INTERNATIONAL CIVIL AVIATION ORGANIZATION

SIXTH MEETING OF THE APIRG COMMUNICATIONS SUB-GROUP (COM/SG/6)

(Nairobi, 24 - 26 September 2002)

Agenda Item 4 : Aeronautical fixed service (AFS)

4.1 : Review of performance and implementation of the aeronautical fixed telecommunication network (AFTN) in the AFI Region, identification of deficiencies and remedial action for their elimination.

SUMMARY

This paper reviews the implementation status of AFTN circuits and their performances, identifies deficiencies and remedial solutions for their elimination.

Action by the meeting is at paragraph 3.

References :

- APIRG/13 - Report
- COM/SG/5 – Report
- COM/SG/6 – WP/5

1. Introduction

1.1 At its last meeting (COM/SG/5) held in Dakar, Senegal from 3 to 6 October 2000, the Communications Sub – group noted that very low progress was made in the implementation of AFTN circuits since APIRG/12 meeting (Tunis, 25-29 June 1999). This paper reviews the current implementation status and the performance of the ATFN in the AFI Region, and identifies deficiencies and remedial measures for their elimination.

2. Discussion

Review of AFTN performance

2.1 WP/5 of this meeting review in detail AFTN performance in the critical analysis which was carried out by the ATN planning task force.

2.2 This paper addresses some aspects of the requirements, based on agreed implementation criteria in terms of technology, transmission speed and circuit control protocols as shown in **Appendix A** to this paper.

Technology

2.3 **Appendix A** shows the level of digitalisation of AFTN in the AFI Region. 29 out of a total of 65 circuits (or 44,3%) are digital circuits, the rest of the circuits still being analogue circuits, thus limiting possibilities of upgrading the transmission speed for some circuits and implementing error check procedures on these circuits.

Transmission speed

2.4 The requirement for a minimum transmission speed of 1200 bits/s is met by the following operational circuits :

Table 2.1

Main circuits	Tributary circuits
1) Addis Ababa/Nairobi 2) Addis Ababa/Niamey 3) Addis Ababa/Djeddah (AFI/MID) 4) Alger/Casablanca 5) Cairo/Nairobi 6) Cairo/Tunis 7) Casablanca/Dakar 8) Johannesburg/Nairobi 9) Nairobi/Mumbai (AFI/ASIA-PAC)	1) Accra/Cotonou 2) Accra/Lome 3) Accra/Niamey 4) Brazzaville/Kinshasa 5) Cairo/Khartoum 6) Cairo/Nairobi 7) Cairo/Tunis 8) Casablanca/Las Palmas 9) Cotonou/Lagos 10) Dakar/Banjul 11) Kano/Lagos 12) Nairobi/Dar-Es-Salaam 13) Nairobi/Entebbe 14) Nairobi/Maurice 15) Nairobi/Mogadishu 16) Nairobi/Seychelles 17) Niamey/Kano

2.5 So far, this requirement of a minimum transmission speed of 1200 bits/s is not applicable to tributary and secondary circuits. The meeting may wish to consider extending the requirement to such circuits in order to increase AFTN global efficiency (WP/5 refers).

Protocols

2.6 The APIRG requested States to progressively implement bit-oriented protocols (BOPs) at their main centres in order to improve data integrity and prepare the migration towards ATN.

2.7 Table 2.2 (page 3) contains the list of AFTN main centres and main circuits using/not using bit-oriented protocols (X.25 or X.25 CIDIN).

Implementation status

2.8 A review of the implementation status of AFTN circuits since COM/SG/5 shows that very few progress has been made so far. Any of the AFTN main circuits yet to be implemented has been achieved, with the exception of the circuit Dakar/Johannesburg (implemented in 1999), the inclusion of which in the AFI Plan was adopted by APIRG/13. The following main circuits are yet to be implemented :

