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BEAMING IN
AN EDITORIAL
International Broadcasting

After my editorial comments about the Voice of America appeared here a few issues back I received some letters from readers commenting upon the state of international broadcasting, more specifically on the approximately 40 nations which are presently beaming Japanese language programming towards North America, ostensibly for the purpose of being heard by the American and Canadian public at large.

It has long been true that in many areas of the world there are very large audiences tuned to the international shortwave bands. This is not only true in remote regions, but also in cosmopolitan areas of Europe on both sides of the lines which separate eastern and western political philosophies. There is every reason to believe that at any given moment people throughout the world are seated around radio receivers in their homes listening to this programming, sometimes taking considerable effort to do so because the signals are being deliberately jammed. The majority of these people aren't what might be considered to be DXers or SWLs, but are those who seek out international broadcasting stations as their prime source of news, entertainment, and general contact with what's taking place around the world. Shortwave broadcasts could well be their prime source of this material and practically all nations are engaged in making available to these listeners copious helpings of programming in the hopes that their viewpoints will be the ones sought out by those people. This programming consists of entertainment, news, cultural material, and often lots and lots of political propaganda in order to promote one country and put down several others. The BBC appears to be the most objective broadcaster, with Radio Sweden, the Swiss Broadcasting Service, and a couple of others also reasonably objective. Other major broadcasters string out in all directions (mostly towards east and west) to varying degrees in their ability to analyze, evaluate, and present their thoughts to the world audience.

This programming flies out around the world in so many languages and on so many frequencies that the international broadcasting bands seem to be bursting at the seams. It appears to some people (myself included) that the general impression of some major overseas broadcasters holds that their programming is used and appreciated by North American audiences on a roughly equal basis to listeners in most other areas. This is a fallacy. It's difficult to tune across the 31 meter international broadcasting bands at night without hearing wall-to-wall English language programming beamed to the North American continent from the likes of Radio Moscow and other Eastern European nations. They are laughing up their sleeves, they're jamming most of the programming which we are sending into their countries and they figure they're having a ball by offering an endless parade of frequencies for their North American programming which isn't even being jammed. Their use of so many frequencies, in fact, is an old anti-jamming technique—one presently used by the VOA, Radio Liberty, and Radio Free Europe to push their own signals into the Soviet Union and Warsaw Pact nations despite the jammers. What they don't know is that the laugh's probably on most of the international broadcasters who are expending much effort, money, and time to send their English language programming to North America. Their mistake may be in estimating their potential impact and influence on the American and Canadian general public based upon the interest in shortwave reception in their own countries by the public at large.

What they haven't seemed to figure out is that in the United States and Canada the general public is scarcely aware that this DX programming is taking place at all. Yes, special DX-tip programming has a wide audience amongst radio hobbyists, and there are many, many thousands of North American listeners out there who devote considerable time to seeking out new stations, new frequencies, schedule changes, and who are trying to figure out how to obtain QSL cards. Omitting such persons from consideration, the question is, are there a sufficient number of other persons in North America who are regular listeners at the dials of a shortwave receiver for the primary purpose of hearing news and general programming which would justify the amount of frequencies and air time required to pour out all of that programming over the airwaves? Fact is, Radio Moscow could probably reach all of its potential listeners in North America with no more than two frequencies, and that probably goes for all other international broadcasters.

According to a report by K. E. Elliott in the 1982 World Radio TV Handbook, a Gallup Poll was taken on behalf of Radio Canada International in 1975. It showed that there were two million persons in the United States who owned shortwave receiving equipment, but only 10% who actually listened once a week or more to monitor major international broadcasters. There was no breakdown given in the WRTVH story as to how these figures related to those who were mostly interested in DX hobby pursuits and

(Continued on page 74)
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Snow White & The Two Dwarves

In the September Mailbag column Tom Kneitel made mention of a station using the tactical callsign "SNOW WHITE" on 32.05 MHz, monitored via skip while working "674" and "711." These stations were heard while taking various range and bearing readings. Be advised this SNOW WHITE is the ID of the geodetic survey vessel USNS HARKNESS (T-AGS 32), designated as Oceanographic Unit Five (OCUNIT 5). The other stations, 674 and 711, are her survey launches. The vessel has been taking surveys in the Pacific, Panama, Navassa Island, Haiti, and the Dominican Republic. Chances are the communications were monitored while they were using PRC 25 or PRC-77 manpack transceivers. The Navy MARS callsign of this unit is NNOXO. The address of the USNS HARKNESS is FPO New York 09573.

A POP'COMM reader
Tennessee

To the many readers who wrote in after that item appeared in September to say that they've also monitored SNOW WHITE: please note.

The photo shows "SNOW WHITES" Range Airmath Geodetic Site on Faux Cape, Haiti.

Reply Cards

In reading Communications Confidential in POP'COMM, I assume that many of the "ute" QSLs you've run were prepared cards which had been supplied to the station for remailing to the monitoring station seeking the QSL. Can you advise me where I can obtain a supply of these cards?

Harry L. Lookabill, W0DPO
Kansas City, MO

Some of those prepared QSLs you've asked about are from my own collection.

When I began sending reception reports to "ute" stations in the late 1940's, I quickly realized that the poor QSL response I was getting was because these stations didn't have actual QSL cards and they didn't want to bother writing out verification letters. At that point, I went to a printer in my neighborhood and told him that I wanted cards which I could send to the stations and which they could fill out, sign, and return to me. I wrote out the text and he ran off a batch of these cards. I don't know of any commercial source of such cards, however check around with local printers and I'm sure you'll find one who can print up cards to your specification. — Editor

Deep DX

I was fascinated to learn that most Naval forces have sophisticated underwater communications systems which permit contacts between shore stations and various vessels (surface and underwater types) as well as divers. This system can also be used between the vessels themselves. Presumably this is a non-radio system which uses sonics. What frequencies are used for this communication?

Todd Mullavey, KVA4JG
Norfolk, VA

You're correct in assuming that these systems use sonics instead of radio. The equipment is quite sophisticated and is similar in use to two-way radio; some of it runs almost 1 kW of power and has long-range capabilities. Frequencies below about 3 kHz have the best range with lower attenuation, while those above 8 kHz have a shorter range but higher intelligibility. Tactical NATO frequencies are closely guarded but some of the others known to me include the following: The U.S. Navy uses AN/WZC2A equipment for SSB/CW communications in two bands, 1.450 to 3.1 kHz and also 8.3 to 11.1 kHz. The USN's SC-100 transceiver system operates on 31.5 kHz. The U.K. has a diver/ship system operating between 40 to 44 kHz and also a G-1720 system which can run voice, CW, and teleprinter communications on 8.087 kHz. The French Navy's ERUS-3 equipment is running voice and CW on 10.5 kHz. Italy's TS-200 SSB/CW system operates between 8.3 and 11.1 kHz, which permits it to interfere with the American and other equipment. Most likely, the NATO frequencies are also in the 8.3 to 11.1 kHz band. — Editor

Was This Mystery Ever Solved?

Your story on the death ray frequencies (October '83 issue) was a very concise overview of this rather grisly topic and was far more straight-from-the-shoulder than anything I've yet seen in the media. Wasn't there some talk a few months back about some sort of sinister signal invading areas of the Pacific Northwest? What is the frequency of that signal?

Carl Martin Bangor, ME

Last March there were various reports of a strange signal coming from unknown sources. The strong signal aroused the alarm of public health officials around Eugene, Oregon, since many local citizens connected the signals with their complaints of ear and throat problems, headaches, and insomnia. There was, it was reported, a 1.1 MHz tone on the 4.750 MHz carrier frequency. Other than the original reports, I never saw any additional information on the signals. If our readers have further information on this, please let us know! — Editor

A Novel Repeater Suggestion

From what I've read about cordless phones, there is a "base" (or pedestrian) unit which transmits in the 1650 kHz band and receives on 49 MHz. The base unit transmits to the hand-held units and repeats the signals from the 49 MHz hand-helds in addition to whatever is coming over the telephone line. It made me wonder if one of these base units could be used (without a connection to the telephone line) as a repeater to permit one hand-held to talk to another. It appears to me that by using one of the range-extending antennas being offered, a base unit might be able to be established as a common repeater for several of my friends and I to use to communicate with one another. Is it legal?

Donald Cortese
New Orleans, LA

That's a new one on me! Certainly it's novel and you could probably get it to work, although I can think of at least three other less complicated ways to chat with neighborhood friends. You'd have to ask the FCC if it's legal. — Editor

Cover to Cover!

As a ham radio operator, shortwave listener, and scanner enthusiast, I subscribe to numerous publications and magazines (QST, 73, RCMA, RIB, etc.). However, POP'COMM is the only one of them that I read page for page. Keep up the good work, and please continue with the articles concerning military communications!

David O. Chastain, N5ERD
Blytheville, AR

Thanks, Dave. We have some pretty far out articles in various stages of writing and production. If you've been enthusiastic about what you've read in previous issues, you'll really like what you'll be seeing in the months ahead! — Editor
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Those who monitor the shortwave communications bands frequently encounter the large amount of military aircraft traffic who hasn't listened on these frequencies and heard coded "SKY KING" and "GIANT TALK" messages? There's much to hear, and the frequencies used by the USAF's HF/SSB (High Frequency Single Sideband) and Global Command Control Systems networks offer endless hours of voice traffic which is usually sent "in the clear" (uncoded).

These frequencies reveal not only all types of USAF aircraft, you'll also hear aircraft belonging to the Navy, Marines, Army, Coast Guard, plus occasional aircraft belonging to some of the Allied Forces. Many aircraft stations are easy to indentify, while others have cryptic "tactical" identifiers which tantalize but defy analysis.

Most of these transmissions are carried out in SSB (upper sideband) while several ground stations have backup AM and also RTTY capabilities which can be used upon request. RTTY is at 100 WPM, 850 Hz FSK, 2 kHz center frequency (Space 2425 Hz, Mark 1575 Hz).

You'll hear transport aircraft, fighters, bombers, Medevac and Airevac operations and practically every other type of aircraft which has a military purpose including weather recon craft and flying fuel tankers!

Communications to be monitored include general flight information, direction finding, and emergencies. There's plenty of 'phone patch' traffic too as the ground stations in these networks can patch calls through between the aircraft and weather stations as well as practically every USAF ground facility in the nation! Also to be heard are the Presidential and Vice Presidential aircraft (Air Force 1 and Air Force 2), plus numerous special flights containing world diplomats and high VIP's and General Staff military personnel. There's no shortage of interesting listening fare.

VIP communications from the diplomats, high ranking military officers, political leaders, Air Force 1 and Air Force 2 are generally handled through the facilities at Andrews Air Force Base in Camp Spring, MD. The station's callsign is AF-A3 and its voice identification is "ANDREWS." While many of the aircraft communicating with Andrews use tactical calls, those using ID's such as "SAM 25776" (etc.) are "Special Air Missions," which is to say that they are VIP flights. Air Force 1 and Air Force 2, of course, are distinctive enough to provide ready recognition. However, if you hear "SAM 2600" you may not know that it is really another ID used by AF-2 but only at times when the Vice President is not aboard. A similar alternate ID is used by AF-1 when the President isn't aboard—it is "SAM 2700."

Andrews handles this VIP traffic on a large number of frequencies and in both upper and lower SSB. Phone patches make up a large portion of the messages they are requested to handle, including calls to the Dept. of State, the White House, and all sorts of other ground facilities, including ones with tactical ID's such as "CRYPTO MAINTENANCE."

Frequencies which Andrews uses at the present time include: 4721, 4731, 5, 5700,
A military air lift command C-141B Starlifter, a global transport which can be heard on these frequencies. (U.S. Air Force photo)

The military air lift command's C-130 Hercules, the popularly monitored aircraft. (U.S. Air Force photo)

Many people don't realize the U.S. Army flies a number of aircraft and these can also be monitored on the HF networks. (U.S. Army photo)

A military air lift command C-5A transport. (U.S. Air Force photo)

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**ISO-17 Magnum Isolator**
4 quad isolated sockets; suppressor; laboratory grade protection... $200.95

---

**USAF HF/SSB Stations**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Location</th>
<th>Operates (GMT)</th>
<th>&quot;CAPSULE&quot; Broadcasts</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>3067 kHz</td>
<td>Croughton</td>
<td>2300-0500</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>3081 kHz</td>
<td>Lajes</td>
<td>2100-1000</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>3144 kHz</td>
<td>Hickam</td>
<td>0600-1700</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>4746 kHz</td>
<td>Lajes</td>
<td>2100-1000</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0000-0900</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td>4747 kHz</td>
<td>MacDill</td>
<td>0400-1600</td>
<td>H +10/40</td>
<td>SSB</td>
</tr>
<tr>
<td>5688 kHz</td>
<td>Yokota</td>
<td>1000-2100</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>5703 kHz</td>
<td>MacDill</td>
<td>0900-2400</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td>5710 kHz</td>
<td>Croughton</td>
<td>2100-0800</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>5710 kHz</td>
<td>Albrook</td>
<td>0200-1200</td>
<td>H +25/55</td>
<td>SSB</td>
</tr>
<tr>
<td>6727 kHz</td>
<td>Scott</td>
<td>0400-1600</td>
<td>none</td>
<td>SSB</td>
</tr>
<tr>
<td>6738 kHz</td>
<td>Andersen</td>
<td>0700-2200</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>Clark</td>
<td>1200-2200</td>
<td>H +25/55</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>Elmendorf</td>
<td>24 hours</td>
<td>H +15/45</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>Hickam</td>
<td>0400-1900</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>Incirlik</td>
<td>0400-1900</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>MacClellan</td>
<td>0400-1600</td>
<td>H +10/40</td>
<td>SSB</td>
</tr>
<tr>
<td>6750 kHz</td>
<td>Yokota</td>
<td>0900-2400</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>6753 kHz</td>
<td>Croughton</td>
<td>24 hours</td>
<td>H +00/30</td>
<td>SSB</td>
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<tr>
<td>6757 kHz</td>
<td>Lajes</td>
<td>24 hours</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>8893 kHz</td>
<td>Loring</td>
<td>2400-1200</td>
<td>none</td>
<td>SSB</td>
</tr>
<tr>
<td>8964 kHz</td>
<td>MacDill</td>
<td>0000-0900</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td>8967 kHz</td>
<td>Lajes</td>
<td>24 hours</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>8967 kHz</td>
<td>Clark</td>
<td>24 hours</td>
<td>H +25/55</td>
<td>SSB</td>
</tr>
<tr>
<td></td>
<td>Elmendorf</td>
<td>24 hours</td>
<td>H +00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>8993 kHz</td>
<td>MacDill</td>
<td>24 hours</td>
<td>H +15/45</td>
<td>SSB</td>
</tr>
<tr>
<td>8993 kHz</td>
<td>MacClellan</td>
<td>24 hours</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td>9011 kHz</td>
<td>Thule</td>
<td>24 hours</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
<tr>
<td>9014 kHz</td>
<td>Yokota</td>
<td>24 hours</td>
<td>H +05/35</td>
<td>SSB</td>
</tr>
<tr>
<td>10780 kHz</td>
<td>Albrook</td>
<td>24 hours</td>
<td>none</td>
<td>SSB</td>
</tr>
<tr>
<td>11176 kHz</td>
<td>Andersen</td>
<td>24 hours</td>
<td>H +20/50</td>
<td>SSB</td>
</tr>
</tbody>
</table>

The aircraft mentioned in the "Capsule" broadcast then respond to the ground station and receive their traffic which many times call for phone patching to various ALCC's (Airlift Theatre Control Centers). These ALCC's all use tactical ID's which are shown in the tactical chart for ground stations accompanying this report.

**Alternate Stations**

The USAF HF/SSB network has several backup ground facilities which are monitored at times. For instance, AFE71 ("CAPE RADIO") at Patrick Air Force Base in Florida is actually primarily assigned to use as the control station of the USAF's Eastern Test Range. It is also used, however, to communicate with aircraft having difficulty in com-
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Location</th>
<th>Operates (GMT)</th>
<th>&quot;CAPSULE&quot; Broadcasts</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>11179 kHz</td>
<td>McClellan</td>
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<td>H + 15/35</td>
<td>SSB</td>
</tr>
<tr>
<td>11182 kHz</td>
<td>MacDill</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>11226 kHz</td>
<td>Lajes</td>
<td>24 hours</td>
<td>H + 15/45</td>
<td>SSB</td>
</tr>
<tr>
<td>11236 kHz</td>
<td>Yokota</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>11246 kHz</td>
<td>MacDill</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>13201 kHz</td>
<td>Andersen</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
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<tr>
<td>13210 kHz</td>
<td>MacDill</td>
<td>24 hours</td>
<td>H + 15/45</td>
<td>SSB</td>
</tr>
<tr>
<td>13215 kHz</td>
<td>Lejes</td>
<td>24 hours</td>
<td>H + 15/45</td>
<td>SSB</td>
</tr>
<tr>
<td>13244 kHz</td>
<td>Lejes</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>15015 kHz</td>
<td>Albrook</td>
<td>24 hours</td>
<td>H + 15/45</td>
<td>SSB</td>
</tr>
<tr>
<td>15031 kHz</td>
<td>McClellan</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>15036 kHz</td>
<td>Clark</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>18002 kHz</td>
<td>Croughton</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>18019 kHz</td>
<td>Albrook</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>20390 kHz</td>
<td>Cape Radio</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
<tr>
<td>23227 kHz</td>
<td>Clark</td>
<td>24 hours</td>
<td>H + 00/30</td>
<td>SSB</td>
</tr>
</tbody>
</table>

The Green Lizard is the popular nickname for the Air Force's C-141B Starlifter in camouflage garb. (U.S. Air Force photo)
**“MAINSAIL” Monitoring Stations**

*The USAF Global Command Control Systems Network (GCCS)*

| Zone 1 (Southeast Asia, including southern China) Ground Station: “CLARK” (AIC2, Clark Air Base, Manila, Philippines) Schedule: 6738 kHz Sunset to 2 hours after sunrise 8993 kHz 24 hours 11176 kHz 1300 to 0200 GMT 15015 kHz 2 hours after sunrise to sunset 18002 kHz 2 hours after sunrise to sunset 23227 kHz 0200 to 1300 GMT |
| Zone 2 (Territory of the Pacific Islands, Australia) Ground Station: “ANDERSEN” (AIE2, Andersen AFB, Guam) Schedule: 6738 kHz 24 hours 13201 kHz Sunset to 2 hours after sunrise 18002 kHz Sunset to 2 hours after sunset |
| Zone 3 (Japan, northeast China, Mongolia, central Siberia) Ground Station: “YOKOTA” (AIF2/AIF80, Yokota Air Base, Japan) Schedule: Same as Zone 2 |
| Zone 4 (Central Pacific south of Hawaii, New Zealand) Ground Station: “HICKAM” (AGA2, Hickam AFB, Honolulu, Hawaii) Schedule: Same as Zone 2 |
| Zone 5 (Alaska, northwest Canada, eastern Siberia, north central Pacific) Ground Station: “ELMENDORF” (AKA5, Elmendorf AFB, Alaska) Schedule: 6738 kHz 24 hours 13201 kHz 24 hours 18002 kHz 2 hours after sunrise to sunset |
| Zone 6 (Pacific Ocean from Canada to below Mexico, from 1,000 to 1,500 miles offshore) Ground Station: “McCLELLAN” (AFI2, McClellan AFB, California) 6727 kHz Sunset to 2 hours after sunrise 6738 kHz Sunset to 2 hours after sunrise 9014 kHz 24 hours 9014 kHz 24 hours 11182 kHz 24 hours 13201 kHz 2 hours after sunrise to sunset 15015 kHz 2 hours after sunrise to sunset 18002 kHz 2 hours after sunrise to sunset |
| Zone 7 (Continental USA, Canada ex-NWT & some arctic areas) Ground Station: “SCOTT” (AFG9, Scott AFB, Illinois) Schedule: 6727 kHz Sunset to 2 hours after sunrise 9014 kHz 24 hours 11182 kHz 24 hours 15015 kHz 2 hours after sunrise to sunset 18002 kHz 2 hours after sunrise to sunset |
| Zone 8 (Central/SO. American & Caribbean, adjacent Atlantic/Pacific waters) Ground Station: “ALBROOK” (AHF4, Albrook Field, Panama) Schedule: 8993 kHz 24 hours 13244 kHz 2 hours after sunrise to sunset 15015 kHz 2 hours after sunrise to sunset |
| Zone 9 (Western No. Atlantic, Gulf of Mexico) Ground Station: “MacDILL” (AFE8, MacDill AFB, Florida) Schedule: 5703 kHz Sunset to 2 hours after sunset 6727 kHz Sunset to 2 hours after sunset 6750 kHz 24 hours 9011 kHz 2 hours after sunrise to sunset 9014 kHz 24 hours 11176 kHz 24 hours 11182 kHz 24 hours 13201 kHz 2 hours after sunrise to sunset 13244 kHz 2 hours after sunrise to sunset 15015 kHz 2 hours after sunrise to sunset 18002 kHz 2 hours after sunrise to sunset |
| Zone 10 (Greenland, Arctic waters of eastern Canada) Ground Station: “THULE” (XPM, Thule Air Base, Greenland) Ground Station: “THULE” (XPM, Thule Air Base, Greenland) 6738 kHz 24 hours 13201 kHz 24 hours |
| Zone 11 (Eastern No. Atlantic, Iceland, Scandinavia, most of Europe except Spain/Portugal & Mediterranean nations. Includes all European USSR areas.) Ground Station: “CROUGHTON” (AJE, Croughton Air Base, England) Schedule: Same as Zone 2 |
| Zone 12 (East-central Atlantic, Spain/Portugal, southern France, N.W. Africa, western Mediterranean) Ground Station: “LAJES” (CUW2, Lajes Field, Azores) Schedule: Same as Zone 11 |
| Zone 13 (Africa south of Algeria/Libya/Egypt, Yemen, S.E. Atlantic, Indian Ocean) Ground Station: “ASCENSION” (AFD14, Ascension Aux. Air Field, Ascension Island) Schedule: Same as Zone 11 |
| Zone 14 (Italy, S.E. Europe, Middle East, Arabia, eastern Mediterranean, Egypt, Libya, Turkey, Iran & east to portions of India & western China) Ground Station: “INCIRLIK” (ADF9, Incirlik Air Base, Turkey) Schedule: Same as Zone 11 |
municating with "ASCENSION." Other Eastern Test Range facilities which may also be used for this purpose include stations on Ascension, Antigua, and Mahi. The frequencies are 10780 and 23090 kHz.

Station AFL2 ("LORING"), located at Loring AFB in Maine, is designated as a secondary guard station and is used when aircraft flying the North Atlantic routes can't get through to "MacDILL." It's frequencies are shown in the chart.

"Mainsail"

The word "Mainsail" is a general net air/ground call used for initiating so-called "command control" traffic to the USAF's Global Command Control Stations (GCCS). The USAF has segmented the globe into 14 specific Command Control Zones, each zone having a single designated GCCS. "SCOTT" is the GCCS for the Continental United States (CONUS), and this station has the ability to remote control transmitters at Loring AFB, MacDill, and MacClellan AFB in order to maximize its coverage. The GCCS's may provide 'phone patches and/or message services between the aircraft and "MAJCOM" command posts, operations centers, etc. When monitoring "Mainsail" communications you're likely to hear not only tactical ID's from the aircraft and some ground stations, but also various Air Force Bases identifying with their actual names, such as Altus AFB, McChord AFB, etc. However, these ground facilities are not being monitored directly but through the transmitting facilities of the GCCS. Commonly heard tactical calls include the ones consisting of the world "RAYMOND" followed by digits, these are Tactical Air Command (TAC) bases.

Insofar as the ID's used by aircraft com-municating with any of these ground stations, some simply identify as "Navy Alpha Bravo 521," "Coast Guard 2101," "Navy Papa Charlie 02," but you'll also hear cryptic ID's such as "Appraiser," "Ots 51," "Pastami," "Rip 19," "Folk 60," "Swan 24," "Ali Baba," "Spar 60," "Edgy 22," and numerous others. Some of these ID's are known outside of the military and they are shown in the accompanying chart of tactical ID's. As far as the rest, their meanings are not generally known and most likely are

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Frequency Use Guide

<table>
<thead>
<tr>
<th>Time</th>
<th>250 - 850 Mi.</th>
<th>850 - 1725 Mi.</th>
<th>1725 + Mi.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midnight</td>
<td>3 to 4.7 MHz</td>
<td>6.7 to 8.9 MHz</td>
<td>6.7 to 11.1 MHz</td>
</tr>
<tr>
<td>4 a.m.</td>
<td>3 to 4.7 MHz</td>
<td>4.7 to 6.7 MHz</td>
<td>6.7 to 8.9 MHz</td>
</tr>
<tr>
<td>8 a.m.</td>
<td>3 to 6.7 MHz</td>
<td>6.7 to 11.1 MHz</td>
<td>11.1 to 18 MHz</td>
</tr>
<tr>
<td>Noon</td>
<td>4.7 to 6.7 MHz</td>
<td>8.9 to 13.2 MHz</td>
<td>13.2 to 18 MHz</td>
</tr>
<tr>
<td>4 p.m.</td>
<td>4.7 to 6.7 MHz</td>
<td>8.9 to 13.2 MHz</td>
<td>11.1 to 18 MHz</td>
</tr>
<tr>
<td>8 p.m.</td>
<td>3 to 6.7 MHz</td>
<td>6.7 to 11.1 MHz</td>
<td>11.1 to 18 MHz</td>
</tr>
</tbody>
</table>

This chart, which indicates the distance between the aircraft and the ground station in statute miles, is used to select the best frequency for communication. Times shown are local time at the ground station. When closer than 250 miles, any frequencies can be used, depending upon operating schedule at ground station for a particular frequency. Actually this chart is a handy reference guide for general monitoring and two-way communications use.

Department of Defense chart

Courtesy of SPEEDX.

changed with the passing of time anyway.

