AFRICA-INDIAN OCEAN REGION (AFI) - AIR NAVIGATION PLAN

VOLUME II

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AFI ANP, VOLUME II

PART 0 – INTRODUCTION

1. GENERAL

1.1 The background to the publication of ANPs in three volumes is explained in the Introduction in Volume I. The procedure for amendment of Volume II is also described in Volume I.

1.2 Volume II contains dynamic plan elements related to:

a) the assignment of responsibilities to States for the provision of aerodrome and air navigation facilities and services; and

b) the mandatory requirements related to aerodrome and air navigation facilities and services to be implemented by States in accordance with regional air navigation agreements.

1.3 Volume II does not list all facilities in the region(s) but only those required for international civil aviation operations in accordance with regional air navigation agreements. A regional air navigation agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified. Documents from the Integrated Aeronautical Information Package and other publications should be consulted for information on additional facilities and for operational information in general. Detailed guidance material or concepts, complementary to the material in Volumes I, II and III are contained in documents that are referenced as AFI Documents.

2. MANAGEMENT OF REGIONAL AIR NAVIGATION PLANS

2.1 The elements in Volume II are reviewed by the Africa-Indian Ocean Planning and Implementation Regional Group (APIRG) in accordance with its schedule of meetings, in consultation with provider and user States, and with the assistance of the ICAO ESAF and WACAF Regional Offices.

2.2 The information on States' facilities and services included in Volume II, should be updated following the process of regional air navigation agreements.

2.3 The development and maintenance of region-specific documents that provide detailed guidance material or concepts that are complementary to the material in Volumes I, II and III is the responsibility of the APIRG.

AFI ANP, VOLUME II

PART I – GENERAL PLANNING ASPECTS (GEN)

1. INTRODUCTION

1.1 The material in this part of Volume II of the AFI ANP is applicable to one or more parts of the ANP. It should be taken into consideration in the overall planning process for the AFI Region.

2. GENERAL REGIONAL REQUIREMENTS

2.1 To facilitate air navigation systems planning and implementation, homogenous ATM areas and/or major traffic flows/routing areas have been defined for the Region(s). While these areas of routing do not encompass all movements in the Region, they include the major routes. This includes the domestic flights in that particular area of routing.

Homogeneous ATM area

2.2 A homogeneous ATM area is an airspace with a common ATM interest, based on similar characteristics of traffic density, complexity, air navigation system infrastructure requirements or other specified considerations. In such an ATM area a common detailed plan will foster the implementation of interoperable ATM systems. Homogeneous ATM areas may extend over States, specific portions of States, or groupings of States. They may also extend over large oceanic and continental areas. They are considered areas of shared interest and requirements.

2.3 The method of identifying homogeneous ATM areas involves consideration of the varying degrees of complexity and diversity of the worldwide air navigation infrastructure. Based on these considerations, planning could best be achieved at the global level if it was organized based on ATM areas of common requirements and interest, taking into account traffic density and the level of sophistication required.

Major traffic flows/routing areas

2.4 A major traffic flow refers to a concentration of significant volumes of air traffic on the same or proximate flight trajectories. Major traffic flows may cross several homogeneous ATM areas with different characteristics.

2.5 A routing area encompasses one or more major traffic flows, defined for the purpose of developing a detailed plan for the implementation of ATM systems and procedures. A routing area may cross several homogeneous ATM areas with different characteristics. A routing area specifies common interests and requirements of underlying homogeneous areas, for which a detailed plan for the implementation of ATM systems and procedures either for airspace or aircraft will be specified.

2.6 The homogeneous ATM areas and major traffic flows/routing areas identified are given in **Table GEN II-1**.

TABLE GEN II-1 – HOMOGENEOUS AREAS AND MAJOR TRAFFIC FLOWS IDENTIFIED IN THE AFI REGION

EXPLANATION OF THE TABLE

Column		
1	Area of routing (AR)	Sequential number of area of routing
2	Homogeneous Areas and/or Traffic flows	Brief description and/or name
3	FIRs involved	List of FIRs concerned
4	Type of area covered	Brief description of type of area, examples: Oceanic or Continental High or low density Oceanic en-route or Continental en-route
5	Remarks	Homogeneous ATM Area and/or Major Traffic Flow and Region(s) concerned

Area of routing (AR)	**Homogeneous Areas and/or Traffic flows**	**FIRs involved**	**Type of area covered**	**Remarks**
1	**2**	**3**	**4**	**5**
AR1	Europe – South America (EUR/SAM) (oceanic)	Dakar Oceanic, Sal Oceanic	Oceanic en-route low density in southern part and oceanic high density in northern part	Major traffic flow EUR//SAM
AR2	Atlantic Ocean interface between the AFI, NAT and SAM Regions	Accra, Dakar, Johannesburg Oceanic Luanda, Sal	Oceanic en-route low density	Homogeneous ATM area AFI/NAT/SAM
AR3	Europe – Eastern Africa routes Including the area of the Indian Ocean	Addis Ababa Antananarivo, Asmara, Dar-es-Salaam, Entebbe, Khartoum, Mauritius, Mogadishu, Nairobi, Seychelles	Continental en-route/ oceanic low density	Major traffic flow AFI/EUR
AR4	Europe to Southern Africa	Beira, Brazzaville, Cape Town, Gaborone, Harare, Johannesburg, Kano, Kinshasa, Lilongwe, Luanda, Lusaka, N'Djamena, Niamey, Windhoek	Continental en-route low density	Major traffic flow AFI/EUR
AR5	Continental Western Africa including coastal areas	Accra, Dakar, Kano, N'Djamena, Niamey, Roberts	Continental/oceanic low density	Homogeneous area AFI
AR6	Trans-Indian	Antananarivo, Bombay, Johannesburg Oceanic, Male, Mauritius, Melbourne, Seychelles	Continental high density	Homogeneous ATM area AFI/ASIA

AFI ANP, VOLUME II

PART II – AERODROMES / AERODROME OPERATIONS (AOP)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in ICAO Standards, Recommended Practices and Procedures (SARPs) related to aerodrome design and operations (AOP). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of AOP facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to AOP facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

2.1 Table AOP II-1 contains the list of facilities and services to be provided by the State concerned at each aerodrome that is listed in Table AOP I-1 in Volume I. Table AOP II-1 shows the operational requirements at each aerodrome to be considered in planning the facilities and services for safe and efficient aircraft operations.

Visual aids for low visibility aerodrome operations

2.2 At aerodromes where there is a requirement to conduct low visibility operations, the appropriate visual and non-visual aids should be provided.

Non-precision approach aids

2.3 Where required by the topographic and/or environmental situation of an aerodrome, improved track guidance during departure and/or approach by specific non-visual and/or visual aids should be provided even if such aids would not normally be required in accordance with the SARPs.

Reduced runway declared distances for take-off

Note. — In the following operational requirements the term "intersection" is used to cover both intersection and junction concepts.

2.4 The reduced runway declared distances for take-off, as for those used for full runway declared distances, should consist of take-off run available (TORA), take-off distance available (TODA) and accelerate-stop distance available (ASDA).

2.5 The datum-line from which the reduced runway declared distances for take-off should be determined is defined by the intersection of the downwind edge of the specific taxiway with the runway edge. The loss, if any, of runway length due to alignment of the aircraft prior to take-off should be taken into account by the operators for the calculation of the aircraft's take-off weight.

2.6 Intersections used as intermediate take-off positions should be identified by the "taxiway designator" to which the datum-line of the associated reduced runway declared distance for take-off refers.

2.7 At each international aerodrome, specific minima visibility for take-off should be established, regulating the use of intersection take-off positions. These minima should permit the appropriate ATC unit to maintain a permanent surveillance of the ground movement operations, and the flight crews to constantly secure their position on the manoeuvring area, so as to exclude any potential risk of confusion as to the identification of the aircraft and intersections used for take-off. The minima should be consistent with the surface movement guidance and control system (SMGCS) provided at the aerodrome concerned.

2.8 The provision of marking and lighting aids together with signs should ensure the safe control and guidance of aircraft towards and at take-off intersections appropriate to the minima visibility criteria retained. At the runway holding position of the associated intersection take-off position, such signs should indicate the runway heading and the remaining TORA in metres.

2.9 At aerodromes regularly used by international commercial air transport, take-offs from runway/taxiway intersections may be justified for the following reasons:

a) runway capacity improvement;
b) taxi routes distances reduction;
c) noise alleviation; and
d) air pollution reduction.

2.10 The appropriate authorities should, upon prior consultation with aircraft operators, agree on the selection of suitable intermediate intersection take-off positions along the runway(s). Accordingly, authorities should determine the reduced runway declared distances for take-off associated with each selected intersection take-off position and establish the specific ATC rules and operational procedures/limitations. Such provisions should be published in the State aeronautical information publications (AIP).

Aerodrome capacity management

2.11 As an integral part of the air navigation system, the aerodrome should provide the needed ground infrastructure including, *inter alia*, lighting; taxiways; runway, including exits; aprons and precise surface guidance to improve safety and to maximize aerodrome capacity in all weather conditions. An efficient aerodrome capacity planning and management should include:

a) reduction of runway occupancy time;
b) the capability to safely manoeuvre in all weather conditions whilst maintaining capacity;
c) precise surface guidance to and from a runway required in all conditions; and
d) availability of information on the position (to an appropriate level of accuracy) and intent of all vehicles and aircraft operating on the movement area for the appropriate ATM community members.

2.12 States should ensure that adequate consultation and, where appropriate, cooperation between airport authorities and users/other involved parties are implemented at all international aerodromes to satisfy the provisions of aerodrome capacity assessment and requirement.

2.13 When international aerodromes are reaching designed operational capacity, a better and more efficient utilization of existing runways, taxiways and aprons is required. Runway selection procedures and standard taxi routes at aerodromes should ensure an optimum flow of air traffic with a minimum of delay and a maximum use of available capacity. They should also, if possible, take account of the need to keep taxiing times for arriving and departing aircraft as well as apron occupancy time to a minimum. The airport collaborative decision making (A-CDM) concept should be implemented to improve airport capacity as early as possible.

Aerodrome capacity assessment and requirement

2.14 The declared capacity/demand condition at aerodromes should be periodically reviewed in terms of a qualitative analysis for each system component and, when applicable, the result of the qualitative assessment upon mutual agreement be used for information.

2.15 The future capacity/demand, based on a forecast for the next five years, should be agreed upon after close cooperation between aerodrome authorities and affected users.

2.16 Operators should consult with aerodrome authorities when future plans indicate a significant increased requirement for capacity resulting in one of the elements reaching a limiting condition.

2.17 Aerodrome capacity should be assessed by aerodrome authorities in consultation with the parties involved for each component (terminal/apron/aircraft operations) using agreed methods and criteria for level of delays.

2.18 Where restrictions in aerodrome capacity are identified, a full range of options for their reduction or removal should be evaluated by the aerodrome authority, in close cooperation with the operators and other involved parties. Such options should include technical/operational/procedural and environmental improvements and facility expansion.

2.19 At many aerodromes, airspace capacity has influence on the aerodrome capacity. If the declared capacity of a specified airspace has influence on aerodrome operations, this should be indicated and action undertaken to reach a capacity in this airspace corresponding to the aerodrome capacity.

2.20 The possibility of overcoming capacity limitations should also take the use of other aerodromes in the vicinity into consideration.

Closure of regular aerodromes

2.21 When a regular aerodrome is to be closed, States should ensure that sufficient alternate aerodromes remain open to provide for the safety and efficiency of aircraft approaching the regular aerodrome that may be required to divert to an alternate.

Scheduling aerodrome maintenance

2.22 States, when planning major aerodrome maintenance work that would affect the regularity of international aircraft operations, should consider the need to notify aircraft operators sufficiently in advance prior to undertaking the scheduled work.

3. SPECIFIC REGIONAL REQUIREMENTS

None

TABLE AOP II-1 - REQUIREMENTS AND CAPACITY ASSESSMENT IN INTERNATIONAL AERODROMES IN THE AFI REGION

EXPLANATION OF THE TABLE

Column

1 Name of the city and aerodrome, preceded by the location indicator.

Note 1— When the aerodrome is located on an island and no particular city or town is served by the aerodrome, the name of the island is included instead of a city.

Designation of the aerodrome as:
RS — international scheduled air transport, regular use;
RNS — international non-scheduled air transport, regular use;
AS — international scheduled air transport, alternate use; and
ANS — international non-scheduled air transport, alternate use.

2 Required rescue and firefighting service (RFF). The required level of protection expressed by means of an aerodrome RFF category number, in accordance with Annex 14, Volume I, 9.2.

3 Aerodrome reference code (RC). The aerodrome reference code for aerodrome characteristics expressed in accordance with Annex 14, Volume I, chapter 1. The code letter or number within an element selected for design purposes is related to the critical aeroplane characteristics for which the facilities are provided.

4 Runway Designation numbers

5 Type of each of the runways to be provided. The types of runways, as defined in Annex 14, Volume I, Chapter 1, are:

NINST — non-instrument runway;
NPA — non-precision approach runway;
PA1 — precision approach runway, Category I;
PA2 — precision approach runway, Category II;
PA3 — precision approach runway, Category III.

6 Remarks. Additional information including critical design aircraft selected for determining RC, critical aircraft selected for determining the RFF category and critical aircraft for pavement strength. Only one critical aircraft type is shown if it is used to determine all the above three elements: otherwise different critical aircraft types need to be shown for different elements.

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
ANGOLA						
FNHU	HUAMBO/Albano Machado RS	7	4E	11 29	NPA NPA	
FNLU	LUANDA/4 de Fevereiro RS	9	4E	05 23 07 25	NPA PA1	

City/Aerodrome/Designation	RFF Category	Physical Characteristics			Remarks
		RC	RWY No.	RWY Type	
1	2	3	4	5	6
BENIN					
DBBB COTONOU/Cadjehoun	9	4E	06 24	NPA PA1	
BOTSWANA					
FBFT FRANCISTOWN/Francistown RS	4	3C	11 29	NINST NINST	
FBSK GABORONE/Sir SeretseKhama Intl	9	4E	08 26	PA1 NPA	
FBKE KASANE/Kasane RS	6	3C	08 26	NPA NINST	
FBMN MAUN/Maun RS	6	3C	08 26	NINST NINST	
FBSP SELEBI-PHIKWE/Selebi-Phikwe RS	4	3C	12 30	NINST NINST	
BURKINA-FASO					
DFOO BOBO-DIOULASSO/Bobo-Dioulasso RS	8	4D	06 24	PA1 NPA	
DFFD OUAGADOUGOU/Ouagadougou RS	9	4E	04 22	PA1 NPA	
BURUNDI					
HBBA BUJUMBURA/Bujumbura RS	7	4D	18 36	PA1 NPA	
CAMEROON					
FKKD DOUALA/Douala RS	9	4E	12 30	NPA PA2	
FKKR GAROUA/Garoua RS	8	4E	09 27	PA1 NPA	
FKKL MAROUA/Salak RS	6	4D	13 31	NPA NINST	
FKKN N'GAOUNDERE/N'gaoundere AS	6	4D	03 21	NPA NINST	
FKKS YAOUNDE/Nsimalen RS	9	4E	01 19	NINST PA2	

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
CAPE VERDE						
GVFM	PRAIA/Francisco Mendes RS	4	3C	03 21	NPA NINST	
GVAC	SAL I./Amilcar Cabral RS	8	4E	01 19 07 25	PA1 NPA	
CENTRAL AFRICAN REPUBLIC						
FEFF	BANGUI/M'Poko RS	8	4D	17 35	NPA PA1	
FEFT	BERBERATI/Berberati RS		3C	17 35	NPA NINST	
CHAD						
FTTJ	N'DJAMENA/N'Djamena RS	9	4E	05 23	PA1 NPA	
COMOROS						
FMCV	ANJOUAN/Ouani RS	4	3B	10 28	NPA NPA	
FMCZ	DZAOUDZI/Pamanzi, Mayotte I. RS	6	3C	16 34	NINST NPA	
FMCH	MORONI/Prince Said Ibrahim RS	7	4D	02 20	PA1 NPA	
CONGO						
FCBB	BRAZAVILLE/Maya-Maya RS	9	4E	05 23	PA1 NPA	
FCPP	POINTE-NOIRE/Agostino Neto RS	6	4C	17 35	NPA NPA	
COTE D'IVOIRE						
DIAP	ABIDJAN/Felix Houphouet Boigny Intl RS	9	4E	03 21	NPA PA1	

City/Aerodrome/Designation	RFF Category	Physical Characteristics			Remarks
		RC	RWY No.	RWY Type	
1	2	3	4	5	6
DEMOCRATIC REPUBLIC OF THE CONGO					
FZNA GOMA/Goma RS	6	4C	18 36	NINST NPA	
FZAA KINSHASA/N'Djili RS	9	4D	17 35	NPA NPA	
FZIC KISANGANI/Bangoka AS	6	4E	06 24	NPA PA1	
FZQA LUBUMBASHI/Luano AS	8	4D	07 25	PA1 NPA	
FZWA MBUJI MAYI/Mbuji Mayi AS	6	4C	17 35	NPA NINST	
DJIBOUTI					
HDAM DJIBOUTI/Ambouli RS	8	4E	09 27	NPA PA1	
EQUATORIAL GUINEA					
FGSL MALABO/Malabo RS	7	4D	05 23	PA1 NPA	
ERITREA					
HHAS ASMARA/Asmara Intl RS	7	4D	07 25	PA1 NPA	
HHSB ASSAB/Assab RS	8	4E	12 30	NPA NINST	
ETHIOPIA					
HAAB ADDIS ABABA/Bole Intl RS	9	4E	07R 25L	NPA PA1	
HADR DIRE DAWA/Dire Dawa Intl RS	7	4D	15 33	NPA NINST	
HABD Bahir Dar International RS	6	4D	04 22	NPA NPA	
HAMR Mekele Alula Aba Nega International RS	7	4D	11 29	NPA PA1	
GABON					
FOON FRANCEVILLE/M'Vengue RS	9	4E	15 33	PA1 NPA	
FOOL LIBREVILLE/Leon M'Ba RS	9	4E	16 34	PA1 NPA	
FOOG PORT GENTIL/Port Gentil RS	6	4C	03 21	NPA PA1	

