

Tropical Bands in review

Lecture by Anker Petersen given on the 16th of June 2007
at the DX-Parliament in Laholm, Sweden .

Introduction

Before I talk about the development in broadcasting on the Tropical Bands, I wish to say a few words about what the Tropical Bands are and about my own interest for DX-ing on these bands. I will try not to be too nostalgic, but rather look closely on the past and future development of this broadcasting.

Let me first remind you that the Tropical Bands include the 60, 90 and 120 metrebands on shortwave:

120 meterband: 2300-2500 kHz
90 meterband: 3200-3400 kHz
60 meterband: 4750-5060 kHz

The International Telecommunication Union (ITU) has allocated these bands for domestic broadcasts, in principle to countries located in the Tropical Zone between the Tropic of Cancer on 23 degrees north and the Tropic of Capricorn on 23 degrees south. This was to give them a safe heaven where they are supposed not to be disturbed by strong international broadcasters.

In many developing countries, radio is still the primary medium and much more widespread than TV. One example today is Afghanistan. In Nigeria, as another example, with a population of 140 million, there are about 24 million radio sets, but only about 7 million TV sets. Printed newspapers play only a minor role in countries where more than 50% of the population are illiterates.

In a few countries, however, the term Tropical Zone has been subject to a wide interpretation.

The former Soviet Union, for instance, which southernmost point was on 35 degrees north in Turkmenistan, declared in 1959 that "it reserved the right to use the broadcasting assignment existing in the bands between 3.950 kHz and 27.500 kHz in the USSR in accordance with the needs of this country" !

Many of you will remember some of its many, strong stations on the 60 mb like Kiev on 4940 and Petrozavodsk near St. Petersburg on 4780 and 5065 kHz. Even Yakutsk in Siberia on 62 degrees north was broadcasting on several frequencies. They could be heard here in Europe each winter when Yakutsk had temperatures down to minus 50 degrees Celsius, - but obviously it was their "Tropical Winter". Nowadays, both Russia and Ukraine are following the regulations of the ITU.

For real DX-ers, these Tropical Bands were – and still are – very interesting, because so many stations in exotic countries can be heard. About 80% of the active stations can be heard here in Europe under the right propagation conditions.

I began to listen to the Tropical Stations back in 1959 when I bought a small shortwave receiver with the 60 metreband for 85 Danish Kroner. Here you see the first stations I identified on 60 meters in March – July 1959:

4710 kHz	Radio Kabul, Kabul, Afghanistan
4760 -	Radio Congo Belge, Leopoldville, Belgian Congo
4800 -	Ondas del Lago, Maracaibo, Venezuela
4840 -	Rádio Clube de Moçambique, Lourenço Marques, Moçambique
4851 -	Rádio Clube do Huambo, Huambo, Angola
4865 -	Emissor Regional dos Açores, Ponta Delgada, Azores
4885 -	Cable & Wireless, Nairobi, Kenya
4890 -	Rádiodifusora Venezuela, Caracas, Venezuela
4940 -	Radio Abidjan, Abidjan, Ivory Coast

Quite nostalgic, isn't it ? None of these stations exist any longer on shortwave today. But there are still a lot of other stations which can be heard on the Tropical Bands.

That raises these questions:

How many have disappeared ?

Where have they gone ?

and when will the last stations disappear ?

That is what I will try to analyze during the rest of my talk.

Since 1959, listening to the domestic broadcasting stations on the Tropical Bands has been the favourite part of my DX-hobby! Furthermore, during the past 25 years I have visited a lot of tropical countries in Central and South America, the Caribbean, Africa, Asia and the Pacific.

Tropical Bands Survey and Domestic Bands Survey.

Fortunately for this analysis, the Danish Shortwave Club International can provide documentation on this broadcasting from the past 35 years. Back in 1972 another Danish DX-er, Mr. Carol Feil and I decided that the Club with its members in more than 40 countries should publish an annual list called the Tropical Bands Survey – the TBS. It was a frequencylist covering all active broadcasting stations between 2.200 and 5.800 kHz and their schedules. It has been published every year since 1973, edited by various members of the Club living in Denmark, Germany, the Netherlands and Argentina. Some data from these annual surveys will be used for my analysis.