- Alger/Niamey
- Brazzaville/Johannesburg
- Brazzaville/Nairobi

Table 2.2

Main centres with BOPs	Main circuits with BOPs	Main centres without BOPs	Main circuits without BOPs
• Brazzaville • Cairo • Dakar • Niamey • Tunis	• Brazzaville/Dakar • Brazzaville/Niamey • Cairo/Athens (AFI/EUR) • Cairo/Beyrouth (AFI/MID) • Cairo/Djeddah (AFI/MID) • Dakar/Niamey • Tunis/Rome (AFI/EUR)	• Addis Ababa • Alger • Casablanca • Johannesburg • Nairobi	• Addis Ababa/Djeddah (AFI/MID) • Nairobi • Addis Ababa/Niamey • Alger/Bordeaux (AFI/EUR) • Alger/Casablanca • Alger/Tunis • Cairo/Nairobi • Cairo/Tunis • Casablanca/Dakar • Casablanca/Madrid (AFI/EUR) • Dakar/Johannesburg • Johannesburg/Nairobi • Nairobi/Mumbai (AFI/ASIAPAC)
Total : 5 centres (50%)	Total : 7 circuits (35%) of which 4 intra-regional circuits (20%)	Total : 5 centres (50%)	Total : 13 circuits (65%)

2.9 Johannesburg/SAM and Johannesburg/ASIPAC[1] entry/exit circuits are not yet implemented.

2.10 17 AFTN circuits in total are yet to be implemented.

[1]Pending its implementation, the circuit Mauritius/Brisbane provides for the link between AFI and ASIA/PAC regions.

Identification of deficiencies

2.11 The list of deficiencies affecting AFTN circuits has been updated by the Secretariat based on available data. The updated list is shown at **Appendix B** to this paper.

2.12 These deficiencies comprise AFI ANP unimplemented requirements and low performance and discontinued circuits.

Remedial actions

2.13 Studies are being carried out by States on the use of satellite technology by resorting to existing or emerging VSAT networks (AFISNET, SADC, CAFSAT, NAFISAT). Solutions include participation of States concerned in existing or planned VSAT networks, their interconnection or their interoperability in the long term.

2.14 When available, public data networks (PDN) and integrated services data networks (ISDN) are also being considered as possible solutions which are described in detail in WP/5.

3. Action by the Communications Sub - group

3.1 The Communications Sub – group is invited to:

a) Take note of the information provided in this paper;
b) Review and update **Appendices A** and **B** ;
c) Urge States involved in deficiencies to endeavour to implement available solutions as a matter of urgency for their elimination; and
d) Formulate any other conclusion aiming at improving AFTN efficiency in the AFI Region.

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APPENDIX A

AFI Rationalized AFTN – Implementation requirements/RSFTA rationalisé – Besoins de mise en oeuvre

Explanation of the table
Explication du tableau

Col. N° Explanations

1 Terminal I and Terminal II. Each circuit appears once in the Table./*Terminal I et Terminal II. Chaque circuit n'apparaît qu'une fois dans le Tableau*

2 Category of circuit/*Catégorie de circuit*:

- M - main circuit/*circuit principal*
- T - tributary circuit/*circuit tributaire*
- S - AFTN station circuit/*circuit de station RSFTA*

3 and 8 Circuit type/*Type de circuit*:

- NIL - not implemented/*Non mis en oeuvre*
- LTT/A - landline teletypewriter, analogue (eg cable, microwave/*circuit télétype terrestre, analogue (i.e. câble, faisceau hertzien)*
- LTT/D - landline teletypewriter, digital (eg cable, microwave/*circuit télétype terrestre, numérique (i.e. câble, faisceau hertzien)*
- LDD/A - landline data circuit, analogue (eg cable, microwave/*circuit de données terrestre, analogue (i.e. câble, faisceau hertzien)*
- LDD/D- landline data circuit, digital (eg cable, microwave/*circuit de données terrestre, numérique (i.e. câble, faisceau hertzien)*
- RTT - radio teletype circuit (HF)/*circuit radiotélétype (HF)*
- SAT/A/D- satellite circuit /a digital or/d digital/*circuit par satellite /a analogue ou /d numérique*

4 and 9 Circuit signalling speed/ *Vitesse demodulation du circuit*

5 and 10 Circuit protocol / *Protocol de circuit*

- NONE: No protocol/*Aucun protocol*
- X.25: ITU X.25 protocol/*Protocol X.25 de l'UIT*

6 and 11 Data transfer code (syntax)

- ITA-2: International Telegragh Alphabet N°2/*Alphabet international N°2*
- IA-5: International Alphabet N°5/*Alphabet international N°5*
- CBI: Code and byte independent (ATN compliant) /*Indépendant des codes et multiplets (compatible ATN)*

7 and 12 Aeronautical network served (AFTN or ATN)/*Réseau aéronautique desservi (RSFTA ou ATN)*

