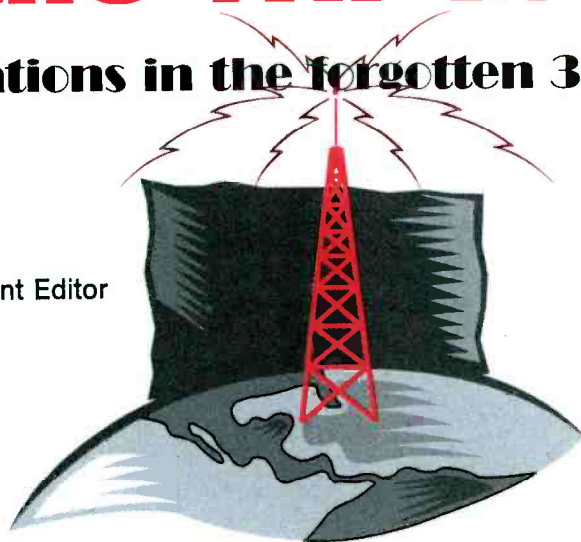


# DXing the VHF Low Band

## Hear distant stations in the forgotten 30-50 MHz band!

By Larry Van Horn, *MT* Assistant Editor



It is an early winter morning in the midwest United States and you're sitting in the radio shack tuning around the bands on your programmable scanner. While you've never heard much down in the 30-50 MHz range you decide to check out some of those obscure frequency ranges.

Suddenly the speaker comes alive with what sounds like state police traffic from somewhere out of state. You recognize that because the towns and locations being transmitted aren't familiar to you. After listening for a while, you determine the transmissions are coming from the state police dispatcher in Raleigh, North Carolina. Not bad, considering your location in the U.S. midwest. But how is reception that distant possible? That's easy. You are getting low band skip propagation.

### What Causes Low Band Skip Propagation?

There are several methods of propagation that can cause distant (DX) public safety stations in the 30-50 MHz band to be received (via skip) at your radio location. Some are very exotic (meteor scatter) and seldom realized, while others are cyclic in nature (E-skip) – the primary method by which we receive these distant stations.

The VHF-low band is the lowest public safety band in our programmable scanners and it shares many of the propagation characteristics of the lower HF spectrum and higher VHF frequencies. While a detailed discussion of how this propagation occurs is outside the scope of this article, we will discuss some of the basics in the paragraphs that follow. If the reader wants a more detailed treatment on the subject, the *ARRL Handbook for Radio Amateurs* has an excellent section on propagation theory.

In the absence of any favorable propagation conditions, the average low band installation (omnidirectional antennas and consumer grade scanners) can expect to receive stations regularly within a 150-200 miles radius of the receiving antenna. This sort of reception will be via **tropospheric scatter**, and the exact mileage will vary, depending on terrain, power, receiver capabilities, and the antenna/coax installed.

If you have a top-of-the-line installation (beam type antennas, communications receivers, and preamplifiers), weak-signal tropospheric scatter can bring in distant stations out to 300 miles or more

nearly any time (especially during hot, hazy, and humid summer mornings). Some special weather effects can also extend the normal groundwave range by a few hundred miles, especially during the spring/fall months, but such longhaul tropospheric ducting in the 30-50 MHz range is a relatively rare event.

**Sporadic E-skip** is probably the most common and certainly the most frequently monitored form of propagation on the VHF-low bands. There are several other forms of ionospheric E-layer propagation, but these modes are minor players compared to E-skip.

Single-hop E-skip openings may last many hours with stations from 350 to over 1500 miles being heard. The primary period of the year when E-skip occurs is spring (late April-early May) well into the



Courtesy of Solar-Terrestrial Physics Division of the National Geophysical Data Center



summer months. Patient monitors will also find another peak in E-skip activity around the Christmas holiday season.

Multiple-hop E-skip occasionally provides transcontinental reception during the summer months, and intercepts with stations in foreign countries from South America, Europe, and Japan have been logged.

Finally, during the peak of the 11-year sunspot cycle, worldwide VHF-low band DX is possible via the **F2 layer** of the ionosphere during daylight hours. As the amount of solar radiation increases (as it does during maximum solar activity), the density/ionization of the layers in the ionosphere increases. These periods of increased ionization drive the maximum usable frequency (MUF) that a given signal will propagate, even higher in frequency. It is not uncommon during periods of solar maximum to see MUF for F2-layer skip drive well past 50 MHz into the 6-meter ham bands, allowing for worldwide skip reception.

Also, F2 backscatter – in which the maximum usable frequency is just below the frequency you are trying to receive – provides an additional opportunity for reception as distant as 2,500 miles.

The VHF-low band DXer will also discover a seasonal connection to 30-50 MHz skip listening. Daytime ionization during the winter months of the F2 layer averages four times the level experienced during the summer months at the same period in the solar cycle, doubling the MUF. This has been dubbed by DXers as the winter anomaly, causing wintertime F2 conditions to be far superior to those in the summer months due to the higher MUFs.

Right now we are approaching solar cycle 23 maximum, and with the winter months upon us conditions are ripe for harvesting a large crop of 30-50 MHz DX stations. Now is the time to tune the VHF-low band for some truly exotic DX.

## So What Can You Expect to Hear?

We have prepared a detailed guide to the U.S. allocations in the 30-50 MHz band in Table One on page 12. Of course, for reception of stations outside the U.S., the allocations set up by each foreign government vary widely. Uncovering foreign radio allocations and frequencies via low band skip is one of the most exciting aspects of radio monitoring. In many cases it's the only way to acquire such data, since many governments do not freely divulge this information.

Not only can the discovery of a new Caribbean or Central/South American frequency be entertaining, it may also prove to be newsworthy. You can occasionally hear military war games, political and civil unrest, government drug enforcement, and a variety of other communications flooding your scanner's speaker during periods of skip conditions.

While it is impossible to provide a detailed list of discrete frequencies in this article, we will cover some of the more interesting communications that have been recently monitored.

## South of the Border Comms

One of the best indicators that long distance skip is propagating from south of the border is the Spanish dispatch operation on 30.22 MHz. This operation appears to originate from either Argentina or Venezuela, and the female dispatcher has been a regular visitor in my shack over the last few months.

There are several paging systems that are believed to be transmitting from Argentina that can be used as indicators of South American DX conditions. Keep an eye on the following frequencies: 32.31, 32.495, 32.68, 32.865, and 33.050 MHz.

Mexico has a string of half-duplex radio telephones in the 29.7-30 MHz band (15 kHz spacing, narrowband FM mode). They have been dubbed "whistlers" because of the continuous high-pitched guard tone heard during conversations. At the start of each call, the tone is interrupted to permit proper dialing of the number being called. These are the frequencies to watch: 29.715, 29.730, 29.745, 29.760, 29.775, and 29.790 MHz.

These radio-telephones seem to be point-to-point links used between hotels and casetas (long distance concessionaires located in their own buildings). The frequency 29.775 MHz is sometimes run parallel with 31.53 MHz.

Mexican federal and state police have been reported on a repeater frequency of 31.85 MHz. This is usually used as prime indicator that the band is open to that part of the world.

## Not All Spanish comes from the South

More than one DXer has been tricked into thinking they have an opening down south when in reality they were hearing the infamous New York "Gypsy" taxi cab dispatchers. During a recent tropospheric opening into that part of the United States, I monitored a large number of these stations on the following frequencies: 30.84, 30.88, 30.92, 30.960, 31.02, 31.04, 31.16, 31.24, and 33.16 MHz, to mention a few.



*Communications from the USAF A-10 aircraft are frequently heard in the VHF Low Band.*

## U.S. Military: A Dominant User

On examining Table One, the large amount of spectrum space devoted to government usage is immediately obvious. The U.S. military still maintains quite a few operations in the low band.

One of the first military stations logged by most low band monitors is the range control frequency (30.450) out of Fort Hood, Texas. A wide variety of interesting traffic can be heard on this frequency and they use a private line (PL) tone of 151.4 Hz. See Table Two for other interesting low band military comms recently intercepted.

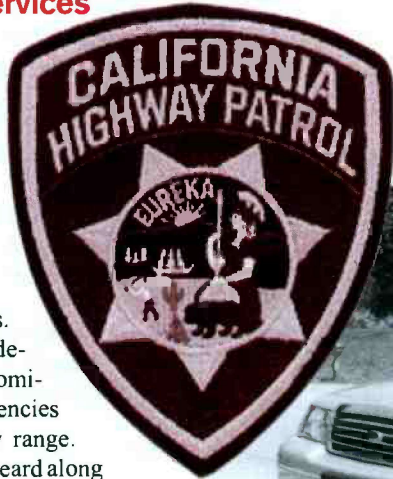
The low band listener will also hear a large amount of air-to-air communications from most of the U.S. military services on a variety of low band frequencies. The US Air Force A-10 aircraft are frequently heard on low band. Keep an ear open for the following frequencies in the narrowband FM mode: 32.35 32.45 32.65 32.675 32.85 34.125 34.15 34.175 34.375 34.40 34.55 34.575 34.60 34.75 36.15 36.35 36.50 36.60 36.825 36.85 38.50 38.65 38.67 38.675 38.70 40.20 40.65 40.95 41.05 41.45 41.50 41.80 41.95 46.65 46.75 46.85 49.75 49.85 49.95



## Police and Fire Services

Police and fire departments can still be widely heard in the VHF low band. Even casual listeners to this band have heard fire department dispatch/fireground operations in the 33 MHz range from the northeast portion of the United States.

Of course, state police departments are still the predominant law enforcement agencies that utilize this frequency range. Probably the most widely heard along the East Coast of the United States during transcontinental openings are the California Highway Patrol 42 MHz channels. It is a lot of fun and pretty exciting to hear long haul fire and law enforcement transmissions.



*The California Highway Patrol is a favorite low band target of east coast DXers during skip conditions—but for a west coast listener, hearing North Carolina would be a real catch!*



## Useful Aids

This form of radio listening is very rewarding, especially if you have some basic tools to work with. One of the first steps any low band enthusiast should accomplish is to map the local 30-50 MHz during dead band conditions. You can do searches within the civilian portions of the band using 20 kHz spacing. Of course, when the skip is in, I highly recommend cutting that search step down to 5 kHz, since foreign band plans and government/military communications do not conform to traditional spacing steps we see in the U.S. allocation plan.

If you are internet active, there is online help for U.S. licensed operations on the Federal Communications Commission website at:

<http://gullfoss.fcc.gov:8080/cgi-bin/ws.exe/beta/genmen/index.hts>



*Federal and state forest firefighters still use low band VHF for areawide communications. (Photo courtesy of Wildlandfire.com website.)*



A good set of *Police Call* books or the Grove FCC database will help those monitors who do not have access to the internet.

There is an internet newsgroup recently organized by Ian Julian, ZL1TBM, in New Zealand devoted to VHF low band DXing. Go to <http://www.onelist.com> and sign up for the VHF Skip list. You will need an email address, as this is the format used to deliver the messages from various members of the group. I hope to see your post on that list real soon.

Current VHF listening conditions are instantly reported and posted on a very unique website hosted by Bob Colyard—the 50 MHz Propagation Logger. You will find Bob's site at URL: <http://raven.cybercomm.net/~slapshot/dxing/50prop.html>

The best source for up-to-date radio propagation information can be found on the NOAA Space Environment Center's radio user page. Here you will find timely information such as recent space environment reports (Joint USAF/NOAA primary and secondary HF

propagation reports, reports of solar and geophysical activity, solar and geophysical activity summaries, and the latest geophysical alert message as broadcast on WWV); the current space environment alerts and warnings; auroral activity estimates from the NOAA/TIROS satellite; and various ionospheric data sets. This site is extremely valuable in determining current conditions regardless of which bands you are monitoring. Spin that browser toward: <http://www.sel.noaa.gov/radio/radio.html>

A reception report of these low band intercepts can be reported to the stations with the aim of obtaining a QSL or verification letter. For more on this subject be sure to read this month's *Beginners Corner* and the *QSL Report*.

So fire up that scanner and give low band DXing a try. Who knows? Maybe you will be lucky enough to hear the North Carolina Highway Patrol dispatch a call on 42.5/42.7 MHz to Grove Enterprises in Brasstown, North Carolina! Good luck and good hunting.

*Continued on page 12*

## What have we done for you lately?

Tripled the amount of information on the MT website, that's what. Our site is a great companion to your printed copy of MT, including a constantly-updated glossary of terms and web links mentioned in the magazine, spectrum allocations; clubs, links, events, frequencies, and mucho more! It's all at [www.grove-ent.com/hmpgmt.html](http://www.grove-ent.com/hmpgmt.html)



## TABLE ONE: MT'S VHF-LOW BAND 30-50 MHZ SPECTRUM GUIDE

Note: The band plan presented in this table is based on US FCC allocations only. Other countries' frequency allocations in this band will vary from what has been presented. VHF low or cordless phone band plans for other countries and other interesting low band intercepts are welcomed by the author at [larry@grove-ent.com](mailto:larry@grove-ent.com) or c/o Monitoring Times.

25.02-25.32	Petroleum Service	37.44	Industrial/Business Service	42.56	Police Communications Service
25.33-25.55	Fixed/Mobile Stations	37.46-37.86	Power Industrial/Business Service		State: CA IL MN NC ND NV OH OR PA TN
35.55-25.67	Radio Astronomy	37.88	Industrial/Business Service		
25.67-26.10	International Shortwave Broadcasting	37.90	Highway Maintenance Service/Special	42.58	Police Communications Service
26.10-26.175	Maritime Mobile		Emergency Service (Also 37.94 and		State: CT MI MO NC NV
26.175-26.48	Land Mobile		37.98)	42.60	Police Communications Service
26.48-26.95	Fixed/Mobile Stations	37.92	Highway Maintenance Service (Also		State: CA IL NC OK PA
26.620	Civil Air Patrol		37.96)	42.62	Police Communications Service
26.955	International Fixed Public	38.00-39.00	U.S. Government/Military		State: CA IL NC PA RI
26.965-27.405	Citizens Band Radio (US 40 channels)	39.02-39.04	Police Communications Service (Also	42.64	Police Communications Service
27.120	Industrial, Science, Medical discrete +/- 160 kHz		39.08 39.12 39.16 39.20-39.44 39.48		State: CA CT MI NC
			39.52-39.56 39.60-39.80 39.84-39.88	42.66	Police Communications Service
27.43-27.49	Industrial/Business Service (27.49 Itinerant)	39.06	39.92-39.96)		State: CA IL NC OH WY
			Any Public Safety Service (2 watts)	42.68	Police Communications Service
27.51-27.53	Industrial/Business Service (Low Power 2 watts)	39.10	Any Public Safety Service (Also 39.18		State: CA CT IL MI NC
			39.50 39.58 39.82 39.90 39.98)	42.70	Police Communications Service
27.54-28.00	U.S. Government/Military	39.46	Police Communications Service		State: CA IL NC NV
28.00-29.70	Amateur Radio 10-meter band		(Intersystem)	42.72	Police Communications Service
29.71-29.79	Industrial/Business Service	40.00-42.00	U.S. Government/Military (except 41.71		State: CA IL NC OH
29.80-29.89	Fixed Stations		as noted below)	42.74	Police Communications Service
29.89-29.91	Fixed/Mobile Stations	40.50	U.S. Government/Military - Distress,		State: CA MI NC NV OH TN
29.91-30.56	U.S. Government/Military		Rescue, Guard and Interservice Use	42.76	Police Communications Service
30.58-30.68	Industrial/Business Service	41.71	Petroleum Service (Oil Spill Contain-		State: CA IL NC
30.70	Petroleum Service (Also 30.78)		ment/Shared with Fed government)	42.78	Police Communications Service
30.72-30.76	Industrial/Business Service (Also	42.02	Police Communications Service		State: CA MO MN NC NV OH OR PA
	30.88 30.92 30.96 31.00 31.04 31.08		State: AK CA GA MS MO WV	42.80	Police Communications Service
	31.12 31.16 31.20 31.24 31.28 31.32	42.04	Police Communications Service		State: IL MI MS NC NV TX (one way
	31.36 31.40 31.44 31.48 31.52 31.56		State: CT FL NE NY WI WV	42.82	Police Communications Service
	31.60 31.64 31.68 31.72 31.76 31.80	42.06	Police Communications Service		State: CA MN NC OR WY
	31.84 31.88 31.92 31.96)		State: MO SC TX WV	42.84	Police Communications Service
30.80-30.82	Industrial/Business Service (Also	42.08	Police Communications Service		State: CA IL MS NC
	30.84 Low Power 2 watts)		State: CA MS OH SC	42.86	Police Communications Service
30.86	Industrial/Business Service/Forestry	42.10	Police Communications Service		State: FL MI MN NC OR VA VT
	Conservation Service (Also 30.90		State: SC WV	42.88	Police Communications Service
	30.94 30.98 31.02 31.06 31.10 31.14)	42.12	Police Communications Service		State: CA IL ID NC NV OR UT WY
31.18	Forestry Conservation Service (Also	42.14	State: CA IN ME MO MS SC WV		Police Communications Service
	31.22 31.26 31.30 31.34 31.38 31.42		Police Communications Service	42.90	State: FL IL NC NV OR TX
	31.46 31.50 31.54 31.58 31.62 31.66		State: ME NY SC WI	42.92	Police Communications Service
	31.70 31.74 31.78 31.82 31.86 31.90	42.16	Police Communications Service		State: CA FL NC OR VA
	31.94 31.98)		State: CA IN MS PA	42.94	Police Communications Service
32.00-33.00	U.S. Government/Military	42.18	Police Communications Service		State: MI NC NV OR UT
33.02	Highway Maintenance Service/		State: CA CT GA MI MS NE	42.96	Industrial/Business Service (Also
	Special Emergency Service (One-way	42.20	Police Communications Service		43.00-43.02 43.06-43.52)
	paging on secondary basis) (Also		State: CA CT IN MS NE	42.98	Industrial/Business Service (Low
	33.06 and 33.10)	42.22	Police Communications Service		Power 2 watts)
33.04	Special Emergency Service (Also	42.24	State: MO NC WI		Industrial/Business Service (Itinerant)
	33.08)		Police Communications Service	43.04	43.54-43.62
33.12	Industrial/Business Service (Also	42.26	State: CA CT ID MI MS		Radio Common Carrier Paging
	33.14 Low Power 2 watts)		Police Communications Service	43.64	Special Emergency Service (Low power
33.16	Industrial/Business Service		State: Industrial/Business Service ND		under 10 watts digital transmissions)
33.18-33.38	Petroleum Service		SC TN WV	43.66	Radio Common Carrier Paging
33.40	Industrial/Business Service (Low	42.28	Police Communications Service	43.68	Special Emergency Service (One way
	Power 1 watt)		State: CA MI NE TN		paging to mobiles only)
33.42	Fire Communications Service (10	42.30	Police Communications Service	43.70-44.60	Industrial/Business Service
	watts or less)		State: CA CT MI MS NE NY	44.62	Police Communications Service
33.44-33.98	Fire Communications Service	42.32	Police Communications Service		State: AL AR KY NY
34.00-35.00	U.S. Government/Military		State: GA MO OK	44.64	Forestry Conservation Service (Also
35.02	Special Emergency Service/	42.34	Police Communications Service		44.68 44.72 44.76 44.80 44.84
	Industrial/Business Service		State: CA IL MA NE SC		44.88 44.92 44.96 45.00 45.04)
35.04	Industrial/Business Service (Itinerant)	42.36	Police Communications Service	44.66	Police Communications Service
35.06-35.18	Industrial/Business Service (Also	42.38	State: CA CT IL NY TN		State: AR AZ FL IL
	35.28 35.32 35.36 35.40 35.44 35.48		Police Communications Service	44.70	Police Communications Service
	35.52)		State: MA MO NC ND WI		State: IL OK
35.20-35.26	Radio Common Carrier Paging (Also	42.40	Police Communications Service	44.74	Police Communications Service
	35.30 35.34 35.38 35.42 35.46 35.50		State: CA IN MA		State: AR FL MA MD OH
	35.54-35.62)	42.42	Police Communications Service	44.78	Police Communications Service
35.64-35.68	Special Emergency Service (One-way		State: CA IN MA TN		State: AL AR FL KY
	paging to mobile receivers only)	42.44	Police Communications Service	44.82	Police Communications Service
35.70-35.98	Industrial/Business Service		State: CA IL MA NH OR		State: AZ KS NH OH
36.00-37.00	U.S. Government/Military (except	42.46	Police Communications Service	44.86	Police Communications Service
	36.25 as noted below)		State: CA IL MA NE		State: CT DE NH OH
36.25	Petroleum Service (Oil Spill	42.48	Police Communications Service	44.90	Police Communications Service
	Containment/Shared with Fed		State: CA CT MI NE NY		State: MA MD OH OK
	government)	42.50	Police Communications Service	44.94	Police Communications Service
37.02-37.08	Police Communications Service (Also	42.52	State: CA IL MA NC NV		State: FL KS NH OH
	37.12-37.16 37.20-37.24 37.28-		Police Communications Service	44.98	Police Communications Service
	37.42)		State: CA CT IL NC NY PA		State: KS NH OH
37.10	Any Public Safety Service (Also 37.18	42.54	Police Communications Service	45.02	Police Communications Service
	37.26)		State: CA ID IL MA		State: CA CT DE NH OH OK



## TABLE ONE, CONTINUED

45.06	Police Communications Service State: FL IL OH TX	45.86	Police Communications Service (Intersystem)	47.42	Special Emergency Service (Reserved for assignment only to national organizations eligible for disaster relief operations)
45.08	Any Public Safety Service (Also 45.12 45.16 45.20 45.24 45.28 45.32 45.36 45.40 45.44 45.48 45.52 45.56 45.60 45.64)	45.88	Fire Communications Service (Intersys- tem)	47.44	Industrial/Business Service (Also 47.48 47.52 47.56 47.60 47.64 47.68)
45.10	Police Communications Service (Also 45.14 45.18 45.22 45.26 45.30 45.34 45.38 45.42 45.46 45.50 45.54 45.58 45.62 45.66 45.70 45.74 45.78 45.82 45.90 45.94 45.98 46.02)	46.06-46.28	Fire Communications Service (Also 46.32-46.50)	47.46	Special Emergency Service (Also 47.50 47.54 47.58 47.62 47.66)
45.68	Highway Maintenance Service (Also 45.72 45.76 45.80 45.84)	46.30	Fire Communications Service (Maximum power 10 watts)	47.70-48.54	Power Industrial/Business Service
		46.52-46.58	Any Public Safety Service	48.56-49.58	Industrial/Business Service
		46.60-47.00	U.S. Government/Military	49.60-50.00	U.S. Government/Military
		47.02-47.40	Highway Maintenance Service (State/ Local only secondary basis to work with state)	50.00-54.00	Amateur Radio 6-meter band

## TABLE TWO: SELECTED LOW BAND MILITARY INTERCEPTS

32.20	Sabre AHP/Fort Campbell, KY: Sabre tactical	38.40	National Guard Common (Nationwide)	41.45	Glenn Martin State Airport, MD: 175FG Tactical Ops/Colt call sign
32.35	Reno-Stead/NG Command Post, NV: Rocky operations	38.65	Fort Bragg, NC: Range control	41.50	Hunter AAF, Savannah, GA: Sunny Operations/Sunny RC-12 aircraft
32.50	Fort Bragg, NC: Range control	38.70	Hunter AAF, Savannah, GA: Sunny Operations/Sunny RC-12 aircraft	41.50	Shelbyville Muni, IN: NG Command Post
34.00	Fort Dix, NJ: Range control	38.70	Westover ARB, MA: NG Operations/ Minuteman Ops	41.75	Fort Bragg, NC: Range control
34.20	USAF Claiborne Range, LA: Range control	38.90	Fort Bragg, NC: Range control/Camp McCall	41.80	Battle Creek, MI: 110FW Tactical
34.40	Warren Grove Range, NJ: Air-to-air communications	40.50	Military Search and Rescue (Worldwide)	41.90	Bradley Airport, CT: Operations/NG Aviation Support Facility
34.90	Fort Campbell, KY: Eagle Radio Flight Following	40.60	Fort Bragg, NC: Helicopter operations	46.85	Kiowa Military Operating Area, PA: Range control
36.75	USAF Claiborne Range, LA: Air-to-ground communications	40.90	Fort Indiantown Gap, PA: Flight Following	46.95	Lowe AHP, AL: Tower
		41.40	Fort Bragg, NC: Tactical operations	49.75	Warren Grove, PA: Range control
		41.41	Fort Indiantown Gap, PA: Range control		
			Fort Bragg, NC: Medical Net		