In 1999, our publication was expanded to cover all active domestic broadcasting stations on shortwave from 2 to 30 MHz . Then it changed name to the Domestic Broadcasting Survey – the DBS which I now am editing. The Tropical Bands are still covered as Part One of the DBS.

Let me show you a small extract from these surveys published in June 1973 and May 2007 covering the narrow frequency spectrum 4.775 – 4.780 kHz, just for comparison.

Tropical Bands Survey 1973:

	<u>kHz</u>	<u>kW</u>	<u>Station & Country</u>	<u>Transmission times in GMT</u>
A	4775	100	Kabul, Afghanistan	HS: 1430-1730, FS: 1300-1400 Urdu, 1400-1430 E
C	4775	10	AIR Gauhati, India	1030-1215 (Gauhati B)
B	4775	1	R Los Andes, Bolivia	1000-0400
B	4775	5	R Dragao do Mar, Brazil	0900-0100
B	4775	1	Voz de Maria, Colombia	1100-0400
A	4777	100	Libreville, Gabon	0430-0630 1630-2300, prolonged Sa/Su
B	4778		R Nac. Progreso, Ecuador	r - <u>0436</u> , r 0545-0555 (ex 4740)
A	4780	50	Petrozavodsk, USSR	0200-2200 M1, local 1500-1530 // 5065 Ru, Finnish
A	4780	4	Djibouti, Afar & Issas	W 0300-0600 0900-2200, Su 0500-2100v
B	4780	5	Em. Reg de Menongue, AGL	1700-1900, r 2134
B	4780	1	R Atahualpa, Ecuador	1045-0435, r /1100-0520v
A	4780	1	La Voz de Carabobo, VEN	1000-0400

Domestic Broadcasting Survey 2007:

	<u>kHz</u>	<u>kW</u>	<u>ITU</u>	<u>Station</u>	<u>Schedule (UTC), remarks</u>	<u>Last log</u>
A	4775	1	B	R Congonhas, MG	[☞ Oct-Feb] 0830-0100v P. Evangelical px	APR07
A	4775	50	IND	AIR Imphal	Northeastern Sce: 0030-0215 1030-1700 E/ Hindi/Sanskrit/Manipuri/Thadak/Tankhal/ Kabri/Mao, E nx 0035 1225(local) 1530, ID: "Akashvani Imphal", (= 7150)	MAR07
A	4775	0,5	PRU	R Tarma, Junín	W 1000-1400 2000-0400, Su 1100-1400 2000-0400 S	APR07
A	4775	50	SWZ	TWR,Mpangela Ranch	International broadcasts: 0340-0800 (Apr-Oct -0900) Lomwe/E/G	APR07
A	4777	100	GAB	Rdif TV Gabonaise, Melen, Libreville	0500-0800 1600-1700 F, ID: "Radio Gabon"; some days -1900*, ck 7270	APR07
A	4780	50	DJI	Rdif. TV de Djibouti, Doraleh	0300-0700(Fr -2002) 0900-2002v Somali/ Afar and occ. A. Somali ID: "Hal Kani wa Radio Djibouti", A ID: "Huna Djibouti". Nx: Somali 0330 1200 1700, Afar 0430 1000 1830, A 0600 1400. During Ramadan -2300*	APR07
A	4780	1	GTM	R Cultural Coatán, San Sebastián Coatán	1030v-1500 2200-0230v S/Chuj, IDs: "Radio Coatán", Esta es Radio Cultural Coatán, a través de 4780 kHz, onda corta, transmitiendo desde San Sebastián de Coatán, Departamente de Huehuetenango,Guatemala,Centroamérica"	APR07

The key words in the policy for our publications are "active stations". This means that they should be up-to-date and only contain stations which have been reported heard by DX-ers during the past 12 months. All other stations are moved to an attachment of deleted stations. A few ones of these may be reactivated later on.

Above you see an activity Code to the left where A means Regular, B Irregular and C Sporadic, as deemed by the Editor. Furthermore the DBS has been expanded with a column to the right called "Last log" indicating the last month during which the station has been heard. This is a useful feature for the DX-er who tries to identify a station.