In addition to the frequencies shown in this report, there are many specialized channels used by the Strategic Air Command, Tactical Air Command, and other USAF activities. It has been the purpose of this report only to cover VIP communications and those of the HF/SSB and GCCS networks. When monitoring these frequencies, you'll note that traffic decreases and increases as the ebb and flow of world tensions changes. In any event, it's never dull, and with the information provided here you should be able to embark upon a major listening effort which will provide you with a far closer look at the behind-the-scenes factors relating to world events.

Listeners first realized that these networks, or their ancestors, were interesting way back during and just after WWII when most operations were confined to two frequencies, 4220 and 4765 kHz. Forty years later the stations are no less interesting and there are dozens of frequencies in use!

Station Addresses:

Albrook Field, APO New York 09825
Andersen AFB, APO San Francisco 96351
Andrews AFB, Washington DC 20331
Ascension Aux. AFB, via Patrick AFB FL 32925
Clark Air Base, APO San Francisco 96274
Croughton Air Base, APO New York 09378
Elmendorf AFB, AK 99506
Hickam AFB, HI 96853
Incirlik AFB, APO New York 09283
Lajes Field, APO New York 09406
Loring AFB, ME 04751
MacDill AFB, FL 33608
McClellan AFB, CA 95652
Scott AFB, IL 62225
Thule Air Base, APO New York 09023
Yokota Air Base, APO San Francisco 96292

Some monitors have been successful in obtaining verifications from these stations, so here are their mailing addresses. A typical address might be written out. Chief Radio Officer, USAF, Thule Air Base, APO New York 09023. Note: Do NOT mention any foreign nation's name in an APO address or otherwise you will not be able to send your letter at domestic postage rates and the Post Office will return your letter for insufficient postage.
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The discovery of oil in the various small states along the Arabian Peninsula has turned those affected from hot, isolated backwaters of the world into hot but rich and modernized lands practically overnight.

What the developed nations achieved through decades of development came to much of this area in a sort of economic “warp drive” transforming them virtually overnight.

Along with the fancy new buildings, ports, roads, schools, hospitals, and so on came growth in broadcasting. And while broadcasting in the area is still somewhat limited, the stations have discovered the high power game and are busy playing at it. Even so, broadcasts from the lands along the edge of the Arabian Peninsula are not a snap to log, not all of them anyway.

Little English is used and there isn’t much in the way of services beamed to this continent. But with just a little effort, one can hear and verify all the stations in the area.

What we’re going to do here is travel along the coast of Saudi Arabia and call at the small states that cling to the edge of the Arabian Peninsula.

At the north end of the Persian Gulf, lying against Southern Iraq and across the gulf from Iran, is Kuwait. At the end of World War II, Kuwait was a poor desert kingdom with a severe water shortage problem and little to recommend it. Kuwait existed by fishing, pearlimg, and trading with its neighbors. Less than thirty years later, Kuwait had the world’s highest per capita income and was providing its citizens with free education, subsidized housing, free medical care, free telephones, and collecting no taxes in return. We don’t need to tell you what happened! Kuwait City was completely rebuilt. Half of Kuwait’s population resides in the capital city and two-thirds of its work force are foreigners who can neither own property nor participate in politics.

Radio Kuwait came on the air in 1951 using only 500 watts, though that power was doubled the first year. That’s quite a difference compared to today. Radio Kuwait’s current punch, two 500 kilowatt transmitters, were added in 1979 and another two are planned. All will feed rotating antenna systems.

Radio Kuwait maintains six services:

- The Grand Mosque at Doha, Qatar.
Abu Dhabi, Dubai, Emirates, formerly the Trucial States. The Second Program, also in Arabic only, is broadcast on medium wave only for six hours per day.

The Third Program, the Holy Koran Service, is aired from 0200 to 0500 on 15.495.

The English Language Program of Radio Kuwait is scheduled from 0500 to 0800 on 15.545.

In Urdu, there's a two hour per day broadcast from 1600 to 1800 on 21.545.

And Radio Kuwait's Persian Program is aired on medium wave only from 0800 to 1000. There's also a stereo FM service.

Radio Kuwait's Arabic identification is "Huna al-Kuwait" and the interval signal is a melody played on a clarinet. Reception reports are verified with a folder QSL. Reports can be sent to Radio Kuwait, P.O. Box 397, Kuwait.

Sailing south on the Persian Gulf we must, unfortunately, pass by Bahrain Island. There's no shortwave broadcasting here, though hopefully someday.

Just south of Bahrain is a lump of land sticking out into the sea called Qatar—an arid, stony, sandy, barren place where oil was discovered in 1939. The capital, Doha, is one of those cities which was little more than a village at the time but is now a modern city with a deepwater port.

Like many of the other countries, the discovery of oil,—while a boon to the economy and standard of living,—has been a blow to the traditional way of life, at least in public. Western dress is common and there are less restrictions on women. There are more immigrants than there are natives, most of whom are of the Sunni Moslem persuasion.

The Qatar Broadcasting Service beams programs mainly to the Arab world but also to North and East Africa, Turkey, and Europe. All the programs are in Arabic but there is some English carried on local medium wave outlets. Transmitters are 100 and 250 kilowatts, the latter having gone on the air in 1981. Two talk and two music studios are located about two and a half miles from the transmitting site which is fed by a VHF link.

Programs include news, features, music, Koran recitations, request programs, and religious talks from 0245 to 2130. Best bets are at sign on at 15.505 and 9.570, from 0705 on 9.570, from 1600 on 17.910, and from 1700 on 15.505. Arabic identification is "Indha'at al-Qatar min al-Doha." Reception reports are welcomed and are carefully checked for accuracy. The address is the Qatar Broadcasting Service, P.O. Box 3939, Doha.

Next door to Qatar are the United Arab Emirates, formerly the Trucial States. Seven sheikdoms make up this loose federation—Abu Dhabi, Dubai, Sharjah, Ajman, Umm al-Quwain, Ras al-Khaimah, and Fujairah. Each is ruled by a sheik who has wide powers. Abu Dhabi and Dubai are the most developed.

A shortwave station called "Saut As Sahil" or "The Voice of the Coast" existed in Sharjah as a commercial station operated by the British with local staff. The station used ten kilowatts on 6.040 but disappeared sometime after the British left in 1971 and, at present, Sharjah has no shortwave.

It took less than ten years, from about 1962 to 1970, for oil money to transform a primitive frontier-type town like Abu Dhabi into a very modern city.

From Abu Dhabi, the Voice of the UAE operates a 250 kilowatt transmitter on 9.685 from 1600 to 2130 in Arabic only. The identification is "Saut al-Emarat al-Arabiyyah al-Mutaiadad min Abu Dhabi." Reception reports go to P.O. Box 637, Abu Dhabi, United Arab Emirates.

Oil was discovered in Dubai in 1969 and Dubai subsequently became home to the major voice from the area, Radio and Color Television Dubai, also known as UAE Radio Dubai, nicknaming itself "The Sunshine Station."

There are three automatic Marconi 300 kilowatt transmitters (and a fourth one planned) at the transmitter site in the desert about 25 miles outside Dubai City. Fourteen antenna arrays are in use. Transmitters are fully automated and controlled from a central, computerized control desk which remembers the times and switching arrangements necessary to conform to the broadcast schedule. Frequency and antenna combinations can be changed from the desk and switching can be done automatically within twenty seconds.
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at Seeb. English is aired from 0900 to 1100 on 11.890 and 9.735. Other times during the 0200 to 2125 broadcast day are all Arabic. Other frequencies used are 9.655 and 9.510. The identification in Arabic is "Indha'at-o Oman min Muscat." Reports go to P.O. Box 600, Muscat.

Off the Omani coast is Masirah Island, site of the British Broadcasting Corporation’s Eastern Relay Station which relays BBC Arabic, Hindu, Urdu, and World Service programs on 6.030, 7.140, 7.160, 9.605, 9.740, 11.740, 11.850, 11.945, 11.955, 15.310, 17.770, and 17.825. Chances for a reply are not too good should you try and confirm this direct (P.O. Box 3716, Ruwi Post Office, Muscat). The BBC in London will send an acknowledgement card for your report but it's highly unlikely they'll indicate you heard the Eastern Relay Station.

On the heel of the Arabian Peninsula is the People's Democratic Republic of Yemen. In simpler times it was just Aden. The British controlled the area for 125 years and left in 1967. A series of border clashes, coups, and tribal uprisings followed.

The port of Aden has a deep, natural harbor and the main commercial district lies in the crater of an extinct volcano. In fact, the area is known locally as "The Crater." There are 1300 separate tribes in the country.

Should you ever find you have need of some frankincense or myrrh, the Yemen People’s Democratic Republic is the place to go, in particular the island of Socotra some distance off the coast.

The Democratic Yemen Broadcasting Service runs 100 kilowatts from Al-Hiswah on 5.970, 6.005, 7.190, and 11.770 from 0300 to 0630 and 1100 to 2230.

The identification in Arabic is "Idha'at al-Jumuriyah al-Yaman al-Dimucratica Ash-Shabaya min Aden." QSLs from this station are somewhat intermittent but with effort can be had. Write P.O. Box 1264, Aden.

The rest of the peninsula's heel is taken up by the Arab Republic of Yemen, sometimes called South Yemen. Facing Ethiopia across the Red Sea, North Yemen saw civil war in the early 1970's as forces loyal to the deposed Imam (backed by Saudi Arabia), and troops loyal to the new republican government (backed by Egypt), fought for several years. The republicans also carried on an on-again, off-again war with South Yemen.

The government station, Radio San'a, operates a 50 kilowatt outlet on 9.780 and is listed to use 100 kilowatts on 4.854. The schedule runs from 0300 to 0700 and 1000 to 2030. There have been some recent receptions of this at their 0300 signal on 9.780. The Arabic identification is "Idha' at al-Jumuriyah al-Arabiyah al-Yamaniyah." Reception reports go to Radio San'a, Ministry of Information, San'a. Replies are inconsistent.

We're in the Red Sea now and have completed our tour, so we can sail north to the Suez Canal, then into the Mediterranean, on across the Atlantic Ocean and home to log these stations. Or shall we fly so we can be at our receivers sooner?
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Winter Weather Scanning
‘Tis The Season To Pay Special Attention To Your Scanner!

BY JAN KARASEWICZ, KPA3SU

Being a scanner fan has its rewards as well as its regrets, most especially during the winter.

As for regrets, well it’s no fun to bother winterizing the antenna system. That usually means double checking the coaxial cable to see if it needs replacing (pinholes or tears in the black outer covering mean its time for a replacement). I also put silicone on all antenna connectors in order to weatherproof them; a little moisture or ice can do wonders for turning people into former scanner users.

Insofar as rewards go, that’s different. Winter brings about lots of interesting activity on the scanner bands, activity which is unique to the season. Guiding it all, of course, is the weather which is peculiar to winter. Therefore, I pay close attention to the events on weather transmissions. Depending upon the area in which you’re located, you can probably find activity on any or all of the following frequencies: 162.40 162.475, and 162.55 MHz. Some of the transmissions may be for areas adjacent to your own location.

If you live in an area which is subject to snow and ice on the roads, that brings about several more cold-season possibilities—for instance, listening in on those state, county, and municipal agencies which activate when sand/salt spreading is required, or when snow removal operations are taking place. You’ll usually find these activities on the frequencies reserved for the Highway Maintenance Radio Service. Since these frequencies will be different in each area, if you don’t know your local frequencies, try putting your scanner on search and check out the following bands: 33.02 to 33.10, 37.90 to 37.98, 45.68 to 45.84, 47.02 to 47.42, 151.13, 156.045 to 157.11, and 158.985 to 159.195 MHz. Chances are the one or more agencies in your area which keep local and major roads clear will be operating within these frequency ranges.

Your municipal, county, and state law enforcement and fire agencies will also have substantially increased activity during winter weather emergencies. The best way to find out these frequencies for your area if you don’t already know them is to check with any shop in your area which sells scanners and scanner accessories. They’ll be happy to give you the frequencies you’re seeking.

Medical emergency frequencies have greatly increased activity during cold weather periods. These can be related to accidents on the road and to persons who must be ferried to doctors or hospitals for treatments. Also included in this category would be search and rescue teams and patrols which are active in mountainous areas. Check out the following frequencies/bands for operations in your own local area: 33.02 to 33.10, 35.02, 35.16, 43.64 to 43.68, 43.70 to 43.79, 45.92 to 46.04, 46.04 to 47.66, 150.775, 150.79, 150.79 to 155.40, 155.025 to 155.195, 155.40 to 155.42, 155.425 to 155.455, 155.455 to 155.475, 155.475 to 155.55 MHz. The American Red Cross is on 47.42 MHz. Most active hospital/ambulance related frequencies appear to be 155.325, 155.355, 155.385, and 155.40 MHz.

Public utilities are often adversely affected by weather emergencies of the ice and snow breed. This would include telephone and electric power companies especially, although many areas of the energy industry will also probably feel the sting of winter. Therefore, all such frequencies are worthy of being monitored for emergency repair activities.

Look for telephone repair crews on the following frequencies and bands: 35.16, 43.16, 151.985, 153.34, 451.175 to
451.675 MHz. Electric power companies can generally be found on these frequencies.

Transportation

All forms of transportation are hampered by winter weather conditions and therefore can be expected to utilize communications far more than usual. The Coast Guard will be heard issuing navigation broadcasts on 157.10 MHz. Vessels can also be heard contacting the Coast Guard on this frequency after making initial contact on 156.80 MHz, the calling and emergency frequency. Actually, it’s always fascinating to keep 156.80 MHz on your scanner if you’re near any seashore, large inland lake, or navigable river. Army Engineers are frequently called in during weather emergencies, especially when ice in navigable waterways has caused flooding and other problems. Listen for their operations on 157, 125, 163, 00, 163, 125, 163, 4125, and 163, 4375 MHz.

Railroad operations can be monitored in profusion during periods of ice and snow. Not only are schedules messed up, but ruling changes must be transmitted and snowplows must be dispatched. Look for these communications between 160, 215, and 161, 565 MHz.

Trucks and buses, of course, are sent into a state of shock during severe winter weather. Look for long-haul truckers to be discussing their problems with the weather on frequencies from 43.86 to 44.44 MHz. Long-haul buses carrying passengers on the interstates can be monitored 43.70 to 43.84 MHz. Municipal bus transportation services are no less affected by snow and ice on the roads; these vehicles can be found operating between 30.86 and 31.12, also 44.46 and 44.60 MHz.

The swarm of tow trucks and various other service vehicles which tend to private vehicles stuck in the snow can be monitored on 150, 815 to 150, 965, 157, 47 to 157, 515, and 452, 525 to 452, 60 MHz.

Aircraft seeking weather information should be monitored on 122.0 MHz, while miscellaneous aero communications of interest will be found on 122, 8, 122, 9, 122, 95, and 123, 0 MHz. Helicopters most often use 123, 05 and 123, 075 when communicating with one another and with

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How many weather related frequencies do you think are in use within earshot of this tender scene?

Vehicles, even if not stuck in the snow, often suffer from cold weather operation. This usually has the police and highway patrol frequencies far more active than usual.

ground facilities. Look for Civil Air Patrol ops on 122.9, 123.1, 148.15, and 149.925 MHz. Airliners checking in with their ground operations offices do so on 128.825 to 132.0 MHz. Naturally, all local airport approach control and control tower frequencies should also be monitored to increased communications activity related to severe weather conditions.

You'll find your area news media (newspapers, broadcast stations) may have reporters out in the field radioing in special reports on local conditions, and these transmissions should be included in your winter-time monitoring activities. Look for newspapers on 173.225, 173.275, 173.325, 452.975, and 453.00 MHz. Broadcast (AM/FM/TV) news crews can usually be monitored between 161.64 and 161.76 MHz, also 450.05 to 450.925, as well as 455.05 to 455.925 MHz.

If you live in an area where there are farmers and ranchers, you may find it of interest to check out the frequencies they normally use since severe winter weather invariably causes these people to have to put in many long hours in order to keep their operations going. Check them out 30.58 to 30.64, 31.28 to 31.96, 33.12, 35.28 to 35.86, 43.02 to 43.52, 151.49 to 151.595, 152.465, 152.48, 152.87, 152.885 to 153.395, 154.49, 154.625, 157.725 to 158.46, and 451.725 to 452.175 MHz.

This should give you plenty to monitor, and you can sit snugly in your home and reach out for many miles in all directions (via your scanner) and be almost as much a part of the action as if you were there in person. And you don't have to wear overshoes or ear muffs, or carry a snow shovel to be right on the scene!

Bibliography

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Energy-Scan. By Tom Kneitel, published by CRB Research.


Military divers on a U.S. Army Engineer's pontoon bridge section prepare to tackle an ice clogged river. Their frequencies are especially busy in severe weather. (U.S. Army photo)
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“W e have spotted a vessel on an intercept course. It’s a Russian warship and they are demanding that we stop immediately and allow them to put personnel aboard. We’re still inside the 12 mile limit. The closest ship is in very tight maneuvers with us now. Two minutes to 12 mile limit. This is getting hairy. They’re playing chicken with us. The last pass was only 20 feet away going full tilt.”

That was the message received from the Greenpeace vessel Rainbow Warrior on July 18, 1983, as it was being pursued at high speed in the Bering Sea by two Russian warships, a merchant ship, and two military helicopters. Members of the ship’s crew had gone ashore earlier that morning at the Russian whale processing station at Loreno, Siberia to document the illegal whaling conducted there. The Russians quickly arrested the shore party and now wanted the ship, too. That would have been a disaster since they would have certainly confiscated the film showing their illegal whaling operation, evidence which we intended to bring before the International Whaling Commission which was meeting in England even as the chase was going on. Peter Wilcox, captain of the Rainbow Warrior, refused all orders to stop and, with a display of superior seamanship, guided the 10 knot Rainbow Warrior as it evaded the Russian warships capable of twice its speed.

The chase lasted for hours as the enraged Russians pursued the vessel well beyond the 12 mile limit. Lloyd Anderson, N6BMI, Radio Officer aboard the Rainbow Warrior, observed the action from the bridge and sent a minute by minute description of the action to the station operated by Greenpeace Radio in San Francisco. Radio propagation had been poor during the voyage from San Francisco to the Bering Sea, and on the day of the chase only the weakest of signals could be exchanged. Even the powerful commercial station KMI, operated by AT&T, could not get through. But by using CW and sending carefully, Lloyd was able to get the details of the chase to the outside world.

The situation was very tense since it was unclear how far the Russians would go in their attempts to stop the Rainbow Warrior. The merchant ship crossed the Rainbow Warrior’s bow at such close range that it seemed one could reach out and touch it, while the helicopters continued to buzz the ship at alarmingly low altitudes. At one point, crewmen were seen to enter the forward gun turret on the warship. Finally, well outside their territorial waters, the Russians broke off the chase and the Rainbow Warrior was able to return safely to Nome, Alaska. Dispatches containing the telegraphed descriptions of the action were sent in near real time by telex from the station in San Francisco to the Greenpeace offices and to news services around the world.

Greenpeace Radio is the communications arm of Greenpeace, an environmental organization probably best known for confronting the whaling fleets of the USSR on the high seas. For such campaigns to be successful, reliable long distance communications are essential. It was soon found that such communications, as provided by public coast stations, are extremely expensive. As a result, Greenpeace established its own communications operation in 1977. Our primary mission today is still to provide reliable contact with the ships and boats Greenpeace operates around the world. To accomplish this, a combination of commercial and amateur frequencies are used, depending on the nature of the traffic to be passed and the equipment aboard the particular ship. The amateur station operates under the call N6VS and the commercial coast station has the call KMC-237. At this point in the sunspot cycle, amateur operations are
conducted almost exclusively on 14 MHz, with commercial operations usually split between 8 and 12 MHz. The coast station is licensed for 18 marine HF voice frequencies between 4 and 22 MHz and for operation in the marine VHF band.

The Rainbow Warrior radio room was completely rebuilt before the voyage to the Bering Sea. The equipment aboard includes a Drake TR-7 R-7 combination for amateur work driving an Alpha 76 amplifier. An emergency portable station consisting of a Kenwood TS430S and a Dentron amplifier can be used as a back up or it can be placed ashore when such communications are required. A Texas Instruments 3000 synthesized HF transceiver is used for the commercial channels, but it can be tuned to the amateur bands as well. The ship's commercial call is GSZY. A Kenwood R-2000 was installed to provide the capability of scanning several HF channels, something which is often necessary when attempting to gather intelligence on target vessels.

Several solutions have been tried over the years, but the one that has proven most successful is also simple and relatively inexpensive. We use Icom IC-M12 marine VHF hand-helds housed in waterproof fiberglass enclosures known as Pelican boxes. The boxes are lined with high density foam and the earphone, microphone, and antenna provide graphic weather information. The antennas consist of several center fed flat tops, a 23 ft. HF whip, a Hustler 4-BTV trap vertical and a Hustler mobile whip along with an assortment of VHF and DF antennas. All antennas and equipment terminate at an antenna patch bay and separate high capacity batteries and a charging system are provided for the radio room equipment.

High speed inflatable speedboats known as Zodiacs are the vessels Greenpeace uses for front line action at sea. They are quite fast and very maneuverable. Radio communications with the Zodiacs is vital for the coordination of the campaign as well as the safety of the campaigners. When operating at high speed in the open ocean, the Zodiacs bounce along from wave top to wave top, generating enormous G forces and drenching everything aboard. Add to that the noise of a high-powered outboard at full throttle and you have a challenging radio installation. Several solutions have been tried over the years, but the one that has proven most successful is also simple and relatively inexpensive. We use Icom IC-M12 marine VHF hand-helds housed in waterproof fiberglass enclosures known as Pelican boxes. The boxes are lined with high density foam and the earphone, microphone, and antenna provide graphic weather information. The antennas consist of several center fed flat tops, a 23 ft. HF whip, a Hustler 4-BTV trap vertical and a Hustler mobile whip along with an assortment of VHF and DF antennas. All antennas and equipment terminate at an antenna patch bay and separate high capacity batteries and a charging system are provided for the radio room equipment.

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leads are brought out through O-ring sealed connectors mounted on the box. A headset and boom microphone arrangement is used to permit hands free operation of the boat and allow the operator to hear radio transmissions over the engine noise. The Pelican box can be mounted on the boat with bungee cords and connected to the 6 dB fiberglass antenna mounted on the transom, or it can be strapped to the body of the operator, in which case a rubber duck antenna is used. Antennas are still a problem since even the best grade of fiberglass whip does not last long before breaking. We hope to try the aluminum and fiberglass antennas made by MORAD for the next campaign. The Icoms have proven themselves to be excellent radios mechanically and electrically, fully up to the harsh treatment we give them.

The first Greenpeace Radio coast station was built at Fort Mason in San Francisco in 1977 in the same building which housed the Greenpeace offices. After several years of operation, the offices were moved to another location on Fort Mason and the site for the station was lost. Since then, Greenpeace Radio has operated out of a house in the Potrero District of San Francisco. The present equipment includes a Drake TR7 and a Kenwood TS520 for amateur work driving a Collins 30L1 amplifier. A Motorola Modar transceiver is used for the VHF coast station and several receivers, including a Collins 51J4, are used for HF monitoring. Various exciters are used for commercial work, the most recent being a Benmar crystal controlled transceiver. An Alden model 519 FAX machine is used to record weather charts to help provide weather information for Greenpeace ships not equipped with their own FAX recorders. A phone patch with several phone lines is available along with the telex terminal in the form of a Kaypro II computer. This computer has been an excellent performer. It is operated immediately adjacent to the communications gear, yet it is completely unaffected by the strong RF fields and generates virtually no RF interference itself.

The restrictions imposed on the Greenpeace Radio shore operation by the surrounding urban environment have been severe. The level of electrical noise is always high. Making the weak signals we often deal with very difficult to copy. Zoning regulations prohibit the erection of our log periodic antenna. This antenna, with a continuous coverage frequency range of 6 to 30 MHz, would greatly improve our capabilities, but its large size (40 ft. boom) would be out of place in a city neighborhood. The mains at the present station are limited to 120V, which just barely supports the 30L1 at full power. An Alpha 77 amplifier is part of our equipment inventory but the power is not presently available to run it. A new home for Greenpeace Radio is obviously needed, preferably one on a rural mountaintop with plenty of electrical power. A search for such a spot is currently underway.

In the last few years, Greenpeace has undertaken several land-based campaigns. Local Greenpeace offices first tried to use CB radio to provide the needed communications links. This proved unworkable and Greenpeace Radio was asked to provide a reliable communications system. The result was a portable, multi-channel UHF repeater along with several Motorola HT220 handhelds and a Fujitsu-Ten under dash mobile. The repeater was built to our specifications by Maggiore Labs and may be operated from battery power or commercial mains. In its first use, it was installed in a communications van which was parked at a site overlooking the area of the action. It proved to be a great success, providing solid, interference-free communications. We are currently authorized to use five frequencies, two repeater pairs, and a simplex channel. The call sign is KAD-4020.

When Greenpeace Radio is asked to provide communications for a land-based campaign, our first step is to obtain topographic maps of the target area and the surrounding high terrain. From this we determine the possible repeater locations and plot out the coverage which would be expected from each site. Next, a local inspection is made to determine such things as road access, power availability, and local weather conditions. On-the-air tests are often conducted at this point to determine the real world feasibility of the proposed path. If the tests confirm the
The Greenpeace Radio System

Station KMC237 San Francisco
4126.4 kHz 16588.5
4145.0 kHz 16591.6
4420.8 kHz 16594.7
6220.0 kHz 22125.4
6223.0 kHz 22128.5
6523.3 kHz 22131.6
8292.5 kHz 22134.7
8295.6 kHz 156.35 MHz
12430.6 kHz 156.425
12433.7 kHz 156.80
12436.8 kHz

Station KDC2860
122.90 MHz
123.10

Station WYK432
47.42 MHz

Station KAD4020
462.60 - 462.725 MHz band

Station N6VS
14 MHz band

predicted coverage area, plans are made for the transport and deployment of the equipment and personnel needed.

