



## Appendix A Results of the AFI VHF and HF Communications Survey – 2012

### 1. Introduction

1.1. IATA conducts aeronautical mobile communications surveys in the AFI Region every 18 months with an objective to determine VHF/HF coverage within the region, in order to identify deficiencies in communication and arrive at corrective action plans to address them, in coordination with States and Air Navigation Service Providers (ANSPs).

The last survey was done on the 7-25 June 2010 but was inconclusive due to inadequate data received from airlines and therefore the report was not provided to States as per item 3.3.21 of the APIRG17 report of 2010.

It was decided that a new survey be carried out before the next APIRG and this was duly done between 16 January and 5 February 2012. The results are presented in this report.

### 2. Airlines participation

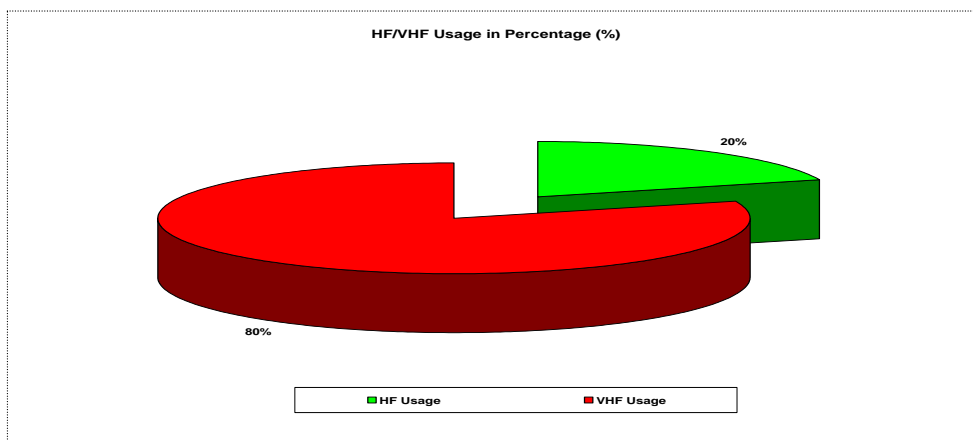
2.1. The following airlines; Air Botswana (BP), Air France (AF), British Airways (BA), Comair (MN), Delta Air Lines (DL), Emirates Airlines (EK), Ethiopian Airlines (ET), Interair (D6), KLM Royal Dutch Airlines (KL), Lufthansa (LH), Swiss International Airlines (LX), Air Madagascar (MD), South African Airways (SA) and Air Portugal (TP); provided data representing 2318 communication reports on 31 ATS units. The data covers most of the AFI Region.

### 3. Participation of States Air Traffic Services Units

3.1. ATS Units of Mogadishu, Botswana, Zimbabwe, South Africa (ATNS) and Angola participated in the survey. This may have been due to the late communication of the survey dates to the States.

### 4. Summary of the results

4.1. Overall, VHF usage in the continent based on the survey stands at 80%, an improvement of 7% compared to the last survey (2009); while HF usage is at 20 % (Fig 1). This maybe attributed to the overall infrastructure improvement in Luanda and Seychelles and to some extent Khartoum.



4.2. In 2009 the some FIRs namely, Brazzaville, Khartoum, Kinshasa, Luanda, Mauritius, Mogadishu, Niamey and Seychelles FIR showed a high HF usage indicating that HF was the primary means of communication.

A comparison carried out for the same FIRs has been done for 2012 survey as per the chart below (Fig 2) to determine if there is any improvement in VHF usage.