Of course the information in the DBS has to be as correct as possible. Therefore it is necessary to recheck official schedules and reports from DX-ers, because from time to time they contain typing errors, or are outdated. The task for the editor is therefore, throughout the year until the next publication, to check the bands himself and follow the loggings from our members around the world. For each station in the list, a note is taken of the months when it has been heard. Furthermore loggings are read in as many printed and internet DX-publications as possible.

Nowadays the informal network of DX-ers around the world is very extensive via the internet, so a new station can hardly appear on the Tropical Bands without being discovered and reported by DX-ers somewhere within a week or so.

Another rather new feature can be found on the website of the DSWCI. That is our Tropical Bands Monitor which I update every month with loggings from DX-ers all over the world. The blue symbol ◆ means that the station has been reported heard in 2007 by a DX-er somewhere in the world during the month marked. Unmarked months mean that no DX-er has reported this station as heard, but not necessarily, that it was off the air.

kHz	ITU	Station	J	F	M	A	M	J	J	A	S	O	N	D
2310	AUS	VL8A, Alice Springs	◆	◆	◆	◆	◆	◆						
2325	AUS	VL8T, Tennant Creek	◆	◆	◆	◆	◆	◆						
2380	B	R Educadora, Limeira,São Paulo	◆	◆	◆	◆								
2460	B	Super R Alvorada, Rio Branco												
2485	AUS	VL8K, Katherine	◆	◆	◆	◆	◆	◆						
2850	KRE	Korean Central Broadcasting Station, Pyongyang	◆	◆	◆	◆	◆	◆						
2960	INS	RPDT2 Manggarai, Ruteng, Flores, LE												
3172,6	PRU	R Municipal, Panoa, Pachitea, Huánuco	◆	◆	◆	◆								◆
3185	USA	WWRB, Manchester, TN	◆	◆	◆	◆	◆	◆	◆					
3200	SWZ	TWR, Mpangela Ranch	◆	◆	◆	◆	◆							

Trends in Tropical Broadcasting

With this systematic registration of broadcasting stations on the Tropical Bands each year, it is possible to make some statistics on how many frequencies were active in each part of the world and compare these numbers. On the next page I have selected data from the Tropical Bands Surveys, published with 12 years intervals in 1973, 1985 and 1997, and the Domestic Broadcasting Surveys from 2003 and 2007:

For each of the 3 first mentioned years and for each year since 2000, I have then counted the number of active Domestic Broadcasting stations between 2.200 and 5.800 kHz. This also includes the frequencyspectrum between the official bands, because some stations are broadcasting there as well. International broadcasters, Clandestine and Pirate stations are not included in these statistics.

During this period of 34 years, most of the countries have had the same, downgoing trend in their use of the Tropical Bands for broadcasting. At the bottom you see that the total number has steadily fallen from 1106 in 1973 to 307 in 2007 - or with 73%.

You will also notice at the bottom that the average reduction per year has been varying during this period. I will come back to this later on.

These numbers answer my first question: How many have disappeared? Answer: 800!

Active domestic broadcast frequencies on 2200 – 5800 kHz

Region	1973	1985	1997	2003	2007
Central Africa	102	76	40	26	22
Southern Africa	57	39	33	9	9
Middle East	9	4	1	0	0
Indian Subcontinent	62	45	45	36	36
South East Asia	40	29	21	7	6
Indonesia	171	105	65	19	15
China, Taiwan, Mongolia	119	110	75	44	39
CIS (former USSR)	61	59	47	21	9
Far East	38	28	28	17	12
Papua New Guinea	17	20	20	20	16
Australia and other Pacific	10	4	13	7	12
Central America, Mexico	21	23	24	17	10
Caribbean	29	3	3	4	3
Northwestern South America	98	41	19	5	3
Ecuador	47	33	22	13	8
Peru	78	69	78	53	39
Bolivia	35	42	25	15	22
Brazil	107	87	67	50	45
Southern South America	5	2	1	0	1
Total	1106	819	627	363	307
Average reduction per year	24	16	44	14	

I will now comment on some of the countries and try to answer the next question: Where have they gone ?