## TABLE 3: CORDLESS TELEPHONE ASSIGNMENTS

### United States

*US Monitors Note: Federal law makes it illegal to monitor cordless phone conversations. These frequencies are presented for informational purposes only to help the low band DXers ferret out potential cordless phone frequencies from similar distant skip signals. Phone users should be aware that these low power phones have been heard great distances under the right ionospheric conditions.*

43.720	New Cordless Phones Base <channel 1>	49.090	New Cordless Phones Handset <channel 6>
43.740	New Cordless Phones Base <channel 2>	49.100	New Cordless Phones Handset <channel 7>
43.820	New Cordless Phones Base <channel 3>	49.160	New Cordless Phones Handset <channel 8>
43.840	New Cordless Phones Base <channel 4>	49.200	New Cordless Phones Handset <channel 9>
43.920	New Cordless Phones Base <channel 5>	49.240	New Cordless Phones Handset <channel 10>
43.960	New Cordless Phones Base <channel 6>	49.280	New Cordless Phones Handset <channel 11>
44.120	New Cordless Phones Base <channel 7>	49.280	New Cordless Phones Handset <channel 11>
44.160	New Cordless Phones Base <channel 8>	49.360	New Cordless Phones Handset <channel 12>
44.180	New Cordless Phones Base <channel 9>	49.360	New Cordless Phones Handset <channel 12>
44.200	New Cordless Phones Base <channel 10>	49.400	New Cordless Phones Handset <channel 13>
44.320	New Cordless Phones Base <channel 11>	49.400	New Cordless Phones Handset <channel 13>
44.360	New Cordless Phones Base <channel 12>	49.460	New Cordless Phones Handset <channel 14>
44.400	New Cordless Phones Base <channel 13>	49.460	New Cordless Phones Handset <channel 14>
44.460	New Cordless Phones Base <channel 14>	49.500	New Cordless Phones Handset <channel 15>
44.480	New Cordless Phones Base <channel 15>	49.500	New Cordless Phones Handset <channel 15>
46.610	Old Cordless Telephone Base <channel 1>	49.670	Cordless Handset <channel 1>
46.630	Old Cordless Telephone Base <channel 2>	49.670	Pre-1984 Cordless Handset
46.670	Old Cordless Telephone Base <channel 3>	49.830	Cordless Handset <channel 2> also Pre-1984 Cordless Handsets
46.710	Old Cordless Telephone Base <channel 4>	49.845	Cordless Handset <channel 3> also Pre-1984 Cordless Handsets
46.730	Old Cordless Telephone Base <channel 5>	49.860	Cordless Handset <channel 4>
46.770	Old Cordless Telephone Base <channel 6>	49.860	Cordless Handset <channel 5> also Pre-1984 Cordless Handsets
46.830	Old Cordless Telephone Base <channel 7>	49.875	Cordless Handset <channel 6>
46.870	Old Cordless Telephone Base <channel 8>	49.770	Cordless Handset <channel 7> also Pre-1984 Cordless Handsets
46.930	Old Cordless Telephone Base <channel 9>	49.875	Cordless Handset <channel 8>
46.970	Old Cordless Telephone Base <channel 10>	49.875	Cordless Handset <channel 9>
48.760	New Cordless Phones Handset <channel 1>	49.830	Cordless Handset <channel 10>
48.840	New Cordless Phones Handset <channel 2>	49.890	
48.860	New Cordless Phones Handset <channel 3>	49.930	
48.920	New Cordless Phones Handset <channel 4>	49.970	
49.020	New Cordless Phones Handset <channel 5>	49.990	

### United Kingdom

Here is the new UK cordless phone band:

31.0375-31.2125 Base sets  
39.9375-40.1125 Hand sets

The new cordless phone band is used by analog as well as digital phone sets. Information courtesy of Ian Julian, ZL1TBM, New Zealand.

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# DXing VHF Low Band Skip

## How to Hear Distant Stations Between 30 and 50 MHz

By Brian Webb

Imagine listening to a police man-hunt on the other side of the country, a cordless telephone conversation from Central America, or a real estate company in Argentina. Far fetched? Not at all. Of the entire radio spectrum, few parts are more interesting than the VHF low band. Lying between 30 and 50 MHz, this region can combine the local communications heard on the higher bands with the long range reception of shortwave. DXing this band is easier than you think. All you need to get started is some basic information.

### Propagation

An important ingredient for successful VHF skip DXing is an understanding of radio wave propagation. Between 30 and 50 MHz, radio signals are propagated long distances by two different means:  $F_2$  and Sporadic-E.

### $F_2$

The primary medium for long distance low band reception is the  $F_2$  layer of the ionosphere. This layer is created by solar radiation and is found on the daylight side of the earth between altitudes of 200 and 250 miles (322 and 402 km). The highest frequency that the  $F_2$  layer is capable of propagating is called the maximum usable frequency (MUF). The  $F_2$  layer's MUF is influenced by the time of day, solar activity, and the season.

The  $F_2$  region's ionization and the MUF are at their minimum before sunrise. As the morning progresses, the  $F_2$  layer's ion density and the

MUF increase, reaching their maximum value around noon. During the afternoon, the  $F_2$  layer's ionization and the MUF decrease.

The daily peak  $F_2$  MUF is heavily influenced by solar activity. When the 11-year solar cycle is at its minimum, the daily peak MUF is approximately 17 MHz. As solar activity increases, the daily peak MUF rises. Eventually, about two years before the peak of the cycle, the daily peak MUF will reach 30 MHz, making long distance VHF reception possible. During the peak of the cycle, the daily peak MUF can reach 70 MHz.

As the solar activity declines, so does the daily peak MUF. About two or three years after the peak of the cycle, the daily peak MUF will drop below 30 MHz, making the VHF low band unusable for long distance DX reception. The solar activity and  $F_2$  MUF decline until the minimum is reached and the next 11-year cycle begins.

VHF  $F_2$  reception also varies according to the season. During the late spring and early summer,  $F_2$  propagation above 30 MHz is scarce and much of the time the band appears to be dead. Conditions are better in the mid-spring and mid-summer when a small number of stations can be heard. Virtually all of these stations are from a zone between 30° north to 30° south of the equator. North American DXers will hear stations from Florida, the Gulf Coast, southern Texas, Mexico, Central America, the Caribbean, and the northern half of South America.

Around the time of the spring and autumn equinoxes, reception from a zone extending from 45° north to 45° south latitude becomes possible. Listeners in North America will hear a mix of U.S. and Latin stations (the equinoxes produce

the best conditions for hearing Latin America). At the same time, very long transequatorial signal paths can occur, allowing reception of stations halfway around the world. North American DXers should be alert for morning openings to southern Africa and afternoon openings to Australia and the South Pacific.

From mid-autumn to mid-winter, the reception footprint moves into the winter hemisphere, and the  $F_2$  MUF is the highest. Although transequatorial propagation is still possible, most of the stations heard are from a zone extending from the equator to the sub-arctic.

The minimum distance from which a VHF signal can be heard via  $F_2$  varies with the frequency. This is a result of the propagation geometry (Figure 1). Local VHF stations are usually heard out to a range of 50 miles (80 km). Fringe stations are sometimes audible out as far as 150 miles (241 km). Extending from 150 miles (241 km) to beyond 1,000 miles (1,609 km) is a dead zone from which  $F_2$  reception is not possible. Signals from this zone penetrate the  $F_2$  layer at angles too steep to be refracted earthward. As the distance from the receive site is increased, the inside edge of the DX zone is reached. This represents the minimum distance that a signal can be heard via  $F_2$ .

At 30 MHz, signals can be heard via  $F_2$  no closer than about 1,200 miles (1,931 km). As the frequency is increased, the inside edge of the receive zone moves farther outward. At 47 MHz, this distance increases to 2,100 miles (3,379 km). Let me clarify this concept with a real world example: From my location in southern California, I can hear stations on 30 MHz from the entire eastern half of the U.S. Up at 47 MHz, however, I can only hear stations from the east coast and Appalachia (PA, SC, NC, FL, CT, DE).

Yet another factor that influences VHF  $F_2$  reception is the DXer's latitude. The length of the  $F_2$  season, daily peak MUF, and consistency of reception all decrease the further the listener is located from the equator. This can be illustrated by comparing my observations of the 1991-1992 VHF  $F_2$  season with those of Max Van Anhem. My receive site is located at 34° north. During the last  $F_2$  season, I received skip for a 10 month period (from late September to late April). The observed daily peak MUF was almost always above 39 MHz and on several days it was above 47 MHz.  $F_2$  reception was consistent; skip was heard almost every day between September and March.

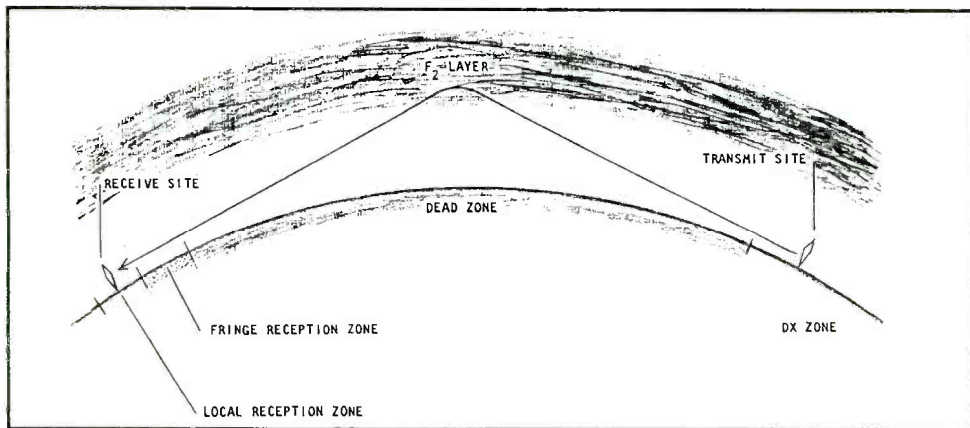


Figure 1:  $F_2$  propagation geometry and reception zones.



Van Arnhem, who is situated at 52° north, noted different conditions. His F<sub>2</sub> season was only 7 months long (from late September to late April), his observed MUF was usually 5 MHz lower than mine, and his reception was much more erratic. In a letter he wrote: "This season, daily variations in the MUF are very great ... there are days without F<sub>2</sub> skip ... while sometimes the MUF is as high as 44 MHz."

Another interesting phenomenon is that F<sub>2</sub> skip is better heard from certain directions compared to others. Over the equator and the tropics, the F<sub>2</sub> layer exhibits the least seasonal variations, is the most immune to solar flares and geophysical disturbances, and exhibits the highest MUF. As you move away from the equator, the F<sub>2</sub> is more influenced by seasonal, solar, and geophysical effects. In addition, the MUF decreases. Thus, for DXers in the temperate latitudes, signals are best heard from the direction of the equator and worst from the direction of the pole (the north pole for listeners in the northern hemisphere and the south pole for DXers in the southern hemisphere).

For North American listeners, signals will be heard best from the south. Immediately before and after the annual mid-year F<sub>2</sub> blackout and during periods of disturbed propagation, virtually all of the stations received will be from Caribbean and Latin America. When F<sub>2</sub> propagation is good, the highest MUF, longest signal paths, and best signal strengths will be towards the southeast, south, and southwest. Conversely, reception of stations from the sub-arctic and arctic is uncommon and transpolar VHF propagation is rare.

## Listen Up: There's Little Time Left

Now that we've gone over the dynamics of F<sub>2</sub> propagation, information on when to listen is in order. As mentioned earlier, solar activity needs to be high for VHF F<sub>2</sub> reception to occur. Unfortunately, the current solar cycle reached its peak a few years ago and solar activity is on the decline. This means that DXers in the temperate latitudes have only two more VHF F<sub>2</sub> seasons remaining. The approximate starting and ending dates of these seasons are listed in Table 1.

**Table 1: VHF F<sub>2</sub> Season Beginning and Ending Dates**  
1992 - 1993

Dxer's Latitude (°N)	Begins	Ends
35	September 7	April 7
45	September 21	March 21
55	October 21	February 21

1993 - 1994

Dxer's Latitude (°N)	Begins	Ends
35	October 21	February 21
45	November 21	January 21
55	--	--

Since VHF F<sub>2</sub> reception is a daytime phenomenon, do all of your F<sub>2</sub> DXing during the day. Some F<sub>2</sub> skip should be present, especially at the lower end of the band (between 30 and 34 MHz). Experiment and listen at different times of the day. Besides hearing new stations, you'll also get familiar with how VHF F<sub>2</sub> skip works. Certain areas are heard best at specific times. The optimum time to hear various areas is summarized in Table 2.

**Table 2: Optimum Times for Various DX Target Areas**

Target Area	Optimum Time
>5,000 miles (8,045 km) east	Sunrise to mid-morning
1,800 to 2,600 miles (2,896 to 4,183 km) east	Mid-morning to noon
Directly north or south	Late morning to early afternoon
1,800 to 2,600 miles (2,896 to 4,183 km) west	Noon to mid-afternoon
>5,000 miles (8,045 km) west	Mid-afternoon to sunset

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## Sporadic-E

VHF low band signals are also heard over long distances via Sporadic-E propagation (also written as  $E_s$ ).  $E_s$  is the result of patches of ionization that form just below the E-layer of the ionosphere. These clouds of ions are dense and occur at altitudes between 50 and 60 miles (80 and 97 km). With diameters between 50 and 100 miles, these ionized patches tend to move towards the west or northwest at speeds between 150 and 250 miles (241 and 402 km) per hour.

The ion density of Sporadic-E clouds is often very high. This leads to observed MUFs well above 50 MHz.  $E_s$  propagation is occasionally present in the 2-meter amateur band and has even been noted as high as 223-225 MHz band. Another consequence of this very high ion density is low signal path loss and very strong signals. It's not unusual to hear a station more than 1,000 miles (1,609 km) away exhibit a stronger signal than your local stations.

Unlike  $F_2$  propagation, which allows DX to be heard from a vast area, E-skip reception is much more limited. Although multi-hop Sporadic-E propagation does occur, most E-skip is the result of a single bounce. This, combined with the fact that  $E_s$  ionization occurs at relatively low altitudes, limits the maximum range of most E-skip to about 1,300 miles (2,091 km). The minimum distance that signals can be heard via Sporadic-E is about 225 miles (362 km) at 30 MHz and 375 miles at 50 MHz.

The small diameter of  $E_s$  clouds further limits the area from which DX can be heard. Sometimes Sporadic-E skip is only heard from an area as small as the state of Kansas. From my listening post in southern California, I usually only hear one or two areas at a time such as northern Texas, Kansas, or the Washington-Oregon-Idaho region.

As mentioned earlier, Sporadic-E clouds tend to drift at high speed towards the west and northwest. This movement has two interesting effects on low band reception. First, the strength of a received signal can go from weak to very strong and back to weak in the course of an hour. In addition, the area being heard often changes. A DXer in California might hear low band stations from Texas in the morning, Colorado in the early afternoon, and Oregon in the evening.

The times at which E-skip appears and the lengths of the openings vary with the DXer's latitude. In the equatorial region, Sporadic-E can appear at any point of the 11-year cycle, in any season, and at any time of day or night. The openings last from several hours to an entire day.

At temperate latitudes, Sporadic-E openings occur each year, regardless of the solar activity. About 80% of the  $E_s$  openings occur in the late spring and early summer with peak activity during the four week period centered on the summer

**Table 3:  
U.S. Non-government  
Frequency Allocations**

30.580 - 31.980
33.020 - 33.980
35.020 - 35.980
37.020 - 37.980
39.020 - 39.980
42.020 - 46.580
47.020 - 49.580

**Table 4:  
U.S. Military and Government  
Frequency Allocations**

30.000 - 30.550
32.000 - 33.000
34.000 - 35.000
36.000 - 37.000
38.000 - 39.000
40.000 - 42.000

solstice. During the mid-year Sporadic-E season, skip can materialize at any time of day, but it's most common in the late morning and early evening. A minor E-skip season also occurs around the winter solstice with most (but not all) openings in the evening. In the temperate regions E-skip openings last from several minutes to an hour.

At the high latitudes and in the polar regions, Sporadic-E is limited to the years of moderate and high solar activity. The openings occur during the night time hours of the spring and autumn and last from several minutes to an hour.

Important indications of Sporadic-E to watch for are changes in television reception on the channels between 54 and 88 MHz (channels 2, 3, 4, 5 and 6 in the Americas). Look for video on normally empty channels, images superimposed on your local station's picture, or your local station's video appearing to pulsate. If you see any of these signs, go to your scanner and check the 30-50 MHz band for E-skip.

## Equipment

Contrary to popular belief, you don't need a receiver like an R-7000 and a log periodic antenna to hear VHF low band skip. Even a modest receiving setup should pull in a large amount of DX. There's a good chance that you already have all of the equipment you'll need.

**Receiver:** Any scanner that can receive the 30-50 MHz band will do. Although not critical, a large channel capacity is helpful, especially for ferreting out E-skip.

**Antenna:** Good VHF skip reception is possible with a relatively simple antenna. If you already have a scanner or shortwave antenna, it might work. You can test your existing antenna by listening between 30 and 40 MHz. If you can hear stations more than 20 miles (32 km) away, your existing antenna will probably suffice.

If your existing antenna isn't up to the task, you can make a simple indoor VHF low band monopole. This type of antenna is easy to make and should work well as long as the surrounding walls are transparent to RF. Cut a piece of hookup wire to a length of 7 feet 3.75 inches (2.22 m) and solder the end to an RF connector. Plug the connector into your radio's antenna jack and then orient the monopole so that it's more or less vertical. Then use a nail or push pin to affix the end to the wall.

**Cassette Recorder:** This is an essential piece of equipment for catching CW station IDs, sta-

tion callsigns, place names, and other information needed to identify a station. A cassette recorder also allows you to save your best DX catches for posterity. Your recorder should have jacks for mic, remote, and earphone as well as a tape counter.

The recorder should be connected directly to the receiver via a patch cord. An earphone or speaker should be plugged into the earphone jack to allow monitoring while the unit is recording.

**Timer:** A useful accessory is an electronic timer. You can use a timer to activate your cassette recorder when you're away from home and record skip for later playback.

## Frequencies

The topic of which frequencies to monitor is too broad to be discussed in detail here. For the newcomer I would suggest beginning by hunting for U.S. skip. My advice is based on the fact that the U.S. probably has more 30-50 MHz stations than any other country, they're widely heard (at least as far as Europe via  $F_2$ ), and they often identify themselves. U.S. VHF low band activity is concentrated into the sub-bands listed in Table 3 (frequencies in MHz).

The sub-bands listed in Table 3 are used by business, police, fire/paramedics, local government, etc. All of the channels are spaced in 20 kHz steps (i.e. 35.020, 35.040, 35.060 MHz, etc).

U.S. Military and other government communications can also be heard. These stations are mostly found in the sub-bands listed in Table 4 (frequencies in MHz):

The U.S. military tends to use channels that are spaced in 50 kHz steps (i.e., 34.000, 34.050, 34.100, 34.150 MHz, etc.). These sub-bands also contain stations operated by other government agencies such as the U.S. Fish and Wildlife Service (34.830 MHz). Since the above segments of the 30-50 MHz band contain relatively few U.S. stations, they're free from interference and serve as windows for foreign DX. Because foreign stations can appear on just about any frequency, scan these sub-bands in 5 kHz increments.

You can increase the amount of skip that you hear by intelligently selecting the frequencies that you monitor. Choose frequencies that will be below the expected MUF. Since the  $F_2$  MUF varies with the 11-year solar cycle and solar activity is declining, select frequencies between 30-43 MHz during the current (1992-1993) F2 DX season and 30-36 MHz during the 1993-1994



season. When searching for Sporadic-E, which often propagates signals above 50 MHz, you may choose frequencies from throughout the 30-50 MHz band. It's also important to select frequencies that are free of local stations. This prevents your radio from locking onto locals while scanning and keeps you from wasting your time trying to identify a local.

When choosing frequencies, give preference to those that have a high volume of radio traffic. These would be U.S. business, special industrial, fire, police, and special emergency (ambulance) frequencies. Be sure to avoid frequencies that are allocated only for mobile or low power use. These frequencies tend to be quiet and rarely have any signals strong enough to be heard clearly. Information on U.S. frequency allocations can be found in the back of any *Police Call* frequency directory in a section titled "Consolidated Frequency Tables."

The more frequencies you search, the greater your odds of finding skip. If your scanner has the channel capacity, (or if you have a second radio), you can also program in the frequencies used in the U.S. for forest products, petroleum production, telephone maintenance, power and utilities, motor carrier (trucks and buses), highway maintenance, local government, forestry conservation, and paging. If you still have channels left that you want to fill, program in U.S. military frequencies.

## Monitoring Techniques

**Single Frequency Monitoring:** This method involves continuously monitoring a frequency for at least 30 minutes and listening for voice and CW station IDs. You can either monitor the frequency in person or record the received signals while you're away from home for later playback.

**Search Between Limits:** This technique uses a scanner's ability to search between two frequencies. It's a simple way to locate skip and determine the MUF. When using this method program your radio to search in 5 kHz steps.

**Limited Channel Search:** This method calls for programming your radio to scan all of the clear channels in a limited portion of the 30-50 MHz band or to only scan the channels used for a specific purpose. For example, you could scan the channels of the 33.420 - 33.980 MHz fire/paramedic sub-band or the low band channels used exclusively by the U.S. Coast Guard.

**Extensive Channel Search:** This approach is a rapid scan of 200 or more clear channels between 30-50 MHz. When used for F<sub>2</sub> DXing, it enables you to easily find skip and determine the MUF. It's also the best way to hunt for Sporadic-E openings. During E-skip season you can use your radio as an Es alarm by letting it operate in this way for extended periods.

These advantages, however, come at a cost. You'll need a radio with at least 200 channels and

be willing to dedicate them to low band DXing. It will also be necessary to carefully select the frequencies to be scanned and then load them one by one into your scanner. Once you begin scanning, you'll find that several of the channels that you believed to be clear are used by local stations. As each of these occupied channels is found, you'll have to replace it with another clear frequency.

## Useful Tips

- As mentioned earlier, many U.S. low band stations identify themselves. The majority of the IDs are a verbal recital of the station's callsign by the base station. Stations operated by businesses sometimes ID when they are calling a mobile unit or at the end of a conversation. Since these IDs are unpredictable, be sure to have your cassette unit recording when you're listening to business and industrial stations.

Many police, fire/paramedic, and ambulance base stations identify themselves at the start of each hour (a few also ID on the half hour). At about 50 minutes past the hour, check police, fire, and ambulance frequencies for activity. If you find an active frequency, go back to it at 58 minutes past the hour, start your cassette recorder, and sit on the frequency for four minutes, to try to catch the ID.

Some stations identify themselves with an automatic Morse Code ID. Most of the time you'll stumble onto one of these IDs as you scan the band. If you don't hear the entire ID, or if it's too fast for you to copy, note the frequency and the time you heard it. Go back to the frequency an hour later with your tape recorder on; if you're lucky, you'll hear the ID again.

