



WORKING PAPER

**SPECIAL AFRICA-INDIAN OCEAN (AFI)
REGIONAL AIR NAVIGATION (RAN) MEETING**

Durban, South Africa, 24 to 29 November 2008

Agenda Item 6: Development of a set of comprehensive work programmes in the air navigation field, aimed at improving efficiency of the air navigation system (Efficiency Committee)

**AERONAUTICAL MOBILE SERVICE (AMS) STATUS AND
PERFORMANCES IN ASECNA AIRSPACE**

(Presented by Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, France, Gabon, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Senegal, Togo, ASECNA Member States)

SUMMARY

This paper accounts for the status of AMS in the ASECNA area. It focuses on the extended VHF coverage and the use of HF in the ASECNA FIRs and calls for cooperative action to be taken when implementing the communications systems near the boundaries of the FIRs.

Action by the meeting is in paragraph 3.

1. INTRODUCTION

1.1 The ICAO AFI/7 RAN Meeting supports strongly the use of very small aperture terminal (VSAT) technology to improve the pilot/controller communications. Since 1997 when it experienced the first remote very high frequency (VHF) using VSAT Station, ASECNA pursued the extension of the VHF coverage by implementing in the various FIR.

1.2 In order to maintain a good quality of service, surveys are regularly conducted.

1.3 In the oceanic areas remote VHF implementation is not possible with the current technologies so high frequency (HF) communication continue to be provided between air traffic control (ATC) and airline crews.

1.4 Since the AFI/7 RAN Meeting ASECNA planned and implemented HF and VHF equipment, based on the newest technologies.

1.5 The reliability of aeronautical mobile service (AMS) (HF and VHF) coverage requires statistical data in order to evaluate the Quality of Service (QoS) offered to the Users.

1.6 ASECNA conducts periodically, in cooperation with IATA, surveys of AMS (VHF/HF) coverage and quality over the FIRs under its responsibility.

1.7 On the other hand the extension of VHF coverage over the boundaries of neighbouring FIRS offers the opportunity to share the remote equipment for the benefit of ATC but can also cause harmful interferences

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2. DISCUSSION

2.1 Status of implementation

2.1.1 Since 1997, ASECNA decided to extend the VHF coverage of its airspace in order to improve the quality of air navigation service, by implementing VHF remote stations in the all the FIRs.

2.1.2 Today, twenty eight remote stations are implemented (see Appendix).

2.1.3 In the same time HF equipments have been replaced as:

- a) primary air ground communication medium over sea area; and
- b) alternative backup to VFH over continental airspace.

2.2 Monitoring the AMS (HF and extended VHF) coverage

2.2.1 According to APIRG/16, Conclusion 16/20 and in a cooperative approach between ANSP and airlines ASECNA holds with IATA a yearly technical panel to review all CNS/ATM pending problems. In order to have the same appreciation of AMS it was decided to cooperate technical and operational including airline crews and air traffic controllers.

2.3 Objective of the survey

- a) testing implemented VHF remote stations range;
- b) diagnosing deficiencies of VHF coverage;
- c) measuring the availability of the HF over FIRs; and
- d) collecting such data to improve and extend VHF coverage.

2.3.1 Methodology:

- a) putting the disposal of the controllers and airlines crews 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;
- b) the quality of the communication is measured by the clarity and the strength of the signal received on a scale of zero to five;
- c) sorting of the data according to the clarity of the receipt; and
- d) pointing of the results on the card of the FIR.

2.3.2 Results:

- a) excellent range of the remote VHF stations;
- b) noticeable improvement in quality of communications, in line with increased availability of VHF;
- c) locating of the portions inadequately covered by VHF and test of HF coverage quality for each FIR;
- d) improvement actions included in the current investment plan in order to solve the deficiencies;
- e) HF is still the only means available in some portions of the FIR (particularly in oceanic area) in the meantime appropriate sites to cover these portions are found; and
- f) the climatic and safety conditions related to some remote VHF stations sites impact on the availability of the service

2.3.3 The results of the survey indicate that remote VHF coverage in ASECNA FIRs has improved the quality of air/ground communication which allows the extension of air traffic control.

2.3.4 Comments from users reported for Brazzaville FIR for example that **no flight crossed the FIR without contact with ATC**.