13 Implementation target date/*Date cible pour la mise en oeuvre*

14 Remarks/*Observations*

APPENDIX A

Terminal I/ Terminal II	Circ. Cat./ Caté. de circ.	Current/Existant					Planned/Prévu					Target Implem. date / Date de mise en oeuvre	Remarks/ Observations
		Circuit type/ Type de circuit	Modulation rate/ Rapidité de modulation (bps)	Prot.	Code	Network/ Réseau	Circuit type/ Type de circuit	Minimum Modulation rate/ Rapidité de modulation bps	Prot.	Code	Network / Réseau		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
ADDIS ABABA													Addis centre can accommodate X25
Asmara	T	NIL					SAT	1200	X25	ITA2	AFTN		NAFISAT
Djibouti	T	RTT	50	NONE	ITA-2	AFTN	SAT	1200	X25	ITA-2	AFTN		NAFISAT
Khartoum	T	NIL					SAT/D	1200	X25	ITA-2	AFTN		NAFISAT
Nairobi	M	SAT/A/	50	NONE	ITA-2	AFTN	SAT/D	1200	X25	IA-5	AFTN		ISDN to explore
Niamey	M	SAT/A	50	TTY	ITA-2	AFTN	SAT/D	1200	X25	IA-5	AFTN		
MID(Jeddah)	M	SAT/A	50	A	ITA-2	AFTN	SAT/A	1200	X.25	IA-5	AFTN		ISDN to explore

ALGER													
Casablanca	M	SAT/A	50	NONE	ITA-2	AFTN	LTT/A	1200	X.25	IA-5	AFTN		
Niamey	M	NIL				AFTN	LTT	1200	X.25	IA-5	AFTN		
Tunis	M	SAT/A	1200	A	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		
EUR (Bordeaux)	M	SAT/A	1200	A	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		

BRAZZAVILLE													
Bangui	T	SAT/D	1200	X.25	ITA-2	AFTN	SAT/D	1200	X25	ITA-2	AFTN		
Dakar	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X-25	IA-5	AFTN		
Douala	T	SAT/D	1200	X.25	ITA-2	AFTN	SAT/D	1200	X.25	ITA-2	AFTN		
Kinshasa	T	MW/V	50	V.24	ITA-2	AFTN	LTT/D	50	TTY	ITA-2	AFTN		
Johannesburg	M	NIL					SAT/D	1200	X.25	IA-5	AFTN		
Libreville	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Luanda	T	NIL					SAT/D	1200	X.25	ITA-2	AFTN		
Nairobi	M	NIL					SAT/D	1200	X.25	ITA-2	AFTN		Nairobi/Dakar/brazzaville
N:Djamena	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Niamey	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Sao Tome	T	NIL				AFTN	SAT/D	1200	X.25	ITA-2	AFTN		

CAIRO													
Khartoum	T	SAT/A	50	TTY	ITA-2	AFTN	SAT/D	300	TTY	ITA-2	AFTN		To coordinate with Khartoum
Nairobi	M	SAT SAT/A	50	TTY	ITA-2	AFTN	SAT/D	1200	X.25	IA-5 IA-5	AFTN		9600 bps proposed by Egypt
Tunis	M	SAT/A	100	NONE	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		CIDIN
EUR(Athens)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
MID(Beirut)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
MID(Jeddah)	M	SAT/D	9600	CIDIN	IA-5	AFTN	SAT/D	9600	CIDIN	IA-5	AFTN		
CASABLANCA													
Dakar	M	LTT/A	2X75		ITA-2	AFTN	SAT/D	2400	V24/FR	IA-5	AFTN		
Las Palmas	T	LTT/A	50		ITA-2	AFTN	LTT/A	50	CIDIN	IA-5	AFTN		
EUR(Madrid)	M	SAT/A	50+1X200		IA-5	AFTN	SAT/A	9000	CIDN	IA-5	AFTN		
DAKAR													
Abidjan	T	SAT/D	2400	X-25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Bamako	T	SAT/D	2400	X-25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Banjul	T	LLT	75	TTY	ITA-2	AFTN	LTT/D	2400	X.25	ITA-2	AFTN		
Bissau	T	NIL					SAT/D	2400	X-25	ITA-2	AFTN		
Johannesburg	M	LTT	2400	V-24	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Niamey	M	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		