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
GAMBIA						
GBYD	BANJUL/Banjul Intl RS	9	4D	14 32	NPA PA1	
GHANA						
DGAA	ACCRA/Kotoka Intl RS	9	4E	03 21	NPA PA1	
GUINEA						
GUCY	CONAKRY/Gbessia RS	8	4E	06 24	PA1 NPA2	
GUINEA-BISSAU						
GGOV	BISSAU/Osvaldo Vieira Intl RS	8	4D	03 21	NPA PA1	
KENYA						
HKEL	ELDORET/Eldoret Intl RS	8	4D	08 26	PA2 NPA	
HKMO	MOMBASA/Moi Intl RS	9	4E	03 21	NPA PA1	
HKJK	NAIROBI/Jomo Kenyatta Intl RS	9	4E	06 24	PA2 NPA	
LESOTHO						
FXMM	MASERU/Moshoeshoe I. Intl RS	7	4D	04 22 11 29	NINST PA1	
LIBERIA						
GLRB	MONROVIA/Roberts Intl RS	8	4E	04 22	PA1 NPA	
City/Aerodrome/Designation		**RFF Category**	**Physical Characteristics**			**Remarks**
			RC	**RWY No.**	**RWY Type**	
1		**2**	**3**	**4**	**5**	**6**
MADAGASCAR						
FMMI	ANTANANARIVO/Ivato RS	9	4E	11 29	PA1 NPA	
FMNA	ANTSIRANANA/Arrachart RS	6	3C	13 31	NPA NINST	

FMNM	MAHANJANGA/Amborovy RS	7	4C	14 32	NPA NINST	
FMNN	NOSY-BE/Fascene RS	6	4C	05 23	NPA PA1	
FMMS	SAINTE-MARIE/Sainte-Marie RS	5	3C	01 19	NPA NPA	
FMMT	TAOMASINA/Taomasina RS	6	4C	01 19	NPA PA1	
FMSD	TOLAGNARO/Tolagnaro RS	6	4C	07 25	NPA NPA	
MALAWI						
FWCL	BLANTYRE/Chileka RS	8	4D	10 28	PA1 NPA	
FWLI	LILONGWE/Lilongwe Intl RS	9	4E	14 32	PA1 NPA	
MALI						
GABS	BAMAKO/Modibo Keita– Senou Intl RS	8	4E	06 24	PA1 NPA	
GAGO	GAO/Gao RS	5	4C	07 25	NPA NINST	
GAKD	KAYES/Kayes RS	4	4C	09 27	NPA NINST	
GASO	SIKASSO/Sikasso RS	4	3C	08 26	NPA NINST	
GAMB	MOPTI - AMBODEDJO RS	6	4C	05 23	NPA NINST	
GATB	TOMBOUCTOU/Tombouctou RS	4	4C	07 25	NPA NPA	

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
MAURITANIA						
GQPA	ATAR/Atar RS	6	4C	04 22	NPA NINST	
GQNI	NEMA/Nema RS	6	4D	10 28	NINST NPA	

GQPP	NOUADHIBOU/Nouadhibou RS	8	4D	03 21	PA1 NPA	
GQNO	NOUAKCHOTT/Nouakchott-Oumtounsy Intl RS	9	4F	16 34 06 24	NPA PA1 PA1 NPA	
GQPZ	ZOUERATE/Zouerate RS	6	4C	10 28	NPA NPA	
MAURITIUS						
FIMP	MAURITIUS/ Sir Seewoosagur Ramgoolan Intl RS	9	4E	14 32	PA1 NPA	
MOZAMBIQUE						
FQBR	BEIRA/Beira RS	7	4D	12 30 06 24	PA1 NPA	
NAMIBIA						
FYKT	KEETMANSHOP/Keetmanshop RS	7	4D	04 22 18 36	NPA NPA	
FYWB	WALVIS BAY/Walvis Bay RS	6	4D	09 27	NPA NPA	
FYWH	WENDKOEK/Hosea Kutako RS	9	4E	08 26 16 34	PA1 NPA	
NIGER						
DRZA	AGADES/Sud RS	6	4C	07 25	NPA NINST	
DRRN	NIAMEY/DioriHamani Intl RS	9	4E	09R 27L O9L 27R	PA1 NPA	
DRZR	ZINDER/Zinder AS	6	4C	06 24	NPA NINST	
City/Aerodrome/Designation		**RFF Category**	**Physical Characteristics**			**Remarks**
			RC	**RWY No.**	**RWY Type**	
1		**2**	**3**	**4**	**5**	**6**
NIGERIA						
DNAA	ABUJA/Nnamdi Azikiwe RS	9	4E	04 22	PA1 PA2	

DNEN ENUGU/Akanu Ibiam Intl RS	8	4E	08 26	NPA PA2	
DNKN KANO/Mallam Aminu Kano Intl RS	9	4F 4E	06 24 05 23	PA2 PA1 PA1 NPA	
DNMM LAGOS/Murtala Muhammed RS	9	4F 4E	36L 18R 36R 18L	NINST PA2 NINST NPA	
DNPO PORT HARCOURT/Port Harcourt Intl RS	9	4E	03 21	NPA PA1	
City/Aerodrome/Designation	**RFF Category**	**Physical Characteristics**			**Remarks**
		RC	**RWY No.**	**RWY Type**	
1	**2**	**3**	**4**	**5**	**6**
DNYO YOLA/Yola RNS	6	4E	17 35	PA1 NPA	
REUNION (France) FMEE SAINT-DENIS/Gillot la Réunion RS	9	4E 4E	12 30 14 32	NINST NPA PA1 NINST	
RWANDA HRYR KIGALI/ Kigali International RS	9	4E	10 28	NPA PA1	
SAO TOME AND PRINCIPE FPST SAO TOME/Sao Tome RS	8	4D	11 29	PA1 NPA	
SENEGAL GOBD DAKAR-DIASS/Blaise Diagne Intl RS GOGS CAP SKIRRING/Cap Skirring RS	9 6	4E 4C	01 19 14 32	PA1 NPA NPA NINST	
SEYCHELLES FSIA MAHE/Seychelles Intl RS	9	4E	13 31	NPA PA1	
SIERRA LEONE GFLL FREETOWN/Lungi RS	8	4D	12 30	NPA PA1	

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
SOMALIA						
HCMI	BERBERA/Berbera AS	4	3B	05 23	NINST NINST	
HCMV	BURAO/Burao RS	4	4B	13 31	NINST NINST	
HCMH	HARGEISA/Hargeisa RS	5	4C	06 24	NPA NPA	
HCMK	KISMAYU/Kismayu AS	7	4D	05 23	NPA PA1	
HCMM	MOGADISHU/Mogadishu RS	8	4D	05 23	NPA PA1	
SOUTH AFRICA						
FABL	BLOEMFONTEIN/Bram Fisher AS	7	3D	02 20	NPA NPA	
			3D	12 30	NINST NINST	
FACT	CAP TOWN/Cap Town RS	9	4E	01 19	PA3 PA2	
			3C	16 34	NINST NINST	
FALE	DURBAN/King Shaka RS	9	4E	06 24	PA2 PA2	
FAOR	JOHANNESBURG/O.R. Tambo RS	9	4E	03L 21R	PA2 PA2	
			4E	03R 21L	PA2 PA2	
FALA	LANSERIA/Lanseria RS	7	4E	07 25	NPA NINST	
FAMM	MAFIKENG/Mafikeng AS	2	4E	04 22	NPA NINST	
FAKN	NELSPRUIT/Kruger Mpumalanga RS	8	4D	05 23	PA1 NPA	
FAPP	PIETERSBURG/Gateway AS	7	3D	01 19	NINST NINST	
				05 23	NINST NINST	
FAPE	PORT ELISABETH/Port Elisabeth AS	7	3D	08 26	PA1 PA1	
				17 35	NINST NINST	

FAUP UPINGTON/Upington RS	7	4D	17 35 01 19 08 26	NPA NPA NPA NPA NINST NINST	
City/Aerodrome/Designation	**RFF Category**	**Physical Characteristics**			**Remarks**
		RC	**RWY No.**	**RWY Type**	
1	**2**	**3**	**4**	**5**	**6**
SWAZILAND					
FDMS MANZINI/Matsapha RS	6	4C	07 25	NPA NINST	
FDSK KING MSWATI III Intl		4E	02 20		
TOGO					
DXXX LOME/Gnassingbe Eyadema Intl RS	8	4E	04 22	NPA PA1	
UGANDA					
HUEN ENTEBBE/Entebbe Intl RS	9	4E	17 35	PA1 NPA	
UNITED REPUBLIC OF TANZANIA					
HTDA DAR-ES-SALAM/Dar-Es-Salam RS	9	4E	05 23	PA1 NPA	
HTKJ KILIMANJARO/Kilimanjoro Intl RS	9	4E	09 27	PA1 NPA	
HTZA ZANZIBAR/Zanzibar RS	5	4D	18 36	NINST NPA	
ZAMBIA					
FLLI LIVINGSTONE/Livingstone Intl RS	4	3C	10 28 15 33	PA2 PA2	
FLLS LUSAKA/Lusaka Intl RS	8	4D	10 28	NPA NPA	
FLMF MFUWE/Mfuwe RSFMND	6	4C	08 26	NPA NPA	
FLND NDOLA/Ndola RSFMND	6	4D	10L 28R 10R 28L	NPA NPA	

City/Aerodrome/Designation		RFF Category	Physical Characteristics			Remarks
			RC	RWY No.	RWY Type	
1		2	3	4	5	6
ZIMBABWE						
FVBU	BULAWAYO/Bulawayo	8	4E	13	NPA	
	RS			31	NPA	
FVHA	HARAER/Harare	9	4E	06	PA1	
	RS			24	PA1	
FVFA	VICTORIA FALLS/Victoria Falls	7	4E	12	PA1	
	RS			30	NINST	

AFI ANP, VOLUME II

PART III – COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in Standards, Recommended Practices and Procedures (SARPs) related to communication, navigation and surveillance (CNS). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of CNS facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to CNS facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

Communications

Aeronautical Fixed Service (AFS)

2.1 The aeronautical fixed service should comprise the following systems and applications that are used for ground-ground (i.e. point-to-point and/or point-to-multipoint) communications in the international aeronautical telecommunication service:

a) ATS direct speech circuits and networks;

b) meteorological operational circuits, networks and broadcast systems, including World Area Forecast System – Internet File Service (WIFS) and/or Satellite Distribution System for Information Relating to Air Navigation (SADIS);

c) the aeronautical fixed telecommunications network (AFTN);

d) the common ICAO data interchange network (CIDIN);

e) the air traffic services (ATS) message handling services (AMHS); and

f) the inter-centre communications (ICC).

2.2 To meet the data communication requirements, a uniform high-grade aeronautical network should be provided, based on the aeronautical telecommunication network (ATN), taking into account the existence and continuation of current networks.

2.3 Contingency procedures should be in place to ensure that, in case of a communication centre breakdown, all the parties concerned are promptly informed of the prevailing situation. All possible arrangements should be made to ensure that, in case of breakdown of a communications centre or circuit, at least high-priority traffic continues to be handled by appropriate means.

2.4 AFS planning should permit flexibility in detailed development and implementation. The required AFTN Stations and Centres are listed in the AFTN Plan in **Table CNS II-1**.

The Aeronautical Telecommunication Network (ATN)

2.5 The ATN should be able to:

a) support applications carried by the existing networks;

b) support gateways enabling inter-operation with existing networks; and

c) support ground-ground communications traffic associated with air-ground data link applications.

2.6 The ATN should make optimum use of dedicated bilateral/multilateral aeronautical links and other communication means commensurate with the operational Quality of Service (QoS) requirements.

2.7 The implementation of the ATN should take into account the need for cost-effective evolution in terms of network capacity, requirements and time-frame and allow for a progressive transition from existing communication networks and services to a uniform, harmonised and integrated communications infrastructure, capable of supporting the implementation of future aeronautical services such as Flight and Flow Information in a Collaborative Environment (F-FICE), System-Wide Information Management (SWIM) applications, etc.

2.8 In case means other than dedicated bilateral links are used by the ATN, States should ensure that service level agreements (SLA) are met in terms of implementation priority, high availability, priority in restoration of service and appropriate levels of security.

2.9 The ATN should provide for interregional connections to support data exchange and mobile routing within the global ATN.

2.10 In planning the ATN, provisions should be made, where required, for interfacing with other international networks. The Required ATN Infrastructure Routing Plan is described under **Table CNS II-2**.

Network services

2.11 The Internet Society (ISOC) communications standards for the Internet Protocol Suite (IPS) should be used for the implementation of AMHS.

2.12 The migration from legacy bit-oriented protocols such as X.25 Protocol suite to IPS should be planned.

2.13 The migration of international or sub-regional ground networks to the ATN based on Internet Protocol (IP) to support AFS communication requirements, while reducing costs, should be planned.

2.14 States should ensure that the solutions provided for the implementation of the ATN meet the air traffic management and aeronautical fixed service requirements. Such requirements should consist of:

a) Performance requirements: availability, continuity, integrity, monitoring and alerting criteria per data flow. In the case where a required communication performance (RCP) is globally prescribed, requirements derived from RCP should be stated;

b) Interoperability requirements;

c) Safety and security requirements, duly derived after the identification of operational hazards and threats, and allocation of objectives; and

d) Implementation process requirements (creation, test, migration, upgrades, priority in restoration of service, termination).

Network management

2.15 An ICAO centralised off-line network management service is provided to participating AFTN/ AMHS centres in the AFI Region under the ATS Messaging Centre (AMC).

2.16 In the case of integrated communications services procured and shared by several States, organizational provisions should allow for the planning and performing of the management of technical performance, network configuration, fault, security, cost division/allocation, contract, orders and payment.

Specific air traffic management (ATM) requirements

2.17 Where ATS speech and data communication links between any two points are provided, the engineering arrangements should be such as to avoid the simultaneous loss of both circuits. The required ATS direct speech circuits plan is detailed under **Table CNS II-3**.

2.18 Special provisions should be made to ensure a rapid restoration of ATS speech circuits in case of outage, as derived from the performance and safety requirements.

2.19 Data circuits between ATS systems should provide for both high capacity and message integrity.

2.20 The Inter-Centre Communication (ICC), consisting of ATS Inter-facility Data Communication (AIDC) application and the Online Data Interchange (OLDI) application, should be used for automated exchange of flight data between ATS units to enhance the overall safety of the ATM operation and increase airspace capacity.

2.21 Where Voice over IP is planned or implemented between ATS units for voice communications, it should meet the ATS requirements. When data and voice are multiplexed, particular attention should be paid to the achievement of the ATM performance and safety requirements.

Specific meteorological (MET) requirements

2.22 The increasing use of the GRIB (Gridded Binary or General Regularly-distributed Information in Binary form) and BUFR (Binary Universal Form for the Representation of meteorological data) code forms for the dissemination of the upper wind and temperature and significant weather forecasts and the planned transition to digital form using extensible markup language (XML)/geography markup language (GML) for the dissemination of OPMET data should be taken into account in the planning process of the ATN.

2.23 In planning the ATN, account should be taken of changes in the current pattern of distribution of meteorological information resulting from the increasing number of long-range direct flights and the trend towards centralized flight planning.

Specific aeronautical information management (AIM) requirements

2.24 The aeronautical fixed service should meet the requirements to support efficient provision of aeronautical information services through appropriate connections to area control centres (ACCs), flight information centres (FICs), aerodromes and heliports at which an information service is established.

Aeronautical Mobile Service (AMS)

2.25 To meet the air-ground data communication requirements, a high-grade aeronautical network should be provided based on the ATN, recognising that other technologies may be used as part of the transition. The network needs to integrate the various data links in a seamless fashion and provide for end-to-end communications between airborne and ground-based facilities.

2.26 Whenever required, use of suitable techniques on VHF or higher frequencies should be made. The required HF network designators applicable for the AFI Region are listed in **Table CNS II-4**.

2.27 Aerodromes having a significant volume of International General Aviation (IGA) traffic should also be provided with appropriate air-ground communication channels.

Air-Ground Data Link Communications

2.28 A Strategy for the harmonised implementation of the data link communications in the AFI Region should be developed based on the Global Operational Data Link Document (GOLD) adopted by ICAO Regions and the Aviation System Block Upgrade (ASBU) methodology.

2.29 Where applicable, controller-pilot data link communications (CPDLC), based on ATN VDL data link Mode 2 (VDL2) and/or FANS-1/A, should be implemented for air-ground data link communications.

2.30 Partial or divergent aircraft data link evolutions that result in excluding messages from aircraft systems should not be pursued. Interim steps or phases toward full implementation of the common technical definition in ground systems should only be pursued on a regional basis, after coordination between all States concerned.

2.31 Harmonization of operational procedures for implementation of the above packages is essential. States, Planning and Implementation Regional Groups (PIRGs) and air navigation services providers should adopt common procedures to support seamless ATS provision across FIR boundaries, rather than each State or Region developing and promulgating unique procedures for common functions.

Required Communication Performance (RCP)

2.32 The Required Communication Performance (RCP) concept characterizing the performance required for communication capabilities that support ATM functions without reference to any specific technology should be applied wherever possible.

2.33 States should determine, prescribe and monitor the implementation of the RCP in line with the provisions laid down in the *ICAO Manual on Required Communication Performance* (Doc 9869).

Navigation

Navigation Infrastructure

2.34 The navigation infrastructure should meet the requirements for all phases of flight from take-off to final approach and landing.

Note: Annex 10 to the Convention on International Civil Aviation—Aeronautical Telecommunications, Volume I — Radio Navigation Aids, Attachment B, provides the strategy for introduction and application of non-visual aids to approach and landing.

2.35 The AFI PBN Regional Roadmap/Plan provides guidance to air navigation service providers, airspace operators and users, regulators, and international organizations, on the expected evolution of the regional air navigation system in order to allow planning of airspace changes, enabling ATM systems and aircraft equipage. It takes due account of the operational environment of the AFI Region(s).

PBN Transition Strategy

2.36 During transition to performance-based navigation (PBN), sufficient ground infrastructure for conventional navigation systems should remain available. Before existing ground infrastructure is considered for removal, users should be given reasonable transition time to allow them to equip appropriately to attain a performance level equivalent to PBN. States should approach removal of existing ground infrastructure with caution to ensure that safety is not compromised. This should be guaranteed by conducting safety assessments and consultations with the users.

Use of specific navigation aids

2.37 Where, within a given airspace, specific groups of users have been authorized by the competent authorities to use special aids for navigation, the respective ground facilities should be located and aligned so as to provide for full compatibility of navigational guidance with that derived from the SARPs.