When researching the communications possibilities for a recent land-based campaign, a UHF path simply could not be found and this created a problem. The campaign personnel would be operating under difficult conditions and were strictly limited in the weight of equipment they could carry beyond what was necessary for their survival. The solution was found in the form of portable 10 watt HF SSB radios made by Spillbury Communications in Canada. These radios are extremely rugged and easy to operate. They weigh only 8 lbs. including their "D" battery power supply. Their performance was amazing and they provided reliable communications over a 500 mile path using lightweight dipole antennas.

It is sometimes necessary to set up a temporary shore station for contact with a Greenpeace ship. During the 1981 campaign against the killing of Harp seal pups in Newfoundland, our base of operation was, as usual, Ma Decker's boarding house in St. Anthony, on the northern tip of the island. Ma had put up Greenpeace members many times before during previous seal campaigns and had no objections when asked for permission to put up an antenna on her house. Scrambling around on the steeply pitched, ice covered roof in the middle of a Newfoundland winter was an adventure in itself, but the job was done. Continuous contact was maintained with the Rainbow Warrior as it maneuvered among the ice floes.

Aircraft are often involved in Greenpeace campaigns ashore and at sea. They are used for spotting and the transport of personnel and supplies. Greenpeace pilots are used but the aircraft are rented which precludes the installation of our own communications equipment. This means that coordination with the aircraft must be done on the aircraft band, using the radios already installed in the aircraft. Greenpeace Radio is licensed for operation as an aerodrome station and for the use of hand-held radios operating in the aircraft band. We use a Terma TPX-10 six channel hand-held and a Terma TPX-750 all channel synthesized hand-held for portable work. The base station is an antique single channel Gorsett Communicator and uses the callsign K-KR260.

Greenpeace Radio works closely with the Red Cross and the other local, state, and federal disaster relief agencies. We are licensed for a base station and several portable and mobiles on the national Red Cross frequency of 4742 MHz. The call of the base station is WYK-432. The portable and mobiles operate under the license of the Golden Gate chapter and use numerical call signs. We have found that the capability to communicate on this channel provides a vital link between amateur communications and the Red Cross chapter during actual emergencies and drills.

Jamming has not been a major problem in most campaigns, but it has occurred. In the 1977 whale campaign, for example, there were two Greenpeace ships operating in the Pacific: the Ohiara Kai from Hawaii and the James Bay from Vancouver. Naturally, there was a rivalry between the two ships. Commercial channels were being used to work the two ships and, while working the James Bay, laughter could be heard in the background. It sounded like visitors to the James Bay radio room were laughing at the Ohiara Kai, which had suffered constant delays in getting to sea. The next night the laughter was there again but much stronger. It was obvious now that it was not coming from the James Bay. It had a diabolical, sinister, maniacal sound. With the selective fading and phase shift typical of shortwave propagation, it was enough to make your hair stand on end. We finally figured out that it was one of those joke shop laugh boxes being held up to the microphone and used as a jammer by the operator on one of the Russian whaling ships. It was effective too, with its broad range of audio frequencies.

Jamming is sometimes more of a problem on marine VHF when operations are being carried out near heavily populated harbors. With everyone in the area listening, it's almost certain that someone will not like what they hear. When this occurs during contacts with the marine operator, we often switch to HF and work KMI, since few local vessels are equipped for HF operation.

Plans for the future of Greenpeace Radio include the location of a new site for the station as a first priority. Only after a new home is secured will the shore station be able to realize its full potential. The recent authorization for Amateurs to use SITOR on the HF bands appears to offer an economical way to provide the boats with a hand copy send/ receive capability at reasonable cost, something which has been needed for some time. We are currently researching the possibility of installing a pilot system. The addition of the Kaypro II has also made it possible to run an HF propagation program, a modified version of MINIMUM, to permit us to predict HF communications paths. We also use a computer program to predict UHF/VHF paths. We expect that this computer will play an increasingly important part in Greenpeace Radio operations.

Mr. Dick Dillmon. N6VS, is a volunteer radio officer for Greenpeace who joined them in 1977 specifically to construct and operate the radio communications system.
"Pirate radio station leaving rather than walk FCC plank!!" was the title of a newspaper article that appeared in the Indianapolis Star, and which was clipped and sent to us by Thomas McKeen of Indiana.

POP COMM reported in this column recently the story of Jolly Roger Radio, an unlicensed FM pirate that had been broadcasting from Bloomington, Indiana regularly since the beginning of 1983.

The Star article reported that JRR is planning on "weighing anchor and preparing to set sail for Britain." Specifically, London.

The 27-year-old Chief Operator of JRR, the Flying Dutchman, was quoted as saying, "I'll pirate 'til the day I die. I simply feel I should move the base out of Bloomington, and the reason for that is that I don't feel the battle for Free Radio can be won here."

The Dutchman denies that the FCC threats to fine him and throw him in jail had anything to do with his decision to move to London, and that he had been considering the move for quite some time.

"I've always been fascinated with the idea of radio that was free, not regulated by the government or controlled by advertising dollars," the Dutchman said.

Europe

Across the Atlantic, things are as active as usual.

Podney Sixe of Cornwall, England says a very popular English pirate has decided to close shop. European Music Radio, first heard on the air in May, 1976, made their final broadcast back in June of 1983, 6 months ago. EMR offered its programming to all of Europe, broadcasting in Swedish, French, German, and Dutch as well as English, on the 48 meter band.

Patient DXers may wish to try their hand at logging the following Euro-pirates. Their addresses are included for QSL reports.

<table>
<thead>
<tr>
<th>Station</th>
<th>Frequency</th>
<th>GMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio King Kong Int</td>
<td>6225 kHz</td>
<td>0845</td>
</tr>
<tr>
<td>Radio Titanic Int</td>
<td>6260 kHz</td>
<td>0930</td>
</tr>
<tr>
<td>Radio Freedom Int</td>
<td>9420 kHz</td>
<td>0900</td>
</tr>
<tr>
<td>Radio Northern Hemisphere</td>
<td>6245/630 kHz</td>
<td>0900</td>
</tr>
<tr>
<td>Radio Apollo Int</td>
<td>6265 kHz</td>
<td>0930</td>
</tr>
<tr>
<td>Radio Rodini Int</td>
<td>6350 kHz</td>
<td>1015</td>
</tr>
<tr>
<td>Radio Galaxica</td>
<td>6306 kHz</td>
<td>0915</td>
</tr>
<tr>
<td>Radio Excalibur Int</td>
<td>6306 kHz</td>
<td>1015</td>
</tr>
<tr>
<td>Radio Fertor Int</td>
<td>6245 kHz</td>
<td>0930</td>
</tr>
<tr>
<td>Radio Anti-Grain Int</td>
<td>6245 kHz</td>
<td>0930</td>
</tr>
</tbody>
</table>

While many pirates come and go in a matter of months, PRN is an exception that has weathered the years.

Paul Royce of Wisconsin received this QSL for his reception of La Voz Del CID.
Christmas pirates; pirates that usually pop up on the bands during the Christmas Holidays and on Christmas Eve itself. This month we'll take a look at the New Year's pirates which are, simply, pirates that have a history of appearing on the radio during the much celebrated holiday of New Year's Eve. I am hoping that you have picked up this issue of POP'COMM during December so you will be able to make some use out of this information. If you purchased this magazine in January, just hang on to it until next New Year's Eve; chances are the same pirates (and maybe some new ones) will show for us again.

One year ago this month in New York City—KPRC delighted listeners in the northeast with their New Year's broadcast featuring a phone-in talk show. The show began around 0600 on 1616 kHz. Reports go to PO Box 747, Exeter, NH 03833.

PRN, Pirate Radio New England, was heard on 1620 kHz beginning about 0500 GMT. The show featured the famous PRN staff, including Mr. Electricity and Capt. Jeff Bliegh. Reception reports go to PRN, PO Box 40554, Washington, DC 20016.

WGUT with Gus Guts and Huey Hughes cheered up 1630 kHz with their professional and entertaining talk show and 1950 vintage music. I am very impressed with these two announcers, who sound like they should be employed at a big gun legal radio station like WABC or WLS. If they show up again on 1630 at 0400 GMT or so, you are undoubtedly in for a treat.

Although not much happened last New Year's on the shortwave bands, this year could be different. Remember, the best places to look for SW pirates is between 7350 and 7450 kHz, especially 7425 kHz, 6200 to 6300 kHz, and possibly the 6900-7000 kHz range. An infrequent, but occasionally active area to watch is just below the beginning of the 80 meter ham band. Take an occasional sweep through 3400 to 3500 kHz and see what's happening.

Another Bust!

Radio North Star Int'l, a pirate famous for its quality programs and, especially, for broadcasting on the obscure frequency of 13787 kHz, was closed recently by FCC officials. The operator is supposedly preparing for a fine of $750. Evidently, the station was 45 minutes into a transmission when the FCC knocked on its doors. Possibly, we'll have more on this soon.

Thank you to all who have been writing in with information and remarks about the Pirates Den. Special thanks to A' C'E. George Zeller, Podney Sixe, and Paul Royce. If you have something you think would be of interest to the readers of this column, by all means, please write. My address: The Pirates Den, c/o Popular Communications, 76 North Broadway, Hicksville, NY 11801. Hope to hear from you soon. Until then, best wishes for a happy and productive 1984!

... from the publishers of CO

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Selected English Language Broadcasts

Winter 1984

BY GERRY L. DEXTER

Note: This list was accurate at the time of compilation. Hundreds of English language broadcasts are to be found on shortwave every day. This is a representative sampling, not intended as a complete reference. Some stations will have only part of their broadcasts in English during a given hour. Others will start, for example, on the half hour. These are indicated by (30), (15), (45) indicating the starting time in minutes past the hour. Other stations will run their English segments into the following hour or even for several hours continuously and are not necessarily carried over in this listing. Some major broadcasters such as the BBC, Voice of America, and Radio Moscow maintain virtual 24 hour per day broadcasts in English. All times are GMT.

<table>
<thead>
<tr>
<th>Time</th>
<th>Station/Country</th>
<th>Frequencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000</td>
<td>Radio Sofia, Bulgaria</td>
<td>9.700, 11.710, 11.150</td>
</tr>
<tr>
<td></td>
<td>REE, Spain</td>
<td>9.630, 11.880</td>
</tr>
<tr>
<td></td>
<td>Tirana, Albania</td>
<td>7.065</td>
</tr>
<tr>
<td></td>
<td>Austrian Radio</td>
<td>9.770 (30)</td>
</tr>
<tr>
<td></td>
<td>Radio Prague, Czechoslovakia</td>
<td>6.055</td>
</tr>
<tr>
<td></td>
<td>Vatican Radio</td>
<td>6.015, 9.605, 11.845 (15)</td>
</tr>
<tr>
<td></td>
<td>Radio Beijing, China</td>
<td>15.120, 17.855</td>
</tr>
<tr>
<td></td>
<td>Voice of Israel</td>
<td>9.815, 9.895, 11.640</td>
</tr>
<tr>
<td></td>
<td>Radio Berlin International, East Germany</td>
<td>11.975</td>
</tr>
<tr>
<td></td>
<td>BRT, Belgium</td>
<td>9.880</td>
</tr>
<tr>
<td>0100</td>
<td>REE Spain</td>
<td>9.630, 11.880</td>
</tr>
<tr>
<td></td>
<td>RAE, Argentina</td>
<td>11.710, 15.345</td>
</tr>
<tr>
<td></td>
<td>Radiodora, Brazil</td>
<td>15.290</td>
</tr>
<tr>
<td></td>
<td>Radio Canada International</td>
<td>9.755</td>
</tr>
<tr>
<td></td>
<td>Voice of Nicaragua</td>
<td>5.950</td>
</tr>
<tr>
<td></td>
<td>Radio Tirana, Albania</td>
<td>7.120</td>
</tr>
<tr>
<td></td>
<td>Radio Prague, Czechoslovakia</td>
<td>9.740, 11.990</td>
</tr>
<tr>
<td></td>
<td>RAI, Italy</td>
<td>9.575</td>
</tr>
<tr>
<td></td>
<td>Radio Luxembourg</td>
<td>6.090</td>
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<tr>
<td></td>
<td>Radio Beijing, China</td>
<td>15.120, 17.855</td>
</tr>
<tr>
<td></td>
<td>SLBC, Sri Lanka</td>
<td>15.425</td>
</tr>
<tr>
<td></td>
<td>Voice of Free China, Taiwan</td>
<td>11.825, 15.345, 17.890</td>
</tr>
<tr>
<td></td>
<td>Radio Japan</td>
<td>17.795</td>
</tr>
<tr>
<td></td>
<td>Voice of Israel</td>
<td>11.655</td>
</tr>
<tr>
<td></td>
<td>Radio New Zealand</td>
<td>17.705</td>
</tr>
<tr>
<td></td>
<td>Austrian Radio</td>
<td>5.945</td>
</tr>
<tr>
<td>0200</td>
<td>Radio Earth (R. Clarin), Dominican Republic</td>
<td>11.700</td>
</tr>
<tr>
<td></td>
<td>HCJB, Ecuador</td>
<td>9.745, 15.155</td>
</tr>
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<td></td>
<td>Radio Prague, Czechoslovakia</td>
<td>7.345</td>
</tr>
<tr>
<td></td>
<td>Radio Netherlands</td>
<td>6.165, 9.590</td>
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</tbody>
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<tr>
<th>Time</th>
<th>Station/Country</th>
<th>Frequencies</th>
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</thead>
<tbody>
<tr>
<td>0300</td>
<td>Radio Polonia, Poland</td>
<td>6.095, 6.135, 9.525, 11.815, 15.120</td>
</tr>
<tr>
<td></td>
<td>Radio Sweden</td>
<td>9.695, 11.705, 17.840</td>
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<tr>
<td></td>
<td>Radio Cairo, Egypt</td>
<td>9.475, 12.000</td>
</tr>
<tr>
<td></td>
<td>Radio RSA, South Africa</td>
<td>5.980, 6.020, 9.615</td>
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<td></td>
<td>Radio Beijing, China</td>
<td>15.120</td>
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<tr>
<td></td>
<td>Voice of Israel</td>
<td>9.815, 11.650, 12.025</td>
</tr>
<tr>
<td></td>
<td>Radio Lebanon</td>
<td>11.955</td>
</tr>
<tr>
<td></td>
<td>Voice of Free China, Taiwan</td>
<td>11.740</td>
</tr>
<tr>
<td></td>
<td>Radio Canada International</td>
<td>5.960</td>
</tr>
<tr>
<td></td>
<td>Radio Bucharest, Roumania</td>
<td>5.990, 9.755, 11.845</td>
</tr>
<tr>
<td></td>
<td>Radio Havana Cuba</td>
<td>11.930</td>
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<tr>
<td></td>
<td>Radio Australia</td>
<td>15.320, 17.795</td>
</tr>
<tr>
<td>0400</td>
<td>UAE Radio, Dubai</td>
<td>15.320, 15.435, 17.775 (30)</td>
</tr>
<tr>
<td></td>
<td>Radio Havana Cuba</td>
<td>11.760, 11.930</td>
</tr>
<tr>
<td></td>
<td>TIFC, Costa Rica</td>
<td>5.055</td>
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<tr>
<td></td>
<td>HRVC, Honduras</td>
<td>4.820</td>
</tr>
<tr>
<td></td>
<td>Radio Tirana, Albania</td>
<td>7.300</td>
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<td></td>
<td>Radio Dublin International, Ireland</td>
<td>6.910</td>
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<td></td>
<td>Radio Polonia, Poland</td>
<td>6.095, 6.135, 9.525, 11.815</td>
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<tr>
<td></td>
<td>Radio Portugal</td>
<td>6.075, 11.925</td>
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<tr>
<td></td>
<td>Radio Japan</td>
<td>17.755</td>
</tr>
<tr>
<td></td>
<td>Voice of Free China</td>
<td>5.985, 11.825, 15.345, 17.800, 17.890</td>
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<td></td>
<td>Voice of Turkey</td>
<td>11.740</td>
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<td>UAE Radio, Dubai</td>
<td>11.730, 15.435, 17.775</td>
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<td>Radio Australia</td>
<td>17.895, 21.680, 21.740</td>
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<td>Radio Prague, Czechoslovakia</td>
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</tr>
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Radio New Zealand 17.705
Radio Japan 15.300
Radio Casino, Costa Rica 5.954
Radio RSA, South Africa 9.765

0600 Radio Canada International
Ghana Broadcasting Corp. 11.960
ELWA, Liberia 4.915
Voice of Nigeria 7.255
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Electronic Security

It's important to protect your electronic equipment from intruders or burglars. Many of you have written in outlining all of the modifications you have made on your radio equipment and communications gear. It would be devastating if someone broke in and took everything. Although you might be able to replace the equipment under insurance, all of those mods will be lost forever.

Putting a burglar alarm system on line at your home or office—even in your car—is not all that hard. It's also not expensive. Professional burglar alarm manufacturers are popping up everywhere with state-of-the-art equipment. The alarm business has never been better, and this means a good variety of equipment at competitive pricing. Alarm manufacturers are constantly trying to outdo their competition by offering the most sophisticated system ever at a reasonable price.

Several Systems

Before jumping into a burglar alarm system, let's review the many varieties that are available.

The least expensive system sold everywhere from dime stores to electronic convenience centers is the Ultrasonic alarm. The inexpensive ultrasonic system consists of a separate ultrasonic transmitter and a separate ultrasonic receiver. The ultrasonic transmitter sends out acoustic (audio) waves around 23,000 Hz (23 kHz). They are driven by a 2-watt amplifier built into the ultrasonic transmitter. Although it's unlikely you will hear these waves, some people say they can. Others complain of headaches when ultrasonic equipment is used near them. Dogs will often go a little crazy when they hear the sound of the ultrasonic transmitter.

Although the inexpensive ultrasonic systems are great for filling up a room with the audio security waves, they may false trigger. Warm air currents, jingling of keys, a phone bell, sirens, drapes moving in the wind, and even household pets may possibly trigger the ultrasonic alarm system. Except for special applications where nothing is going to move in the protected area, I would recommend you look to a more sophisticated set up to protect your home electronics.

Radar alarms operate on an RF frequency of 10.525 GHz, the X band. This is the same frequency band used by police radar systems.

The radar alarm sends out radio waves and receives them with an accompanying receiver. The power output may be up to 20 milliwatts. The radar waves can easily protect a large room or office facility. They may also transmit through drywall for a limited range.

Similar to the ultrasonic system, a Doppler shift occurs when something moves and disturbs the waves. This Doppler shift is detected in the receiver, and an alarm is activated. In other words, anything moving will trigger the alarm. If you plan to protect an area where there is a chance of pets, venetian blinds blowing in the breeze, or other moving objects disrupting the radar waves, better think twice about this type of system. Although fire and police sirens and wind currents won't set it off, anything that moves just a little bit may! You can actually have the system too sensitive for home applications.

Most professionals in the home and office burglar alarm business recommend hard-wired alarm systems. This type of system consists of wire loops and sensors that protect entryways and specialized pieces of electronic equipment. You can put a sensor on just about anything to include your desk chair or even that large radio receiver. Although the installation of a hard-wired system is more time-consuming, the chances of a false alarm are dramatically reduced. With a hard-wired system, the only time you are going to get a false is if you make a mistake and open up a protected area without turning off the alarm system!

Closed-Loop Versus Open-Loop Systems

In security language, the loop is the circuit into which various sensors are wired in your house or at your business. A closed-loop strings sensors like old-style Christmas tree lights—in series. A series system is vulnerable if one sensor becomes faulty—none of the other sensors will work until the one faulty sensor is fixed. Similar to Christmas tree lights that use the series circuit, if one light goes out, they all go out.

If you installed a closed-loop protection system and a sensor malfunctioned when you were away from home, the alarm would go through its cycle and from then on your entire house or business would be unprotected until the problem sensor is fixed. (Most alarms have an automatic reset after a certain time limit.)

An open-loop system has no current flowing during its normal protected operation. All sensors are wired in parallel on an open-loop system. Not only is installation considerably easier, but failure of one of the sensors does not affect the others. Open-cir-
cuil sensors—by the nature of their design—resist swinging shut regardless of the severity of a shock when a door is slammed or someone walks upstairs. Because electrical current never runs through an open-loop system, the potential problem of electrolysis is also totally avoided which will keep your sensors “fresh” for many years.

It is true that cutting a wire on a closed-loop system will cause it to alarm, but an intruder must first get inside to cut the wires. By that time the alarm is already tripped and latched in, and cutting a sensor wire won’t do anything to stop it. Many alarm manufacturers produce control units that may operate on either open- or closed-loop systems. This allows the owner and installer to make a decision as to whether to go closed- or open-loop. I prefer the open-loop system.

When the main control center recognizes an interruption to the normal loop circuit, it activates a series of selected alarms.

You may wish to have only an inside alarm bell sound. You may also wish to have an outside as well as inside alarm sound, or have the unit automatically dial up your local police department.

There are also electronic horns that synthesize voice words, such as “burglar,” “fire,” or “help.” You might also tie into your alarm system a small 27 MHz transmitter that will send out an electronic page signal on frequencies near Citizens Band. You might also qualify for alarm paging frequencies near 72 MHz, too. Companies such as Page Alert of Gardena, California, offer small paging receivers that will automatically let you know once your alarm system has been activated.

One of the beauties about a loop-alarm system is that you can go about your business or home with the alarm turned on without tripping it if you are careful. Here at my house, I have two stages on the loop system: At night, everything is wired up, including all doors, backyard gates, my dune buggy parked outside, and just about everything else that might be tampered with. If any wires are either shorted or cut, or any door or gate opened, the alarm system goes off. I can select whether or not it wakes me up gently or blasts me out of the bed and wakes up the neighbors, too.

During the day, the outside perimeter is turned off, but all of my equipment is still protected. Sensors will detect when any major piece of equipment is moved. This would include the electric typewriter, individual pieces of amateur radio equipment, recording equipment, and just about anything else that normally stays in one place during a normal day’s operation.

**Installation**

Installation of a loop-alarm system takes about a day. The wires you are running are similar to twisted-pair telephone wires, 24 gauge. They are so small that you can put them just about anywhere. They can easily hide in molding or just about anywhere that they are slightly out of sight.

You don’t need to wire every single entry automatically test all the sensors. If it detects that any one sensor has malfunctioned or is not latched in (you forgot to close the sliding glass door), the alarm will not set. It will beep and flash at you telling you to check out all sensors to locate an open entry area. You can develop a series of switches to isolate which portion of the house or office is having the problem. Then it’s simply a case of looking over your notes, checking out each sensor, and then discovering that somebody has left one of the unused windows ajar.

If your alarm box indicates that everything is set, throw the switch and you are on the air. Momentary blackouts or a local lighting strike won’t disturb a thing—the alarm circuitry takes care of all that.

You can spend under $100 with a radar or ultrasonic alarm and have it do a reasonable job. Be prepared to get up several times to reset it, because it may fail due to a variety of common causes.

If you opt to spend $300 or $400 on an alarm system, chances are you may never have a false unless you accidentally trigger it yourself. That’s a good way to test your system! The hard-wired alarms generally will last a great deal longer than the less expensive radar or ultrasonic alarms that always seem to “wear out.”

One manufacturer of a closed/open loop alarm system specifically makes alarms for the hobby radio user. The alarms lend themselves perfectly for installation to guard against intruders and those that may wish to steal your radio equipment. They can be used in cars, boats, businesses, and at home. They will send to any Popular Communications reader a detailed catalog on their alarm system. Write to Cordmar Industries, Inc., 8800 N. Bayshore Drive, Miami, Florida 33138, and ask for their Radio Room Alarm System, and tell them that Gordon sent you.

Until you get that new alarm system on line, keep a watch on your equipment and don’t let anyone know what type of radio gear you may have behind those closed doors!
Uncle Sam’s Navy Pirates

Changing Radio Callsigns As Often As They Changed Their Flags – These Pirates Were On A Secret WWII Mission!

BY HARRY COOPER

Kapitänteutnant Reinhard Hardegen was the U-boat Command's “Ace of Aces” in early 1942. This flamboyant German submarine commander won his Iron Cross by sinking some 100,000 tons of allied shipping off the American east coast in January of 1942 during the opening thrust of Operations Paukenschlag. To sink some of his victims, Hardegen even took the U-123 right into New York Harbor, venturing up the Hudson River as far north as the Narrows on one occasion!

It was evening of 26 March 1942 and U-123 was again on station off America’s east coast, when her lookouts spotted a small, 3,200 ton tramp steamer slowly plodding southward battling heavy seas, occasionally letting off clouds of sooty black smoke. She looked easy, too easy, so Hardegen called upon his Navigation Officer and a Midshipman for their opinion. They too saw this lone American merchant ship as a ripe plum to be plucked easily from the tree. Hardegen made the decision to attack on the surface, using a torpedo rather than the U-123’s 4.1 inch deck gun.

Hardegen maneuvered U-123 to a point within 650 yards of the unsuspecting ship, the gathering darkness helping him to maintain cover. A single torpedo flashed almost silently from the bow tube, and in a few seconds an explosion blew into the air at the bow of the ship. She slowed, then stopped dead in the water. As Hardegen and his Watch Officer looked on, fires broke out on the decks of the victim ship.

The U-boat radio operator intercepted the distress call on 500 kHz, which he relayed to Hardegen on the bridge. “WKCA, Caroline torpedoed, burning, position 36° N, 70° W.”

The rusty old ship began to list slightly, but she didn’t settle in the water. One of the lifeboats dropped into the water, filled with men, and began to draw away from the stricken ship. A second lifeboat still hung in the davits. U-123 was now coming slowly around Caroline’s stern, and Hardegen saw more men attempting to get into the other lifeboat.

“Let the men get away from the ship,” Hardegen ordered. “Don’t want to shoot them up as well.”

A decent gesture, but Hardegen could hardly be expected to know that this ship carried double the number of crew she should have. The crewmen he watched abandoning ship were known as the the panic party. Their task was to convince an attacking U-boat skipper that he had done his job, and that the crew was leaving the helpless ship for the U-boat to finish off at will. The deck fires were carefully set in controlled tubs to give the effect of a doomed ship. More American sailors were hiding aboard Caroline—not merchant seamen, but U.S. Navy seamen—and they waited for the right moment to spring their trap on this unsuspecting Iron Cross hero.