- Accurate record keeping is a simple way to enhance VHF low band DXing. Taking detailed notes of what you hear can help you produce higher quality loggings, identify what you hear, and DX more efficiently. When you intercept interesting radio traffic, write down the basic facts and anything that might assist you in identifying the station, such as the following:

- Frequency
- Date (UTC)
- Time (UTC)
- Mode (Narrow Band FM, AM, etc.)
- Type of signal (voice, voice and music, modulated CW)
- Type of propagation (F<sub>2</sub> or E<sub>s</sub>)
- Language (English, Spanish, French, etc.)
- Accent (U.S. Southern, New York City-New Jersey, Mexican, etc.)
- Place names mentioned (Cherokee County, I-95, Avenida Juan Peron, etc.)
- Callsigns heard
- References to the local time
- Subject matter discussed

Maintaining lists is also helpful. Since I'm only interested in hearing skip, I try to avoid frequencies that are used by local stations. This is easy, because I keep a list of all locally used frequencies. I also maintain a list of clear frequencies which have distant stations that I haven't had a chance to log. It contains frequencies used by distant U.S. business and military stations and the frequencies on which Morse Code IDs have been noted.

## Time to Get Started

F<sub>2</sub> skip is still feasible until February or April, depending upon your latitude, so let's not waste any time recording and logging potential skip transmissions. In a second installment, we'll discuss how to identify those unknown loggings, how to build an outdoor VHF sloping dipole if your current antenna has not proven adequate, and we'll publish a selected list of logged and identified skip communications for your inspiration!

Meanwhile, I'd be interested in what you hear. Comments and questions are welcome at the following address: Brian Webb, P.O. Box 6484, Thousand Oaks, CA 91359-6484.

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# How To Hear Central America And The Caribbean On Your Scanner!

*Guerrillas, G.I.'s, Maneuvers, War... And More!*

BY CHUCK ROBERTSON, #IL-141 AND DAVE BEAUVAIS, KB1F





Without a doubt, some of the most easily-heard and intriguing VHF Low Band skip to sneak across our American borders in recent years has been in the form of sensitive communications from highly controversial—and in many cases, highly secret—military operations in Central America.

A case in point: the recent joint U.S./ Honduran military exercises known as “Big Pine I” and “Big Pine II” have filled the lower end of the 30-50 MHz VHF band with fascinating tactical communications on a regular, sometimes daily basis. The presence of a permanent cadre of American advisors in Honduras, coupled with the widely-reported establishment of long-term American support bases in that country, make it a good bet that this tactical activity will continue to be heard for a long time to come.

With the sporadic E season now upon us, “double-hop” propagation from Central America to most parts of the United States promises some very thrilling reception indeed. But even during winter and spring months, the tendency of signals between approximately 30 and 35 MHz to propagate well along a north-south path has produced some astonishing and unexpected catches—which can only be described as a military security officer’s nightmare and a scanner enthusiast’s delight!

### The Yankee/DX Connection

So what’s really happening down there?

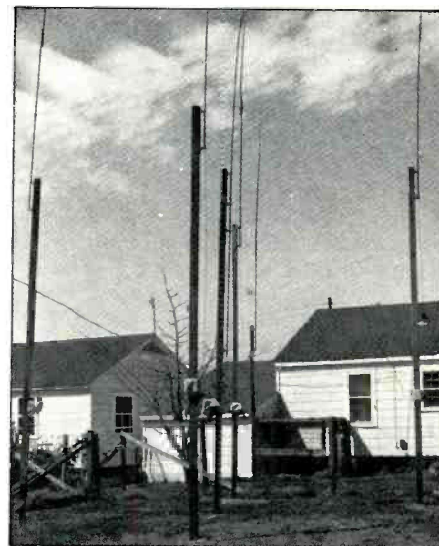
Observations made during the Big Pine exercises indicated that U.S. and Honduran military personnel worked together amiably, although a language barrier sometimes led to minor problems. The U.S. military appeared to dominate the operation—at least from the standpoint of managing communications logistics; and personnel were frequently found hopping from channel to channel as they tried to keep field operations well-organized. “Headquarters” or “control” channels were manned by both Hondurans

and Americans. (See Table 2 for a log of unusual Low Band frequencies carrying U.S. military traffic from Central America.)

In November 1983, with more than 5,000 American troops and 6,000 Honduran soldiers participating—and aided by strong early-winter F-layer propagation on the north-south path—tactical communications virtually saturated the bottom end of the VHF Low Band. During one particularly heavy period of war games, an English-speaking Honduran stated he was using an “AN/VRC-46 and a whip.” These vehicular units have ten pre-set channels in the 30 to 76 MHz range, with an output ranging from 10 to 35 watts depending on the frequency used. (For a description of this and related field equipment, see “Get In On Uncle Sam’s High Tech Electronics,” *POP’COMM*, February, 1983, p. 8) For the most part, a 50 kHz spacing between active channels was noted in these exercises.

More joint military exercises are occurring this summer in Honduras. Maneuvers are scheduled to take place in the mountainous western region bordering El Salvador and Guatemala. The announced plan is for U.S. troops to participate, along with military forces from El Salvador, Guatemala, and Honduras, in “counterinsurgency” training, with a special emphasis on raising the profile of the Guatemalans in the region’s highly-polarized military theatre.

Evidence seems to point to the fact that these exercises are less a showpiece than they are a cover for funneling U.S. military support to forces bent on overthrowing the leftist government of Nicaragua. These *contras*, as they are commonly known, figure prominently in our story as well—since *someone* in the region has been heard using very sophisticated, high-tech radios (employing, at various times, both digital and analog voice scramblers, as well as unscrambled Spanish), to make some very terse, terse, and seemingly under-fire transmis-



Some installations run communications on many frequencies simultaneously.

sions monitored here in the states (as we shall see).

Our own military, by comparison, uses virtually no scrambling in its Big Pine tactical operations on these frequencies; while these mysterious, high-security, scrambled radios are precisely the type of equipment that one would expect to be included in the not-very-secret “covert aid” provided to the *contras* by the American Central Intelligence Agency.

In the last analysis, one of the really exciting things about this “freak” propagation from Central America is that it gives you an opportunity to hear for yourself what’s *really* going on down there—and quite possibly, to add something entirely new to our public knowledge about clandestine guerrilla activities, which the intelligence community seems to want to keep hidden.



The evidence that contras are being supported with American-made high-tech scrambler radios which are more secure than even our own military communications links is curious in itself, having been accidentally discovered by one of the authors in the course of routine monitoring operations with a scanner—even before *Popular Communications* reported this fact in the September, 1983 issue (“Nicaraguan Rebels Use Yank Radios,” *POP’COMM*, September, 1983, p. 9).

The opportunity facing us as “civilian monitors” was stated by an editor of one of the radio club journals, who wrote: “It wasn’t until quite recently that it became apparent that a number of the things [we have been] receiving are of significant interest (other than the phenomenon of “skip,” which I have always thought of as interesting), and perhaps even of newsworthiness.”

### **(Spectrum) Space Invaders!**

When the U.S. military conducts operations in foreign countries, the Low Band frequencies employed have a good chance of turning up on your favorite local public safety or business channels. There are several reasons for this.

In the first place, the radio spectrum is shared in common by the whole earth. Every nation and every army (and every police and fire department) has no choice but to use the same frequencies. Clearly, the Low Band component of military communications is only a *small part* of any tactical communications system—but it’s the part which Mother Nature has conspired to carry to your antenna, through various near-miracles of ionospheric propagation. So it behooves you to be thankful for her “gift from the blue,” instead of fretting about the High Band and UHF stuff you *can’t* hear!

Second, and more to the point: Band plans for frequency allocations differ in other countries, so military channels must be arranged so as to limit interference to local radio systems of the host country. There are numerous instances—some of them humorous—of bewildered stateside police and fire dispatchers doing verbal battle with strange-tongued (and even scramble-voiced) “aliens” who have mysteriously landed on “their” personal dispatch frequency!

Finally, it must be said that within the limits mentioned, the American military has never been bashful about seizing new radio frequencies on an *at-will* basis—with a cavalier aplomb that would land us normal radio mortals in the pokey in short order if *we* ever tried it! An acquaintance of ours who once served in the Army remembers “one summer tour I spent at Fort Bragg, North Carolina, when *all we did* was look for clear frequencies to use for Army field operations” in a skip-infested band!

Military communications (and the licensing of military radio operators, for that matter) is not under the jurisdiction of the Federal Communications Commission. Hence, ordinary FCC allocation tables are considered by military communications planners to be of an advisory nature only.

**Table 1:**  
*U.S. Government Official Channelization Chart*

30.00-30.55
32.01-32.99
34.01-34.99
36.01-36.99
38.27-38.99
40.01-41.99
46.61-46.99
49.61-49.99

**Note:** A 20 kHz spacing between channels is most common, but there are many exceptions.

The 38.01-38.25 subband is set aside for radio astronomy, although there are some low power bases and mobiles operating there.

The 49.70-49.90 subband is shared with short-range unlicensed communications devices, such as cordless telephones. “Talk-man” communicators, wireless microphones, toy walkie-talkies, and remote control units.

There are, however, certain portions of the 30-50 MHz band which have been set aside specifically for use within the continental United States by our military forces. These segments are listed in Table 1 and Table 2.

A quick comparison between Table One (“U.S. Government Official Channelization Chart, 30-50 MHz”) and Table Two (“Non-Standard Channels Logged With Central American U.S. Military Traffic, 1982-1984”) confirms our point: much of this traffic is *not* confined to the reserved military sub-bands. Tactical transmissions are liable to turn up *anywhere* in the band, although in practice the lower half of the band is more likely to survive the rigors of long-distance ionospheric transit than the upper half; the bottom 5 MHz should be viewed as prime territory for concentrated scanner search operations on any day of the year (and late into the evenings too, when spring and summer sporadic E conditions prevail).

Still, as in so many other aspects of this bizarre propagation business, the “rules” are determined to make fools of those who take them too seriously! Some of the most hair-

**Table 2:**  
*Non-Standard Channels Logged With Central American U.S. Military Traffic, 1982-1984*

30.60	31.85
30.70	31.90
30.85	31.95
30.90	32.00
31.00	33.00
31.05	33.05
31.10	33.10
31.15	33.20
31.20	33.35
31.30	33.50
31.40	33.65
31.45	33.75
31.50	35.00
31.55	35.50
31.60	37.15
31.65	37.25
31.70	37.40
31.75	37.70
31.80	37.80

raising transmissions from guerrilla contras were in fact logged on 45.44 MHz—way beyond the bounds of normal propagation behavior in a declining sunspot year! Whether a patch of sporadic E was responsible is still not clear. The moral of this story: keep your ears open! Count nothing out! Anything is possible.

And at the other end of the band, don’t forget that the international common carrier/utility allocation *actually* begins at 29.7 MHz, just above the top edge of the 10-meter ham band. A lot of fascinating signals—including South American auto telephone and paging services—occupy that small piece of real estate between 29.7 and 30 MHz! It bears close watching, especially as an early indicator of a propagation path in the process of opening up to the higher frequencies.

### **Some Nuts And Bolts – And A Few Loose Screws!**

So you’ve got your scanner hooked up to a good outside omni antenna—or a directional antenna pointed south—and it’s purring away in “Search” mode between 29.7 and 49.99 MHz. What, exactly, can you expect to hear? What’s in this for you, anyway? Are they *really* out there?

Let’s find out by taking a step-by-step tour up the band—bypassing strong local signals, of course; and for the sake of the demonstration, compressing the time line of a few years worth of monitoring down to a half-hour or so. Given those limits, what follows is a good healthy slice of the activity actually heard from Central America during the past two years, using nothing more than an array of Bearcat and Regency scanners, and very modest, garden-variety rooftop antennas. We’ll have to hop back and forth a bit to follow the traffic; but for the most part, we’ll scan the band in logical order, from low end to high. Flack jackets all set? We’re off!

**30.00, 30.05, 30.10, 30.45, 30.55, 30.90, 31.45:** Here we have U.S. military aircraft, monitored during the joint Marine/Honduran maneuvers conducted near Puerto Castilla in Northern Honduras. One pilot mentions he has to get permission from the Hondurans to participate in the mission. “Missions” may be war games, or they may be construction projects.

**30.20, 31.70, 32.60:** No sooner airborne, and already the flying is choppy! Here we encounter something known as “time division scrambling”—Spanish-speaking voices which sound like they’ve been recorded on magnetic tape, and the tape cut into little bits, and the bits pasted back together again in a random order! You can pick out syllables (or just phonemes), but it’s hard to make sense out of the transmission.

The system works something like this: imagine that a transmission one-half second (or 500 milliseconds) long is divided up into 5 millisecond slices. This means there are 100 “slices” in the complete message. But instead of stringing them together in a linear fashion (slice one, followed by slice two, followed by slice three, all the way to slice one-



hundred), imagine that both your transmitter and the target receiver are pre-programmed to look first at slice thirty-seven, then at slice sixty-two, then at slice fifteen, then at slice twelve—and to hold the slices in a delay circuit with a 100-slice capacity, until the microchip “tray” has been filled with all 100-slices—at which time another circuit picks them out and presents them to the audio output in the proper sequence: slice one, followed by slice two, followed by slice three... etc. Handled by computer chips, it's child's play! The complete signal is received a mere half-second late, by which time the tray is electronically emptied, and the next half-second of the message has begun to fill in the same pre-programmed sequence.

This seems to be what we're hearing. Sometimes, this “slicing” is coupled with a familiar pitch-inversion scrambler (such as your local police may use when they don't want you to know that a squad car is being dispatched to the drugstore to pick up a carton of cigarettes for the dispatcher!), for double security. (An excellent discussion of these and other kinds of scrambling can be found in Lee Lapin's “Secrets of Scramblers,” *POP'COMM*, July, 1983, p. 16).

All we can tell for sure is that someone in Central America has a vested interest in not being understood by the wrong parties! But there's more of this to come... and worse...

**30.31, 30.35, 30.39:** Carriers with guard tones (high-pitched whistles similar to what you hear on an unused auto telephone channel) were noted. All three suddenly left the air together. The purpose and interrelationship of these three is unknown, but they were heard simultaneously with the reception of other military traffic.

**30.40:** Intermittent guard tone, broken by clear voice and SSB communications. U.S. military origination. This was a semi-duplex operation; the other side of the conversation was noted on 30.20 with no guard tone, and 100% SSB. This arrangement allowed one person to use SSB while the other used clear voice. Simplex operation on 30.40 has also been noted.

**30.20, 30.35, 30.55, 32.00, 32.25, 32.35:** Guard tone channels (continuous carrier) with occasional clear voice communications. U.S. military origination.

**30.05, 30.40, 30.85, 30.95, 31.93, 31.96, 31.98, 32.00, 32.60:** And now the plot *really* thickens! We have just heard the future of “secure” communications, and it is...NOISE! Welcome to the maddening world of the dreaded “DVP”—or Digital Voice Processing!

We've already described the time division mode of scrambling in which a voice is sliced up into pieces a few milliseconds long, and re-assembled in a different order. Now imagine, if you can, that instead of being sliced into milliseconds, a voice is actually atomized into tiny, instantaneous bits a mere hundred-thousandth of a second long; and that each bit is assigned a random position in a complex chain; and that only tiny matching microcomputers inside the transmitter and receiver know the codes that allow them

to re-assemble these bits in the proper order, making audio sense out of what sounds to an ordinary radio receiver like electronic nuclear rubble!

Crack the codes? No chance—unless you have an electronics lab at your disposal, and a powerful computer fully dedicated to a long, painstaking analysis. Even then the outcome would be doubtful.

So how widespread is this awful stuff? All of the frequencies listed above have been noted carrying DVP-type scrambling. You'll know it when you hear it: one short burst of a single, continuous tone, followed by a “roaring” noise very similar to the sound of an open squelch on an FM receiver. The burst of static, or roaring noise, is actually

the human voice of other data in its atomized form. (The tone-burst tells the computer where in the sequence to start looking for the first bit of information, and it then continues looking in a pre-determined order, known only to the logic program shared by the conspiring microchips in the transmitter and receiver!)

Our very own FBI and Secret Service have been experimenting with DVP—with unsettled results. Some agents have been heard to give up in utter frustration and return to normal-voice mode when they couldn't get their expensive, gizmo-laden high-tech radios to work! Running DVP through a repeater evidently does horrible things to the integrity of the ultra-fine bits of

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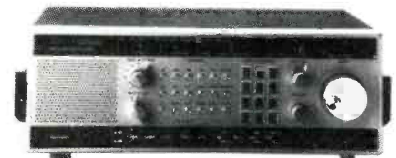
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data, often rendering this high-priced security system completely worthless. Clearly, the kinks are still being worked out of the DVP mode.

So what does this have to do with Central America? Let's come in for a closer look:

**31.42:** DVP-type scrambling—low power

**31.43:** DVP-type scrambling—low power

**31.44:** DVP-type scrambling—medium power

**31.45:** DVP-type scrambling—low power

**31.46:** DVP-type scrambling—medium power

**31.47:** DVP-type scrambling—low power

**31.49:** clear voice English—medium power

What we have here is a system known as a communications *trunk*: a multi-channel network which may be providing flexible, high-capacity point-to-point communications between two fixed locations, or which may be linking various widely-scattered bases together in a single unified system. Our tip-off as to the location of the trunk comes when we note that clear-voice Spanish military communications are sometimes heard on the 31.45 channel—in the midst of the DVP transmissions! Another interesting characteristic of this system is that the channels 31.44 and 31.46 are usually, but not always, keyed simultaneously. Place of origin is not known at this time—but the Spanish voice coms make Central America the main contender.

**31.90 to 32.00:** Yet another trunk with similar channel spacing and operating characteristics—also in DVP—can be heard between 31.90 and 32.00 MHz. On 32.00, we find a continuous carrier with a high-pitched guard tone. This channel features occasional DVP-type scrambling, alternating with normal voice communications that are clearly U.S. military in origin. Guard tones are very popular on military circuits. The Russian military likes them too, as we discovered one morning in October of 1978, when this band cracked wide open to the Soviet Union, and their tactical military communications suddenly started pouring in on household scanners all over the eastern United States!

It often pays to monitor these seemingly dead carriers. You literally never know what's going to turn up! One of the truly classic examples is the following listing:

**32.60:** This "dead carrier" channel was monitored for half an hour with no signs of life. Suddenly, and without warning, four voices (at least one of them female) appeared and took turns reading from a script which sounded like something straight out of the Twilight Zone!!! The phrase, "Would you record—now?" was repeated over and over in an almost robotic, emotionless drone, with the blank space being filled by a different one-syllable word as each voice took its turn: "Would you record *mode* now?" "Would you record *page* now?" "Would you record *rape* now?" "Would you record *jay* now?" "Would you record *snipes* now?" "Would you record *chord* now?" "Would you record *maze* now?" "Would

you record *void* now?" "Would you record *flight* now?" "Would you record *scrub* now?" "Would you record *earth* now?" "Would you record *force* now?" "Would you record *hurt* now?"

After the phrase "hurt now," this channel went silent again, and remained silent for the half-hour during which the monitoring continued.

Bizarre? Creepy? Spooky? You betcha! I STILL get the willies listening to these droning, android voices on our reference tape!

A knowledgeable source indicates that similar transmissions have been monitored in the 300 MHz military aircraft band (just now becoming available to scanner owners through the latest generation of expanded-coverage radios), where they have been linked to AWACS radar-intercept training exercises originating at various U.S. air bases. Anyone having a solid explanation for this somewhat frightening catch, please contact the authors!

**30.40 (repeater output), 30.80, 31.30, 31.40, 33.65, 34.10, 37.75 (repeater output):** Military operations in former Dutch protectorates, Caribbean region. Most of this activity is believed to originate in Surinam. Following a period of independence from the Netherlands, Surinam suffered a bloody military coup in February of 1982, when the National Military Council took control of the government—assassinating the prime minister, along with many of the tiny country's leading writers, physicians, professors, intellectuals and other "elite" professionals, just for good measure.

A conversation monitored on 37.75 at the time of the coup indicated that sporadic fighting was still going on, and that a helicopter was needed to evacuate wounded in the midst of heavy gunfire. These were *not* war games!

Communications from Surinam are readily identified by this nation's curious dialect—a frothy brew of pidgin Dutch, English, Spanish, French, Indonesian, Hindi, and possibly Hebrew! It's fascinating to listen to these people talk. A lot can be understood, and they often switch to straight (in fact, very clipped, proper, uppercrust, British-sounding) English. Here's what a request for a helicopter ("Buzzard") sounded like on 33.65 MHz:

Base: Zero reference your last send, over.

Kilo 26: Heliquet for Buzzard, over.

Base: Zero Roger, over.

Kilo 26: Alpha Tusk Resub Bravo. Load 21 times 5 days resub. Register so far, over?

Base: Zero Roger, over.

Kilo 26: Charlie, pick up Papa Tango Gulf 600 and Delta Papa Tango Gulf 870, over. ("Kilo" designators are used by coastal fleet vessels.)

Another "Heliquet" episode on 37.75 had a certain off-the-wall humor about it—unless it was *your* life that was at stake, I suppose! Here we had the spectacle of the base controller arguing with a field officer about the proper procedure to be followed, and necessary paperwork to be completed, before a helicopter could be dispatched to

evacuate wounded men from combat!!! Their argument centered on the question of whether the need to evacuate took priority over the completion of a formal request through proper bureaucratic channels! (I'm just glad I wasn't the poor guy who lay there bleeding while his superiors duked it out over the radio!) The impersonal, clipped, highly proper accents of the participants made this ridiculous exchange sound like some wacko Monty Python comedy skit!—though a rather grim comedy indeed. I had a mental picture of men lying in blood on the ground, while some very out-to-lunch officers sipped their chutney and debated the fine points of the application of the operations handbook!

**32.25:** The 10th U.S. Corps, 23rd Armament Division, motorized rifle regiment was engaged in war games against the "Transnovian" Army! (Hey... weren't they fighting the *Fredonians* in one of those great old Marx Brothers movies?!)

**32.30:** Brazilian military. Portuguese language tactical communications heard. Low band military skip from this country is relatively rare, though whether from propagation difficulties or simply from sparse use of these frequencies in Brazil is not clear.

**32.25, 32.45, 36.55, 40.80, 41.10, 41.90:** U.S. Navy operations, Puerto Rico. Military frequencies in Puerto Rico and the U.S. Virgin Islands follow the same allocation chart as the continental United States. Propagation from the Caribbean to the mainland is generally outstanding year-round, making these operations very easy and common catches.

**33.05:** Chemical warfare exercises. One participant stated there was still an indication of "nerve toxins." We hope he was referring to dummy tracer gases. It's against international conventions to use the real stuff. (But this is a good illustration of the way in which potentially serious and newsworthy information can turn up on your scanner: What if they were using the real stuff? They're using it in the Middle East!

**33.10:** Communications from U.S. Navy ships anchored off the coast of Central America. The 62,000-ton aircraft carrier *Coral Sea* and several other vessels were stationed east and west of Central America at this time, to discourage Nicaragua from retaliation against Honduras for harboring contras.

**33.35 (repeater output):** U.S. war games in Central America. This repeater was being used to amplify and relay infantry communications from the field.

