AGENCE POUR LA SECURITE DE LA NAVIGATION AERIENNE EN AFRIQUE ET A MADAGASCAR

Telecommunication Infrastructure for VHF

VHF Data Link (VDL) for Air / Ground communication

ASECNA Experience

Introduction

The provision of air navigation service relies on available, reliable and integrated Communications, Navigation and Surveillance systems.

According LIM AFI and RAN AFI/7 conclusions and recommendations, the satellite technology has been adopted to implement aeronautical telecommunications services and meet the requirements of the International Civil Aviation Organization(ICAO).

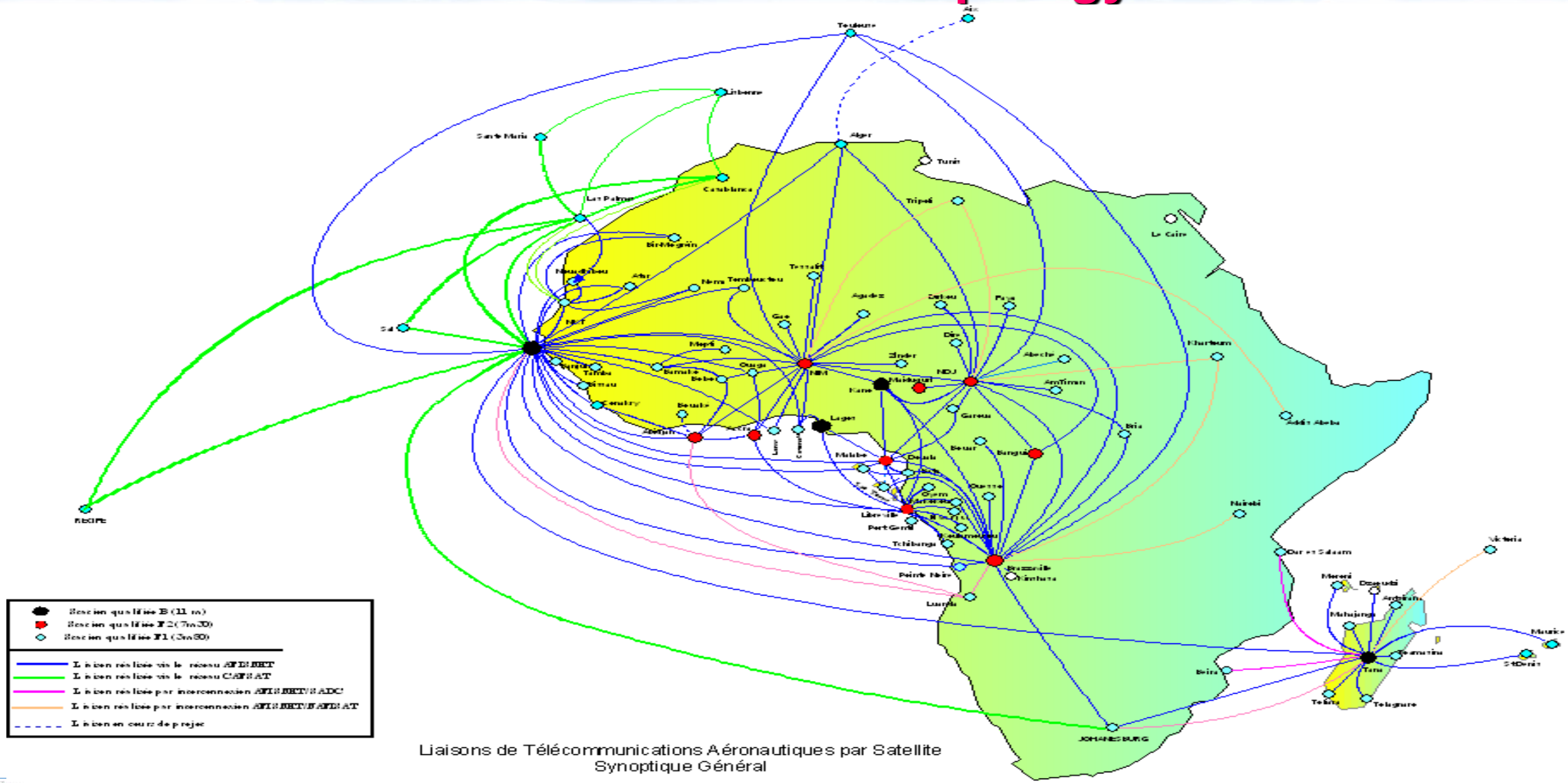
AFISNET, the first aeronautical VSAT network, was developed to support and perform the Aeronautical Fixed Service and the aeronautical Mobile Service as well as other future services.

