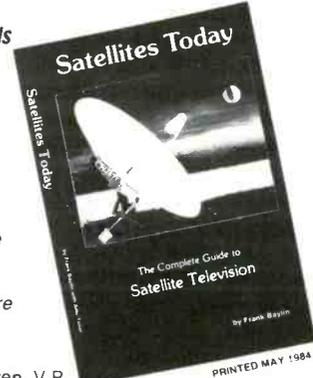
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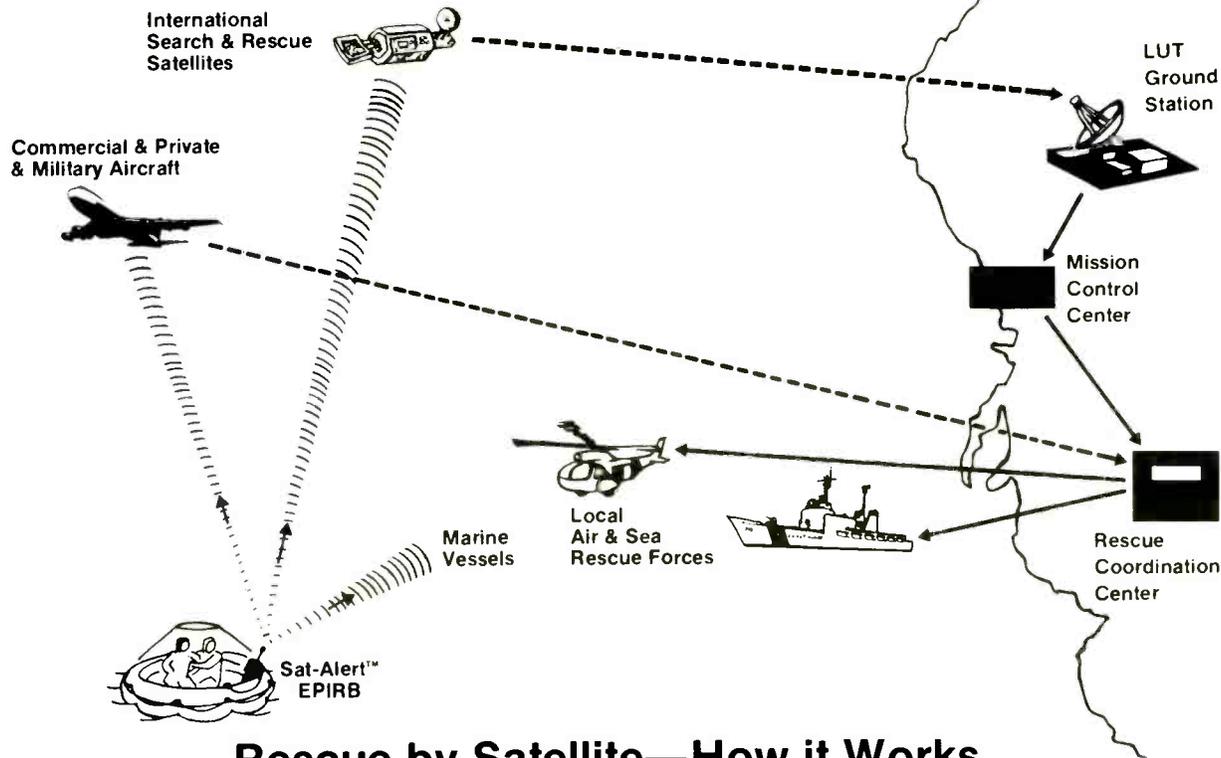
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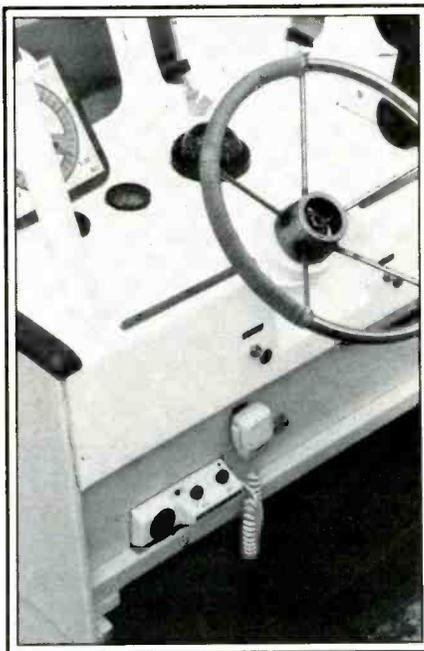
regular marine communications from ship to ship. Its primary purpose is a common channel, other than Channel 16, on which any vessel may communicate with another vessel that has VHF equipment for safety purposes.

There are seven pleasure boat ship-to-ship communications channels: Channel 68, Channel 9, Channel 69, Channel 71, Channel 78, Channel 70, Channel 72.

You may use any of these channels to intercommunicate to other ships in your area. The radio messages you transmit must relate directly to the operation of your vessel, and all communications must be kept to a minimum. Like a party line, other vessels in your area may wish to use the same frequencies.

Yacht clubs, ship supply stores, and fuel docks may also use Channels 68, 9, 69, 71, and 78 to communicate from shore to ship. These shore-based VHF stations must first obtain a special FCC license called a "limited coast station permit." A rather lengthy application form (FCC Form 503 with area frequency coordination required) is necessary to obtain a VHF shore station license. Just like on ship-to-ship channels, you must keep your communications to a yacht club or ship supply store as short as possible, and all communications must relate directly to the activities of your marine operation. Yes, you can make reservations at the yacht club guest dock, but no, you are not permitted to carry on a lengthy conversation with the club regarding the details of the ski trip you took last Thursday!

Commercial vessels are not allowed to use non-commercial frequencies. Commercial vessels have their very own set of com-



A compact marine VHF set.

mercial channels, and here is a list of channels permitted only for commercial operators to use: Channel 07A, Channel 9, Channel 10, Channel 11, Channel 18A, Channel 19A, Channel 79A, Channel 80A, Channel 67, Channel 8, Channel 77, Channel 88A.

Pleasure boat operators are not allowed to use these frequencies. They are reserved exclusively for commercial boats to communicate ship-to-ship as well as ship-to-

limited coast shore stations (ship-to-ship traffic only on Channels 67, 08, and 77). Channel 88A may also be used by aircraft and helicopters to communicate fish spotting information to commercial fishermen—and while it's illegal to transmit on these frequencies, there is no harm in monitoring them to get the very latest scoop on where the fish are biting!

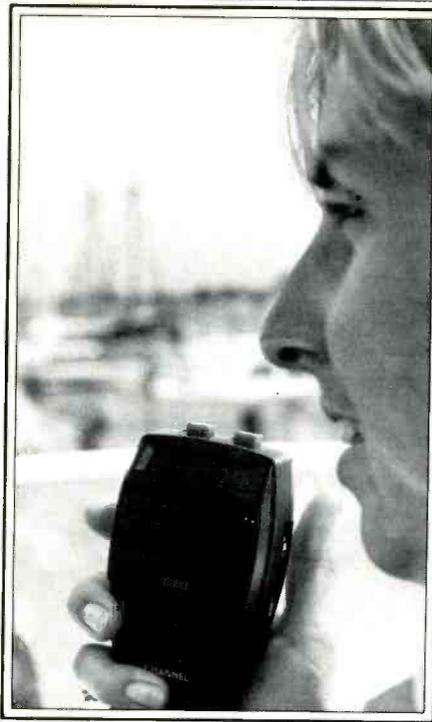
Marine Channel 9 is shared by both commercial and pleasure boats; so if you wish to talk to a commercial fishing boat, first call them on Channel 16, and then switch to the neutral Channel 9 for both pleasure and commercial operators.

Channel 13 should be monitored when approaching large ports with big-ship traffic. Channel 13 is one of the traffic control channels, and big-ship captains and their pilots use Channel 13 for bridge-to-bridge communications. We are not talking about draw bridges—rather the bridge of one pilot house to the bridge of another. You would only transmit on this frequency if you were in imminent danger of being run down by a large super tanker. By law, when they near a port, they must guard their Channel 16 and 13 simultaneously—so take your best shot!

Routine port communications traffic will take place on channels: Channel 65A, Channel 66A, Channel 12, Channel 73, Channel 14, Channel 74, Channel 20.

By listening in on these channels, you can find out where these big ships are going, and also receive instructions on port pilots when entering strange harbors.

Throughout the United States, most harbor patrols and local harbor masters may have you switch from Channel 16 to Chan-



A combination speaker/mike on a VHF radio setup.

nel 12 for port operation communications. You are allowed, as a pleasure boat operator, to use these channels—but only when directed to by the port control operators. Under no circumstances would you use any navigational channels for routine ship-to-ship communications.

Channel 15 is right next to the emergency and distress channel, Channel 16. When you hear the distinctive warbling sound of an emergency position indicating radio beacon, it means that someone in your area is in distress. The EPIRB will alternate between Channel 16 and Channel 15 automatically. EPIRB's are only one-way transmitters, so you won't be able to establish communications to the vessel that is sinking or may have already gone under. Your role is to immediately contact the Coast Guard on Channel 16 and let them know that you hear an EPIRB in your particular area. Call the Coast Guard when the EPIRB switches from Channel 16 to Channel 15 so you can hear their response. They may ask if you have direction finding capability; and if so, what bearing the EPIRB is from your computed location.

The law of the sea says that you will do everything in your power to effect a rescue in an emergency situation. Don't think that someone else is going to handle that call for help when you hear the distinctive sounds of an EPIRB. It's your responsibility as the captain of your ship to make every effort in saving a life at sea. Always report EPIRB signals to the U.S. Coast Guard on Channel 16.

The following channels are used for placing phone calls to the marine operators on shore: Channel 24, Channel 84, Channel 25, Channel 85, Channel 26, Channel 86, Channel 27, Channel 87, Channel 28,

Channel 23 (foreign), Channel 22 (foreign), Channel 88 (Great Lakes and St. Lawrence Seaway).

It's best to register ahead of time with your local marine operator before you attempt to place a phone call through their service. This is easily accomplished by making a shore-side phone call to your local telephone operator and asking her to connect you with the local marine operator that serves your port. Marine electronics specialty houses may also have marine telephone operator registration forms for private services not listed with your regular telephone operator. Many of these private marine operators offer terrific telephone service, to include message handling, conference calling, as well as selective signaling.

The best bargain of the marine telephone service is that there is no monthly fee if you don't use their service—you're only charged for the phone calls you place. If you sit the winter out and never make a phone call, you don't get a single bill! The average price of a 3-minute phone call to a local shore-side station is generally less than \$2.00. It's the best bargain in town.

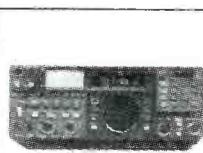
Marine telephone operators will announce traffic lists on VHF Channel 16 on the hour. However, due to tremendous traffic on Channel 16 during the summer months, you may wish to monitor, with a second VHF set, your public correspondence marine telephone channel to receive phone calls the second they are placed to your vessel from a shore-side station. You can do this with a small hand-held transceiver. This lets you guard both the international distress Channel 16 as well as the local marine telephone channel.

Since telephone channels are separate transmit and receive frequencies, it's impossible to transmit ship-to-ship on vacant

phone channels. You simply won't hear the other ship station respond because your receiver is somewhere else 4.6 kHz higher than your transmitter. However, if you wish to establish ship-to-ship communications through a telephone operator because both of you are well beyond VHF line-of-sight range, the phone company will patch you in together. While they do charge you for the service, your signals will boom in loud and clear thanks to the phone operator "repeater" lash up. You could be as far as 300 miles away and still stay in contact.