**34.10, 36.35, 36.85:** U.S. Air Force operations, Puerto Rico. (See notes under U.S. Navy, above.)

**36.87 (repeater output)**

**33.87 (input for 36.87)**

**36.90 (repeater output)**

**33.90 (input for 36.90)**

**36.97 (repeater output)**

**33.97 (input for 36.97)**

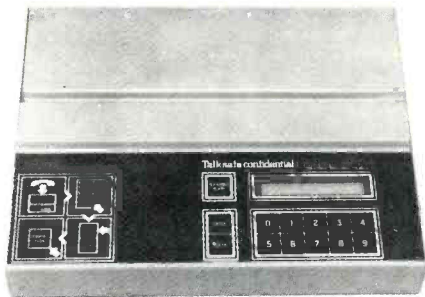
These three repeaters are a real mystery. They appear to sit idle, waiting for... what? The only reason they were discovered is that



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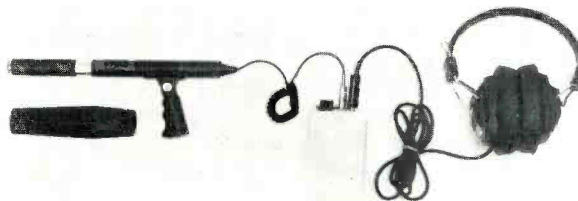
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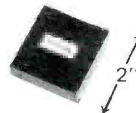


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fire service skip signals from all over the United States are occasionally rebroadcast over them. The U.S. fire frequency 33.90 is a perfect match for the 36.90 repeater, and is therefore relayed loud and clear. But the 33.87 and 33.97 inputs are 10 kHz off from U.S. allocations, so a bit of distortion occurs.

Based on propagation patterns and the fact that fire traffic from all parts of the continental U.S. is being repeated, it is thought that these machines are located on the northern coast of South America. One source claims that they are owned by oil companies in Venezuela. It's equally possible that they are maintained by government or military interests—for what profit-making business would find it economically advantageous to let three repeaters sit idle?

In any event, the make for a fascinating "watch" since they're clearly in a state of readiness and could suddenly become very active. It's a real object lesson in the sometimes bizarre interdependency of planetary communications systems as well: rural fire departments in Maine being heard (without their slightest knowledge or inkling) clear across the continent, and on another frequency altogether, through the maverick antics of one very bored repeater somewhere in South America! What would Marshall McLuhan have said!

**36.87, 45.44:** Certainly one of the hottest of all DX catches. Time division scrambling, used simultaneously with frequency inversion (pitch) scrambling, to produce a very high-security field radio system. All evidence points to Nicaraguan contras engaged in their guerrilla war against the Sandinista government of Nicaragua (ref. Tom Kneitel's "Nicaraguan Rebels Use Yank Radios," *POP'COMM*, September, 1983).

According to Kneitel's report: "A reader in Honduras...reports that 45.44 MHz has been a popular contra frequency; transmissions monitored include some using a voice scrambler."

More than a year earlier, on June 25, 1982, during a period of intense sporadic E propagation, mysterious transmissions were heard on 45.44 MHz in Southern Illinois.

The transmissions—eerily garbled and vaguely ominous—caused some consternation to at least one local dispatcher of the Southern Illinois Emergency Services and Disaster Agency, also operating on 45.44! He must have thought an alien invasion was in progress!!!

During one series of transmissions on 45.44, the "alien" radio operator switched to clear voice mode, and urged repeatedly in Spanish, "Basa, Basa Cielo: guaroco!" This has been translated by a Spanish-speaking monitor as, approximately: "Base, Sky Base: shelter! (or, "Take shelter"). At the time of monitoring, the existence of such high-tech scrambler radios in the hands of the Nicaraguan contras, and their use of 45.44, were completely unknown. Kneitel's article finally blew the cover off the operation, and helped to identify a rare and spectacular DX catch indeed!

The contras have recently become notorious for their air strikes on key Nicaraguan industrial and military installations, as well as their air support for invading ground troops. Contra airstrips are located in northern Costa Rica and southern Honduras. The Nicaraguan government has charged that the raids are financed and organized by the Central Intelligence Agency.

At the time of this writing, a rash of "mysterious" U.S. helicopter crashes—all but one of them attributed to non-hostile causes such as "bad weather" and "engine failure"—have resulted in the loss of several American lives. These crashes have occurred along the Honduran/Nicaraguan border, where the contras are most active. The Pentagon hotly denies that it is providing direct air support or cover to the contras.

Keep a close watch on these frequencies! Clearly, not everything worth hearing has yet been consigned to the uncrackable crackle of DVP—though we can expect to hear a lot more of it turning up where such sensitive and covert activities are or may be taking place.

### Back On The Home Front

And finally, here are just a few of the state-

side military channels to sharpen your ears for, now that the band is hot with summertime sporadic E! (For more information, refer to Tom Kneitel's *Top Secret Registry of U.S. Government Radio Frequencies*, an outstanding Low Band list!)

**30.00:** MX Missile Radio Net, Channel 48  
**32.23:** White House to Camp David communications!

**34.60:** Nellis AFB and Nuclear Testing Range, Nevada (aircraft frequency)

**36.05:** Shoshone MX Missile Receiving Site Net, Nevada

**41.10:** White Sands Missile Range Recovery Net, New Mexico

Low Band skip is a vast and kaleidoscopic field of study. Clearly, we've just scratched the surface of the subject—limiting ourselves to one small corner of the world where strange propagation, and stranger political events, are having a daily impact on our lives and our monitoring activities.

Whatever the current name for these "joint military exercises," America looks to have made a long-term commitment to Central America, with over 700 permanent troops assigned to maintain the airstrips, ocean piers, radar stations and other installations built during Big Pine I and II. From the huge U.S. embassy complex in Tegucigalpa, to the anti-guerrilla tactics base at Puerto Castilla, it's clear the Yanks are dug in. And it's clear that Central America will continue to fill your scanner with fascinating skip for months and years to come.

Curiously enough, almost nothing was heard on Low Band relating to the Grenada invasion. Central American war games continued to be heard more or less as usual—along with some powerful stateside military skip from a training base known as "Long Rifle," of which we'll hear lots more in a subsequent article. Perhaps Low Band was avoided during the invasion of Grenada because of its well-known penchant for being heard at great distances, and the fact that the administration was decidedly media-shy during the event.

Before we drop you safe and sound back at your home QTH, we leave you with a very important reminder: While charting our Central American course, even in such a shortened form, we've had to gumshoe our way gingerly around hundreds of bone-crushing signals—from off-shore oil drilling rigs, Jamaican horse-bookies, Trinidadian taxi drivers, even (we kid you not!) the frightfully efficient German Autobahn Police—and more beeps, squeaks, tweets, grunts, groans, squawks, squeals, and buzzes than any mere mortal should ever be forced to endure!

We hope to analyze some of the more humanly inviting of these Low Band skip signals for you in the future. In the meantime—keep your ears on! It's comforting to know that turnabout is fair play, and that you, too, can listen to Big Brother...listening to you!

Check your flack jackets as you deplane, please. And one last request before you go: "Would you record *Orwell* now!!!" **PC**

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# Low Band Military Aero Scanning

## *The VHF "Low Band" Still Has Mysteries To Reveal!*

BY RICK MASLAU, KNY2GL

**T**he military forces have moved their aeronautical communications to the esoteric 225 to 400 MHz UHF band, right? Well, yes, but many scanner enthusiasts don't (yet) seem to realize that *everything* didn't fly off to UHF Land.

There's still quite a bit of military aeronautical traffic left to monitor right in the old out-of-vogue low band (30 to 50 MHz). These communications are mainly concerned with helicopter communications from Army Aviation and Army National Guard units, although there are also other units to be heard there. These units are often heard operating with practice drills or maneuvers, however, at times they do become involved in very real emergency situations such as search and rescue work, or functioning during forest fires or in the aftermath of violent weather. Army choppers played a vital rescue role in January of 1982 when Air Florida Flight 90 went into the Potomac River in Washington, DC.

A listing of many of the active low band military aero stations is shown here, and remember that even if you're not within ground range of these base stations, you can probably hear the choppers when they're airborne as their transmission range will be substantially increased. Aircraft flying at only 500 feet can be monitored for 30 miles, and as their altitude increases, so does their transmission range.

There are other military aeronautical stations not included in our listing, and you may wish to spot check certain frequencies known to be popular with these stations to see how many you can discover. And don't forget that when band conditions are right, that is, open for skip reception, you may be able to hear stations hundreds or even thousands of miles away on the low band.

Some popular Army National Guard aeronautical frequencies include: 32.30, 32.50, 34.15, 34.40, 35.00, 36.00, 36.10, 36.50, 36.70, 36.80, 38.45, 38.70, 38.85, 40.10, 40.25, 40.30,



*Army and Army National Guard 'copters still make heavy use of frequencies in the 30 to 50 MHz range. (U.S. Army photo)*

40.90, 41.00, 41.60, 41.70, 41.90, 42.00, 49.00, 49.40, 49.70, 49.80, 49.90, and 49.95 MHz. Note that 41.00 MHz is especially popular.

While 30.10 MHz is often used at Army heliports for fire and crash purposes, the following frequencies are in use for control tower use: 32.10, 37.00, 38.90, 41.50, 41.80, and 46.70. Especially popular is 41.50 MHz, with 40.50 MHz used as an emergency channel.

Range control stations often operate on: 30.45, 32.70, 34.20, 34.29, 34.30, 34.45, 34.50, 34.70, 36.10, 36.33, 36.75, 38.30, 38.50, 38.90, 40.45, and 40.60 MHz.

During practice drills and maneuvers it maybe worth checking out the following frequencies sometimes used for tactical purposes: 30.09, 34.00, 34.10, 36.45, 38.40,

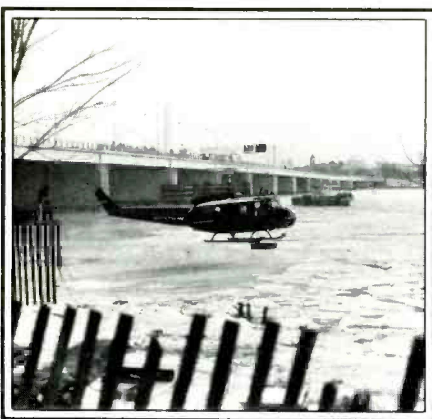


*While 41.50 MHz is a popular Army control tower frequency, other frequencies in this range are also utilized. (U.S. Army photo)*



## Selected Low Band Military Stations

AL BIRMINGHAM MUNIC AIRPORT	38.70	MHZ	ARMY GUARD	MS C D LEMONS MUNIC APT, TPELO	49.85	ARMY GUARD
AL BROOKLEY AIRPORT, MOBILE	36.80		ARMY GUARD	MT HELENA REGIONAL APT	40.65	ARMY GUARD
AL DANNELLY FIELD, MONTGOMERY	40.30		ARMY GUARD	NC BOGUE USMC, NEWPORT	48.70	OPERATIONS "BOGUE 03"
AZ SIERRA VISTA MUNIC APT	41.50		ARMY AVIATION	NC CHERRY POINT USMC	30.45	CONTROL TWR (EMERG)
AZ YUMA PROVING GROUND	41.50		CONTROL TOWER	NC CAMP MACKALL	38.90	RANGE CONTROL
CA CAMP PENDLETON USMC	41.95		CONTROL TWR (EMERG)		41.75	CONTROL TOWER
CA CAMP ROBERTS	38.90		RANGE CONTROL		41.95	CONTROL TWR (EMERG)
	41.50		OPERATIONS	NC NEW RIVER USMC AIR STATION	41.95	ARMY GUARD
CA FT IRWIN	38.90		RANGE CONTROL	NC RALEIGH-DURHAM APT	49.95	ARMY GUARD
	41.50		OPERATIONS	NC ROWAN CO APT, SALISBURY	49.95	ARMY GUARD
CA FT DRD	41.50		ARMY AVIATION	ND BISMARCK MUNIC APT	49.80	ARMY GUARD
CA HAMILTON FLD, SAN RAFAEL	34.50		ARMY AVIATION "MARATHON MARKER"	NE LINCOLN MUNIC APT	38.50	ARMY GUARD
CA LOS ALAMITOS	41.50		ARMY RESERVE	NH CONCORD MUNIC APT	46.65	ARMY GUARD
	65.05		ARMY GUARD	NJ MC GUIRE AFB	41.30	ARMY AVIATION
CA MATHER AFB, SACRAMENTO	41.00		ARMY GUARD	NJ MERCER CO APT, TRENTON	41.00	ARMY GUARD
CA STOCKTON METRO APT	49.00		ARMY GUARD	NV RENO/STEAD APT	40.40	ARMY GUARD
CA TUSTIN USMC HELICOPTER STATION	41.95		USMC (EMERG ONLY)	NY ALBANY CO APT, ALBANY	41.00	ARMY GUARD
CA TWENTYNINE PALMS USMC	41.70		GROUND CONTROL	NY FT DRUM, WATERTOWN	49.90	CONTROL TOWER
CO BUTTS AAF, FT CARSON	44.10		WEATHER	NY LONG ISLAND MACARTHUR APT, ISLIP	41.00	ARMY GUARD "LONG ISLAND GUARD"
CT BRADLEY INT'L APT, WINDSOR LOCKS	41.90		ARMY GUARD "FURY OPS"	NY NIAGARA FALLS INT'L APT	41.00	ARMY GUARD
CT GROTON-NEW LONDON APT	40.90		ARMY GUARD	NY STEWART APT, NEWBURGH	49.75	ARMY AVIATION
DE GREATER WILMINGTON APT	46.90		ARMY GUARD		38.20	ARMY RESERVE "CRISPY CHARIOT"
FL CRAIG MUNIC APT	40.90		ARMY GUARD		40.10	ARMY RESERVE
FL ORLANDO INT'L APT	46.60		ARMY RESERVE	OH AKRON-CANTON REGN'L APT	46.75	ARMY GUARD
GA BUSH FIELD, AUGUSTA	32.50		ARMY MEDEVAC	OH LORAIN CO REGN'L APT, ELYRIA	38.10	ARMY RESERVE
	46.70		ARMY AVIATION	OH OHIO STATE UNIV, COLUMBUS	46.80	ARMY GUARD
GA DOBBINS AFB, ATLANTA	47.00		ARMY GUARD	OH PORT COLUMBUS INT'L APT	38.10	ARMY RESERVE
GA FT BENNING	36.70		CONTROL TOWER	OH SPRINGFIELD-BECKLEY MUNIC APT	34.15	AIR GUARD "WOLF CUB"
	41.50		CONTROL TOWER	OK TULSA INT'L APT	46.90	AIR GUARD "LUNAR OPS"
GA FT STEWART	38.50		CONTROL TOWER	OR MC NARY FIELD, SALEM	40.90	AIR GUARD
	38.70		OPERATIONS	PA FT INDIANTOWN GAP	40.90	GROUND CONTROL
	41.30		ARMY AVIATION "VICTORY RADIO"		40.95	ARMY GUARD
	48.50		ARMY AVIATION "VICTORY RADIO"	PA GREATER PITTSBURGH INT'L APT	36.35	AIR GUARD "STEEL"
GA HUNTER AAF, SAVANNAH	46.70		CONTROL TOWER	PA WILLOW GROVE NAVAL AIR STATION	46.85	AIR GUARD
GA WINDER AIRPORT	34.00		ARMY GUARD	RI QUONSET STATE APT, N KINGSTOWN	49.70	ARMY GUARD "FIERCE ALPINE"
IA BOONE MUNIC APT	40.60		ARMY GUARD	SC COLUMBIA METRO APT	38.10	ARMY AVIATION
IA DAVENPORT MUNIC APT	40.60		ARMY GUARD	SC MC ENTIRE ANG BASE, COLUMBIA	41.30	ARMY GUARD
IA DES MOINES INT'L APT	41.45		AIR GUARD	SD JOE FOSS FLD, SIOUX FALLS	36.85	AIR GUARD "CLARENCE 49"
IA WATERLOO MUNIC APT	40.60		ARMY GUARD	SD RAPID CITY REGN'L APT	41.50	ARMY GUARD
ID BOISE AIR TERMINAL	41.50		ARMY GUARD		34.40	OPERATIONS "SABRE OPS"
IL CHICAGO MIDWAY APT	47.00		ARMY GUARD	TN FT CAMPBELL	34.80	CONTROL TOWER
IL GREATER PEORIA APT	34.15		AIR GUARD		40.85	GROUND CONTROL
IL SCOTT AFB, BELLVILLE	46.60		ARMY RESERVE	TN MC GHEE TYSON APT, KNOXVILLE	49.80	ARMY GUARD
IN INDIANAPOLIS BROOKSIDE AIRPARK	34.70		ARMY RESERVE	TN SMYRNA APT	49.80	ARMY GUARD
IN SHELBYVILLE MUNIC APT	41.50		ARMY GUARD	TX ELLINGTON AFB, HOUSTON	41.00	ARMY GUARD
KS BEECH FACTORY, WICHITA	38.90		CONTROL TOWER	TX FT BLISS	36.70	CONTROL TOWER
KS FORBES FIELD, TOPEKA	41.70		ARMY GUARD		34.50	DISPATCHER
KS FT LEAVENWORTH	41.50		CONTROL TOWER	TX DALLAS NAVAL AIR STATION	34.70	ARMY RESERVE
KS FT REILY	30.30		OPERATIONS		46.80	ARMY GUARD
	41.50		CONTROL TOWER	TX FT HOOD	32.10	CONTROL TOWER "GRAY TOWER"
KY CAPITAL CITY APT, FRANKFORT	36.20		ARMY GUARD		38.70	DISPATCHER
KY FT CAMPBELL	33.20		WEATHER	TX ROBT J MILLER MUNIC APT, AUSTIN	30.45	RANGE CONTROL
LA ACADIANA REGN'L APT, NEW IBERIA	41.50		ARMY RESERVE	UT SALT LAKE CITY INT'L APT	38.30	RANGE CONTROL
LA FT POLK	40.35		WEATHER	VA CAMP A P HILL	52.75	ARMY GUARD
	41.30		OPERATIONS "POE OPS"	VA FT BELVOIR	38.30	OPERATIONS
	41.50		CONTROL TOWER	VA FT PICKETT	38.40	OPERATIONS
MA FT DEVENS, AYER	46.95		OPERATIONS "MOORE OPS"	VA FT EUSTIS	41.95	CONTROL TOWER
	49.90		ARMY RESERVE "PILGRIM OPS"	VA QUANTICO USMC AIR STATION	40.40	ARMY GUARD
MA OTIS ANG BASE, FALMOUTH	51.15		ARMY GUARD	VA R E BYRD INT'L APT, RICHMOND	46.90	ARMY GUARD
MA WESTOVER AFB, CHICOPEE	38.70		ARMY GUARD	VT BURLINGTON INT'L APT	34.60	VIP AIRCRAFT "BULLSEYE RADIO"
ME BANGOR INT'L APT	41.20		ARMY GUARD	WA FT LEWIS, TACOMA	41.50	CONTROL TOWER
MI ABRAMS MUNIC APT., GRAND LEDGE	41.85		ARMY GUARD		32.30	OPERATIONS
MI CAMP GRAYLING	37.00		CONTROL TOWER		38.90	WEATHER
	41.80		RANGE CONTROL	WA SNOHOMISH CO APT, EVERETT	46.70	ARMY RESERVE
	41.90		OPERATIONS	WI DANE CO REGN'L APT, MADISON	40.80	ARMY GUARD
MN CAMP RILEY	49.20		CONTROL TOWER	WI FT MC COY	38.50	CONTROL TOWER
	36.10		RANGE CONTROL		41.70	CONTROL TOWER
MN ST PAUL DOWNTOWN APT	49.65		ARMY GUARD	WI CAMP DOUGLAS	34.20	RANGE CONTROL "HARDWOOD RANGE"
	41.50		ARMY RESERVE	WI WEST BEND MUNIC APT	40.80	ARMY GUARD
MO JEFFERSON CITY MEM APT	46.70		ARMY GUARD		41.60	ARMY GUARD
	41.95		CONTROL TOWER			
MO SPRINGFIELD REGN'L APT	38.45		ARMY GUARD "SHOW ME ZULU"			
MO WHITEMAN AFB, KNOB NOSTER	41.00		ARMY GUARD			



Army choppers play a vital part in emergencies, such as this daring mission over the icy Potomac River in January of '82. (U.S. Army photo)



Chopper communications during maneuvers can sound as dramatic as actual combat commos. (U.S. Army photo)

40.55, and 40.99. Note that these frequencies would also be used during actual emergencies.

In general, the following "low band" frequency segments are set aside for use by various federal agencies, including the military: 30.00 to 30.51, 32.00 to 33.00, 34.00 to 35.00, 36.00 to 37.00, 38.00 to 39.00, 40.00 to 42.00, 46.60 to 47.00, and 49.66 to 50 MHz. Some exploration of these frequency ranges will undoubtedly turn up all manner of interesting stations. Tom Kneitel's book, *Top Secret Registry of U.S. Government Radio Frequencies*, is a good reference guide to exploring federal communications between 30 MHz and the UHF bands.

Our chart, by the way, also lists some of the tactical identifiers used in place of standard call signs by the stations listed. **PC**



# Tracking Godzilla: The Contra Connection

**You Asked For More on Low Band Skip DX. Here's More!**

BY HUGH STEGMAN, NV6H

**"A**ll units, check for open mike."  
Nobody remembers which fire department dispatcher heard it first. It was a blistering, full-quieting carrier, and it played havoc with emergency fire and rescue radio on 33.48 MHz. Wherever this channel was used in the United States, the same thing happened. In Athol, Massachusetts, new equipment was useless for hours at a time. In Los Angeles, an expensive data system was disrupted. This open carrier continued for months, through the entire winter of 1981.

As if the radio techs didn't have enough to worry about, things only got stranger. By 1982, the stuck carrier was gone, but police from 39.48 MHz were coming through on the fire channel, some six MHz lower. Signals spread far beyond the normal range of low-powered mobiles. In Los Angeles, distant desert pursuits were heard at the beach. The county sheriff had always wanted coverage this good, but this was not the way to get it!

On other days, the fire channel was crushed by a truly horrendous variety of monster-flick noises. One listener, noting these ominous buzzes, crunches and hisses, immediately dubbed the offending transmitter "Godzilla". The name sticks to this day.

"Godzilla" quickly attracted the attention of low-band VHF DX'ers. Listeners devoted to this unusual hobby-within-a-hobby are used to such weirdness. They are attracted by a good mystery. Even so, "Godzilla" has remained the most mysterious of all. Soon traced to a super-power repeater somewhere in Costa Rica, the trail has led some theorists as far afield as the battle zones in southern Nicaragua, and the supply lines of a covert war. Since this repeater is still in use today, these mysteries are still open for investigation by listeners.

It was determined almost immediately that "Godzilla" was simple, F2-layer "skip". 1981 came during a solar peak, and this low-VHF skip was very strong. Even so, the repeater had to be running far too much

power. "Godzilla" had breath of fire, but very poor ears.

As a variety of DX'ers compared notes and tapes, mostly through a California column edited by skip fanatic Mike Britt, the actual frequency was shown to be 33.475 MHz. The "input" frequency, where the beast listened without benefit of tone protection, was thus 39.475. (In all cases, the 5 kHz difference can be ignored, as it only adds slight distortion.) This input was so close to the 39.48 MHz police channels that any skip from them was repeated throughout North America, again by skip. Yes, this was a classis, two-way, repeater path. Similar ones have been heard on other frequencies.

Chuck Robertson, an Illinois listener with a good setup, was among the first to discover identical systems on 33.675 and 33.875 MHz. While these lacked the "Godzilla" noises, they too repeated any 39 MHz police signals reaching their unprotected inputs. Even simple scanners were getting action from Haiti clear to California, plus whatever Spanish was being spoken by the Costa Ricans themselves.

At first, the Spanish language traffic from the primary users of these monsters was considered something of an irritation. It just

stepped on the U.S. skip, and never seemed to be very interesting. Mostly, it was just boring, business conversation.

However, something about this activity puzzled even native Spanish speakers. By spring of 1984, when local use of "Godzilla" peaked, much of the traffic seemed to lack content. A female dispatcher made a lot of calls, but never raised anyone. People talked, but not to each other. Lines often sounded more like a bad script.