Nouakchott	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Conakry (Robertsfiield)	T	SAT	2400	V-24	IA-5	AFTN	SAT/D	2400	V24	IA-5	AFTN		
Sal	T	SAT/D	2400	V.24	IA-5	AFTN	SAT/D	2400	X-25	IA-5	AFTN		
SAM(RIO)	M	SAT	2400	V24	IA-5	AFTN	SAT/D	2400	V.24	IA-5	AFTN		
JOHANNES-BURG													X25 planned/ IA-5 capable
Antananarivo	T	NIL				AFTN	SAT/D	1200	V.24	IA-5	AFTN		
Beira	T	SAT/D	1200	TTY	ITA-2	AFTN	SAT/D	1200	TTY	ITA-2	AFTN		
Bujumbura	T	NIL					SAT/D	1200	TTY	ITA-2	AFTN		VSAT planned
Gaborone	T	SAT/D	1200	TTY	ITA-2	AFTN	SAT/D	1200	TTY A	ITA-2	AFTN		
Harare	T	SAT/D	1200	TTY A	ITA-2	AFTN	SAT/D	1200	A	ITA-2	AFTN		
Kigali	T	NIL					SAT/D	1200	TTY	ITA-2	AFTN		
Lilongwe	T	SAT/D	1200	TTY A	ITA-2	AFTN	SAT/D	1200	TTY A	ITA-2	AFTN		
Lusaka	T	SAT/D	1200	TTY A	ITA-2	AFTN	SAT/D	1200	TTY A	ITA-2	AFTN		
Maputo	T	SAT/D	1200	TTY A	ITA-2	AFTN	SAT/D	1200	TTY A	ITA-2	AFTN		
Maseru	T	SAT/D	1200	TTY	ITA-2	AFTN	SAT/D	1200	TTY	ITA-2	AFTN		
Manzini	T	LTT/A	1200	TTY	ITA-2	AFTN	SAT/D	1200	TTY A	ITA-2	AFTN		

Nairobi	M	LTT/A	50	TTY A	ITA-2	AFTN	SAT/D	1200	X.25	ITA-2	AFTN		
Windhoek	T	SAT/D	1200	TTY	ITA-2	AFTN	SAT/D	1200	NONE	ITA-2	AFTN		
ASIA/PAC (Brisbane)	M	NIL					SAT/D	1200	X.25 A	IA-5	AFTN		
SAM (Buenos Aeres)	M	NIL					SAT/D	1200	X.25	IA-5	AFTN		
NAIROBI													
Dar es Salaam	T	LTT/A	50	NONE	ITA-2	AFTN	LTT/A	50	NONE	ITA-2	AFTN		
Entebbe	T	LTT/A	50	A	ITA-2	AFTN	LTT/A	50	A	ITA-2	AFTN		
Mauritius	T	SAT/A	50	A	ITA-2	AFTN	SAT/A	50	A	ITA-2	AFTN		
Mogadishu	T	NIL		A		AFTN	SAT/A	50	A	ITA-2	AFTN		SITA
Seychelles	T	SAT/A	50	A	ITA-2	AFTN	SAT/A	50	NONE	ITA-2	AFTN		
ASIA (Mumbai)	M	LTT/A	50	A	ITA-2	AFTN	LTT/A	1200	X.25	ITA-2	AFTN		
NIAMEY													
Accra	T	SAT/A	50	TTY	ITA-2	AFTN	SAT/D	2400	X.25	IA-5	AFTN		ACCRA X25 TBC
Kano	T	SAT/D	50	A	ITA-2	AFTN	SAT/D	2400	X25	IA-5	AFTN		
N'Djamena	T	SAT/D	2400	X.25	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Ouagadougou	T	SAT/D	2400	X25	IA-5	AFTN	SAT/D	2400	X25	IA-5	AFTN		
TUNIS													
Tripoli	T	LTT/A	50	NONE	ITA-2	AFTN	LTT/A	50	NONE	ITA-2	AFTN		TBC with TUNIS