2.38 States should ensure and oversee that service providers take appropriate corrective measures promptly whenever required by a significant degradation in the accuracy of navigation aids (either space based or ground based or both) is detected.

Surveillance

2.39 An important element of modern air navigation infrastructure required to manage safely increasing levels and complexity of air traffic is aeronautical surveillance systems.

2.40 The surveillance systems to be used in the AFI Region are as follows:

a) Secondary Surveillance Radars (SSR) Mode A, C and S in terminal and en-route continental airspace;

b) Automatic Dependent Surveillance – Broadcast (ADS-B) and Multilateration (MLAT) in terminal areas;

c) ADS-B and Wide Area Multilateration (WAM) in most of the airspace;

d) Automatic Dependent Surveillance – Contract (ADS-C) in some parts of the oceanic and remote continental airspace.

Required Surveillance Performance (RSP)

2.41 The Required Surveillance Performance (RSP) concept characterizing the performance required for surveillance capabilities that support ATM functions without reference to any specific technology should be applied wherever possible.

2.42 States should determine, prescribe and monitor the implementation of the RSP in line with the provisions laid down in the ICAO Manual on Performance-Based Communication and Surveillance (Doc 9869).

2.43 When operating Mode S radars, States should coordinate with their corresponding Regional ICAO Office the assignment of their corresponding interrogator identifier (II) codes and surveillance identifier (SI) codes, particularly where areas of overlapping coverage will occur. In the AFI Region only II codes will be used until the growth of the traffic and pace of fleet equipage justify the extension to the use of SI codes.

2.44 The required surveillance infrastructure for the AFI Region is detailed in **Table CNS II-6A** and the allocation of II codes is summarized in **Table CNS II-6B.**

Frequency Management

Aeronautical Mobile Service (AMS)

2.45 Frequencies should be assigned to all VHF aeronautical mobile service (AMS) facilities in accordance with the principles laid out in Annex 10, Volume V and *ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718) Volumes I and II, and take into account:

a) agreed geographical separation criteria based on 25 kHz interleaving between channels;

b) agreed geographical separation criteria for the implementation of VDL services;

c) the need for maximum economy in frequency demands and in radio spectrum utilization; and

d) a deployment of frequencies which ensures that international services are planned to be free of interference from other services using the same band.

2.46 The priority order to be followed in the assignment of frequencies to service is:

a) ATS channels serving international services (ACC, APP, TWR, FIS);

b) ATS channels serving national purposes;

c) channels serving international VOLMET services;

d) channels serving ATIS and PAR; and

e) channels used for other than ATS purposes.

2.47 The criteria used for frequency assignment planning for VHF AMS facilities serving international requirements should, to the extent practicable, also be used to satisfy the need for national VHF AMS facilities.

2.48 Special provisions should be made, by agreement between the States concerned, for the sharing and the application of reduced protection of non-ATS frequencies in the national sub-bands, so as to obtain a more economical use of the available frequency spectrum consistent with operational requirements.

2.49 When necessary extended VHF coverage by VSAT will be implemented in order to increase AMS along the major flow of traffic and States are encouraged to share through agreements and Memoranda of understanding, location of remote VHF stations in order to ensure continuity of AMS around FIR boundaries.

2.50 States should ensure that no air/ground frequency is utilized outside its designated operational coverage and that the stated operational requirements for coverage of a given frequency can be met for the transmission sites concerned, taking into account terrain configuration.

Radio navigation aids for Aeronautical Radio Navigation Services (ARNS)

2.51 Frequencies should be assigned to all radio navigation facilities taking into account agreed geographical separation criteria to ILS localizer, VOR and GBAS, X and Y channels to DME, in accordance with the principles laid out in Annex 10, Volume V and *ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718) Volumes I and II. Also, the need for maximum economy in frequency demands and in radio spectrum utilization and a deployment of frequencies which ensures that international services are planned to be free of interference from other services using the same band, need to be considered.

2.52 The principles used for frequency assignment planning for radio navigation aids serving international requirements should, to the extent possible, also be used to satisfy the needs for national radio aids to navigation.

2.53 Aeronautical Frequencies and Interrogator Identifier (II) Codes will be assigned by the ICAO Regional Offices at the request of State CAAs using the software Frequency Finder developed by ICAO.

Support to ICAO Positions for ITU World Radiocommunication Conferences (WRCs)

2.54 Considering the importance and continuous demand of the radio frequency spectrum and for the protection of the current aeronautical spectrum and the allocation of new spectrum for the new services and system to be implemented in civil air navigation, States and international organizations are to support ICAO's position at ITU World Radiocommunication Conferences (WRCs) and in regional and other international activities conducted in preparation for ITU WRCs.

Note: The Handbook on Radio Frequency Spectrum Requirements for Civil Aviation *(Doc 9718) Volume I, contains ICAO policy statements relevant to the aviation requirements for radio frequency spectrum. The handbook is intended to assist States and ICAO in preparing for ITU WRCs.*

3. SPECIFIC REGIONAL REQUIREMENTS

3.1 Communication

3.1.1 The AFI Region is characterized by a poor availability of public/private reliable telecommunication infrastructure meeting the requirements of air navigation services. In this regard, the provision of aeronautical communication in the AFI Region is based on satellite communication Networks comprising Very Small Aperture Terminals (VSATs).

3.1.2 These interlinked Networks (AFISNET, SADC/2 and NAFISAT, CAFSAT) are the backbone to supporting the implementation of ground/ground communication in the framework of the implementation of the ATN ground segments. These networks enable the interconnection to the neighbouring regions of EUR, MID, NACC SAM. The networks are also used for the extension of VHF coverage and future implementation of VDL Mode 2 stations for continental airspaces.

3.2 Navigation

3.2.1 All types of augmented GNSS are planned to be implemented in the AFI region in accordance with the AFI Regional GNSS strategy. However the implementation of SBAS is under discussion between users and air navigation service providers in order to find a common understanding for a cost effective implementation. Four specific conditions have been agreed to be met prior to the implementation of SBAS in the AFI Region:

a) subjected to APIRG Conclusion 17/29: Need of an independent Cost Benefit Analysis;

b) full compliance with ICAO technical requirements;

c) case to case cost benefit agreement before implementation; and

d) civil aviation stakeholders in particular governments should guarantee that there will be no cross-subsidization of non-civil aviation users of SBAS. The user- pay principle is to be applied across all sectors.

3.3 Surveillance

3.3.1 The AFI Region is characterized by various brands of Secondary Surveillance Radars compatible Mode S and ADS-B Stations are being deployed in a pre-operational phase. The implementation of these surveillance sensors by Administration/Organizations results in unused overlapping of coverage. In order to ensure a seamless aeronautical surveillance service provision along the Traffic Flows (Areas of Routing), the surveillance systems in the AFI Region will be integrated through the sharing of surveillance data amongst Air Traffic Control Centres via the satellite telecommunication.

3.4 Spectrum

3.4.1 As described in section 3.1, the AFI Region aeronautical satellite based networks are operating in the C-band 3400-4200MHz for downlink–Space to Earth and 5625-6425MHz for Uplink-Earth to Space. In tropical regions, due to more pronounced rain attenuation at higher frequency bands, this frequency band remains the only viable option for satellite links with high availability.

3.4.2 This band is subject to threats by International Mobile Terminals (IMT) on the downlink C- Frequency Band (3.4-4.2 GHz). In order to ensure the safe operation of aeronautical communication in this band, the ITU World Radiocommunication Conference (WRC) held in Geneva in 2015 adopted Resolution 154 (Rev.WRC 15) on the consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the frequency band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1. The establishment of policies and implementation of national aeronautical spectrum in the AFI Region will take due consideration of this Resolution.

TABLE CNS II-1 - AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK (AFTN) PLAN

EXPLANATION OF THE TABLE

Column

1 The AFTN Centres/Stations of each State are listed alphabetically. Each circuit appears twice in the table. The categories of these facilities are as follows:
M - Main AFTN COM Centre
T - Tributary AFTN COM Centre
S - AFTN Station

2 Category of circuit:

M - Main trunk circuit connecting Main AFTN communication centres.
T - Tributary circuit connecting Main AFTN communication centre and Tributary AFTN communications centre.
S - AFTN circuit connecting an AFTN Station to an AFTN communication centre.

3 Type of circuit provided:

LTT/a - Landline teletypewriter, analogue (e.g. cable, microwave)
LTT/d - Landline teletypewriter, digital (e.g. cable, microwave)
LDD/a - Landline data circuit, analogue (e.g. cable, microwave)
LDD/d - Landline data circuit, digital (e.g. cable, microwave)
SAT/a/d - Satellite link, with /a for analogue or /d for digital

4 Circuit signalling speed in bits/s.

5 Circuit protocols

6 Data transfer code (syntax):

ITA-2 - International Telegraph Alphabet No. 2 (5-unit Baudot code).
IA-5 - International Alphabet No. 5 (ICAO 7-unit code).
CBI - Code and Byte Independency (ATN compliant).

7 Remarks

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
CONGO						
BRAZZAVILLE	M					
BANGUI	T	SAT/d	1.2	Frame Relay	IA-5	
DAKAR	M	SAT/d	9.6	Frame Relay	IA-5	
DOUALA	T	SAT/d	64/9.6	Frame Relay	IA-5	
KINSHASA	T	SAT/d	9.600	Frame Relay	IA-5	
JOHANNESBURG	M	SAT/d	128/9.6	Frame Relay	IA-5	
LIBREVILLE	T	SAT/d	9.600	Frame Relay	IA-5	
LUANDA	T	SAT/d	9.600	Frame Relay	IA-5	
MALABO	S	SAT/d	64/9.6	Frame Relay	IA-5	
NAIROBI	M	SAT/d	64/19.2	Frame Relay	IA-5	
N'DJAMENA	T	SAT/d	9600	Frame Relay	IA-5	
NIAMEY	M	SAT/d	64/9.6	Frame Relay	IA-5	
SAO TOME & PRINCIPE	T	SAT/d		Frame Relay		
ETHIOPIA						
ADDIS ABABA	M					
ASMARA	T	SAT/d	64 – 9.6	None	IA-5	
DJIBOUTI	T	SAT/d	Kbps	None	IA-5	
KHARTOUM	T	SAT/d	9.6	None	IA-5	
NAIROBI	M	SAT/d	Kbps	None	IA-5	
NIAMEY	M	SAT/d	64 – 9.6	Frame Relay	IA-5	
(MID)	M	SAT/d	Kbps		IA-5	
			64 – 9.6 Kbps			
			--			
			64 – 9.6 Kbps			
			300 baud			
			9.6 Kbps			
			64 – 9.6 Kbps			
KENYA						
NAIROBI	M	SAT/d	-	-		
DAR-ES-SALAAM	T	SAT/d	-	-	IA-5	
DZAOUDZI	S	SAT/d	-	-	IA-5	
ENTEBBE	T	SAT/d	1.2Kbit/s	None	IA-5	
MAURITIUS	T	SAT/d	64/9.6	None	IA-5	
MOGADISHU	T	SAT/d	64/9.2	None	IA-5	
MORONI	S	SAT/d	64/19.2	None	IA-5	
SEYCHELLES	T	SAT/d			IA-5	
ST. DENIS	S	SAT/d			IA-5	
(ASIA)H	M	SAT/d			IA-5	

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
NIGER						
NIAMEY	M					
ACCRA	T	SAT/d	64/9.6 bps	Frame Relay	IA-5	
COTONOU	S	SAT/d	50 BD	Frame Relay	IA-5	
DAKAR	M	SAT/d		Frame Relay	IA-5	
EUR	M	SAT/d		Frame Relay	IA-5	Algiers
KANO	T	SAT/d	100 baud	Frame Relay	IA-5	
LAGOS	S	SAT/d	64/9.6 bps	Frame Relay	IA-5	
LOME	S	SAT/d	2.4 K	Frame Relay	IA-5	
N'DJAMENA	T	SAT/d	64/9.6 baud	Frame Relay	IA-5	
OUAGADOUGOU	T	SAT/d	9.6 bps	Frame Relay	IA-5	
SENEGAL						
DAKAR	M					
ABIDJAN	T	SAT/d	32 Kbps	Frame Relay	IA-5	
BAMAKO	T	SAT/d	32 kBPS	Frame Relay	IA-5	
BANJUL	T	SAT/d	32 Kbps	Frame Relay	IA-5	
BISSAU	T	SAT/d	32 Kbps	Frame Relay	IA-5	
BRAZZAVILLE	M	SAT/d	64 Kbps	Frame Relay	IA-5	
CONAKRY	S	SAT/d	32 Kbps	Frame Relay	IA-5	Via Roberts
(EUR)	M	SAT/d	64 Kbps	Frame Realy	IA-5	Casablanca
FREETOWN	S	SAT/d	32 Kbps	Frame Relay	IA-5	Via Roberts
JOHANNESBURG	M	SAT/d	64 Kbps	Frame Relay	IA-5	
NIAMEY	M	SAT/d	64 Kbps	Frame Relay	IA-5	
NOUAKCHOTT	T	SAT/d	32 Kbps	Frame Relay	IA-5	
ROBERTS	T	SAT/d	32 Kbps	Frame Relay	IA-5	
SAL	T	SAT/d	32 Kbps	Frame Relay	IA-5	
(SAM)	M	SAT/d	64 Kbps	Frame Relay	IA-5	Rio de Janeiro

State/Station	Category	Requirement				Remarks
		Type	Signaling Speed	Protocol	Code	
1	2	3	4	5	6	7
SOUTH AFRICA						
JOHANNESBURG	M					
ANTANANARIVO	T	SAT/d	-	Frame Relay	IA-5	
BEIRA	T	SAT/d	-	Frame Relay	IA-5	
BRAZZAVILLE	M	SAT/d		Frame Relay	IA-5	
BUJUMBURA	T	SAT/d			IA-5	
GABORONE	T	SAT/d			IA-5	
HARARE	T	SAT/d			IA-5	
KIGALI	T	SAT/d			IA-5	
LILONGWE	T	SAT/d			IA-5	
LUSAKA	T	SAT/d			IA-5	
MAPUTO	M	SAT/d			IA-5	
MASERU	M	SAT/d			IA-5	
MANZINI	T	SAT/d			IA-5	
NAIROBI	M	SAT/d			IA-5	
WINDHOEK	T	SAT/d			IA-5	
(ASIA/PAC)	T	SAT/d			IA-5	Brisbane
(SAM)	T	SAT/d			IA-5	Buenos Aires
LOME	S	SAT/d	2.4K	Frame Relay	IA-5	Accra
TOGO	S	SAT/d	-	IPV4	ITA-2	Niamey
	S	SAT/d	-	IPV4	ITA-2	Kano
	S	SAT/d	-	IPV4	ITA-2	Lagos
	S	SAT/d	2.4K	Frame Relay	IA-5	Cotonou
	S	SAT/d	2.4K	Frame Relay	IA-5	Abidjan
	S	SAT/d	2.4K	Frame Relay	IA-5	Douala
	S	SAT/d	2.4K	Frame Relay	IA-5	Livreville
	S	SAT/d	2.4K	Frame Relay	IA-5	N'Djamena
	S	SAT/d	2.4K	Frame Relay	IA-5	Brazzaville

CHART CNS II-1 - RATIONALIZED AFI AFTN PLAN CHART

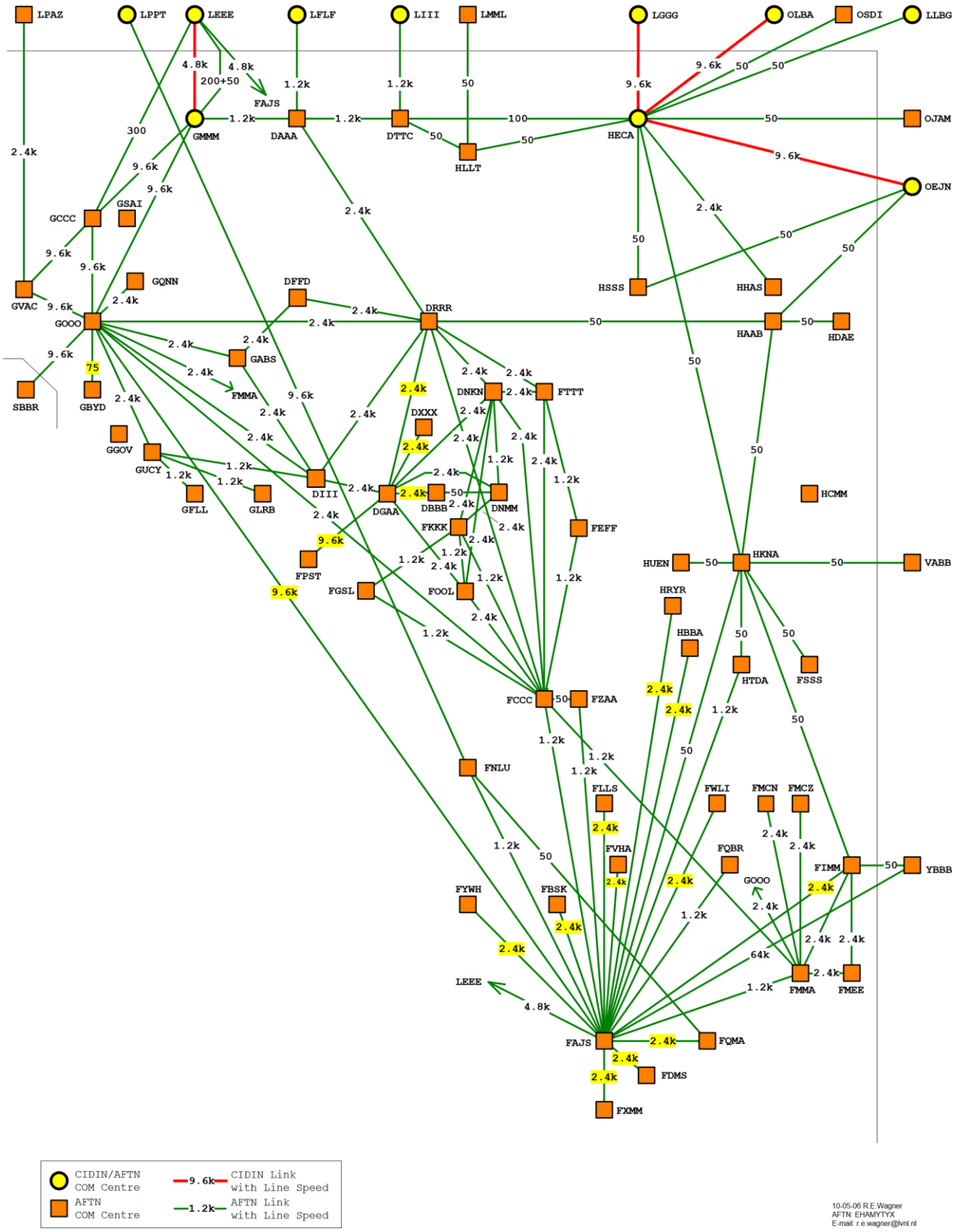

TABLE CNS II-2 - REQUIRED ATN INFRASTRUCTURE ROUTING PLAN

EXPLANATION OF THE TABLE

Column

1 Name of the Administration and Location of the ATN Router

2 Type of Router (in end systems (ES) of the Administration shown in column 1)

3 Type of Interconnection:

Inter-Regional: Connection between different Regions/ domains
Intra-Regional: Connection within a Region/ domain.