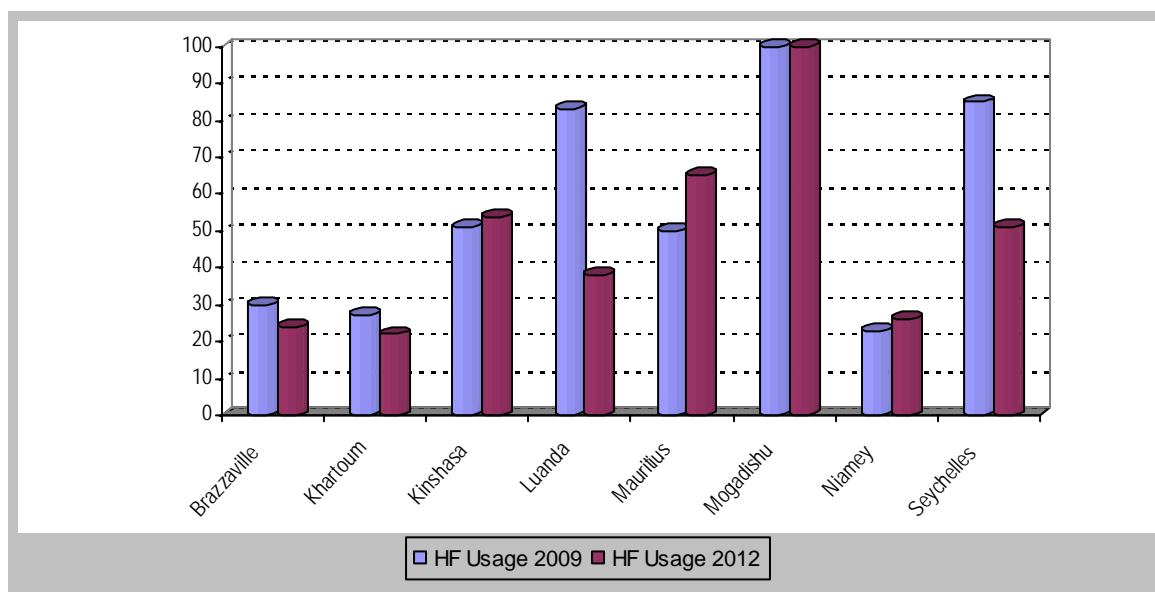


Fig 2

It is generally assumed that an increase in VHF communication usage vis-à-vis a decrease in HF communication usage usually indicates an improvement in the overall status of communication in the FIR as more airlines use the more effective VHF communication channels.

This assumption is clearly shown in the chart which shows a marked reduction in HF usage for Luanda and Seychelles in 2012 compared to 2009. Refer to the detailed analysis for the reasons behind this.

Improvement in Khartoum FIR is not visible in fig 2 above. This is because of an increased usage of HF which is mainly restricted to the South-Eastern part of Sudan FIR bordering Ethiopia FIR according to the survey results.

It should be recognized that Khartoum has invested tremendously in aeronautical mobile communication infrastructure.

Mogadishu uses HF communications only.

4.3. The table below (fig 3) summarizes the VHF/HF and CPDLC usage and the respective success rate. The figures in the table have been arrived at based on the data received during the survey period and are indicative of the reality on the ground.



No.	ATS UNIT	NO OF CALLS		TOTAL	NIL COMMUNICATION			% HF Usage	%VHF Usage	CPDLC		
		HF	VHF		HF	VHF	TOTAL			Login	Auto Transfer	Logout
1	Abidjan	13	12	25	3	1	4	52	48	4	1	1
2	Accra	14	78	92	0	3	3	15	85	19	2	4
3	Addis Ababa	6	79	85	6	5	11	7	93	0	0	0
4	Algiers	7	219	226	0	6	6	3	97	157	16	33
5	Antananarivo	16	71	87	0	3	3	18	82	3	0	2
6	Bamako	0	15	15	0	0	0	0	100	1	0	0
7	Beira	4	47	51	0	1	1	8	92	0	0	0
8	Brazzaville	30	94	124	13	21	34	24	76	58	7	17
9	Cairo	0	20	20	0	0	0	0	100	0	0	0
10	Dakar	15	77	92	1	2	3	16	84	19	1	3
11	Dar es salaam	0	46	46	0	3	3	0	100	0	0	0
12	Douala	0	30	30	0	2	2	0	100	0	0	0
13	Entebbe	0	13	13	0	0	0	0	100	0	0	0
14	Gaborone	0	91	91	0	4	4	0	100	0	0	0
15	Harare	1	79	80	0	2	2	1	99	0	0	0
16	Johannesburg	5	43	48	0	0	0	10	90	0	0	0
17	Kano	3	87	90	0	6	6	3	97	0	0	0
18	Khartoum	28	97	125	12	26	38	22	78	0	0	0
19	Kinshasa	57	48	105	38	33	71	54	46	0	0	0
20	Lagos	0	34	34	0	4	4	0	100	0	0	0
21	Libreville	0	18	18	0	0	0	0	100	2	0	1
22	Lilongwe	0	14	14	0	1	1	0	100	0	0	0
23	Luanda	62	100	162	14	6	20	38	62	0	0	0
24	Lusaka	0	31	31	0	1	1	0	100	0	0	0
25	Mauritius	13	7	20	0	0	0	65	35	7	0	2
26	Mogadishu	94	0	94	5	0	5	100	0	0	0	0
27	Nairobi	5	67	72	0	3	3	7	93	0	0	0
28	N'djamena	6	97	103	0	4	4	6	94	67	8	14
29	Niamey	68	196	264	2	20	22	26	74	140	41	36
30	Seychelles	19	18	37	0	0	0	51	49	38	1	17
31	Windhoek	0	24	24	0	2	2	0	100	0	0	0

Fig 3 Table of the summary of the VHF, HF and CPDLC Survey



#### 4.4. Notes

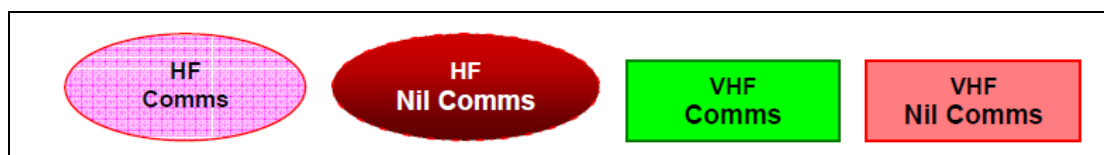
Successful (use of VHF/HF) communication or VHF/HF success rate is described in this survey as;

- 'Communication established' -strength/Clarity 2-4,
- 'Communication established and is excellent' -strength/Clarity 5.