Up today AFISNET covers more than 28 countries, including ASECNA countries, Nigeria, Ghana, Roberts FIR, Algiers, South Africa, Europe and SAM countries.

Overview of AFISNET

STANDARDS (TYPE)	SERVICES (TYPE) SFA / SMA	QUANTITY
F1 (3,7m)	SFA and SUR	30
F1 (3,7m-4,5m)	SFA,SMA and SUR	15
F1 (3,7m-4,5m)	SMA	74
F2 (7,3m)	SFA,SMA and SUR	7
B (11m)	SFA,SMA and SUR	2
TOTAL		128

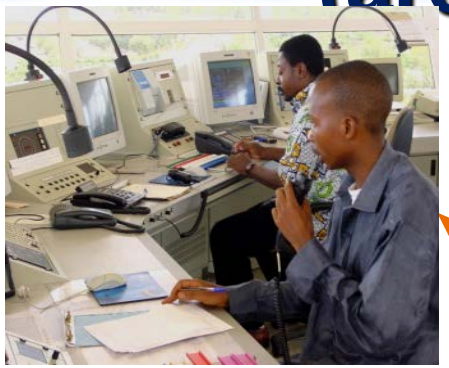
AFISNET current Topology



Services supported by AFISNET

- ✓ AFTN/AMHS
- ✓ ATS/DS, AIDC
- ✓ GTS and evolution to WIS
- ✓ Surveillance data sharing, including radar coverage, ADS, CPDLC
- ✓ AMS :Extended remote VHF
- ✓ GNSS : Augmentation(GBAS, SBAS…)
- ✓ Administrative Aeronautical , Communication

Operational & Non-Operational Services (architectures)