Shortwave listeners are used to this kind of traffic. A current example may be found among the man small nets that operate with total impunity on out-of-band radios, usually between 6.5 and 8 MHz. While most are undoubtedly fishing boats, a few are something else.

The traffic on "Godzilla", along with some on the other two repeaters, was something else. Many people, including this author, spent days searching atlases and air charts for place names they'd heard. Very few were ever found.

Though many people had the same idea at the same time, Mike Britt did the most research, and spent months playing tapes for natives of the region. In early 1984, he came up with a startling conclusion.

According to this theory, the three re-

## Currently Active 33 MHz Super Repeaters

As heard by Chuck Robertson, Illinois, and Hugh Stegman, California.

Output	Input	Traffic
33.425	39.425	Spanish/alert tones & business traffic
33.475	39.475	Repeats 39.48 MHz U.S. police radio
33.525	39.525	Repeats 39.52 MHz U.S. police radio
33.625	39.625	Spanish/business traffic
33.675	39.675	Spanish
33.825	39.825	Godzilla-like noises/kerchunking
33.875	39.875	Repeats 39.88 MHz U.S. police radio

*Scanners lacking capability for programming these frequencies will still receive clear signals on the even channels, as they also lack sharp selectivity.*



peaters were, and perhaps still are, a covert supply network for the "southern front" Contras operating in Costa Rica. These groups, which sought the overthrow of the Nicaraguan government, controlled most of the border between these two countries in the years before 1985.

While this seems a bit far-fetched, the evidence given by Britt remains persuasive. 33.475 MHz sounds like a ranching operation, but some of that traffic could indeed have been coded supply orders. The same voices were heard on 33.675, supposedly a lumber company. 33.875 sounded like a medical aid channel.

While this operation was not part of the later "Iran/Contra scandal", at least some of the same CIA "cargo kickers" were almost certainly involved. Also, a few of the hired pilots have recently been accused of moonlighting as drug smugglers.

A *Newsweek* story of the period described the use of private ranches in this enterprise. The owners, including some Americans, gave at least moral support. Could they have lent some of their radios as well?

In the most significant intercept, Britt heard a radio operator giving traffic from "La Penca". This military air strip, just inside Nicaragua, was at that time a headquarters for the charismatic Eden Pastora.

Pastora, the notorious "Comandante Zero", directed 4500 loyal troops. He was a popular Sandinista general who took to the hills after a factional dispute. Although he scored some impressive anti-Sandinista victories, he was far too independent for this proxy war. His Democratic Revolutionary Alliance ("ARDE", in a play on Spanish for "burning"), never received as much U.S. aid as some other groups.

The best account of "Comandante Zero" at work appears in *Time* magazine of April 30, 1984. He is described as giving orders, "... over a single radio channel." This supports the idea that he lacked the sophisticated tactical equipment being given the northern alliance. Even even some overpowered, under-engineered and conspicuous repeaters would have been good for something. Less essential traffic would not tie up the busy command control channel.

Unfortunately for radio listeners trying to solve this mystery, solar activity and ARDE both declined. The VHF skip grew weaker. Meanwhile, Pastora refused to join a Contra alliance being promoted by U.S. interests. His meager aid was cut off.

On May 30, Pastora called a press conference to protest this move. As journalists leaned closer, a booby-trapped tape machine blew up. "Comandante Zero" was wounded, and an American reporter was killed. Though many suspect the CIA, there is no proven U.S. link to this bombing. It, too, remains a mystery.

ARDE was beaten back and dispersed. "Godzilla" was silenced, not by force but by low solar activity. The 33 MHz Contra connection remained unproven. Was it just an-

other unsolved radio mystery?

Perhaps not. In 1988, the low-VHF skip has returned. Chuck Robertson has again heard a loud, if somewhat better behaved, repeater on 33.475 MHz. Others have confirmed that radio use in the region is increasing. There appears to be some sort of band plan here, with several new super repeaters on the air. All have outputs on 33 MHz, with the distinctive -25 and -75 channels. Since the inputs are exactly six MHz higher, the

U.S. police communication is again being repeated. As the solar activity continues to pick up, these powerful radios should soon be audible on scanners throughout North America.

What will be heard this time? Were these really just business repeaters all along? Were their users just people who hired the wrong engineers? Will "Godzilla" stomp the fire departments again?

Stay tuned, and find out.

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# Scanner Skipping To The Caribbean

*Hey, Mon! It's The Low Band DX Season*

BY CHUCK ROBERTSON

**N**ext time you want to relax on a beautiful tropic isle, turn on your scanner and let the Caribbean come to you. Use seasonal skip DX reception to save you waiting on boarding lines at airports or cruise ship piers. Under the right ionospheric conditions, the 30 to 50 band MHz will make it all happen for you. As we enter the peak period for Solar Cycle 22, long distance F2 skip will be common in this band during the daylight hours of fall, winter, and early spring.

Powerful Caribbean repeaters and pagers begin showing up at sunrise. Listen for phone-in pagers on 35.34 MHz (St. Thomas, USVI), and 35.26 MHz (San Juan, PR). The St. Thomas ham repeater on 29.66 is a landmark.

An hour or two after sunrise, the skip really gets hot and exotic Caribbean comms pour over North America like dark rum over ice. All you need is your scanner and your friendly DX guide. That's me.

## **Jamaica**

Jamaican dialect is not only distinctive, but beautiful to hear in all its varieties. As

with any locality, there are numerous colloquial terms in use. You can often figure out some of them, but Jamaica has its share of imponderables that confront the scanner user. You realize that "How far you go?" simply asks "Where are you?" But what do you make of "One Love"? It means "Good-bye." Other expressions to be heard include:

Bang-a-rang = Confusing information.

Irie = Good/happy.

Babylon = Hassles from the police.

Gates = Home.

Horse dead and cow fat = Skip the irrelevant details.

In Jamaica, they space channels with 25 kHz between them (as opposed to 20 kHz spacing in the U.S. and Canada). From 31 to 33 MHz there are simplex systems used by business and government agencies. From 33 to 36 MHz are talk-in frequencies for repeaters in the 34 to 39 MHz portion of the band. Not much is known about operations above 39 MHz, but there may be some radio telephones above 43 MHz.

Car phones have turned up in full duplex

between 30 and 31 MHz. Check 30.135, 30.145, and 30.335 MHz. Cannot positively identify these as from Jamaica, but strongly suspect so.

Table I provides a monitoring guide to stations logged via skip from Jamaica.

## **Dominica**

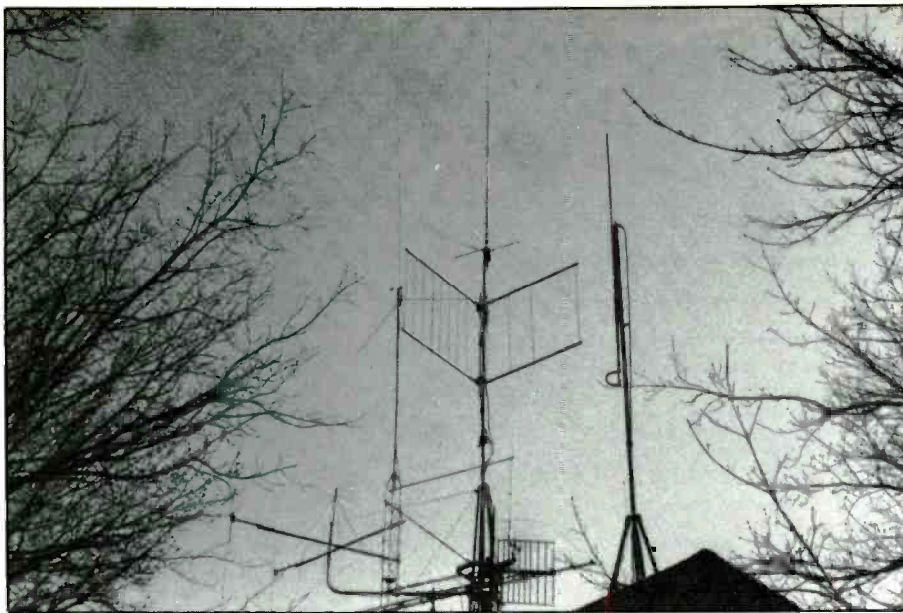
The island nation of Dominica is in the eastern Caribbean near Guadeloupe and Martinique. A busy island-wide security operation with roving patrols has its comms on 37.18 MHz. Listen for *Romeo Control* (the base), which is located in Roseau (Dominica's capital). Mobiles ID as *Alpha Papa 14*, *Alpha Bravo 12*, *Mobile 9*, etc.

Locations often mentioned include Scotts Head, Vieille Case, Pont Casse Junction, Delice, Coulibistri, Marker 3, and The Treasury. Standard BWI English is used.

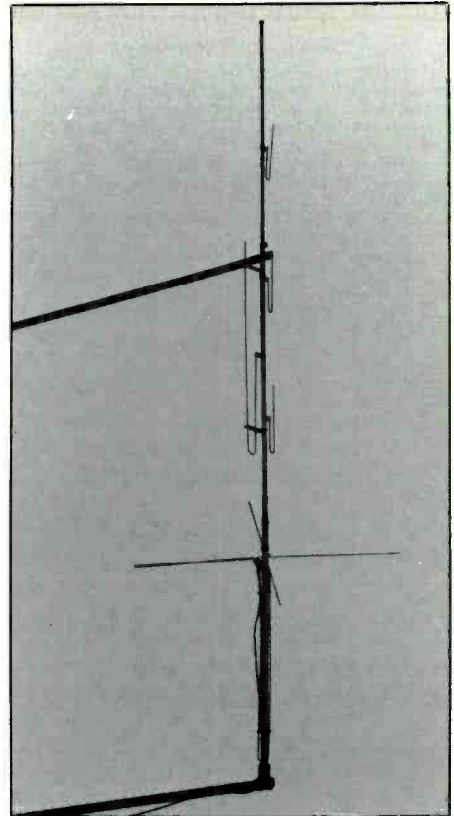
## **Bahamas Islands**

Visitors to the Bahamas have commented that there isn't much use of two-way





Some of the author's antennas.



The author's Butternut SC-3000 multi-band scanner antenna.

Table I - Jamaica Loggings

<p>31.475: Active. 31.775: Brandon Hill Security, Montego Bay. "Red Nose receiving, stand by for Peter Rabbit." 31.85: Mellow Man candy company. 31.875: Appliance &amp; furniture sales/service; "DOC #" 31.925: "ATL Base" (importers?). 31.95: Horse race bookies. There are 2 bases, Spanish Town (also called Sales) &amp; Crossroads (at Cayamanas Park, Kingston). Races held Wed. &amp; Sat., - occasional other times. Traffic consists of odds &amp; payout data. Same format used by all Jamaican bookie stations. 32.025: Active. 32.05: Domestic servants, Kingston. 32.075: Min. of Development, Kingston. Eva Base, Jagger Base, San Sona Base. 32.10: "Half Way Tree" base, a horse race bookie in Kingston. 32.125 &amp; 32.175: Jamaican Industr. Developm. Corp (JIDC); VIP transp. &amp; accomodation in Kingston &amp; Spanish Town area. 32.20: Active. 32.225: "Stepping Stone Base" 32.25: Security patrols. 32.275: Kingston area business radio. 32.30: Horse race bookie stations, "HQ" &amp; "Orange Street." 32.35: Swamp Base, Sun Base, Base 1, Mobile 2, Security Section. Construction job in Morant Bay. 32.40: "DD Base" &amp; mobiles, a home builder in Kingston. 32.425: Active; marine/mobile units. 32.45: May be fuel delivery svc to bauxite industry strip mining sites. 32.45: House builder, Kingston. 32.475: Drapper Hardware Store, Kingston, delivery service.</p>	<p>32.525: Min. of Education, Kingstan. One Sun. afternoon they were playing classical music here. 32.55: "Kingston" &amp; "Sales," bookies. 33.00 &amp; 33.25: Active. 33.825: Input to 36.825 repeater. Active. 33.875: Input to 36.875 repeater for bookie stas "Kingston" &amp; "Mandeville." 33.90: Sewer or water pipe trenching, Kingston. 33.95: Input to 36.95 repeater for a Kingston florist, "Peter Base" mobiles. 33.975: Input to 36.975 repeater for construction. 34.00: Trucking. 34.025: Domestic servants, Kingston. Also used by a firm doing sewer or water line work-- mobiles use "B-#" ID's. 34.05: Input to 37.05 repeater. Same business that operates simplex on 32.05. 34.10: Input to 37.10 repeater for hvy eqpt repair. One base at Savana-La-Mar. "Chinook Base" is for helo ops. Prabably bauxite industry, possibly Kaiser Bauxite Company. 34.20: Input to 37.10 repeater for Ocho Rios shopping centers. 34.225: Input to 37.225 repeater for petro deliveries. Land mobiles use "SD #" ID's, tankers ID as "Tanker #." 34.25: Input to 37.25 repeater. Active. 34.30: Input to 37.30 repeater. Medical? 34.40: Input to 37.40 repeater. "Unit 1." 34.45: Input to 37.45 repeater. Rural petro delivery. Mobiles ID as "BG #." 34.55: Input to 37.55 repeater. Kingston business. 34.70: Input to 37.70 repeater. Active. 34.80: Input to 37.80 repeater. "Tango Control." 34.85: Input to 37.85 repeater. Active. 35.35: Input to 38.35 repeater. Active. 43.55: Active repeater output. 43.65: Active repeater output. 43.675: Active repeater output. 45.525: Active repeater output. Bookie. 45.80: Active repeater output. Bookie.</p>
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Table II - Trinidad & Tobago

<p>42.20: "San Fernando Transport," oil tanker ops. 42.40: "South Base," construction ops. Mobiles use "DC #" ID's. 42.70: Oil tankers &amp; escorts. Ships use "DS #" ID's. 42.90: Offshore oil rigs &amp; ships. Galiota Point &amp; Stark Point are bases at oil fields. 43.34: Petro ops bases include "Workshop," "Pipeline 3" &amp; "Base." Mobiles use "Patrol #" &amp; "SW #" ID's. 43.68: "Control" electric power utility. Mobiles use "ET #" ID's. 43.91: "Control" electric power utility. Mobiles use "BC #" ID's. 43.96: Waterway channel excavation. 44.21: "Base" &amp; "Transfer #" petro ops. 44.27: "Kings Wharf" shared repeater in/near Fyzabad. 44.33: Petro ops. 44.39: Oil exploration. 44.40: Petro ops repeater, Port of Spain. 45.52: "Control" electric power utility. Mobiles use "GG #" ID's. 46.075: Repeater output for petro ops; Helicopter base; offshore rigs; mobiles use ID's like "Charlie Alpha." 48.75: "Control" fire dept. base. Dispatchers have personal ID's like "Control 5."</p>
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radio. However, from my location in Illinois, I've picked up point-to-point radio telephone channels between 48 and 50 MHz, 20 kHz channel spacing. These are the island side of half-duplex circuits. Often, the other half of the conversation can be heard weakly. The stations transmit at all times, even when not in actual use. The open carrier makes turning them in easier.

There are 700 islands spread out over a chain 760 miles in length that comprise the Bahamas. Even though about only thirty of the islands are inhabited, I have not been

able to pinpoint the exact locations of these stations.

Callers on 48.00, 48.42, and 48.96 MHz have been monitored placing calls through the "Nassau Operator." Nassau (on New Providence Island) is the capital city of the Bahamas. Listen for calls on: 48.00, 48.04, 48.20, 48.28, 48.42, 48.82, 48.96, 49.40, 49.42, 49.62 MHz.

Business comms have turned up on 49.05, 49.25, and 49.875 MHz. The repeater output on 49.875 is a transport company. The station has a two-second delay

and often rebroadcasts U.S. police department skip picked up on its input frequency.

The language is BVI English, with some use noted of French Creole and Spanish.

### Barbados

Barbados is the eastern edge of the Caribbean Islands, The English used sounds a bit like Jamaican, but clearer. The island has a busy car phone owner operating on 30.055 MHz, full duplex. The chap regularly phones his ministry and doctor friends from



**Table III - U.S. Virgin Islands**

29.66: Ham repeater on St. Thomas, input freq is on 29.56 MHz. Many U.S., Canadian & European hams seem to be able to key this one. Other repeaters in USA here, too, but the one in USVI is the most regularly heard.

30.84: Security Communications, an alarm company, St. Croix. They have 500 2-watt intrusion devices.

31.24: KYT360, Caribbean Harbour Club.

32.70: National Guard.

35.06: KYP486, Taylor Brown Hospital.

35.22: Phone-in & non-voice paging stations.

35.34: Phone-in paging, St. Thomas.

37.10: WXR202, USVI local gov't., St. Croix; WXR203, same on St. Thomas.

42.96: Tropical Deliveries, mobiles in St. Thomas.

**Table IV - Puerto Rico Loggings**

30.92: KRW768, El Conquistador Hotel, Plovo Sardin.

31.04: WCJ310, Radio City Communications.

31.52: KJA513, Conduit & Foundation Corp.

32.25, 32.45, 36.55, 40.80, 41.10: USN Roosevelt Roads Station.

33.10: KYD809, local gov't., San Juan.

33.14: PR Armored Car Svc., island-wide.

33.16: KBNT744, Master Lock Security Co.; also KNEA926, Pompei Towing Svc., Levittown.

34.10, 36.35, 36.85: Romey AFB.

35.26: KOS225, phone-in pager, San Juan.

35.70: KDNC335, Nieves Iron Works.

35.72: KKU247, Gonzales Construction Co.

35.88: KVC658, Polyplastics, Inc.

35.96: WXJ982, Guynabo Towing.

35.98: World University, San Juan.

37.16: Simulcast paging with 35.26. Might be a foreign repeater unintentionally picking up skip on its input frequency.

42.96: KMJ776, Camp Guali, Cayey.

44.00: KJJ247 & KJJ251, Torres Trucking Co.

44.28: La Flor de Mayo Express Co.

47.28 & 47.44: KKJ412 & WCU831, Lord Electric Company.

**Table V - Active Cuban Frequencies**

33.35*	35.10	40.28*	41.98	43.625*	45.70
33.375*	37.00	40.33	42.10	43.84	46.28
33.50*	37.15*	40.36	42.125*	43.94	47.55
33.60*	37.18	40.40	42.25*	44.00	47.59
34.025	37.46	40.80	42.60	44.04	48.60*
34.525*	37.74	41.10	42.76	44.30*	49.00*
34.83	37.80	41.15	43.20*	44.33	49.525*
35.00	38.10	41.18	43.25*	44.50	49.60*
35.02	39.46	41.525	43.28*	44.90	49.98
35.15*	40.03	41.76	43.41	45.02	
35.61	40.06	41.84*	43.435*	45.10	

\* = Repeaters

**Table VI - Haiti/Dominican Republic**

33.25: Haiti.

34.03: Ships & port base, Haiti.

34.21: Plant opns., Santo Domingo, DR

34.55: Repeater output, Santo Domingo, DR

34.575: Repeater output (31.775 input), Santiago, Dom. Rep.

37.19: Repeater output (31.37 input), construction company in Santiago, DR. Sometimes uses speech inversion scrambler.

40.75 & 42.00: Haiti.

42.50: Construction, Haiti.

many others in the region. Loggings from Trinidad and Tobago are shown in Table II.

### U.S. Virgin Islands

The USVI consists of three main islands and about fifty smaller ones. The local English dialect is called Calypso, which is similar to Jamaican. There are many stateside residents, as well as tourists from around the world that can be monitored over the paging stations on 35.22 and 35.34 MHz. Some recent USVI skip loggings are in Table III.

### Netherlands Antilles

Unique military and business comms come from the Netherlands Antilles. The language varies from English to Dutch, plus an odd mix of Dutch, Spanish, Portuguese, African, Hebrew, and English. This mix is called Papiamentu. Dutch is the official language on the island of Saba, St. Eustatius, and southern St. Maarten, but English dom-

inates. French is spoken in much of St. Maarten. On Aruba, Bonair, and Curacao, you'll hear English and Papamientu.

The defenses of the Netherlands Antilles are handled by the navy of the Kingdom of the Netherlands. The comms in these forces are in a variety of English and Dutch dialects. Transmissions are WBFM in clear voice and Time Domain scrambling, 25 kHz channel spacing. Look for these on: 30.05, 30.40, 30.80, 31.075, 31.175, 31.25, 31.30, 31.40, 31.75, 31.775, 32.10, 32.70, 33.65, 34.10, 36.025, 37.75 MHz.

Base ops are on 32.10 MHz using the ID of "600." Individual personnel use 600-series designators. Another base is on 32.70 MHz (sometimes simulcast on 32.10 MHz) and ID's as "800." Vessels and aircraft use 33.65 and 37.75 MHz.

Williamstad Company (national guard?) comms on Curacao are noted on 31.075, 31.175, 31.25, 31.75 and 31.775 MHz.

Business comms (25 kHz channel spacing) are NFM, in Dutch, and have turned up on: 32.05, 32.125, 31.175, 32.20, 32.25, 32.30, 34.55, and 36.025 MHz.

### Puerto Rico

A strong phone-in pager in Puerto Rico on 35.26 MHz is a good indicator that the band is open to the island. This pager runs an auto CW ID of KOS225 to help pin down what you're copying. For maritime comms, tune 31.48 MHz for ships of the Gulf Fleet Marine Corp. (HQ in Louisiana). The vessels can often be heard from San Juan harbor. There's an active business station on 31.68 MHz that has something to do with silver.

Some recent loggings from Puerto Rico are in Table IV.

### Cuba

Cuba appears to have stations established helter skelter on odd and even numbered frequencies throughout the band, with some channels skewed 5 kHz (as with the repeater on 43.435 MHz). There are agricultural repeaters on 33.35 and 33.375 MHz that are so active that they're convenient to use to check for band openings to Cuba. All comms from Cuba are in Spanish.

A listing of some of the many Cuban frequencies recently logged here via skip are in Table V.

### Haiti/Dominican Republic

The island of Hispaniola is host to Creole-speaking Haiti, and to the Dominican Republic, Where Spanish is spoken. The frequencies in Table VI are those I've recently logged from there.

### Conclusion

Beginning now, and in the coming months, these stations should be there for the taking. You'll want, of course, a good outside-mounted antenna intended for reception of 30 to 50 MHz frequencies. **PC**

his Jeep. Because of the relatively low frequency used, this car phone station is often heard when little else is coming through.

### Trinidad and Tobago

This two-island nation is near Venezuela. The main language is English, although Hindi, Spanish, and Creole are also noted. This is an oil producing nation, and therefore has become more industrialized than





# Scanning The World

## Low Band Skip Delivers The World Into Your Scanner

BY CHUCK ROBERTSON

Last winter, Russian, German, and French language communications were coming through on the scanner almost as often as Spanish from Latin America. Every morning from 0100 to 0600 UTC, from my location in Illinois, I could count on band openings in Europe with distances of over 9,000 miles. Days when these stations didn't come through were a rare exception.

Skip stations from Canada, Latin America and the Caribbean peaked around 0300 UTC. By mid-afternoon, stations in the Pacific were filling my scanners with sounds of the Orient. Wherever you live, this winter will be bringing you scanner skip in the 30 to 80 MHz band.

### Glasnost via The Low Band

As noted by a Soviet DX'er in a recent issue of POP'COMM, the local citizens don't monitor the VHF "action bands." Although he didn't go into details, it's because those frequencies are considered "closed." Anybody caught randomly tuning above 30 MHz could find themselves aboard the next train to Siberia for the snow shoveling auditions. But there's nothing to stop you from picking up Russian comms on these frequencies.