In March 2003, I visited the smallest independent nation in Africa, São Tomé e Príncipe, which is also one of the most poor countries. I saw the remains of the former tropical band transmitter of Rádio Nacional de São Tomé e Príncipe broadcasting on 4807,5 kHz with 10 kW. Some of you may even have heard it around year 1980. The transmitter was provided and maintained by Portugal when the islands still were a colony. But at the independence in 1975 the Portuguese left the islands, and because no other nation did support, as it was expected by the local government, the transmitter and antenna were never maintained properly. According to our Tropical Bands Surveys, the station was regularly heard until mid 1982, but only sporadically during the succeeding three years. During a storm in 1985 the antenna broke down and the shortwave transmitter has been off the air since then. The broken antenna could still be seen when I was there.

The USA has leased the site and now operates the VOA Pinheira relay station from there, and also the mediumwave transmitter of Rádio Nacional on 945 kHz. Both stations are maintained by local technicians under continuous U.S. supervision and therefore still performing very well. I think this is typical for many of the developing countries. Because of lack of money or knowledge – or both – they are only able to run shortwave transmitters established by the former colonial powers, until the equipment fall apart, unless they get support from abroad.

A DX-er in Ghana, Charles Wompiah, reported to me five years ago that the transmitter of the Ghana Broadcasting Corporation – Radio One, broadcasting mostly in African languages on 4915 kHz, had been off the air for two months due to a breakdown of the old valves. It came back only because valves were cannibalized from the Radio Two transmitter which did broadcast daytime on 6130 kHz and at night on 3366 kHz all in English. Radio Two has not been heard on shortwaves since April 2003. Radio One on 4915 kHz continued to be weak and unstable, but has not been reported heard since November 2006. This is a typical example of an old shortwave transmitter installed right after the independence by a foreign contractor who no longer exists, and where all the spareparts in the meantime have been used up.

Our Scottish member in the DSWCI, George Brown, experienced something similar when he visited Radio Vanuatu in the Pacific in November 2001. They used a two channel 10 kW transmitter tuned to 4960 and 7260 kHz, normally switching frequency around local sunrise and sunset. During the visit one channel on the transmitter at Emten Lagoon developed a fault, and the other one had to be used all the time. The other standby transmitter on 3945 kHz was out of service because of shortage of spare parts to make it operational. DBS monitoring indicates that 3945 and 4960 kHz have been off the air since then, while 7260 kHz has been regularly heard.

Some years ago I went to Fiji to check local broadcasting in the central Pacific. They had ceased using shortwaves, but in the 1970'ies they used 90 meters. At a hotel on the Coral Coast I rented a bungalow where a longwire could be stretched up in the palm trees outside. However, a hundred years ago the population there was cannibals, so it could be an interesting experience, if they would be offended by my antenna.

When the gardener saw it, I said the local greeting "Bula, Bula" to him and smiled. He smiled back and said "Bula, Bula". I was extremely happy for that, because "Bula Bula" also means: "I will not EAT you today!"

From this location I was able on the tropical bands to hear Papua New Guinea, Australia, Vanuatu and China well during the dark hours. Some international stations on other shortwave bands and a few mediumwave stations in the Pacific could also be heard with fair reception. But daytime listening was a disaster: Nothing on FM, on MW only two channels from Radio Fiji, with transmitters located 10 km away, and on SW only stations on a total of seven frequencies between 2 and 22 MHz! Fiji is simply too faraway from everything!

In Ecuadorial Guinea, Chinese engineers in 2003 have provided and installed a new transmitter for Rádio Nacional, Bata. China also accepted to give an intensive maintenance course in Beijing on the new equipment to a number of Ecuadorial Guinea technicians. The local government had bought an electric generator to keep the radio regularly supplied with energy, because the commercial power is unstable, as in most other developing countries. Nowadays, the new transmitter can be heard strongly here in Scandinavia every evening on 5005 kHz, because it is well maintained.

Another example is the technical and financial support Zimbabwe gets these days from China to keep their shortwave transmitters operational for broadcasts as well as for jamming!