ATS/DS

VHF

AFTN

GTS

VHF DATA LINK

ADS-C /CPDLC

GNSS

ES - 1090

Supervision

ADS-B / MLAT

Intranet

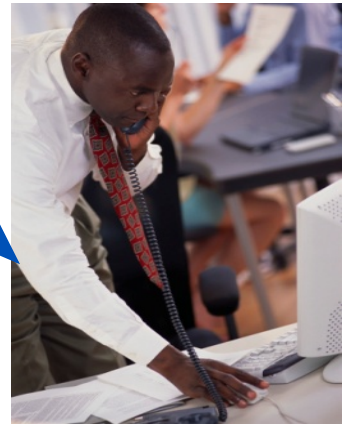
Internet

ACC

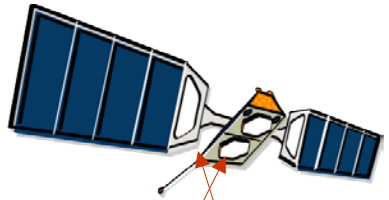
VIDEO-CONF

GMAO

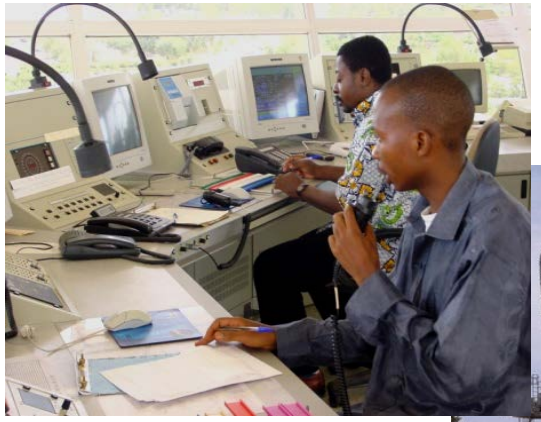
@-Services



