



INTERNATIONAL CIVIL AVIATION ORGANIZATION

IP N°9.6



## Sixteenth Meeting of AFISNET Satellite Network Management Committee

(Dakar, Senegal, 17-19 December 2007)

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### Agenda Item 9: Any other business

#### Extended VHF coverage for Aeronautical Mobile Service

(Presented by ASECNA)

#### SUMMARY

This paper accounts for the extension of the VHF coverage in the FIRs in charge of ASECNA in order to improve the air navigation service.

Because of overlapping coverage between neighboring FIRS one should note that interferences can occur. Natural conditions of the site where new stations are to be located become more and more difficult rising up the cost of investment.

So when implementing extended VHF coverage stations, cooperative actions are to be conducted in the Region in order to share the capability of those remote VHF stations located near the boundaries of FIRS and to avoid interferences.

This should be efficiently done by periodic fly check involving airlines.

*(See called actions suggested to SNMC in paragraph 3)*

## **1. Introduction**

The ICAO AFI/7 RAN Meeting supports strongly the use of VSAT technology to improve the pilot /controller communications. Since 1997 that it experienced the first Remote VHF using VSAT Station, ASECNA pursue the extension of the VHF coverage by implementing in the various continental FIRs areas.

In order to measure the performance level and maintain a good quality of Service, surveys are regularly conducted involving airlines (IATA). The last one was conducted in September (3 to 23rd) in coordination with IATA according to conclusion 02/12 of CNS (CNS/SG) meeting hosted in Dakar (22 - 25 May 2007).

The reliability of the VHF coverage implemented requires statistical measures in order to evaluate the Quality of Service (QoS) offered to the Users. The establishment of availability will be a good tool to follow-up the VHF coverage.

## **2. Discussion**

### **2.1 Status of implementation**

Since 1997, ASECNA decided to extend the VHF coverage of its airspace in order to improve the quality of air Aeronautical Mobile service (AMS) for navigation service, by implementing VHF remote stations in the whole continental FIRs. Today, twenty eight (28) remote stations are implemented as shown in figure 2 in appendix.

This number is to be increased after the implementation of the planed new VHF stations.

### **2.2 Monitoring the extended VHF coverage**

#### **2.2.1 Objective of the survey:**

- Testing implemented VHF remote stations range
- Diagnosing deficiencies of VHF Coverage
- Improving and extending VHF Coverage

#### **2.2.2 Methodology:**

- Putting the disposal of the controllers of a survey form (in annex), to report the quality of the communications according to the flight level , the hour of flight and the reports positions
- The quality of the communication is measured by the clarity and the strength of the signal received on a scale of zero to five.
- Sorting of the data according to the clarity of the receipt
- Pointing of the results on the card of the FIR.

#### **2.2.3 Results**

- Excellent range of the remote VHF stations in N'djamena and Niamey Firs;
- Average results in Antananarivo;
- Dakar and Brazzaville to be consolidated;
- Noticeable improvement in quality of communications, in line with increased availability of VHF;
- Locating of the portions inadequately covered in each FIR;

- Improvement actions included in the current and coming investment plans in order to solve the deficiencies;
- The climatic and safety conditions related to some remote VHF stations sites impact on the availability of the service.

### 2.3 Improvement of the AMS

New way points are to be covered in the on going project after the coordinating yearly technical panel between ASECNA and the users (IATA).

<b>FIR</b>	<b>SITE or WAY POINT</b>	<b>COVERAGE IMPROVEMENT</b>
<b>ANTANANARIVO</b>	MAEVA, KOBAR ( TROMLIN)	East of the FIR
<b>BRAZZAVILLE</b>	SAO TOME, BANGUI	West and East
<b>DAKAR</b>	POVAS, SENOX, ERMIT	North East, centre East and south East of FIR
<b>NIAMEY</b>	MOPTI, TOBUK, RAMIN, ERKEL, KIRMI EREBO, IKTAV, ENDOK BIDOM, INAMA, EPUSA	Centre North and North East of the FIR
<b>NDJAMENA</b>	GARIN, TONBA, TUMO, ABEICHE	North East and centre East

Some of these points to be covered are located near the FIR boundary and the related equipments implementation should take the benefit of cooperative actions between ANSP.