EUR(Rome)	M	SAT/A	1200	X-25		AFTN	SAT/A	1200	X.25	ITA-2	AFTN		
ACCRA													
Cotonou	S	LTT/A	50	NONE	ITA-2	AFTN	LTT/A	2400	X25	IA-5	AFTN		
Lome	S	LTT/A	50	A	ITA-2	AFTN	LTT/A	2400	X25	IA-5	AFTN		
ANTANA-NARIVO													
Dzaoudzi	S	SAT/D	2400	V24	IA-5	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
Mauritius	T	SAT/D	2400	V24	IA-5	AFTN	SAT/D	2400	V24	IA-5	AFTN		
Moroni	S	SAT/D	2400	V.24	IA-5	AFTN	SAT/D	2400	V24	IA-5	AFTN		
DOUALA													
Malabo	S	SAT/D	1200	X25	IA-5	AFTN	SAT/D	1200	X.25	IA-5	AFTN		
KANO													
Lagos	S	SAT/A	50	NONE	ITA-2	AFTN	SAT/D	2400	X25	IA-5	AFTN		

LAGOS													
Cotonou	S	LTT/A	50	NONE	ITA-2	AFTN	SAT/D	2400	X.25	IA-5	AFTN		
MAURITIUS													
Saint Denis	S	SAT/D	2400	V24	IA-5	AFTN	SAT/A	2400	V24	IA-5	AFTN		
ASIA/PAC (Brisbane)	T	SAT/A	50	A	ITA-2	AFTN							To maintain until operation of J'Burg /ASIA/PAC
Johannesburg	T	SAT/D	1200	TTY	ITA-2	AFTN	SAT/D	1200	X.25	IA-5	AFTN		
Conakry													
Robertsfield	S	SAT/D	1200	X25	IA-5	AFTN	SAT/D	1200	X25	IA-5	AFTN		
Freetown	S	SAT/D	1200	X25	IA-5	AFTN	SAT/D	1200	X25	IA-5	AFTN		

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APPENDIX B

Deficiencies AFTN

StateName	*Requirements*	*Facilities or Services*	*Description of Deficiency*	*Date first reported*	*Comments on Deficiency*	*Description of Corrective action*	*Executing Body*	*Target date for implementation*	*Priority*
Algeria									
	AFTN Plan, AFI Rec. 9/7	Algiers AFTN Centre	Main circuit Algiers/Niamey	1998	Unreliable	VSAT being implemented	Algeria, ASECNA	2002	U
Angola									
	AFTN Plan, AFI Rec. 9/7	Luanda AFTN centre	Circuit Luanda/Brazzaville	1998	Not implemented	To implement VSAT	Angola, ASECNA		U
Burundi									
	AFTN Plan, AFI Rec. 9/7	Bujumbura AFTN Centre	Circuit Bujumbura/Johannesburg	2002	Not implemented	VSAT under consideration	Burundi, South Africa		U
Comoros									
	AFTN Plan, AFI Rec. 9/7	Dzaoudzi AFTN centre	Circuit Dzaoudzi/Antananarivo	1996	Not implemented	Implement LTT circuit	Comoros, ASECNA		A
Congo									
	AFTN Plan, AFI Rec. 9/7	Brazzaville AFTN centre	Circuit Brazzaville/Luanda	1998	Not implemented	To implement VSAT	ASECNA, Angola		A
	AFTN Plan, AFI Rec. 9/7	Brazzaville AFTN centre	Main circuit Brazzaville/Johannesburg	1998	All traffic to/from Southern Africa is hindered	The two States have agreed to interconnect the ASECNA and SADC VSAT networks	ASECNA, South Africa		U
	AFTN Plan, AFI Rec. 9/7	Brazzaville AFTN centre	Main circuit Brazzaville/Nairobi	1998	VSAT circuit and 50-baud leased circuit being	To implement the circuit	ASECNA, Kenya		U