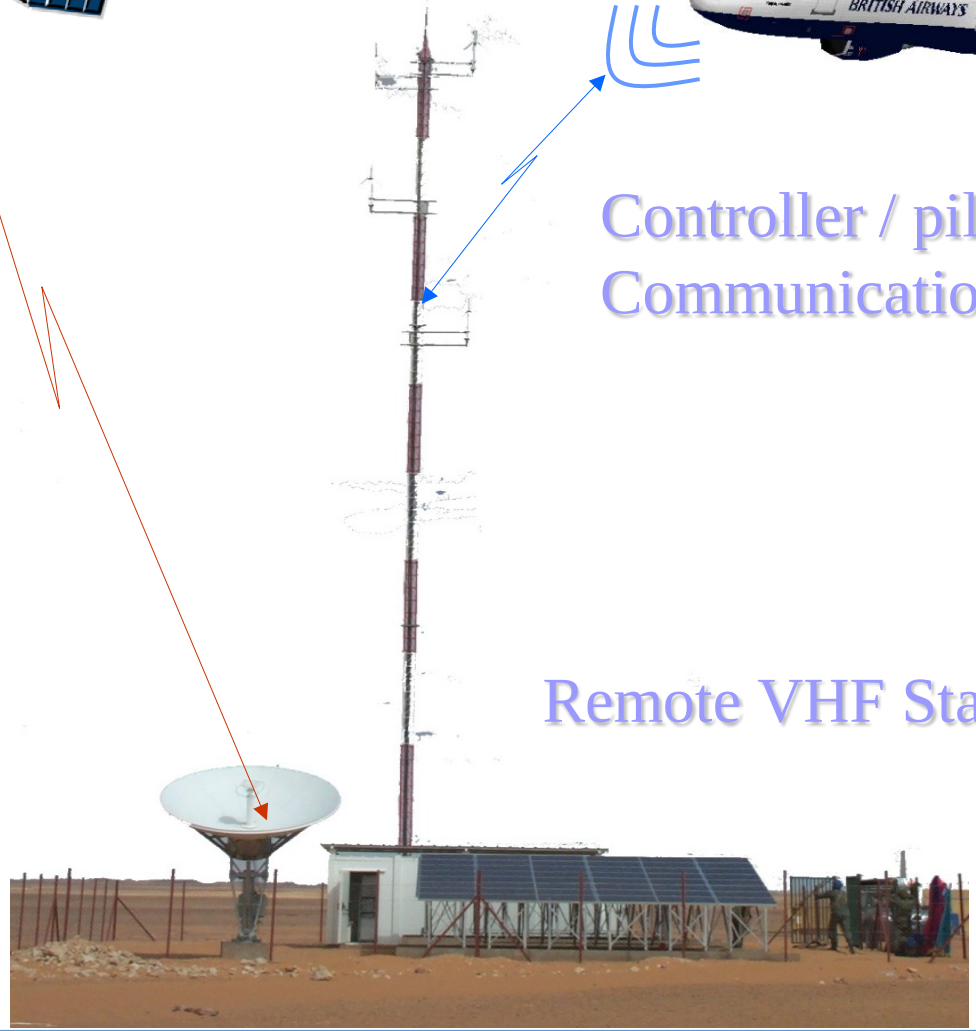
Extended Remote VHF, Principle



Controller / pilote
Communication

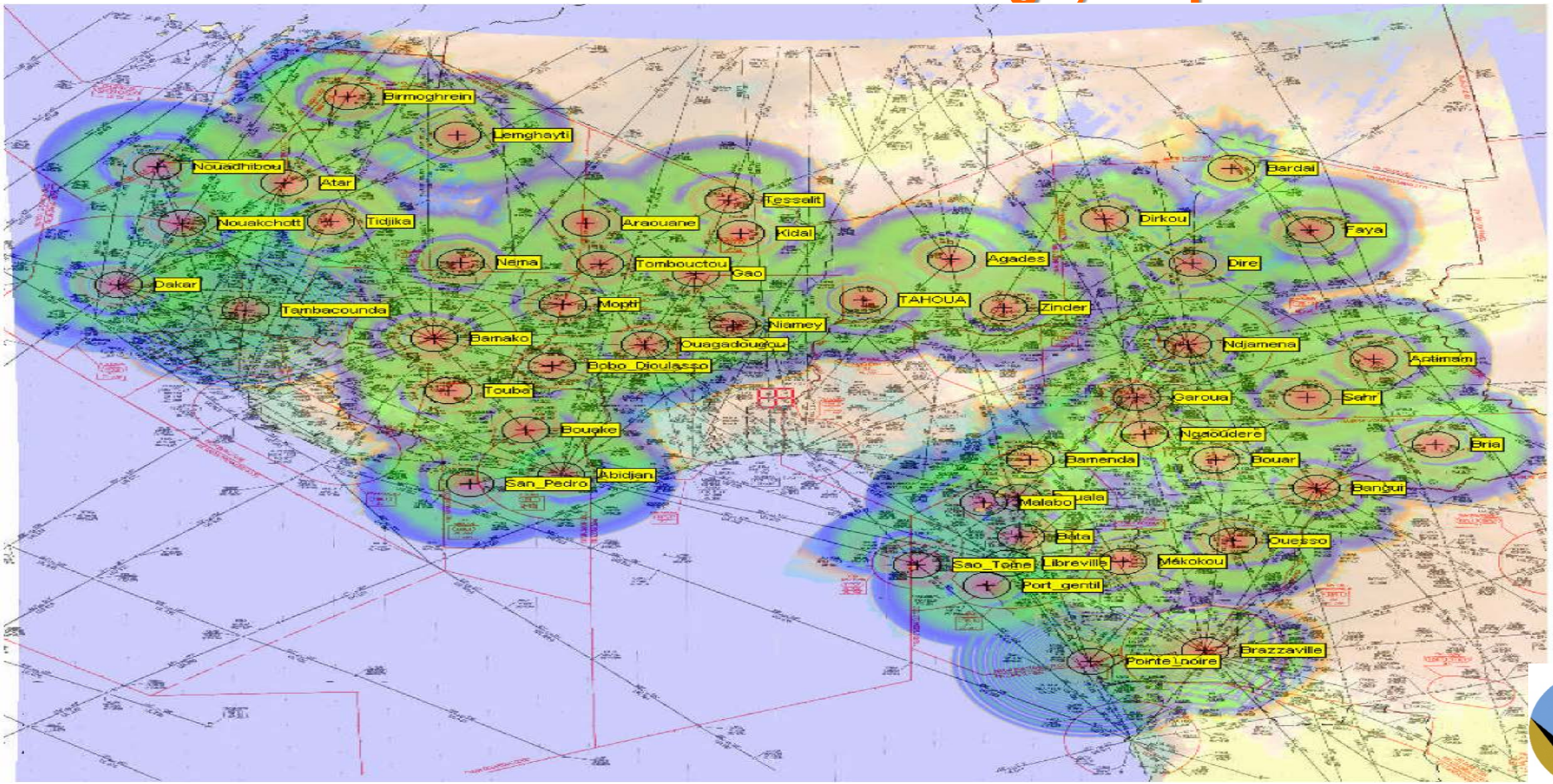


Control Center



Remote VHF Station

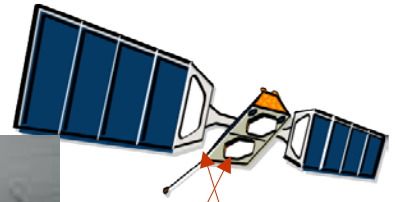
Extend VHF coverage, map



ASECNA VHF for Data Link