As the lifeboats pulled away from the Caroline, Hardegen thought he detected the deserted ship beginning to move ever so slowly in the direction of his U-boat. Impossible!

In the wardroom of Big Horn, Commander Lewis Farley at the head of the table. The ship’s doctor is at far left, with Lt. Ed. Mack beside him.

Big Horn’s hedgehog detonates on a submerged U-boat.

Ammunition racks on Big Horn.
sible, the crew had abandoned. Still, he ordered half speed ahead on the twin diesels and began a slow turn to starboard. Caroline matched the moves of the U-boat. But now, Hardegen wondered. The ship was empty.

Caroline suddenly bolted to full speed, heading straight for the side of U-123. Trap doors flew open on the tramp steamer, canvas were torn away, hidden seamen scrambled across the decks, the Jolly Roger joined the stars and stripes on the flaghoist, and gunfire blazed from guns hidden along Caroline's decks! The trap had been sprung, and the hunter had become the sitting duck! Machine guns chattered! Water spewed into the air around U-123 as U.S. Navy shells hit nearby.

Totally caught by surprise, Hardegen now realized the trap into which he had been lured! Black smoke belched from the U-boat's twin diesels as she tried to escape. Two shells exploded close astern, and another alongside, washing tons of sea water over the decks of the fleeing U-boat. Blazing white-hot machine gun tracer bullets cluttered through the conning tower! Hardegen's Midshipman clutched his side, groaned, and fell to the deck. A violent explosion roared inside the U-boat. She was hurt!

Hardegen ordered the bridge cleared of everyone but himself and one of his officers; then the hatches were dogged down and the watertight doors were shut.

Turning his attention back to Caroline, he saw large black objects hurtling through the air in the direction of U-123—depth charges! Stunned, he realized that Germany's top U-boat Ace had been fooled like a rank amateur!

**Project LQ**

What manner of ship was this Caroline, to tackle a German U-boat? When Japan opened hostilities against the United States that fateful day in December of 1941, the German High Command was taken by surprise as much as America herself. But Hitler quickly ordered Admiral Doenitz to dispatch a force of U-boats to raid along the American coast. Doenitz could send only five boats, but they caused so much havoc in January of 1942 up and down the eastern seaboard from the Gulf of St. Lawrence to Cape Hatteras, that Doenitz sent back more and more U-boats to patrol the entire American coast from Maine to the Gulf ports of New Orleans, Galveston, Pensacola, and Pascagoula.

The U.S. Navy was powerless to stop them! The "all powerful American Navy" existed solely in the minds of Navy planners and Admirals. In truth, America had virtually nothing along its eastern shores that could remotely serve as a U-boat hunter/killer. The United States needed time, and Caroline and others in America's pirate fleet would buy that time.

The birth of "Project LQ" occurred on 19 February 1942, when a man walked into Riggs National Bank in Washington, DC and deposited half a million dollars into the accounts of Mr. F.J. Horne and Mr. W.S. Farber. "Mr. Horne" was in reality Vice Admiral Horne of the U.S. Navy. "Mr. Farber" was Rear Admiral William Farber, Horne's assistant. The money was further broken out into dummy companies; $50,000 went into the account of the Eagle Fishing Company, $100,000 went into the account of the Asterion Shipping Co., and another $100,000 went into the operating fund of the Atik Shipping Co.

Each of these three "companies" owned one vessel. The Eagle Fishing Company "owned" a 133 foot diesel-powered New England trawler named Wave, Asterion Shipping Company "owned" the ancient 3,200 ton steamer Evelyn, and the Atik Shipping Company "owned" her 3,200 ton sister ship Caroline.

**Supply Officer Lt. Ed Mack of Chicago, transferring from one of the patrol craft to Big Horn.**

**Big Horn's Bridge Officer keeps a sharp look-out for U-boats.**

The duty of the patrol craft was to rescue survivors of Big Horn in the event of U-boat attack—if there were survivors!

In February of 1942, the three ships were brought into the Portsmouth Navy Yard for outfitting. They were given a dazzling array of ordnance, including heavy guns concealed by camouflage nets and break-away bulkheads, depth charges, machine guns, and the latest in sonar, radar, and radio communications equipment.

The trawler Wave was renamed the USS Eagle. The steamer Evelyn became USS Asterion, and Caroline was USS Atik.

Both the Evelyn and the Caroline had been built in 1912 and had sailed for 30 years as merchant vessels for the A.H. Bull Shipping Line. In 1912, the Evelyn's radio call sign was KZP, but that was later changed to WKCE when ship calls went to 4-letter formats. The Caroline was originally assigned the call KGZ, later changed to WKCA.

The trawler Wave (USS Eagle, AM132)
was a 314 ton vessel built in 1938. Later she would be renamed the USS Captor (PYc-40). As participants in “Project LQ,” the vessels would continue to use their long established civilian identities and radio call signs, however they also had the option to use fictitious names, fictitious radio call signs, and fly flags of various nationalities.

U.S. Navy Commander Lewis Farley briefed his three skippers on Q-ship operations and techniques. All orders were verbal. Nothing was put down on paper. These skippers and their officers had been hand-picked by Farley for this mission, and on 23 March 1942, Lt. Commanders Harry Hicks (Arik, a/k/a SS Caroline), G.W. Legwen (Asterion, a/k/a SS Evelyn), and L.F. Rogers (Eagle, a/k/a trawler Wave) headed their decoy ships to sea, knowing they were on their own if they ran into trouble. The Navy had nothing to send to their aid.

Caroline’s encounter with U-123 took place only three days after she departed port. She had definitely given Hardegen and his U-boat crew a fierce battle, but she had allowed the submarine to withdraw out of range and escape.

**U-123 Returns**

Caroline was still stopped dead in the water, waiting for the U-boat to return. Her panic party had re-boarded, stored the lifeboats back in their racks, and extinguished the controlled fires they had set on deck. Caroline waited to resume battle with U-123, but she no longer enjoyed the element of surprise. The sheep’s clothing was off the wolf, and when the U-boat returned it was submerged to periscope depth.

No longer the fool who was caught in a trap, Hardegen was again Germany’s top U-boat skipper. He carefully brought U-123 into attack position, undetected by the crew of the Caroline. When his sights lined up on Caroline’s engine room, he gave the command to fire! The torpedoman’s hand hit the firing button. A single torpedo sped on its way. Caroline’s 30 year career on the high seas, three days of which were spent as an undercover U.S. Navy Q-boat, appeared to be over.

Twenty four seconds after Hardegen’s order to fire, Caroline was rocked by a thundering explosion which forced the bow under water as far as the bridge, causing her stern to lift so high out of the water that Hardegen could see the propeller still turning helplessly in the air.

At 0530 on 27 March, Hardegen brought U-123 back to the surface, but this time out of range of Caroline’s guns. He would not allow himself to be tricked a second time. This time there was no trick. Caroline was finished. Just before 0600, three heavy explosions echoed across the water, Caroline’s bow shot skyward, then the entire ship slid beneath the waves. None of the lifeboats—or the crew—were ever seen again!

**Second Thoughts**

The Navy’s top brass were now having second thoughts about “Project LQ,” but there was still no effective defense force on the east coast. The U-boats were still running unchecked across America’s vital shipping lanes. There was no choice but to continue “Project LQ.”

The Gulf Sea Frontier Command decided that since the East Coast Command had Q-boats, they would get into the act as well. They decided upon sail power for their decoy activity, obtaining a two-masted schooner named Alice, which they turned into a Q-boat. But when the German saboteurs that U-584 dropped off on a Florida beach near Jacksonville were nabbed by the FBI, they carried a complete set of the conversion plans of Alice. Alice was quickly recalled and decommissioned.

By this time, Cmdr. Farley had enough of “desk sailing.” He obtained a former Gulf Oil Company, 7,100 ton, 425 ft., tanker called the Gulfdawn (callsign WONK). This vessel had been built in 1938, but it was given a new name when it became a Q-boat (USS Big Horn, AO-45, then IX-207). The vessel’s tanks were filled with sealed oil drums to keep her afloat, even if she were to be ripped open by torpedoes. The latest weaponry was installed, including 3-inch guns, many .50-cal. machine guns (some on tracks so they could be slid into their hiding places), depth charges, 2½-inch hedgehogs, “mouse traps,” radar, sonar, and a high frequency radio direction finder.
(HFDF, commonly nicknamed "huff duff") with which to pin down the locations of marauding U-boats.

The only gun visible on Big Horn was the after battery's 3-inch gun, commanded by a Chicagoan, Lt. Ed Mack. The two large spotlights, unheard of on tankers of this vessel's type, were disguised with broomsticks and canvas covering. Probably the most grim reminder of Big Horn's role in the infant war were the two small patrol craft that followed her just out of sight over the horizon. It was the sole duty of these patrol craft to pick up any of Big Horn's survivors fortunate enough to be left alive after the anticipated U-boat attack!

The crew of the Big Horn was mostly made up of "brig releases," men who were serving time in the Navy's jails. Since the life expectancy of a Q-boat was short, at best, the men could volunteer for this duty and have their sentences dropped when (and if) they returned. The hazardous duty pay was great.

Big Horn always took the "coffin corner" in convoy, seemingly staggering astern of the main body of ships, hoping to entice a U-boat to the surface and attack with her deck guns rather than wasting a torpedo. Big Horn, like other Q-boats, was a slow and unmaneuverable ship, and she had to hope that the U-boat fell for the ruse and fought it out on the surface. The Q-boats were no match for U-boats once their true intentions were realized by the German skippers. They had to sink the U-boat on their first attack, or suffer certain destruction by counterattack. Caroline had proven this most dramatically and tragically.

Since they all wore civilian clothes and used the flags and radio callsign of nearly every neutral and Allied country at one time or another, the officers and men of Big Horn knew that they would be shot as spies if they were ever captured. The Stars and Stripes were shown when the ship was at general quarters. Then the fictitious nationality flag was hauled down, Old Glory would snap to the flagsstaff, along with the skull and crossbones of the Jolly Roger!

Big Horn came under attack five times during her short career, the first time off St. Paul's rocks in South America. Another time she was so far from the U-boat that she had to fire on the roll to rob her shells the full distance. She encountered her third U-boat off Recife, Brazil and the fourth off the Florida coast. Her fifth time under fire was again off the Florida coast, but this time she wasn't attacked by a German U-boat—but by a flight of U.S. Navy planes! At the time, Big Horn was flying one of her fictitious nationality flags and communicating via radio with another vessel while using an equally phony radio callsign. The Naval aircraft spotted the vessel in an area where it didn't seem to belong, that coupled with the use of a callsign which didn't check out in their records made her look so suspicious that it brought about the air attack. Before she could run up the Stars and Stripes and get on the air with adequate identification signals, she was machine gunned several times by the American fighters. Fortunately, there were no injuries and the damage was light.

The final straw for "Project LQ" came with the Irene Forsythe, a beautiful three-masted schooner which the Navy renamed the Aeolis. Even though her commander, Lt. Cdr. Richard Parmenier, was an antisubmarine expert, the jinxes which seemed to follow "Project LQ" right from the start showed Aeolis no mercy. The boat sailed into a hurricane off Bermuda and had to limp, badly damaged, into Hamilton Sound for repairs. No further records remain about this vessel, but a rumor later circulating among seamen during the war said that she was sunk by machine gun fire from a U-boat she attacked.

A Failure?

On the surface, the Q-ship project seemed to have been a total failure. Caroline/Aeolis was sunk three days into the operation, Alice was in and out of service before ever seeing action. Irene Forsythe/Aeolis was apparently sunk attacking a U-boat. The three remaining ships, Evelyn/Asterion, Wane/Eagle, and Gulf GA/P Big Horn were removed from anti-submarine duty and given weather-reporting duties. None of the six vessels in "Project LQ" ever sunk a German U-boat.

Disastrous as the project might seem to have been, the men of the Q-ships were the courage and guts that the U.S. Navy needed during those bleak, early days of the war when there were no ships. They helped to hold the line while America was taking a terrible beating along her eastern shores until other measures could be taken. Ultimately, the dreaded U-boats became nothing more than "iron coffins" for fully 75% of the cream of the German Navy.

The Jolly Roger flew alongside the Stars & Stripes whenever Big Horn went to Battle Stations!

There were controlled fires set on board the "Q" ships to trick the attacking U-boat into thinking the ship was in mortal danger.

Chicagoan Ed. Mack (wearing the shirt) commands the after battery on USS Big Horn.

About the author: Harry Cooper has written many articles for leading naval/patching publications, as well as novel and audio patching magazines. He is presently writing a book about the service of western hemisphere supply boats used by U-boats during WWII. He's done extensive research on U-boats and is considered one of the world's foremost authorities on their activities. Harry runs an organization called SHARKHUNTERS (P.O. Box 137, Fox Lake IL 60020), for U-boat researchers.
Rising From The Depths Of The Sea,  
"The" Pirate Broadcaster  
Is Back On The Air!  

BY CLIVE RICHARDSON

When last heard from, the final message from Radio Caroline was "From all of us, for the moment, goodbye and God bless." The last (and to its many fans and supporters) tragic words from Radio Caroline were uttered on March 20th, 1980, only minutes before the station settled to the bottom in the storm-tossed seas of the Thames Estuary. Now, like Aphrodite, rising from the depths of the sea—Radio Caroline, the world's most well-known high-seas pirate broadcasting station, has risen to again take its place on the airwaves. The Radio Caroline saga is perhaps no stormier than the weather conditions which sent it to the deep six almost three years ago.

Radio Caroline has long been fondly known as "The Lady" to her friends, and those who recall the glory days of offshore pirate broadcasting of the 1960's and 1970's will always retain Radio Caroline in their memories as the most prominent of all offshore broadcasters of the era. Ask people to search their memories and most of them will quickly say that Caroline and her offshore colleagues died in the mid-1970's, yet Caroline has doggedly clung to life now for 20 years. It wasn't easy.

A Stormy Career

The actual ship that hosted Radio Caroline during her halcyon years started life as a three-masted steel schooner in 1921. Built in Kiel, Germany, she was converted to a motor cruiser in 1927. For the next 30 years, the Olga (or Margaretha, as she later became) travelled the North Sea until she fell into disuse. The ship was purchased by a Swedish company (with American backers) and was turned into a broadcasting ship which identified itself on the air as Radio Nord. Two 10 kw transmitters (neither was licensed) gave the station a very potent signal from its position off Stockholm. It was great while it lasted, but that was only two short years. At that time the Swedish government legislated against pirate broadcasting by 1962 Radio Nord was silenced.

Renamed Bon Jour, and then again renamed Mogda Maria, the crusty old lady broadcast only occasionally over the next few years and even made a trip to the USA before heading back to Europe and eventually dropping anchor off Essex in Britain. On March 28th, 1964, the ship was given yet another new name, the Mi Amigo. On May 9th, 1964, she began broadcasting under the identification Radio Atlanta. In July of 1964 the station merged with and became known on the air as Radio Caroline. The station was named after President John F. Kennedy's daughter.

As Radio Atlanta, the station was operating on 1507 kHz. When the station became Radio Caroline, the frequency changed to 940 kHz. Although a varied career thus ensued, the vital statistics aren't enough to explain the popularity of Radio Caroline. Nor can we explain what is so special about this station that she has long been thought of so fondly and what convinced her present backers that the station simply could not be silenced forever just because it was sent to the bottom of the sea by inclement weather.

The Caroline Saga

We need to take a quick look at social history to try to comprehend the station's immense appeal. In the early 1960's, teenagers were gaining an identity of their own. These were the heirs to the so-called Beat Generation, by the 1960's they were called flower children by some, hippies by others, or just plain teenagers by most. They had their own unique brand of music, dress codes, social life. Moreover, they seemed to have lots of money to spend.

Auntie Beeb, the staid old BBC, maintained staunch resistance to the onslaught of contemporary music and was steadfastly presenting stuffy dance band music despite the growing dissatisfaction with its programming. Radio Caroline, as the first of its type, played Merseybeat pop and lots of specialities, soul, ska, psychedelic sounds, and rock. The enthusiastic DJ's were young, informal, hip, and they spoke the language of young people. They also knew their facts about the artists and rock groups, the new trends in music, the latest groups and their forthcoming albums. Without the rigid constraints of the BBC, Caroline could play lengthy album tracks, Top Twenty music, and could easily relate to the upbeat lifestyle of its listeners.

Over the years Caroline developed its style for a "young, mobile, and moderately-intelligent audience," as described in the words of Ian Anderson, one-time engineer on Caroline and historian of the station.

In 1966, the station installed a 50 kw Centennial Electronics transmitter (it still retains the 10 kw transmitters as stand-by) topped into its 1/4 wavelength antenna. Over the years the station survived fire, mutiny, impounding by Dutch authorities, being washed ashore on the Essex coast, sinking, and (most importantly) the 1967 Marine Broadcasting (Offences) Act which firmly declared offshore broadcasting from Britain's territorial waters to be blatantly illegal.

Caroline's popularity and lead was followed by about a dozen other offshore broadcasters and, as time has shown, it became a situation that could hardly be regarded complacently by the British Government or Civil Service. The much-protected monopoly on broadcasting was threatened, in their opinion, by the anarchy of the offshore pirates.

It was claimed that the offshore stations caused interference to "authorized" broadcasting services and emergency services. They said that there were no frequencies available for such broadcasts, that the stations went against democratic standards of broadcasting, that stations operating without safeguards and guidelines were totally intolerable. These arguments, no matter how valid or boldly (and often) they may have been presented to the public, made little difference to the eagerly-listening fans who fell within the potential audience of four million. Neither did the claims make any difference to the offshore broadcasters.

So the Marine Broadcasting (Offences) act was passed, offering stiff penalties for offenders. Prison sentences and fines were the crowbars used by this legislation in order to pry the offshore broadcasters from the airwaves. In Caroline's case, at least, the legislation did not have noticeable success.

Supplies were ferried to the ship. Holland became the haven for offshore DJ's on shore leave and, to its dismay, the Government came to realize that there seemed to be no one person they could hold responsible or investigate since the station was run almost on a co-op basis without a formal hierarchy of leadership!

Caroline tried several frequencies over the years, sometimes using two separate programs simultaneously on different frequencies. Even the transmitter power fluctuated along with the price and availability of fuel oil to run the station's two generators. At times there were non-English language programs presented for audiences on the European continent. The traditional format of the station underwent a major modification in 1972 with the introduction of "L.A." or Loving Awareness, a concept promoted by
Radio Caroline before she slid beneath the waves.

In 1970 the Government began the introduction of an Act, that was to signify the end for Free Radio in Britain. The MARINE OFFENCES (broadcasting) ACT

In the early 1970's, Radio Caroline sent this brochure to its listeners in order to explain its plight.

Ronan O'Rahilly, the founder and mentor of Radio Caroline, L.A. was a sort of self-awareness philosophy project in order to in-sure love, peace, change in the individual and improvement on how the individual relates to others. Although a popular philosophy at the time, there were more persons who felt that this philosophical material detracted from the station rather than enhanced it.

In The Silt

After March 20th, 1980, of course, all of this was moot since the ship, transmitter, antenna, record library, and everything else physical that belonged to Radio Caroline was lying in the silt of the Thames Estuary.

Plans for a "new" Radio Caroline, supposedly to be heavily backed by American dollars, were quickly announced. It was then stated that a new vessel, the Imagine, was being prepared. This ship would have more space aboard and would be sporting a 300 foot antenna. The guiding light would again be the venerable Ronan O'Rahilly, who still was saying that L.A. would be an integral part of Radio Caroline's existence. All sorts of on-the-air dates were announced, but the date most often mentioned was about March 10th, 1982. An operating frequency of 716 kHz was also announced.

As fate (and perhaps the fickle finger of finances) would have it, the new Radio Caroline arrived back on the air on August 21st, 1983—about 17 months late and on 963 kHz, but with a 50 kw transmitter which is being heard well throughout the listening area. The promised 300 foot antenna is in place and doing a fine job. Since the vessel is in international waters, the British Government has no ability to silence the station. Supplies are being ferried from locations in Spain. Assisting O'Rahilly with promotional and advertising help is the popular American radio personality, Wolfman Jack.

There has been talk of a possible shortwave outlet for Radio Caroline, as well as considerations for AM stereocasting. Additional programs to the European continent in various languages may also be transmitted at a later date. For now, there's plenty of rock music going out over Caroline's transmitter and the hope is that there will also be a copious amount of advertising revenue coming in, especially from American companies. The new Radio Caroline is located aboard a converted former Icelandic trawler which, as promised, is now named Imagine—after the well-known John Lennon song of the same name.

The Question

I still have not answered the question of what has made Radio Caroline so special. It certainly seems that the station's main claim to fame was that it smashed the traditional mold of broadcasting. Although, in the long run, the British Government had considerable success in breaking the back (and spirit) of the pirates, it did come to realize that the stations were actually offering something the people wanted to hear. So Radio 1, a so-called pop-oriented "young" station, was launched from various locations on 1063, 1089, and 1485 kHz. Some of the former pirate station DJs were even hired by Radio 1. There are also a number of independent (non BBC) local stations now on the air which offer programming aimed at a contemporary audience.

Almost more importantly, Caroline's reputation as THE offshore pirate radio station seems to have earned it a very special place in every listener's heart. The station has always had its problems, going off the air for extended periods, and its philosophical outlook towards the end of its previous period of operation did leave something to be desired. But it has a romance, a mystique, an aura of its own; some might wish to call it charisma. Maybe because it bucked the system and won, or because it has fiercely clung to life against seemingly overpowering odds, people look upon it with affection and were heartened at its return last August.

As Ian Anderson said, "The pirate radio station overcame...by an informal business organization, a steady source of idealistic backers and the enthusiasm of young broadcasters who were willing to put up with a lot for the chance to play rock 'n' roll..."

Insofar as "putting up with a lot" goes, it appears that Radio Caroline's spot in the center of controversy may not yet be over. Almost as soon as it went on the air last August, it came under fire from several low-power university-based broadcasters who also operate on 963 kHz. Things have never been easy for Caroline.

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Reader Inquiries

At Cohen of Grass Valley, California, says he’s purchased several military surplus vehicles which he’s restoring for various uses, including survival operations. He’s having a problem with obtaining information and parts concerning the communications equipment for these vehicles. He wonders if we can direct him to any source for what he requires. My suggestion for one possible source is Fred J. Lindig Radio Specialties, P.O. Box 11493, Tucson, AZ 85734-1493. This company has a catalog (costs $1, refundable with first order) relating to vehicle restorations, mil communications gear, mounts, antennas, and other ex-GI items.

From Utica, Mississippi comes a card from Larry Tilden that reports he is having difficulty obtaining BA-37 or BA-38 batteries which are required to power his BC-611 hand-held military transceiver. Larry, you can get adapter units which will permit the use of standard batteries in a BC-611. Units are also available for utilizing standard batteries in the AN/PRC-6 and AN/PRC-4. Details are available from TNM Enterprises, P. O. Box 2331, Anaheim, CA 92804. For those several others who have written in asking about the BA-399/U mil battery required for the AN/PRC-4 helmet walkie-talkie, these can be obtained from B. Asbury, 56 Harvester Ave., Batavia, NY 14020. Check with the supplier regarding prices and availability.

Charles Mosconi, Woodbridge, Virginia says that when he was in military service he once saw a room “gone over” by intelligence specialists using a device which could detect any hidden transmitters (bugs) which might have been placed there. He wonders if we can identify the equipment and advise where such a device can be purchased. Unfortunately the descriptive data provided by Charles wasn’t sufficient to permit an exact identification; however one unit which can be used for this purpose, and which is available on the surplus market, is the RF-204/U RF interference detection set. These sell for about $110 (new) and one source we know of is Frank Moreland, 3748 Yosemite, San Diego, CA 92109.

I continue to receive constant inquiries asking about companies that can supply military surplus communications equipment in small single-unit lots or in lots ranging up to 25 or 50 or more. Four reliable sources offering a nice selection of transmitters, receivers, hand-held units, manpacks, and other commo equipment are: Fair Radio Sales, P. O. Box 1105, Lima, OH 45802; Michael P. Murphy, 11621 Valle Vista Rd., Lakeside, CA 92040 (catalog $1 plus self addressed stamped long envelope); Baytronics, Box 591, Sandusky, OH 44870; and Western Wireless Inc., 4840 Tahoe Circle, Martinez, CA 94553 (catalog $3). If these four companies can’t supply what you want in the way of mil surplus commo gear, then it probably doesn’t exist. By obtaining the catalogs of these four companies, you’ll have a pretty complete picture of just which equipment is available on the surplus market.

Topographic Maps

As a special treat to kick off the new year, we are presenting a special feature this month, submitted to the column by reader Dennis G. Brewer of North Carolina. Anyone who has ever considered establishing a communications system in a remote area can attest to the importance of being thoroughly familiar with the “lay of the land” in order to check out obstructions, signal paths, elevations above sea level, etc. Dennis offers some suggestions on an easy and relatively inexpensive way of doing this.

The U. S. Government publishes topographic maps that should be of interest to survivalists and anyone else at all curious about his or her surroundings.

"Topographic" indicates that the maps show elevations—the “lay of the land” in other words—where the hills and valleys are located.

The maps most likely to be of interest to survivalists are designated as the “7.5-minute series.” Each map covers a 7.5-minute square (in latitude and longitude). One inch

Hubbard produces a series of 3-D raised relief maps which are highly detailed and worth having.
on the map equals 2,000 feet on the ground. These maps are not your standard road maps! They are exquisitely detailed—roads, trails, rivers, large ditches, dams, railroads, township lines, swamps, campsites, woodlands, orchards, transmission lines, even buildings and some fence lines!

Inspection of the maps of your "neighborhood" is almost certain to turn up some surprises. My family, for example, regularly vacations in a certain place that we thought we knew pretty well. Maps revealed roads that we never knew existed—and an old railroad right-of-way... complete with a tunnel! We discovered structures in areas nearly inaccessible in the dry summer weather. We can't help but wonder about the snowy winter.