2.3.5 This result is the main aim of all the efforts undertaken by ASECNA since several years to modernize his AMS system in coordination with the users.

2.3.6 These results have been sent to ICAO-WACAF with respect to **Conclusion 16/9 of APIRG/16**.

2.4 **Improvement of the AMS**

2.4.1 The investigation shows also that new way points are to be covered in the on going project after the coordinating yearly technical panel between ASECNA and the users (IATA).

2.4.2 Some of these points to be covered are located near the boundary of FIRs and the related equipments implementation should take the benefit of cooperative actions between ANSP and manage possible harmful interference.

2.4.3 One may note that the extended VHF coverage offers the opportunity to support automatic dependent surveillance — broadcast (ADS-B) and global navigation satellite system (GNSS) augmentation signals.

3. **ACTION BY THE MEETING**

3.1 The meeting is invited to:

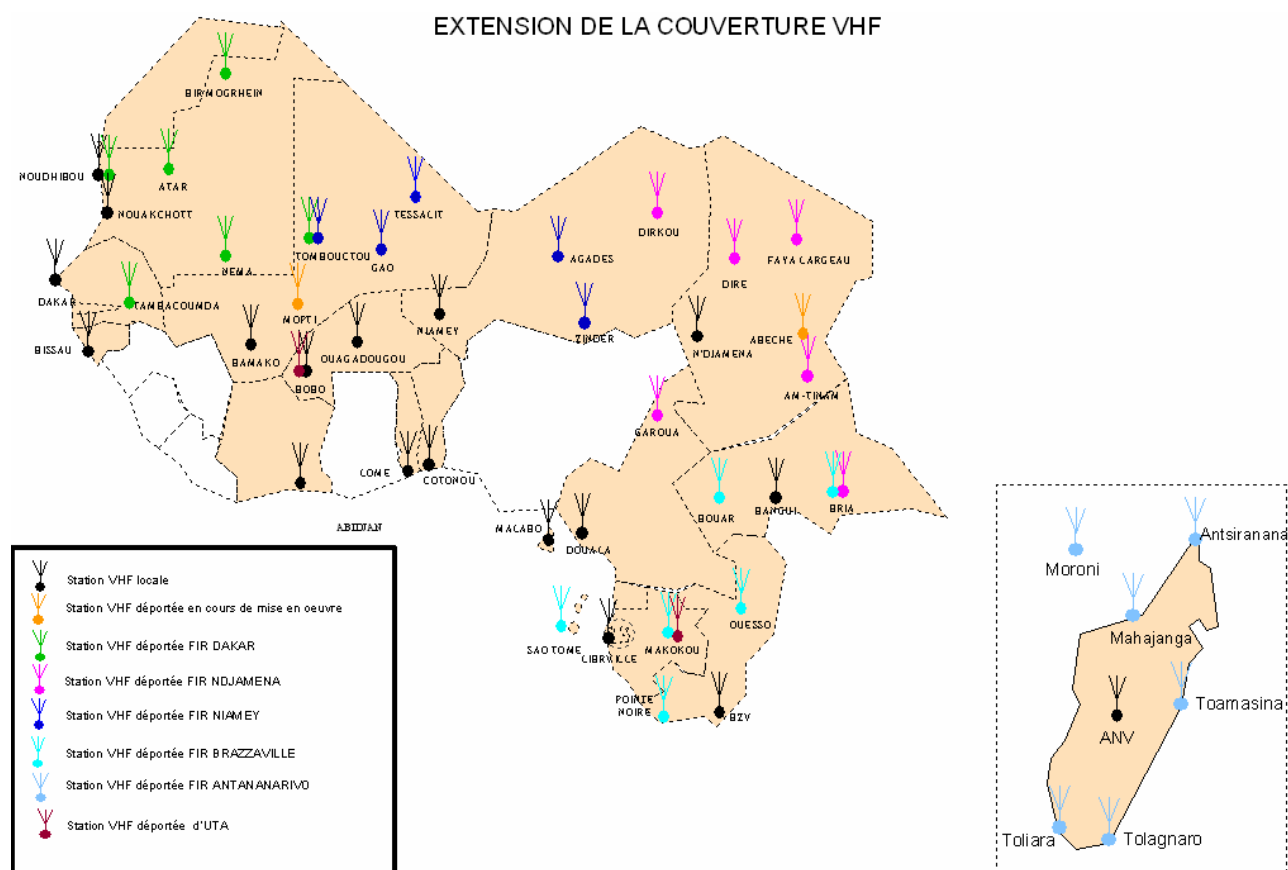
- a) take note of the information provided above;
- b) recognize the technical and financial efforts undertaken in the area since last AFI RAN Meeting in the modernization of AMS particularly by the extension of VHF coverage supported by AFISNET;