Another interesting note about the marine VHF telephone system is that the ship transmission on the telephone input frequency is also repeated out on the telephone channel transmit frequency. This allows you to monitor both sides of the conversation without having to switch from the input to the output. Simply dial up the marine telephone channel on your VHF set, but program in a marine 160 MHz output frequency, and you'll hear both sides of the call—no matter how far away the ship station is from your particular location. This makes for great listening. However, if you're placing a phone call on marine VHF, just remember, everyone can hear what you're saying, too.

If you are actively into boating, you might want to invest in a marine VHF hand-held to take advantage of the ship-to-ship and ship-to-shore services available, to include the Coast Guard and the marine telephone operator. If you don't like getting your feet wet but enjoy listening to mariners out on the water, you might try your hand at scanning the marine Coast Guard and telephone channels. Chances are you will hear some juicy conversations; and if ever there was a fish story, chances are you'll pick it up on your next VHF-FM marine telephone call.



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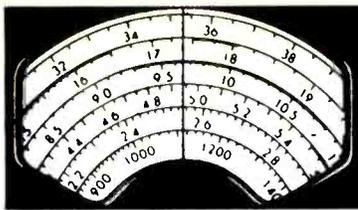
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COMMUNICATIONS CONFIDENTIAL

YOUR GUIDE TO SHORTWAVE "UTILITY" STATIONS

As Ron departed the scene back in December '84, your data inputs have been coming in to me. In this issue of CommCo I will present some of this data, in the form of topic discussions.

Before I get into it, a word about contributor ident's. Some of you have occupations, or for personal reasons, find that it is not wise for your real name to be associated with certain material that you submit. I have no qualms about IDing you as "an unidentifiable source" or even by a pseudonym you select. I understand that to be identified with certain data might prove to be a problem for you, so I'll go along with anyone who wishes that his or her real name not be given. BUT, you must correctly identify yourself to me in that correspondence—one reason being that I might want to follow up on the data, and as such will have to get in contact with you.

Another reason would be to keep a lid on a Pandora Box situation. It is possible that a fringe element could fabricate data and sign it with a pseudonym in order to pull something off at POP'COMM's expense. So, don't just ID yourself with a code name and expect me to publish your material—not without my knowing who you really are. I'll keep your confidence, just as long as you are up front with me.

Commercial Aeronautical

There are a percentage of utility monitors that prefer to listen in on the commercial air/ground frequencies. To many other utes, there is nothing spectacular in monitoring position reports from airliners working air traffic control stations. Some find this aspect about as exciting as spending the day watching the grass grow.

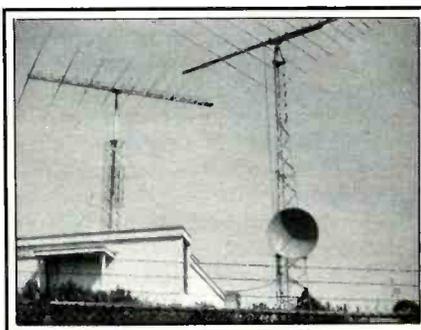
But one of the joys of utility DXing is the unexpected that can occur even in the mundane world of commercial aeronautical comms.

For Ray Cormack of Ottawa, Canada, 31 December 84 proved to be an exciting day. Ray was monitoring 6577 kHz, listening to New York ATC working various inflight airlines. After American Airlines flight 626 gave its position report, it announced that it was being hijacked to Cuba. AA 626 was on a flight from St. Croix, Virgin Islands to JFK, New York. On board was a prisoner who overpowered his guards and took over the flight. The subsequent comms from AA 626 were quite interesting, and Ray hung on until 626 switched over to VHF.

Ray won't forget it, and I hope his out of the ordinary catch will serve to illustrate that anything can happen when you're utility DXing.



Dave Carlson of San Diego, California sent us photos of an unmanned federal transmitter site atop a hill near his home town. Everything is run by remote control and protected from the inquisitive by some very impressive "keep away" signs, given further inspiration by a barbed wire topped fence.



Another view of Dave Carlson's mystery transmitter discovery showing the two log periodic HF beams and also a microwave dish. Anybody know what this station is?

FEMA

FEMA, the Federal Emergency Management Agency, is an outgrowth of the old DCPA (Defense Civil Preparedness Agency). It is geared to national emergencies such as natural disasters (hurricanes, earthquakes, etc) as well as to assure that there will be a governmental command and control in the event of a nuclear war. FEMA stations carry out comms in voice, RTTY, and CW. Of the CW transmissions, one type has drawn considerable interest. These are the encrypted messages sent by either WGY 912 Mount Weather, Virginia or WGY 908 Denver, Colorado. Much speculation has been raised as to what these slow repeated Morse letter transmissions could be saying.

Frequencies predominantly employed are: 3379 and 14886 by WGY 908 and 4780 and 18744 kHz by WGY 912.

One CommCo reader has done considerable monitoring of these strange transmissions and has come up with an interesting observation.

To recap, these transmissions consist of 30-letter characters, repeated over and over for roughly 13 minutes. This is followed by 2 minutes of silence, then commences another but different 30-character transmission. This routine can go on for over a 12-hour period.

Trying to decipher the texts proved negative, but this did turn up. It seems that for a given letter, it will only be followed (the next letter) by certain letters. The breakdown of this is as follows:

A...	BIVX
B...	LOQRVUWZ
C...	EHLMTOW
D...	AJK
E...	CEFHLPQRT
F...	BCDKLOPRVXZ
G...	NOTU
H...	BFHMOQT
I...	EHJLOTW
J...	BEFGKX
K...	ANOQU
L...	CFJKNOUV
M...	FNORU
N...	ACFGJOQRS
O...	CDEFHIJKPQRWXY
P...	NORTU
Q...	EOSU
R...	EFNORUVZ
S...	OQT
T...	ABCFHLMOPRT
U...	BEGIOQSUVZ
V...	CHRWX
W...	EFILY
X...	AGNOQT
Y...	ACO
Z...	BEIOX

It is to be noted that because of this arrangement, one can rule out random letter association. If these transmissions had only a purpose to keep the frequency "occupied," to prevent anyone else from using it, these transmissions might be plain nonsense. In that case, a given letter would be followed by any of the 26 possibilities. But there is a pattern of linked usage, and this indicates that something is stated in those transmissions.

The 30-character length is very short, and if a letter for letter substitution cipher technique is being utilized, then it is possible that each 30-character transmission is only a part of a message. If it requires X-number of 30-character messages to complete one full

way; the first three digits indicate the area you and your neighbors are in, and the last four digits are your specific telephone.

Having knowledge of Autovon prefixes tells you the ground location. This can be an air base, military/defense facility or switching station. U.S. military Autovon prefixes are published in FLIP manuals (FLight Information Publication). They come in several volumes, covering specific portions of the globe, and are available from the U.S. Government Printing Office. Autovon prefixes are only part of the data presented for each airfield. As both U.S., foreign, and commercial air fields are included, you have to do some tedious read through to extract the data. There is a printing office publication that lists only Autovons.

In any event, 947 is the Autovon prefix for March AFB in California. March is a Strategic Air Command (SAC) base. The ground party IDed only by the last four telephone digits. This is a common security practice involving units that are part of classified operations.

The aircraft IDed as "Aircraft 787." This tends to rule out a bomber or tanker, since they are normally assigned tactical callsigns the likes of "Piano 34" or "Banks 91" and so on. RTTY coordination meant that 787 was RTTY equipped. This pointed to a SAC reconnaissance or flying command post type.

Daryll must have made the logical assumption that 787 were the last numbers of the aircraft tail code. Using this, he checked out a publication and scanned the RC/EC-135 and E-4A/B types for a match. This tallied with 74-0787, a SAC NEACP E-4A (Modified Boeing 747-200B).

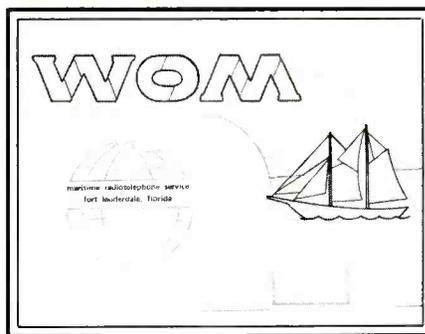
Tail numbers and other related data on USAF, ANG, and USAFR aircraft, are available via a publication titled *United States Military Aviation: The Air Force* by Robert J. Archer. This book is obtainable from publishers, the likes of Zenith Aviation. Another Autovan/air base/squadron data source is the annual *Air Force Almanac* published as part of the magazine subscription issues put out by the Air Force Association.

Aircraft serial numbers are assigned per fiscal year. They cover not only aircraft, but missiles and drones. Only the last 5 digits are shown on the aircraft tail or missile/drone body. In the case of this E-4A, it was procured/ordered in 1974 and was the 787th airborne item so ordered. The E-4A would carry a tail code number of 40787.

Determining the data on military aircraft using "static" callsigns follows similar procedures. Let's take "GULL" as an example.

We now know this is a static callsign used by USAF weather recon aircraft, based at Keesler AFB, Mississippi. How we know this was a result of MILTAC buffs doing detective work.

When the GULL callsigns first appeared on the airwaves, their type, base, and squadron were unknown. Monitoring revealed that they passed weather observations (often of a hurricane nature) to Miami or Mather Monitor. Other phone patches went primarily to the same Autovan prefix.



Elton Manzione of Athens, Georgia received this attractive QSL from coastal telephone station WOM in Ft. Lauderdale, Florida.

Contents of these patches revealed that the aircraft was communicating with its home base unit. ATC data, such as departure and destination points, often showed the same air base being mentioned time and time again.

Putting it all together, some MILTACS sent out reception reports that confirmed the identity of the GULL static call. They were WC-130E/H aircraft from the 53rd WRS (Weather Reconnaissance Squadron) based at Keesler AFB.

The GULL callsigns are followed by two numbers (example- GULL 24). This is a mission code number and does not represent a specific WC-130. As such, you could obtain QSLs from GULL 17, 24, 35, only to find that you QSLed the same aircraft (this would be determined by asking for the aircraft tail number on your PFC card).

SAC aircraft use mission callsigns. Hence a B-52 assigned "Banjo 79" would only be valid for that mission. The same B-52 could fly another mission the next day and would have a different callsign. So, compiling lists of SAC airborne units is a waste of time. Need I mention that all SAC comms are classified, so don't even try to QSL them . . .

Number Transmissions

Bob Dyquetta comments on a number transmission peculiarity that was being discussed a year or so ago. This pertains to the significance of doublet, triplet, and sequential numbers appearing in a given number transmission text.

During attempts to crack the coded 4- and 5-digit groups, some number buffs were drawn to the fact that a specific number might be repeated two or more times in succession, or that a series of numbers would be in successive order. Examples of this are: 81664—33350—93456.

This led some number buffs to speculate that these alignments had a definite significance. Bob says that they do not.

Any plain text message that is designated to be encoded must undergo a transformation. The simplest method is to take the orderly letter to numerical association (A = 01, B = 02, and so on) and mix them up (A = 14, B = 21, and so on). This simple substitution method can easily be decoded, provided you have a text of a few paragraphs.

High Seas Radiotelephone Station WOM operated by American Telephone and Telegraph Company is pleased to acknowledge your reception of our signals on 8746.8.