4 Connected Router: List of the Administration and location of the ATN routers to be connected with the router shown in column 1.

5 Bandwidth: Link Speed expressed in bits per second (bps)

6 Network Protocol: If Internet Protocol Suite is used, indicate version of IP (IPv4 or IPv6)

7 Via: The media used to implement the interconnection of the routers. (in case of IP service bought from a service provider, indicate VPN)

8 Remarks

Administration and Location	Type of Router	Type of Interconnection	Connected Router	Bandwidth	Network Protocol	Via	Remarks
1	2	3	4	5	6	7	8
Angola		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Benin		Intra	Niamey	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Botswana		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Burkina Faso		Intra	Niamey	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Burundi		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Cameroon		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Cabo Verde		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Central African Republic		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Chad		Intra	Niamey	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Comoros		Intra	Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Congo	BBIS	Intra	Dakar, Johannesburg Niamey	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
Cote d'Ivoire		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Democratic Rep. Congo		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Djibouti		Intra	Addis Ababa	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Equatorial Guinea		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Eritrea		Intra	Addis Ababa	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Ethiopia	BBIS	Intra	Nairobi, Niamey	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
Gabon		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Gambia		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Ghana		Intra	Niamey	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Guinea		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Guinea-Bissau		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS

Kenya	BBIS	Intra	Addis Ababa, Johannesburg, Niamey	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
Lesotho		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Liberia		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Madagascar		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Malawi		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Mali		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Mauritania		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Mauritius		Intra	Nairobi, Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Mozambique		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Namibia		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Niger	BBIS	Intra	Dakar, Brazzaville, Addis Ababa	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
Nigeria		Intra	Niamey	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Reunion		Intra	Mauritius	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Rwanda		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Sao Tome & Principe		Intra	Brazzaville	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Senegal	BBIS	Intra	Niamey, Brazzaville, , Johannesburg,	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
		Inter	EUR (Alger), SAM			IP/VSAT	
Seychelles		Intra	Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Sierra Leone		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Somalia		Intra	Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
South Africa	BBIS	Intra	Brazzaville, , Dakar, Nairobi,	64KBits/s	IPV6	IP/VSAT	AFTN/AMHS
		Inter	MID (Cairo), SAM			IP/VSAT	
South Sudan		Intra	Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Swaziland		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Togo	FRAD	Intra	Niamey	64Kbits/s	IPV4	VSAT	AMHS
	FRAD	Intra	Accra	32Kbits/s	V24	VSAT	AFTN
	FRAD	Intra	Kano	32Kbits/s	V24	VSAT	AFTN
	FRAD	Intra	Lagos	32Kbits/s	V24	VSAT	AFTN
	FRAD	Intra	Cotonou	64Kbits/s	IPV4	VSAT	AMHS
	FRAD	Intra	Abidjan	32Kbits/s	IPV4	VSAT	AFTN
	FRAD	Intra	Douala	32Kbits/s	IPV4	VSAT	AFTN
	FRAD	Intra	Libreville	32Kbits/s	IPV4	VSAT	AFTN
	FRAD	Intra	N'Djamena	64Kbits/s	IPV4	VSAT	AMHS
	FRAD	Intra	Brazzaville	64Kbits/s	IPV4	VSAT	AMHS
	FRAD	Intra	Niamtougou	32Kbits/s	IPV4	VSAT	AFTN
Uganda		Intra	Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
United Republic of Tanzania		Intra	Johannesburg, Nairobi	32Kbits/s	IPV6	IP/VSAT	AFTN/AMHS
Western Sahara		Intra	Dakar	32Kbits/s	IPV6	IP/VSAT	
Zambia		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	
Zinbabwe		Intra	Johannesburg	32Kbits/s	IPV6	IP/VSAT	

TABLE CNS II-3 - ATS DIRECT SPEECH CIRCUITS PLAN

EXPLANATION OF THE TABLE

Column

1 and 2 Circuit terminal stations are listed alphabetically by the Terminal I.

3 A — indicates ATS requirement for the establishment of voice communication within 15 seconds.
D — indicates requirements for instantaneous communications.

4 Type of service specified:

LTF — landline telephone (landline, cable, UHF, VHF, satellite).

RTF — radiotelephone.

5 Type of circuits; Direct (DIR) or Switched (SW).

D — indicates a direct circuit connecting Terminals I and II.

S — indicates that a direct circuit does not exist and that the connection is established via switching at the switching centre(s) indicated in column 6.

IDD — International direct dialling by public switch telephone network

Note 1.— Number of D and/or S circuits between Terminals I and II are indicated by numerical prefix, i.e. 2 D/S means 2 direct circuits and one switched circuit.

Note 2.— Pending the implementation of proper ATS voice circuits, and provided that aeronautical operational requirements are met, IDD services may be used for the ATS voice communications in low traffic areas.

6 Location of switching centre(s). Alternate routing location, if available, is indicated in brackets.

7 Remarks

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
ANGOLA						
LUANDA	ACCRA	A	SAT	D		
APP-FIC	RECIFE	A	SAT	D		
	BRAZZAVILLE	A	SAT	D		
	GABORONE	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	KINSHASA	A	SAT	D		
	LUSAKA	A	SAT	D		
	WINDHOEK	A	SAT	D		
BENIN						
COTONOU	ACCRA	A	SAT	D		
	LAGOS	A	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	LOME	A	LTF	D		
BOTSWANA						
GABORONE	FRANCISTOWN	A	LTF	D		
ACC	HARARE	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	LUANDA	A	SAT	D		
	LUSAKA	A	SAT	D		
	WINDHOEK	A	SAT	D		
FRANCISTOWN	BULAWAYO	A	LTF	D		
TWR	GABORONE	A	LTF	D		
BURKINA FASO						
BOBO DIOULASSO	ABIDJAN	A	SAT	D		
	ACCRA	A	SAT	D		
	BAMAKO	A	SAT	D		
	OUAGADOUGOU	A	SAT	D		
OUAGADOUGOU	ABIDJAN	A	SAT	D		
	ACCRA	A	SAT	D		
	BAMAKO	A	SAT	D		
	BOBO DIOULASSO	A	SAT	D		
	NIAMEY	A	SAT	D		
			SAT	D		
BURUNDI						
BUJUMBURA	DAR-ES-SALAAM	A	SAT	2 S	Kigali/Dar-es-Salaam	
APP	GOMA	A	LTF	1 S	Kigali	
	KIGALI	A	SAT	1 S		
	KINSHASA	A	SAT	D	Implemented but not activated	
CAMEROON						
DOUALA	BATA	A	SAT	D	Douala	
APP	BRAZZAVILLE	A	SAT	D		
	GAROUA	A	SAT	D		
	KANO	A	SAT	D		
	LAGOS	A	SAT	D		
	LIBREVILLE	A	SAT	D		
	MALABO	A	SAT	D		
	N'DJAMENA	A	SAT	D		
GAROUA	DOUALA	A	SAT	D		
APP	N'DJAMENA	A	SAT	D		
CABO VERDE						
SAL	DAKAR	A	SAT	D		
ACC	LAS PALMAS	A	SAT	D		
	SANTA MARIA	A	SAT	D		
CENTRAL AFRICAN REPUBLIC						
BANGUI	BRAZZAVILLE	A	SAT	D		
APP	GBADOLITE	A	SAT	D		
	N'DJAMENA	A	SAT	D		
CHAD						
N'DJAMENA	BANGUI	A	SAT	D		
APP/FIC	BRAZZAVILLE	A	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	DOUALA	A	SAT	D		
	GAROUA	A	SAT	D		
	KANO	A	SAT	D		
	KHARTOUM	A	SAT	D		
	MAIDUGURI	A	SAT	D		
	NIAMEY	A	SAT	D		
	TRIPOLI	A	SAT	D		
COMOROS						
DZAOUDZI APP	ANTANANARIVO	A	SAT	D		
MORONI APP	ANTANANARIVO	A	SAT	D		
CONGO						
BRAZZAVILLE APP-FIC	ACCRA	A	SAT	D		
	BANGUI	A	SAT	D		
	DOUALA	A	SAT	D		
	KANO	A	SAT	D		
	KHARTOUM	A	SAT	D		
	KINSHASA	d	SAT	D		
	LIBREVILLE	A	SAT	D		
	LUANDA	A	SAT	D		
	N'DJAMENA	A	SAT	D		
	SAO TOME	A	SAT	D		
COTE D'IVOIRE						
ABIDJAN APP	ACCRA	A	SAT	D		
	BAMAKO	A	SAT	D		
	BOBO DIOULASSO	A	SAT	D		
	DAKAR	A	SAT	D		
	NIAMEY	A	SAT	D		
	OUAGADOUGOU	A	SAT	D		
	ROBERTSFIELD	A	SAT	D		
			SAT	D		
DEMOCRATIC REPUBLIC OF THE CONGO						
BUKAVU	KIGALI	A	LTF	1 S		
GBADOLITE	BANGUI	A	SAT	D		
GOMA	BUJUMBURA	A	LTF	1 S		
	KIGALI	A	LTF	1 S		
KINSHASA	BRAZZAVILLE	d	SAT	D		
	BUJUMBURA	A	SAT	D		Implemented but not activated
	DAR-ES-SALAAM	A	SAT	D		
	ENTEBBE	A	SAT	D		
	KHARTOUM	A	SAT	D		
	KIGALI	A	SAT	D		Implemented but not activated
	LUANDA	A	SAT	D		
	LUSAKA	A	SAT	D		
LUBUMBASHI	NDOLA	A	LTF	D		
DJIBOUTI						
DJIBOUTI	ADDIS ABABA	A	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
APP	ASMARA	A	SAT	D		
	DE DAWA	A	LTF	1 S		
	HARGHEISA	A	RTF	D		
	MOGADISHU	A	SAT	D		
	SANA'A	A	SAT	D		
EQUATORIAL GUINEA						
BATA	DOUALA	A	SAT	D		
APP	LIBREVILLE	A	SAT	D		
	MALABO	A	SAT	D		
MALABO	BATA	A	SAT	D		
APP	DOUALA	A	SAT	D		
	LIBREVILLE	A	SAT	D		
ERITREA						
ASMARA	ADDIS ABABA	A	SAT	D		Implemented
ACC	DJIBOUTI	A	SAT	D		but not
	JEDDAH	A	SAT	D		activated
	KHARTOUM	A	SAT	D		
	SANA'A	A	SAT	D		
ETHIOPIA						
ADDIS ABABA	ASMARA	A	SAT	D		Implemented
ACC/FIC	DJIBOUTI	A	SAT	D		but not
	JEDDAH	A	SAT	D		activated
	KHARTOUM	A	SAT	D		
	MOGADISHU	A	RTF	D		
	NAIROBI	A	SAT	D		
	SANA'A	A	SAT	D		
DIRE DAWA TWR	DJIBOUTI	A	LTF	D		
GABON						
LIBREVILLE	ACCRA	A	SAT	D		
ACC	BATA	A	SAT	D		
	BRAZZAVILLE	A	SAT	D		
	DOUALA	A	SAT	D		
	KANO	A	RTF	D		
	LAGOS	A	SAT	D		
	MALABO	A	SAT	D		
	SAO TOME	A	SAT	D		
GAMBIA						
BANJUL	BISSAU	A	SAT	D		
APP	DAKAR	A	SAT	D		
GHANA						
ACCRA	ABIDJAN	A	SAT	D		
APP/FIC	BOBO DIOULASSO	A	SAT	D		
	BRAZZAVILLE	A	SAT	D		
	COTONOU	A	SAT	D		
	KANO	A	SAT	D		
	LAGOS	A	SAT	D		
	LIBREVILLE	A	SAT	D		
	LOME	A	SAT	D		
	LUANDA	A	SAT	D		
	NIAMEY	A	SAT	D		
	OUAGADOUGOU	A	SAT	D		
	SAO TOME	A	RTF	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
			SAT	D		
GUINEA						
CONAKRY	BISSAU	A	SAT	D		
APP	FREETOWN	A	SAT	D		
	ROBERTSFIELD	A	SAT	D		
GUINEA-BISSAU						
BISSAU	BANJUL	A	SAT	D		
APP	CONAKRY	A	SAT	D		
	DAKAR	A	SAT	D		
KENYA						
MOMBASA	DAR-ES-SALAAM	d	LTF	2 S	Nairobi/Dar-es-Salaam	
APP	KILIMANJARO	A	SAT	2 S	Nairobi/Dar-es-Salaam	
	NAIROBI	d	RTF	1 S	Nairobi	
NAIROBI	ADDIS ABABA	A	SAT	D		
ACC	DAR-ES-SALAAM	A	SAT	D		
	ENTEBBE	A	SAT	D		
	KHARTOUM	A	SAT	D		
	KILIMANJARO	d	RTF	D		
	MOGADISHU	A	SAT	D		
	MOMBASA	d	RTF	1S	Nairobi	
	SEYCHELLES	A	SAT	D		
LESOTHO						
MASERU	BLOEMFONTEIN	A	SAT	1S	Johannesburg	
APP						
LIBERIA						
ROBERTSFIELD	ABIDJAN	A	SAT	D		
ACC/FIC	BAMAKO	A	SAT	1 S	Dakar	
	CONAKRY	A	SAT	D		
	DAKAR	A	SAT	D		
	FREETOWN	A	RTF	D		
LIBYA						
BENGHAZI	ATHENS	A	LTF	D		
APP	MALTA	A	LTF	D		
TRIPOLI	ALGIERS	A	**SAT**	D		
ACC/FIC	CAIRO	A	SAT	D		
	KHARTOUM	A	SAT	D		
	MALTA	A	SAT	D		
	N'DJAMENA	A	RTF	D		
	NIAMEY	A	SAT	D		
	TUNIS	A	SAT	D		
MADAGASCAR						
ANTANANARIVO	BEIRA	A	SAT	D		
ACC/FIC	DAR-ES-SALAAM	A	SAT	D		
	DZAOUDZI	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	MAURITIUS	A	RTF	D		
	MORONI	A	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	SAINT-DENIS	A	SAT	D		
	SEYCHELLES	A	SAT	D		
MALAWI						
LILONGWE	BEIRA	A	SAT	D		
ACC/FIC	DAR-ES-SALAAM	A	SAT	D		
	HARARE	A	SAT	D		
	LUSAKA	A	SAT	D		
MALI						
BAMAKO	ABIDJAN	A	SAT	D		
APP	BOBO DIOULASSO	A	SAT	D		
	DAKAR	A	SAT	D		
	GAO	A	SAT	D		
	MOPTI	A	RTF	D		
	OUAGADOUGOU	A	SAT	D		
	ROBERTSFIELD	A	SAT	D		
			SAT	1 S	Dakar	
GAO	BAMAKO	A	SAT	D		
APP	MOPTI	A	SAT	D		
	NIAMEY	A	SAT	D		
MOPTI	GAO	A	SAT	D		
TWR	BAMAKO	A	SAT	D		
MAURITANIA						
NOUADHIBOU	DAKAR	A	SAT	D		
APP	LAS PALMAS	A	SAT	D		
	NOUAKCHOTT	A	SAT	D		
NOUAKCHOTT	DAKAR	A	SAT	D		
APP	NOUADHIBOU	A	SAT	D		
NOUAKCHOTT	LAS PALMAS	A	SAT	D		
ACC	ALGER	A	SAT	D		
	BAMAKO	A	SAT	D		
	NIAMEY	A	SAT	D		
	CASABLANCA	A	SAT	D		
	DAKAR	A	SAT	D		
MAURITIUS	ANTANANARIVO	A	SAT	D		
MAURITIUS	BOMBAY	A	RTF	D		
ACC/FIR	COCOS	A	RTF	D		
	JOHANNESBURG	A	SAT	D		
	PERTH	A	RTF	D		
	SAINT-DENIS	A	SAT	D		
	SEYCHELLES	A	SAT	D		
MOZAMBIQUE						
BEIRA	ANTANANARIVO	A	SAT			
ACC/FIC	DAR-ES-SALAAM	A	SAT	D		
	HARARE	A	SAT	D		
	LILONGWE	A	SAT	D		
	LUSAKA	A	RTF	D		
	MAPUTO	A	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	JOHANNESBURG	D	SAT	D		
MAPUTO	BEIRA	A	SAT	D		
APP	DURBAN	A	SAT	1 S		Johannesburg
	JOHANNESBURG	A	SAT	D		
	MANZINI	A	SAT	D		
NAMIBIA						
WINDHOEK	BLOEMFONTEIN	A	SAT	1 S	Johannesburg	
ACC/FIC	CAPETOWN	A	SAT	1 S	Johannesburg	
	GABORONE	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	LUANDA	A	SAT	D		
NIGER						
NIAMEY	ABIDJAN	A	SAT	D		
ACC/FIC	ACCRA	A	SAT	D		
	ALGER	A	SAT	D		
	DAKAR	A	SAT	D		
	GAO	A	SAT	D		
	KANO	A	SAT	D		
	N'DJAMENA	A	SAT	D		
	OUAGADOUGOU	A	SAT	D		
	TRIPOLI	A	SAT	D		
NIGERIA						
KANO	ACCRA	A	SAT	D		
ACC/FIC	BRAZZAVILLE	A	SAT	D		
	DOUALA	A	SAT	D		
	LAGOS	A	SAT	D		
	LIBREVILLE	A	RTF	D		
	MAIDUGURI	A	SAT	D		
	N'DJAMENA	A	SAT	D		
	NIAMEY	A	SAT	D		
LAGOS	ACCRA	A	SAT	D		
ACC/FIC	COTONOU	A	SAT	D		
	DOUALA	A	SAT	D		
	KANO	A	SAT	D		
	LIBREVILLE	A	SAT	D		
MAIDUGURI	KANO	A	SAT	D		
APP	N'DJAMENA	A	SAT	D		
				D		
REUNION (France)						
SAINT-DENIS	ANTANANARIVO	A	SAT	D		
APP	MAURITIUS	A	SAT	D		
RWANDA	BUJUMBURA	A	SAT	D		
KIGALI	BUKAVU	A	LTF	1 S	Kigali	
APP	DAR-ES-SALAAM	A	SAT	D	Kigali	
	ENTEBBE	A	SAT	D		
	GOMA	A	RTF	1 S	Kigali/Kinshasa	
	KINSHASA	A	SAT	D		Activated