If you like to hike, hunt, build antennas—or just wonder what is beyond the forest or over the ridge—you will love these maps. They're outrageously inexpensive, too! Just $2.00 each, postpaid!! You can get a free index of any state (as well as Puerto Rico, U.S. Virgin Islands, Guam, American Samoa, and Antarctic) and a booklet describing topographic maps by writing to the U.S. Geological Survey office covering your primary area of interest. East of the Mississippi River: Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202. West of the Mississippi: Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, CO 80225.

Editor's postscript: As some additional information to the interesting and useful ideas presented by Dennis, I'd like to mention that another source of maps are those produced by Hubbard, Box 104, Northbrook, IL 60062. Hubbard produces 3-D raised relief maps which are pretty fantastic. These are made from hard plastic and you can actually see and feel the contour of the land surface. The Hubbard maps are large size and available for select mountainous areas of eastern and western USA, plus Hawaii. Prices are less than $14 per map (shipping extra). Write to Hubbard for a catalog.
New RTTY software packages seem to be released monthly as various low-cost demodulators are introduced to market. RAK Electronics, Box 1585, Orange Park, FL 32067-1585 announced two RTTY software packages to interface either the Commodore 64 or VIC-20 with a TTL compatible terminal unit such as the MFJ1224/5 or the HRA Electronics TU-II. At $19.95 plus $2.00 S & H for the RAK software combined with the low-cost VIC-20 and MFJ unit, this comprises the least expensive full-screen RTTY system. This also allows reception of 5 to 30 wpm morse code in addition to 45 to 100 baud Baudot.

The HAM transmitting version, the RTTY II converts the Commodore 64 and VIC-20 computer into a bidirectional video display RTTY terminal. Features include split screen operation, four 255 character definable messages, and four preset messages, including RTTY QO, RY test, time transmission, and CW ID. A total of 16 different functions and controls are available.

Keep in mind, however, that a serious penalty in readability is paid if a Commodore VIC-20 is used. Ever try to read a 22 character line that will wrap around four times to complete a sentence? An awkward, chopped-up display results. This is fine at first, but wears on one during extensive usage. The Commodore 64 or a standard 80 x 24 display is certainly preferable to the limited character density of the VIC-20. It still is the lowest cost introduction to RTTY with the exception of the single line portable RTTY units such as the minireader.

Several of our readers have inquired as to the proper interpretation of the RTTY weather format. In 1878, the directors of the national weather services established the International Meteorological Organization (IMO) whose aim was the orderly observation of the weather. After World War II, the IMO was reorganized as the World Meteorological Organization (WMO) and in 1951 the United Nations recognized the WMO as a specialized agency. The WMO exists to promote the application of meteorology to agriculture, shipping, aviation, and many other human endeavors. This requires a massive worldwide exchange of meteorological information for forecasting and extensive research. More than 130 countries now collaborate in a surface network of 7000 observing stations!

Surface weather observation involves the measurement of certain parameters that, taken together, give a full description of the meteorological state of the lower atmosphere at any one time period. The most familiar parameters are pressure, temperature, humidity, cloudiness, visibility, wind, precipitation, and sunshine. These form the core or basis of the many other variations possible. Pressure is the parameter that forms the center of most synoptic or overall analyses. Synoptic analysis means the use of meteorological data obtained simultaneously over a wide area for the purpose of presenting a comprehensive and hopefully instantaneous picture of the state of the atmosphere. This instantaneous weather snapshot is made possible by RTTY communications and other forms of communications. Actually, a three hour maximum time span is considered by WMO to be instantaneous. Figure 1 outlines the RTTY numeric code used in transmitting synoptic weather information. This outline represents a brief review of the measurement and observations taken at full synoptic stations, some every half hour but most every three hours from midnight GMT.

Using a global network of over 7000 land stations and over 5000 passenger and merchant ships that make observations at sea, a broad weather picture is obtained. After all, one observation post will not give us much understanding of the general atmospheric conditions but many such stations all observing with the same regularity will give us a synoptic time-changing overall pattern. This surface observation is complemented by the meteorological satellites used for detecting closed forms and measurements of radiation (usually infrared). Surface observation cooperation is fostered by the World Meteorological Organization, but the actual facilities are provided by the national meteorological services.

The observations of the weather are translated into Baudot numbers and transmitted to each national meteorological center by RTTY. By using HF, this weather information is made available to all countries from a large area quickly. Several million coded figures are received daily. Referring to Figure 1, we can see how the numeric Baudot numbers are broken down. The first three numbers indicate the specific station. For example, 405 refers to Washington.

**Intercepts**

<table>
<thead>
<tr>
<th>Frequency (kHz)</th>
<th>Callsign</th>
<th>Location</th>
<th>Agency</th>
<th>Time GMT</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>17509</td>
<td>KRH51</td>
<td>London, England</td>
<td>US Embassy</td>
<td>1500</td>
<td>100/850N</td>
</tr>
<tr>
<td>17545.5</td>
<td>FTR54</td>
<td>Paris, France</td>
<td>AFP News (Spanish)</td>
<td>1520</td>
<td>67/425N</td>
</tr>
<tr>
<td>17567</td>
<td>CLN570</td>
<td>Havana, Cuba</td>
<td>Prensa Latina</td>
<td>1504</td>
<td>67/425N</td>
</tr>
<tr>
<td>18405</td>
<td>RCT57</td>
<td>Nikolayev, Ukrainian SSR</td>
<td>TASS (French)</td>
<td>1515</td>
<td>67/425R</td>
</tr>
<tr>
<td>18671</td>
<td>FTS67/13</td>
<td>Paris, France</td>
<td>AFP News (English)</td>
<td>1519</td>
<td>67/425R</td>
</tr>
<tr>
<td>19070.6</td>
<td>Rabat, Morocco</td>
<td>MAP News (French)</td>
<td>1529</td>
<td>67/425R</td>
<td></td>
</tr>
<tr>
<td>19171.1</td>
<td>Rabat, Morocco</td>
<td>MAP News (French)</td>
<td>1530</td>
<td>67/425R</td>
<td></td>
</tr>
<tr>
<td>19235</td>
<td>RWW70</td>
<td>Moscow, USSR</td>
<td>TASS News (French)</td>
<td>1532</td>
<td>67/425R</td>
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<tr>
<td>19830</td>
<td>RWW76</td>
<td>Moscow, USSR</td>
<td>TASS News (Portugal)</td>
<td>1538</td>
<td>67/425R</td>
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<tr>
<td>19070.6</td>
<td>WKF39</td>
<td>New York, NY</td>
<td>AP (testing)</td>
<td>1540</td>
<td>67/850N</td>
</tr>
<tr>
<td>19865</td>
<td>YZJ4</td>
<td>Belgrade, Yugo</td>
<td>Tangung News (Spanish)</td>
<td>1541</td>
<td>67/425N</td>
</tr>
<tr>
<td>20078</td>
<td>FTU8</td>
<td>Paris, France</td>
<td>Min. For. Affairs</td>
<td>1544</td>
<td>67/425N</td>
</tr>
<tr>
<td>20318.5</td>
<td>FTU31A</td>
<td>Paris, France</td>
<td>AFP News (Spanish)</td>
<td>1628</td>
<td>67/425N</td>
</tr>
<tr>
<td>20330.4</td>
<td>?</td>
<td>Tripoli, Libya</td>
<td>News (French)</td>
<td>1630</td>
<td>67/425N</td>
</tr>
<tr>
<td>20560</td>
<td>?</td>
<td>Tripoli, Libya</td>
<td>JANA News (English)</td>
<td>1633</td>
<td>67/425R</td>
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<tr>
<td>20785.9</td>
<td>CMN92</td>
<td>Rabat, Morocco</td>
<td>MAP News (French)</td>
<td>1637</td>
<td>67/425R</td>
</tr>
<tr>
<td>20957.1</td>
<td>?</td>
<td>Rabat, Morocco</td>
<td>News (Spanish)</td>
<td>1639</td>
<td>67/425N</td>
</tr>
</tbody>
</table>

**Figure 2**: These are selected listings from the RTTY log of Tom Kneitel, NY.
Symbolic Form of Message

```
iii  N°4fF  VVwwW  PPfTT  NiC;hCuCM  TdT,app  7RRR,5
```

Sample Coded Message

405  83220  12716  24731  67292  30228  74542

**Explanation Of Symbols And Map Entries**

<table>
<thead>
<tr>
<th>Symbols in order</th>
<th>Explanation of symbols and decode of as they appear</th>
<th>Example above</th>
</tr>
</thead>
<tbody>
<tr>
<td>iii</td>
<td>Station number 405 - Washington</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Total amount of cloud 8 - completely covered</td>
<td></td>
</tr>
<tr>
<td>dd</td>
<td>True direction from which wind is blowing 32 - 320° NW</td>
<td></td>
</tr>
<tr>
<td>ff</td>
<td>Wind speed in knots 20 - 20 knots</td>
<td></td>
</tr>
<tr>
<td>VV</td>
<td>Visibility in miles and fractions 12 - 13/15 or 3/4 miles</td>
<td></td>
</tr>
<tr>
<td>ww</td>
<td>Present weather 71 - continuous light snow</td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>Past weather 6 - rain</td>
<td></td>
</tr>
<tr>
<td>ppp</td>
<td>Barometric Pressure (in millibars) reduced to seal level 247 - 1024.7 mb.</td>
<td></td>
</tr>
<tr>
<td>TI</td>
<td>Current air temperature 31 - 31°F</td>
<td></td>
</tr>
<tr>
<td>Nh</td>
<td>Fraction of sky covered by low or middle cloud 6 - 7 or 8 tenths</td>
<td></td>
</tr>
<tr>
<td>C;</td>
<td>Cloud type 7 - Fractocumulus and/ or Fractocumulus of bad weather</td>
<td></td>
</tr>
<tr>
<td>h</td>
<td>Height of base of cloud 2 - 599 feet</td>
<td></td>
</tr>
<tr>
<td>CM</td>
<td>Cloud type 9 - Altostratus of chaotic sky</td>
<td></td>
</tr>
<tr>
<td>C;1</td>
<td>Cloud type 2 - Dense cirrus in patches</td>
<td></td>
</tr>
<tr>
<td>Td,</td>
<td>Temperature of dewpoint 30 - 30°F</td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>Characteristic of barograph trace 2 - rising steadily or unsteadily</td>
<td></td>
</tr>
<tr>
<td>pp</td>
<td>Pressure change in 3 hours preceding observation 25 - 3.8 millibars</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Indicator figure</td>
<td></td>
</tr>
<tr>
<td>RR</td>
<td>Amount of precipitation 40 - 0.45 inches</td>
<td></td>
</tr>
<tr>
<td>R,</td>
<td>Time precipitation began or ended 4 - 3 to 4 hours ago</td>
<td></td>
</tr>
<tr>
<td>s</td>
<td>Depth of snow on ground</td>
<td></td>
</tr>
</tbody>
</table>

A complete station directory can be obtained from NOAA, National Weather Service, Communications Division, Grammanx Building, 8060 13th Street, Silver Springs, MD 20910. Also, the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, World Wide Marine Weather Broadcasts. Stock #D03-018-00071-7, price $2.00. Also from the U.S. Government Printing Office available inclusion a general weather catalog #58-234 issued June 18, 1976. An excellent source of meteorological stations listed by country is the World Wide Radioteletype Stations in Frequency Order, list "R", by Klingenfuss. This lists in Chapter VII many countries (from Afghanistan to Viet Nam) that transmit weather coded data. Universal Electronics, 4555 Groves Road, Suite 3, Columbus, OH 43227 sells list "R" for $12. Listed after the station number is total cloud cover, wind direction, wind speed, visibility (in miles), present weather, past weather, barometric pressure, current air temperature, low or middle cloud cover, cloud type, height of base of cloud, secondary cloud types, temperature of dewpoint, barometric tendency, pressure change in 3 hours preceding observation, indicator, amount of precipitation, time of precipitation, and depth of snow (if any) on ground. Quite a complete weather observation! Now, to receive the weather codes, please turn off your "unshift on space" or USOS switches. Since the weather codes are transmitted as strictly numeric codes, USOS will switch the display to a letters mode upon reception of a space character. Of course, we do not want to mix letters in a numeric format. Some of the more recent sampling of meteorological RTTY signals can be found by tuning to the frequency listings in Figure 1.

**New 1982 DX Countries Chart**

Now available!

Large-size wall chart lists all the official DX Countries in the world with a host of valuable data about size, population, government, etc. No shack is complete without one! 23" x 35", two colors, on heavy poster stock. Mailed by First Class mail, folded in 9" x 12" envelope. Only $2.95 each, postpaid. Quantity prices available.

**CALLING ALL SOUTHERN CALIF. DX'ERS!**

SCADS is having a gathering and invites all SWL's and radio fans! The get-together will be 18 February, 1984, at the Mercury Bank Room, 4140 Long Beach Blvd., Long Beach, CA, 10 AM to 4 PM PST. There will be a potluck lunch, raffle awards, door prizes, auction. A film on the BBC will be shown and there will be equipment displays, plus a guest speaker, a Q & A session. Radio station giveaway goodies and local club displays are a part of the day. For more information, send a #10 legal size SASE to SCADS, 3809 Rose Ave., Long Beach, CA 90807-4334. Thanks to Stew MacKenzie of ASWL and SCADS for letting us know about this. Hope you can be there; these gatherings are always interesting and enjoyable. All of us here at POP'COMM want to wish ASWL all the best on the club's 25th year as a hobby group!
Beacon Monitoring Techniques

How To Monitor The Really Low Bands

BY MICHAEL MIDEKE, WB6EER

A few especially hardy or stubborn souls have always made a pastime of monitoring the Low Frequency spectrum. Until recently, this activity has been complicated by the necessity of obtaining special receivers and by the amount of tedious research required to identify signals. With the appearance of an increasing number of general coverage receivers and converters that will tune down to at least 150 kHz, it becomes possible for the casual listener to see what can be heard below the broadcast band. Thanks to The Longwave Club of America and the dedicated efforts of members Ken Stryker and John Clements, the comprehensive Beacon Guide and other resources are available for the identification of thousands of signals in the Low Frequency region.

Between 150 and 500 kHz, at least seven types of signals may be found (see listing appended). This article will be concerned with the two types of transmissions likely to be most easily heard and identified by the casual listener: Broadcasting and Non Directional Beacons (NDBs).

The Low Frequency broadcast band extends from 155 through 281 kHz. There is no LF broadcasting in North or South America, but many stations running 500 kw and more are active in Europe, North Africa, and Asia. Many listeners on the east coast of North America are able to hear European and North African broadcasts. East Asian stations are regularly copied on the west coast of North America. Some of the more successful listeners in the inland states are able to copy a few LF broadcast signals. Listeners located mid-continent from the Canadian border north have a good chance of hearing broadcasters from both Europe and East Asia.

Here are some LF broadcasters that have been frequently reported by North American members of The Long Wave Club of America over the past two years:

Europe/North Africa
- 155 kHz Brasov, Romania
- 164 kHz Allouis, France

East Asia
- 155 kHz Khabarovsk, USSR
- 182 kHz Petropavlovsk, USSR
- 191 kHz Blagoveschensk, USSR
- 245 kHz Vladivostok, USSR

DXing LF broadcasters is mainly an activity for winter nights. A path of darkness between transmitter and listener is practically essential over the long distances involved. However, spectacular signal enhancement can occur at dawn and sunset and the long-distance signals of East Asia.

BC453 receiver and tuned active whip antenna. Receiver has been converted to solid state by the author and modified to cover 160-500 kHz in two bands. Active whip also constructed by the author, includes variable inductor to tune whip and a pre-amplifier.
Non Directional Beacons

There are thousands of Non Directional Beacons (NDBs) operating between 194 and 415 kHz and in a small additional band between 512 and 532 kHz. Most such beacons operate around the clock, 365 days a year and the majority have just one purpose—to mark a particular place for the convenience of ship and air traffic. This is achieved by the continuously repeated broadcast of an assigned identifier (IDENT) in International Morse Code. Idents are run at a fairly slow speed, so even if you don’t know the code they can be easily copied by writing down the dots and dashes and looking up the letters. If you miss it the first time, don’t worry, it’s sure to repeat. A little serious DXing on the beacon band and the listener may well find that he has memorized the code with very little pain and strain!

In addition to the ident, a few high power stations provide continuous or scheduled weather information and Notices To Airmen. These transmissions are conventional AM phone and they can provide useful weather updates as well as good clues to stations’ locations. Most listeners will find they are within easy daytime range of several NDBs and at least one voice weather outlet.

NDBs are classified according to Aeronautical and Marine service. The two types of beacons can be distinguished by frequency and by transmission format. Aeronautical beacons have exclusive use of 200 - 285 kHz and 325 - 352 kHz. Maritime beacons have a primary use of 285 - 325 kHz, shared with inland Aeronautical beacons on a non-interference basis. American and Canadian marine beacons will transmit idents consisting of one or two characters for 50 seconds, followed by a 10 second dash. In some cases three or more Marine beacons will operate sequentially on a single frequency. Each beacon in the sequence will transmit 50 seconds of ident and a 10 second dash, then it will be silent until its turn comes around again. Frequently, the DXer will find he can hear only one or two elements of a five beacon sequence and it becomes quite challenging to try to dig out the missing beacons.

American Aeronautical beacons virtually all have an ident consisting of three characters with a repetition rate between 6 and 12 seconds. Canadian Aero beacons are readily identifiable because each repetition of the ident is followed by a short dash. Canadian Aero idents may consist of either two or three characters, and numerals as well as letters may be used.

Natural and man-made noises are practically always a problem on LF, but noise can often be waited out or steps can be taken to reduce its severity. Effort that leads to more signals being heard inspires attempts to dig still deeper into the background, resulting in still more signals being heard. So it is not really surprising that a fair number of dedicated enthusiasts devote a large part of their listening time to frequencies below 500 kHz. Some have managed to log and identify well over 1,000 beacons, representing many states and countries, several continents, distances of 5,000 miles and more. Several times in my few years of DXing the beacon band I have decided that I’ve logged about everything I could expect to hear except for new signals (worldwide, new beacons are being assigned frequencies and ids at a rate of 20 to 50 per month) only to find whole new realms appearing either at the whim of propagation or as a result of my technical efforts.

During winter months, the long nighttime hours are often nearly or completely free of atmospheric noise. At such times, propagation will be observed to vary on a continual basis, with signals fading on periods of anywhere from a couple of minutes to an hour or more. As any given frequency may be simultaneously occupied by as many as forty (or even more) beacons in different locations; on a good evening, it is possible to leave the receiver set on one spot for hours at a time, observing several signals in a complex fading pattern which will eventually bring many or all into the clear long enough to identify. Add a loop or other directional antenna and the game becomes even more fascinating.

Surprises abound on longwave. I have been listening late in the evening to a strong voice weather station only 100 miles away and heard PJG in the Netherlands Antilles coming fading up on the same frequency until it was perfectly readable! Ordinary daytime propagation for all but the most powerful NDBs is at most around 300 miles. However, occasional variations in the D layer brought about by geomagnetic disturbances will create enhanced propagation conditions which bring daytime signals from 900 to 1300 miles up to easily readable levels. Such openings tend to occur during the winter with mid-morning and mid-afternoon peaks. Frequently, the opening is directional to north or south. There are always exceptions. Summertime openings have been observed and the phenomenon is not always directional. From my location on the Central California coast I have sometimes copied Victoria, B.C.; Lethbridge, Alta; Circle, MT; Albuquerque, NM; and El Paso, TX at a single short midday listening session.

Dawn is a special time on longwave. Here on the west coast I find that about 45 minutes before sunrise most of the signals and noise from the east have disappeared and conditions are just right for reception of signals from across the Pacific. Beginning in late June or early July, beacons from New Zealand, Australia, New Guinea, and the Polynesian Islands can sometimes be heard. By August, the southernmost signals are heard only rarely but several Hawaiian signals appear, including some beacons running as little as 15 watts. In September, the emphasis shifts north to Japan and by October and November a few beacons along the Siberian Coast, the Siberian broadcast stations, and a few Alaskan NDBs are the extent of the dawn “catch” from my location.

Such signals don’t last for long and they do not appear every morning by any means, so this is a waiting game in which a well devised listening strategy will pay off. Listeners in other locations will find the dawn effect has different characteristics. Even a few degrees of latitude along the coast can make surprising differences as to what can be heard when. Every location has its peculiar advantages and problems and no location will exactly duplicate results obtainable somewhere else.

Sunset propagation can also be dramatic on longwave. Sometimes a couple of the more effective east coast beacons can be heard well before dark in California. East coast listeners have a good shot at European beacons and broadcasters around sunset, before noise and interference from the west become a problem.

Receivers And Techniques

The aspiring longwave listener has many possible choices of receiving equipment. Many general coverage receivers now reach down to at least 150 kHz. Some perform better than others, and in general you get what you pay for in new equipment. Practically all receivers will benefit from the use of external antenna tuning and impedance matching circuitry. Some receivers and converters will be virtually useless without such help. At least two companies (Palomar and MFJ) offer receiving converters which permit copy to 10 kHz or lower, using a communications or general coverage receiver as a tunable first IF at 3.5 or 4 MHz. These converters work quite well, with attainable results generally limited by the quality of the receiver employed. Again, antenna tuning and matching will prove desirable if not essential.

Very fine military surplus receivers of modern design are sometimes available, usually at fairly high cost. The older surplus gear should not be neglected. Often it had to have the hulling or for a few dollars at radio flea markets. Many listeners are obtaining excellent results with TRF receivers such as the RBL and RBA “boat anchors” which may be over 40 years old. At the frequencies...
of interest. Tuned Radio Frequency (TRF) designs can be highly effective and some of the older military gear was very well designed and constructed. The BC453 receiver (190–550 kHz), fondly remembered by many Hams as the "QSER," is still an excellent receiver. It can be found for as little as $50 at flea markets! Several experimenters have had good luck with solid-state conversions of the BC453; in fact for some the conversion and modification of these receivers has become almost a hobby in itself.

For information about using a converter, check with MFJ Enterprises (Mississippi State, MS 39762) about their Model 331 or Model MFJ-332. Also contact Palomar Engineers (1924 F West Mission Blvd., Escondido, CA 92025) for specs of their VLF equipment.

Many listeners will be disappointed in their first attempts to hear signals on the low bands. Typically they will hear a few weak signals buried in a combination of roaring noise and a welter of misplaced AM broadcast signals, plus an assortment of grinding and throbbing sounds. At this point it is easy to switch the thing off, blaming receiver or location or both. In many cases, the only fault of the receiver is that it is placed in an environment filled with extremely intense RF fields on undesired frequencies. These signals make their way into the receiver's front end and create all sorts of havoc.

What is needed is an antenna tuner or pre-selector or filter to reduce the intensity of out-of-band signals reaching the receiver, hopefully eliminating front-end overloadng with all of its disastrous consequences. Several units are available commercially. However, this is an area where it is not difficult to "roll your own," a few hours playing with a few inductors and a couple of variable capacitors variously arranged between antenna, receiver, and ground can be both instructive and rewarding. You can't hurt the receiver and you can hear the results of your efforts. But be absolutely sure there is no AC line voltage present on any exposed part of the receiver.

A carefully designed and constructed LF antenna tuner can have sufficiently narrow passband to substantially reduce the amplitude of broadband noise reaching the receiver. Noise is mainly broadband, signals are narrowband, if the receiver is inhaling more spectrum than the signal occupies, the signal to noise ratio is degraded. While antenna tuning can improve receiver performance, it is no solution to big noise problems. If the receiver must be operated from the AC lines, then a good line filter is in order. If the receiver has the option of battery operation, it may prove worthwhile to use battery power even from the home listening post. It may be necessary to establish a separate ground for the receiver, as well isolated as possible from existing utility grounds. Wire antennas should be run at right angles to powerlines and away from noise sources insofar as possible. Loop antennas should be tuned to the desired frequency and oriented to null worst noise or to peak the desired signal, whichever works best. Whips should be located in the quietest available location.

In general, except when listening for voice signals, the most effective reception will be obtained with BFO (CW position) using a narrow IF bandwidth if available and a reasonably sharp audio filter, bearing in mind that when distortion interferes with intelligibility you have gone too far! Most NDBs do not actually modulate a carrier; rather, they generate two signals separated by the desired audio beat frequency. One signal is continuously on while the other is keyed according to the ident. So, a selective receiver in the "CW" position will tune the keyed portion of the beacon transmission just like any other CW signal. Good selectivity will eliminate the "carrier" signal, along with a great deal of noise and interference.

Here is a list of beacons whose signals have been consistently heard outside their immediate coverage area during the past two years. Thanks to the "Loggings" section of The Loudown for much of this information. As far as is known at present, all listed stations are presently on the air on the listed frequencies, but frequencies and ident do change irpredicatly. Happy listening and good luck!

Resources:

The Longwave Club of America
45 Wildflower Road
Levittown, PA 19057
$10 per year. Includes subscription and contributing privileges to The Loudown—20 to 30 pages of good information every month.

The Beacon Guide by Clements and Stryker. Lists over 5500 beacons by frequency and ident. Update sheets published in The Loudown. LWCA members $6, non members $7. Century Print Shop, 6059 Essex St., Riverside, CA 92504-1599. Check or money order payable to Don Erickson.

### Distribution Of Main Users: 150-500 kHz

- 150-200 Military
- 150-200 "Carrier Current" power grid telemetry
- 150-190 1 Watt experimenters
- 155-285 Broadcast (Europe, Asia, Africa)
- 194-285 Aeronautical beacons
- 285-325 Marine beacons primary, Aeronautical beacons
- 325-415 Aeronautical beacons
- 415-500 Maritime Mobile and Shore Communications, shared with some military and soon to be shared with Aeronautical beacons

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**Selected Non-Directional Beacons**

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**FREE SAMPLE AVAILABLE UPON REQUEST**
It sounds like it's science fiction, but soon radio signals containing bursts of data will be bounced off meteor trails in Alaska.

The new Meteor Burst Communications System, recently approved by the Federal Communications Commission, allows a large network of remote transmitters to be tied together for the collection and transmission of data. The new system to be used by the state of Alaska will enable the state to collect aviation weather data from many isolated areas that may be either dangerous or inaccessible for human operators.