WOM transmits on directional and omni-directional antennas in the 4, 8, 13, 17 & 22 MHz bands.

We wish you continued success in the radio communication field.

Flip side of Elton Manzione's QSL card of maritime radiotelephone station WOM.

The modern method is to mate the normal plain text numerical equivalents with a series of random numbers. Bob calls this a random numerical key (RNK). Such RNKs are derived by computer programming. Numbers are either randomly selected or are the by-product of a mathematical formula.

Whatever the method, the resulting RNK is a sequence of numbers having no logical order.

You'll note that to convert plain text characters into numerics requires two numbers per character. This is a straightforward 2 for 1 system. Using this combined with an RNK sequence can produce interesting results.

A simple procedure to encrypt a message is to place the numerically converted plain text below the RNK sequence, and add their values together to form the enciphered text.

Bob gave these examples, using only one word from the plain text. The word is "from." Its numerical equivalents are: 06-18-15-13. This, by chance, aligns with the following RNK sequence: 16-04-07-09. By the addition method, the enciphered results are: 22-22-22-22. If the same word "from" occurs again, it would align with another portion of the RNK sequence. This could be: 06-16-41-65. This would produce an encipherment of: 12-34-45-78.

These are extreme examples, but are shown to illustrate that doublets, triplets, and sequential number sequences can be arrived at by pure chance, and not by any designed purpose.

But in any discussion of the number transmission texts, there are certain unknown factors to take into consideration.

- It is unknown if the message texts are actually conventionally worded statements.
- If they are not, then the enciphered text may actually be designators for item references. This could mean that 2-3-4 or 5 numbers are required for each item.
- Likewise, even if it were a worded statement, it is unknown if the encryption process is based on a 2 for 1 system. This is the most economical way, but it could also utilize 3-4 or 5 RNK sequence numbers, for a single character encipherment.
- There is no significance in grouping. Whether the groups are in four or five, this is done as an aid in correctly copying a transmission. It is by far easier and with less error

to copy blocks of numbers rather than one unbroken stream of numerics.

•It is unknown if the encrypted text was derived from a single stage or a multi-stage encipherment. To illustrate, take the first example (22-22-22-22).

This is then aligned with a different RNK such as: 61-49-01-27 to produce: 83-71-23-49. A variation is to use the same RNK sequence for a second time. This gives you: 38-26-29-31. A third time use would produce: 54-30-36-40. This is a secure method because the prime numbers (the RNK sequence) cannot be ascertained. To decipher, you subtract in reverse order each RNK sequence stage.

By a paper and pencil method, this is tedious work. But with a programmed computer, it is no problem to decode a message that may have been enciphered through two or more stages.

Because of these unknown factors, it is impossible to make any valid statement concerning these number transmission texts. All one can do is to follow up on a specific line of reasoning, and see if the results indicate that possibility.

Exploring the mysteries surrounding the number transmissions is a fascinating journey through frustration. Bob Dyquetta has authored several *POP/COMM* articles on this subject with the purpose of presenting the possibilities to you. You then must make your own determination as to which sounds plausible. Bob hopes that his articles will inspire number buffs to conduct their own probing, which could uncover more clues and eventually the basic answers.

The Russian Woodpecker

I don't have to ask any of you if you've heard the series of wide bandwidth rapid pulses that occur throughout much of the HF bands. Called the woodpecker, these nerve-racking machine gun like clicks not only totally QRM legitimate radio comms, but of you listen to them for any length of time, you can end up with headaches, feelings of tenseness, and other unpleasant side effects. Radio buffs have launched campaigns to have these pulsations stopped, but their efforts will not succeed.

The woodpecker sounds are pulsations from the Soviet Union's OTH-B (Over The Horizon Backscatter radar). It is, in effect, part of their early warning network. The OTH-B is actually two separate facilities—one transmits, the other receives. This pair is located in the vicinity of Minsk and Nikolayev, in the eastern USSR.

Protest as we might, they will continue, even though they inadvertently or deliberately (depending on your point of view) interfere with legitimate radio communications. The reason is that they are part of that nation's national security effort.

The ITU (International Telecommunications Union) is the worldwide regulatory body for radio usage. Although they have definite rules and regulations that its member nations are to abide by, the ITU by-laws have a loophole. This loophole concerns ra-

Canadian Military Frequencies

2828 kHz	Search and Rescue
4133 kHz	Coast Guard
4435 kHz	Coast Guard
4490 kHz	Search and Rescue
4704 kHz	Search and Rescue
5690 kHz	Larr, W. Germany
5718 kHz	Search and Rescue
6693 kHz	Search and Rescue
6705 kHz	Air Traffic Cntrl.
6716 kHz	Air Force/Navy
6753 kHz	Weather
9006 kHz	Air Traffic Cntrl.
11233 kHz	Air Traffic Cntrl.
13254 kHz	Halifax Military
13257 kHz	Air Traffic Cntrl.
15031 kHz	Air Traffic Cntrl.
15035 kHz	Air Traffic Cntrl.

Navy Stations

CFN Halifax	3290	4253	5097
6430	8697	12726	15920 kHz
CKN Victoria	3288	4268	4303
4495	6384.5	6445	6950 8463 kHz

Reader Eric Earl (VE6CRM) of Calgary passed along some Canadian military frequencies in response to a reader request in a recent issue.

dio activities, conducted by a nation, on behalf of its national security. ITU member nations police themselves, and when it comes to national security, the ITU doesn't interfere with these radio activities.

The mainstream radio stations adhere to the regulations. They use allocated call letters, operate within frequency bands and use transmission modes allocated for their particular service. Their locations and operator of record are all known.

Military and governmental transmissions fall into the loophole. When needed, they are not required to use recognized call letters/callsigns, or operate in assigned bands. This simply means, for national security reasons, these stations can use any frequency, transmission method, and mode that they require to carry out their task.

This is why number transmissions have gone on unchallenged for years. They operate under some form of governmental control for purposes assumed to be in a nation's interest.

The Russian OTH-B is a direct part of the Soviet Union's national security. Even though it interferes with other radio comms, the ITU is powerless to stop them. We in North America can protest all we want, but our objections will fall on deaf ears, in the Kremlin. So long as the USSR requires an HF OTH-B, the woodpecker will continue to be a source of nerve racking QRM. This is a military/political reality of our times.

Utility QSLing

Successfully QSLing utility stations has several major hurdles—reporting proce-

dures, when required, reports in other languages specifically tailored to the ute stations, and above all, mailing address data.

One of my last tasks as the editor for the Speedx utility guidebook (*SRGU*) was a section on the basics of QSLing, along with a 5-language reception report and PFC layout, which included optional words, phrases, and sentences so as to conform your report to a specific class of ute stations.

I'm not plugging the *SRGU*, but instead am using this to lead into the main problem I encountered with the guidebook, that being the appalling lack of accurate mailing address data. There is an overwhelming need for comprehensive address data on all types of ute stations. Every ute QSLer clamors for it, yet few respond to pleas to submit what they have.

I believe that some utes think that somewhere there exists a master list of utility addresses, and all we need to do is sit back and wait for someone to find it and offer it via a publication. A master source list does not exist! The bulk of the now known addresses came from utility QSLers who passed that info to a hobby club or magazine column editor.

So I have a proposition for you. Do you want to obtain as many utility station mailing addresses as possible? If so, you have to do something for me. I will publish as many mailing addresses as you send in to me. This means that you'll have to rummage through your QSLs or other material containing addresses, copy them down, and send them in. I'll be willing to bet that each one of you QSL buffs has one or more addresses that no one else has.

So that is my proposition to you. I'll run a full page of addresses each and every month, providing that you take the time to send them in to me.

As the old saying puts it, "one hand washes the other." You do something for me, I'll do something for you, and everyone will benefit from it.

UFOs and UREs

Mention UFOs (Unidentified Flying Objects) and you'll get a full range of opinions that cover the entire pro/con spectrum. I'm not going to engage in this controversial subject, but I do want to put forward a question that has a bearing on utility monitoring.

To present this question, assume for the moment that UFOs are real, and therefore have a physical reality. This means that these craft are under some sort of intelligent control. This could be either of a "manned" nature, or via a type of "remote control." In any case, it would be reasonable to assume that some sort of detachable radiowave communications or emissions exist.

If some reports are to be taken as fact, UFOs have apparently radiated R-F energy, producing an induction powerful enough to turn on lights or disrupt electrically driven devices. In some instances, witnesses reported tingling sensations, which suggests exposure to a high R-F energy field.

The point I'm making is this: unless UFOs

communicate via telepathic means, they would have to resort to some type of "radio" communications, or transmit/receive sensory methods (like radar).

As for frequencies, this would cover those propagated through free space—in other words, virtually any frequency from long wave through teraHertz.

The transmission medium and modes would likewise be unknown; voice or what passes for audio, tone pulse, digital, extremely narrow or wide bandwidths, and an assortment of other possibilities.

By mentioning this subject, I am not cracking up. Those that have strong pro or con feelings utilize reports, photographs, and such to support and explain their beliefs. With few exceptions, no real effort has been made to determine if there is some type of radio emission that cannot be identified as either having a terrestrial origin, or those on frequencies associated with the intergalactic electromagnetic medium. So are there any UREs (Unidentified Radio Emissions)?

We are accustomed to hearing all manner of noises, and that's the problem. We merely assume that all are man-made or a by-product of nature.

To my knowledge, there has never been a survey of hams or radio monitors who reside in the area at the time a UFO was reported. Hence it is unknown, if at that time, some unusual radio "interference" occurred and was heard by these individuals.

Now I'm not pandering to the fringe element, nor proposing any bizarre monitoring project. But I am advancing the question that asks, "is every odd thing we hear identifiable as a product of man's radio spectrum usage, or nature's cosmic symphony?"

If you're somewhat bored, this question could prompt you to keep an ear tuned to anything unusual coming from your receiver. At the very least, this could enable you to eventually identify a good deal of what now sounds odd or bizarre, but is actually originating from human activities or nature herself.

Above all, keep a tape recorder at the ready to record any "noises" that are of an unknown nature to you. Then do some detective work to eliminate or identify that emission. If still unknown, contact a fellow buff and see what he/she can make of it.

I admit it is far out. But just remember, it wasn't too long ago that individuals were called crazy when they proposed that man could communicate with one another thousands of miles apart without wires.

Basic Utility Reference Material

For those of you new to utilities, the most important acquisitions are good basic reference manuals. There are two that I can highly recommend. One is the *Confidential Frequency List* by Gilfer Associates. The other is the *Klingenfuss Utility Guide* published in the U.S. by Universal Shortwave. Both are general coverage in scope, covering the HF frequencies, with the main data presented by frequency. Transmission

modes include all those found in utility communications use.

The CFL and KUG overlap in some instances, but both have unique qualities of their own. These two reference books should be part of any utility buffs library.

There are a host of other books and lists that cater to more specific aspects of the utilities. You've seen that MILTAC monitors utilize some material not commonly thought of as radio oriented. As such, you may use material that others are not familiar with.

As an aid to you fellow utility buffs, I ask that you write to me, giving details of the materials that you've found of genuine asset in your particular utility endeavor. Later on, a comprehensive listing can appear in this column to aid those who have similar interests.

The CommCo Format

As you can judge from this issue, topics can range through a wide spectrum of utility interests. The exact monthly format will heavily depend on what you, the reader, sends into CommCo. In any event, the presentation will remain as flexible as possible in order to cater to a wide variety of interests.