The band from 32 to 47 MHz is used by government ministries. Between 36 and 47 MHz there are ambulances, taxis, construction projects and other industrial users. Soviet TV broadcast channels fill the 48 to 66 MHz portion of the spectrum. Base and mobile stations are permitted in the 47 to 48.50 MHz, and 56.50 to 58 MHz bands, but only on a secondary non-interference basis. Soviet FM'casters use the 66 to 74 MHz, and 76 to 87.50 MHz bands, with ground-based aero navigation transmitters on 75 MHz (74.60 to 75.40 MHz guard band).

Soviet military comms are in WBFM mode and take place throughout the bands. From 20 to 48.65 MHz there are Regimental level comms. Platoon and Company level traffic is concentrated between 48.50 and 51.50 MHz. Division level personnel and vehicle-mounted repeaters operate between 60 and 70 MHz. These bands are carefully structured for security within the military so that commanders can't be monitored by lower echelon personnel. In Table I there are listed Soviet military frequencies logged last winter.

Much Soviet military traffic is taken up with lengthy counts, presumably for tuning



The Soviet military R-126 transceiver operates between 48.50 and 51.50 MHz for Platoon and Company level comms. It has three transmit channels and a tunable receiver.

and adjustment of equipment. Imagine my surprise when a Soviet soldier monitored on 31.4375 MHz abruptly switched from Russian into rather good English to continue his counting!

It should be noted that practically every Soviet mil communication I monitored eventually ended up using time-domain

Table I - Soviet Military			
30.475	33.30	34.65*	39.525*
31.4375	33.375*	36.00	40.55
31.65	33.3875	36.05	41.00
31.80	33.40	36.125*	41.05
31.95	33.45	36.175*	41.225
32.025	33.4825	36.225	41.325*
32.06*	33.575	36.335	41.40
32.25	33.5875	36.40	41.46
32.375	33.75	36.50	41.75
32.65	33.925	36.60	41.80
32.75	34.025	36.65	41.90*
32.80	34.075	37.175	42.125
32.86	34.275	37.225*	42.225
33.12*	34.30*	37.70	42.35*
33.175	34.325	38.30	42.45*
33.225	34.35	38.35	42.75*
			42.90

Table I. Soviet military channels in clear-voice and with scrambling. Those frequencies shown with asterisks indicate government ministries and industrial projects. Soviet radios seem to be set up for 12.5 kHz channel spacing although any frequency can be used.

(TD) scrambling. It seems that the Soviets put a premium on voice protection and are aware that these signals are skipping outside of their borders where they can be monitored by others. The type of TD used incorporates speech inversion, which gives the whole communication an even higher level of security than plain TD. The preamble tones that key the receivers to the scrambling sequence are often used as alerting tones when operating in clear-voice mode.

Well, who else besides you and I do you think is listening in on these stations, now that POP'COMM has let the frequencies out for the very first time? If you've got a good outside antenna on your scanner, next thing you know *The Russians Are Coming!*

### West Germany

German skip stations start rolling in here around 0230 UTC and hang in to 0500 UTC. The most active comms are from the highway maintenance and motor assistance repeaters operating with 20 kHz channel spacing between 34.76 to 35.00 MHz. The repeater inputs are around 70 MHz.

The most active repeater outputs logged are:

34.76	34.84	34.92
34.78	34.86	34.94
34.80	34.88	34.96
34.82	34.90	34.98

The 37.80 to 38 MHz band (25 kHz channel spacing) is allocated for motorbike instruction schools. These are the frequencies: 37.80, 37.825, 7.85, 37.875, 37.90, 37.925, 37.95, 37.975, and 38.00 MHz.

Military units in the FRG make much use of the low band in WBFM mode. In fact, the radios used by most European military forces operate in 25 and 100 kHz increments between 68 and 87.50 MHz.

### United Kingdom

No shortage of military operation anywhere between 29.70 and 87.50 MHz in the UK. NBFM or AM with 12.5 kHz channel spacing is generally being encountered.

There's a full-duplex telephone circuit on 30.695 MHz. Hospital digital pagers are on 31.725, 31.75, and 31.775 MHz, AM mode. Emergency alarm devices for the elderly and infirm are on 34.925, 34.95, and 34.975 MHz, AM mode.

American military comms coming from



Table II - United Kingdom

30.025 to 31.70 MHz band US military	74.025 MHz MOULD, Midland/Linc/Manchester	76.525 MHz USAF Security Lakenheath
30.025 MHz USAF Fairford	73.0375 MHz MOULD, Shropshire	76.55 MHz USAF Security Upper Heyford
30.50 MHz American Embassy, London (FM)	74.05 MHz MOULD, Midlands	Alconbury & Greenham Common
30.55 MHz USAF Fairford	74.0625MHz MOULD, Midlands/Manchester	76.625 MHz USAF Greenham Common
30.695 MHz mobile phone	74.075 MHz MOULD, South Wales	76.65 MHz USAF Upper Heyford & Alconbury
30.9875 MHz USAF Fairford, Security	74.0875MHz MOULD Midlands/Manchester/S. Wales	76.675 MHz USAF Security Midlands/Lakenheath
31.00 MHz USAF Fairford, Security	74.10 MHz RAF Police Honnington (mobiles 79.20)	76.70 to 76.95 MHz Customs/Excise (12.5 kHz steps)
31.25 MHz USAF Gloucester	74.1125 MHz MOULD Midlands/S. Wales CH-1	76.7125 MHz Customs, Manchester (AM)
31.1825 MHz USAF Fairford	74.125 MHz MOULD Brecons/Shropshire/Midlands	76.725 MHz Customs, Manchester (AM)
31.30 MHz USAF Fairford, Medical	74.1375 MHz MOULD South Wales	76.775 MHz Falmouth link, Coast Guard
31.725 MHz Hospital pagers (paired 161.00 MHz)	74.15 MHz MOULD Midlands/Shropshire	76.80 MHz USAF Bentwaters
31.75 MHz Hospital pagers (paired 161.025 MHz)	74.1625 MHz MOULD Manchester/Midlands	76.825 MHz Phone links, Southwestern UK
31.775 MHz Hospital pagers (Paired 161.05 MHz)	74.2125 MHz MOULD, South Wales	76.85 MHz Falmouth link, Coast Guard
31.80 to 34.90 MHz band USAF	74.225 MHz MOULD, Lincs/Midlands	76.90 MHz USAF bases, gate security
32.20 MHz USAF Security, many bases	74.2375 MHz MOULD, MOULD, Shropshire/Lincs	76.925 MHz USAF bases, gate security
32.30 MHz USAF Fairford	74.25 MHz RAF Police Bentwaters	76.9375MHz Customs, Manchester (AM)
32.5125 MHz USAF Fairford	74.2625MHz MOULD, South Wales	76.95 MHz Customs, Manchester (AM)
32.60 MHz USAF Fairford	74.3125MHz MOULD, Shropshire/S. Wales	76.9625 to 77.50 MHz Personal Mobile Radio
32.80 MHz USAF Fairford	74.3375MHz MOULD, Manchester	mobiles, 12.5 kHz separation, mobiles to
33.25 MHz USAF Birdscote/Lakenheath/Mildenhall	74.35 MHz MOULD, Brecons/Wales	bases in 86.8625 to 87.50 MHz band
33.50 MHz USAF Birdscote/Lakenheath/Mildenhall	74.375 MHz MOULD, Brecons/S. Wales	77.525 to 77.9875 MHz Land Mobile (12.5 kHz)
34.025 MHz USAF Fairford	74.3875 MHz MOULD, South Wales	77.575 MHz Ipswich repeater (AM)
34.10 MHz USAF Medic services	74.40 MHz MOULD, Brecons/Wales	77.8125MHz Repeater (AM)
34.15 MHz USAF Mildenhall/Lakenheath, crash	74.4125MHz MOULD, Brecons/Shropshire/S. Wales	78.00 to 78.30 MHz Land Mobile (12.5 kHz)
34.90 MHz USAF Mildenhall/Lakenheath	74.4375MHz MOULD, Midlands	78.00 MHz Mil. Ops., South Wales
34.925 to 34.975 MHz Emerg. alarms for elderly (2w)	74.45 MHz MOULD, Brecons/Wales	78.10 MHz Air Training Corps (AM)
35.005 to 35.205 MHz band Radio Control (1.5w)	74.4625MHz MOULD, Brecons	78.19 to 78.2525 MHz BBC-TV mobile comms
35.25 to 37.75 MHz Mil tactical (50 kHz spacing)	74.5125 MHz MOULD, Brecons/Midlands	78.3125 to 79.0875 MHz USAF Police FM (12.5 kHz)
38.30 to 40.00 MHz Mil tactical (50 kHz spacing)	74.525 MHz MOULD, Brecons	78.35 MHz USAF Police/Fire ops
39.75 MHz Royal Signals Tatoon Display (FM)	74.5375MHz MOULD, Midlands/Brecons/Lincs	78.50 MHz USAF Police Woodbridge/Bentwaters
39.90 MHz USAF Fairford	74.55 MHz Basil Control Police	78.525 MHz USAF Police Woodbridge/Bentwaters
40.20 to 41.00 MHz band Radio control of models	74.5625 MHz MOULD, Bloreng Site, S. Wales	78.55 MHz USAF Fire Midlands
41.00 to 46.60 MHz Mil tactical (50 kHz spacing)	74.575 MHz Brecons/Shropshire/Manchester	78.5875 MHz USAF Base PD Woodbridge
45.30 MHz British Army, Stanford	74.5875MHz MOULD, South Wales	78.625 MHz USAF Police Bentwaters
45.425 MHz British Army, Stanford	74.60 MHz MOULD, Midlands	78.725 MHz USAF PD Woodbridge/Bentwaters
46.00 MHz Royal Signals Cardiff Tatoon Display	74.6125MHz Bloreng Site/Midlands	78.80 MHz USAF Ground Bentwaters
47.00 to 47.44 MHz Mil tactical (50 kHz spacing)	74.625 MHz MOULD, Brecons	79.05 MHz RAF Honington
47.45625 to 47.54375 MHz Cordless phone handsets	74.65 MHz MOULD, Midlands/Brecons/Shropshire	79.075 MHz Air Training Corps, Cosford
12.5 kHz channel spacing	74.6625MHz MOULD, Wales	79.10 to 79.9875 MHz MOULD Mil Ops (12.5 kHz
47.55 to 49.00 MHz Mil tactical (50 kHz spacing)	74.675 MHz MOULD, South Wales	spacing), simplex/duplex (paired 74.675) FM
49.00 to 50.00 MHz Autofon	74.70 MHz MOULD, Brecons/Wales	79.10 MHz RAF PD Ch. 1 Wattisham/Honington
49.90 to 50 MHz Mil tactical	74.725 MHz MOULD, Manchester/Shropshire	79.125 MHz RAF Ground Svc St. Athan/Notts/Darby
56.625 MHz Royal Signals Cardiff Display	74.750 MHz MOULD, Manchester/Shropshire	79.15 MHz RAF PD Ch. 2 National
61.00 MHz Wireless microphones	74.7625MHz MOULD, South Wales	79.20 MHz RAF PD Ch. 3 Nat/Wattisham/St Athan
68.00 MHz Mil, S. West Engineers (AM)	74.7875MHz MOULD, South Wales	79.20 MHz RAF Refuel/Fire Honington/St Athan
68.05 MHz Mil, Cheltham, Transport Service (AM)	75.25 to 76.70 MHz band USAF (25 kHz spacing FM)	79.2125MHz MOULD, Manchester/S. Wales/E. Anglia
68.10 MHz Mil, S. West Engineers (AM)	75.25 MHz USAF Midlands	79.25 MHz USAF Crash/Fire Honington
68.6875 MHz Mil, Cheltham, Transport Service (AM)	75.30 MHz USAF East Anglia	RAF PD Ch. 4 National
68.7875 MHz Mil, Cheltham, Transport Service (AM)	75.325 MHz USAF Midlands/Lakenhth/Mildenhall	79.275 MHz RAF Gnd Svcs, St Athan
68.9875MHz Mould, South Wales (FM)	75.3375MHz USAF Bentwaters	79.30 MHz RAF PD Ch. 5 National/Wittering
69.30 MHz Sea Cadets (notional frequency)	75.35 MHz USAF Security Midlands/E. Anglia	79.325 MHz RAF Gnd Svcs, Cosford/Honington
69.575 to 69.80 MHz Mobile Service (pair 84 MHz)	75.40 MHz USAF Security East Anglia	79.35 MHz RAF PD Ch. 6 National (Zero Control)
25 kHz spacing (FM)	75.425 MHz USAF Ground, Upper Heyford	79.375 MHz RAF PD Honington
68.8225 to 69.9625 MHz BBC-TV Auxiliary Broadcast	75.45 MHz USAF Upr. Heyford/Lakenheath/Mildnh	79.40 MHz RAF PD Ch. 7 National/Wattisham
12.5 kHz spacing, paired 74.70-75.2625 MHz	75.50 MHz USAF Security Upper Heyford	79.4125MHz MOULD, South Wales
70.025 to 70.50 MHz Amateur (Beacons/CW/SSB/FM)	75.525 MHz USAF Security Woodbridge	79.45 MHz USAF PD Ch. 8 Cosford (Charlie Cntrl)
70.025 to 70.075 MHz Amateur (CW beacons)	75.55 MHz USAF Security Alconbury/Upr. Heyford	79.475 MHz USAF PD (Zero Control)
70.20 MHz Amateur SSB calling frequency	75.575 MHz USAF Ground Bentw./Lakenh./Mildhall	79.4875MHz Southend Isl. repeater control
70.45 MHz Amateur FM calling frequency	75.5875 MHz USAF Security Upper Heyford	79.50 MHz USAF PD Ch. 9 National/Honington
70.50 to 71.50 MHz Police/Fire Ambulance	75.675 MHz USAF Security Lakenheath/Mildenhall	79.55 MHz USAF PD Ch. 10 Wattsham. (Bazel Cntrl)
12.5 kHz steps, mobiles in 80 MHz band	75.80 MHz USAF Security Upper Heyford	79.575 MHz Wattisham PD (Silicon Control)
70.825 MHz Devon Fire Department	75.825 MHz USAF Security Investigators	79.60 MHz USAF PD Ch. 11 National
70.90 MHz Ipswich Fire Department	76.0125MHz MOULD, Midlands/South Wales	79.65 MHz USAF PD Ch. 12 National
71.5125 to 72.7875 MHz Private Mobile Radio	76.05 MHz USAF Lakenheath/Midlands	79.7125 to 79.9875 MHz RAF Gnd Svcs & Mil Ops
12.5 kHz spacing, bases in 85 MHz band	76.0625MHz Mil. Ops, South Wales	12.5 kHz channel spacing, FM
71.9875 to 72.0875 MHz Automotive service,	76.1125 MHz MOULD, South Wales	79.7125MHz MOULD, South Wales (duplex 74 MHz)
12.5 kHz spacing, bases in 85 MHz band	76.125 MHz MOULD, Midlands/South Wales	79.775 MHz USAF Fire Binbrook
72.80 to 76.70 MHz Land Mobile, Private & Gov't.	76.225 MHz USAF common, most bases	
73.10 MHz Mil Police, Aldershot (FM low power)	76.325 MHz USAF Maint., Upper Heyford	
73.475 MHz Mil Police, Malesworth & Greenham	76.3625MHz Mil. Ops, Brecons	
73.70 to 73.925 MHz RAF 61st Sig Sqn bases,	76.40 MHz USAF Security Midlands	
25 kHz spacing, mobiles 84.125-84.35 MHz	76.45 MHz USAF Security Fairford	

Table II. It's been practically impossible to get frequency listings for the U.K., so this directory is a first. Better save it for future reference.

bases in the UK are numerous, and in NBFM at 12.5 kHz steps. USAF base ops at Fairford are heard on 30.025 MHz. Listen for things like "Control to 1347—go to Transit Alert Facility . . . they're ready for pickup." Convoy escorts are logged on 32.60, with warehouse ops on 32.5125 MHz. Work on aircraft and water delivery is monitored on 32.80 MHz with ID's like Control, Area 2, Hotel 5. Frequency 34.025 MHz is quite active with base/mobile comms. Listen for Tanker 3, Mobile 6, Water Truck 50, and Control. Security ops have been logged on 30.9875, 31.00, and 31.1825 MHz. These ops are low keyed compared to domestic military comms. The affirmation "10-4" is used instead of the usual "Roger."

UK frequencies are virtually unknown to North American monitors, although the fact that everything is in English makes these stations of extreme interest. POP'COMM breaks the ice with a UK low-band scanner listing, offering this information in Table II for handy reference as the loggings roll in.

### I Love Paris In The Winter

The basic bandplan for France goes something like this:

- 29.70 - 48.00 MHz Military
- 30.00 - 37.00 MHz Police
- 32.00 - 35.00 MHz Railroads
- 37.00 - 47.00 MHz ?
- 72.00 - 72.50 MHz Hydro Power Utilities
- 75.00 - 82.00 MHz Taxicabs

Table III - French Repeaters

30.5075	35.025	35.75	36.0175
31.65*	35.0375	35.775	36.0375
31.175	35.05	35.80	36.05
31.25	35.0625	35.8125	36.0625
31.90	35.075	35.8175	36.075
32.10	35.10	35.825	36.10
32.95*	35.125	35.8375	36.125
33.7875	35.15	35.85	36.15
33.8325	35.1625	35.8625	36.1875
34.6075	35.175	35.875	36.50
34.9075	35.20	35.90	36.8125
34.9125	35.275	35.925	37.00
34.95	35.30	35.95	37.4625
34.975	35.50	35.975	40.30
35.00	35.525	35.9875	41.425
35.0125	35.625	36.00	42.00
35.0175	35.70	36.0125	42.10

Table III. French repeaters. Asterisks indicate simplex ops, WBFM. A full-duplex radio-phone system is on 30.5075. the spacing used is 12.5 kHz.





Britain's PTR349 military transceivers cover 37 to 50 MHz (Model A), and 47 to 57 MHz (Model B) in 25 kHz steps, FM.



The French military TRC559 military manpack transceiver operates with NBFM with channels spaced 25 kHz apart between 30 to 80 MHz.

In early '86, the 41 to 47 MHz band was opened up for two-way base/mobiles when French TV Channel 2 was relocated. Perhaps some of our readers in France can fill in the gaps and missing details. See Table III for active French comms I logged last winter.

There are loads of repeaters between 34.90 and 36.20 MHz. They use a unique tone-burst access format that sounds like pushing the buttons on a tone pad when making a phone call. This is the CCIR selective system (widely used in Europe). It consists of 5 to 7 ms. tones sent in sequence, and is used exclusively on the low-band.

When you hear these tones, you can be assured that the French language comms you're copying are coming all the way from La Belle France, and not from any of the other places where French is spoken.

French language stations having a peculiar wavering tone-burst have shown up on several frequencies with 50 kHz channel spacing. These include: 30.15, 31.70, 31.95, 32.05, 32.15, 32.20, 32.25, 32.40, 32.80, and 25.90 MHz. Inasmuch as these fast-paced, professional comms come in along with South American skip, their origin may be France's ultra modern

space exploration facility at Kourou, French Guiana.

### South Korean Riot Police

Radical students and worker rallies are just about a daily event in South Korea. Riot police are always on the scene of the protests, waiting to swing into action at the

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Table IV - More International Best Bets

- 30.10: Non-voice pager, probable European.
- 30.60, 30.75, 39.70: W. German heliports, WBFM.
- 30.86: Italian, NBFM.
- 31.80: W. German airfields, nationwide, WBFM.
- 31.95: US mil in Europe, taxi svc, NBFM.
- 32.05 & 33.075: Israeli stations in Hebrew & Yiddish; check from 42 to 46 MHz for Israeli private radio-telephones. Mil ops fill most of low band in Israel.
- 32.20 & 32.40: Arabic radio-telephones, full duplex NBFM. On 32.20 there's a US mil op overseas in NBFM with ID "Equipment Control."
- 32.25 & 33.85: US mil ops overseas, NBFM.
- 32.40 & 37.60: Screeching sound, usually when European skip is working.
- 32.60, 32.70, 34.75: Norwegian Mil, WBFM mode with ID "Alpha."
- 33.20, 33.70, 37.40, 37.60, 40.20, 40.80: US airfield ops in W. Germany, WBFM.
- 33.40: Slovic, NBFM.
- 34.40: Arabic, NBFM.
- 34.38: Repeater output, German, NBFM.
- 37.00: Security? English & Dutch; "National Bank;" radios have unique 5-tone burst access, NBFM.
- 37.30: US mil air/ground weather ops in South Korea. Bases here include A-511 at Pyongtaek; H-208 in Yongsan; & H-220 in Tong du Chon, WBFM.
- 37.80: Irish mil ops, some English. ID's as "Security," "Lima 1," "Lima 2," WBFM. The 30 to 48 MHz band is used by the mil in Northern Ireland, with 35 to 48 MHz mostly for long range helo/aircraft control channels.
- 37.80: German, maybe motorcycle training, NBFM.
- 42.20: Repeater output, German, NBFM.
- 42.40: W. German tower ops, WBFM.

Table IV. An assortment of odds and ends you'll want to watch for during band openings this winter.





The author's AS-756/TRC military surplus antenna is a dual three element yagi that will operate between 30 and 100 MHz.

slightest provocation. High-energy riot police comms are being heard on 34.50 MHz. Also check out other 34 MHz channels in 25 kHz steps for additional military comms. South Korea comes in best during the late afternoon hours.

## Hawaii

Although one of the 50 United States, it's still a thrill for mainland monitors to log signals from Hawaii via the scanner bands. Here are some that have been logged:

- 30.76 MHz WRT815, Zion Securities, Laie.
- 43.10 MHz KAU249, Castle and Cook Sugar Refinery, Wahiawa.
- 44.36 MHz KXA503, J.R. Express, Honolulu.
- 46.10, 46.36, 46.56 MHz Many fire departments.
- 47.50 MHz Oahu Civil Defense, many bases.
- 48.54 MHz Hawaii Electric Light and Power Co., many bases.

## Guam

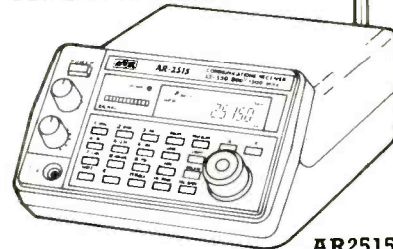
Guam is a U.S. Possession in the Pacific. Try for these:

- 30.96 MHz KJF648, Aviation Services, Ltd., Barrigade.
- 33.16 MHz KWY384, Guam Cable TV, Agana (repeater input is 30.92.)
- 35.06 MHz KLD231, Carlos Construction, Agana.
- 35.14 MHz WRN991, Hanyang International Hotel, Tamuning.

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# Scanning Central America

## Shadowy Communications from the Southern Hemisphere Herald Tomorrow's Headlines

BY CHUCK ROBERTSON

The evening TV news confirms that Central America is turning into a political hot spot and land of terrorism and intrigue that most of us used to associate with Southeast Asia or the Middle East. Thanks to the benefits of the sunspot cycle, your scanner brings it right to you while it's happening, giving the situation a much sharper edge than yesterday's news tapes shown to you courtesy the TV networks.

You'll monitor the many military and paramilitary groups operating in Central America. The U.S. military keep a nervous watch on the Panama Canal, while troops in Honduras and El Salvador conduct non-stop war games and training exercises. Meanwhile, local militaries, drug barons, plus a ragtag mix of left and right wing guerillas keep the region on the cutting edge of anarchy, or at least revolution. Yes, when the VHF "low band" is open for skip to Central America, there's never a lack of military macinations and intrigue.

U.S. Government mobiles are monitored tracking a mysterious "target" vehicle that's been tagged with a bumper beeper transmit-

ter. Their comms are observed on 31.75 MHz. *Searcher 110* was tense as he instructed his companions, "Target fading in and out . . . still heading north . . . negative contact at this time . . . last seen 12 kilometers out."