- c) encourage States/organizations to conduct periodic technical and operational surveys concerning the availability of VHF coverage;
- d) recommend cooperation between ANSP/States to improve VHF coverage notably by sharing VHF coverage at the boundaries of the FIRs; and
- e) recommend States/organizations to conduct before implementation of VHF coverage, a deep survey of AMS VHF frequencies spectrum to avoid interferences.

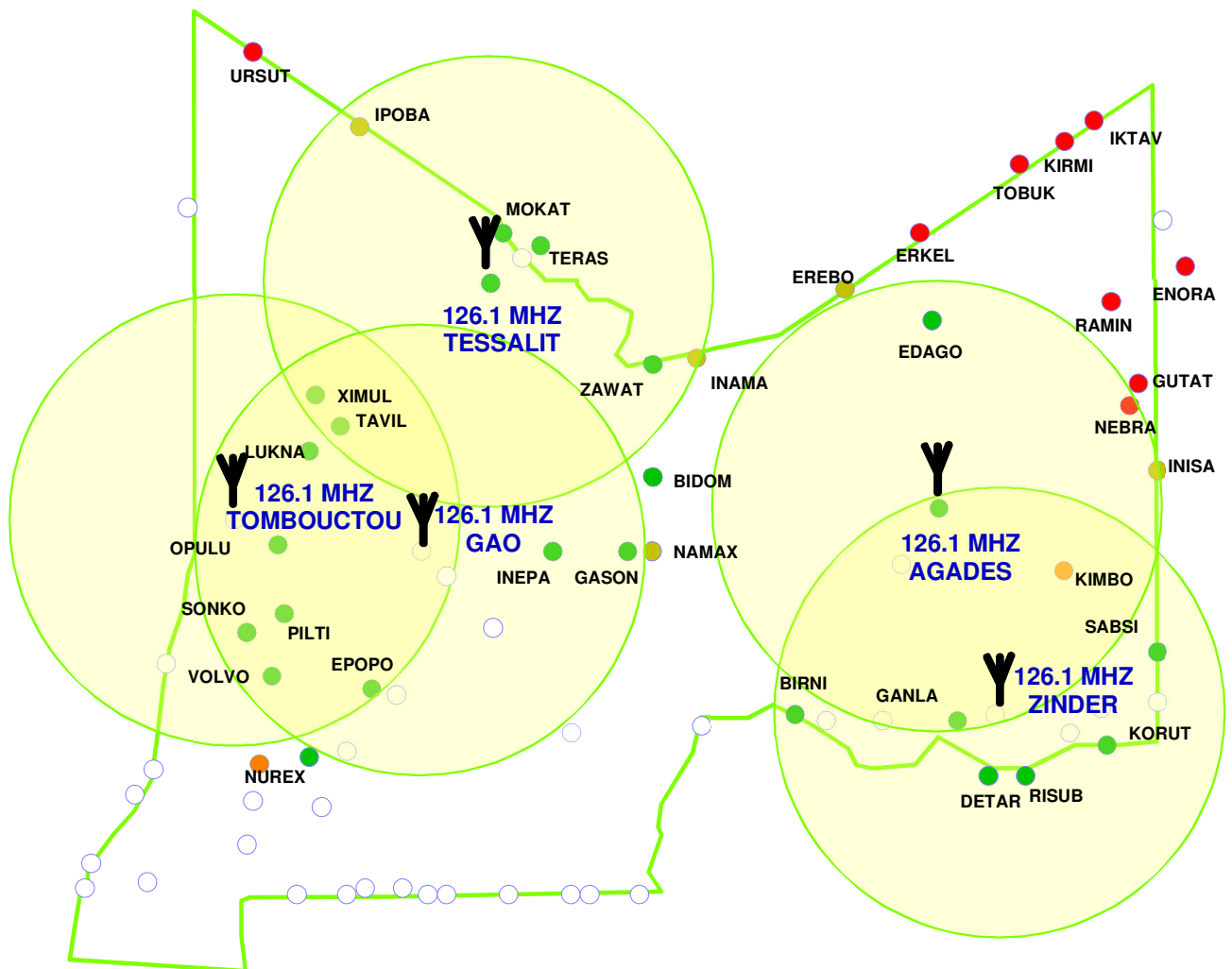
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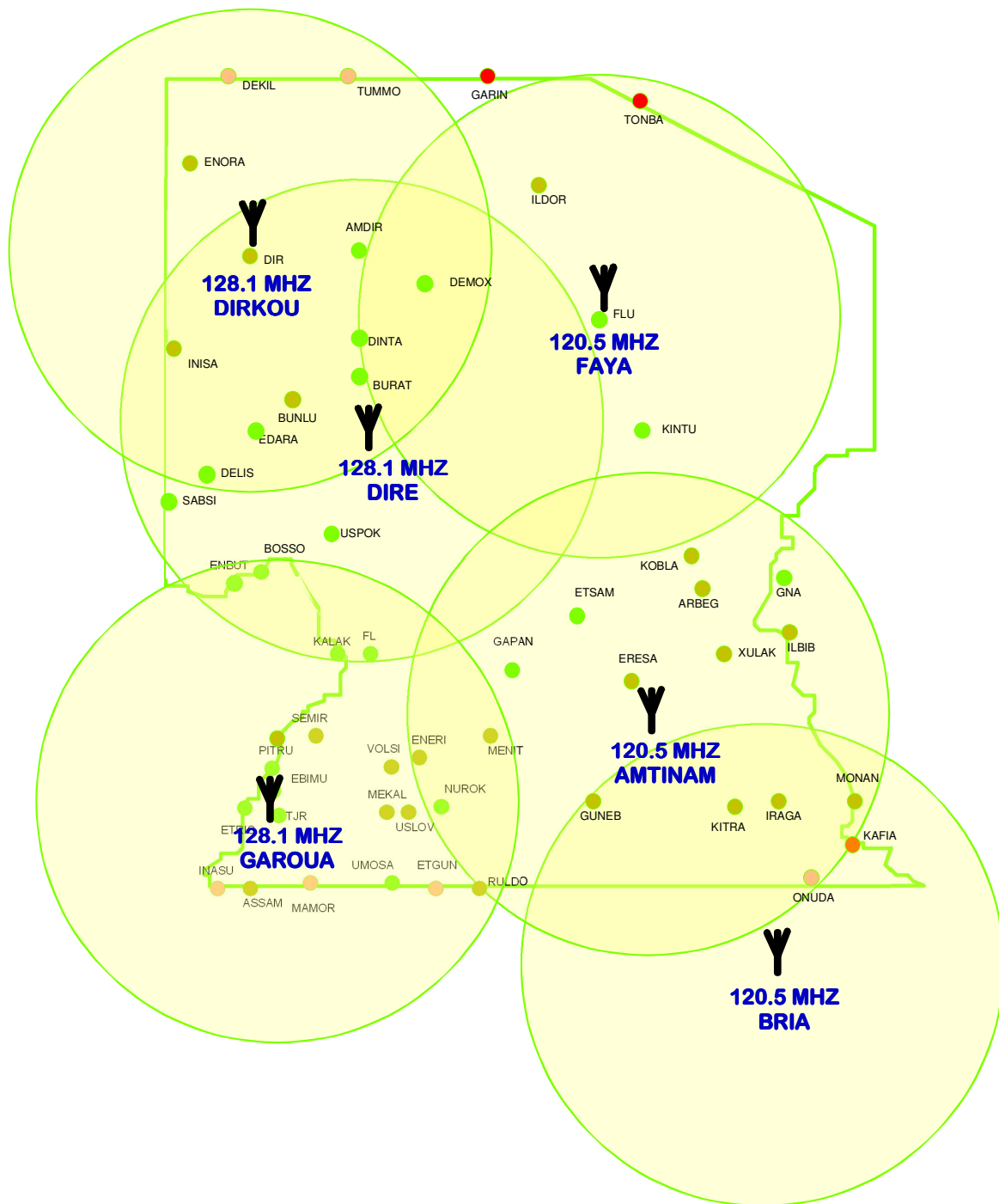
APPENDIX