There are certain parameters and limitations. CommCo is basically HF oriented, covering frequencies from .01 Hz up to 30 MHz. Although any utility topic is fair game, VHF and UHF areas are not within the scope of this column.

If the re-routed mail is any indication, then it appears that many of our monthly get-togethers will be to explore topics that are not your average run of the mill variety. In doing so, some will spark controversy, and it may well be that a few topics will be continually touched on from issue to issue.

As I've said, what turns up in this column, will in large measure, be a reflection of what you send in—so suggestions and, above all, data, will be the key ingredient that motivates CommCo.

I must point out that after I took over CommCo, the concept was for me to edit utility discussions, while my counterpart would present your loggings. In effect, this is sort of a running experimental concept, but in any event, the ultimate goal will be to satisfy you, the reader.

Intercepts

Send your best utility station intercepts to Jim Taggart, Utility Intercepts Editor, Popular Communications magazine, 76 North Broadway, Hicksville, NY 11801. Listings should be in ascending frequency order (that is, lowest frequency first), showing time (in GMT), callsign, location, mode (if RTTY, give WPM or baud rate, shift, and whether normal or reverse), language if other than English, and type of traffic or communications noted, and any comments or remarks.

Here we go for this month—a really terrific assortment of ute DX from our contributing monitors:

194: TUK, Nantucket, MA, radiobeacon. (Burt Knight and Jim Pinfield, Concord, NH)

307: Very slow CW with "L" repeated several times,

then a long tone at 0525. At 0526 "O" was sent followed by a tone, then the letter "Z." Jim was inspired to tune these frequencies by a story in the January POP/COMM. Probably several beacons alternating on the frequency. (James Ingram, Aromas, CA)

338: MS, a radiobeacon west of New Orleans, LA. (Bud Stacey, Semmes, IN)

382: LQ radiobeacon with YL giving weather at 0148. (John P. Carlson, Littleton, MA)

391: DDP radiobeacon, San Juan PR at 0009. (Gary P. Vendetti, Millville, NJ)

2766.8: MGJ sending a series of VVV in CW at 0257. This callsign is listed as Faslane UK. (Alice Brannigan, MA)

3039: IDR8, Rome, Italy, with CW V-marker at 0400. (Eric Olithwaite, CA)

3123: At 2230 a YL repeated "This is a test for all communications." (Jac Baker, Russia, OH)

3269.2: 2V2D repeated in CW at 0551. (Alice Brannigan, MA)

3415: YL repeating "Alpha Romeo Tango Two" under heavy interference from Shannon Aeradio at 0503. (Dan Burns, Warmminster, PA)

4025: 5-digit numbers station, SS/YL at 0300. (Burns, PA)

4055: 5-digit numbers station, GG/YL in AM mode then switching into RTTY. Weak signal. Noted at 0430. (Anthony Tarantini, Central Islip, NY)

4416: ZEBRA 8 YANKEE heard using USB at 0100. "Flash Traffic" SAC type broadcast smack in the middle of the 4 MHz maritime band! (Daryll Symington, Holland, OH)

4419.4: HOBNOB 03 calling HOBNOB's 17, 28, 35, and 44 for radio checks followed by a drill at 1606. USB mode. This is a USCG channel. (Jeanette Johnson, Kew Gardens, NY)

4428.7: NMN, USCG Portsmouth VA in USB at 0404. Marine weather broadcast with YL operator. (Jerry Brumm, Chicago, IL)

4625: VEB2, most likely in Canada but exact location not known, with time pulses at 2358. (George Osier, Norfolk, NY)

4730: 4-digit numbers station, SS/YL at 0216. (Joseph Sepulvado, Nekoosa, WI)

4747: Weather and air traffic control communications at 1314. Mentioned Travis AFB. (David S. Bailey, Broomfield, CO)

4770: 5-digit numbers station, 3/2 format, GG/YL in AM mode at 2230. Sounded like a "live" broadcast but suffered from interference from Radio Kaduna in Nigeria. (Osier, NY)

4813: LZM7/LZA8, Sofia, Bulgaria with RTTY "RY" test tape (425/50N) at 0008. (E.R. Howard, NJ)

5457: LZA6, Sofia, Bulgaria, with RTTY "RY" test tape (425/50R) at 0225. (Howard, NJ)

5460: WWV45, Rabat, Morocco, VOA news in French at 0324 via RTTY (425/75N). (Bob Violette, NY)

5616: SUC, Cairo, Egypt, with RTTY (850/50R) test running "RY" at 0225. (Howard, NJ)

5692: PAPERBOY working BARRACUDA 1 and 2 with target acquisition reports at 2304. A few minutes later INDIA 2 DELTA working ECHO 8 WHISKEY with coded traffic. Sounds like anti-drug smuggler stuff! (Kenneth F. Newell, Miami Lakes, FL)

5696: USCG Helicopter 1500 sending a taped message at 0133 to COMSTA San Francisco. (Ricky Ketchum, Austin, TX)

5740: HZN, Jeddah, Saudi Arabia, at 0236 in RTTY (425/50N) announcing: "Kingdom of Saudi Arabia Meteorology and Environmental Administration Marine Weather Bulletin." (Howard, NJ)

5937: 5-digit numbers station SS/OM at 0545. At 0600 station announced a series of zeros and went off the air just in time for SWBC station to come on using 5935 kHz. (Dan Smith, Morrisville, NY)

5985: 5-digit numbers station, SS/YL in AM mode at 1000. Went on and off the air several times. (Bob Salwasser, St. Paul, MN)

6550: Boeing Flight Test, Seattle WA working ALLEN 02. Also Rockwell Flight Test working aircraft N-4579-D in SSB at 1412. (K. Eichman, Gahanna, OH)

6676: Bangkok Volmet, Thailand, very weak in SSB at 1212. Also Sydney, Australia, Volmet at 1230 and Singapore Volmet at 1250, all SSB. (Eichman, OH)

6694: C.JX, St. Johns Military Radio, Canada, sending aviation weather at 2231 in USB. (Osier, NY)

6698: GOLF 2 VICTOR transmission to SKYKING at 0710 with coded message. ZULU 7 UNIFORM also noted in SSB. Military traffic. (B. Churchill, Larned, KS)

6712: Various tactical stations such as BITTERHONEY,

STINGER, ALABASTER, OFFHAND, GET SET, GRAPEVINE, INDIA 6 VICTOR in USB around 0425. (Shirley Lieb, Oak Park, IL)

6714: TEAL 60 aircraft LSB mode at 0007. Contact with BIG DADDY (TEAL OPS) with traffic. (Symington, OH)

6737: ETD3, Addis Ababa, Ethiopia, with RTTY "RY" tape (850/50R) at 2219. (Tom Kneitel, NY)

6761: SICK BAY to MOVER VAN in USB at 0415. This frequency has been very active of late with all types of military traffic. (Lieb, IL)

6775: XTU, Ouagadougou, Upper Volta, at 0353 with RTTY (425/50N) test tape of "RYRY." (Kneitel, NY)

6785: 5-digit numbers station, SS in AM mode at 0435. (Lieb, IL) Also noted here were WUB2, WUB3, WUB4, WUB5, and WUB55 with radio checks in SSB at 1350. WUB55 announced Tampa Bay. These are Army Engineers stations. (Eichman, OH)

6802: 4-digit number station, SS/YL in AM mode at 0520. (Leo Boberschmidt, Kensington, MD) Also noted at 0600 by Dan Smith. (Morrisville, NY)

6840: ECHO KILO INDIA 2 sounded similar to the familiar KILO PAPA ALPHA 2 transmissions. Noted at 0206. This frequency always produced DX of interest. (Boberschmidt, MD)

6880: 5-digit numbers station, SS/YL at 0430 in AM mode. (Lieb, IL)

7050: PAPA DELTA, Philippines Armed Forces units passing traffic in USB at 0135. Nice catch! (Greg Harris, WB9MIL, FPO San Francisco)

7439: 5-digit numbers station, SS/YL at 0530. (Jim Lonsdale, Phoenix, AZ)

7532: YL op repeating "Data Foot Scott" every 10 seconds, then bagpipes for 10 seconds at 2034. At 2036 it went into GG numbers. (Vendetti, NJ)

7590: 3/2-digit numbers station, EE/YL at 2012 in AM mode. (John L. Walsh, Holliston, MA)

7690: TUH, Abidjan, Ivory Coast, RTTY (425/50N) "RY" tape at 0125. (Kneitel, NY)

7834: KNY21, Yugoslav Embassy, Washington, DC, with diplo traffic in Serbo Croat and crypto (how could you tell the difference?—Ed.) in RTTY (425/100R) at 2205. (Robert Margolis, Skokie, IL)

7846: 5-digit numbers station, SS/YL at 0730 in USB mode. (Smith, NY)

7915: AFA4MA, USAF MARS station in RTTY (850/45R) with traffic at 0135. (Alice Brannigan, MA)

8118: FLLS (actual callign 9JZ6), Lusaka, Zambia, calling FLND and FWKI at 0502 in RTTY (425/50N) also run "RY" tape. (Brannigan, MA)

8161: Various tactical stations in USB around 1510 with ID's like B7P, P6Y, V4A, G7D, H2A, K1C, B2C—11 ID's in all. And, under it all, some guy kept counting from 1 to 10 in Spanish! (Ted Moran, Chicago, IL)

8353: HJNZ, ship "La Guajira" at 0430 in TOR/FEC mode exchanging traffic with coastal station WLO. (Howard, NJ)

8400: 4-digit numbers station in Chinese! YL announcer at 0252. Good one, Greg! (Harris, FPO San Francisco)

8502: WKM, Atlantic Marine Radio, New Haven CT with CQ in CW. This is a new station and it announces the following frequencies: 442, 8502, 12948 kHz with hours 1100 to 0300. Station address is 45 Victory Drive, New Haven, CT 06515. (Les Wachinsky, Meriden, CT) When you see new coastal stations like this (and WSC also) going on the air, it sort of makes you wonder why they decided to kill old standby WSL—Ed.

8558: CCV6, Valparaiso Naval Radio, Chile, with time pulses at 0055 under lotsa QRM from CW stations. (Osier, NY)

8591: XVN8 calling XVG9 in CW at 2330. Our records here show this frequency with the callign XVVS8, Ho Chi Minh City Radio in Vietnam—runs a CW weather broadcast at 0048, 0448, and 1148—Ed. (Harris, FPO SF—by the way, Greg is a USN Radioman in the Philippines)

8646: Vishakhapatnam Naval Radio, India, running VVV in CW at 1315. (Harris, FPO SF)

8680: WSC, Tuckerton NJ coastal telegraph station with CW marker at 2008. (Margolis, IL)

8832: Hong Kong in USB with weather at 1330. (Harris, FPO SF)

8903: Brazzaville Aeradio, Congo, working an aircraft in English at 2326. (William Mayer, PA)

8972: NOVEMBER 8 ECHO advising PAPA 1 YANKEE to commence "Exercise Bird Dog." Mentioned weather conditions at 39-17N 67-23W. (Dennis McEwan, Bronx, NY)

9003: JYADV, Jordanian aircraft flying from Miami to Santo Domingo noted in English at 2100. Someone aboard the aircraft sounded quite frantic and said he had urgent traffic for someone at a hotel in Santo Domingo.