A minute later, *Searcher 230* rebounded, "picked up track about 10 kilometers out." And so it went, but who were these Americans tracking? Were these military units looking for guerillas? Were they DEA agents following a shipment of drugs headed northward to the U.S. via the Mexican corridor?

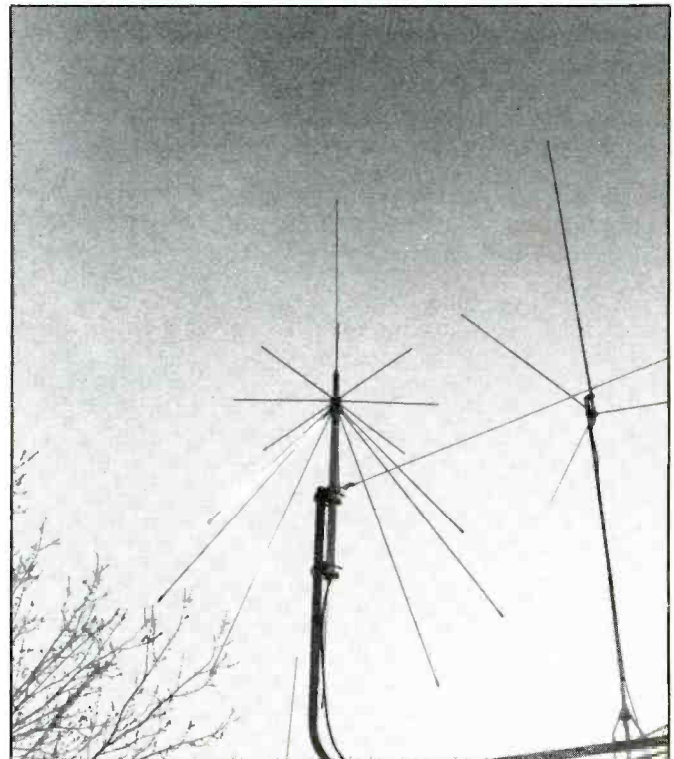
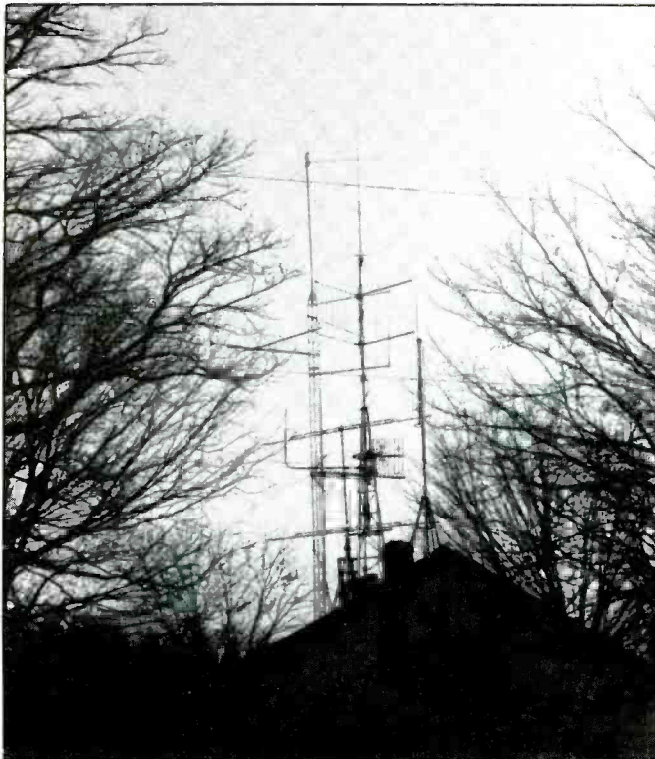
### You Can Listen, Too!

Last winter at this time, the airwaves were thick with scrambled communications from this region. Low power manpacks, hand-helds, as well as mobile units used by local security patrols were heard with Time Domain scrambling. U.S. military units were observed with (DES and MUX) scramblers, too. Frequencies below 40 MHz, scrambled and in the clear, make it northward for all of us to copy without much difficulty.

A peculiar type of digital data burst turned up in the skip. It's like a *boop-beep* type of signalling. They're brief (less than 3 seconds), and are certainly related to military or federal activities. Weapons or telemetry is a possible source. It's been logged on 31.45, 31.86, 32.65 and 32.90 MHz. Even the Nevada Test Site repeater on 36.33 runs these signals. What's going on?

New in the Central American comms scene is equipment with 12.5 kHz channel increments. Local military forces have been spotted on frequencies like 33.525, 34.025 and 34.6825 MHz. Soviet low band radios are known to have 12.5 kHz channel spacing, so perhaps the Sandinistas in Nicaragua have such sets. U.S.-backed forces use radios with 50 kHz and 10 kHz channel spacing.

A voice multiplexing (MUX) trunk with continuous guard tones was found operating week after week on 31.925, 31.95 and 31.975 MHz (NBFM mode). DES scrambling was also monitored on 31.975, which took me by surprise. Occasional clear voice comes through on 31.95, and when it did, it





revealed that this unusual net was operated by the U.S. military. For a description of MUX, DES, and TD scrambling techniques, see the September '88 issue of POP'COMM feature, *It's Scanner DX Skip Season!*

## Unusual Aero Comms

On 36.45 MHz, two apparent U.S. aircraft enroute Colombia gave a detailed minute-by-minute description of the ground below as they overflew Panama and the nearby San Blas Islands. "Those are the Cuna Indians there on the beach. They live on the San Blas Islands. They're similar to the Philippine people. This chart shows the area we're now over is uncharted . . . I'm going down for a look at the volcano . . ." This type of guided tour was monitored for about 2 hours beginning at about 1400 UTC one morning last winter.

Maintenance on the Panama Canal and its reservoirs is conducted by the U.S. Army Corps of Engineers, with comms on the Command Net frequency 31.75 MHz. ID's I've logged here include *Coco Solo 23* (mobile); *Guabala Air* and *48-Air* (towers); *Forward Base Camp*; *Fort Sherman*; *Fort Gullick*; *Station 99*; *LSE Site*; *Corps Site*; *Robert 79'er*; *Army 292* (helo); *Madden Lake* and *Gatun Lake* (reservoirs); *Rio Indio* (tributary of Madden Lake); and *Balboa City*.

Also, vessels of Gulf Fleet Marine moving through the canal can be heard on 31.48 MHz. These commercial vessels pass position reports to *Harvey Base*, located in New Orleans, LA.

## Military Stuff

Honduran troops are heard regularly on 32.00 MHz in clear voice Spanish. ID's here include *El Gun* and *Booma*. Locations mentioned are Pito Solo and Campo Palmerola (Palmerola AFB, Honduras). Lively US/Honduran war games on the Coco River (near Tocoa) were tuned on 30.25 and 31.00 MHz. Ground forces had ID's like *Wolf 7*, while helos had ID's like *Dragon 27*.

The language barrier made for problems between the forces. On 35.00 MHz, pilot of a U.S.A. aircraft ID's as *Vulture 23* asked another station, "Is he speaking English. Later *Vulture 23* dryly observed that, "100 infantry managed to dismount before they died." Good thing these were only maneuverers and not the real thing! For more of these frequencies, see our Low Band Skip Log.

## Meddlin' In Medellin

A short crawl through the dense underbrush at the Panamanian border and you're in Colombia. What with dozens of private drug armies terrorizing the countryside and cities, the police dispatchers rack up lots on mike time. A very active one uses NBFM and is heard on 34.50 MHz, with mobile units on the same frequency). This dispatcher seems to be located in Medellin, which is to cocaine what the south of France is to Bordeaux wine.

Last spring the frequency was going wild with comms relating to the attempted escape of drug runners from Bellavista penitentiary. At attack force stormed the bastions in a failed attempt to free some of the drug kingpins there. Approximately 20 men armed with grenades and automatic weapons tried to shoot their way past the guards.

Any time skip comes rolling in from Colombia, try listening on 34.50 MHz, also 36.80 and 45.50 for "Bogota."

We are presenting a Low Band Skip Log that lists some Central American skip reception you can watch for. A few Caribbean, Pacific, and South American loggings are sprinkled in for good measure. Military intercepts are WBFM, everything else is NBFM unless noted otherwise. SS = Spanish; PP = Portuguese; EE = English; BIWI = British West Indies; BI = Business.

### Low Band Skip Log

- 29.625 & 29.655: Whistler RT's in in SS boatlegging in the ham band.
- 29.72, 29.80, & 29.90: US mil exercises in Pacific: "Send report to Battalion," "Uniform-71," "Juliet-71," "November-75." See 30.10 logging.
- 29.80: US mil ID as "Hotel."
- 29.815: SS outbander in NBFM; a beep at end of each xmn.
- 29.935: SS outbander in AM mode. Actually, the range 29.70 to 29.95 is often saturated with SS outbanders.
- 29.97: US mil in Pacific: "Red-3, 0226."
- 29.975: SS agri ops, NBFM.
- 30.00: USN Shore Patrol somewhere.
- 30.03: USAF airfield management.
- 30.05: Joint mil exercises, EE/SS: "Victor-64 at Base Camp."
- 30.10, 30.80, 31.00, 31.10: US mil exercises, Pacific area: "Stop due to weather," "November-74," "Uniform-37."
- 30.25 & 33.85: Joint mil exercises, EE/SS, 2 companies; "Alpha Tank," "Charlie Tank."
- 30.475: Security Service, San Salvador, El Salvador, 24-hr. ops, very active.
- 31.00: Medical svc, Guatemala City, Guatemala.
- 31.70: Mil ops, EE/SS: "Crackerbox Ops."
- 31.80 & 35.20: Petro related BI, many bases in Honduras: Tegucigalpa, Sierra; also a base in Mexico ID's as "Mexico."
- 31.96: BI in San Salvador, El Salvador.
- 31.98: SS phone-in pager; 2 tones then message.
- 32.01: Port ops, maybe El Salvador.
- 32.02: Costa Rican BI.
- 32.05: BIWI: "I'm at Mountain View."
- 32.08: Petro ops in SS, Mexican.
- 32.10: EE/SS military; "Proud Banner" (vessel), "Bubblegum-53."
- 32.20: Guatemalan BI in SS: "Guatemala."
- 32.225: Repeater out, SS BI.
- 32.30: Joint mil ops, EE/SS; convoy.
- 32.31: Joint mil ops, EE/SS; battalion on move.
- 32.35: SS mil: "Saturno."
- 32.44: Managua, Nicaragua: BI
- 32.45: Repeater out; Central American BI.
- 32.68: Honduran BI: Tegucigalpa, Juticalpa, San Antonio.
- 32.65: Mexico military, SS.
- 32.75: US mil: "Peck to Rad-1. Go to covered mode."
- 33.10: US Security patrol, Tegucigalpa, Honduras.
- 33.20: Repeater out (32.78 in); BI with bases in Honduras, El Salvador, & Mexico.
- 33.425-33.825: Many repeater outputs (inputs exactly 6 MHz higher) for Central American BI's.
- 33.49: Tegucigalpa, Honduras: BI in SS.
- 33.50 & 33.60: Mexican military. Primary base freqs. ID as "Militar Mexico."
- 33.85: Military ops; PP.
- 34.06 & 34.66: Honduran BI: Tegucigalpa, Choluteca, San Lorenzo, Taujica.
- 34.30: Base & port ops: Panama Canal. Also EE & SS mil ops: "India 24" & "34."
- 34.50: USAF: "Engine light is on...must land!" "Buckeye Ops," "Buckeye-196," "Snowman" (a/c) at 1547 UTC.
- 34.60: Police or BI in SS: "Central, Panama 36."
- 34.60: EE/SS mil, range ops: "3-Papa-27" (US) & "Uniform-53" (SS).
- 34.60: Hindi & EE, maybe Trinidad, Suriname, or Guyana: "How's your mother?"
- 34.725: SS BI: AM mode, very active. May be Managua, Nicaragua.
- 34.83: SS BI: Santo Miguel.
- 35.35 & 34.90: EE/SS mil maneuvers, Central Am.
- 35.825: 3-tone telemetry, So. America. Other stas

found from 35.55 to 35.75 in 25 kHz steps, AM mode.

- 35.91: SS BI; Mexico.
- 36.00: French Creole, Haiti, some hollering. Also a repeater out similar to 32.50 MHz.
- 36.24: SS BI: Colon, Panama.
- 36.35: Port ops: Panama.
- 36.50: SS petro BI. Calling for Arco.
- 36.65: USN ships, So. Pacific: "Yellow Beat," "Port-15."
- 36.80: USAF ops: "Switch 344.6 MHz."
- 37.35: BI, Panama.
- 37.60, 37.65, 37.70: SS pager, AM mode, 2-tones then messages.
- 39.34: Repeater out: BI in Honduras.
- 40.45: SS police patrols, NBFM.
- 40.55, 40.64, 40.66, 40.68: Various types of beeping tones. Federal agencies involved in tracking target vehicles sometimes use the 40 MHz band for the transmitter. The 40.66-40.70 MHz sub-band is allocated for sea buoys, wildlife tracking & field disturbance sensors. Freq 40.68 MHz allocated for medical, industrial, scientific devices.
- 40.76: Repeater out, French Creole. Xmsn has odd multiple tone-burst access.
- 40.87: 2-tone digital signalling.
- 41.00: Security patrol in SS/EE, may be in Honduras.
- 41.10, 41.28, 41.34, 41.40, 41.52, 41.58, 41.64, 41.70, & 41.80: SS tfc with many phonetics & numbers. San Jose, Costa Rica mentioned.
- 41.425: SS BI, Mexico. Bank deposit numbers.
- 41.82: SS BI with names & places listed: Colon, Panama.
- 42.18: Repeater out: PP from Brazil.
- 42.26: SS BI, La Plata, Argentina.
- 42.275 & 42.975: EL Salvador, BI.
- 42.62: Pager from Argentina: 2 tones followed by voice message sent twice. Also check: 31.35 32.68 32.82 32.96 35.08 35.28 35.32 37.12 37.42 37.62 39.64 & 46.26 for similar.
- 43.00: BIWI: Trinidad?
- 43.65: Fire Dept., Colon, Panama; SS.
- 44.30: Repeater out (44.675 in), an SS BI in clear speech & inversion scrambling. Also a repeater out in SS from a BI in Santiago, Cuba "Santiago-4."
- 46.25: SS BI, Venezuela.
- 47.325: Repeater out, SS BI with tone burst access.
- 48.075: Repeater out, SS BI; San Antonio.
- 48.75: Fire Dept., Trinidad.
- 49.05: Repeater out: BIWI, maybe Bahamas.
- 49.60: Panamanian government ops in Cristobal.

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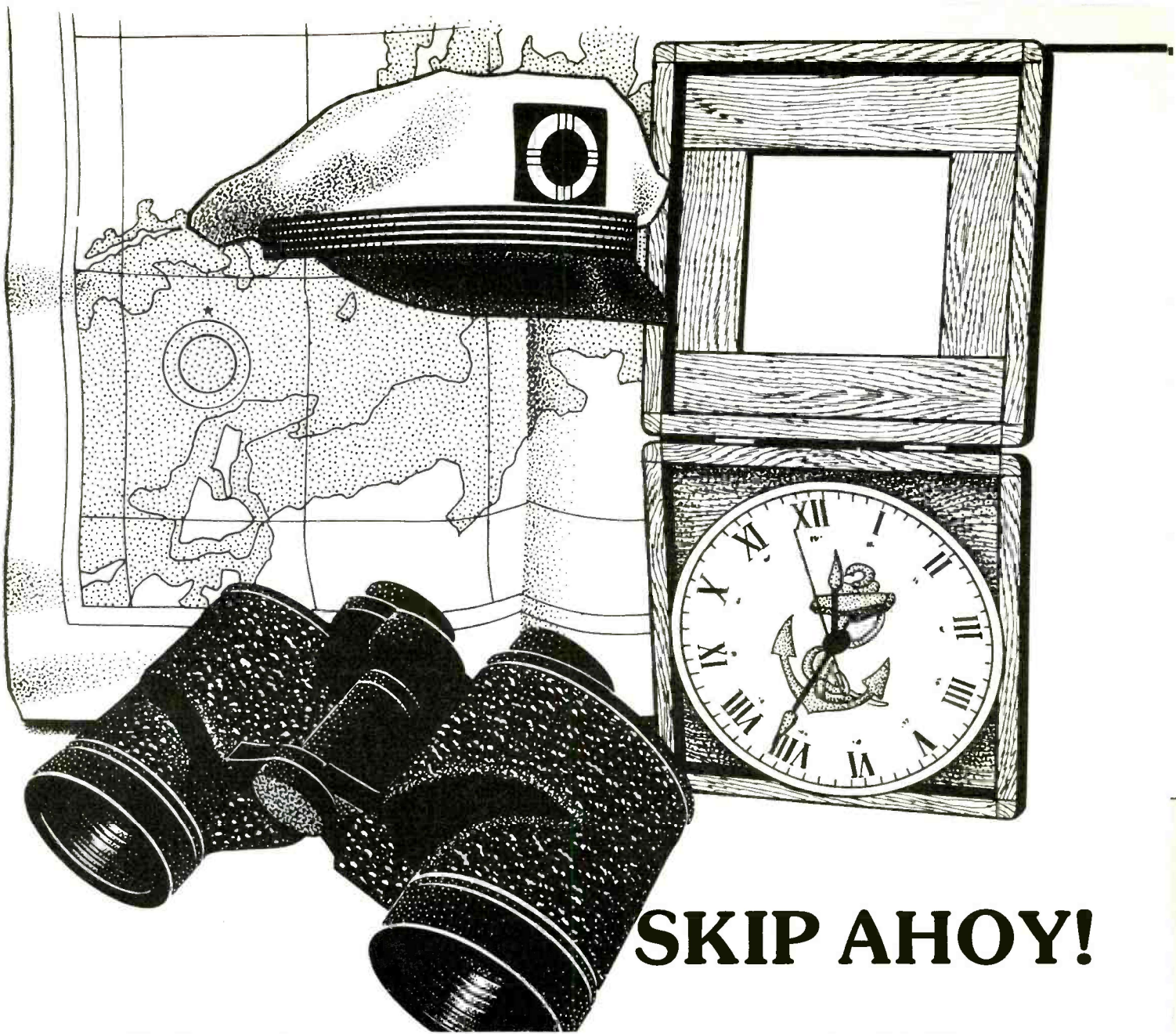
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# SKIP AHOY!

## *DX'ing Maritime Communications on the VHF "Low Band" With Your Scanner.*

BY CHUCK ROBERTSON

**T**he frequency 31.48 MHz, at first glance, doesn't strike you as anything very extraordinary, at least no more so than any of the other 60-odd channels allocated in the 30 to 50 MHz range for the Special Industrial Radio Service. If, for no other reason than being the frequency used by the Gulf Fleet Marine Corporation's many land bases and ocean-going vessels transporting crude oil and other cargo, it turns out to be one of the most exciting frequencies going. For years I've kept this frequency on tap in my scanner, for no matter which direction is bringing in skip, the action goes full tilt.

There's lots of information on ship positions, sea and weather conditions, cargo

status, and routing. There's also no shortage of ship-to-ship chit-chat.

Mostly, the vessels monitored are cruising in the Gulf of Mexico and the Caribbean, although the excellent skip conditions of late have brought in Gulf Fleet vessels located in the Mediterranean and the Pacific who are able to contact the company's "Harvey Base" in Louisiana. Only problem is that this network of stations doesn't have the exclusive use of 31.48 MHz, and during periods when skip is rolling in, the frequency becomes wall-to-wall chatter with other stations located in all areas of the nation. Sometimes, when the pileup gets especially bad, Harvey Base and the vessels have

even switched modes from NBFM to SSB in an effort to maintain contact through the wall of signals.

Gulf Fleet vessels are authorized to use 220 watts on FM. Most of these vessels can be discerned because they have the word "Gulf" as part of their name (see our roster). Of course, depending upon the primary language of the ship's captain, you might well hear the name of the vessel spoken in Spanish, Norwegian, Dutch, German, or Portuguese.

### **Touching Base**

There are at least four Gulf Fleet bases, the main one called Harvey Base (callsign



**Table 1**

Apolo del Golfo	Gulf Raven
Atlantic Sea Horse	Gulf Ruller
Barbara G. 5	Gulf Saber
Bering Sea Horse	Gulf Sea Horse
Brazo	Gulf Seas
Caribbean Sea Horse	Gulf Star
Chesapeake Sea Horse	Gulf Storm
Comoro Uno	Gulf Thunder
El Mira de Felice	Gulf Titan
Gulf Ace 2	Gulf Viking
Gulf Breeze	Gulf Wind
Gulf Cajun	Juno del Golfo
Gulf Commander	Jerry G. 6
Gulf Duke	Liberty Service
Gulf Eagle	Lilly Gidfrey
Gulf Falcon	Luke Z. de Felice
Gulf Fever	Matagorda Sea Horse
Gulf Fleet 302	Mary de Felice
Gulf Hawk	Martie de Felice
Gulf Joy'	Micheal de Felice
Gulf Lightning	Mr. Andrie
Gulf Miss	Mr. Mat
Gulf Neighbor	Mr. Roberts
Gulf Pride	Nelly Gidfrey
Gulf Prince 2	Pacific Sea Horse
Gulf Queen 2	San Mataos Sea Horse
Gulf Rambler	Saturno del Golfo
Gulf Ramp	Tarot 2

*Table 1 - Some of the Gulf Fleet vessels heard on 31.48 MHz.*

KXF841) and located south of New Orleans. For local comms, there's a 500 watt transmitter with an antenna mounted 30-feet above ground. This is used for contracting crew vans, maintenance trucks, and vessels near the coast and on the Mississippi River.

A second 500-watt transmitter is located at Leeville, south of Harvey, and has the call sign KQZ242. This transmitter is remote controlled from Harvey, but has its antenna atop a 600-foot tower. Another remote controlled transmitter (WZU846, 100 watts) is at Sabine, TX and uses an antenna mounted on a tower 580-feet in height. No wonder Harvey Base has such great coverage!

### Identification

As a general rule, callsigns aren't used. Sometimes vessels will request the base station to use a particular transmitter site, such as, "go to Leesville." Or they may call for "KQZ," short for KQZ242. When they want Sabine, they may ask for it by name, or as "WZ," short for WZU846. One captain got confused and mixed everything up, asking for "KZU," he got no reply.

Another base is located in Larose, LA. This base can also access the Leeville and Sabine Pass remote transmitter sites. You can't monitor the Larose station very often

**Table 2**

Harvey Base—Harvey, LA; KXF841
Leeville—Remote transmitter at Leeville, LA; KQZ242
Sabine—Remote transmitter at Sabine Pass, TX; WZU846
Larose Base—Larose, LA Also called "Home Office"; seldom heard.
Carmen Base—Carmen, Mexico, Gulf of Campeche
HNG Base—Honduras?

*Table 2 - Gulf Fleet major bases and transmitter sites.*

unless a vessel is calling and the operator at Harvey Base is temporarily away from the radio.

Larose Base has also been monitored on 31.44 MHz, although I can't find any FCC record for Gulf Fleet Marine on this frequency. Frequency 31.40 MHz even appears to be in occasional use by Gulf Fleet Marine vessels, at least I've heard it used twice during *Mayday* situations. At those times, vessels were heard shifting between 31.40, 31.44, and 31.48 MHz in an attempt to get help. There might even be other channels to use at 20 or 40 kHz spacing, although I haven't monitored any in use.

A third base is at Carmen, Mexico. This is on the oil-rich Gulf of Campeche. HNG Base is the fourth base, possibly located at Honduras. Both of these stations use English or Spanish. Actually, there are other minor bases on 31.48 MHz, such as *Pujon Base* (Louisiana?), which is a docking facility utilized by Gulf Fleet Marine vessels. *Pujon* isn't operated by Gulf Fleet Marine, and has also been noted on 33.38 MHz and mentioning that they were switching to VHF high-band marine channels to relieve congestion on 31.48 MHz.