4.5. When the Strength and Clarity of the communication is either 0 or 1, then communication is deemed to be 'No or poor Communication established'.

When Strength is 2 but Clarity is 1, it means the pilot or Air Traffic Controller is *battling* and therefore the communication is deemed as poor. However, when the strength is 1 and clarity is 2 or greater, then the applicable category is 'Communication established'.

This may need to be revised for the next survey and discussion with IFALPA, IATA and ICAO need to take place so as to ensure a clear reflection of what the pilots are saying with regards to Strength and Clarity when recording the two parameters.





## Part II – Analysis of the results by FIR

### Abidjan FIS

#### VHF/HF

Not enough data for VHF and HF was received and therefore the results were inconclusive.

#### CPDLC

*See results under Dakar FIR*

### Accra FIR

#### VHF/HF

A total of 92 calls were made (78 on VHF and 14 on HF).

Success rate; VHF 96% and HF 100%

In 2009, VHF calls at TATAT, SENOR and LITAK had 'Nil Comms'. In 2012, only TATAT had 'Nil Comms'. However, this was only 1 (once) in 9 calls. No further investigation is required.

#### CPDLC

Total of 35 attempts on CPDLC were made. Out of these; 54% had successful LOG-IN, 06% had successful AUTOMATIC TRANSFER and 11% had successful LOG-OFF.

### Addis FIR

#### VHF/HF

A total of 85 calls were made (79 on VHF and 6 on HF).

Success rate; VHF 94% and HF (Zero) 0%

In 2009, 50% of VHF and HF calls at EPSIX, ANTAX and AMATO had 'Nil Comms'. Additionally, all calls at position TIKAT recorded 'Nil Comms'.

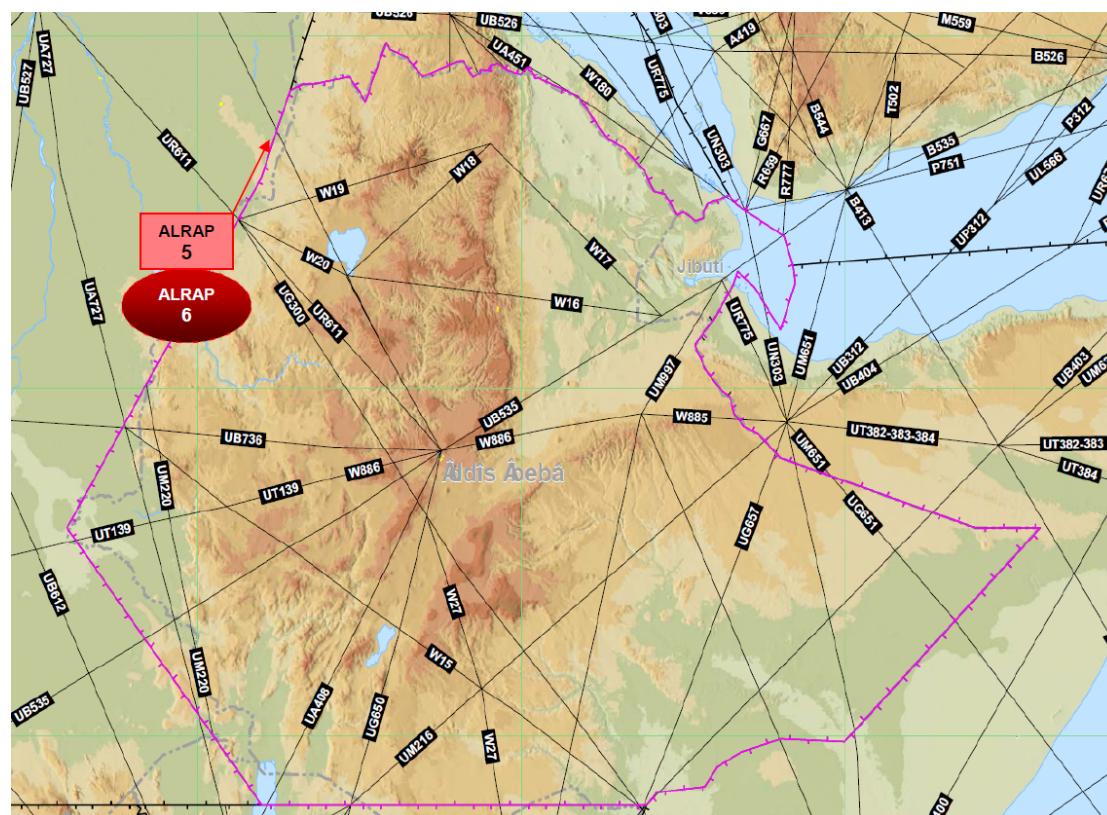
In 2012, only positions ANTAX had 'Nil Comms'.

At position ALRAP, none of the calls made on VHF and HF were successful. Further investigation is required. There is a probable 'Blind' spot at this position. *(See Khartoum FIR)*

#### CPDLC

No CPDLC available in Addis FIR.

## Addis FIR Chart



## Algiers FIR

### VHF/HF

A total of 226 calls were made (219 on VHF and 7 on HF).