Pilot said that he flies this route every day. Also heard pilot speaking in Arabic. (William Mayer, PA)

9006: Between 2000 and 2300 heard scrambled speech, high speed RTTY, also plain voice transmission announcing "Radar is up, start radar data point." NAVY 742 called Lockheed Los Angeles, and Palmdale (CA). Also heard Edmonton Military (Canada), 4 BRAVO, and LOCKHEED 742. (Philip Humes, Santa Rosa, CA)

9023: DEER HUNTER 04 working CHOP HOUSE, BREWMASTER, TURNPIKE, SIGN POST, GALLANT FOX, and SUB SONIC. Talked of "setting up" and using secure communications. Switched to 11007 kHz but went back to 9023 kHz. Military comms, Dan—Ed. (Burns, PA)

9123: 5-digit numbers, SS/YL at 0930. (Ron Brochu, KA0SGU, Duluth, MN)

9240: PTT Moscow's international radiotelephone terminal facility running a voice mirror in EE/YL and FF/OM, USB at 0520. (Margolis, IL)

9251: ELRB, Monrovia Aeradio, Liberia, running RTTY (325/50N), no time specified. (Knight, Pinfield, NH)

9265: 5-digit numbers station, GG/YL at 0200 in AM mode. (Tarantini, NY)

10296: ZRH, Cape Naval Radio, RSA at 0006 in RTTY (850/50R) running "RY" tape and calling NAU. NAU also noted simultaneously on 10710 kHz in RTTY (850/50N) calling ZRH. (Howard, NJ)

10880: 5LA10, VOA Monrovia, Liberia, with English news at 0030 via RTTY (425/75R). (Howard, NJ)

11035: AIR FORCE 2 on LSB at 2145 with phone patch to residence of TIMBERWOLF. (Margolis, IL)

11118: "This is the motor shop with a test count 1-2-3-4-5-5-4-3-2-1-Lift off," repeated several times between 1615 and 1625. This is a USAF frequency. (Johnson, NY)

11271: APPLESAUCE (probably Hickam AFB), ERIC 02, and ARIS 02 (helicopters) and QUELL 03, 04, and 09 (probably C-130's), and COAST GUARD 1414. From 0055 to 0235 noted attempting to remove sick passenger from the ship ASIAN BEAUTY. During the mission one chopper crashed on the deck with loss of life, 2 picked from sea. (K. Johnson, Fairbanks, AK)

12061: RFLIA, Ft. de France, Martinique, military station calling RFLIG at 2039 via RTTY (850/50R). (Howard, NJ)

12373.4: GBCF, vessel PACIFIC PRINCESS ("The Love Boat") working WOM with a phone patch, USB at 1638. (Symington, OH)

12502.7: URUJ, Soviet cargo vessel MATOTCHKINE CHAR calling URB2 at 2230 via RTTY (170/50N). (Howard, NJ)

12750: CWA, Cerrito Radio, Uruguay running CW at 0020. (Vendetti, NJ)

13205: NETHERLANDS NAVY 835 working PAPA

JULIET XRAY and PAPA ECHO MIKE via SSB between 2040 and 2253. (Eichman, OH) Good catch!

13463: Cut number CW traffic. Messages ATA RIMMI AIDA and IGM MTMTU WWWTU were repeated for 5 minutes each at 1407. Parallel transmission (or spurious) on 13888 kHz. (Eichman, OH)

13520: FSB72, INTERPOL in Paris (St. Cloud) with police bulletins in French. A rough frequency to log this station because of USN traffic here that knocks everything else out. If you can get the frequency when the USN isn't using it, you'll catch this station. (Margolis, IL)

13587.1: HBD20, Swiss Embassy, Berne, Switzerland with news in French and traffic in German or 5-letter groups to KNY27 (Swiss Embassy in Washington). Noted at 1353 in TOR mode. (Margolis, IL)

14480: Spanish speaking male calling "Benita" repeatedly in USB at 1748. ("The Old Sarge," Milwaukee, WI)

14563: Time division scrambling noted at 1805. ("Old Sarge," WI)

14686: All sorts of anti-drug smuggling activity on SSB, ID's such as ATLAS, FLINT 106, JAGUAR, 93 ALPHA, 53 ALPHA, PANTHER. Also mention of switching to UHF 361.8 MHz. Noted around 1600 to 1700. Also monitored on 11246 kHz around 1830. (McEwan, NY)

15075: 4-digit numbers station, SS/YL at 0227. Runs parallel to 6802, 9075, and 11532 kHz. (Joseph E. King III, Lexington, SC)

17816: CLN573, Havana, Cuba, calling UJY2, Kalingrad, USSR, in CW at 1602. (Eichman, OH)

20742: Unidentified station using the ID letters "GMN" sending RTTY "RY" transmission followed by 5-digit groups at 1831. RTTY was 425/66R. (Margolis, IL)

26190: ABC-TV in Los Angeles programming being relayed on this frequency from 1807 to 2015. (Stacey, AL)

28440: UFL, Vladivostok, USSR with CW VVV tape at 0200. (Harris, FPO SF)

29845: Mexican radiotelephone, full duplex, similar to 29885, 30145, and 30185 kHz. (Chuck Robertson, Creal Springs, IL)

44350: Mexican pil rigs—paging, signalling, phone comms. (Robertson, IL)

A really terrific assortment of stations. Your contributions to the Intercepts section are enthusiastically sought. Although we have tried to include the choicest loggings from all who send in, because of the space we have available we can't run every single logging submitted. Some monitors send in more than 100 loggings every month! We'll be back next month and hope to see your best utility station loggings!

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CIRCLE 29 ON READER SERVICE CARD

LISTENING POST

BY GERRY L. DEXTER

WHAT'S HAPPENING: INTERNATIONAL SHORTWAVE BROADCASTING BANDS

Even though we are well into spring with an automatic increase in atmospheric noise on the bands, don't let that deter you from the search! This time of the year and, indeed, even through the summer months, there are some excellent DX openings—especially from those weak, low power stations in Latin America. The higher bands should be improving somewhat, remaining open later into the evenings, despite the current low sunspot count.

The Voice of the United Arab Emirates at Abu Dhabi has begun use of its new high power transmitters as forewarned in this column a couple of months ago. But the station didn't kick things off on any of the higher band frequencies as had been expected. Instead they chose the 60 meter band frequency of 4.800 for broadcasts in Arabic and request for reports to Box 63, Abu Dhabi. Good signals too, despite QRM from the Ecuadorian, from around 2200 GMT and on into the evening. Look for usage of those higher frequencies to come into use eventually.

Syria, having restarted its shortwave service a few months ago, has now expanded into a multi-language foreign service using the following schedule: English to North America from 1200-1230 on 17.510; Turkish to Europe at 1330-1430 on 9.480; Russian to Europe at 1800-1830 on 7.455; German to Europe from 1835-1905 on 11.685; French to Europe 1905-2005 on 11.685; English to Europe 2005-2105 on 11.685; Arabic to Latin America from 2200-2300 on 7.430, 9.485; Spanish to Latin America 2300-2340 on 7.430, 9.485; and Portuguese to Latin America 2340-2400 on 7.430 and 9.485. Check 7.425 as an alternate to 7.430.

Kenya has registered some higher band usage for their long-awaited 250 kilowatt transmitters. No guarantees that they are actually on at this point, but they are listed for 1230-1530 on 6.050 and 7.225; 1530-1930 on 9.655 and 11.745; and 1930-2130 on 6.050 and 7.225.

Radio El Espectador in Uruguay has returned to the air. Check for their Spanish language programs on 11.835 during the 2300-0100 period.

Radio Portugal has had to cut back on their English transmissions. Budget cut-backs have forced the dropping of English on weekends so you can now hear Radio Portugal only on weekdays in English to North America.

Radio Netherlands now has their 500 kilowatt transmitters at Flevoland fully operational, replacing the site at Lopik. The site of the four 500 kilowatt units is below sea



This is R. L. Bearer's shack in Toledo, Ohio. But that's not R. L., it's his wife—who also enjoys DX'ing.



Here's Leonard Szalony of Fontana, California, who holds ham call NC6W.

level and thus their promotional line "2,000 kilowatts under the sea."

According to an item in the bulletin of the Ontario DX Association, George Otis, head of High Adventure Ministries (operators of the Voice of Hope in Lebanon and the yet-to-start KVOH in California) plans to put a 1.5 million watt transmitter on the air from a freighter anchored in the South China Sea. Target date is Easter, 1986. KVOH is now scheduled to start April 7. Plans also exist to raise the Voice of Hope's power to 1.5 million watts (ERP).

At the other end of the power spectrum, tiny Radio NYAB in Bhutan is reported to be hopping around in an effort to find an interference-free channel (not that it will help us much, even if they do). The station has been noted by Indian DX'ers on Sundays at 0830 to 0900 on 6.970 and in subsequent weeks on 6.895 and 7.170. The nominal channel is 7.040.

The 1985 convention of the Association of North American Radio Clubs is fast approaching. This year's event is sponsored by the National Radio Club and will be held from July 19 to 21 at the Red Carpet Expo Center in Milwaukee, Wisconsin. There's free limousine service to and from the airport around the clock and the hotel is easily accessible from the interstate. You can call in your reservation for a room by phoning 1-800-328-1111 (in Minnesota it's 1-800-272-1408). Use the special ANARC ID number: RAD222. For more information, send a self addressed stamped envelope (2 stamps or 3 IRCs) to Anarcon '85, P.O. Box 24, Cambridge, Wisconsin 53523. ANARC, incidentally, has restyled their newsletter. A 12-month subscription is \$7.50 from ANARC Newsletter, 1500 Bunnbury Drive, North Whittier, CA 90601. It's a good way to keep up with news of the radio listening hobby.

Another regional club is the Ozark Mountain DX Club, which publishes a twice-monthly bulletin of some 4 pages. Bulletins

are 25 cents per copy, so you can subscribe for as long as you like at that rate. For information contact the Ozark Mountain DX Club, Rt. 1, Box 437, Berryville, Arkansas 72616, with an SASE.

Still another regional club is the Cascade Mountain DX Club, and information on that one can be had from Craig Parsley, 9200 112th Avenue NE, Kirkland, Washington 98033. Again, include a self addressed stamped envelope.

If you live in Michigan, you can hook up with the newly formed Michigan Area Radio Enthusiasts, now issuing an allwave newsletter and planning regular meetings. Membership is open to those living in the border areas of Ohio, Indiana, and Ontario as well. Send 25 cents and a self addressed envelope to Don Hosmer, 24500 Union, Dearborn, MI 48124 and that'll get you info and a sample newsletter.

If you have, or want to start, a local or regional club, let us know and we'll be glad to pass along the details. Local and regional clubs are a very important element in the hobby and the more of them, the better!

Mailbag

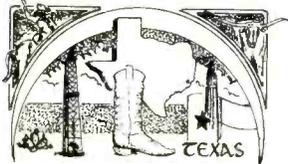
Let's peak into the mailbag.

Welcome to Mitch Sams of Wichita, Kansas, who edits the Ozark Mountain DX Club newsletter. Mitch has been DX'ing since 1971 and notes he's especially disappointed with the propagation this year (who isn't). He'd been looking forward to some Indonesian DX'ing, but very little showed. It has been several years since there was really good reception from Indonesia outside the west coast. Like they say, "wait'll next year!"

Sheryl Paszkiewicz in Manitowoc, Wisconsin is the proud owner of a new NRD 515 receiver. Enjoyed the visit with you and John Meyer, Sheryl—but never knew it could get that cold!