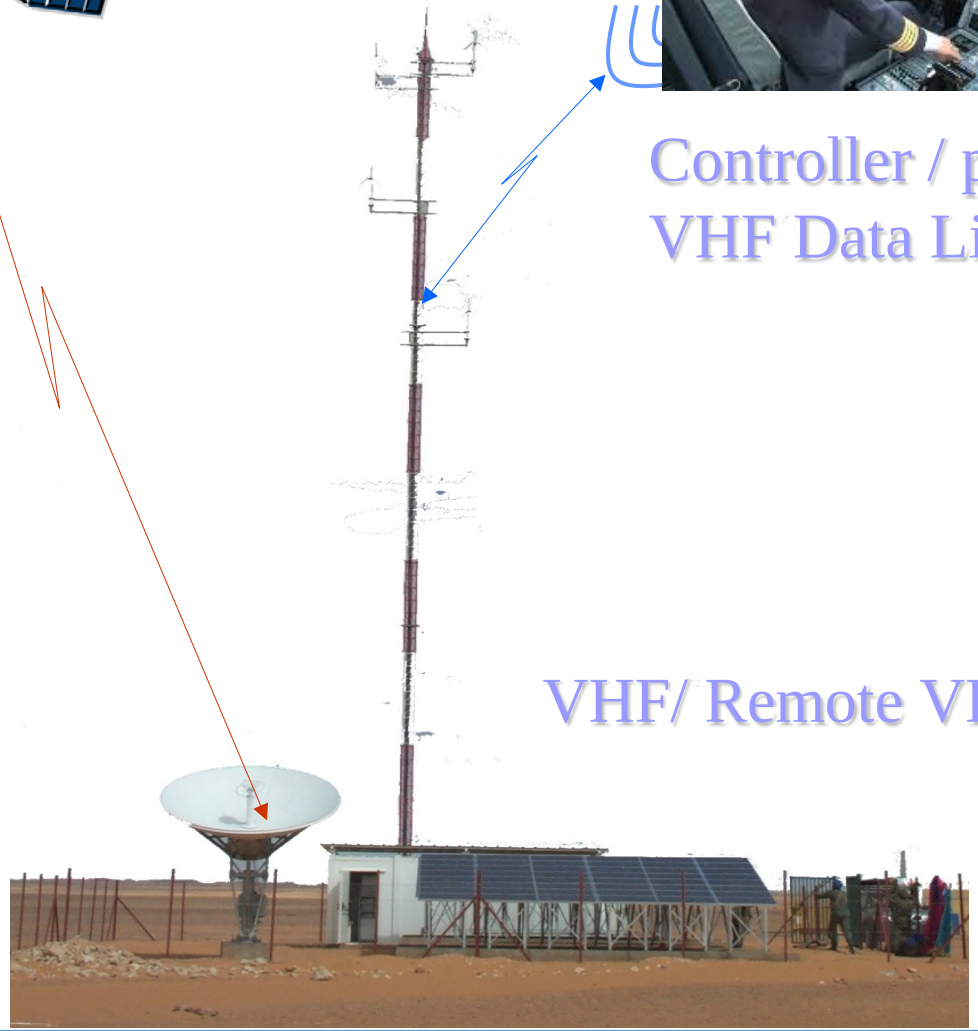
VHF Type and Provider	VDL features	QUANTITY
EM-9000 AC series , Telerad	Yes for mode 2	230
RE-9000 AC series , Telerad	Yes for mode 2	230
BNS – series Telerad	Yes for mode 2	115
Antennas GLP	250 NM for range	230
VSAT / SATCOM Infrastructure		81