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
SAO TOME AND PRINCIPE						
SAO TOME	ACCRA	A	SAT	D		
TWR	BRAZZAVILLE	A	SAT	D		
	LIBREVILLE	A	SAT	D		
SENEGAL						
DAKAR	ABIDJAN	A	SAT	D		
ACC/FIC	ATLANTICO	A	SAT	D		
	BAMAKO	A	SAT	D		
	BANJUL	A	SAT	D		
	BISSAU	A	SAT	D		
	LAS PALMAS	A	SAT	D		
	NOUAKCHOTT	A	SAT	D		
	PIARCO	A	SAT	D		
	ROBERTSFIELD	A	SAT	D		
	ROCHAMBEAU	A	SAT	D		
	SAL	A	SAT	D		
DAKAR-DIASS APP	BANJUL	A	SAT	D		
	BISSAU	A	SAT	D		
	NOUAKCHOTT	A	SAT	D		
	SAL	A	SAT	D		
SEYCHELLES	ANTANANARIVO	A	SAT	D	Victoria/Mumbai	
SEYCHELLES	MUMBAI	A	LTF	2 S		
APP	DAR-ES-SALAAM	A				
	MALE		SAT	D		
	MAURITIUS	A	RTF	D		
	MOGADISHU	A	SAT	D		
	NAIROBI	A	SAT	D		
SIERRA LEONE						
FREETOWN	CONAKRY	d	SAT	D		
APP	ROBERTSFIELD	d	SAT	D		
SOMALIA						
MOGADISHU	ADDIS ABABA	A	SAT	D		
ACC/FIC	MUMBAY	A	RTF	2 S	Mogadishu/Mumbai	
	DJIBOUTI	A	SAT	D		
	NAIROBI	A	SAT	1 S		
	SANA'A	A	SAT	D	Nairobi	
	SEYCHELLES	A	SAT	D		
HARGEISA	DJIBOUTI	A	RTF	D		
APP						
SOUTH AFRICA						
BLOEMFONTEIN	CAPETOWN	A	SAT	D		
	DURBAN	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	MASERU	A	SAT	D		
	PORT ELIZABETH	A	RTF	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	REMARKS
1	2	3	4	5	6	7
	WINDHOEK	A	SAT	D		
CAPETOWN	BLOEMFONTEIN	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	PORT ELIZABETH	A	SAT	D		
	WINDHOEK	A	SAT	1 S	Johannesburg	
DURBAN	BLOEMFONTEIN	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
	MANZINI	A	SAT	D		
	MAPUTO	A	SAT	D		
	PORT ELIZABETH	A	RTF	D		
JOHANNESBURG	ANTANANARIVO	A	SAT	D		
	BLOEMFONTEIN	A	SAT	D		
	BRASILIA	A	SAT	1 S	Ezeiza	(SAM)
	CAPETOWN	A	SAT	D		
	DURBAN	A	RTF	D		
	EZEIZA	A	SAT	1 S	Ezeiza	(SAM)
	GABORONE	A	SAT	D		
	HARARE	A	SAT	D		
	LUANDA	A	SAT	D		
	MANZINI	A	SAT	D		
	MAPUTO	A	SAT	D		
	MAURITIUS	A	RTF	D		
	MONTEVIDEO	A	SAT	1 S	Ezeiza	(SAM)
	PERTH	A	SAT	D		
	PORT ELIZABETH	A	SAT	D		
	RIVADAVIA	A	SAT	1 S	Ezeiza	(SAM)
	WINDHOEK	A	SAT	D		
PORT ELIZABETH	BLOEMFONTEIN	A	SAT	D		
	CAPETOWN	A	SAT	D		
	DURBAN	A	SAT	D		
	JOHANNESBURG	A	SAT	D		
SOUTH SUDAN						
JUBA	NAIROBI	A	LTF	2 S	Juba/Nairobi	
	KHARTOUM	A	LTF	2 S	Juba/Khartoum	
SWAZILAND						
MANZINI	DURBAN	A	SAT	1 S	Johannesburg	
	JOHANNESBURG	A	SAT	D		
	MAPUTO	A	SAT	D		
TOGO						
LOME	ACCRA	D	SAT	D		
	COTONOU	D	SAT	D		
	NIAMTOUGOU	D	SAT	D		
	LAGOS	D	SAT	D		
	KANO	D	SAT	D		
	OUAGADOUGOU	D	SAT	D		
	ABIDJAN	D	SAT	D		
	NIAMEY	D	SAT	D		
	DOUALA	D	SAT	D		
	LIBREVILLE	D	SAT	D		
	BRAZZAVILLE	D	SAT	D		

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	N'DJAMENA	D	SAT	D		
NIAMTOUGOU	ACCRA	D	SAT	D		
	LOME	D	SAT	D		
	OUAGADOUGOU	D	SAT	D		
UGANDA						
ENTEBBE	DAR-ES-SALAAM	A	SAT	D		
	KHARTOUM	A	SAT	D		
	KIGALI	A	SAT	D		
	KINSHASA	A	SAT	D		
	NAIROBI	A	SAT	D		
UNITED REPUBLIC OF TANZANIA						
DAR-ES-SALAAM ACC/FIC	ANTANANARIVO	A	SAT	D		
	BEIRA	A	SAT	D		
	BUJUMBURA	A	SAT	D		
	ENTEBBE	A	SAT	D		
	KIGALI	A	RTF	D		
	KILIMANJARO	A	LTF	1 S		
	KINSHASA	A	SAT	D		
	LILONGWE	A	SAT	D		
	LUSAKA	A	SAT	D		
	MOMBASA	d	SAT	2 S		
	NAIROBI	A	SAT	D		
	SEYCHELLES	A	RTF	D		
	ZANZIBAR	A	SAT	1 S		
KILIMANJARO APP	DAR-ES-SALAAM	A	LTF	1 S	Dar-es-Salaam	
	MOMBASA	A	LTF	2 S	Dar-es-Salaam/Nairobi	
	NAIROBI	A	LTF	2 S	Dar-es-Salaam/Nairobi	
ZANZIBAR	DAR-ES-SALAAM	A	LTF	1 S	Dar-es-Salaam	
WESTERN SAHARA						
EL AIOUN	LAS PALMAS	A	LTF	D		
DAKHLA	NOUADHIBOU	A	LTF	D		
ZAMBIA						
LUSAKA	BEIRA	A	SAT	D	Lusaka	
	DAR-ES-SALAAM	A	SAT	D	Lusaka/Dar-es-Salaam	
	GABORONE	A	SAT	D		
	HARARE	A	SAT	D		
	KINSHASA	A	SAT	D	Lusaka	
	LILONGWE	A	SAT	D		
	LUANDA	A	SAT	D		
	NDOLA	A	LTF	2 S	Lusaka/Kinshasa	
NDOLA	LUBUMBASHI	A	LTF	D		
	LUSAKA	A	LTF	D		
ZIMBABWE						
BULAWAYO	FRANCISTOWN	A	LTF	D		
	HARARE	A	LTF	D		
HARARE	BEIRA	A	SAT	1 S	Lusaka	

ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS			CIRCUIT			REMARKS
TERMINAL I	TERMINAL II	TYPE	SERVICE	D/S	TO BE SWITCHED VIA	
1	2	3	4	5	6	7
	BULAWAYO GABORONE JOHANNESBURG LILONGWE LUSAKA	A A A A A	LTF SAT SAT SAT SAT	D D D D 1 S	 Lusaka	

CHART CNS II-3 - AFI RATIONALIZED ATS-DS CHART

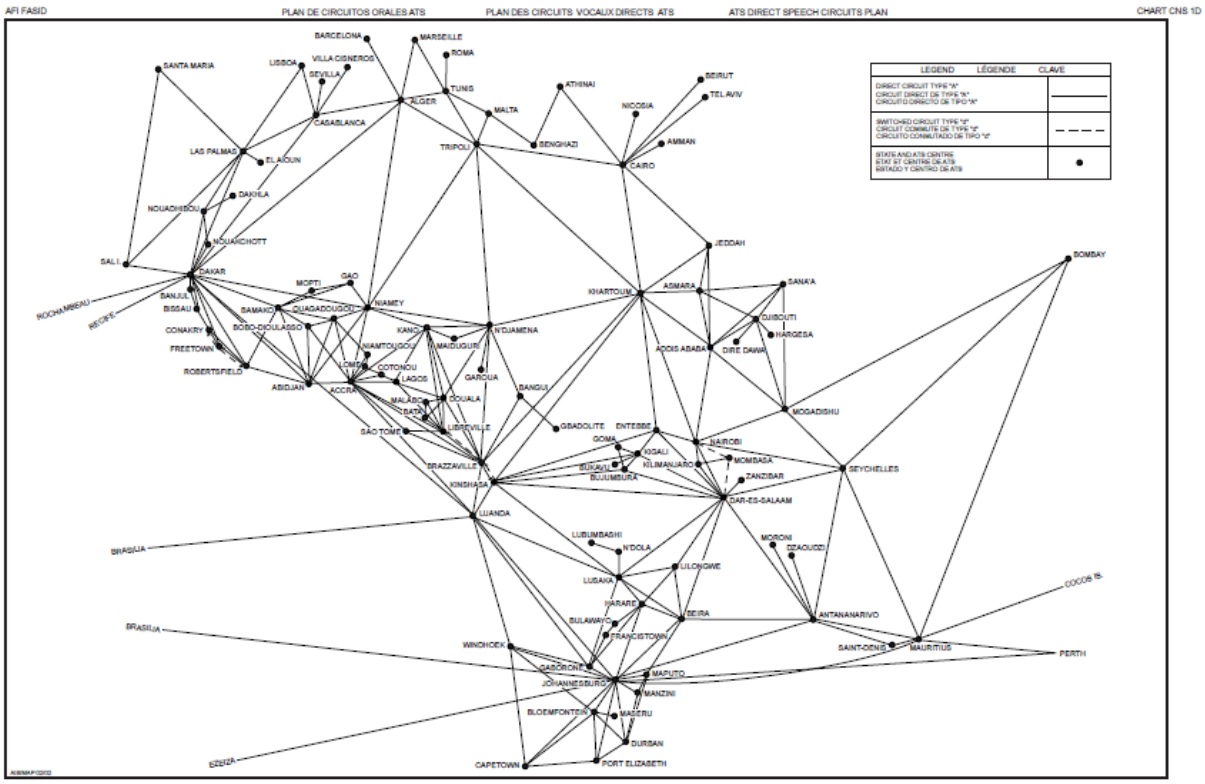

TABLE CNS II-4 - HF NETWORK DESIGNATORS APPLICABLE FOR THE AFI REGION

EXPLANATION OF THE TABLE

Column

1 Name of station, preceded by its location indicator.

2 Network designators assigned to the facility providing HF radiotelephony en-route communications (selected from the provisions of the allotment plan in Appendix S27 to the ITU Radio Regulations).

NOTES

The ICAO designators for HF MWARA and VOLMET networks in the AFI Region are derived from the ITU allotment area abbreviations as contained in Appendix S27 to the ITU Radio Regulations.

ITU allotment area:

Two- and three-letter alpha entries indicate major world air route areas (MWARA):

Four-letter alpha entries indicate VOLMET areas:

Location Indicator and Name of Location	HF en route Family
ANGOLA FNHU HUAMBO/Albano Machado TWR APP-L FNLU LUANDA ACC-U GP ACC-L FNLU LUANDA/4 de Fevereiro SMC TWR1 APP-U APP-I APP-L VOLMET ATIS	AFI-4 AFI-4R SAT-1
BENIN DBBB COTONOU/Cadjehoun TWR TWR APP-H SMC FBSP SELEBI-PHIKWE/Selebi-Phikwe TWR SMC	AFI-4R
BOTSWANA FBFT FRANCISTOWN/Francistown TWR APP-H SMC	

FBSK GABORONE ACC-U FBSK GABORONE/Sir Seretse Khama TWR APP-H SMC FBMN MAUN/Maun TWR APP-H SMC FBKE KASANE/Kasane	2AF-4 AFI-4R
BURKINA FASO DFOO BOBO-DIOULASSO/ Bobo-Dioulasso DFOO BOBO-DIOULASSO/ Bobo-Dioulasso TWR APP-I DFFD OUAGADOUGOU DFFD OUAGADOUGOU/Ouagadougou TWR APP-U	 AFI-1R AFI-!R
BURUNDI HBBA BUJUMBURA ACC-I ER HBBA BUJUMBURA/Bujumbura SMC TWR APP-H APP-I	 AFI-4R
CAMEROON FKKK DOUALA ACC-U 2-ER NE VOLMET FKKD DOUALA/Douala SMC TWR APP-I APP-U FKKR GAROUA/Gaoua TWR APP-I FKKL MAROUA FKKN N'GAOUNDERE/N'Gaoundéré TWR FKYS YAOUNDE/Nsimalen TWR APP-I	 AFI-4R AFR-4R AFI-4R
CAPE VERDE	

GVFM PRAIA/Francisco Mendes TWR APP-L GVAC SAL I. ACC-U 2-ER ACC-L GVAC SAL I./Amilcar Cabral TWR APP-I	SAT-1 AFI-1 SAT-2 AF !-2
CENTRAL AFRICAN REPUBLIC FEFF BANGUI FIS-L 2-ER FEFF BANGUI/M'Poko TWR APP-I	AFI-4R
CHAD FTTT N'DJAMENA ACC-U FIS-L FTTJ N'DJAMENA/N'Djamena TWR APP-I	AFI-2
COMOROS FMCV ANJOUAN/Ouani TWR FMCZ DZAOUDZI/Pamanzi, Mayotte I. TWR APP-I FMCH MORONI FMCH MORONI/Hahaia TWR APP-L	AFI-5
CONGO FCCC BRAZZAVILLE ACC-U FIS-U VOLMET (HF) FCBB BRAZZAVILLE/Maya-Maya TWR APP-U FCPP POINTE NOIRE/Agostino Neto TWR APP-I	AFI-6 AFI-4R
COTE D'IVOIRE DIII ABIDJAN ACC-U VOLMET DIAP ABIDJAN/Felix H. Boigny SMC	

TWR APP-H DIBK BOUAKE/Bouaké SMC TWR APP-I	AFI-4R
DEMOCRATIC REPUBLIC OF THE CONGO FZNA GOMA FZNA GOMA/Goma TWR APP-I FZZA KINSHASA ACC-U 4-ER FZAA KINSHASA/N'Djili TWR APP-I FZIC KISANGANI FIS-U ACC-I FZIC KISANGANI/Bangoka TWR APP-I FZQA LUBUMBASHI ACC-U FZQA LUBUMBASHI/Luano TWR APP-U	AFI-4R AFI-4 AFI-4R AFI-4R AFI-4R
DJIBOUTI HDDD DJIBOUTI HDAM DJIBOUTI/Ambouli SMC TWR APP-H	AFI-3R
EQUATORIAL GUINEA FGSL MALABO/Malabo TWR APP-I	
ERITREA HHSB ASSAB/Assab Intl. HHAS ASMARA/Asmara Intl. SMC TWR APP-U ACC-U	AFI-3
ETHIOPIA HAAB ADDIS ABABA ACC-U 3-ER HAAB ADDIS ABABA/Bole Intl	AFI-3 AFI-3R

SMC TWR APP-I HADR DIRE DAWA/Aba Tenna SMC TWR APP-I	
GABON FOON FRANCEVILLE FOON FRANCEVILLE/M'Vengué TWR APP-L SMC FOOO LIBREVILLE ACC-U FIS-L FOOL LIBREVILLE/Léon M'Ba SMC TWR APP-U FOOG PORT GENTIL TWR APP-I SMC	 AFI-4R AFI-4R AFI-4R AFI-4R
GAMBIA GBYD BANJUL/Yundum SMC TWR APP-H	
GHANA DGAA ACCRA ACC-U 2-ER DGAA ACCRA/Kotoka Intl SMC TWR APP-I APP-U DGSI KUMASI/Kumasi TWR	 AFI-4R
GUINEA GUOK BOKE/Baralandé TWR GUCY CONAKRY GUCY CONAKRY/Gbessia SMC TWR APP-I GUFH FARANAH/Badala TWR GUXD KANKAN/Diankana	 AFI-1R

TWR GULB LABE/Tata TWR GUNZ N'ZEREKORE/Konia TWR VOLMET	
GUINEA-BISSAU GGOV BISSAU/Oswaldo Viera Intl TWR APP-H FIS-L SMC	
KENYA HKEL ELDORET/Eldoret Intl. SMC TWR APP-I HKMO MOMBASA/Moi Intl SMC TWR APP-U HKNA NAIROBI ACC-U FIS-L HKNA NAIROBI/Jomo Kenyatta Intl SMC TWR APP-U APP-I	AFI-3 AFI-3R
LESOTHO FXMM MASERU FIS-L FXMM MASERU/Moshoeshoe I Intl SMC TWR APP-H	AFR-4R
LIBERIA GLRB MONROVIA ACC-U 2-ER GLRB MONROVIA/Roberts Intl SMC TWR APP-I	AFI-1R AFI-1
MADAGASCAR FMMM ANTANANARIVO FIS-U ACC-U GP VOLMET (HF) FMMI ANTANANARIVO/Ivato TWR APP-I	INO-1 AFI-5