A. J. Blakeslee of Brookfield, Connecticut forwards a letter from Trans World Radio in Monaco, which notes that 7.160 was

DXing World Cultures and Personalities



WDX5LH

Larry Hastie of Baytown, Texas designed and printed his own SWL card.

dropped at the start of 1985 and TWR now uses only 9.495 for its European service in English.

Bob Schroeder of Oklahoma City wants to know how to go about QSL'ing stations that broadcast in languages the listener doesn't speak or understand. That's always a tough one to answer without taking up several pages. Normally the best you can do is describe what you've heard as accurately as possible. You can learn to write reports in foreign languages by using foreign language reporting guides such as the one published by SPEEDX (7738 East Hampton Street, Tucson, AZ 85715) available at \$1.50 per copy. Sorry, we don't know of any clubs in the Oklahoma area. Anybody else?

How long does it take for Voice of America QSLs to arrive wonders Michael Goetsch of Berea, Ohio. Well, it shouldn't take too long, but sometimes there are jam ups in the works. QSLs should come through eventually. If not, there are always follow-up reports.

Pat McDonough in Pittsburgh has been busy adding equipment, namely a Realistic DX-400, Realistic Pro 2020 programmable scanner, and a Regency D-310 programmable scanner for his car. The first new sta-

tion he logged on the DX-400 was also his first pirate logging.

Thomas Miller in Syracuse, New York notes that Radio Earth now runs Sundays only, over Radio Clarin. They're on from 1600 to 2300 and Clarin was planning some antenna improvements as of late January. Tom also passes word that Radio Earth has T-shirts for sale at \$8 each. Write Radio Earth, P.O. Box 92-2, Santo Domingo, Dominican Republic for details.

Sara Vickers in Pittsburgh had a brief spurt of interest in listening a couple of years ago and then gave it up. She recently discovered POP'COMM and that got her to dig her receiver out of the closet and get going in earnest. She wonders about coverage of soccer matches in English on stations other than the BBC, so if anyone knows, let us know. Sara is also interested in hearing Argentine stations other than RAE. Unfortunately, Radio El Mundo and Radio Splendit went off shortwave last year, so the only major station left is Radio Belgrano, scheduled until 0200 on 6.090 and 11.780. Radio Malargue can sometimes be heard around 1000 on 6.160, but it's a pretty tough catch.

John A. Morris checks in from Palau, Sardinia where he's serving with the Navy and thinking about buying an NRD 515.

Barbara Harris of Nashville, Tennessee forwards a copy of a letter she received from Radio Jamaheriya's Malta office. Barbara wonders why the Malta office replies fairly readily but responses from Libya rarely hap-

pen. We've no answer for that except that the Malta office was apparently set up to handle listener mail, although the whys are a mystery. Incidentally, the letter mentions that former verification signer Mohammed Sweidan is now with the Libyan Mission to the United Nations. The new signer at the Malta office is Evan Mame.

George Moissant at 760 - 39th Avenue, San Francisco, CA 94121 needs help in locating service manuals for his Hallicrafters SX-99 and SX-122 receivers. Please write George if you can help or know where you can obtain these manuals.

And Takahasi Tadasu in Tokyo, Japan joins us this month and notes that signals from the Caribbean and the east coast of North America are the hardest to hear in Japan.

Let's hear from you next time. Your loggings, questions, schedules, shack photos, and clippings are always most welcome.

Listening Reports

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

Albania Radio Tirana on 7.065 at 0007 with news, ID in English. (Vickers, PA) 7.070 with sign off in English at 2227 (Favata, NY) 7.080 English sign on at 0630. into news. (Alpert, NY) 7.120 at 0245 in English. (Hunt, NC) ID 0128 and into English. (Alpert, NY) 11.960, 1236-1245 English news and current events. (Moran, IL)

Algeria Radio Algiers, 15.215 at 2007. world news in English. (Mills, BWI) 17.745 at 1700 in French with pop music. (McDonough, PA)

Angola Radio Nacional, Luanda with English on 11.955 from 2100-2200. Music and news briefs, good but RTTY or telegraphic QRM at times. (Schroeder, OK)

Antigua BBC Relay on 6.175 at 0108-0145. variety

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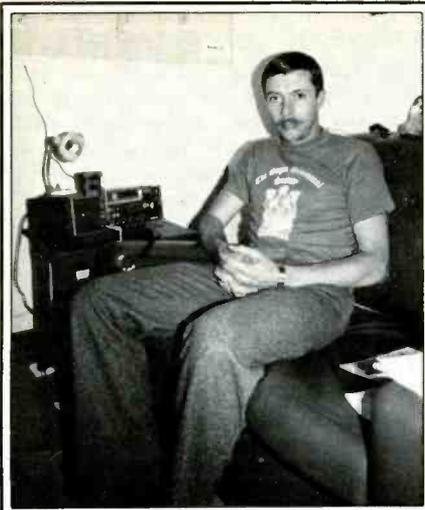
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CIRCLE 33 ON READER SERVICE CARD



John A. Morris, who serves with the Navy in Sardinia.

of English programs. (Carlson, CO) 9.510 at 0836 to North America and the Caribbean. (Pastrick, PA) Deutsche Welle relay, 6.040 with English to North America at 0120. (Pastrick, PA)

Argentina Radiodifusora Argentina al Exterior (RAE) at 1130 on 11.710. Time check, ID in English and Spanish, time and frequency announcements and news from Buenos Aires. (Goetsch, OH) 0210 with English talks about PLO and Mideast. (Pastrick, PA) At 0359 ending English, into Spanish. (Vickers, PA) 15.345 at 0415 in Spanish, talk about Margaret Thatcher. (Gardner, MD)

Australia VNG Time Station on 12.000 at 0539. (McDonough, PA)

Radio Australia, 6.035 at 1440 in English. Also on

6.060 and 6.080. (Moran, IL) 6.045 Lyndhurst transmitter at 1115 with talk on U.S. spy satellites, bases and missiles in Australia. 6.080, Shepparton site, at 1100 with news. (Goetsch, OH) 7.215 at 2030 with Australia/Pacific news. (Mills, BWI) 9.595 English at 0815 with "Talkback" program. (Pastrick, PA) 17.795, 0530-0600 with "Talkback." (Szalony, CA) At 2300 with world news, pops. (Limbirt, MI)

Austria Austrian Radio with English to North America at 0350, talk on Alpine ski production. (Pastrick, PA) Here and on 6.000 at 0049. (Shute, FL) 6.000 at 0143-0155 sign off with "Austrian Report." (Fravel, WV) 0350 "Austrian foods." (Hunt, NC)

Belgium BRT in English on 17.610 at 1402 with "Cultural Report." (Shute, FL) 5.910 at 0030 in English mentioning the BRT DX Club. (Limbirt, MI)

Belize Radio Belize, 3.285 at 0150 music, weather. Sign off at 0400 after drama program. (Miller, GA) 0054-0104 pops and ID on the hour. (Fravel, WV)

Brazil Radio Globo, 11.805, two man announcers in Portuguese, rapid delivery with reverb. (Moran, IL) Radio Anhanguera, 4.915 at 0258 in Portuguese with time checks, ID, LA pops. (Paszkiwicz, WI) 0045-0115, ID at 0100. (Thompson, Great Britain)

Radiobras, 15.290 at 0235 with Brazilian pops, ID. (Vickers, PA) 0245 in Portuguese. (Meyers, MO) Radio Nacional at Manaus, 4.845 at 0150. ID in Portuguese at 0200. (Thompson, Great Britain)

Radio Nacional Amazonia, 11.780 at 2030-2100 man announcers in Portuguese, musical ID, Latin pops. (Moran, IL)

Bulgaria Radio Sofia, 7.115 at 2130 in English, world news. (Hunt, NC)

Burma Burma Broadcasting Service, 5.985 at 1500-1600 in English, carrying American and European pops. (Tadasi, Japan)

Cameroon Radio Douala, 4.795 at 2202 in French. (Shute, FL)

Canada BBC via Sackville, 9.515 at 1714. (Saunders, NJ)

CFRX, relay CFRB Toronto, 6.070 at 2231 with commercial, talk, pop music. (Goetsch, OH) 1704 with weather. (Vickers, PA)

CHU time station, 3.330 at 1013, time signals, French and English IDs. (Goetsch, OH) Also on 7.335 all day. (Meyers, MO)

Radio Canada International, 5.960 at 0100 with interval signal and anthem. (Meyers, MO) 0050 with Falkland Islanders' attitude towards Argentina. (Vickers, PA) 0420 English to North America and talk about Canadian politics. (Pastrick, PA) Politics of hunger and Ethiopian famine at 0313-0330. (Carlson, CO) 9.760 with news in English at 2215. (Favata, NY) 2100 on 11.720 with Nazi prison camps in World War II. (Hunt, NC)

Chad Radiodiffusion National Tchadienne, 4.904.5 at 0545 in French, with music. (Saunders, NJ)

Chile Radio Nacional 15.140 at 1900 with Latin and American pops, ads. Good signals. (Schroeder, OK) 1351 with romantic music. (Shute, FL) 1800-1845. (Moran, IL)

China Radio Beijing, 0951 in English, Chinese folk tales. Fair on 9.700. (Alpert, NY)

Clandestine Radio Venceremos 6.567 at 0059. Regional music, revolutionary announcements and slogans. Sign off with shouted "venceremos" over FMLN anthem. (Goetsch, OH)

La Voz del Cuba Independiente y Democratica, with Camilo Cienfuegos program on 6.300 at 0637, music, IC 0704 "Esta es La Voz del Cuba Independiente y Democratica... en la cadena radial del Radio Camilo Cienfuegos y CID." (Goetsch, OH) Strong on 6.229.7 parallel 7.400 at 0620. Also 2027 on 9.939.5. (Alpert, NY) 9.940 at 2100-0000, political speeches, Latin pops. (Moran, IL)

Radio Quince de Septiembre, anti-Nicaraguan, 5.555 at 1200-1210 in Spanish. (Moran, IL)

Colombia Radio Sutatenza, 5.095 at 0230 with Latin music. (Schroeder, OK)

Radio Nacional de Colombia, 9.635 at 1230-1235, ID and man in Spanish. (Moran, IL)

Congo La Voix de la Revolution, in French at 2209 on 15.190. (Shute, FL)

Costa Rica Radio Impacto, 6.150 at 0405 in Spanish. (Meyers, MO)

Radio Columbia, 4.850 in Spanish with ID at 0401, excited announcers following ID. (Gardner, MD) TIFC, English religious program at 0330 on 5.055. (Schroeder, OK)

Radio Reloj, 4.832 at 0402 music, IDs, time checks, all Spanish. (Goetsch, OH)

Cuba Radio Havana, 6.140 English to North and Central America at 0345. (Pastrick, PA) English news ending 0428, into UN Radio Service Report. (Alpert, NY) 0150-0221 in English. (Carlson, CO) 9.525 at 0630 sign on of Pacific Coast of North America service. to 0800 sign off. (Alpert, NY)

11.725 at 0350 in English with ID 0400. (Vickers, PA) 11.760 at 0000. (Meyers, MO) 15.300 at 2110, life of Fidel Castro. (Hunt, NC) 17.750 at 2100 with Central and South American news. (Favata, NY)

Czechoslovakia 0125 on 5.930, English to North America, talk of Czechoslovakia's friendly relations with Vietnam. (Pastrick, PA)