In Southern Africa it is the similar, sad stories: Lesotho National Broadcasting Service of 4800 kHz has been off the air since 2002, because they are awaiting transmitter spare parts. The two transmitters of the Namibia Broadcasting Corporation on 3270 and 3290 kHz used to be heard well here in Europe until year 2002. Then the modulation deteriorated and the signals disappeared. Their National Assembly was unable to grant the cash injection of 66 million Namibian Dollars which was needed to get the broadcasting back on the air.

Let me jump to Indonesia which always has been a popular target for DX-ers. Back in 1973 it was the country in the world with most stations broadcasting on the Tropical Bands – no less than 171. Many of these were private, low powered and irregular. But most of these and of the Government owned Radio Republik Indonesia stations have disappeared from the Tropical Bands, maybe because of transmitter problems, but rather because they have been replaced by Mediumwave or FM. In this vast country, today there are at least 600 mediumwave transmitters and 625 FM transmitters, but only 15 active Tropical Bands transmitters !

When I visited Guatemala in Central America in 2002, I noticed the same. Just seven stations did still broadcast on shortwave. Today only 3 shortwavestations are on the air! But most of the country is covered by FM-stations. In the old colonial city of Antigua, 25 kilometres west of Guatemala City, I counted no less than 90 (nine zero) stations on the FM-band ! So in that country the need for stations on the Tropical Bands is diminishing and quickly approaching zero. Mr. Wayne Berger at Radio Cultural has disclosed that the transmitters on 3300 and 5955 kHz were only kept on the air until January 2005 to please DX-ers!

In 1996, I visited the station Emisora Gran Colombia in Quito, Ecuador, together with DX-Editor Richard McVikar from HCJB. I asked what had happened to the shortwave transmitter on 4911 kHz which used to be heard in Europe. The station manager told us that the coverage by their mediumwave transmitter on 610 kHz was sufficient to reach their audience in and around Quito, so there was no longer a need for the broadcasts on 60 meters – and by the way, the elderly engineer who was the only one who was able to operate this transmitter, had died! In 1973 no less than 47 stations in Ecuador were active on the Tropical Bands. Today it is only 8.

HCJB is regularly heard on 3220 kHz from the huge transmittersite at Pifo which I visited. But most others Ecuadorian shortwave stations are very irregular. For many years Radio Bahái in Otavalo which I also visited, could be heard on 4950 kHz. But in June 2001 the station disappeared from shortwave.

The country with most stations on the Tropical Bands today is Brazil with 45 frequencies in use! This huge country needs shortwave to broadcast to its people in the rural and rainforest areas, while FM has taken over in the more densely populated areas. But the big networks have their own satellite systems. With those, it is no longer economically impossible to transmit programmes to small, rural FM-stations which can relay them to the surrounding area. Consequently the use of Tropical Bands is also on decline in Brazil with less than half of the frequencies in use today, that could be heard in 1973.

Two other countries which still have many stations on the Tropical Bands are Peru and Bolivia broadcasting mainly to the Indian population in the isolated settlements in the High Andes and the Amazon jungle which cannot be reached by FM. But it must be added that many of these stations are not on the air on a daily basis and some are replaced by new stations each year.

The Japanese DX-er Takayuki Inoue Nozaki (TIN), has visited the Andes countries many times. He reported from Bolivia in year 2000, that the small, privately owned commercial broadcasters on shortwave have ceased existing. This was due to the decrease in profits made by selling airtime for commercial advertisements and personal messages. New commercial broadcasting enterprises bristle on FM which replace shortwave and mediumwave. Religious organizations seem to buy up many of the old commercial AM transmitters.