A meteor burst radio system uses a computer-aided switching system coupled with special transmitters to bounce radio signals off the ionized, or charged, particles left behind by a passing meteor. The meteor trails are continually produced in the Earth's atmosphere at altitudes of 50 to 75 miles. Radio signals that are bounced off these charged trails can be received at distances up to 1,250 miles away. Although the meteor trails last for only a few seconds, the system works because billions of meteors are constantly entering the atmosphere.

In the system approved for the state of Alaska, a base station would control the flow of data from up to 1,000 remote transmitter sites. The base station transmits a coded digital signal until it picks up a meteor trail and is received at a remote transmitter site. When the remote transmitter receives that signal, it transmits any information it has collected in a high-speed burst back to the base station as long as the meteor trail remains available.

"The ability to communicate by reflecting radio waves off of ionized meteor trails was recognized around 1951," the FCC said in its six-page decision authorizing the establishment of the service. However, advances in technology such as solid-state electronics and computers did not allow such a system to become more reliable and affordable until the 1970's, the FCC added.

"Meteor burst communications can provide an alternative mode of operation to conventional skywave propagation, microwave or satellite systems," the FCC said. "Further, the ability to transmit from remote or hazardous locations without the need for a human operator will contribute to improving individual safety."

The two frequencies—one for the base station and the other for the remote transmitters—allocated by the FCC for use in Alaska are 42.40 and 44.10 MHz. The FCC also allocated a pair of frequencies for private systems in Alaska. These frequencies, 44.20 and 45.90 MHz, might be used by mineral exploration companies as well as scientists and firms interested in avalanche prediction.

The Commission will issue only developmental licenses to those applying in the new service, however, to safeguard against possible problems such as television interference.

Although this may be new for Alaska, the federal government has operated meteor burst communications systems for some time. One such system, operated by the Department of Agriculture in the west, collects and transmits information on snow depths and ice flows in remote locations.

Tricking The BC-220FB

Alan O'Connell of New Ross, Ireland, sends along some tips on getting the Bearcat 220FB to search out of band. Our readers outside the United States and Canada who have these "foreign band" Bearcat scanners might want to try this trick on their radios (the "foreign band" Bearcat units include the 66-88 MHz midband).

In order to search the 50-54 MHz amateur band, Alan says he uses the following technique:

Press "50"
"Enter"
"Limit/hold"
"66"
"Limit/hold"
"Search"
"Limit/hold"
"Search."

The radio then should search between 50 and 66 MHz. Both the lower limit (50 MHz) and the upper limit (66 MHz) already are programmable into the radio. Alan says he also has "tricked" his BC-220FB to search between 174 and 420.450 MHz as well using the above technique. However, he notes the set suffers severely from "birdies" above 330 MHz.

Alan also notes that with further experimentation, the scanner receives in the AM mode between 136 and 144 MHz (some military aircraft in the United States operates in the AM mode in this band). Also, the channel spacing is 25 kHz, the same as the 118-136 MHz aircraft band on the radio.

Alan goes on to say that the out-of-band frequencies cannot be entered into the radio's memory. However, a frequency such as 66.005 MHz can be memorized once the set is programmed to search between 50 and 88 MHz. The scanner retains the 5 kHz spacing in the 30-50 MHz band, right through the 66-88 MHz band, even though the normal search spacing is 12.5 kHz in this range.

Call Temps

Have you been hearing some callsigns lately that sound more like telephone numbers? Perhaps they really are telephone numbers.

The FCC recently amended Part 90, the rules for all land mobile radio services, to allow for temporary licensing for all new users of existing shared repeaters or base stations. So while the user waits for the license to come back from the FCC, the business or agency uses a callsign of WT followed by...
telephone systems, and microwave transmitters. The unit even has a jack so that it can be connected either to a printer or TV screen to receive weather satellites.

Now if the manufacturers can figure out ways to receive even more of the technological advances, i.e. DVP, packet, amplitude compandered sideband...

Mailbag

Peter Prichard of Krebs, Oklahoma, writes in to say he heard a station on 45.10 one morning identify as "Somerset County Police Radio Network." He theorized it may have been Somerset County, New Jersey, that he was hearing.

Actually, Peter, you were hearing Somerset County, Pennsylvania, and their correct callsign is KGG601. (Somerset County, New Jersey, operates on 39.18 MHz and I wouldn't be surprised if you hear them some day as well.) He says he was able to listen to the station clearly for at least four hours.

Peter does raise an interesting question about how to obtain QSLs from stations he hears on his scanner, especially when he doesn't have an address. In the case of the Somerset County station, your letter probably would be delivered if you addressed it either to the chief dispatcher or communications director in care of the Somerset County Police Radio Network in Somerset, Pennsylvania, which is the county seat of that county and is where the transmitter is located.

Generally your letter will get through without a street address for most public safety agencies. There's usually only one police department in a town, so if you address it to the police chief, include the name of the department or agency and the town, it should get there. It wouldn't hurt to call the post office for the zip code of the town to help route your letter faster.

In order to make your letter more meaningful to the department or agency you hear, include sufficient details about what you heard to indicate it actually was their station (such as "Headquarters" contacted Car 90 at 1304 EST, Car 92 at 1306 EST, Car 93 at 1313 EST, etc.). Be careful about including actual details about what you heard as that might cause problems with the Communications Act of 1934, which governs the divulging of intercepted radio communications.

Also, include details on how well the station was received. The most helpful information will include details such as: Were other stations also being heard via skip on the same channel at the same time? Was the station you were listening to interfering with any other stations? Are you able to receive their station on a regular basis?

Be polite in your request, explain about your hobby, describe your radio equipment and antenna, and don't hesitate to ask for details about the station you heard. It helps to make your QSL more meaningful for both you and to whom you sent the letter.

Clarence C. Neumann of Hardwick, Minnesota, writes in to say he's having problems with some type of power surge noise he con-
continuously heard on some channels on his scanner. It's really hard for us here to diagnose problems by letter not knowing all the circumstances. In many cases, the problems seem to be due to "local" interference. In this case, Clarence, you might very well have some sort of problem locally that is causing interference, which is why the manufacturer can't find any problems when you send back the scanner for repair. Local problems could range from nearby power lines, electric fences, a video game in a bar, etc. There are lots of possible causes: check around and you might just find the source.

Eric E. Rector of South Bend, Indiana, also has a "local" problem. Anytime he tries to listen to the local police on UHF and VHF they continuously talk on the weather channel, causing interference, which makes it impossible for him to listen to the police.

Eric, you might find there are a few scanner frequency stations that have their own QSL cards (as shown here), but usually it means sending them a prepared card to return to you.
Guide To RTTY Frequencies 2nd ed.
Details on 5500 RTTY stations/frequencies in two lists. "Real" press schedules, inside information on new RTTY techniques, etc. 192 pages, paperback, $9.95. Order #G205.

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by Tom Kneitel, K2AES
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World Press Services Frequencies
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Signature required on all charge orders.
Reader Dan Nicholson of Missouri sends along a photo of his listening post. Like so many listeners, Dan has added a microcomputer to his set of DXing tools. Note that Dan uses a Radio Shack SX-190 receiver which was manufactured for Radio Shack by Trio-Kenwood. I once owned one and was quite pleased with it... and I wish I hadn't sold it! Our thanks to Dan for the look at his shack!

George Osier of New York has had great success in getting verifications and other material from time signal stations. He has sent along verifications from JYJ, Japan, and YVTO, Venezuela. As you can see, time signal station QSLs can be just as fancy as those from shortwave broadcast stations. Our thanks to George for sharing them with us!

"The Voice Of The Jaguar"

Now that would be a great name for a pirate radio station! However, it's an apt description for a rather puzzling station first mentioned in this column back in the September, 1983 issue. At that time, Terry Lindley of Alabama reported hearing a station on 15411 kHz at 0711 which was nothing more than a male voice describing a Jaguar automobile, repeating continuously, in SSB.

After the September column appeared, George Zeller of Ohio wrote to report he had also heard the same transmission on 5200 kHz at 0410. George reports that it sounded like the repeating tapes used at auto shows and exhibitions. A second letter was received from Gene Krolak of Michigan who reported hearing the same thing on 5200 kHz from 0722 to 0804. He reports that at one point there was an interruption in the transmission and a sound similar to a tape being rewound.

So what is this? I feel it is most likely a military station testing using the Jaguar tape or an unauthorized testing of a transmitter by a private company or individual. Has anyone else heard this station or have a clue as to what it is?

Nicaragua Claims C.I.A. Is Behind Numbers Stations!

Reader Joe Erwin of Virginia heard the shortwave broadcaster La Voz de Nicaragua on May 26, 1983 and sent them a reception report. They sent him a verification letter and a bonus—a book titled C.I.A. Conspiracy in Nicaragua. In it, Nicaragua claims C.I.A. agents there received coded messages via shortwave radio!

"The September issue of New York magazine carried a story about the guerrilla war against the Sandanista regime in Nicaragua carried out by the "contras." Contra leader Eden Pastora, the legendary "Commander Zero" of the Sandanista victory, has since broken with the Managua government. The photo here shows Pastora seated in front of a modern ham transceiver, which the New York article claims he uses to argue with Sandanista troops in the field! The transceiver shown covers the ham bands in one MHz wide segments (3-4..."

Our thanks to Joe Erwin for passing along this fascinating material!

"More On Nicaragua"

The September 12, 1983 issue of New York magazine carried a story about the guerrilla war against the Sandanista regime in Nicaragua carried out by the "contras." Contra leader Eden Pastora, the legendary "Commander Zero" of the Sandanista victory, has since broken with the Managua government. The photo here shows Pastora seated in front of a modern ham transceiver, which the New York article claims he uses to argue with Sandanista troops in the field! The transceiver shown covers the ham bands in one MHz wide segments (3-4..."
MHz, 7-8 MHz, etc.) in SSB, CW, AM, and FM modes, making it ideal for guerrilla communications. This story underlines a point made in this column several issues ago—the frequencies in and around the various ham bands are excellent places to look for various unusual radio activity!

**Direction-Finding With Loops**

Look through the ads here in POP-COMM and you'll see various advertisers offering what are known as "loop antennas." These antennas are manufactured by such firms as McKay-Dymek, Palomar and others. Basically, a loop antenna is a compact indoor antenna that receives in a figure 8 pattern. This means, for example, that a loop could receive stations located in the north and south well but would "reject" (have decreased signal pickup) for stations located to the east or west. Loops are mounted so they can be rotated, enabling a DXer to reduce interference from stations located at right angles away from the station you want to receive. Loop antennas also allow you to do direction-finding.

Two or more listeners using loops can determine where a station is located with a high degree of accuracy. For example, suppose two listeners, one in New York and the other in Oregon, coordinate their efforts and try to determine where a station is located. By using loops and corrected compasses, it would be possible for both listeners to determine accurate bearings for the station's location. Lines can be drawn from these bearings and extended until they intersect. If the bearings from our New York and Oregon listeners intersected at Dallas, Texas, then that would be where the station they monitored would be located.

It is also possible to determine with a good degree of accuracy where a station is located by using a loop yourself. The secret is to keep records of bearing of stations whose locations are known and comparing these against stations whose locations are a mystery. For example, if a five-digit Spanish numbers station was located on approximately the same bearing as Radio Havana Cuba, that would be a strong piece of evidence the station was located in Cuba. If, however, it was located on the same bearing as WWV, then obviously Cuba would be an unlikely location for the station! (Much of the evidence pointing to stateside transmitter sites for various numbers stations has been accumulated through such direction-finding techniques.)

Any listener interested in doing serious research into determining the locations of various unidentified stations should equip themselves with a loop. I would especially like to hear from any listeners with loops who would be interested in taking part in coordinated monitoring activities designed to pin down the locations of various stations.

**Ask Uncle**

Speaking of direction-finding, some of the most sophisticated direction-finding equipment is owned by our own Federal Communications Commission. Since most of you reading this column are American taxpayers, you have a right to make sure this equipment (paid for with your taxes) is fully utilized. The next time you hear a strange station—such as a numbers station, an unknown beacon or time signal, an unidentified network, etc.—why not try to ask the FCC to take a bearing and tell you what you're hearing? To help you along, here's the locations and phone numbers of some FCC monitoring stations:

- Powder Springs, GA: (404) 943-5420
- Grand Island, NE: (308) 382-4296
- Laurel, MD: (301) 655-4000
- Belfast, ME: (207) 338-4088
- Douglas, AZ: (602) 367-2133
- Fort Lauderdale, FL: (305) 473-9845

If you do happen to ask the FCC to locate and identify some unknown signals, please pass along the results to Communications Confidential—particularly if you ask them to locate any numbers stations!

**Cryptography And Microcomputers**

Odd's are that many of you reading this column own a microcomputer of some sort. I prepare this column each month on an Osborne I microcomputer using the WordStar word processing program.) If so, you may be interested in a book by Caxton C. Foster called Cryptanalysis for Microcomputers published by Hayden Press. In it, you'll find detailed descriptions of various encoding and decoding schemes (such as the one-time pad system) along with BASIC programs to allow you to generate your own codes and cyphers. While it won't let you decode numbers stations transmissions with your microcomputer, it will give you a better insight into how codes are generated and used. You should be able to find this book in many microcomputer book sections.

On a separate note, I would like to hear from readers who are using microcomputers in their DXing and who have modems in their microcomputer systems.

**Broadcast Support Transmissions**

In our September, 1983 column, we had a report of an unidentified ABC TV broadcast relay on 26392 kHz. John Tomaszkie- wicz of Omaha, Nebraska writes that 26100-26500 kHz is allocated for transmitting television audio to production assistance, camera, and remote unit personnel. These stations operate in the FM mode with a maximum of 1.5 watts of power. In the Omaha area, John reports that WOWT-TV operates two such transmitters on 26150 and 26450 kHz. Many thanks for the info, John! How about the rest of you monitoring this range and seeing if any stations in your area use such transmitters? Report any you run across to Communications Confidential!

**From The Mailbag**

Robert Comeau of Nova Scotia writes that utility station WMH is soliciting reception reports of their new transmitters on 63515.5, 8610, and 17093.6 kHz. Their address is the same one given in the September, 1983 edition of this column. Marine Radio WMH, Dundalk Marine Terminal, 2700 Broening Highway, Baltimore, MD 21222. The person soliciting the reports is Chuck Reville, K3FT, Records Chief. All three frequencies will be CW. Thanks for the
Decoded spy message supposedly transmitted by the C.I.A.

Nicaraguan leader Eden Pastora argues almost daily with Sandinista troops using a modern transceiver designed for amateur use. These transmissions are adjacent to the ham bands. (Photograph by Michael Kramer)

Spy message supposedly transmitted by the C.I.A. on 9074 kHz.

Message Number One. I received your letter message number two. I have not received your letter number one. I think it got lost. Do not worry. Write me again. I'm giving you the address again. Mr. Felipe Castro Torres, P.O. Box Nineteen Dash Six Three Five repeat P.O. Box Nineteen Dash Six Three Five. Mexico nineteen DF. Wait for another message with requirements. Best Regards. Luck. Linda Cristal. End End End.

Note: This message was broadcast by the CIA on February 1, 1983.

Message Number Four. I have received your letters Number Seven, Number Eight also Number Nine. The fourth of this month at seven in the morning repeat the fourth of this month at seven in the morning you must go two blocks west of the Aragon Restaurant. There is a yellow wooden post there and at its side in an old bucket a package containing the bottle of wine that Boby told you about. Put it away wait for an opportunity. Do not despair. At waist level put a chalk line on the pole. Regards. Linda Cristal. End End End.

Note: This message was broadcast by the CIA on May 31, 1983.
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61
"Folk sculpture" in which code pads were hidden.

6738: Air Force Two running phone patch through McClellan AFB, CA to Scott AFB, IL in SSB 0330. (Craig Rose, CA) Welcome to the column, Craig!


6769: That 305-mile military traffic in SSB 0355. (Stewart MacKenzie, CA).

6840: "Charlie India Oscar Two" repeated by woman 0240, accent had last word pronounced as "ah-kair.

Two weeks later, pips were heard on this frequency 0325; then a long pip at 0300 and into letter groups in CW. four letters per group. (Thad Adamaszek, OH). An excellent rate. That there has been much speculation as to what the purpose of the various "three phonets/one digit" transmissions are for, with one popular theory being that they are "markers" for various spy/spy numbers/diplomatic traffic. This reception seems to be evidence to support that theory. Also interesting is the use of pips as a lead-in to a "spy" message. Could this be an explanation for the next report and similar unidentified time signals reported in this column recently? (Editor)

6840: Unidentified time signals here 0209-1055 perhaps EBC. Cadiz, Spain. (Peggy Thompson, CA) Welcome to POP COMM and the column. Peggy! Doubt this station is EBC. However, there would be an awful lot of daylight between you and Spain at that hour, making propagation along the path very difficult. Maybe a new Asian time signal? Readers, keep an eye on this frequency. (Editor)


7600: HD2110A. Guayaquil, Ecuador. time signals 0120. (Jim Morrison, ME and Tom Kneitel, NY)

7605: Victor Kilo Victor Two in AM repeated 2347.

(George Osier, NY) Some have suggested these types of transmissions originate from embassies, particularly those belonging to Eastern Bloc nations. How about you readers in the Washington and Ottawa areas checking this out with a portable receiver? Similar to 684010 kHz emissions. (Editor)


8313: Five-digit German numbers station with female announcer 2229. transmission began normally but then went into a "5" pattern and later into a "2" pattern—very obvious! two "lines" at 2340, then again at 2347. (George Osier, NY) Excellent catch. George! This is the first report I've seen of a German numbers station with the "5" or "2" pattern. (Editor) That "5" or "2" refers to numbers stations which read digits in groups of five but with a distinct and appar- ently deliberate "break" between the first and second and third and fourth digits of each group. (Editor)

8417: "315" repeated twice by female in Spanish, then a count from one to zero repeated twice, followed by four digit groups in Spanish 0404. (Thad Adamaszek, OH)

8700: YUR, Rijeka, Yugoslavia. calling CQ in CW at 0329. (Tom Kneitel, NY)

8928: RSPF 928, Portland, OR, aviation weather report read by man in SSB 0335. (Stewart MacKenzie, CA)

9372: "Charlie India Oscar Two" repeated by female 0149. (Robert Conrowe, NC)

1020: AFER. U.S. Air Force, MacDill AFB, FL, working "Tree Beam" in SB 0350. (Tom Lewandowski, NY)

1040: Five-digit German numbers station with female announcer 2330 in SSB. Opened with "Hotel Kilo" repeated twice, followed by a "Kilo" and then six more letters. (Thad Adamaszek, OH)

1050: Five-digit German numbers station with female announcer 0209. (Thad Adamaszek, OH)

9704: Four-digit Spanish numbers station with female announcer 1100, good signals (Jim Morrison, ME). Four-digit Spanish numbers station with female announcer 0109. Opened with "uno ocho cero" (180) repeated twice, followed by a count from one to ten in Spanish. This was followed by ten minute pauses, then announcer said "grup doce, cuatro, cinco, cinco" twice and then into four digit groups. (George Osier, NY)

9975: Five-digit German numbers station with female announcer 0203. transmission opened with a series of double beep groups. (Jim Morrison, ME)

10004: RIR, Irak, USSR, time signals and CW identification 1149. (Fred Lesnick, NY)

10390: Interp CW net 1815, passing traffic related to stolen gold and jewelry. (Tom Lewandowski, NY)

10470: Five-digit German numbers station with female announcer 0206. was in SSB. (Thad Adamaszek, OH)

11243: "Eyesight. "Muzzle," and "Skyhunk" passing coded traffic in SSB 1809. (George Osier, NY)

11482: Five-digit German numbers station with female announcer 1821. (George Osier, NY)

11533: Four Spanish numbers station with female announcer 2213, was in SSB. (George Osier, NY). Excellent reception. George! (Editor) "D4" in Spanish, repeated from 1200-1210, then RTTY bursts from 1210-1212. Excellent signals and was in parallel to 1215 kHz. (Jim Morrison, ME) Another excellent report! (Editor)

11546: Five-digit German numbers station with female announcer 0118, was in SSB. (George Osier, NY)

12095: Five-digit German numbers station with female announcer 0127, was in SSB. (Thad Adamaszek, OH)

12682: LFC, Rogaland Radio, Norway, CQ marker in CW 0350. (Tom Lewandowski, NY)

12690: LFR, Vengar, Bulgaria, CQ marker in CW 0340. (Tom Lewandowski, NY) Also reported at 2358. (Tom Kneitel, NY)

13030: FUF, Francy Navy, Fort-de-France, Martinique. "VVV" marker in CW 1605. (Jim Morrison, ME)

13031: VRN60. Hong Kong, CW marker 1155. (VRN60 DE VRN PSE QSO VPS 'George' ZH029)

13900: UAT, Moscow, USSR. "DE UAT" marker in CW 1616. (Jim Morrison, ME)

13202: JIA, Tokyo, Japan. aviation weather report read in English by man at 0410, SSB mode. (Stewart MacKenzie, CA)

13340: CLP1, Havana, Cuba, calling CLP13 in CW 2330 and into five letter groups. (Don Schimleck, VA)

13382: GFT, Blacknoll Radio, Blacknell, England, CQ marker in CW 1900. (Jim Morrison, ME)

13428: "077 transmitting five-figure groups in CW 2041, all numbers sent normally except that zero sent is "T." (Don Schimleck, VA)

13429: Five-digit Spanish numbers station with female announcer 2129 Signal was strong but audio distorted, suddenly shifts up 204 Hz and then down to 3294 Hz. Bad hum at 20 kHz and back down again twice more. When audio ended a sound like a tape flapping could be heard in the background. (Don Schimleck, VA)

13440: Five-digit Spanish numbers station with female announcer 1130. (Jim Morrison, ME)

13468: "0129.2 912 TTT T" in CW 2311. (Jim Morrison, VA)

13512: Six figure CW groups, five groups per message. 2313, similar to transmissions previously heard on 13395 and 14561 kHz. (Don Schimleck, VA)

13526: 5. CCS, Chilean Navy, Santiago, Chile. "VVV" marker in CW 2054. (Don Schimleck, VA)

13547. Spanish language traffic in SSB 1712. appears to be part of inter American military net. (Don Schimleck, VA)

13808: Pips at 0127, long pip at 0130 and into female Spanish numbers station, in four digit groups repeated over and over. (Thad Adamaszek, OH) Now this is unusual! A good logging. Thad! Readers, check out this frequency from time to time. (Editor)


14361: KWSY, U.S. Embassy. Athens, Greece. QRA marker in CW 2382. (Brian Graham, NY)

14500: LOR, Buenos Aires, Argentina. time signals. CW identification repeated three times 2349. (Fred Lesnick, ON)

15024: RKTTO, possibly a Soviet aircraft. working Col. Havana, Cuba in CW 0104. (Dale Unger, PA / AS1C).

16587: 1. KHT. Cedar Rapids. IA. ship traffic in SSB 1646. (Dale Unger, PA / AS1C).

16735: HLG, Seoul, Radio. S. Korea. in CW at 2253. (Tom Kneitel, NY)


16693: "VVV DE YHM" marker in CW 1701. (G. J. Harris, APO San Francisco) This is a call allocated to Indonesia. Anyone have any information on this station? (Editor)

16740: DJ2Z, Manila Radio, Manila, Philippines. call repeated in CW 1655. (Fred Lesnick, ON)

16948: RCV, Soviet Navy, Moscow. USSR calling CQ in CW via CW. (Tom Kneitel, NY)

17051: 5OW, Fred, D. R. Dakar, Senegal. CQ marker in CW 1725. (Tom Lewandowski, NY)

17173: 1M, Bahrain Radio, Bahrain, "DE AVM" marker in CW 1741. (G. J. Harris, APO San Francisco)

17796: "June Day" and "Tea Bag" reading coded messages in SSB around 1545. Other tactical calls heard included "Stampele," "Ovation," and "Yule Tree." (Dan Nicholson, MO) All these calls are military tactical. (Editor)

Many thanks for the super support this month! See all of you next month in Communications Confidential!
Report On Future Private Land Mobile Telecommunications Requirements


The study was prepared by the Private Radio Bureau’s Planning Staff to provide projections of future private land mobile telecommunications requirements through the end of the century. As the third and last phase of PR Docket 82-10 (Notice of Inquiry, Interim Report and this Final Report), this report consolidates the available information regarding future private land mobile telecommunications requirements, including comments submitted in PR Docket 82-10 in response to the Notice of Inquiry and the Interim Report.

The report projects spectrum requirements for 26 metropolitan areas. It reviews spectrum efficient technologies, which are currently in use and those which may have future private land mobile applications, and estimates their future impact on spectrum requirements. The technologies reviewed include trunking, digital emissions, narrow-band systems, and cellular systems. The report concludes that additional spectrum is needed over the next 15-20 years to meet private land mobile requirements in the major urban areas even with increased employment of spectrum efficient technologies and equipment. Alternative means of meeting the projected spectrum requirements are also discussed.

The report may be reviewed at the FCC Library, Room 639, 1919 M Street, N.W., Washington, DC 20554, and a limited number of copies are available at the FCC Office of Public Affairs, Room 207, 1919 M Street, N.W., Washington, DC 20554, (202) 254-7574. Copies may be purchased from the International Transmission Services, telephone (202) 296-7322 in Washington, DC, and (703) 352-2400 in Fairfax, Virginia.

Permit Digital Electronic Message Services At 18 GHz

The Commission has adopted rules to permit allocation of part of the 18 GHz band to Digital Termination Systems (DTS) for digital electronic message service and to make DTS frequencies available to private users.

In addition, the Commission rechanneled certain segments of the 18 GHz band to permit narrower bandwidth channel assignments. Little use is made of this band due to its wideband channelization, poor cost competitiveness with other high-capacity communications facilities, the shortened path lengths of several kilometers required for reliability of these systems of high-channel density and problems with service restoration of such high-capacity systems.

It noted that lower capacity microwave systems at 18 GHz using narrowband channels could be attractive for telephone, utility, railroad, and oil companies, particularly because of congestion at lower frequencies.