Dominican Republic Radio Clarin with Radio Earth service at 2130 (Sunday, Editor). (Hunt, NC) 11.700 at 2238-2301, all Spanish, news and current events. (Fravel, WV)

East Germany Radio Berlin International, 0310 on 6.125, news in English. (Mills, BWI)

Ecuador HCBJ 9.745 at 0112 with talk on how transmitters are repaired. (Vickers, PA) Stamp collecting at 0255. (Hunt, NC) 9.655 English to Europe at 0800 with religious program. (Pastrick, PA) 6.095 with news and religion in English at 0305. (Meyers, MO)

Radio Splendit, 0801-0816 on 5.025 with music program in Spanish. (Fravel, WV)

HIZIOA time station, 7.600 at 0018 with time pulses, announcements by man in Spanish. (Limbirt, MI)

Radio Pastaza, El Puyo, 3.316 at 0349 with music. (Shute, FL)

Egypt Radio Cairo, 9.675 in English at 0235 with talk about 1985 Egyptian commemorative stamps. (Hunt, NC) 9.805 at 2132 in European service. (Shute, FL) 12.050, 1735-1745, drama in Arabic. (Moran, IL)

England BBC on 3.955 at 0415 with talk about money. 3.975 in Bulgarian at 0431. (Saunders, NJ) 7.325 with world news at 0305. (Hunt, NC) News and sports 0235-0300. (Carlson, CO) 15.070, parallel 9.515 at 1714 in World Service. (Saunders, NJ) 1730 with pop music. (Vickers, PA) 15.400 with Top 20 ending at 1900. (Favata, NY)

Ethiopia VORE in English with ID at 1500 on 9.560. (Shute, FL)

Falkland Islands FIBS on 3.958 at 0900 sign on with news, weather, music. Exceptionally heavy ham QRM. (Fravel, WV)

Finland Radio Finland International, 15.400 at 1300 in English with news and "Perspective." (Gardner, MD)

France Radio France International, 11.955 with music and talk by man at 1729. (Saunders, NJ) 3.965 at 0719 in French. (Fravel, WV)

French Gulana RFI relay with English to South and Central America at 0325 on 9.790 with news from Africa. (Pastrick, PA) 0215 with news in English. (Vickers, PA) 0415 with news in English. (Gardner, MD) 11.675 at 0330 with news in French. (Moran, IL)

Gabon Africa Number One, in French at 2242 on 4.810. (Shute, FL)

Greece VOA, Kavala relay at 0756 on 11.840 in English to 0800 sign off. (Goetsch, OH)

Voice of Greece, 15.630 at 1237 with ID, world news in English. Also on 11.645 and 17.565. (Mills, BWI)

Guatemala Radio Cultural, TGNA 3.300 in Spanish with uninterrupted easy listening music 0407-0430. (McDonough, PA) 1145-1200 in Spanish, folk and popular music. (Moran, IL)

English Bible Lesson at 0340. (Hunt, NC)

Honduras La Voz del Junco, 6.075 at Santa Barbara, in Spanish at 1225. (Shute, FL)

Hungary Radio Budapest, 6.025 at 0200 with world news and DX program in English. (Limbirt, MI)

India All India Radio in English at 2136, parallel 11.620 with Indian music. (Shute, FL)

Iraq Radio Baghdad, 9.610 at 2130 in English with press review, Middle Eastern music. (Gardner, MD) 2205 in English with QRM and bad audio. (Shute, FL) 2130 ID through heavy QRM. (Schroeder, OK) 1719 Arabic music and talk. (Saunders, NJ)

Italy RAI in English to North America on 9.575 at 0102, east-west relations, peace talks. (Pastrick, PA)

Israel Kol Israel, 7.412 at 2000-2030 news in English, better on 9.440. (Moran, IL) 0106 English to North and South America. (Pastrick, PA) 9.009 at 0500 with news, better on 9.440. (McDonough, PA)

Japan JJJ time signal station at 0334 on 8.000, ID in Morse code, then woman repeating "JJJ." Very poor. (Shute, FL)

Jordan Hashemite Kingdom Broadcasting Service, tentative on 11.920 at 2221 in Arabic with male vocals, applause. (Paszkiwicz, WI)

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Kuwait Radio Kuwait, 9.840 at 1535-1555 man in Arabic with pop music program. (Moran, IL) 11.675 at 2030 with rock, English, several IDs to 2100 sign off. (Miller, GA)

Liberia VOA relay on 15.600 at 1705-1720, world news in English. (Moran, IL)

Libya LJB 17.940 at 1645-1700 heard in Arabic. (Moran, IL)

Luxembourg Radio Luxembourg on 6.090 at 0000 in English with pop music, interference. (Limbert, MI)

Madagascar Radio Netherlands relay on 9.540 at 2045 in English with American pops. (Hunt, NC)

Malta IBRA Radio at 0700 on 6.110 with IS, ID in English, music. Into French. (Alpert, NY)
Radio Mediterranean, 6.110 at 2228 in French with ID, into English 2230. (Moran, IL)

Mexico Radio Mexico International, 9.705 at 0516-0526 sign off in Spanish. (Fravel, WV) 0250 with Latin music, woman with ID. (Hunt, NC) 15.430 at 2005-2025 with pop music, Spanish. (Moran, IL)

Monaco TWR in English to Europe at 0810 on 9.495 with religious programs. (Pastrick, PA)

Netherlands Radio Netherlands 11.740 at 2035 with Sunday "Happy Station" program. (Shute, FL) 6.020 sign on at 1030 to Australia/New Zealand in English. Parallel 9.650 but poor on both. (Alpert, NY) 17.605 at 2205 in Dutch. (Vickers, PA)

Netherlands Antilles Trans World Radio, Bonaire in English to North and Central America at 0420 on 9.535. (Pastrick, PA)

Radio Netherlands Bonaire relay, 9.590 in English at 0235 with world news. (Hunt, NC) 0318 on 6.165 "View from the Dutch Pop Scene." (Pastrick, PA)

Nicaragua Voice of Nicaragua 6.015 with English at 0430. (Meyers, MO) El Salvador guerrilla news 0415. (Gardner, MD) Anti-American items during English at 0150. (Pastrick, PA)

Nigeria Radio Nigeria (FRCN) Kaduna, 4.770 at 0631. QRM from Mayak/Cuba-4.765. (Shute, FL)

Voice of Nigeria, 15.120 at 1805-1830 commentary on relations with Brazil. (Moran, IL)

North Korea Radio Pyongyang 9.745 at 2350-0005, anti-U.S. talk in English, ID heard at 0000. QRM HCJB. (Moran, IL)

Pakistan Radio Pakistan, Islamabad, 5.095 at 1515-1535 with news in Urdu, Pakistani music. (Tadasi, Japan)

Papua New Guinea Radio North Solomons, Bougainville, tentative on 3.325 at 1309 in language with pop/music, talk by woman. (Paszkievicz, WI) To 1400 sign off with Beatles, woman in Pidgin, ID. (Sams, KS)

Radio Manus, Admiralty Islands, 3.315 at 1309 in Pidgin with ID, announcements, country western music, island music. Utility QRM. (Paszkievicz, WI)

Radio East New Britain, tentative on 3.385 at 1305 in Pidgin with talk, island music, mentions of New Guinea. (Paszkievicz, WI)

Paraguay Radio Nacional, 9.735 in Spanish at 0130.

Very strong but some QRM. (McDonough, PA) 2230 with Paraguayan popular and folk music, list of network stations. (Moran, IL)

Peru Radio Atlantida, 4.790 at 0030-0100 in Spanish. ID at 0100. (Thompson, Great Britain)

Philippines Radio Pilipinas (Maharlika Broadcasting System) relay DZFM medium wave 0630-0930 on 6.170. News in English, parallel 3.286. (Tadasi, Japan)

Pirates WMTW on 7.425 with rock, 0440. (Schroeder, OK)

Tangerine Radio, 7.436 at 0749. (Goetsch, OH)

Portugal Radio Portugal, 6.095 sign on in Portuguese at 2300. (Alpert, NY)

Saipan KYOI with rock/pop at 2131 on 9.670. (Shute, FL)

Solomon Islands Solomon Islands Broadcasting Corp. at 1018 on 5.020 with music, possible ID 1100, definitely their interval signal. (Goetsch, OH)

South Africa Capital Radio, Transkei on 3.930 at 0409 with music and talk. (Saunders, NJ) 9.765 at 0630. (Shute, FL) 7.149 at 0531 with Top 40 in English. (Sams, KS)

Radio RSA on 5.980 at 0230 with news. (Carlson, CO) 6.010 at 0200 with "News Around Africa." (Pastrick, PA) 0200 with news. (McDonough, PA) 9.615 at 0240 discussion. (Hunt, NC) 11.900 sign on in French at 1959 after English ID. (Alpert, NY) 15.185 at 1757 to 1830 with German and English announcement, into German service. (Moran, IL) 1732 in Afrikaans. (Saunders, NJ)

Spain Radio Exterior Espana on 17.660 at 1727, discussion program in Spanish. (Vickers, PA) 9.630 at 0100 with news in English. (McDonough, PA) At 0000 with news, music, tourist program. (Favata, NY) 0050 with English to North and Central America. Spanish lesson 0054. (Pastrick, PA)

Sri Lanka Sri Lanka Broadcasting Corporation on 11.801 with sub-continental music. ID at 0115 by soft spoken YL in local language. (Sams, KS)

Swaziland Trans World Radio on 3.200 in local language with religious music at 0416. (Saunders, NJ)

Switzerland Swiss Radio International, out-of-band frequency of 9.170 at 0145 in English, "Take Five" at 0150. (Mills, BWI) 9.725 with Swiss music at 0313. (Shute, FL) 9.885 to 2215 sign off in English. (Hunt, NC) 0144 sign on in English. (Vickers, PA)

Syria Damascus, tentatively on 7.425 at 0228 sign on in what sounded Arabic. (Shute, FL)

Tahiti Radio Tahiti, 11.825 at 0300 with island music, woman announcer in French. (Hunt, NC)

Taiwan Voice of Free China on 5.985 (via WYFR, Editor) in English. Chinese lesson at 0245. (Carlson, CO) 0215 on 6.065 with news and Chinese rock music. (Meyers, MO)

Unidentified 7.112 in Portuguese or vernaculars with African pops to 0555 fade. (Sams, KS)

United Arab Emirates UAE Radio, Dubai English to

North America on 9.565 at 0330. World news, "Spotlight on the Young Women of the UAE." (Pastrick, PA)

United States VOA on 7.653.4 with English in AM mode at 0200. (Alpert, NY) Central and South American service on 5.995 with IS in Spanish at 0040. (Vickers, PA) 17.790 in English at 1404. (Vickers, PA)

United Nations Radio, 11.740 in English at 0730, then into Spanish. Subject matter seemed African-orientated. (Alpert, NY)

National Bureau of Standards, WWV on 5.000. (Meyers, MO) WWVH, Hawaii on 15.000 at 1848. (Favata, NY)

WYFR on 9.355 at 2100. (Meyers, MO)

WRNO 7.355 at 0250. (Meyers, MO) At 0200 with pop/rock. (Saunders, NJ) 15.420 oldies, and address. (Favata, NY) 6.185 "Disc and Data" at 0805. (Pastrick, PA) Now carrying "Entertainment Coast to Coast" from CBS "RadioRadio" young adult network right before Saturday 0530 "World of Radio." (Alpert, NY)

WINB 17.730 at 1855, easy music to 1900. (McDonough, PA)