### All Over

Gulf Fleet's vessels turn up on a number of additional low-band frequencies licensed to other port facilities, oil rigs and shipping companies. For instance, the *Gulf Fleet 50* has been heard on 44.27 MHz repeater using the King's Wharf in Fyzabad, Trinidad and Tobago. The vessel *Apolo del Golfo* has been monitored on 32.60 MHz while communicating with offshore oil rigs, possibly in the Gulf of Mexico. Sometimes you'll hear Gulf Fleet vessels mention that they're switching to Exxon or Conoco channels. You'll also hear vessels from several companies that deal with Gulf Fleet Marine operating on their 31.84 MHz frequencies.

### Can We Talk?

Fascinating comms come from the Gulf Fleet vessels, like the report from not long ago that was midway between Trinidad and

**Table 3**

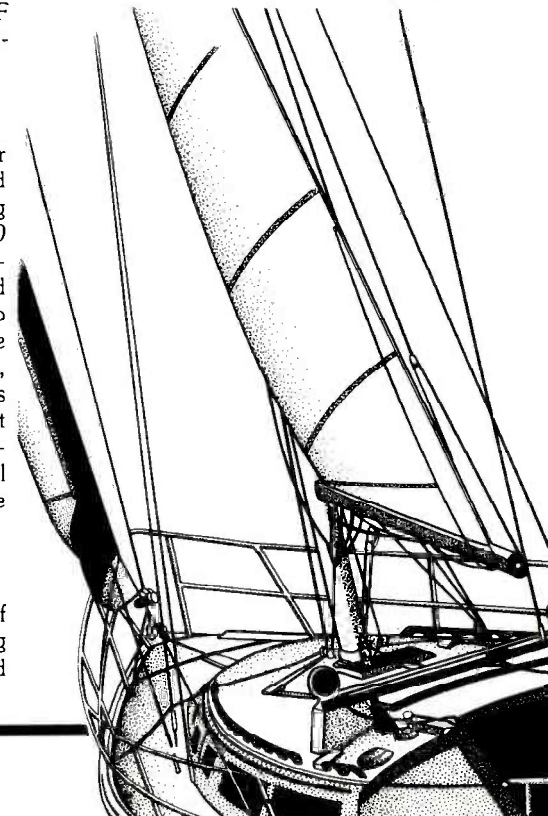
30.66, 33.28 Kerr McGee Corp.
30.70, 48.64 Shell Oil
30.74, 30.78, 30.82 Gulf Oil
30.78, 31.16, 33.18 Chevron
33.20, 33.38 CONOCO
33.24 Signal Petroleum
33.26 TENNECO
33.28, 49.16 Cities Service
33.34, 35.48 Union Oil
33.36 EXXON
33.38 Pujon dock
46.68 Coastal States Gas
48.82 Texas Eastern
48.92 Texas Gas
48.98 Getty Oil
49.04 PENNZOIL
49.08 Texoma
49.18 Mobile Oil
49.30 Marathon Oil
49.34 Sun Corp.
49.50 AMINOIL

*Table 3 - Low-Band petroleum operations in the Gulf of Mexico.*

Louisiana when the captain reported that one of the crew members was "freaking out."

Sometimes things get tense when the vessels get close to certain coastlines, like Peru, Nicaragua, or Angola. Like the time the skipper of one of the ships radioed, "I'm going to Nicaragua in the morning. Got my machine gun with me." Maybe he was only kidding, but it still sent a shiver up my spine!

Aye, matey! Program 31.48 MHz into your scanner and brace yourself to the mizzenmast for swashbuckling high seas adventure. **PC**







# Oil Rig DX

## *Tuning In On The Hunt For Engery In The Gulf Of Mexico*

BY J.C. TUGWELL, KTX5SM

**Y**ou may have heard that things have slacked off in the industries hunting and drilling for offshore oil and gas. You wouldn't think so if you witnessed the recent installation of Texaco's Green Canyon Block 6 deepwater oil and natural gas production platform that went into operation

last October. Far taller than the largest skyscraper in New Orleans, this massive rig can yield daily production rates of 60 million cubic feet of natural gas and 2,500 barrels of oil. The platform cost Texaco and Union Exploration Partners, Ltd. about \$32.5-million and represents part of an eventual

investment of roughly \$70-million the companies will spend to develop the lease on the drilling point.

Obviously, reports announcing the demise of the petroleum and natural gas industry have been in error. This is good news for lots of folks, not the least of which are



**Table I**

All Frequencies Listed in MHz

30.66	35.48	49.04
30.70	48.56	49.06
30.74	48.58	49.08
30.78	48.60	49.10
30.82	48.62	49.12
31.32	48.64	49.14
31.40	48.66	49.16
31.44	48.68	49.18
31.48	48.70	49.20
31.52	48.72	49.22
31.60	48.74	49.24
31.64	48.76	49.26
31.72	48.78	49.28
31.76	48.80	49.30
33.18	48.82	49.32
33.20	48.84	49.34
33.22	48.86	49.36
33.24	48.88	49.38
33.26	48.90	49.40
33.28	48.92	49.42
33.30	48.94	49.44
33.32	48.96	49.46
33.34	48.98	49.48
33.36	49.00	49.50
33.38	49.02	

Table I. Best bet skip frequencies in the Petroleum Radio Services.

monitoring enthusiasts since the hunt for energy in the Gulf of Mexico is a source of signals that can be tuned on HF and scanner bands. When skip conditions are working in the 30 to 50 MHz bands, scanner owners in far distant places can listen to the drilling and support operations.

### Where to Tune

Almost every drilling rig has a helicopter landing pad. Also, the coasts of Louisiana and Texas are dotted with private helicopter landing bases operated by the oil/gas companies and also by private helo support service companies.

HF frequencies use SSB mode for air/ground communications and are 2878, 3019, 3434, 4672, 5463, and 5508 kHz. If you happen to be located within 50 to 100 miles of these coasts, it will pay you to set your scanner to 122.7, 122.725, 122.75, 122.85, 122.9, 123.025, 123.05, and 123.075 MHz for this activity in the VHF aero band.

General operations between the shore facilities of the exploration companies and the offshore rigs can be tuned, too. On your communications receiver, switch to SSB mode and listen on 2292, 2398, and 4637.5 kHz. Your best bet will probably be putting some of the 30 to 50 MHz band Petroleum Radio Service frequencies into your scanner, as these tend to skip great dis-

tances. Some of the best bet frequencies are shown in Table I. Be aware that many frequencies used by the oil/gas companies are shared with logging companies. Also, note that the FCC's rules permit many Petroleum Radio Service frequencies to be used by local fuel oil and gasoline delivery truck dispatchers and tankers.

As you might expect, there is a constant flow of supply and miscellaneous work boats operating between shore points and the drilling rigs. While many of these operate on frequencies found in Table I, virtually

all can also operate in the VHF-FM maritime band. If you're located near the coastlines of Louisiana or Texas, monitor: 156.05, 156.175, 156.35, 156.45, 156.50, 156.55, 156.90, 156.95, 156.975 and 157.025 MHz.

Then, next time the bill comes for your gasoline credit card, you'll have a much better idea of all the trouble that people are going to in order to extract energy from its hiding places beneath the ground. Not that it will make paying any more fun, but at least you'll understand!

PC

## Feeling Left Out?

Have your favorite communications (Police, Fire, etc) moved to the 800MHz band? Are the scanners available which access this band too expensive? If you are like many scanning enthusiasts, this can be a real dilemma. For those of you who are still in a futile search for 800 MHz coverage on your hand held scanning radio, GRE America, Inc. has a product for you. Introducing the newly developed **Super Converter™ II** which has all of the features that you have come to enjoy in our **Super Converter™ 8001** (810 - 912 MHz coverage, etc.), and more.

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# Disaster Scanning

## *Earthquakes! Hurricanes! Wars! The Safest Way to Witness Them is via Low Band Skip!*

BY CHUCK ROBERTSON

If only one thing could be said about the monitoring hobby, it would be that when disaster strikes, you can still be one of the first on the scene without having to leave the safety of your own home—even from a thousand miles away. And, while HF bands produce their own share of exciting comms, my personal preference is for the action in the 30 to 50 MHz “VHF Low Band” which can produce loads of excitement.

Favorable propagation conditions can turn your scanner into a news-gathering center, bringing in distant base and mobile comms from hundreds or thousands of miles away. Program in the right 30 to 50 MHz frequencies and you'll have the inside scoop on all of the behind-the-scene drama and action.

### **Shake, Rattle, and Roll**

When the earthquake struck the Bay Area of California, there were no quick estimates as to the extent of the damage. Initial estimates from the broadcast media were only guesses, and the morning light revealed how wrong they were. It was the worst earthquake to strike the area since 1906.

The morning after the quake, I turned on my scanner and looked around—not quite sure of what I would hear. I didn't know if there would be two-way activity left in operation. Only a few Business Radio Service mobile units were up and active at the early hour I was monitoring. A businessman on 35.06 MHz was saying, “It's bad over here. Cracks in the street, and up the walls of the house. It's worse than the newspeople said. I shut down my electrical appliances. My gas meter was running on and on.”

Meanwhile, on 35.96 MHz, someone was heard to say, “It's a mess up here. Don't try to follow me.”

Helicopters assessing the damage seemed to be everywhere. On 34.50 MHz the military comms were non-stop. “Army 801 to Hamilton Advisory—We have cracks in the Crystal Springs Dam, I can see a wet spot. Ask the Army Engineers for an inspection. The dam north of Crystal Springs is OK.”

Other helos on 40.10 MHz checked out the highways and reported traffic jams while the base station passed on to them messages that they were picking up from the UHF aero band. Emergency supply deliveries were also being coordinated here, “Idaho 76, take your load to Watsonville.”

Monitoring 32.10 MHz produced California National Guard personnel involved with the removal of fallen concrete slabs from the devastated Nimitz Freeway in Oakland, “EOC says that when you get through moving those three poles, return the jackhammer and shut down operations.”

Stranded and injured motorists rescued from the Nimitz Freeway were put up at the Marine Support Station on Treasure Island; you could hear the comms relating to this taking place on 36.60 MHz. Other bases on this frequency were at Alameda and Oakland, “We're waiting for the FEMA driver.”

Santa Clara County was especially active on the air, and estimates of injuries were being tallied on 37.08 MHz: “Apparently we have fifty injured at Hillcrest.” The dispatcher requested each reporting base to give their ID “for the record.”

See Table I for more quake comm frequencies. Of course, the scary thing is that as severe as the recent quake was in the Bay Area, it's probably neither the last of the area's quakes, nor the worst Bay Area residents can expect to face. My own local area, in Illinois, sits atop the New Madrid fault. In 1811, it produced the worst quake ever reported in North America. Who knows what might happen to the heartland of the nation if this baby slips again. That made more than casually interested in following the California quake.

### **Blowin' in The Wind**

Hurricane Hugo, for whatever reason, was one of the most powerful hurricanes of the Twentieth Century. When it came roaring into the U.S. Virgin Islands, it damaged or totally destroyed virtually all structures and utilities on St. Croix.

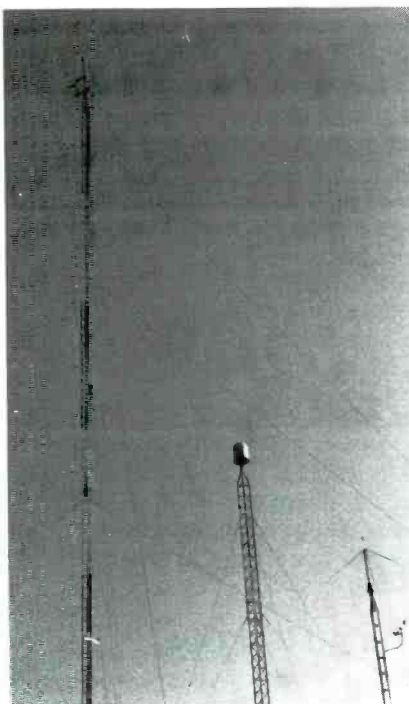
In the immediate aftermath of Hugo, it seemed as if the entire governmental struc-



ture of St. Croix had been given a knockout punch. Law enforcement operations were disrupted, with reports of widespread looting by police and national guard personnel, as well as by the general population.

Washington had to dispatch more than one thousand MP's to help restore order to the island. Two MP battalions (of three companies each) and a headquarters unit, plus one hundred US Marshals and FBI agents





A trio of Civil Defense agency towers that include low band antennas.



Many Civil Defense agencies rely heavily on low band comms.

were airlifted to the island.

Near-anarchy awaited them. The first group to arrive moved quickly to establish a mobile control tower at the wrecked airport. It wasn't long before all sorts of comm frequencies were put in action to serve many purposes. Suddenly, my scanner lit up with roving security patrols, stakeouts, food and water distribution, delivery of generators and heavy equipment, plus much other

emergency traffic. I had a front row seat for the law enforcement and clean-up operations on St. Croix.

Security patrols and other missions were coordinated on the battalion channel 37.05 MHz: "The refrigeration company has received a shipment of ice. We need security for an unruly crowd here at the warehouse. Have soldiers stand by with helmets and riot shields."

"Foxtrot 98, we have a report of a large crowd at Sunny Isle Shopping Center at the taco stand."

"Subject arrested. He had the key to the stolen vehicle in his possession."

"Send joint patrol to the office of the Governor at Christianstad, meet FBI agents there."

Two of the "best MP's" were sent to "brief ABC correspondents for Nightline." Three







days saw F2 layer DX openings well above 50 MHz. New and exciting comms were logged weekly, including exotic foreign traffic as well as disaster comms within the U.S.

This month (April) will see more great band openings, especially to the Caribbean. Openings to Europe, Asia, and Africa should also occur. It's not too late to hear great DX in the 30 to 50 MHz scanner band, but don't wait much longer. As Spring digs in, those wonderful F2 openings will fade away and be replaced for a while by short-hop Sporadic-E skip. Now is the time to search 30 to 50 MHz, or even as high as 88 MHz, for the drama of the world to unfold before you, arriving via your scanner as-it-takes-place.

The information in this report, plus the additional listings tables provided, should help you log all those distant stations.

#### 1989-90 Low Band DX Loggings

SS= Spanish; PP= Portuguese; EE= English; BI= Business; MUX= Voice Multiplexing; BWI British West Indies English.

- 29.70: EE, a ham who works for US Dept. of State in Caracas, Venezuela working USA hams.
- 29.815: Mid-East lang.; a beep after each xmsn.
- 29.8175: Duplex phone circuit in SS.
- 29.875: PP BI (Brazil).
- 29.895, 29.905: SS duplex phones.
- 29.90: Me. can BI in SS.
- 29.945: SS outbnder, Santa Rita.
- 30.00, 31.24, 36.30, 37.475: USSR mil clear voice number counts: Adin, Dva, Tri, Chitiri...
- 30.055, 30.135, 30.145, 30.335, 30.515, 30.835, 49.80: Duplex phone circuits, BWI.
- 30.125: British duplex phone; either UK or West Indies.
- 30.30: US mil range control is southwest: Renegade; "Tornado 5 miles east."
- 30.335, 45.45: Cuban duplex phones, Havana.
- 30.45: MUX net, US mil. Constant tone.
- 30.5075, 36.50: French duplex phones.
- 30.875: Repeater-out. A foreign station regularly repeats US BI skip.
- 31.15, 32.725, 33.3625, 33.3925, 33.45, 33.525, 33.775, 34.325, 36.50, 38.05, 40.18: USSR mil, clear voice & time domain scrambling.
- 31.30, 32.05, 38.05: Afrikaans, RSA.
- 31.375: Non-voice pager, maybe Europe.
- 31.50, 49.11: EE duplex phone, maybe US pirate.
- 31.70: US/SS mil exercises: Tango 15; Bod Guy says, "We have two casualties."
- 31.83: SS pager. 2-tone voice msg.
- 32.075: US mil ops in UK, NBFM.
- 32.10: Dutch from Netherlands Antilles. Also Cal. National Guard looking for missing personnel at Big Bear.
- 32.25: US mil exercises in Central America, "Troops are going down for escarpment."
- 32.315: PP BI, maybe northern Brazil.
- 32.425, 33.125: Hebrew Comms.
- 32.45: Jamaica: "Meet the Governor this afternoon. It's a question and answer thing."
- 32.80: SS pager, Argentina.
- 33.225, 33.375: Arabic.
- 33.25: Middle East.
- 33.25, 33.35, 33.375: MUS mil MUX. Constant tone.
- 33.54: PP Brazil, police or ambulance.
- 33.60: Repeater out (37.125 in). Cuban BI station repeats US police skip from 37.12. Also see 37.125. French repeater out, CCIR tone access.
- 33.65: US mil exercises in Central America: Packman, Team 11.
- 33.775: Dutch mil, Netherlands Antilles.
- 33.8075: Continuous data flow, Europe or Middle East.
- 34.25, 34.30, 34.35, 34.40, 34.50, 34.55, 34.60, 34.70, 34.75: Turkish repeaters.
- 34.29: Oriental.
- 34.35: Afrikaans, RSA, mil or police.
- 34.40, 36.075, 36.225, 36.425, 36.575, 36.825, 36.925, 37.00, 37.225, 37.275, 37.725, 38.125, 38.275: USSR ops, ministries & projects.
- 34.40: US mil war games, Europe, maybe W. Germany. "Tank battalion has engaged Spetznaz."
- 34.70: S. Korean mil.; also SS mil, "Uno, Venezuela."
- 35.0875, 35.1875, 35.2625, 35.2875, 35.60, 35.9125, 44.55, 41.00: France, repeaters with CCIR tone bursts, probably police use.

- 35.60, 35.63, 35.72, 35.75, 35.78, 35.81, 35.84, 35.87, 35.89: Colombian duplex phones. Those on 35.75 & 35.81 often aboard boats.
- 35.78: MUX half-duplex phone, comes in with skip from Europe.
- 35.85: Repeater out, France, maybe police.
- 36.00: German mil, some EE, position report.
- 36.025, 36.10: Oriental.
- 36.025: Repeater out, France, police.
- 36.05: Repeater out, US Dept. Energy at Nevada Test Site, "ATZ on ground zero."
- 36.125, 36.975, 37.775: USSR repeaters with tone burst access.
- 36.485: BWI, power utility maintenance with comms + pager, "Skyway to 20."
- 36.525, 36.625, 36.875, 37.175: USSR ops, alerting tones used.
- 36.60: Repeater out. Foreign sta repeats US skip from 33.60 such as Canton Twp. FD in OH, also Winchester, CT. See 37.125 MHz info. Also RSA in Afrikaans & EE, "Plaza National."
- 36.65: SS & EE mil, Control Alpha. Also voice & tone paging, maybe Hawaii.
- 36.70: US mil, ID as Apache.
- 36.775: USSR ops, ID as Platform. Tone bursts used. Possibly a repeater.
- 36.85: US mil in Puerto Rico, Ramey AFB: Angel 8, "Drop bombs at 1000 feet."
- 36.985: BWI, like 36.485 MHz.
- 36.95: USAF exercises, maybe Europe, "Aircraft in Siberia on Screen." ID as Eagle 2.
- 37.00: RSA police, Afrikaans & EE.
- 37.05: RSA police, Soweto, EE, Afrikaans & a Bantu language.
- 37.125: Repeater out (33.60 in). This SS BI repeater often plays out US FD skip.
- 37.20: Repeater out, rebroadcasts distorted SS skip.
- 37.55, 37.72: Repeater out, PI, Brazil.
- 37.85: US tracking ops keeping tabs on suspect dragging around a tailing transmitter: "Update Track 73. Now at Kennel heading southwest; Now at Licorice heading south. Update Track 73. Now at Jello 79 heading southwest." In fed agent slang, the term Kennel means a police station.
- 38.075: Oriental mil.
- 38.15: Repeater out, even keys up on noise.
- 38.26: Repeater out, PP Brazil.
- 38.425: SS duplex phone, repeats US PD's.
- 39.65: Venezuelan duplex phone. Other Venezuelan phones found 39.50 to 40.00 MHz in 25 kHz steps. Other S. American phones between 34.50 and 35 MHz, also 45 and 46.50 MHz in 25 kHz increments.
- 39.75: US MP's in Seoul, S. Korea. ID as Protector Foxtrout.
- 40.16, 40.18, 40.22: Repeater out, PP but rebroadcasts US & Canadian skip.
- 40.50: Non-voice pager, maybe Europe.
- 40.53: Telemetry, switching tones.
- 40.55: Repeater out, France, CCIR tone bursts.
- 41.00: Palmerola AFB, Honduras with US & hispanic mil ops, ID as Palmerole Range. Also heard here was a Turkish phone circuit, plus a repeater out with US BI skip.
- 41.09: Non-voice paging.
- 41.455: SS messages to people in San Jose, Costa Rica. The 41 MHz band has many of these.

- 41.975: Repeater out, SS BI but repeats US PD's.
- 42.15: French: "Contrôle de Paris."
- 42.80: Repeater out, SS BI.
- 43.28: Repeater out plays US BI skip.
- 43.9175, 44.835, 44.985: SS duplex phones.
- 46.10: SS BI repeater out has US skip.
- 46.11, 46.20, 47.13: Hebrew (some EE) duplex phones.
- 46.25: New Zealand video.
- 46.375, 46.55, 46.55, 46.85: French repeaters with unusual fast, fluttering tone-burst access.
- 46.38: Brazilian duplex phone.
- 46.50, 46.56, 46.725, 46.80, 46.83, 46.90, 46.975, 47.70: Duplex phones. When calls are finished, open carriers remain with occasional tone bursts. Very odd format. Un-ID language with some German & EE phrases tossed in.
- 46.54: Repeater out with US skip.
- 48.25, 48.75: European TV video.
- 48.975: Repeater out, SS BI has distorted comms of US school buses & other BI's.
- 50.00: US mil range control.
- 50.10: Police, Mexico City.
- 50.74-50.76: New Zealand TV audio.
- 67.40: US mil: Patrol 1, Cowboy, Rat Rig.

#### California Quake Comms Log

- 29.55: Hams in Bay Area.
- 29.80: Bay area outbanders.
- 30.96: School buses.
- 31.14: San Francisco metro buses.
- 31.16: Business, "Water line broken and it's flooding."
- 31.35: US mil clean-up crews.
- 32.50: Convoy enroute from Edwards AFB, "Get the 40-ton roller kit up to San Francisco tomorrow." Trail 1, Trail 3.
- 33.06: Santa Clara ambulances.
- 33.08: Search & rescue, "Send Medic 12 to Alameda."
- 34.00: US mil, but mostly chit chat.
- 34.50: Hamilton Advisory, Crisis Advisory, 6th Army EOC, Rescue 621. Jolly 87, Idaho 338-- all helos in Bay Area. Mentioned UHF 228.65 & 232.2 MHz.
- 34.60: Bay Area helos, Idaho 336.
- 34.70: Mil: "Planes out of Oakland haven't taken off yet."
- 35.00: Mil patrols, "Sign out manpacks tonight."
- 35.75: Mil personnel discussing network TV coverage of quake.
- 35.98: Business, "Power down...can't even get across bridge. You'll have to work this side of the bay."
- 36.60: Alameda Fleet Landing, CI Fleet Landing, Treasure Island, Oakland, (vessel) Kansas City, NBGI, Orffish 895, Cord 40.
- 37.90: Electric power utility ops.
- 40.10: Mil helos, base ID was AAA.
- 41.05, 42.00: Radio checks.
- 42.08: Base ops for 42.28 mobiles-- CHP comms in Bay Area. Also simplex ops 42.08 MHz.
- 42.42: CHP bases (mobiles 42.84) around Oakland.
- 42.50: CHP in San Jose area to mobiles on 42.82.
- 45.52: Clean-up ops, Alameda.

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