Success rate; VHF 97% and HF 100%

### CPDLC

Total of 187 attempts on CPDLC were made. Out of these; 84% had successful LOG-IN, 09% had successful AUTOMATIC TRANSFER and 18% had successful LOG-OFF.

Communication considered as adequate. No further report.



## **Antananarivo FIR**

### VHF/HF

A total of 87 calls were made (71 on VHF and 16 on HF).  
Success rate; VHF 97% and HF 100%

### CPDLC

Only 03 attempts on CPDLC were made. Out of these; 100% had successful LOG-IN, None of them had successful AUTOMATIC TRANSFER and 02 (67%) had successful LOG-OFF.

Communication considered as adequate. No further report.

## **Beira FIR**

### VHF/HF

A total of 51 calls were made (47 on VHF and 4 on HF).  
Success rate; VHF 98% and HF 100%

Communication considered as adequate. No further report.

No CPDLC available in Beira FIR.

## **Brazzaville FIR**

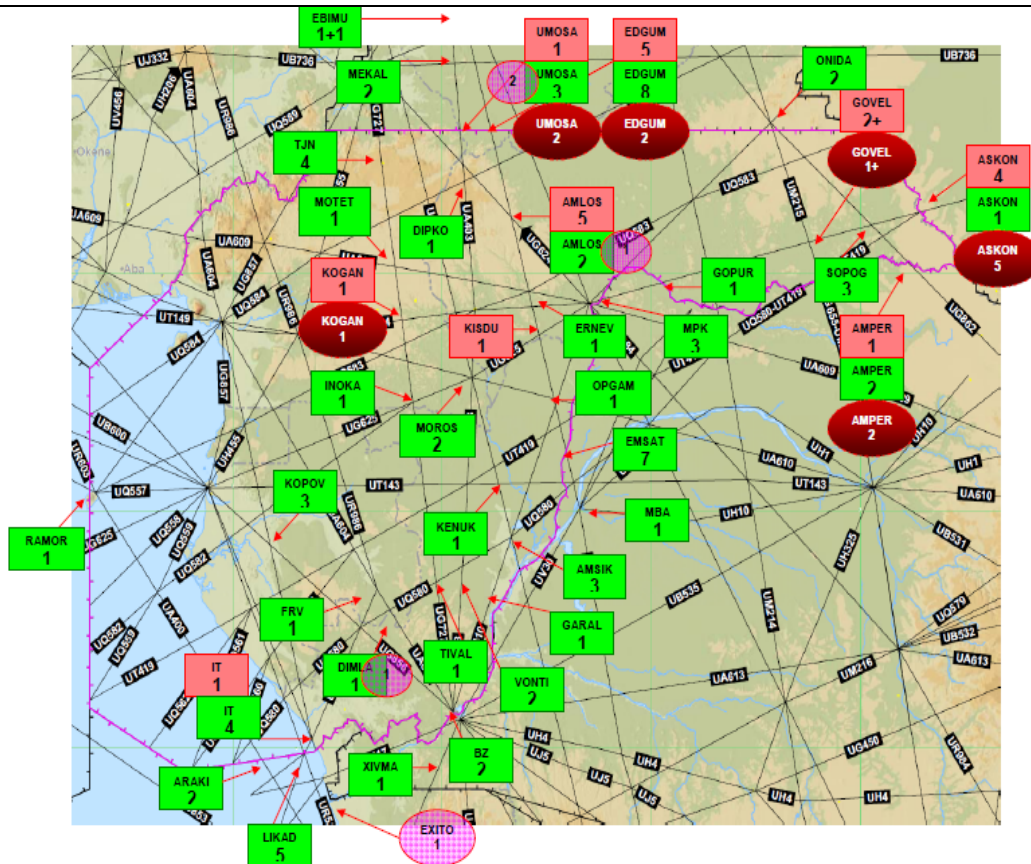
### VHF/HF

A total of 124 calls were made (94 on VHF and 30 on HF).  
Success rate; VHF 78% and HF 57%

Like in 2009, there were several positions in the North and North-Eastern part of the FIR that showed numerous communication inadequacies. These were EDGUM, UMOSA, AMALOS, GOVEL, ASKON and AMPER. There is a need to address this situation urgently.



## Brazzaville FIR Chart



## CPDLC

Total of 83 attempts on CPDLC were made. Out of these; 70% had successful LOG-IN, 8% had successful AUTOMATIC TRANSFER and 20% had successful LOG-OFF.

## Cairo FIR

### VHF/HF

A total of 20 calls were made, all of which were on VHF.  
Success rate; VHF 100%

Communication considered as adequate. However, in 2009 there was an issue of 'Nil Comms' at position DITAR which is at the boundary of Cairo and Tripoli FIRs. Since Tripoli was not involved in this survey, there is still a need to evaluate whether this issue has been resolved.

## CPDLC

No CPDLC data was available for Cairo FIR.





## **Canarias FIR**

### VHF/HF

Not enough data was available to make any deductions.

### CPDLC

Total of 04 attempts on CPDLC were made. Out of these 02 had successful LOG-IN, none had successful AUTOMATIC TRANSFER and 01 had successful LOG-OFF.