USSR Radio Moscow North American Service, 7.320 with news at 0300. (Hunt, NC) 9.760 at 0100 with news and talk. (Vickers, PA) 6.115, via Havana, 0355. Into World Service at 0400. (Pastrick, PA) 7.195 still here for North American service despite reports this transmitter was to be shut down for repairs. (Alpert, NY)

World Service on 15.455 in English at 1315. (Gardner, MD) 6.090 at 2117, parallel to 7.265, 7.285, 7.195, 7.355. (Alpert, NY) 11.860 (via Havana) at 1724. (Saunders, NJ) 0800 on 11.800, parallel 11.705 and 9.750. (Alpert, NY)

Magadan transmitter, English with "woman's program" at 1230, 5.945. (Moran, IL)

Vatican Vatican Radio 9.605 at 0050 with message from the Pope, in English. (Vickers, PA) 6.252 at 0619 ending English, into unknown language. (Alpert, NY) 9.606 at 0055 in English. (Pastrick, PA)

Venezuela Radio Tachira, San Cristobal, 4.830 at 0802 with news in Spanish. (Shute, FL) Music, ID at 0355. (Hunt, NC)

Radio Rumbos, Caracas, 4.970 at 0330, Latin music, ID, doorbell sound effects. (Hunt, NC)

Radio Juventud, 4.900 at 0100 with ID in Spanish. (Thompson, Great Britain) 0320 with American pops. (Hunt, NC)

Ecos del Torbes, 4.980, 0340 Latin music and ID. (Hunt, NC) 0030 with ID. (Thompson, Great Britain)

Radio Barquisimeto, 4.990 Latin music, ID in Spanish 0030. (Thompson, Great Britain) 0350, heavy QRM. (Hunt, NC)

YVTO time station, 6.100, 0438-0455. (McDonough, PA)

Radio 980, El Tigre, 3.253 at 0160. (Shute, FL)

West Germany Deutsche Welle, 15.135 at 1710 with news in German. ID. (Vickers, PA) 3.995 in European service, in German, 0427. (Saunders, NJ) 4.880 in sideband with news in English at 0100. (Thompson, Great Britain)

Voice of America, Munich, 3.980 at 0719 with "Newsline" program. (Fravel, WV)

Yugoslavia Radio Yugoslavia on 9.620 at 2130. (Shute, FL)

Thanks to you, it works: Mike Limbert, Niles, MI; Robert Pastrick, Conway, PA; Takahasi Tadasi, Tokyo, Japan; Billy Hunt, Durham, NC; Ted Moran, Chicago, IL; John P. Carlson, Littleton, CO; Eric Gardner, Cambridge, MD; David R. Alpert, New York, NY; James Mills, So. Caicos, British West Indies; Michele Shute, Pensacola, FL; Nicholas Favata, Syosset, NY; John Miller, Thomasville, GA; Pat McDonough, Pittsburgh, PA; Michael Goetsch, Berea, OH; Larry Fravel, Clarksburg, WV; Marty Meyers, Kansas City, MO; Don Saunders, East Brunswick, NJ; P. Thompson, Penrhyn Bay, Great Britain; Leonard Szalony, Fontana, CA; Bob Schroeder, Oklahoma City, OK; Sara Vickers, Pittsburgh, PA; Mitch Sams, Wichita, KS; and Sheryl Paszkiewicz, Manitowoc, WI.

Til next month, good listening!

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Beaming In (from page 4)

formation. As (and if) such groups begin to get their acts together and contact us, we will bring you further information.

Those wishing to contact the AOSC should write to David B. Marshall, President, All Ohio Scanner Club, 50 Villa Road, Springfield, OH 45503. IDEX can be reached in care of Frank Aden, Jr., P.O. Box 2082, Boise, ID 83701. Be sure to include a self-addressed stamped envelope for the information you seek.

Speaking Of Clubs

Sometimes readers ask why *this* or *that* club is never mentioned in our pages. My answer is that it's probably because, even if it happens to be a really great club, we don't know anything about the group.

POP'COMM is on the mailing lists of a number of top national DX clubs, and that includes the LWCA, ASWLC, ACE, NASWA, AOSC, ANARC, SPEEDX, and the Ontario DX Assn. We know what such groups are doing and how well they are serving their members. That's why we frequently mention them in POP'COMM.

Some prominent DX groups, such as IRCA, and NRC, don't have us on their mailing lists, so they just don't get the same amount of mentions in our pages.

And, of course, there are other clubs (many of which are probably very good) that aren't mentioned at all because we have never heard from or of them. Clubs whose public relations are so primitive that they haven't found any reason to seek out publicity in our pages have every right to remain a secret. Far be it from us to drag them, kicking and screaming, into the limelight.

Those who write to ask why their favorite club is never mentioned in POP'COMM, or is mentioned only rarely, might check with these clubs to ask how much effort the club makes to keep us abreast of their activities.

Give Me Liberty?

The *World Radio TV Handbook* blurb on Radio Liberty describes it as a non-profit, privately managed network broadcasting news and information. It's supported by U.S. government appropriations. Radio Liberty, and its affiliated station, Radio Free Europe, have been sending their broadcasts to Eastern Europe and the Soviet Union for more three decades.

Increased funding has been allocated for RL/RFE, a clear indication that the government recognizes the important potentials for the network. The new funds will be used to increase the signals heading eastward from BCB and SW transmitters in West Germany, Spain, and Portugal.

It's therefore somewhat curious to note that RL, which has done a good job of bringing news and information about Western life, events, opinions, and values to its audience (and it has a large audience, to be sure), is starting to draw fire because of some

of what it has been saying to its listeners. Learned observers such as Richard Pipes (Professor of History at Harvard, and former advisor on Soviet matters to President Reagan) and Simon Wiesenthal (hunting for Nazis) are complaining that for almost three years RL has been presenting its listeners with some rather odd information that seems calculated to turn its audience off. Writing in the *Christian Science Monitor*, Dimitri K. Simes, Senior Associate at the Carnegie Endowment for International Peace, commented, "A growing number of critics worry that if trends continue, Soviet listeners will hear anti-Western, anti-democratic polemics, suppression of unpleasant news, extremist nationalism and anti-Semitism."

RL, for instance, is accused of saying that life in the West is corrupt and not suitable for the USSR. RL has supposedly claimed that liberals who were critics of the Czar were wrong and was a causal factor in the Bolshevik revolution, singling out the Jews for direct responsibility in the overthrow of the Czar. And, while admitting that pogroms directed against Jews (in the Ukraine) at the time of the Russian civil war were unfortunate, they should be understood when viewed against the backdrop of Jewish support for the Red cause.

Furthermore, RL is accused of saying kindly things about the Galitchina S.S. division, which was comprised of Ukrainian volunteers who fought against the French and other European peoples. Specifically, RL

supposedly said that their aspirations were commendable goals of freedom-seeking Ukrainians.

In defense of RL, officials for the government's Board for International Broadcasting claim that the charges are not only misguided but are calculated to undermine the station. They say that the offending statements were not in their proper context and that they reflected the personal views of well-known Soviet observers the likes of Alexander Solzhenitsyn.

Critics, however, point out that the strange comments they note going out over the air seem to go deeper than a superficial level and are backed up by comments and opinions offered by RL staffers off the air. During an interview, an important editor in RL's Russian language section made the rhetorical comment, "And who has established that anti-Semitism is wrong?" At an open meeting in Washington, a top official of RL offered praise to *Veche Magazine*, a strongly anti-Semitic publication directed at Soviet emigres.

If the allegations made by Wiesenthal and Pipes are, indeed, incorrect or taken out of context to the point where they have become distorted, then something should be done to see that RL's messages are stated in more succinct terms. If the allegations are correct, then it does seem like a Senate investigation is overdue, or at least Sen. Proxmire should offer up one of his Golden Fleece awards for the questionable use of public funds. PC

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WORLD CLASS RECEIVER

ICOM introduces the **IC-R71A** 100KHz-30MHz superior-grade general coverage receiver with innovative features including keyboard frequency entry and wireless remote control (optional).

This easy-to-use and versatile receiver is ideal for anyone wanting to listen in to world-wide communications. Demanding no previous shortwave receiver experience, the **IC-R71A** will accommodate an SWL (shortwave listener), Ham (amateur radio operator), maritime operator or commercial operator.

With 32 programmable memory channels, SSB/AM/RTTY/CW/FM (optional), dual VFO's, scanning, selectable AGC and noise blanker, the **IC-R71A's** versatility is unmatched by any other commercial grade unit in its price range.

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ICOM introduces a unique feature to shortwave receivers... direct keyboard entry for simplified operation. Precise frequencies can be selected by pushing the digit keys in sequence of frequency. The frequency will be automatically entered without changing the main tuning control. Memory channels may be called up by pressing the VFO/M (memory) switch, then keying in the memory channel number from 1 to 32.

Thirty-two tunable memories offer instant recall of your favorite frequency. Each memory stores frequency, operating mode, and a backup battery maintains the memories for up to five years.

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- **Frequency Coverage:** 0.1 MHz-30.0 MHz
- **Frequency Control:** CPU based 10 Hz step Digital PLL synthesizer with dual VFO system. Direct frequency entry through keyboard or RC-11 remote unit. • **Memories:** 32 tunable memories store frequency and mode. • **Scanning:** Memory and band scan with auto-stop. • **Frequency Readout:** 6 digit 100 Hz fluorescent readout. • **Frequency Stability:** Less than 250 Hz after switch on 1 min to 60 mins, and less than 50 Hz after 1 hour. With option CR-64 high stability crystal. Less than +50 Hz after switch on 1 min to 60 mins, and less than ±10 Hz after 1 hour at normal room temperature. Less than ±100 Hz in the range of -10°C to +60°C. • **Receiving Mode:** A¹, A² (USB, LSB), F¹ (Output FSK audio signal), A³, F². • **IF Frequencies:** 1st: 70.4515 MHz, 2nd: 9.0115 MHz, 3rd: 455KHz, 4th: 9.0115MHz (except F²); with continuous Passband Tuning (except F²). • **2nd IF Center Frequency:** SSB (A²/J) FM*(F¹)—9.0115 MHz, CW (A¹) RTTY (F¹)—9.0106 MHz, AM (A³)—9.0100 MHz. • **Sensitivity (when preamplifier is ON):** SSB, CW, RTTY: Less than 0.15 microvolts (0.1—1.6 MHz: 1 microvolt) for 10 dB S+N/N; AM: Less than 0.5 microvolts (0.1—1.6 MHz: 3 microvolts); FM*: Less than 0.3 microvolts for 12dB SINAD (1.6—30MHz). • **Selectivity:** SSB, CW, RTTY: 2.3 KHz at -6dB (Adjustable to 500 Hz min), 4.2KHz at -60dB; CW-N, RTTY-N: 500 Hz at -6dB, 1.5KHz at -60dB; AM: 6KHz at -6dB (Adjustable to 2.7KHz min), 15KHz at -50dB; FM*: 15KHz at -6dB, 25KHz at -60dB. • **Antenna Impedance:** 50 ohms Unbalanced (Single wire can be used on 0.1—1.6MHz). • **Weight:** 7.5kg (16.5 lbs.). • **Dimensions:** 111mm(H)x286mm(W)x276mm(D)(4 3/8 in. x 11 1/4 in x 10 7/8 in). • **Power Supply Requirements:** 117V or 235V ±10% 50-60Hz 30VA, (100V/200V/220V use requires internal modification).

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