VDL-2 Application

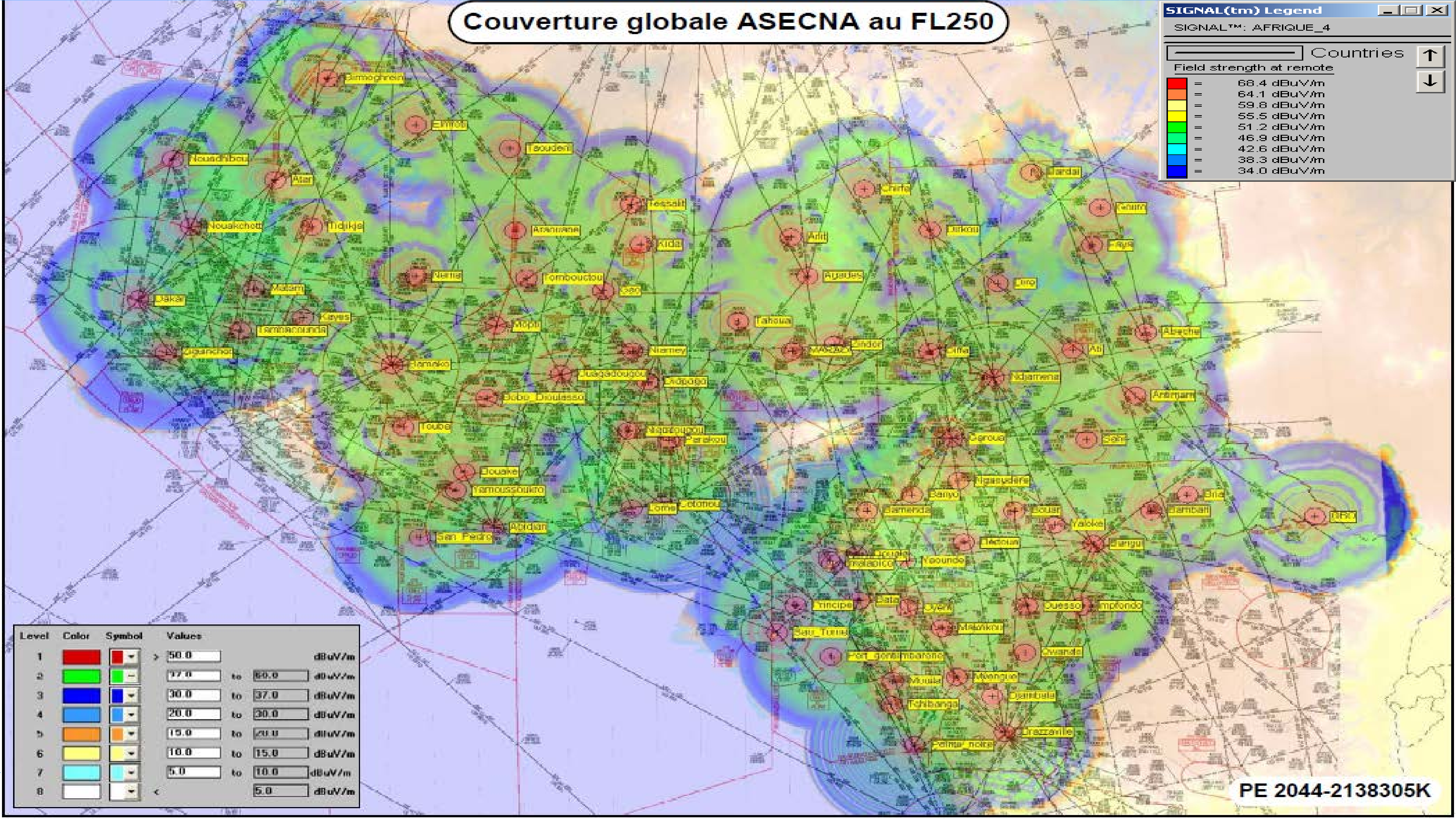


Controller / pilote
VHF Data Link (VDL)