**One may note that the extended VHF coverage needs a deep survey of AMS VHF frequencies spectrum to avoid interferences.**

### 3. Conclusion

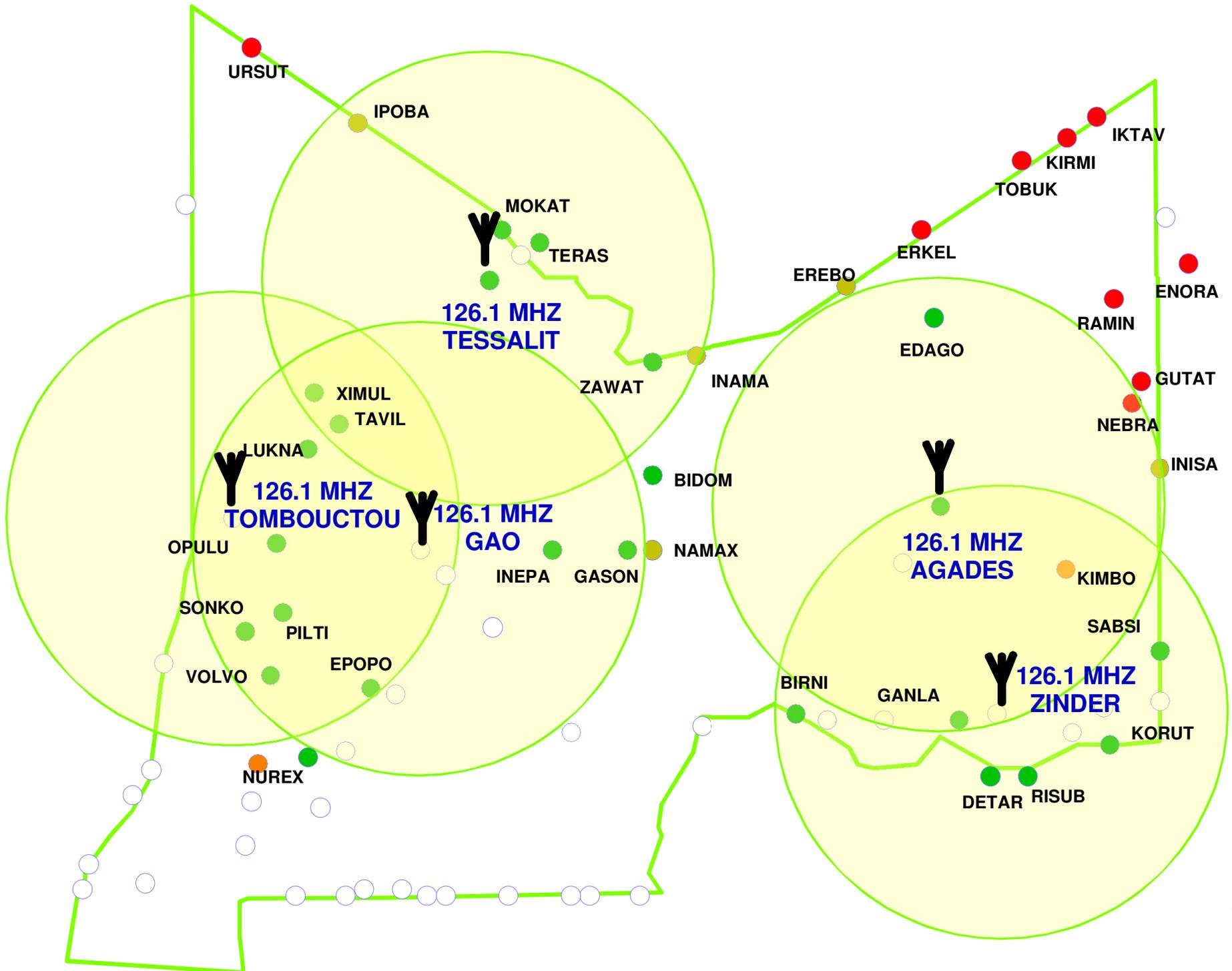
The meeting is invited to:

- take note of the information above and to encourage all COM centers to conduct surveys concerning the availability of VHF coverage;
- suggest cooperation in the Region to improve VHF coverage *notably by sharing VHF coverage at the border of the FIRs*;
- Suggest conducting a *deep survey of AMS VHF frequencies spectrum to avoid interferences between neighboring spaces.*