StateName	Requirements	Facilities or Services	Description of Deficiency	Date first reported	Comments on Deficiency	Description of Corrective action	Executing Body	Target date for implementation	Priority
	AFTN Plan, AFI Rec. 9/7	Brazzaville AFTN centre	Circuit Brazzaville/Sao Tome	1998	VSAT planned	To implement the circuit	ASECNA, Sao Tome & Principe		U
Djibouti									
	AFTN Plan, AFI Rec. 9/7	Djibouti AFTN centre	Circuit Djibouti/Addis Ababa	2002	Unserviceable	To repair and upgrade. Modem available in Djibouti as well as new automatic switching centre	Djibouti, Ethiopia	28/11/2002	U
Equatorial Guinea									
	AFTN Plan, AFI Rec. 9/7	Malabo AFTN centre	Circuit Malabo/Bata	2001	Bata has no AFTN connection	To implement circuit	ASECNA	2003	U
Eritrea									
	AFTN Plan, AFI Rec. 9/7	Asmara AFTN centre	Circuit Asmara/Addis Ababa	1998	The circuit has been disconnected	To be restored	Eritrea, Ethiopia	28/11/2002	U
Ethiopia									
	AFTN Plan, AFI Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Djibouti	2002	Unserviceable	To repair and upgrade. Modem available in Djibouti as well as new automatic switching centre	Ethiopia, Djibouti	28/11/2002	U
	AFTN Plan, AFI Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Asmara	1998	This circuit has been disconnected	To be restored	Ethiopia, Eritrea	28/11/2002	U
	AFTN Plan, AFI Rec. 9/7	Addis Ababa AFTN centre	Circuit Addis Ababa/Khartoum	1996	Not implemented	VSAT NAFISAT in project	Ethiopia, Sudan		A
Guinea Bissau									
	AFTN Plan, AFI Rec. 9/7	Bissau AFTN centre	Circuit Bissau/Dakar	1998	Not implemented	Implement LTT circuit	ASECNA, Guinea Bissau		U

StateName	Requirements	Facilities or Services	Description of Deficiency	Date first reported	Comments on Deficiency	Description of Corrective action	Executing Body	Target date for implementation	Priority
Kenya									
	AFTN Plan, AFI Rec. 9/7	Nairobi AFTN centre	Main circuit Nairobi/Brazzaville	1998	VSAT circuit and 50-baud leased circuit being	To implement the circuit	Kenya, ASECNA		U
Madagascar									
	AFTN Plan, AFI Rec. 9/7	Antananarivo AFTN centre	Circuit Antananarivo/Dzaoudzi	1996	Not implemented	Implement LTT circuit	ASECNA, Comoros		A
	AFTN Plan, AFI Rec. 9/7	Antananarivo AFTN centre	Circuit Antananarivo/Johannesburg	2002	Not implemented	Interconnection VSAT ASECNA & SADC	ASECNA, South Africa		U
Niger									
	AFTN Plan, AFI Rec. 9/7	Niamey AFTN centre	Main circuit Niamey/Algiers	1998	Unreliable	VSAT being implemented	ASECNA, Algeria	2002	U
Rwanda									
	AFTN Plan, AFI Rec. 9/7	Kigali AFTN centre	Circuit Kigali/Johannesburg	2002	Not implemented	VSAT circuit in project	Rwanda, South Africa		U
Sao Tome & Principe									
	AFTN Plan, AFI Rec. 9/7	Sao Tome AFTN centre	Circuit Sao Tome/Brazzaville	1998	VSAT planned	Implement the circuit	Sao Tome & Principe, ASECNA		U
Senegal									
	AFTN Plan, AFI Rec. 9/7	Dakar AFTN centre	Circuit Dakar/Bissau	1998	Not implemented	Implement LTT circuit	ASECNA, Guinea Bissau		U

South Africa

StateName	Requirements	Facilities or Services	Description of Deficiency	Date first reported	Comments on Deficiency	Description of Corrective action	Executing Body	Target date for implementation	Priority
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Main circuit Johannesburg/Brazzaville	1998	All traffic to/from Southern Africa is hindered	The two States have agreed to interconnect the ASECNA and SADC VSAT networks	South Africa, ASECNA		U
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Inter-regional circuit Johannesburg/SAM (Buenos Aires)	1996	Not implemented	Implement LTT circuit	South Africa, Argentina		U
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Inter-regional circuit Johannesburg/ASIA/PAC (Australia)	2002	Not implemented	Implement LTT circuit	South Africa, Australia		U
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Circuit Johannesburg/Antananarivo	2002	Not implemented	Interconnection VSAT ASECNA & SADC	South Africa, ASECNA		U
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Circuit Johannesburg/Bujumbura	2002	Not implemented	VSAT under consideration	South Africa, Burundi		U
	AFTN Plan, AFI Rec. 9/7	Johannesburg AFTN centre	Circuit Johannesburg/Kigali	2002	Not implemented	VSAT circuit in project	South Africa, Rwanda		U
Sudan									
	AFTN Plan, AFI Rec. 9/7	Khartoum AFTN centre	Circuit Khartoum/Addis Ababa	1996	Not implemented	VSAT NAFISAT in project	Ethiopia, Sudan		A