## **Dakar FIR**

### VHF/HF

A total of 92 calls were made (77 on VHF and 15 on HF).  
Success rate; VHF 99% and HF 93%

### CPDLC

Total of 31 attempts on CPDLC were made. Out of these; 61% had successful LOG-IN, 6% had successful AUTOMATIC TRANSFER and 17% had successful LOG-OFF.

Communication considered as adequate. No further report.

## **Dar es Salaam FIR**

### VHF/HF

A total of 46 calls were made and all on VHF.  
Success rate; VHF 93%

### CPDLC

No CPDLC available in Dar FIR.

Not enough data was received. No further report.

## **Entebbe FIR**

### VHF/HF

A total of 13 calls were made and all on VHF.  
Success rate; VHF 100%

### CPDLC

No CPDLC available in Entebbe FIR.

Not enough data was received. No further report.



## **Gaborone FIR**

### VHF/HF

A total of 91 calls were made, all on VHF.  
Success rate; VHF 100%

Communication considered as adequate. No further report.

No CPDLC available in Gaborone FIR.

## **Harare FIR**

### VHF/HF

A total of 80 calls were made (79 on VHF and 01 on HF).  
Success rate; VHF 97% and HF 100%

Communication considered as adequate. No further report.

No CPDLC available in Harare FIR.

## **Johannesburg FIR**

### VHF/HF

A total of 48 calls were made (43 on VHF and 5 on HF).  
Success rate; VHF 100% and HF 100%

Communication considered as adequate. No further report.

Not enough data was available to assess usage of CPDLC in Johannesburg FIR.

## **Kano FIR**

### VHF/HF

A total of 124 calls were made (121 on VHF and 03 on HF).  
Success rate; VHF 92% and HF 100% (Includes Lagos shown separately in Fig 3)

There seems to be an improvement on VHF from 76% in 2009 to 92% in 2012. However, there are 'Blind' spots around POTGO, LIPAR and EPETA and around boundary positions of ETRIS, EBIMU and TJR.

It is important to note the improvement in VHF communications at position OBUDU, which in 2009 had a success rate of 22% compared to 96% in 2012. Continued improvement is desirable.

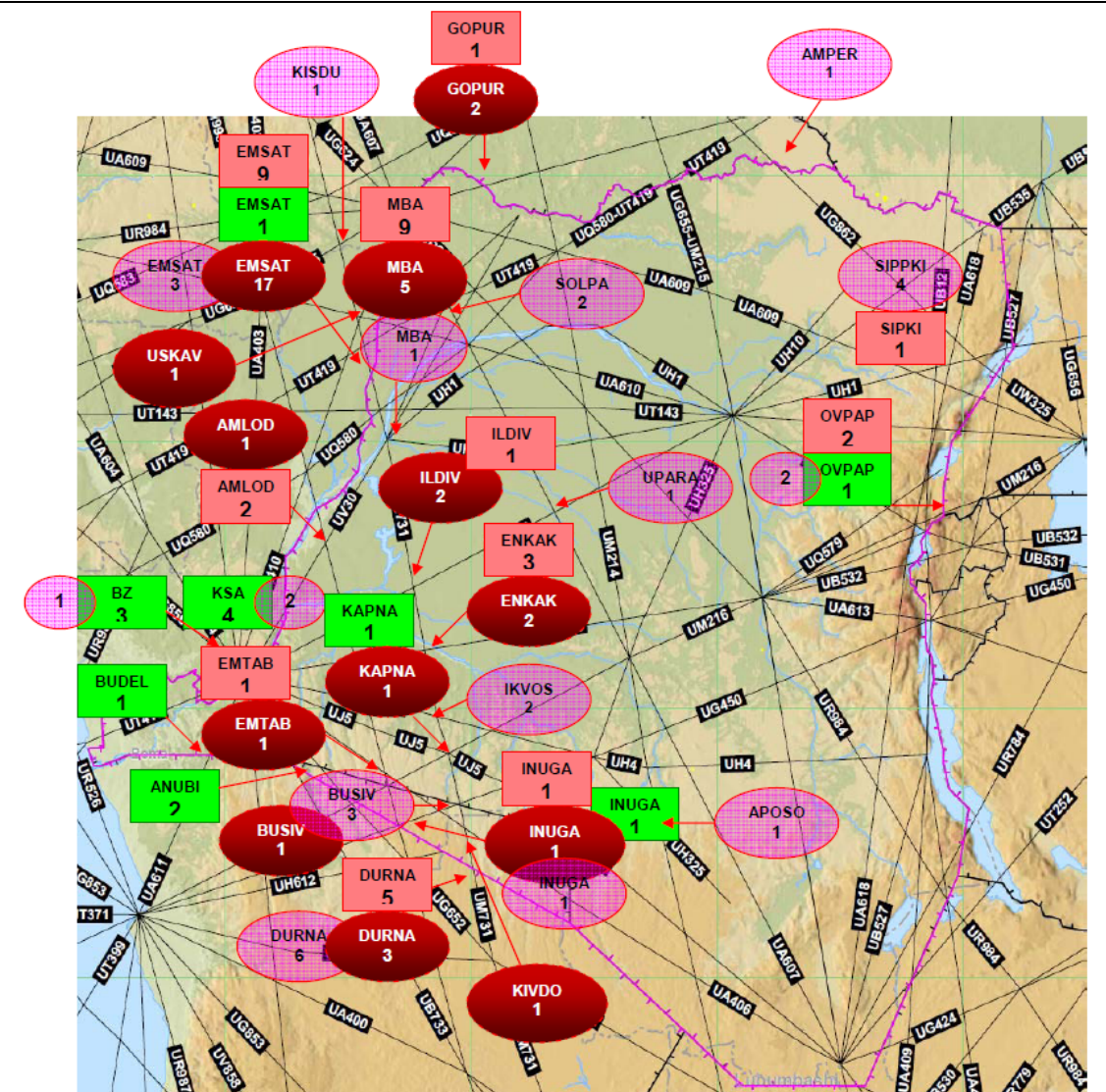
No CPDLC available in Kano FIR.