FMNA ANTANANARIVO/Arrachart TWR FMNM MAHAJANGA/Amborovy TWR APP-I FMNN NOSY-BE/Fascène TWR FMMT TOAMASINA/Toamasina TWR APP-I FMSD TOLAGNARO/Tolagnaro AFIS FMMS SAINTE MARIE/St. Marie AFIS	
MALAWI FWCL BLANTYRE/Chileka SMC TWR APP-U FWLI LILONGWE/Lilongwe Intl. SMC TWR APP-U APP-I FWLL LILONGWE ACC-U ER	AFI-4R
MALI GABS BAMAKO GABS BAMAKO/Sénou TWR APP-I APP-U GAGO GAO GAGO GAO/Gao TWR APP-I GAKY KAYES/Kayes TWR GAMB MOPTI-BARBE/Mopti-Barbe TWR GANR NIORO/Nioro TWR GATB TOMBOUCTOU/Tombouctou TWR	AFI-1R AFI-2R
MAURITANIA GQPP NOUADHIBOU	AFI-1R SAT-2R

GQPP NOUADHIBOU/Nouadhibou TWR APP-I GQNO NOUAKCHOTT – Oumtounsy SMC TWR/APP ATIS	AFI-1R SAT-2R
MAURITIUS FIMP MAURITIUS ACC-U FIMP MAURITIUS/Sir Seewoosagur Ramgoolam Intl SMC TWR APP-U	INO-1
MOZAMBIQUE FQBR BEIRA ACC-U 3-ER FIS-L FIS-U FQBR BEIRA/Beira TWR APP-I SMC FQMA MAPUTO ACC-U ER FQMA MAPUTO/Maputo TWR APP-U SMC FQTT TETE GP ER FQWP NAMPULA GP ER	INO-1 AFI-4 AFI-4R
NAMIBIA FYKT KEETMANSHOOP/Keetmanshoop TWR APP FYWB WALVIS BAY/Walvis Bay TWR APP FYWH WINDHOEK FYWH WINDHOEK/Windhoek Intl. TWR APP-I	AFI-4
NIGER DRZA AGADES/Sud TWR DRRR NIAMEY	AFI-2

ACC-U 2-ER FIS-U DRRN NIAMEY/Diori Hamani Intl TWR APP-U SMC	AFI-4
NIGERIA DNAA ABUJA/Nnamdi Azikiwe TWR APP-I DNKK KANO ACC-U 2-ER DNKN KANO/Mallam Aminu Kano SMC TWR APP-U DNLL LAGOS ACC-U 3-ER DNMM LAGOS/Murtala Muhammed SMC TWR APP-U DNPO PORT HARCOURT/Port Harcourt SMC TWR APP-L APP-U	 AFI-2 AFI-4 AFI-4
REUNION (France) FMEE SAINT-DENIS/ Gillot (La Réunion) SMC TWR APP-U	
RWANDA HRYR KIGALI/ Kigali International SMC TWR APP-H ACC-L	 AFI-4R
SAO TOME AND PRINCIPE FPST SAO TOME FPST SAO TOME/Sao Tome TWR APP-I SMC	 AFI-4R
SENEGAL GOGG ZIGUINCHOR/Ziguinchor TWR GOGS CAP SKIRING/Cap Skiring	

TWR GOOO DAKAR ACC-U 3-ER FIS-U GOSS SAINT-LOUIS/Saint-Louis TWR GOTT TAMACOUNDA/Tambacounda TWR GOBD DAKAR-DIASS/Blaise Diagne SMC TWR APP-U ATIS	AFI-1 SAT-1 SAT-2
SEYCHELLES FSIA MAHE ACC-U ER FSIA MAHE/Seychelles Intl SMC TWR APP-U	INO-1 AFI-5 AFI-3
SIERRA LEONE GFLL FREETOWN GFLL FREETOWN/Lungi SMC TWR APP-I	AFI-1
SOMALIA HCMI BERBERA/Berbera TWR APP-U HCMV BURAO/Burao TWR HCMH HARGEISA/Hargeisa TWR APP-U HCMK KISIMAYU/Kisimayu TWR APP-U HCMM MOGADISHU ACC-U HCMM MOGADISHU/Mogadishu SMC TWR APP-U	AFI-3
SOUTH AFRICA FAAB ALEXANDER BAY/ Alexander Bay TWR FABL BLOEMFONTEIN ACC-U	

FIS-L FABL BLOEMFONTEIN/Bloemfontein TWR APP-I FACT CAPE TOWN ACC-U FACT CAPE TOWN/CapeTown TWR FADN DURBAN/Durban ACC-U FIS-L FADN DURBAN/Durban TWR APP-I FAJS JOHANNESBURG ACC-U GP FAJS JOHANNESBURG/Johannesburg TWR APP-I FAGM JOHANNESBURG/Rand TWR FALA LANSERIA/Lanseria TWR FAUP UPINGTON/Upington TWR	INO-1 AFI-4 AFI-4R
SWAZILAND FDMS MANZINI/Matsapha TWR APP-I	
TOGO DXXX LOMÉ DXXX LOMÉ/Tokoin TWR APP-I DXNG NIAMTOUGOU/Niamtougou TWR APP-H	AFI-4R
UGANDA HUEN ENTEBBE ACC-U HUEN ENTEBBE/Entebbe Intl TWR APP-L	AFI-3

UNITED REPUBLIC OF TANZANIA	
HTDA DAR-ES-SALAAM	
ACC-U	
ACC-L	AFI-4R
VOLMET	AFI-4R INO-1
HTDA DAR-ES-SALAAM/ Dar-es-Salaam	
SMC	AFI-4
TWR	AFI-4R
APP-L	
APP-I	
HTKJ KILIMANJARO/Kilimanjaro Intl	
SMC	
TWR	
APP-I	
HTZA ZANZIBAR/Zanzibar	
SMC	
TWR	
APP-I	
WESTERN SAHARA	
GSAI EL AAIUN/El Aaiun	
TWR	
APP-L	
GSVO VILLA CISNEROS/Villa Cisneros	
TWR	
ZAMBIA	
FLLI LIVINGSTONE/Livingstone Intl	
TWR	
APP-H	
FLLS LUSAKA	
ACC-U 3-ER	AFI-4R
FLLS LUSAKA/Lusaka Intl	
TWR	
APP-H	
FLMF MFUWE/Mfuwe	
TWR	
APP-H	
FLND NDOLA/Ndola	
TWR	
APP-H	
ZIMBABWE	
FVBU BULAWAYO/Bulawayo	
TWR	
APP-H	
FVHA HARARE	
ACC-U	
GP	
FIS-L 2-ER	
FVHA HARARE/Harare	
TWR	
APP-I	

FVFA VICTORIA FALLS/Victoria Falls TWR APP-I	

CHART CNS II-4 - HF EN-ROUTE RADIOTELEPHONY NETWORKS AND VHF EXTENDED RANGE

Frequency (KHz)	ITU allotment area	AFI-1	AFI-2	AFI-3	AFI-4	AFI-5	INO-1	SAT-1	SAT-2	V AFI	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
2851	A				X						
2854	F								X		
2860	I									X	
2878	S				X						
2935	A										(1)
3404	T									X	
3419	V		X								
3425	AF					X					
3452	I	X						X			(3)
3467	AF			X							
3476	I						X				
4657	SA					X					
5493	T				X						
5499	V									X	
5517	AF			X							
5565	I								X		
5634	AF						X				
5652	I		X								
6535	AF	X						X			(3)
6538	I									X	
6559	SA				X						
6574	T			X							
6586	AFI, MID,				X						
6673	SP INO,	X									
8852	NAT AFI,									X	
8861	CEP AFI	X						X			(3)
8870	V			X							
8873	AF				X						
8879	I						X				
8888	AF				X						
8894	I,		X								
8903	SA				X						
10057	T									X	
11291	IN								X		
11300	O			X							
11330	AFI,										(1)
13261	CWP									X	
13273	SAT		X								
13288	V			X							

Frequency (KHz)	ITU allotment area	AFI-1	AFI-2	AFI-3	AFI-4	AFI-5	INO-1	SAT-1	SAT-2	V AFI	Remarks
1	2	3	4	5	6	7	8	9	10	11	12
13294	AFI INO,				X						
13306	NAT SAT,						X				
13315	NCA SAT								X		
13357	SAT AFI,	X						X			(3)
17955	INO	X						X	X		(3)
17961			X	X	X		X				

Note.— Headings of columns 3 through 11 indicate the ICAO designator for HF MWARA and VOLMET networks operating in or adjacent to the AFI region and are derived from the ITU allotment area abbreviations as contained in Appendix 27 Aer2 to the ITU Radio Regulations.

ITU Allotment areas from ITU RR Appendix 27 Aer2:

Two- and three-letter entries indicate major world air route areas (MWARAs):

AFI	=	Africa	CEP	=	Central East Pacific
EUR	=	Europe	CWP	=	Central West Pacific
INO	=	Indian Ocean	NAT	=	North Atlantic
MID	=	Middle East	NP	=	North Pacific
NCA	=	North Central Asia	SAT	=	South Atlantic

Four-letter entries indicate VOLMET areas:

V AFI	=	VOLMET area — Africa-Indian Ocean
V EUR	=	VOLMET area — Europe
V MID	=	VOLMET area — Middle East
V NCA	=	VOLMET area — North Central Asia
V SEA	=	VOLMET area — South East Asia

Numeric followed by alpha(s) indicates regional and domestic air route areas (RDARAs).

Column 12 — Remarks indicate:

1) Available for future use in the allotment area indicated, subject to coordination with ICAO.

2) Available for future use in the network indicated, subject to coordination with ICAO.

3) Frequency selected by applying the provisions of Appendix 27/21 of Appendix 27 Aer2 to the ITU Radio Regulations.

MID-1
AFI-1
AFI-2
AFI-3
AFI-4
AFI-5
INO-1
SAT-1
SAT-2
TUNIS
ALGER
CASABLANCA
TRIPOLI
BENGHAZI
GHARDAIA
CAIRO
ZARZAITINE
GRAN CANARIA
TAMANRASSET
NOUADHIBOU
NOUAKCHOTT
SAL I
GAO
KHARTOUM
ASMARA
DAKAR
NIAMEY
N'DJAMENA
OUAGADOUGOU
BAMAKO
KANO
DJIBOUTI
BOBO DIOULASSO
CONAKRY
ADDIS ABABA
FREETOWN
MAROUA
BOUAKE
LAGOS
GAROUA
LOME
MONROVIA
BANGUI
KISANGANI
ENTEBBE
ABIDJAN
ACCRA
COTONOU
DOUALA
MOGADISHU
GOMA
NAIROBI
LIBREVILLE/LÉON M'BA
KIGALI
SÃO TOME
LIBREVILLE
BUJUMBURA
PORT GENTIL
FRANCEVILLE
BRAZZAVILLE
KINSHASA
MAHE
DAR ES SALAAM
MORONI
LUANDA
LUBUMBASHI
LILONGWE
NAMPULA
LUSAKA
TETE
HARARE
ANTANANARIVO
MAURITIUS
BEIRA
WINDHOEK
MAPUTO
JOHANNESBURG
GABORONE
MASERU
CAPETOWN
LEGENDE LÉGENDE CLAVE
HF STATION
ESTACION HF
VHF EXTENDED RANGE
COUVERTURE VHF ÉLARGIE
COBERTURA VHF AMPLIADA

TABLE CNS II-AFI-1 – NAVIGATIONAL AIDS

EXPLANATION OF THE TABLE

Column

1 Name of the State/Territory, city and aerodrome and, for en-route and terminal area aids, the location of the facility.

2 Type of runway:

NINST — non-instrument
NPA — non-precision approach runway
PA1 — precision approach runway, Category I
PA2 — precision approach runway, Category II

3 The function served by the aids shown in columns 4 to 8:

A/L — approach and landing
E— en-route
T — terminal

4 ILS — Instrument landing system. The designation number of the runway to be served by an ILS is indicated together with a Roman numeral I or II to indicate a facility performance Category I or II ILS, respectively.

Note.— The symbol "" indicates that the ILS requires a Category II signal quality but without the reliability and availability provided by redundant equipment and automatic changeover.*

5 Locator, either associated with an ILS or for use as an approach aid to an aerodrome.

6 Distance measuring equipment. Aligned with the ILS shown in column 4 when the DME is required to serve as a substitute for a marker beacon component of ILS. When aligned with the VOR in column 7, indicates a requirement for the DME to be collocated with the VOR.

7 Recommended VOR.

8 NDB.

Note 1.— New requirements for NDB are discouraged. En-route navigation requirements are to be met by VOR/DME facilities.

Note 2.— A plus sign (+) indicates that the NDB should be withdrawn when the recommended VOR or VOR/DME is implemented.

Note 3.— The LF/MF NDB annotated with the symbol "#" are, with few exceptions, existing national facilities which are not protected from interference to the extent required by the international planning provisions of Annex 10.

9 The distance and altitude to which signal protection of the VOR or VOR/DME is required indicated in nautical miles (NM) and in hundreds of feet, or recommended rated coverage of NDB expressed in nautical miles.

Note.— Rated coverage is defined as the area surrounding an NDB within which the strength of the vertical field of the ground wave exceeds the minimum value specified for the geographical area in which the radio beacon is located.

10, 11 To be developed:

GNSS — global navigation satellite system (including GBAS and SBAS).

GBAS (ground-based augmentation system) implementation planned to be used in precision approach and landing CAT I, CAT II, CAT III.

SBAS (satellite-based augmentation system) planned to be used for route navigation, for terminal, for non-precision approach and landing. An "X" indicates service availability; exact location of installation will be determined.

Note.— CAT I by GBAS or SBAS will be available at locations where analysis of historical MET data or traffic characteristics justifies the requirement.

12 Remarks.

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS		Remarks Remarques Observaciones
									GBAS	SBAS	
1	2	3	4	5	6	7	8	9	10	11	12
ANGOLA											
CUITO CUANAVALE		E			X	X		200/500			
HUAMBO/Albano Machado	11 NPA 29 NPA	A/L			X	X		200/500			
KUITO		E			X	X		200/500			
LUANDA/4 de Fevereiro		E			X	X		200/500			
	05NPA	A/L		X	X	X					
	23PA1	A/L	23-II*	X	X	X					
LUENA		E			X	X		200/500			
SAURIMO		E			X	X		200/500			
		E					X+#	50			
BENIN											
COTONOU/Cadjehoun		E			X	X		200/500			
	06 NPA	A/L		X	X	X					
	24 PA1	A/L	24-II*	X	X	X					
BOTSWANA											
FRANCISTOWN		E		X	X	X		200/500			
	11 NINST	A/L									
	29 NINST										
GABORONE/Sir Seretse Khama Intl		E			X	X		200/500			
	08 PA1	A/L	08-I								
	26 NPA	A/L			X	X					
KASANE/Kasane	08 NPA	A/L			X	X		200/500			
	26 NINST										
MAUN/Maun		E			X	X		200/500			
	08 NINST	A/L				X					
	26 NINST										
KANG		E				X		200/500			
SELEBI-PHIKWE/Selebi Phikwe	12 NINST	A/L					X				
	30 NINST										
BURKINA FASO											
BOBO-DIOULASSO/Bobo-Dioulasso		E			X	X		200/500			
	06 PA1	A/L	06-I	X	X	X					
	24 NPA	A/L		X	X	X					
OUAGADOUGOU/Ouagadougou		E			X	X		200/500			
	04L PA1	A/L	04L-II*	X	X	X					
	22R NPA	A/L		X	X	X					
BURUNDI											
BUJUMBURA/Bujumbura		E			X	X		200/500			
	18 PA1	A/L	18-II*	X	X	X					
	36 NPA	A/L			X	X					
CAMEROON											
DOUALA/Douala		E		X	X	X		200/500			
	12 NPA	A/L		X	X	X					
	30 PA2	A/L	30-II	X	X	X					
FOUMBAN		E				X		200/500			
GAROUA/Garoua		E			X	X		200/500			
	09 PA1	A/L	09-II*	X	X	X					
	27 NPA	A/L		X		X					
MAMFE		E				X		200/500			
	08NINST					X	X				
	26NINST					X	X				
MAROUA/Salak	13 NPA	A/L				X	X				
	31 NINST										
M'BANGA		E					X	200			
N'GAOUNDERE/N'Gaoundéré		E				X		200/500			
	03 NPA	A/L		X		X					
	21 NINST										
YAOUNDE/Nsimalen		E		X	X	X		200/500			
	01 NINST										
	19 PA2	A/L	19-II*	X	X	X					

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS		Remarks Remarques Observaciones
									GBAS	SBAS	
1	2	3	4	5	6	7	8	9	10	11	12
CAPE VERDE											
PRAIA/Francisco Mendes	04 NPA	A/L		X							
SAL I./ Amilcar Cabral	22 NINST	E			X	X		200/500			
	01 PA1	A/L	01-II		X	X					
	19 NPA	A/L			X	X					
		E					X	400			
CENTRAL AFRICAN REPUBLIC											
BANGUI/M'Poko		E			X	X		200/500			
	17 NPA	A/L		X	X	X					
	35 PA1	A/L	35-II*	X	X	X					
BERBERATI/Berberati		E				X		200/500			
	17 NPA	A/L		X		X		200/500			
	35 NINST										
CHAD											
ABECHE		E				X		200/500			
N'DJAMENA/N'Djamena		E			X	X		200/500			
		E					X	250			
	05 PA1	A/L	05-II*	X	X	X					
	23 NPA	A/L		X	X	X					
MOUNDOU		E				X		200/500			
COMOROS											
ANJOUAN/Ouani	10 NPA	A/L		X							
	28 NPA										
DZAOUDZI/Pamanzi, Mayotte I.	16 NINST										
	34 NPA	A/L		X	X	X		40/250			
MORONI Prince Said Ibrahim		E			X	X		200/500			
	02 PA1	A/L	02-II*	X	X	X					
	20 NPA	A/L	X	X	X	X					
CONGO											
BRAZZAVILLE/Maya-Maya		E			X	X		200/500			
	06 PA1	A/L	06 -II*	X	X	X					
	24 NPA	A/L		X	X	X					
MAKOUA		E				X		200/500			
POINTE-NOIRE/Agostino Neto		E			X	X		200/500			
	17 NPA	A/L		X	X	X		200/500			
	35 NPA	A/L		X	X	X					
							X	150			
COTE D'IVOIRE											
ABIDJAN/Félix Houphouet Boigny		E			X	X		200/500			
	03 NPA	A/L		X	X	X					
	21 PA2	A/L	21-II	X	X	X					
BOUAKE/Bouaké		E			X			200/500			
	03 NPA	A/L			X						
	21 NPA	A/L			X						
DEMOCRATIC REP. OF THE CONGO											
BUNIA		E				X		200/500			
GOMA/Goma		E			X	X		200/500			
	18 NINST										
	36 NPA	A/L			X	X					
KALEMIE		E				X		200/500			
KANANGA		E				X		200/500			
KINDU		E				X		200/500			
KINSHASA/N'Djili		E			X	X		200/500			
	06 NPA	A/L		X	X	X					
	24 PA1	A/L	24-II*	X	X	X					
KISANGANI/Bangoka		E				X		200/500			
	13 NPA	A/L		X		X					
	31 NPA	A/L		X		X					
LUBUMBASHI/Luano		E			X	X		200/500			
	07 PA1	A/L	07 -II*	X	X	X					
	25 NPA	A/L		X	X	X					
MBUJI MAYI/Mbuji Mayi	17 NPA	A/L		X		X					
	35 NINST	A/L									