The key modifications affecting Parts 21, 74, 94 of the rules are:

1. Allocation of two 100 MHz bands consisting of 10 two-way channels each 10 MHz wide at 18.360-18.460 and 18.940-19.040 GHz for DTS.
2. Rechannelization of the 18.460-18.940 GHz band to provide for both 10 and 20 MHz channel widths.
4. Allowing private radio licensees under Part 94 to use the 10.6 and 18 GHz bands for DTS.
5. Adoption of frequency stability standards at 18 GHz for DTS stations and narrowband interband links, operational fixed point-to-point stations and non-DTS operations.

Rules Amended For 800 MHz Private Systems

The Commission amended Part 90 of the rules to simplify the method of determining a station’s theoretical service area for systems operating in the 800 MHz band.

Under the new rules, a 20 mile radius around the transmitter, rather than a 40 dB contour, is the criterion to determine market service area. This amendment eliminates the need for licensees to make complicated field strength calculations required under the present 40 dB contour method.

The Commission noted that defining market service area in terms of a ‘radius instead of a field strength contour makes the rule clearly less difficult and less expensive for the private land mobile user, as well as easier to administer for the Commission. It added that it would consider rule waivers in cases where defining service area in terms of a 20 mile radius would preclude operations which otherwise would be allowed under a 40 dB contour rule.

New Experimental Stations

The Commission, by its Office of Science and Technology, Frequency Liaison Branch, took the following actions:

KM2XML, ITEK Corp., Lexington, Massachusetts and Hawthorne, California. Research station to operate on 9800 and 10,300 MHz to conduct in-plant test of an airborne sensor to airborne relay to ground station data link system for export.

KM2XNN, Geostar Corp., South Lake Tahoe, California. Developmental station to operate on 1990.0 and 2492.0 MHz for purpose of simulating the operating characteristics of the Geostar Satellite system to demonstrate and verify theoretically predicted accuracy, S/N ratio and timing requirement of the Geostar radiodetermination system.

KM2XNV, Atlantic Scientific Corp., Melbourne, Florida. Research station to operate on 948.5 MHz to assess the feasibility of a lightning location system using time-of-arrival electromagnetic waveform sensing techniques.

KM2XNW, Litton Systems Inc., Van Nuys, California. Research station is scheduled to operate on 2900-3100 MHz band to test radar prior to shipment to the Kingdom of Saudi Arabia.

KM2XNX, Hughes Aircraft Company, Malibu, California. Research station to operate on 3625-4200; 5850-6425; 10950-11700; 14000-14500 MHz bands to be used as part of an antenna test range to obtain antenna characteristic for the Intelsat VI Satellite.

KM2XNY, HDS, Inc., Reston, Virginia. Developmental station to operate on 18.61, 18.65, and 18.75 GHz to test and develop microwave radios prior to type acceptance.

KM2XNZ, Univ. of Alaska, Fairbanks, Alaska. Research station to operate on 3192.5, 5736.5, 9941.5, and 12256.5 kHz to provide communications to research groups located in the field.

KM2XOA, Telsat Corp., Houston, Texas. Developmental station to operate on various discrete frequencies between 21,825 and 23,175 MHz to develop microwave equipment.

KM2XOB, Colorado Electro-Optics, Inc., Boulder, Colorado. Developmental station to operate on 928.000-928.350 and 952.000-952.350 MHz bands to develop a modulation scheme that is spectrally efficient and reliable, to test prior to type acceptance and develop parts necessary for the system.

KM2XOC, Norby Supply Company, Seattle, Washington. Research station to operate on 121.5 and 243.0 MHz to conduct tests on recertification of inflatable life rafts.

KM2XOF, Electrocom, Inc., Groton, Connecticut. Research station to operate on 467.325 MHz to provide a data link in connection with a research project.

KM2XOH, Aeroquip Corp., Area of Barrington, Illinois. Research station to operate
on 160.920 and 161.190 MHz to test equipment to assure interference to radio or radar equipment will occur.

**KM2XO1 and KM2XO1, Geostar, Corp., Minami, Nevada and Kern, California.** Developmental stations to operate on 1999.0 and 2492.0 MHz for purpose of simulating the operating characteristics of the Geostar Satellite system to demonstrate and verify theoretically predicted accuracy, S/N ratio, and timing requirement of the Geostar radiodetermination system.

**KM2XOK, Rensselaer Polytechnic Institute, Troy, New York.** Research station to operate on 158.660; 461.825; 466.925 MHz to measure the relative usefulness of radio communication location system.

**KM2XOL, Ecology Department, Southern Connecticut.** Research station to operate on 216.0-216.1 MHz band to conduct behavior and ecology study via telemetry.

**KM2XOP, GTE Communications Products Corp., Needham, Massachusetts.** Research station to operate on various frequency bands to conduct exploratory research into techniques for self adaptive operation of two-way communication equipment in the HF band.

**Private 800 MHz Applicants No Longer Have To Show Purchase Orders**

The FCC’s Private Radio Bureau will no longer require applicants for private land mobile licenses in the 800 MHz bands to submit copies of equipment purchase orders with their applications.

Previously, the Bureau had required purchase orders as proof of an applicant’s ability to make immediate use of requested frequencies, as prescribed in Section 90.127 of FCC rules. But new rules governing 800 MHz licensing have made the purchase order unnecessary.

Applicants are still required to submit other supplementary information as specified in rule Sections 90.356 (for trunked systems) and 90.607 (for conventional systems). Both sections are reproduced on the back of this notice.

The rules governing 800 MHz licensing and operation are in Part 90, Subparts M (trunked) and S (conventional) as published in the Federal Register of September 16, 1982, pages 41027-41045 and in the October 1982 edition of Title 47 of the Code of Federal Regulations (47 CFR), available from the U.S. Government Printing Office. For more information, applicants should refer to the rules or contact the bureau’s Licensing Division by writing to FCC, Gettysburg, PA 17325, or calling (717) 337-1212.

**FCC Issues New Radio Equipment List**

The Federal Communications Commission’s January 1983 Radio Equipment List is now available. The list contains equipment considered by the FCC as acceptable for Licensing in the following services: Experimental Radio; Domestic Public Radio; Radio Broadcast, Experimental, and Auxiliary, and Special Broadcast; Cable Television Relay; Stations on Land in Maritime Services and Alaska-Public Fixed Stations; Stations on Shipboard in Maritime Services, Aviation; Private Land Mobile Radio; Private Operational-Fixed (Microwave); and Amateur Radio.

Inquiries concerning listing of equipment may be sent to the FCC Laboratory P.O. Box 429, Columbia, MD 21045. Telephone (301) 725-1585.

Copies of the Radio Equipment List are available for reference in the Public Reference Room. Room 239, at the FCC’s central office at 1919 M Street NW, Washington, DC and at each of the Commission’s field offices. Copies of the list may be purchased from the ITS, Room 315, 1200 19th St. NW, Washington, DC 20554; telephone (202) 296-7322. Mail orders may be sent to ITS, 4006 University Drive, Fairfax, VA 22030. The cost is $50.00, plus postage.

Copies of breakout listing of Citizens Radio (CB) transceivers and of broadcast transmitters and translators also are available from the ITS. The cost is $10.00 per list (approximately 100 pages each).

**Use Of Volunteers For Amateur Examinations Approved**

The Commission authorized volunteers to prepare and administer examinations for amateur radio operator licenses above the Novice Class.

This change will affect the limitations in opportunity for amateurs to take the examinations that have resulted from funding and personnel cutbacks. The exams at present are administered by FCC personnel; usually at Field Operations Bureau offices. In some areas they now are given only once a year, and the number of remote locations has been reduced.

Legislation enacted in September 1982 authorized the FCC to use licensed amateurs on a voluntary and unpaid basis to prepare and administer amateur exams.

Under the program, individuals and organizations will propose questions for all examinations based on the FCC’s Study Guide for the Amateur Radio Operator License Examinations. The FCC will issue lists of approved questions which it will draw on for exams.

Written examinations will be administered by three-person teams of examiners who will report to regional Volunteer Examiner-Coordinators (VECs). The VECs will assist in an orderly flow of information to and from the Commission, coordinate the efforts of volunteer examiners and minimize the likelihood of fraud or abuse. In a departure from the proposed rules, the Commission has decided to substitute regional VECs for nationwide VECs. The regions will correspond to the present amateur licensing callsign districts.

Specific qualifications to participate in the volunteer program are spelled out to eliminate any possible conflicts of interest.

This action does not change the procedures recently adopted for the use of volunteers in the preparation and administration of examinations for the novice class amateur radio operator license in P.R. Docket 82-727.

**Facsimile Service Available To High Seas Vessels**

The Commission amended its rules to provide for maritime mobile use of facsimile communications between coast stations and vessels on the high seas by the use of high frequencies (3-30 MHz).

The Commission said it was unnecessary to adopt detailed equipment standards beyond spectrum characteristics (e.g. emission, power, bandwidth, and frequency tolerance), since facsimile communications will primarily be between vessels and shore facilities of the vessel operator, thus assuring equipment compatibility. Further, it said, the absence of detailed standards will provide for maximum user flexibility and encourage innovation.

**GMRS Temporary Permit Rules Become Effective – Form 574-T Available**

On January 20, 1983, the Commission adopted new rules in Parts 1, 2, and 95, Subpart A, pertaining to the establishment of a Temporary Permit for users in the General Mobile Radio Service (GMRS). The effective date of those rules was delayed pending Office of Management and Budget approval of the new Temporary Permit form. The new form (FCC Form 574-T) has now been approved and is available in FCC field offices.

The rule amendments to Parts 1, 2, and 95, Subpart A, which are contained in Appendix A to the Report and Order of January 20, 1983 (PR Docket No. 82-184; FCC 83-21; 48 FR 4783, February 3, 1983) became effective September 26, 1983.

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**Back Copies**

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

We have lots of news, comments, questions, and loggings this month, so let's get right to them.

Another page can be turned in the story of Radio Cuba Independiente y Democrática. About August 19, 1983, the government of the Dominican Republic ordered Radio Clarin to stop carrying the C.I.D. “Radio Maximo Gomez” service following complaints from the government of Cuba. Clarin complied but the Dominican Republic’s broadcaster’s association raised objections about the procedure used by the government.

About two weeks later, Radio Clarin was heard to carry anti-Castro programming but without any mention of C.I.D., so it’s unknown at the moment who is producing the new anti-Castro programming. C.I.D., meantime, has appealed to Radio Clarin to reinstate the program. So, 11 700 remains a good spot to watch for developments in the Caribbean-Central American radio war.

World Music Radio, a program service based in Holland, is now aired over the Irish quasi-pirate station, Radio Dublin International. The WMR broadcasts are scheduled from 0700 to 0900 on Sundays, repeated from 0100 to 0300 Mondays (GMT) on Radio Dublin’s 6,910 frequency. The last half hour of each transmission will feature DX tips from Andy Sennitt, Assistant Editor of the World Radio TV Handbook.

Some years ago, World Music Radio was aired over Radio Andorra (until the station ceased broadcasting) and more recently was aired on the Italian pirate, Radio Milano International.

Reception reports on WMR’s broadcasts will be verified with a QSL card. Reports should include three International Reply Coupons and be addressed to World Music Radio, P.O. Box 4078, 1009 AB Amsterdam, The Netherlands.

Thanks to Larry Magne of International Broadcasting Services Ltd. for forwarding this information.

The Association of North American Radio Clubs has asked us to advise readers that ANARC’s popular publication Choosing A Receiver by Harold Sellers has been sold out. A new edition is in preparation and we’ll let you know when it’s ready.

If you happen to hear any of the Papua New Guinea regional stations announcing as “Radio Kundu,” relax. You don’t have something new. The National Broadcasting Commission has renamed its services. The provincial services, formerly Radio Three, have taken this new name. Kundu is a Pidgin word for a type of ceremonial drum common in village culture.

Radio One, the PNG national network, has become the Karai Service. Karai is the Motu word for cockatoo which, according to the BBC newsletter, is one of the few birds in Papua New Guinea which can be taught to speak. The second national network, formerly the Radio Two commercial service, has become the Kalang Service. Kalang is another Pidgin word meaning, variously, the gold-lipped pearlshell, or an earring or a long feather—all highly prized objects used locally as a medium of exchange. So the name is a fitting one since it’s for the commercial service.

SWL and ham operator Edward Charles Wolf, N4GOZ of Pompano Beach, Florida keeps in touch with the world in both transmitting and monitoring activities.

Mail Call

Leading off this month are bravos from Brazil. Carlos Alberto T.V. Frazano writes from Osasco in Sao Paulo state to say how much he enjoys POP/COMM and The Listening Post. Carlos has been a DXer for a number of years and his activities have included writing and publishing the first booklet about the shortwave listening hobby in Brazil. We’re looking forward to having more information from Carlos in future months.

George R. Neff of Niles, Ohio has two years of SWLing under his belt, using a Panasonic RF-2600 receiver. George puts anywhere from one to five hours a day in at the dials. George mentions learning some minimal French and Spanish to aid in station identification and report writing and notes that Radio Netherlands has material available on this subject. There is a booklet on Latin American DXing which includes sample report forms in Spanish and Portuguese, but we don’t know if any of their material covers French. There are a lot of answers to be had in the various Radio Netherlands booklets and info sheets available, however. For a copy of their Listener Services Catalogue, write Media Network, English Section, Radio Netherlands, P.O. Box 222, 1200 JG Hilversum, Holland.

Another Panasonic RF-2600 user is James Wildman of Cape Elizabeth, Maine. James is also using an adaptation of the “DXers Dipole” featured in the April 1983 POP/COMM, along with MFJ antenna tuners and active antenna accessories.

George Osier of Norfolk, New York checks in to report recent QSLs from Radio Free Grenada, Ecos del Turbes in Venezuela, and the Caribbean Beacon on 1,610
kiloHertz. He hopes the latter qualifies as shortwave. That's pretty much up to you, George. At the Listening Post, we more or less use the country and station-counting guidelines of the North American Shortwave Association and they start shortwave from 2.000 MHz. But there's no law that says you can't count anything over 1,605 as shortwave if you wish.

The year 1968 is when James W. McKee of Winston-Salem, North Carolina got busy with his first shortwave receiver. He's been inactive for a number of years and wants information about a code used to report reception to stations. You're probably talking about the SINPO code. James. In this arrangement, the letters stand for strength, interference, noise (static), propagation (fading), and overall quality, respectively. Numbers from 1 to 5 are assigned to each letter to indicate the signal strength, how much or how little interference or fading was a factor and so on. Thus, SINPO 55555 indicates perfect reception. The other extreme is SINPO 11111. More common readings might look like SINPO 43443—meaning fairly good strength, moderate interference, slight static and fading, and overall fair quality. Other variations on the code are SINLOG, which simply uses "F" for fading instead of "P," and "SIO" which eliminates the reporting of fading or noise.

Paul Gordon of Meriden, Connecticut has gotten interested in sending reception reports and collecting QSL cards and would like to know how to go about it. Well, Paul, that's a long story. Essentially, you need to request the frequency, time and date (in GMT or UTC), give the station some information on how well they were heard and provide as much detail as possible about the program items you heard. Once a day we'll be doing a feature article on reception reports and QSLing that'll cover all the bases.

In Cookeville, Tennessee, uses a Realistic DX-160 and Kenwood R-1000 for shortwave broadcast monitoring. He's very active in monitoring other bands and is president of the local Jack Daniels Single Sideband Radio Club. Wonder what they serve at meetings? A check of his shack photo shows quite a line-up of equipment!

Larry Remple of Lisle, Illinois is curious about Radio Earth International. REI is a program carried by Radio Clarin and not a station with its own transmitter. Programs are taped in studios in Curacao and flown to the Dominican Republic. The Chicago area contact is simply an office since principals of Radio Earth are from that area.

Seven years went into developing the listening station operated by Edward Chris Wolf and he's got it to the point now where he can pretty much cover the entire spectrum. He operates a ham station, N4GOZ and uses a Sony 2001 for shortwave listening. The shack was put together with the idea of having a "survival radio system" available in the event of hurricanes or other disasters.

Carl L. (he prefers we don't use his last name) of Castro Valley, California, has gotten ten back into shortwave listening and bought two scanners thanks to POPCOMM. For shortwave he's using a Panasonic RF-3100 with an old National SW54. Carl wonders about the dating and cost of the National. I'm not an expert Carl, but if pressed to make a stab at it, I would say the SW54 dates to the early 1950s and was probably priced at around $60.

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Listening Reports

Here's what's on. Remember, all times are GMT.

**Alaska** The new station, KNLS, heard on 11.820 from 0900 sign on to 1000 with a brief horn interval signal, English opening ID, then seemingly an ID in Russian followed by an hour of big band music. (Lazarus, LA) On 9.690 at 1300 with music, talk in Chinese, religious music. "Chorons of Fire" theme at 1330 with identification, address, and sign off at 1350. (Paskiewicz, WI)

**Angola** Emissora Provincial de Nambémia, tentatively noted on 5.013 at 0505 to 0610 after Radio Truth signed off. In Portuguese with highlife music. (Clayford, FL)

**Argentina** Radio Sociedad de Argentino de Exterior (RASE) on 6.060 in Spanish with news and music at 0100. (Krze- mien, IL)

**Australia** Austrian Radio noted on 11.665 at 0515 in German with waltzes and classical music, parallel to 15.165. (Mackenzie, CA)

**Australia** Radio Australia on 15.120 at 0600 with local call-in ad in English. Signal sign on in English, news and DX program. Parallel to 15.160, 17.795, 15.290, and 9.570. At 1805 in English on 11.725 with world news and pop music. On 15.160 at 0445 in English with concert music. (Mackenzie, CA) Regional outlet VLH9 at Lyndhurst heard at 1200 on 9.680 with news and time check, and "Sunday Rental." (Paskiewicz, WI)

**Belgium** Belgian Radio and TV on 15.570 in Dutch with pop music and man announcer. (Mackenzie, CA)

**Benin** The regional station of Parakou heard at 0550 on 5.025, two announcers, and upbeat African rhythms. (Koren, WI)

**Bolivia** Radio San Miguel, tentatively noted on 1029 to 1039 and 1015 to 1025 with Latin music. (Lazarus, LA) Radio Ilumani on 6.025 heard at 0017 with Latin ballads. U.S. pops. with interference from APRTS on 6.030. (Koren, WI)

**Brazil** Radio Nacional Amazônicos heard on 6.120 sign on from 0752 with good signal. Sign on with chimes to 0758 when had opening announcement by man with bossa nova music in background. (Lazarus, LA) On 15.445 at 2150 in Portuguese with sports events, identifications, and ads. (Mackenzie, CA) Radio Bras on 15.290 to 0200 to 0300 in English with news, commercial, tourist news, and Brazilian music. (Mackenzie, CA) Radio Anhanguera at Goiania on 4.915 found at 0165 to 0330 with a drama, Brazilian music, ads, and ID. (Koren, WI) Radio Universo at Curitiba on 6.020 heard at 0718 with Latin music, many singles, and interference from the VOA also on 6.620 from 0728. (Koren, WI) Radio Cultura do Para, with religious program at 0857 on 5.045, leaving fade out by 0928. (Koren, WI)

**Bulgaria** Radio Sofia on 15.100 heard with news, weather, commentary, and schedule information from 0000 to 0100, in English. (Alaska, MA)

**Burma** The Burma Broadcasting Service is scheduled on 1.785 from 0030 to 0630, on 9.730 from 0330 to 0730, and on 5.040 from 0320 to 1600. English is scheduled at 0200, 0700, and 1430. (Stephens, AL)

**Cameroon** Radio Douala, the new regional station, heard on 4.795 at 0445 to 0500 when had news headlines in English, African music, and local languages. (Clayford, FL) Heard from 0501 to 0525, tentatively, with news in French and English and program of choral music. (Lazarus, LA) The National Service from Yaounde heard on 4.911 at 0535 in English. (Clayford, FL)

**Canada** CHINX from Halifax, Nova Scotia, heard on 6.130 at 1907 to 1918 with pop music and local ads. QSL received was signed by Kurt J. Ancenault, Chief Engineer. (Greenberg, NY)

**China** Radio Beijing found on 15.520 at 1235 in English with news and commentary. (Alaska, MA) The Xiang People's Broadcasting Station from Lhasa, Tibet, heard on 4.750 to 2330 to 0010 at very weak level, with programs in Chinese. (Clayford, FL) Radio Beijing on 17.650 at 0350 in English with "Music From China," in parallel to 15.385 and 17.855. (Mackenzie, CA)

**Clandestines** Radio Quince (15) de Septiembre, anti-Sandinista, heard on 6.901 from 0240 to 0341 with continuous talk by man in Spanish in Spanish with many mentions of the Fuerza Democratica Nicaraguan closure prayer by woman at 0335, anthem, and sign off. (Lazarus, LA) Radio Misoks, 6.965, heard from 2233 to 2317 sign off with political talk by man in Spanish and presumed Miskito language. (Lazarus, LA) La Voz de Sandino on 6.215 at 0430 to 0504 sign off with a powerhouse signal. Talks in Spanish, English, and presumed Miskito. English identification as 'The Voice of Sandino. The Voice of Free Nicaragua' member of the ARDE radio communications system, coming to you from this high mountain.

Here's the attractive QSL card issued by Ecos del Torbes in Venezuela. This one belongs to George Osier in New York.

---

The Voice of Nicaragua has sent this nice pendant to some of its listeners. Thomas J. McKeon of Indianapolis got this one.
Taken at a California DXers gathering, here is a photo of (l. to r.) Mr. and Mrs. Stew Mackenzie, Bill, Don Schmidt, Len and Bob Syphax. (Photo courtesy of Bob Syphax, KA7DBW)

which someday will be broadcasting from Managua or Bluefields. (Lazarus, LA) (All of the above are anti-Nica-

The breakdown of the SINPO code.

guation, and advertisements. (Wildman, Clarin, with "Words And

5 excellent
4 good
3 fair
2 poor
1 barely audible

England BBC World Service on 12.095 at 0325 with "The World Today" (Mackenzie, CA) in Arabic on 15.235 at 0358. (Mackenzie, CA)

France Radio France International in English from 0430 to 0500 at 11.705 with news and commentary. Voice of Germany sign on at 0455 blocked further reception. (Mackenzie, CA)

French Guiana RFO Cayenne heard on 05.055 at 0917 with man announcer in French. French pop music, time pips, and news at 0930. Parallel to 6 and 170 good reception. (Paszkiewicz, WI)

Greece The VOA relay at Karaba heard with VOA News in English at 0415 at 9.925. (Mackenzie, CA)

Guatemala La VoZ de Nahuala from the town of the same name heard on 3360 with marimba instruments, man announcer briefly between each selection at 1015. (Koren, WI)

Hungary Radio Budapest on 15.220 in English at 0300 with news and commentary. (Krzemien, IL)

Iceland Italian Radio International Service logged on 13.797 in Iceland at 1900 with news and local weather. (Koren, IL)

International Waters The Voice of Peace, pre-

sumed the one heard on 5.240 to sign off around 0040. Very weak but occasional pop music was heard. Suffered from long, deep fades. (Crawford, FL)

Israel The Voice of Israel with commentary on 15.600 in English (Radio Israel). On 15.105 at 0050 sign on in English with news and weather, into French at 0155. Parallel to 9.815. On 12.025 at 0340 in Russian, parallel to 15.105. 11.655, and 9.815, the latter two frequencies were jammed. On 15.615 in 11.600 Chinese with jazz program. (Mackenzie, CA)

Japan Radio Japan noted on 9.505 at 1710 in English with news, commentary, and music. On 15.260, the Far East Network was heard at 0350 in English with a sports interview. (Mackenzie, CA)

Kuwait Radio Kuwait's home service found on 15.495 at 0335 in Arabic with Koran recitations. (Mackenzie, CA)

Liberia The VOA Relay at Monrovia heard on 15.600 at 2120 in English with a press interview. (Mackenzie, CA)

Lithuania The S.P.L.A.V.BC in Arabic at 0245 in 17.930 with Arabic music. (Mackenzie, CA)

Lesotho Radio Lesotho noted on 4.8000 from 0405 to 0500 with vernacular program, woman announcer. Afghan music, advertisement for Hammont Tobacco at 0405 in English followed by religious program from the Catholic Cathedral in Masereu. (Crawford, IL)

Luxembourg Radio Luxembourg on 6.090 in Eng-

lish at 0130 with top 40 songs. (Koren, WI)

Malta Radio Maltese Radio at 2355 in 5.995 man in talk, strong instrument. Weak signal under an open carrier, strong tone at 2347 blocked signal completely. (Koren, WI)

Montserrat The Deutsche Welle Relay station on 11.705 in English at 0500 with world news and "Micro-

phone of Europe" (Krzemien, IL)

Netherlands Radio Nederland heard at 1450 on 17.605 in English. (Adams, MA)

New Zealand The Pacific Service of Radio New Zea-

land is scheduled from 1800 to 2100 on 11.960 and 15.485. 2115 to 0515 on 11.705 and 0530 to 1215 on 11.960. To Australia and Northwest Pacific from 2115 to 0515 on 15.485 and 0515 to 1215 on 9.620. Four IRCs required for a QSL reply. (Stimson, PA) Heard on 17.704 at 0400 in English with identification, news, music and weather. (Adams, MA)

Nicaragua Voice of Nicaragua on 5.950 at 0423 in English to Latin music, propaganda, with English language leader Daniel Ortega. Central American news. Switched to Spanish at 0500 and signed off at 0503. (English from

Here's POPCOMM reporter Larry Rem-

pala of Lisle, Illinois at his listening post.

0100 to 0200 (Wildman, MD) The 0500 to 0550 English segment heard better than earlier. 0110 segment

Nigeria Radio Nigeria at Kaduna on 7.740 from 0447 to 0453 with disc jockey pop music show, news, political affairs programming. All in English. (Wildman, MD)

North Korea Radio Pyongyang on 9.977 and 9.745 in English at 1130 with a commentary on journalism (Kremen, CA)

Norway Radio Norway International's weekly Sun-

day-Monday English program is scheduled to Western Europe at 0400 on 15.225, 15.175, and 9.590. At 1300 to Eastern North America on 17.840, to Central America and North America at 1400 on 17.840, 21.575, 21.730, 14.175, and 17.15, to Western North America at 1600 on 17.15, to North America generally at 2200 on 11.675, and to Eastern North America on 0000 on 6.110, 11.870, and 9.525. (Velleni, Italy)

Peru A number of goofs from Inca land this month.