## Kinshasa FIR Chart



## Lilongwe FIR

### VHF/HF

A total of 14 calls were made and all on VHF.  
Success rate; VHF 93%

### CPDLC

No CPDLC available in Lilongwe FIR.

Not enough data was received. No further report.

## Luanda FIR

### VHF/HF

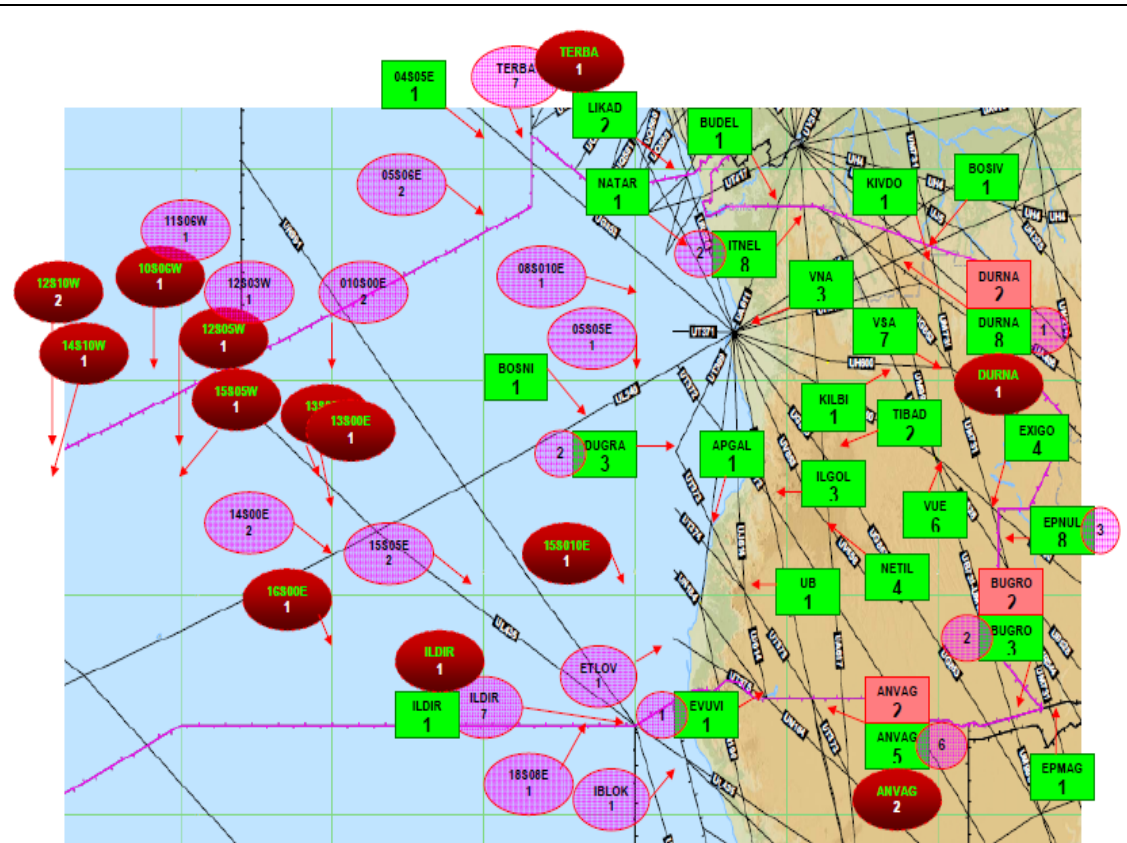
A total of 162 calls were made (100 on VHF and 62 on HF).  
Success rate; VHF 94% and HF 77%

There was an improvement on successful VHF communication from 83% in 2009 to 94% in 2012.  
There was also an improvement on VHF usage from 17% in 2009 to 62% in 2012. That in itself reflects an improvement in VHF infrastructure.

Usage of HF was mainly restricted to Luanda oceanic airspace. This means that there is still an need to implement ADS-C/CPDLC.

No CPDLC available in Luanda FIR.

### Luanda FIR Chart





## **Lusaka FIR**

### VHF/HF

A total of 31 calls were made and all on VHF.  
Success rate; VHF 97%

### CPDLC

No CPDLC available in Lusaka FIR.