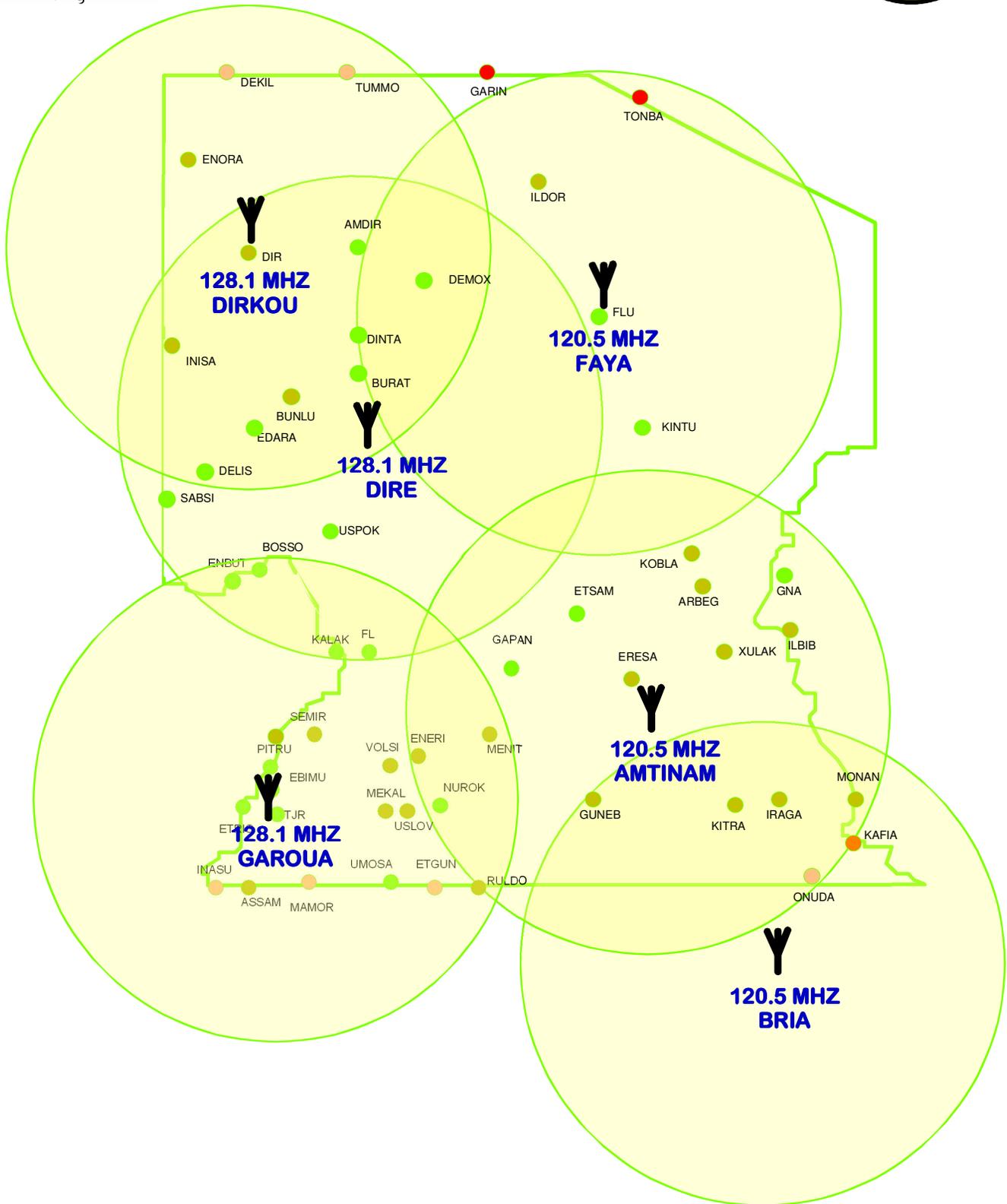


# RESULTS FROM IATA/ASECNA VHF COVERAGE SURVEY IN NIAMEY FIR





# RESULTS of IATA/ASECNA VHF COVERAGE SURVEY IN N'DJAMENA FIR



# RESULTS of IATA/ASECNA VHF COVERAGE SURVEY IN ANTANANARIVO FIR