Radio Vision: 5.360 heard from 0238 to 0255 at strong level in Spanish with everything from folkloric music to punk rock. (Crawford, FL) Radio Bagua. Bagua. 3.310 to 1052 sign on at 11.12, other times caught signing on at 1055 and 1100, opening with short segment of violin music and full ID by man followed by Peruvian national anthem. (Lazarus, LA) Radio Satellite. 6.725 from 0420 to 0442 sign off. Heard tentatively, uninterrupted Peruu-

ian music, a few announcements, definite mention of "Cajamarca - Republica del Peru" at 0440 before brief fade during prior to national anthem. (Lazarus, LA) Radio Los Andes on 5.030 at 0590 with vocals, an-

nouncements, ads. theme from Romance and Julia on pi-

ano, ID, and mentions of Huancarucu. (Koren, WI) Radio Orientte. Yurimaguas. on 6.190 at 0238 with flute music, husmos selections but interference from the BBC on 6.195. (Koren, WI) Radio Rosa Roja. 5.045 at 0335 with love music with violin, weak but ok in the clear. (Koren, WI)

Philippines The VOA relay with news and "Break-

fast Show" at 0330 sign on. (17.745. (Mackenzie, CA)

VOA Tinang relay at 1128 on 6.110 with features on new products, issues in the news. Fair level (Paszkie-

wicz, WI)

Poland Radio Polonia on 15.120 in English at 0300 with news and commentary. (Kremen, IL)

Portugal An unknown station time 10.41, heard for many years at 5.402, 8.435, 2335 to 2347 on upper sideband with woman giving time every 10 seconds followed by two pips. Time given for zone GMT plus one. (Crawford, FL)

Saipan KYO1 on 6.370 at 1741 in English and Japan-

ese and Os for "Super Rock Radio" along with pop mu-

sic. On 15.190 at 0425 suffering from interference from Radio Moscow in Chinese. (Mackenzie, CA)

Senegal ORTS Dakar. 4.890 at 0539 sign on, inter-

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Mackenzie, Huntington Beach, California;
Sheryl Paszkiewicz, Manitowoc, Wisconsin;
Mark Konen, Milwaukee, Wisconsin; John
Stephens, Huntsville, Alabama; Lawrence
Greenberg, Rockville Centre, New York;
Giovanni Vellini, Trieste, Italy; Dennis
Sawson, Sykesville, Pennsylvania; Rick
Krzemien, Carol Stream, Illinois; James
Wildman, Cape Elizabeth, Maine; Henry
Lazarus, New Orleans, Louisiana; George
R. Neff, Niles, Ohio; and David Crawford,
Oak Hill, Florida.

See you next month. Good listening!

THE MONITORING MAGAZINE

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New Receivers

Universal Amateur Radio announced two new shortwave radios never before available to the retail customer in North America.

Through special arrangements with the Japan Radio Company, Universal Amateur Radio is offering two of JRC's finest commercial marine-grade receivers. Both units are presently in wide use by coastal stations worldwide and on board many new ocean-going vessels. These radios offer a degree of manufacturing excellence and performance never before available to the SWL community.

Japan Radio NRD-92 Communications Receiver

The NRD-92 is an up-conversion phase-locked digital frequency synthesized receiver covering 90.00 kHz to 29999.99 kHz in the CW, SSB, DSB (AM), FSK (RTTY), and FAX modes. Preset frequencies of 500 kHz and 2182 kHz are also provided. Bandwidth filters of 6.0 kHz, 3.0 kHz, and 1.5 kHz are standard and can be used independent of mode. The radio will operate from 120 or 220 VAC or - 24 VDC.

Japan Radio NRD-93 Communications Receiver

The NRD-93 is an enhanced version of the NRD-92 offering additional capability. An additional mode position and filter is provided. Digitally displayed passband tuning has been added as well as an analog frequency display scale. A 60 channel memory that stores frequency, mode, and bandwidth has also been incorporated into this receiver.

The NRD-92 and 93 are of plug-in-modular design throughout (exc. power supply). Both units include a speaker, AC power cable, BK cable (for BK signal, line output, and SP output), and a complete set of standard spare parts including every fixed resistor and capacitor, all variable resistors and fuses, plus a spare antenna connector and BK relay.

Options include a receiver cabinet, DC power cable, extension PC board, preset timer, filters, special spare parts (all semiconductors), and scanning unit. The matching scanning unit has a 300 channel capacity and is capable of preset reception, 9-group scanning reception, and sweep reception. There is also an optional remote control unit for the NRD-93 External Memory Option.

This equipment is available exclusively through Universal Amateur Radio. For more information, contact Universal Amateur Radio, 1280 Aida Dr., Reynoldsburg, OH 43068, or circle 112 on the reader service card.

Shortwave Frequency Directory

The Shortwave Frequency Directory is a comprehensive directory of frequencies and station operators in the 1.6 to 30 MHz communications spectrum with special emphasis upon U.S. Government operations. The large-format (8½" by 11"), 200 page directory includes some 5,000 listings, including USAF, USN, Coast Guard, Army, foreign military, emergency, embassies, Dept. of State, FCC, Dept. of the Interior, spy stations, ships, aircraft, overseas telephones, and more—done up in a spiral binding for desk-top convenience. This is a large and indispensable reference for any monitoring station and it comes with an updating supplement (no additional cost). This publication provides detailed breakdowns of SAC networks, Navy networks, Canadian military networks, mystery stations, NORAD, disaster networks, search and rescue units, Coast Guard, Cuban Air Force, USCG Aircraft roster, TAC, plus plenty of information on those elusive tactical military callsigns. This book, compiled by Bob Grove, contains far more information on federal communications below 30 MHz than Grove's earlier book, Federal Frequency Directory.

If you're one of the many people who explores the mysteries of non-broadcast communications below 30 MHz, then you'll certainly want to have the Shortwave Frequency Directory at hand for instant reference while you're monitoring. This book (including the updater supplement) is $12.95 per copy plus $3 for First Class mailing. If 4th Class Book Rate mailing is desired, send $12.95 for the book and $1 for postage.

Order from CRB Research, P.O. Box 56, Commack, NY 11725.

Complete Portable Power Plant

The Hande-Pakage includes everything necessary for traveling "power equipped." The power behind the KH1 is the KH1 Hande PakTM rechargeable battery. The KH1 packs 12 volts, 1.2 amps of energy, yet it only weighs one pound.

The Hande-Pak is vinyl-cased with a built-in receptacle, suitable for any "cigarette" plug (the most commonly used 12 volt connecting device). A charger is added to the Hande-Pakage allowing the battery to be recharged in 1-2 hours.

The R37 DC Voltage Converter completes the Hande Pakage. This item converts 12 volts DC into either 3, 6, 9, or 12 volts, saving both money and energy, since unneeded power is not wasted. In addition, the R37 comes equipped with a multiple adaptor plug, so it fits just about all radios with external power jacks.

This compact, complete package is extremely economical compared with "throw away" batteries, which can only be used for a limited amount of time and then quickly run out of power. The KH1 can be used for a variety of purposes. It can be recharged hundreds of times and will also save the user over $100 on the average.

From recreational activities to scanner use and computing, the KH1P Hande Pakage is suitable for you to take along. Contact KAPCO, Inc., 1270 Jarvis Avenue, Elk Grove Village, IL 60007.
The deadline for this month's column found me in the middle of South America, 18 degrees below the equator. A company in Bolivia was very interested in the possibility of supplying satellite television systems to people throughout the region. The Telesat company of Miami, Florida supplied the Bolivian entrepreneurs with a 5-meter aperture antenna, international satellite earth station receiver, and 70-degree LNA. I was asked to accompany Telesat's technician, Terrell McClintock, to Bolivia to assist with the installation.

Bolivia just happens to be one of the most isolated areas in South America. More than two hundred years ago, Bolivia lost its Pacific Ocean territory to Chile in a debilitating war. Today, Bolivia is a landlocked nation with little manufacturing capabilities. Oil, minerals, and cattle are the main resources of this third world country. Existing television services are minimal, with most of the country limited to viewing one or two channels of Spanish language programming.

An evening flight to Santa Cruz de la Sierra, Bolivia from the Miami international airport delivered us without event to a location far below the equator. While this location is beyond the reach of our North American domestic satellites, we knew from previous experiences that there are numerous international satellites that can be intercepted within the region. (See POP'COMM series "DXing the International Satellites," February, March, and April 1983 issues.) Some of the INTELSAT birds carry the programs from a number of Central and South American countries. This would give the Bolivians several channels of Spanish-language television for their viewing enjoyment.

Upon our arrival we spoke with several Bolivian people about the program services which we knew would be available. At first, we were surprised by the amount of skepticism expressed about receiving satellite TV at this location! Then we learned the reason behind the skepticism. A year before, a Bolivian gentleman had gone to the United States and purchased a complete home earth station package which he promptly took back with him to Bolivia. Following the manufacturer's instructions precisely, he assembled the system and began looking for the birds. Unfortunately, he never found a single satellite signal. The problem was that the American assembly instructions required that the antenna be pointed south. This is fine for locations north of the equator, but in South America this aligned the gentleman's antenna toward the empty skies over Antarctica, leaving early this would-be satellite TV pioneer without a single satellite to view. We assured the local Bolivians that, with the proper antenna orientation, we would succeed in delivering satellite television into their living room.

Shortly after arrival, we began assembling the Odom 5-meter antenna. This antenna is made from a radar wire mesh that slits into grooves in the sides of the parabolically-curved support struts. One especially nice feature of this antenna is the placement of a hole through the center of the antenna hub. This allows you to stand at the back of the antenna and look directly into the mouth of the feedhorn and LNA. By sighting this hole, you can precisely adjust the LNA mount assembly so that the feedhorn and LNA sit exactly at the center of the dish's focal point.

The receiver used was the Avcom 3R with a 1/2 transponder filter and threshold peakcircuity which helps to extend the reception capabilities of the unit when intercepting the relatively weak signals of the INTELSAT birds. To achieve the lowest system noise temperature possible, a 70-degree LNA was used. The Odom antenna was equipped with an MTI computerized antenna positioner with motorized actuator.

Within a few hours of our arrival we had the antenna assembled. After connecting the various cables and connectors, we settled down to the serious business of sweep-ing the skies in search of the birds. We were almost immediately rewarded with reception of satellite TV from Venezuela. At the time, the Pan American games were being held in Caracas, Venezuela and we treated our Bolivian hosts to a smorgasbord of sporting events via the INTELSAT bird at 27.5 degrees west longitude. Everyone there was very excited. It was the first reception of TV via satellite by a home earth station ever to occur in the area and one of the first South American installations this far south of the equator.

On the following day we returned to the installation to align the antenna so that the polar mount would accurately track through all of the available satellites. It was then that we discovered that the correction factor from magnetic to true north supplied by the local Bolivian airport was off by more than 10 degrees. This affected our calculations considerably, making reception of the INTELSAT bird at 1 degree west more difficult because of local obstructions along the eastern horizon. Our Bolivian host then suggested another location: a flat rooftop three stories up! In order to move the 16-foot antenna we would have to transverse many obstacles in the neighboring yard. "No problem," said Roberto. He arranged for about 15 Bolivians to assist in the relocation of the antenna which came off without a hitch. In little more than an hour's time we had relocated the system and were rewarding the local participants with reception of baseball from the Pan American games. With the polar mount axis of the antenna properly aligned, we were able to view the following selection of programming. While our reception took place in the center of South America,
How Would You Like Ham Call Letters in 9 Weeks?

Are you one of the thousands of hobby radio enthusiasts who wanted a ham radio ticket, but were stymied by the code and heavy technical tests? If so, there is good news from the Federal Communications Commission.

The FCC is now going public with all test questions and will be allowing amateur radio volunteers to administer the examinations.

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

No longer will exam questions be kept secret. Right now you can receive all of the 200 test questions for the amateur radio beginner license test, the Novice License. Similar to aircraft FAA exam procedures, publishing companies and Radio School, Inc., have developed multiple-choice-type answers for these questions, as well as a key giving the correct answer for every question. This allows the beginner student to know exactly what is required to pass the 20-question FCC Novice test.

The FCC will soon publish all the questions for the amateur radio Technician, Advanced, and Extra Class theory tests, too.

But What About the Code? The Morse Code requirements still stand for any amateur radio license. For the beginner regular classroom instruction, Radio School offers a complete home-study Novice license course. In about 30 days after receiving the complete course, you should be prepared to have a local ham Novice license, you must send and receive international Morse Code at 5 words per minute. This is slow enough that many students learn the code at this speed within 30 days. The code test is administered by a neighbor volunteer examiner ham, relying on the applicant of the pressure of an FCC-administered code test. You can take the code test in a relaxed atmosphere in your home, or at the volunteer examiner’s ham shack.

Once you pass the 5 word-per-minute code test, you won’t need to take the code test over again to obtain the coveted Technician, voice-class license. The Technician class license lets you operate voice through the satellites, repeaters on 2 meters, plus skip propagation on 6 meters. The Technician license only requires a 50-question multiple-choice exam to be passed. Then, with the Technician license, it’s only a 13 word-per-minute code test to get your worldwide, voice class, General license.

A company called “Radio School” lets you get into ham radio the easy way. If you don’t have time for regular classroom instruction, Radio School offers a complete 5 wpm code test tape for your volunteer examiner.

FCC Form 610 for you and the volunteer examiner

Examination answer sheet for your 20-question theory test

Detailed instructions, for you, on how to find a local volunteer amateur radio examiner

Also included are detailed instructions to the volunteer examiner on how to conduct the actual test, plus his test questions and code test tape.

As you can see, everything is here for both you and your volunteer ham examiner. Courses are also available for all of the other grades of ham licenses, too.

You may order the Radio School beginner course by mail or telephone. Then, as soon as it arrives, try it out in the privacy of your home and car, and see how easy it is to learn the code and understand the easy beginner theory questions. After that, if you aren’t 100 percent satisfied with your instructional material, simply send it back and Radio School will see to it that you get a complete refund with no questions asked!

Just fill out the coupon below and send it to Radio School with your personal check. Your order will be sent out the very next day.

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**INTELSAT IV F1**

**53 Degrees West Longitude**

The Mexican lease services on this bird are transmitted via a spot beam centered on Central America. Consequently, these signals are very weak at locations well within South America. The following transponders can be enjoyably viewed in Bolivia only with a very large antenna, at least 30 feet in diameter. Estimated EIRP (effective isotropic radiated power) is approximately 17 dBW.

1. 3720 GHz XEW-TV Mexico City Channel 2
2. 3805 GHz TRM Telecommunicaciones de la Republica de Mexicana
3. 3965 GHz XETV’s selection of U.S. network programs
4. 3980 GHz XHDF-TV, Mexico City’s channel 13

During the Pan American games, we also noticed that the Mexicans were using transponder 24 (4175 GHz) for television transmissions from the Pan American games. Unlike the other transponders on board this bird which are on a spot beam, this transponder was sent via a global beam antenna. This made the service watchable in Bolivia with the 5 meter aperture earth station, with an estimated EIRP of 25 dBW there.

**INTELSAT V-F2**

**34.5 Degrees West Longitude**

Transponders 22, 23, and 24 are active at various times of the day, carrying international news feeds, sports events, and sporadic entertainment programs. EIRPs vary depending on who is originating the uplink and whether a full or half transponder format is in use. This results in EIRPs in the 17 to 27 dBW range. Since these transmissions are only made via a global beam antenna which is the weakest in signal strength of the various antennas available from the V series birds, we were quite pleasantly surprised to find that many of the feeds were at or above threshold. This made the video quality quite good when the transponders were operated full throttle. Many sporting events were seen here including soccer games from South America, professional baseball and football games from the U.S., and various competitions from the Pan American games in Caracas.

**INTELSAT V-F4**

**27.5 Degrees West Longitude**

1. 3725 GHz Cadena 1. TV from Bogota, Colombia
2. 3765 GHz RTP-TV, Channel 7 Lima, Peru
3. 3870 GHz Venezolana de Television, Caracas, Venezuela
4. 4177 GHz Argentina Television Color, Buenos Aires

Colombia’s TV service is in the half transponder format with an estimated EIRP of 26 dBW in Bolivia. Audio is specially encoded via SCPC or single channel per carrier techniques, rendering it unavailable from your standard earth station receiver. Peruvian satellite TV has an estimated EIRP in Bolivia of 29 dBW. This service is transmitted in the full transponder format with audio SCPC encoded. Venezuelan TV from Caracas has an estimated EIRP of 30 dBW in Bolivia. It is transmitted via a full transponder with the audio on a standard subcarrier. Good reception of Venezuela’s audio requires a wide/narrow audio bandwidth switch on the receiver, with the control in the narrow position. Argentina’s TV service is also transmitted via this bird with an EIRP in Bolivia of 27.5 dBW. ATC is transmitted in the full transponder mode, with a standard audio subcarrier used.

**INTELSAT V-F3**

**24.5 Degrees West Longitude**

Transponders 22, 23, and 24 carry a variety of international news and sports feeds in either the full or half transponder format. On the night we were to leave Bolivia, we were asked to take a spin through the satellite belt in search for the South American Cup soccer game between Brazil and Argentina. The game was not available via Brazilian TV and soccer fans in Santa Cruz expected it to be the game of the year. We found the game on the INTELSAT bird at 24.5 degrees west. It was completely above threshold with the color in the American NTSC standard. Had I not seen it myself, I would not have believed that a 5 meter earth station could provide a perfect picture from a global beam transmission. But since this was a new V series satellite, it appears that it has considerably more transmitting power than the INTELSAT IV and IVA series satellites which preceded it. We had to leave in the early moments of the game, but we later learned that the final score was 1 to 0, with Argentina the winner. Our Bolivian friends had ended up setting up their television sets outside next to one of the main avenues in town. More than three thousand Bolivians descended on the scene that night, viewing the game and totally disrupting local traffic along the highway.

**INTELSAT IVA-F4**

**21.5 Degrees West Longitude**

1. 3725 GHz Bandeirantes TV, Sao Paulo, Brazil
2. 3805 GHz Rede Globo TV, Rio de Janeiro, Brazil
3. 3925 GHz Rede Globo TV

All three channels of Brazilian television available from this satellite are transmitted via a hemispheric beam in the full transponder format with the audio contained on a standard audio subcarrier frequency. Both Bandeirantes and Rede Globo have an estimated EIRP in Bolivia of 31 dBW, making them the strongest satellite signals available in the region. Transponder 11 (which is sent via a global beam) is much weaker, with an estimated EIRP of 23 dBW.

**INTELSAT V-F5**

**18.5 Degrees West Longitude**

Transponders 22, 23, and 24 are used for video transmissions of international news and sporting events.

**GORIZONT 7**

**14 Degrees West Longitude**

Both transponders 6 and 9 are active on this satellite. Transponder 6 is the strongest of the two, with occasional video transmissions from the Soviet Union in the full transponder format. Estimated EIRP is 28 dBW. Transponder 9 is also active, but much weaker when received in Bolivia. Estimated...
EIRP is 22 dBW with a selection from around Eastern Europe and Cuba. Gorizont is allowed to wander in a figure eight orbit that is centered on the equator. Consequently, the satellite antenna must be adjusted in elevation to receive the satellite when it is appreciably above or below the equator.

**Symphonie 1 & 2**

11.5 Degrees West Longitude

Symphonie only transmits signals into the western hemisphere on an occasional basis, using transponder 14. These feeds consist of news and sports coverage from the French TF-1 television network.

**INTELSAT IV-F8**

1 Degree West Longitude

This is the furthest satellite to the east which can be viewed from Bolivia. Transponder 1 and 2 are occupied by ABC news London and CBS LSAT Europe. This pair of half transponder transmissions relay news and sporting events from Europe to the United States. EIRP in Bolivia is around 17 dBW. Transponder 16 and 18 are used for occasional video feeds from Europe or Africa. We viewed television from Morocco and other countries in Africa during our visit. Transponder 24 carries the full time service of the Armed Forces Radio Television Service (AFRTS). AFRTS supplies news and sports video programming to American military personnel located at overseas military installations. (See September, 1983 POP-COMM). AFRTS is transmitted via a global beam in the full transponder format. Estimated EIRP in Bolivia is 23 dBW.

As Terrell and I flew back to Miami following the successful completion of our installation, we both felt that South America was a fertile territory for satellite earth stations. With as many as eighteen available channels, international satellite TV services provided an exciting mix of international programming, which was very attractive when compared to the available local television services. Little did I know how soon I would be returning to the land below the equator.

If you would like to learn more about satellite television, The World of Satellite Television by Mark Long and Jeffrey Keating is available from Solar Electronics International, 156 Drakes Lane, Summertown, Tennessee 38483. Price is $10.00 plus $1.00 for shipping and handling.

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one cannot public shortwave manufacturers how many international shortwave broadcasts beamed if, TV were both unceremoniously casts was ever particularly listening to the English language broadcasts in our general direction. Not so. It would be a far better approach to try to cultivate and build a North American audience for this programming. But, of course, the failure of these programs to gain an audience here is an old story.

Potential audiences have to be made aware that the international programming is there to be heard. Years ago there were major newspapers (such as The New York Times) that carried international broadcast schedules. These days, the general media ignores such programming information. To the majority of persons in the general public, shortwave radio implies getting a Ham ticket, learning CW, or both. Most people haven't the foggiest notion of what it's all about, what equipment is needed, where/ how to listen, or anything else connected with such listening. It appears distant, vaguely complicated, and possibly expensive. ANARC and several other hobby groups have attempted to change this situation but (as Ferrell observed in his 1971 editorial), one of the problems has been that, "a lack of positive direction, along with pettiness, fragmentation, and a variety of minor annoyances plague the worthwhile hobby." This is still true and, of course, a lack of funds to accomplish this educational feat is also a problem.

Another problem lies with the broadcasters themselves. The North American audience is different than someone listening to international broadcasts from a remote hut in the Andes Mountains, in the Fiji Islands, or from an apartment in Prague. North American audiences are spoon fed their news and entertainment programming as a result of clever and slick promotional campaigns engineered by media professionals who seem to know the right kind of glitter to use on the public hereabouts. Constant polling of the audiences helps these program packagers to know the directions to head in which to capture and hold an audience. It's highly competitive. While a person can read several magazines on the same topic per month, they can only tackle one single radio or TV program at a time. If an audience is to be captured from 9 to 10 p.m. on a Tuesday night, the programming package has to be the one single program which catches their interest. While some of the programming on the international shortwave bands is excellent, the majority of state-sponsored programming is either far too political or otherwise deadly boring to vie for the attentions of these audiences. There has been no significant research done by overseas broadcasters to learn the kind of programming which might be of interest to the rather unique tastes of the North American public. North American audiences would probably love some of the BBC's comedy shows, if only they knew that they were as funny as Monty Python—but, unfortunately, they don't know about those programs. North American audiences also like rock music and would probably like to hear more of the local groups from various nations than programs on how alfalfa and soybeans are cultivated using modern implements. American station WRNO has the right idea—plenty of music!

It would be great to see North American audiences remember that in pre-TV days there was ample reason to spend many hours listening to the shortwave voices of the world. The way it looks now, far too much of this programming is grossly underutilized. What with so much in the way of news taking place in the Middle East, Central America, and the Caribbean, you'd think that would be a sufficient "hook" to snag the North American audience, enough reasons for newspapers to run the frequencies to monitor. Despite all of the media talk of "Radio Free Grenada" last October, nobody ever told the public RFG's frequencies!

Readers are invited to offer comments on the various ways overseas broadcasters can increase their impact upon North American audiences.

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**Beaming In** (from page 4)

how many were seeking news and entertainment.

Between the years 1960 and about 1970, manufacturers who were once major equipment suppliers to the shortwave listening consumer seemed to fade away from this market, one by one—Hallicrafters, Hammarlund, National Radio, Grundig, RME. During the past few years, however, there has been an amazingly brisk influx of exceptionally fine receiving equipment directed at shortwave listeners from companies such as ICOM, Panasonic, G.E., Grundig, McKay-Dymek, Kenwood, Drake, Yaesu, Electra, Sony, Japan Radio Corporation, Collins, and others. And they're doing well in this market. There are also many multi-band broadcast receivers now in the hands of the public in addition to those that are actually communications receivers. Even taking into account that there are far more receivers around that are capable of picking up shortwave broadcasts than there were in 1975, one cannot help but wonder how many people hereabouts normally forego an evening of TV to turn on a receiver to sit back and listen to the programming on those bands.

As far back as 1971, in an editorial in Popular Electronics, Perry Ferrell observed that some "international broadcasters are phasing out programs aimed at North America simply because listeners appear to be more interested in QSLs and frequency changes than in programs on the 'air.' It appears that this reported action on the part of SW broadcasters may have had amiable justification. How many people do you personally know who actually spend any amount of time regularly listening to the programming on these frequencies, as opposed to brief hobby-type listening?

If the North American audience response was ever evaluated by American TV network standards, there wouldn't be a single English language broadcast beamed to North America! Star Trek and The Paper Chase each had a far larger audience than all of the combined English language broadcasts beamed to North America, and they were both unceremoniously dumped from the networks for having too small a following. It's a fate which has befallen scores of TV programs, be they "good" or "bad."

Let's explore this more graphically. Even if, for instance, there were presently 200,000 regular non-DX hobby listeners in North America who dutifully tuned in on international shortwave broadcasts beamed here in English, it is still hardly representative of the general public. Moreover, once those 200,000 listeners were divided up between Radio Moscow, Radio Sweden, BBC, Kol Yisrael. Deutsche Welle, and others that would make the size of the average audience receiving their programs about 5,000 listeners each. My 200,000 figure is probably far too generous. Contrast this with contemporary methods to evaluate the interest of an American audience.

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