Not enough data was received. No further report.

## **Mauritius FIR**

### VHF/HF

A total of 20 calls were made (07 on VHF and 13 on HF).  
Success rate; VHF 100% and HF 100%

### CPDLC

Total of 07 attempts on CPDLC were made. Out of these all had successful LOG-IN, none had successful AUTOMATIC TRANSFER and 29% had successful LOG-OFF.

Not enough data was received on VHF and HF. No further report.

## **Mogadishu FIR**

### VHF/HF

A total of 162 calls were made and all were on HF.  
Success rate; HF 95%

Communication in Mogadishu is only based on HF. In 2009, the survey indicated challenges at positions SUHIL and VEDET. In 2012, there was a marked improvement at these two positions with a success rate of 93% and 92% respectively.

Other position, ITMAR and MOGDU have also shown tremendous improvement.

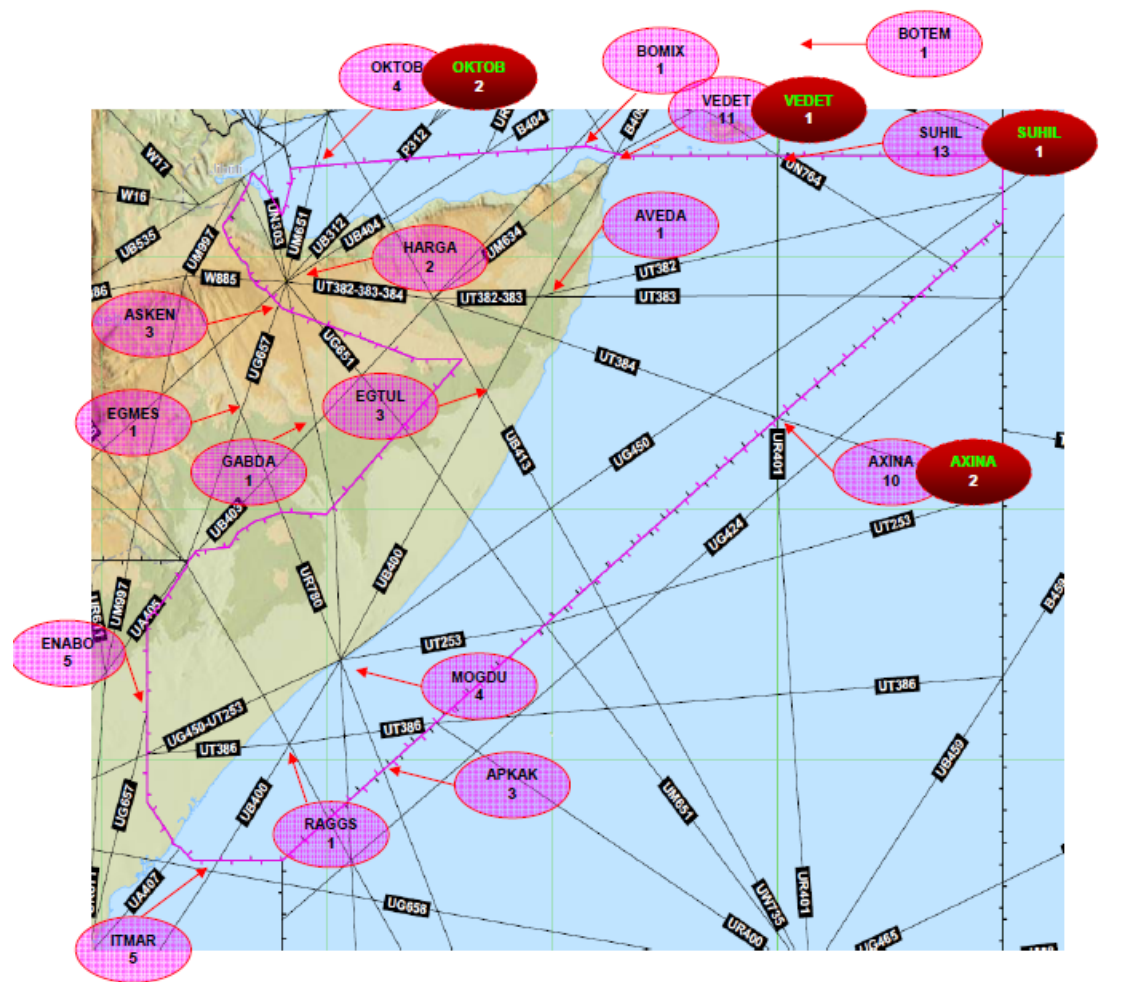
There is a need to implement ADS-C/CPDLC.

### CPDLC

No CPDLC available in Mogadishu FIR.



## Mogadishu FIR Chart



## Nairobi FIR

### VHF/HF

A total of 72 calls were made (67 on VHF and 05 on HF).

Success rate; VHF 96% and HF 100%

Communication considered as adequate. No further report.

No CPDLC available in Nairobi FIR.