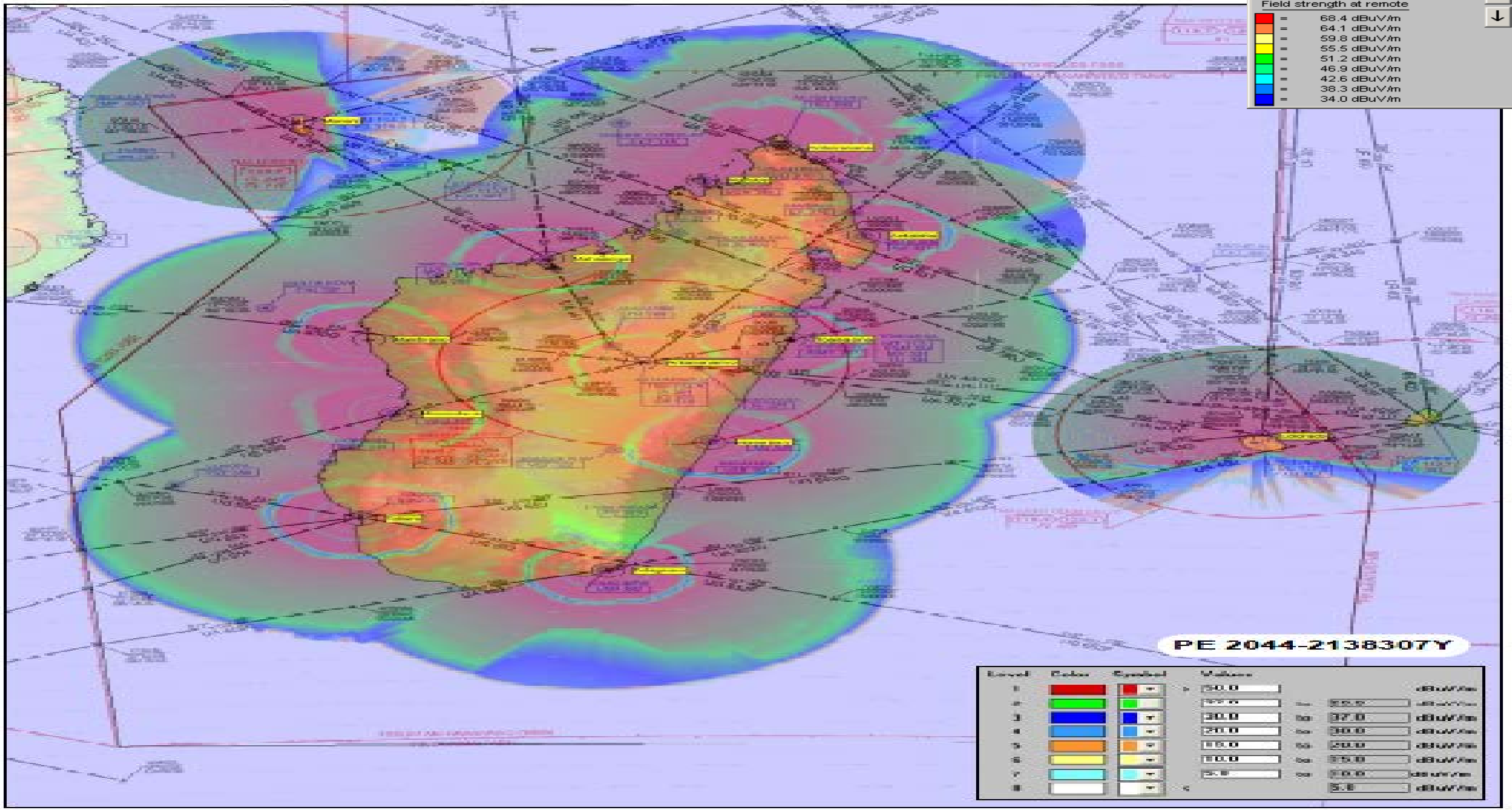
Control Center



VHF/ Remote VHF Station


Couverture globale ASECNA au FL250
SIGNAL(tm) Legend
SIGNAL™: AFRIQUE_4
Countries
Field strength at remote
= 68.4 dBuV/m
= 64.1 dBuV/m
= 59.8 dBuV/m
= 55.5 dBuV/m
= 51.2 dBuV/m
= 46.9 dBuV/m
= 42.6 dBuV/m
= 38.3 dBuV/m
= 34.0 dBuV/m
Nouadhibou
Atar
Nouakchott
Tidjikja
Taoudeni
Tessalit
Kidal
Tombouctou
Gao
Nema
Dakar
Kayes
Tambacounda
Ziguinchor
Bamako
Mopti
Niamey
Ouagadougou
Bobo_Dioulasso
Agades
Tahoua
Zinder
Diffa
Ndjamena
Abeche
Ati
Faya
Zouar
Bardai
Dirkou
Arlit
Garoua
Sarh
Ngaoundere
Bamenda
Banyo
Douala
Yaounde
Bangui
Bambari
Yaloke
Berberati
Parakou
Cotonou
Lome
Abidjan
San_Pedro
Yamoussoukro
Bouake
Principe
Sao_Tome
Port_gentil
Ouesso
Impfondo
Mouila
Tchibanga
Djambala
Makokou
Brazzaville
Pointe_noire
Level
Color
Symbol
Values
1
2
3
4
5
6
7
8
> 50.0 dBuV/m
37.0 to 50.0 dBuV/m
30.0 to 37.0 dBuV/m
20.0 to 30.0 dBuV/m
15.0 to 20.0 dBuV/m
10.0 to 15.0 dBuV/m
5.0 to 10.0 dBuV/m
< 5.0 dBuV/m
PE 2044-2138305K

Couverture Madagascar ASECNA au FL250 avec le site Colorado



Thank you for your attention

See You Soon !