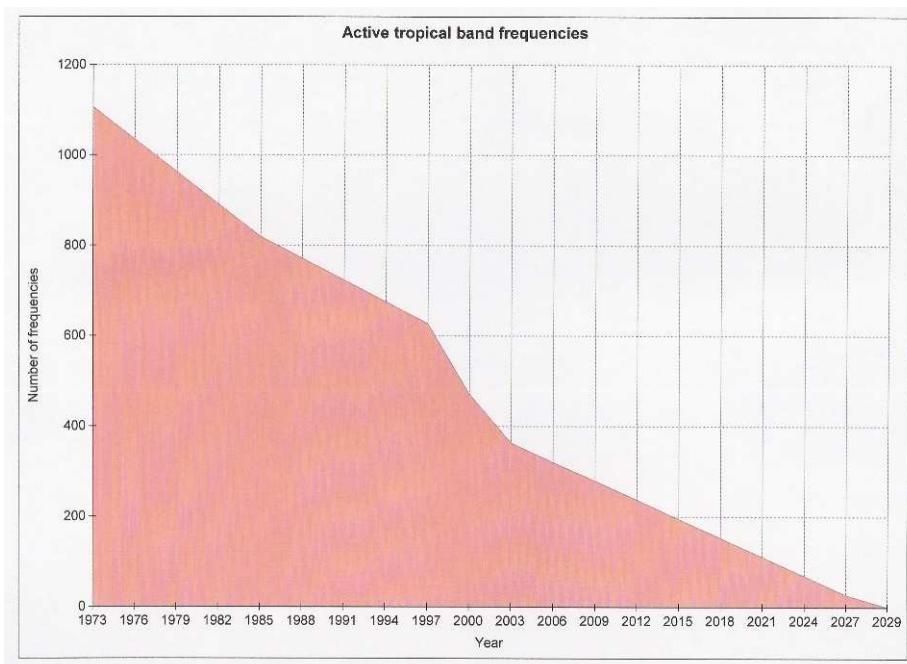
I experienced the same development when I travelled through Peru and Bolivia last November. I heard 18 stations on the Tropical Bands from Peru and 6 from Bolivia while I was there. But in the Peruvian capital Lima I heard 34 FM-stations, in Cusco 29 FM-stations and in the Bolivian capital La Paz 21 FM-stations. But none of these FM-stations did broadcast the typical Indian folkmusic! La Paz is located in a valley in the Andes mountains in 4000 meters altitude. On the mountain rim 400 meters above the city there is a lot of radio and TV transmitters.

Let me close with a look at another popular DX-country, Papua New Guinea. Their number of broadcasting stations seems to be stable since they got new transmitters in the early eighties. But that is not the case! These transmitters which mostly are on 90 meters, have big problems and most of them are only on the air a few weeks per year for financial constraints. It is remarkable that nearly all stations are operational during elections.

The future

My third question was: When will the last stations disappear from the Tropical Bands?

From the total figures on my previous list of active frequencies on these bands, I have made a graphic which is shown here:



You see that the curve of the total number of active broadcast frequencies in the Tropical Bands is going very steadily downwards. During the first 24 years from 1973 to 1997 479 stations disappeared from these bands with an average of 20 per year. But then from 1997 to 2001 the disappearance drastically increased to 295 in four years or 74 per year in average. Since then the annual decrease has flattened out and been around 14 since 2004.

I suppose that this trend will continue and when I prolong the curve beyond 2007, it will hit ZERO around year 2029. So it is my guess that after that year there will no longer be domestic broadcasting on the Tropical Bands.

It raises two further questions:

1. What shall the Tropical Bands DX-ers do after 2029 ?

I will suggest DX on Mediumwaves where there still is a lot to hear. There may also still be international broadcasts on the shortwave bands.

2. Which radiostations will take over the Tropical Bands when the Domestic Broadcasters have left ?

Our longtime member in Sri Lanka, Victor Goonetilleke, who visited Stockholm at the EDXC Conference in 1984, expects more international broadcasters. Another possibility is to allocate the Bands to radioamateurs.

To sum up:

1. 73% of the stations have left since 1973.
2. Because of:
 - Replacement by FM
 - Low technical standard
 - Poor economy
3. The last stations may leave by 2029.

We are approaching the end of the Era of Domestic broadcasting on the Tropical Bands ! The technical standard of a large part of the transmitters on the Tropical Bands is poor. In more developed countries they are being replaced by FM-networks and it can be feared that the trend will continue to go downwards and the stations will all have left around year 2029. So the days of Tropical Bands DX-ing are coming to an end and we are approaching the Sunset !

However, you can still hunt for and maybe get QSL's from 307 Domestic Broadcasting Stations on the Tropical Bands, before it is too late. Fortunately the interfering broadcast and utility stations are also disappearing. So do not give up your Tropical Bands DX-ing! It is just a matter of switching on your receiver and tune in to these frequencies at the right times and with good propagation!