## N'Djamena FIR

### VHF/HF

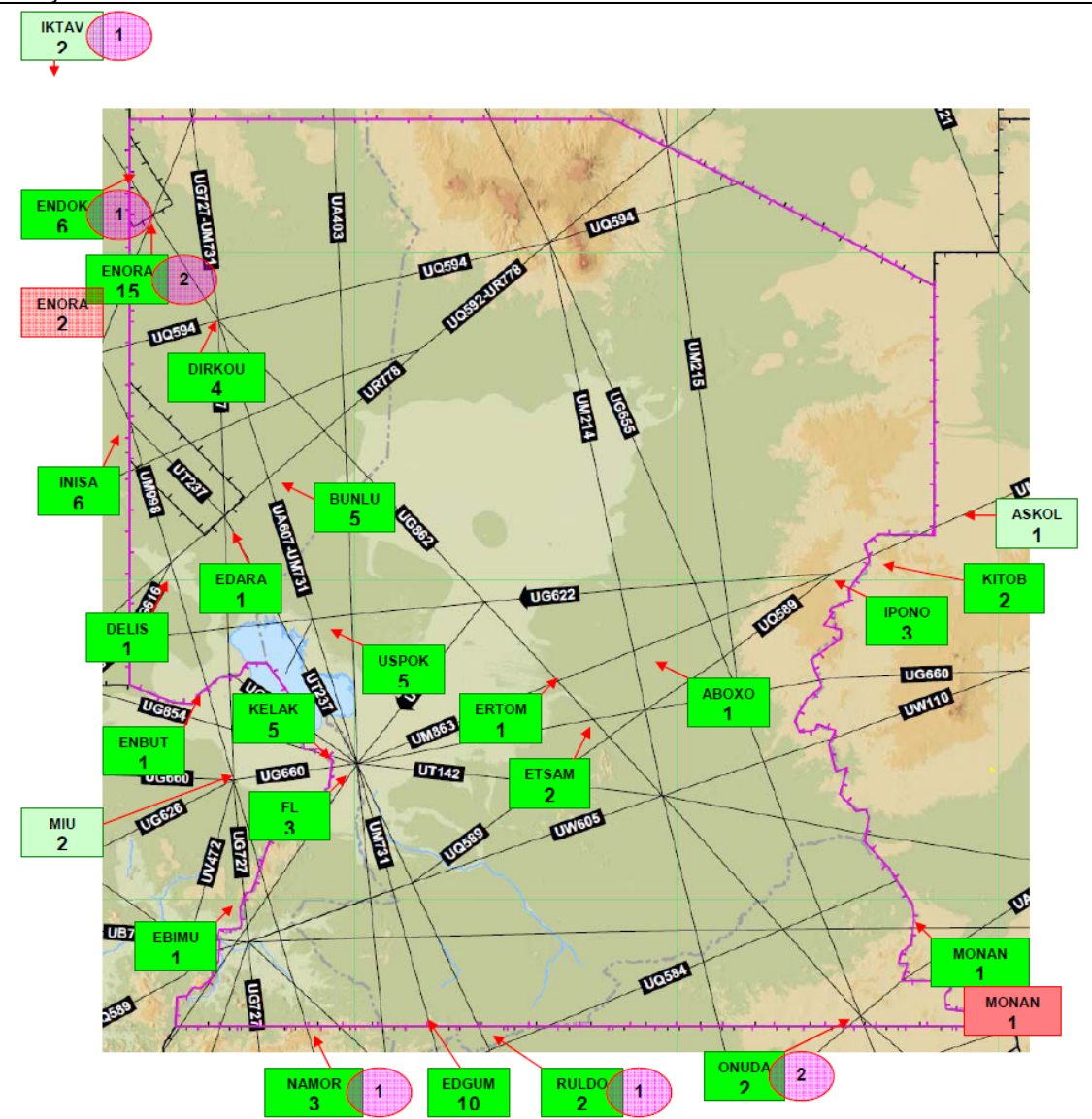
A total of 103 calls were made (97 on VHF and 06 on HF).  
Success rate; VHF 96% and HF 100%

### CPDLC

Total of 74 attempts on CPDLC were made. Out of these 91% had successful LOG-IN, 11% had successful AUTOMATIC TRANSFER and 19% had successful LOG-OFF.

Communication considered as adequate.

### N'Djamena FIR Chart





## Niamey FIR

### VHF/HF

A total of 264 calls were made (196 on VHF and 68 on HF).  
Success rate; VHF 90% and HF 97%

Like in 2009, there is still some communication inadequacy in the north of the FIR bordering Algiers FIR. Although there was improvement of VHF communication at positions TOBUK, EREBO and ERKEL compared to 2009, there were a lot of HF calls which could mean that pilots reverted to HF whenever they had difficulty on VHF especially around TERAS, EREBO, ENDOK, IKTAV and ERKEL. It is important to note that VHF and HF usage was split at about 50% a piece.

Consideration should be taken on the area bordering Algiers with regards to improving VHF communications.

Also, note that 54% of the CPDLC attempts were at these 5 positions.

### CPDLC

Total of 197 attempts on CPDLC were made. Out of these 71% had successful LOG-IN, 21% had successful AUTOMATIC TRANSFER and 18% had successful LOG-OFF.

Communication considered as adequate.

## Niamey FIR Chart