Location of Extended VHF Stations in ASECNA

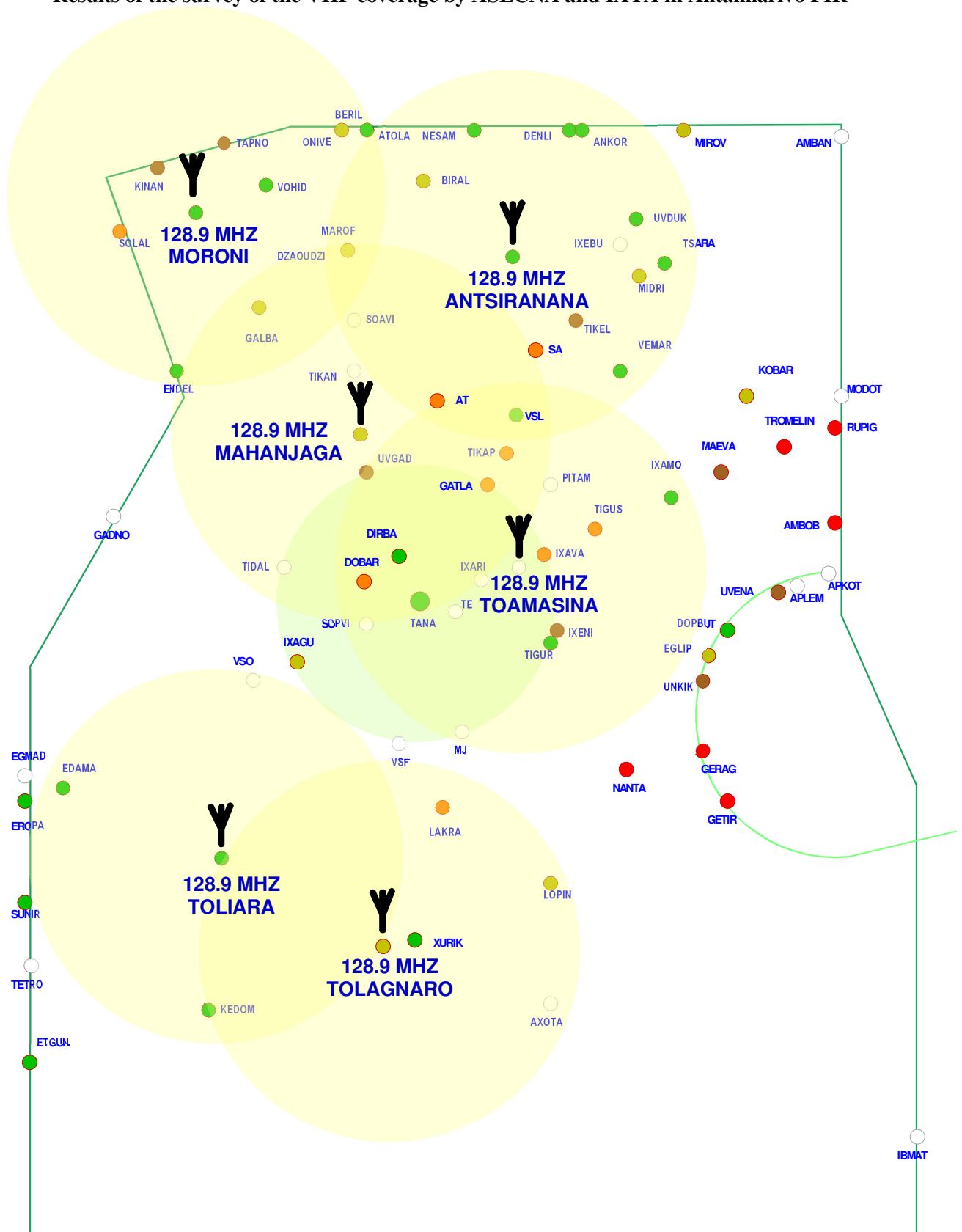


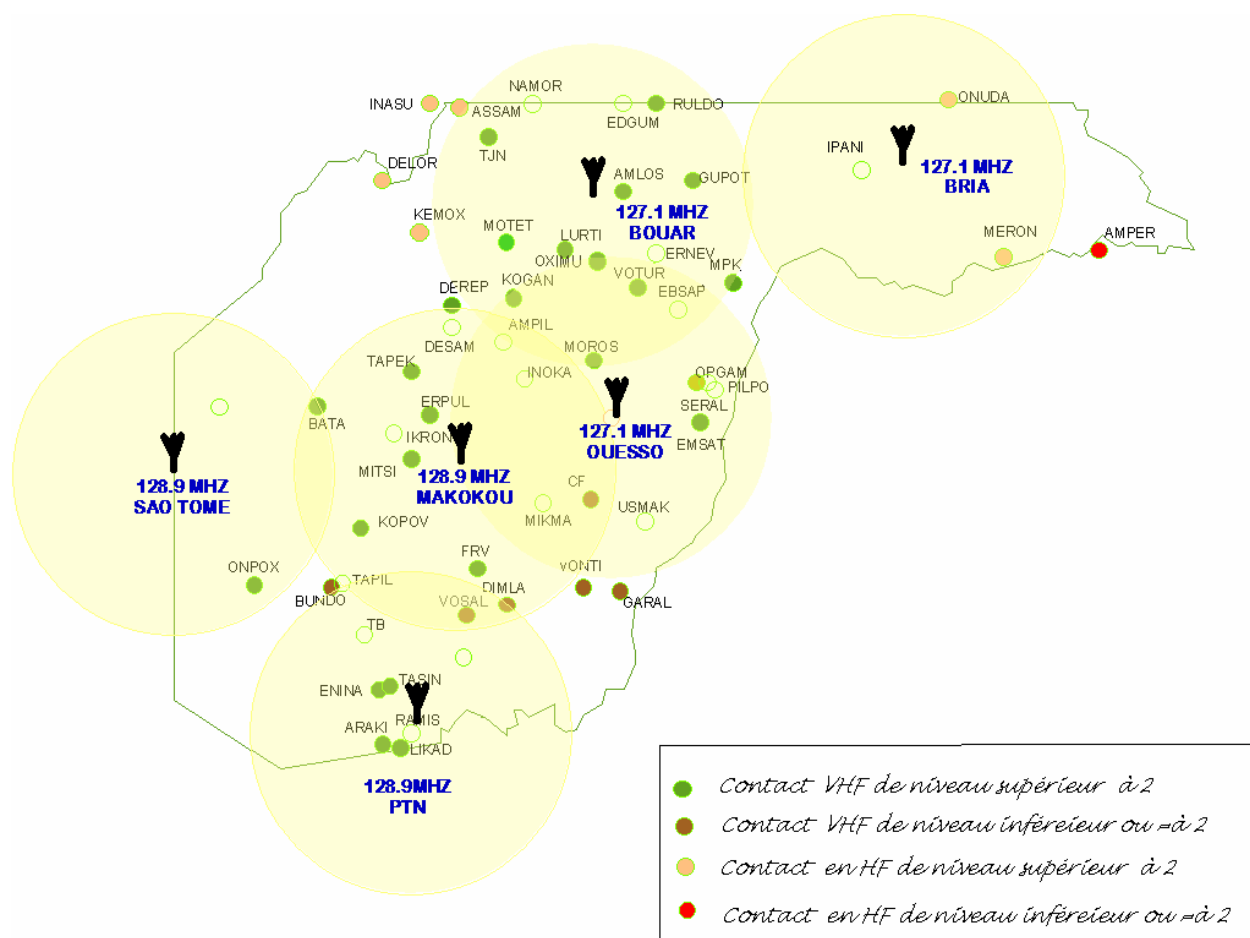
Results of the survey of the VHF coverage by ASECNA and IATA in Niamey FIR



Results of the survey of the VHF coverage by ASECNA and IATA in N'Djamena FIR

Results of the survey of the VHF coverage by ASECNA and IATA in Antannarivo FIR



Results of the survey of the VHF coverage by ASECNA and IATA in Brazzaville FIR

Enhancement programme (waypoints planned to be covered by the ongoing project)

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

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