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS		Remarks Remarques Observaciones
									GBAS	SBAS	
1	2	3	4	5	6	7	8	9	10	11	12
DJIBOUTI											
DJIBOUTI/Ambouli		E			X	X		200/500			
	09 NPA	A/L		X	X	X					
	27 PA1	A/L	27-II*	X	X	X					
EQUATORIAL GUINEA											
BATA		E					X	200			
MALABO/Malabo		E				X		200/500			
		E					X+	150			
	05 PA1	A/L	05-I	X		X					
	23 PA1	A/L		X		X					
ERITREA											
ASMARA/Asmara Intl		E			X	X	X	200/500			
	07 PA1	A/L	07-II*	X	X	X					
	25 NPA	A/L		X		X	X				
ASSAB/Assab	12 NPA	A/L					X	150			
	30 NINST	A/L									
ETHIOPIA											
ADDIS ABABA/Bole Intl		E			X	X		200/500			
	07 NPA	A/L		X	X	X					
	25 PA1	A/L	25-II*	X	X	X					
MAKALE		E			X	X		200/500			
DIRE DAWA/Dire Dawa Intl		E			X	X		200/500			
		E					X#	150			
	15 NINST	A/L									
	33 NPA	A/L		X	X	X					
GAMBELA		E					X	200/500			
LALIBELA		E					X	200/500			
GABON											
FRANCEVILLE/M'Vengue		E			X	X		200/500			
	15 PA1	A/L	15-II*	X	X	X					
	33 NPA	A/L		X	X	X					
LIBREVILLE/Léon M'Ba		E			X	X		200/500			
	16 PA1	A/L	16-II*	X	X	X					
	34 NPA	A/L		X	X	X					
PORT GENTIL/Port Gentil		E				X		200/500			
	03 NPA	A/L		X		X					
	21 PA1	A/L	21-I	X		X					
GAMBIA											
BANJUL/Banjul Intl		E			X	X		200/500			
	14 NPA	A/L		X	X	X					
	32 PA1	A/L	32-I	X	X	X					
GHANA											
ACCRA/Kotoka Intl		E			X	X		200/500			
	03 NPA	A/L		X	X	X					
	21 PA1	A/L	21-II*	X	X	X					
KUMASI/Kumasi		E			X	X		200/500			
	02 NPA	A/L		X		X		25/100			
	20 NPA	A/L					X	100			
PAMPA/Pampa		E			X	X		200/500			
TAMALE/Tamale		E			X	X		200/500			
	05 NPA	A/L		X	X	X					
	23 NPA	A/L									
GUINEA											
CONAKRY/Gbessia		E			X	X		200/500			
	06 PA1	A/L	06-II*	X	X	X					
	24 NPA	A/L		X	X	X					

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS		Remarks Remarques Observaciones
									GBAS	SBAS	
1	2	3	4	5	6	7	8	9	10	11	12
GUINEA-BISSAU											
BISSAU/Osvaldo Vieira Intl		E			X	X		200/500			
	03 NPA	A/L		X	X	X					
	21 PA1	A/L	21-I	X	X	X	X				
KENYA											

ELDORET/Eldoret Intl	08 PA2	A/L	08-II	X	X	X		200/500			
	26 NPA	A/L		X	X	X					
GARISSA		E			X	X		200/500			
LODWAR		E			X	X		200/500			
		E					X	350			
MANDERA		E			X	X		200/500			
MOMBASA/Moi Intl		E			X	X		200/500			
	03 NPA	A/L		X	X	X					
	21 PA1	A/L	21-I	X	X	X					
NAIROBI/Jomo Kenyatta Intl		E			X	X		200/500			
	06 PA-2	A/L	06-II	X	X	X					
	24 NPA	A/L		X	X	X					
NAKURU		E			X	X		40/250			
LESOTHO											
MASERU/Moshoeshoe I Intl		E			X	X	X	200/500			
LIBERIA											
MONROVIA/Roberts Intl		E			X	X		200/500			
	04 PA2	A/L	04-II	X	X	X					
	22 NPA	A/L		X	X	X					
MADAGASCAR											
ANKAZOBE		E					X	200/500			
ANTANANARIVO/Ivato		E		X	X	X		200/500			
	11 PA1	A/L	11-II*	X	X	X					
	29 NPA	A/L		X	X	X					
ANTSIRANANA/Arrachart		E		X	X	X		200/500			
	13 NPA	A/L		X	X	X					
	31 NINST	A/L									
MAHAJANGA/Amborovy		E			X	X		200/500			
	14 NPA	A/L		X	X	X					
	32 NINST	A/L									
MAINTIRANO		E				X		200/500			
MORAMANGA		E					X	200/500			
MORONDAVA		E				X		200/500			
NOSY-BE/Fascène		E			X	X		200/500			
	05 NPA	A/L		X	X	X					
	23 PA1	A/L	23-I	X	X	X					
SAINTE-MARIE/Sainte-Marie		E		X		X		200/500			
	01 NPA	A/L				X					
	19 NPA	A/L				X					
TOAMASINA/Toamasina		E				X		200/500			
	01 NPA	A/L		X		X					
	19 PA1	A/L	19-I	X							
TOLAGNARO/Tolagnaro		E			X	X		200/500			
	07 NPA	A/L			X	X					
	25 NPA	A/L			X	X					
TOLARIA		E				X		200/500			
MALAWI											
BLANTYRE/Chileka		E			X	X		200/500			
	10 PA1	A/L	10-I	X	X	X					
	28 NPA	A/L									
LILONGWE/Lilongwe Intl		E			X	X		200/500			
	14 PA1	A/L	14-I	X	X	X					
	32 NPA	A/L		X	X	X					

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS GBAS	GNSS SBAS	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10	11	12
MALI											
BAMAKO/Sénou		E		X	X	X		200/500			
	06 PA1	A/L	06-II*	X	X	X					
	24 NPA	A/L		X	X	X					
GAO/Gao		E				X		200/500			

	07 NPA	A/L		X		X		200/500			
	25 NINST	A/L									
KAYES/Kayes		E				X		200/500			
		E					X+	200			
	08 NPA	A/L		X		X					
	26 NINST	A/L									
KIDAL/Kidal	10 NPA	A/L		X							
	28 NINST	A/L									
MOPTI-BARBE/Mopti-Barbe	05 NPA	A/L		X		X		200/500			
	23 NINST	A/L									
NIORO/Nioro	08 NPA	A/L		X							
	26 NINST	A/L					X+	50			
TESSALIT		E				X		200/500			
		E					X+	200			
		E			X	X		200/500			
		A/L		X	X	X					
		A/L		X	X	X					
MAURITANIA											
ATAR/Atar		E				X		200/500			
		E					X+	200			
	04 NPA	A/L		X		X					
	22 NINST	A/L									
NEMA/Néma	10 NINST	A/L									
	28 NPA	A/L		X		X		200/500			
NOUADHIBOU/Nouadhibou		E			X	X		200/500			
	03 PA1	A/L	03-II*	X	X	X					
	21 NPA	A/L		X	X	X	X	200			
NOUAKCHOTT/Oumtounsy											
	06 PA1	A/L									
	24 NPA	A/L	24-II								
	16 NPA	A/L									
	34 PA1	A/L	34-II		OT	OT	X	200/500			
ZOUERATE/Zouérate		E						200/500			
	10 NPA	A/L		X		X					
	28 NPA	A/L				X					
MAURITIUS											
MAURITIUS/Sir Seewoosagur Ramgoolam Intl		E			X	X		200/500			
		E					X	450			
	14 PA1	A/L	14-I	X	X	X					
	32 NPA	A/L		X	X	X					
MOZAMBIQUE											
BEIRA/Beira		E			X	X		200/500			
	12 PA1	A/L	12-II*		X	X					
	30 NPA	A/L			X	X					
LIMPOPO LICHINGA		E					X	300			
LICHINGA		E			X	X		200/500			
MAPUTO/Maputo Intl		E			X	X		200/500			
	05 NPA	A/L			X	X					
	23 PA1	A/L	23-II*		X	X	X				
NAMPULA		E			X	X		200/500			
QUELIMANE		E				X		200/500			
TETE		E		X		X		200/500			
NAMIBIA											
KEETMANSHOOP/ Keetmanshoop		E			X	X	X	200/500			
	06 NPA	A/L			X	X	X				
	24 NPA	A/L									
WALVIS BAY/Walvis Bay		E			X	X	X	200/500			
	09 NPA	A/L			X	X	X				
	27 NPA	A/L									
WINDHOEK/Hosea Kutako		E			X	X	X	200/500			
	08 PA1	A/L	08-II*		X	X	X				
	26 NPA	A/L			X	X					
Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS GBAS	 SBAS	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10	11	12
NIGER											
AGADES/Sud		E				X		200/500			

	07 NPA	A/L		X		X					
	25 NINST	A/L									
DIRKOU		E				X		200/500			
NIAMEY/Diori Hamani Intl		E		X	X	X		200/500			
	09R PA1	A/L	09R-II*	X	X	X					
	27L NPA	A/L		X	X	X					
ZINDER/Zinder		E				X		200/500			
	06 NPA	A/L				X					
	24 NINST	A/L									
NIGERIA											
ABUJA/Nnamdi Azikiwe		E			X	X		200/500			
	04 NPA	A/L	04-II		X	X					
	22 PA2	A/L	22-II*	X		X					
KANO/Mallam Aminu Kano Intl	06 PA2	E			X	X		200/500			
	24 PA2	A/L	06-II		X	X					
		A/L	24-III*	X							
		E			X	X		200/500			
	01L PA2										
LAGOS/Murtala Muhammed	19R PA2	A/L	01L-II	X	X	X					
	01R NPA	A/L	19R-II								
	19L PA2	A/L		X	X	X					
		A/L	01R-II	X	X	X					
PORT HARCOURT/Port Harcourt Intl		E			X	X		200/500			
	03 NPA	A/L			X	X					
	21 PA1	A/L	21-II*		X	X					
RÉUNION (France)											
		E			X	X		200/500			
SAINT-DENIS/Gillot (La Réunion)	14 PA1	A/L	14-II*	X	X	X					
	32 NINST	A/L									
	12 NINST	A/L									
	30 NPA	A/L		X	X	X					
RWANDA											
KIGALI/		E			X	X		200/500			
Kigali International	10 NPA	A/L		X	X	X					
	28 PA1	A/L	28-II*	X	X	X					
SAO TOME AND PRINCIPE											
SAO TOMÉ/Sao Tome		E			X	X		200/500			
	11 PA1	A/L	11-II*	X	X	X					
	29 NPA	A/L		X	X	X					
SENEGAL											
CAP SKIRRING/Cap Skirring	14 NPA	A/L									
	32 NINST	A/L		X				25/100			
DAKAR-YOFF		E			X	X		200/500			
DAKAR-DIASS/Blaise Diagne Intl	01 PA1	T	01-II*		X	X		200/500			
	19 NPA	A/L			X	X		25/100			
		A/L			X	X					
SAINT-LOUIS/Saint-Louis	18 NPA	A/L		X				25/100			
	36 NPA	A/L		X				25/100			
TAMBACOUNDA/Tambacounda		E		X		X		200/500			
	06 NINST	A/L		X		X					
	24 NINST	A/L		X		X					
Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS GBAS	 SBAS	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10	11	12
ZIGUINCHOR/Ziguinchor		E				X		200/500			
	10 NINST	A/L									
	28 NPA	A/L		X		X					
SEYCHELLES											
MAHE/Seychelles Intl		E					X	150			
	13 NPA	A/L									
	31 PA1	A/L	31-II*		X						
PRASLIN		E			X	X		200/500			
SIERRA LEONE											
FREETOWN/Lungi		E			X	X		200/500			
	12 NPA	A/L			X	X					
	30 PA1	A/L	30-II*	X	X	X					
SOMALIA											

BERBERA/Berbera	05 NINST	A/L									
	23 NINST	A/L									
BURAO/Burao	13 NINST	A/L									
	31 NINST	A/L									
HARGEISA/Hargeisa		E			X	X		200/500			
		E					X+	150			
	06 NPA	A/L			X	X					
	24 NPA	A/L									
KISIMAYU/Kisimayu		E			X	X		200/500			
		E					X+#	200			
	05 NPA	A/L			X	X					
	23 PA1	A/l	23-II*		X	X					
MOGADISHU/Mogadishu		E			X	X		200/500			
	05 NPA	A/L			X	X					
	23 PA1	A/L	23-II*		X	X					
SOUTH AFRICA											
BLOEMFONTEIN/Bloemfontein		E			X	X		200/500			
	02 NPA	A/L		X	X	X					
	20 NPA	A/L			X	X					
	12 NINST	A/L									
	30 NINST	A/L									
CAPE TOWN/Cape Town		E			X	X		200/500			
	01 PA1	A/L	01-II*		X	X					
	19 PA2	A/L	19-III		X	X					
		E			X	X		200/500			
DURBAN/Durban	06 PA1	A/L	06-II*	X	X	X					
	24 PA1	A/L	24-II*		X	X					
GREEFSWALD		E			X	X		200/500			
HARTEBEESPOORTDAM		E				X					
JOHANNESBURG/Johannesburg		E			X	X		200/500			
	03L PA2	A/L	03L-II	X	X	X					
	21R NPA	A/L		X	X	X					
	03R PA2	A/L	03R-II	X							
	21L PA2	A/L	21L-II								
LANSERIA/Lanseria	06L NPA	A/L		X		X		25/100			
	24R NINST										
MAFIKENG/Mafikeng	04 PA1	A/L	04-I	X	X	X					
	22 NINST	A/L			X	X					
NELSPRUIT/Nelspruit	NINST	A/L		X	X	X					
	NINST	A/L			X	X					
PIETERSBURG/Gateway		E			X	X		200/500			
	01 NINST	A/L		X	X	X					
	19 NINST	A/L									
PORT ELIZABETH/Port Elizabeth	08 PA1	A/ L	08-II*		X	X					
	26 PA1	A/L			X	X					
	17 NINST	A/L									
	35 NINST	A/L									
UPINGTON/Upington		E			X	X		200/500			
	17 NINST	A/L									
	35 NPA	A/L			X	X					
SOUTH SUDAN											
		E			X	X		200/500			
JUBA/Juba	13 PA1	A/L	13-II*		X	X					
	31 NINST	A/L									
MALAKAL		E					X+	200			

Station/Territory Station/Territoire Estación/Territorio	Rwy type Type de piste Tipo de pista	Function Fonction Función	ILS	L	DME	VOR	NDB	Coverage Couverture Cobertura	GNSS		Remarks Remarques Observaciones
									GBAS	SBAS	
1	2	3	4	5	6	7	8	9	10	11	12
SWAZILAND											
MANZINI/Matsapha		E			X	X		200/500			
	07 NPA	A/L		X	X	X					
	25 NINST	A/L									
TOGO											
LOME/Tokoin		E						200/500			
	04 NPA	A/L			X	X	X				
	22 PA1	A/L	22-II*		X	X	X				
		E						200/500			
NIAMTOUGOU/Niamtougou	03 PA1	A/L	03-II*	X	X	X					
	21 NPA	A/L		X	X	X					
UGANDA											
ENTEBBE/ Entebbe Intl		E			X	X		200/500			

	17 PA1 35 NPA	A/L A/L	17-II*	X X	X X	X X					
UNITED REPUBLIC OF TANZANIA											
DAR-ES-SALAAM/Dar-es-Salaam		E E			X	X	X	200/500 350			
	05 PA1 23 NPA	A/L A/L	05-II*	X X	X X	X X					
DODOMA		E E			X	X	X+	200/500 150			
KILIMANJARO/Kilimanjaro Intl		E			X	X		200/500			
	09 PA1 27 NPA	A/L A/L	09-I	X X	X X	X X					
MBEYA		E E			X	X	X+	200/500 100			
MWANZA		E			X	X		200/500			
ZANZIBAR/Zanzibar		E			X	X		200/500			
	18 NINST 36 NPA	A/L A/L			X	X	X+	100			
ZAMBIA											
MONGU		E E				X	X+	350 200/500			
KAPIRI		E					X+	350			
SOLWEZI		E				X		200/500			
LIVINGSTONE/Livingstone Intl		E			X	X		200/500			
	11 NPA 29 NPA	A/L A/L			X X	X X					
LUSAKA/Lusaka Intl		E			X	X		200/500			
	10 PA1 28 NPA	A/L A/L	10-II*	X X	X X	X X					
MFUWE/Mfuwe		E			X	X		200/500			
	08 NPA 26 NPA	A/L A/L			X X	X X					
NDOLA/Ndola		E			X	X		200/500			
	10L NPA 28R NPA	A/L A/L			X X	X X					
ZIMBABWE											
BULAWAYO/Bulawayo		E			X	X		200/500			
	13 NPA 31 NPA	A/L A/L			X X	X X					
GOKWE		E				X		200/500			
HARARE/Harare		E			X	X		200/500			
	05 PA1 23 PA1	A/L A/L	05-II* 23-II*	 X	X X	X X					
HWANGE		E				X		200/500			
MASVINGO		E			X	X		200/500			
VICTORIA FALLS/Victoria Falls		E				X		200/500			
	12 PA1 30 NINST	A/L A/L	12-II*	X							

TABLE CNS II-AFI-2 – SURVEILLANCE SYSTEMS

EXPLANATION OF THE TABLE

Column

1 Name of State/Territory and location of radar head facility or FIR

2 Area of routing

3 Air traffic services unit served by the facility or FIR

4 Primary surveillance radar

5 Coverage of primary surveillance radar in nautical miles

6 Secondary surveillance radar and modes, namely Modes A, C or S

7 Coverage of secondary surveillance radar in nautical miles

8 Automatic dependent surveillance broadcast (under development)

9 Automatic dependent surveillance contract

10 Remarks

Note.— The following codes are used in columns 4, 6, 8, 9 and 10:

I — Required and implemented

Column 6

I — Implementation using conventional SSR

MI — Implementation using monopulse SSR

X — Required but implementation status not determined

N — Required but not implemented

A — Existing facility provided to supplement or substitute the requirement

F — Future plan

<-Year — Planned commissioning year to be used as appropriate in conjunction with “F” and “N”

>-Year — Planned commissioning year to be used as appropriate in conjunction with “A” and “I”

State/Territory and Location État/Territoire et Emplacement Estado/Territorio y Ubicación	AR	ATS unit served Organisme ATS desservi Unidad ATS servida	PSR	Coverage Couverture Cobertura (NM)	SSR Modes Modos (A,C or/ou/o S)	Coverage Couverture Cobertura (NM)	ADS-B	ADS-C	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10
ANGOLA	AR-2								
Luanda	AR-4 AR-8	Luanda ACC			F<-2003			N	MSSR planned
BOTSWANA	AR-4								
Gaborone	AR-8	Gaborone ACC						N I N	
CANARY ISLANDS (Spain)	AR-1								5 radars on multi- radar system
Gran Canaria	AR-6	Canarias ACC			I(A/C)	200			
Lanzarote		Canarias ACC			I(A/C)	220		N	
Las Palmas		Canarias ACC			I(A/C)	150			
La Palma		Canarias ACC			I(A/C)	170			
Tenerife		Canarias ACC			I(A/C)	120		F<-2004	Between 005/-210/
CAPE VERDE	AR-1								
Sal		Sal ACC						N<-2002	
CHAD	AR-4								
N'Djamena	AR-9	N'Djamena ACC			N<-2002			F<-2003	
CONGO	AR-4								
Brazzaville	AR-5	Brazzaville ACC						N	
COTE D'IVOIRE	AR-5								
Abidjan		Abidjan ACC			Mode S	200		ADS-C	
DEMOCRATIC REP. OF THE CONGO	AR-4								
Kinshasa		Kinshasa ACC							
ERITREA	AR-3								
Asmara	AR-9	Asmara ACC						F<-2002	
ETHIOPIA	AR-3								
Addis Ababa		Addis Ababa ACC						N	
GHANA	AR-5							N	
Accra		Accra ACC							
Tamale		Accra ACC						N	
GUINEA/ LIBERIA/ SIERRA LEONE									
Robertsfield	AR-5	Roberts FIC/ACC						I>-2001	
KENYA	AR-3	Nairobi ACC							
Nairobi					I(A/C) I(A/C)			N	
MADAGASCAR	AR-3								
Antananarivo	AR-10	Antananarivo ACC							
MALAWI	AR-8								
Lilongwe		Lilongwe ACC			I(A/C)	200 200			

State/Territory and Location État/Territoire et Emplacement Estado/Territorio y Ubicación	AR	ATS unit served Organisme ATS desservi Unidad ATS servida	PSR	Coverage Couverture Cobertura (NM)	SSR Modes Modos (A,C or/ou/o S)	Coverage Couverture Cobertura (NM)	ADS-B	ADS-C	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10
MAURITANIA Nouakchott-Oumtounsy	AR-1 AR-5	Nouakchott ACC Nouakchott-Oumtounsy TWR/APP			I(S)	250	F<-2019	I	Mode S ready
MAURITIUS Mauritius	AR-3 AR-10	Mauritius ACC							
MOZAMBIQUE Beira	AR-8	Beira ACC						N	
NAMIBIA Windhoek	AR-4 AR-8	Windhoek ACC						N	
NIGER Niamey	AR-4 AR-9	Niamey ACC			F(A/C) F<2003	250 250	F<-2019	F<-2004	
NIGERIA Kano Lagos	AR-4 AR-9 AR-5	Kano ACC Lagos ACC			I(A/C)	250		F<-2005 F<-2005	Mode S ready
RWANDA Kigali	AR-3	Kigali FIC			MI(AC)	I 250			
SENEGAL Dakar-Yoff	AR-1 AR-2 AR-5	Dakar ACC Diass TWR Diass APP			I(S)	250		I	
Dakar-Diass	AR-1 AR-2 AR-5	Diass TWR Diass APP Dakar ACC						N	
SEYCHELLES Seychelles	AR-3 AR-10	Seychelles ACC						N	
SOMALIA Mogadishu	AR-3	Mogadishu FIC			I(A/C) I(A/C)			N	
SOUTH AFRICA Cape Town Johannesburg	AR-2 AR-4 AR-8 AR-10	Capr Town ACC Johannesburg ACC Johannesburg Oceanic						I N	
UGANDA Entebbe	AR-3	Entebbe ACC						N	
UNITED REPUBLIC OF TANZANIA Dar-Es-Salaam	AR-3 AR-8	Dar-Es-Salaam ACC						N	
ZAMBIA Lusaka	AR-4				I(A/C)				

TABLE CNS II-AFI-3 – AFI SSR II CODES

EXPLANATION OF THE TABLE

Column

1 Name of State/Territory

2 Abbreviations for the State

3 Location of radar head facility

4 Surveillance sensor

5 Interriogator Identification Code

COUNTRY	ABBR.	LOCATION	SERVICE	II CODE
1	**2**	**3**	**4**	**5**
Angola	AGL	Luanda		1
Benin	BEN	Cotonu	SSR Mode S	1
Botswana	BOT	Gaborone		1
Burkina Faso	BKF	Ouagadougou	SSR Mode S	2
Cameroon	CME	Douala	SSR Mode S	2
Cape Verde	CPV	Sal		2
Central African Rep.	CAF	Bangui	SSR Mode S	1
Chad	TCD	N'Djamena		3
Comoros	COM	Moroni	SSR Mode S	1
Congo	COG	Brazzaville		3
Côte D'Ivoire		Abidjan	SSR Mode S	3
Democratic Republic of Congo	-	Kinshasa		2
Eritrea	ERI	Asmara		1
Ethiopia	ETH	Addis Ababa		2
Gabon	GAB	Libreville	SSR Mode S	4
Ghana	GHA	Accra	SSR Mode S	4
		Tamale		5
Guinea Bissau	GUB	Bissau	SSR Mode S	3
Guinea/Liberia/ Sierra Leone	-	Robertsfield		4
Kenya	KEN	Nairobi		2
Madagascar	MDG	Antananarivo		1
Malawi	MWI	Lilongwe		2
Mali	MLI	Bamako	SSR Mode S	1
Mauritania	MTN	Nouakchott	SSR Mode S	4
Mauritius	MAU	Mauritius		2
Mozambique	MOZ	Beira		3
Namibia	NMB	Windhoek		3
Niger	NGR	Niamey		3

Nigeria	NIG	Kano		4
		Lagos		6
		Abuja	SSR Mode S	7
		Ilorin	SSR Mode S	8
		Maiduguru	SSR Mode S	2
		Numan	SSR Mode S	5
		Obubra	SSR Mode S	9
		Port Harcourt	SSR Mode S	10
		Talata Mafara	SSR Mode S	11
Rwanda	RWA	Kigali	SSR Mode S	15
Senegal	SEN	Dakar		5
Seychelles	SEY	Seychelles		2
Somalia	SOM	Mogadishu		1
South Africa	RSA	Cape Town		1
		Johannesburg		2
		Cape Town		2
Togo	TGO	Niamtougou	SSR Mode S, A &C	12
		Lomé		
Uganda	UGA	Entebbe		1
United Republic of Tanzanua		Dar-Es-Salaam		3
Zambia	ZMB	Lusaka		4
Zimbabwe	ZWE	Harare		5

Note 1: Algeria, Canarias, Morocco and Tunisia are no longer in the AFI Regional Air Navigation plan, However IIcode assignment for stations in AFI requires regional coordination taking into account the vicinity of stations location including those in these countries.

Note 2: Egypt, Libya and Sudan are not in the AFI Region. However IIcode assignment for stations in AFI requires regional coordination taking into account the vicinity of stations location including those in these countries.

TABLE CNS II-AFI-4 – ATM AUTOMATION SYSTEMS

EXPLANATION OF THE TABLE

Column

1 Name of State/Territory and location of radar head facility or FIR

2 Area of routing

3 Air traffic services unit served by the ATS automation systems. The abbreviations for this column are:

AACC — Area approach control centre
ACC — Area control Centre
APP — Approach control
EC — En-route centre
FIC — Flight information Centre
SMC — Surface movement control
TCU — Terminal control unit
TMA — Terminal control area
TWR — Tower control

4 Surveillance sensor linked to the ATS automation systems. Four-letter FIR identifier, enclosed in brackets, shall be shown for sensors outside the FIR.

5 Radar data processing system

6 Fight data processing system

7 Minimum safe altitude warning system

8 Automatic dependent surveillance

9 Controller-pilot data link communications

10 ATS inter-facility data link communications

11 Processing area of the radar data processing system in (nautical miles)^2

12 Number of ATS positions

13 Remarks

Note.— The following codes are used in columns 5 to 12:

I — Required and implemented.

X — Required but implementation status not determined

N — Required but not implemented

A — Existing facility provided to supplement or substitute the requirement

F — Future plan

<-Year — Planned commissioning year to be used as appropriate in conjunction with “F” and “N”

>-Year — Planned decommissioning year to be used as appropriate in conjunction with “A” and “I”

State/Territory and location État/Territoire et emplacement Estado/Territorio) y bicación	AR	ATS unit served Organisme ATS desservi Unidad ATS servida	Data source Source des données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/ RDPS (NM)[2]	NPOS	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10	11	12	13
ANGOLA Luanda	AR-2 AR-4 AR-8	Luanda ACC			N		N	N	N			
BOTSWANA Gaborone	AR-4 AR-8	Gaborone ACC			F<-2001		N	N N	N N			
CAPE VERDE Sal	AR-1	Sal ACC			N		N	N	N			
CHAD N'Djamena	AR-4 AR-9	N'Djamena ACC		N	N	N	N<-2002	N<-2002	N			
CONGO Brazzaville	AR-4 AR-5	Brazzaville ACC			N		N	N	N			
COTE D'IVOIRE Abidjan	AR-5	Abidjan ACC			N	I	I	I	I		3	
DEMOCRATIC REP. OF THE CONGO Kinshasa	AR-4	Kinshasa ACC			N		N	N	N			
ERITREA Asmara	AR-3 AR-9	Asmara ACC			N		N	N	N			
ETHIOPIA Addis Ababa	AR-3	Addis Ababa ACC			I		F<-2002	F<-2002	N			
GHANA Accra	AR-5	Accra ACC			I		N	N	N			
GUINEA/LIBERIA/ SIERRA LEONE Robertsfield	AR-5	Robertsfield ACC			N		N	N	N			
KENYA Nairobi	AR-3	Nairobi ACC	Mua Hills Eldoret Poror Wajir Mombasa	I	I	N	N	N	N			
MADAGASCAR Antananarivo	AR-3 AR-10	Antananarivo ACC			I-2001		I-2001	I-2001	N			
MALAWI Lilongwe	AR-8	Lilongwe ACC					N	N	N			

State/Territory and location État/Territoire et emplacement Estado/Territorio) y bicación	AR	ATS unit served Organisme ATS desservi Unidad ATS servida	Data source Source des données	RDPS	FDPS	MSAW	ADS	CPDLC	AIDC	PA/ RDPS (NM)[2]	NPOS	Remarks Remarques Observaciones
1	2	3	4	5	6	7	8	9	10	11	12	13
MAURITANIA Nouakchott-oumtounsy	AR-1 AR-5	Nouakchott ACC Nouakchott-Oumtounsy TWR/APP	Nouakchott Control Nouakchott Oumtounsy TWR	I	I	I	I			250	4	
MAURITIUS Mauritius	AR-3 AR-10	Mauritius ACC			N		N<-2001	N<-2001	N			
MOZAMBIQUE Beira	AR-8	Beira ACC			N		N	N	N			
NAMIBIA Windhoek	AR-4 AR-8	Windhoek ACC			N		N	N	N			
NIGER Niamey	AR-4 AR-9			N N	F<-2004		F<-2004	F<-2004	N			
NIGERIA Kano Lagos	AR-4 AR-5 AR-9	Kano ACC Lagos ACC	Dakar-Yoff	I I	N N	I	N N	N N	N N	250 250	4 3	AIDC OP with DIII
Rwanda **Kigali**	AR-3	Kigali FIC		I	I I	I I			N X			
SENEGAL Dakar-Yoff	AR-1 AR-2 AR-5	Dakar ACC Dakr FIC	Dakar-Diass		I		I	I				
Dakar-Diass	AR-1 AR-2 AR-5	Diass TWR Diass APP		I I	N	N	N	N	N			
SEYCHELLES Seychelles	AR-3 AR-10	Seychelles ACC			N		N	N	N			
SOMALIA Mogadishu	AR-3	Mogadishu FIC			I I		N I	N I	N N			
SOUTH AFRICA Cape Town Johannesburg	AR-2 AR-4 AR-8 AR-10	Cape Town ACC Johannesburg ACC			F<-2001				N			
SUDAN Khartoum	AR-3 AR-9	Khartoum ACC			N		N	N	N			
UGANDA Entebbe	AR-3	Entebbe ACC		I	N		N	N	N			
UNITED REPUBLIC OF	AR-3 AR-8	Dar- Es-Salaam ACC										

AFI ANP, VOLUME II

PART IV - AIR TRAFFIC MANAGEMENT (ATM)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in Standards, Recommended Practices and Procedures (SARPs) related to air traffic management (ATM). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of ATM facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to ATM facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

Optimization of traffic flows

2.1 The Planning and Implementation Regional Groups (PIRG), through regional air navigation agreement, are responsible for the optimization of the traffic flows through the continuous improvement of the regional ATS route network and organized track systems and implementation of random routing areas and free route airspace in the Region(s) through the set-up of appropriate mechanisms for regional and inter-regional planning and coordination.

2.2 Whenever practicable, States should, in close coordination with operators, establish the most efficient routings.

2.3 The requirements for regional ATS route network, in particular, for ATS routes over the high seas and airspace of undetermined sovereignty, should be agreed upon through regional air navigation agreement.

Note: States' AIPs and other States publications should be consulted for information on the implemented ATS routes.

Aircraft Identification-SSR Code Management

2.4 Within the context of air traffic management (ATM) and the provision of air traffic services (ATS), SSR code management is a key element of ATM to ensure continuous, unambiguous aircraft identification. The number of secondary surveillance radar (SSR) codes is limited and poor management of the assignment of SSR codes results in capacity constraints and aircraft delays. States and air navigation service providers (ANSP) should apply the SSR Code Allocation Plan approved by the APIRG. The SSR Codes Allocation Plan of the AFI Region is addressed in the Specific Regional Requirements of Volume II

3. SPECIFIC REGIONAL REQUIREMENTS

Working Principles for the Construction of Air Routes

3.1 The ATS routes agreed through regional air navigation agreement are listed in **Table ATM II-AFI-1.** The routes should be developed based on the ICAO SARPs and PANS-OPS and PANS-ATM criteria and parameters. The following should be taken into consideration for the development and management of the AFI Region ATS route network:

a) Where possible, routes should be established to increase efficiency, reduce complexity and provide additional benefits to users;

b) separation assurance principles should apply;

c) routes should be established with sufficient separation to operate independently;

d) where possible, routes in a radar environment should be procedurally (laterally) separated;

e) segregated tracks should be established on medium/high density routes and be determined by set criteria;

f) where required, routes should be constructed to support terminal area management procedures, e.g. SIDs/ STARs and flow management techniques, as applicable;

g) holding patterns should be laterally separated from other tracks, and tolerances captured within a single sector;

h) a maximum of two routes should be constructed on medium/high density routes and be determined by set criteria.

i) multiple crossing points involving major traffic flows should be avoided;

j) en-route crossings should be minimized. Where crossings are inevitable, they should, where possible, be established for cruise configuration. Such crossings should occur, wherever possible, within surveillance coverage;

k) airspace sectorization should take account of the route structure, and workload considerations. If necessary, airspace should be re-sectorized to accommodate changes to air route configuration;

l) routes should be constructed so as to reflect the optimum navigation capabilities of the principle users (primarily RNAV);

m) the prime determinant should not be the number of track miles. A small increase in track miles may optimize traffic flow, avoid unpredicted delays or avoid holding requirements. Consideration should also be given to the provision of a range of routes which will permit operators to choose cost-efficient routes over the range of expected seasonal wind patterns;

n) due allowance should be given to existing and future flight data processing (FDP) and radar data processing (RDP) capability (i.e. notification of message for auto hand-off ect.);

o) periodic safety audit and review process of routes should be conducted to test demand against capacity criteria, and the principles. This should ideally be done in parallel with the annual sectorization review; and

p) routes that can no longer be justified should be deleted.

TABLE ATM II-AFI-1 - AFI REGION ATS ROUTE NETWORK

EXPLANATION OF THE TABLE

Column

1 Designator of ATS route and Type (Conventional, RNAV10, RNAV5 or RNAV1 etc.)

2 Significant points defining the ATS routes. Only prominent locations have been listed. Additional points where facilities are provided to complete navigational guidance along a route, but not otherwise marking significant characteristics of the route (change of heading of centre line, intersection with other routes, etc.) have normally not been included. Locations shown in parentheses indicate significant points outside the Region.

Note 1. Not representing the operator's requirements. Operator's required route and/or navaids are shown in square brackets ([ ]).

Note 2. Subject to further study. Including the associated navigation aid coverage.

Note 3 Subject to military agreement.

Note 4. Not acceptable at present.

Note 5. At present, implementation possible only during specific periods (e.g. weekends, nights, etc., as published).

Note 6. At present, implementation of the RNAV route only possible above FL 300, or as published.

Note 7. Unidirectional use.

Note 8. For ATS route or part thereof is RNAV 1

Whenever reference to name States is made in Table ATM II-AFI 1 in connection with the above notes, the following abbreviations, based on those indicated in Location Indicators (Doc 7910), are used:

DB Benin
DF Burkina Faso
DG Ghana
DI Côte d'Ivoire
DN Nigeria
DR Niger
DX Togo
FA South Africa
FB Botswana
FC Congo
FD Swaziland
FE Central African Republic
FG Equatorial Guinea
FH Ascension
FW Malawi
FX Lesotho
FY Namibia
FZ Democratic Republic of the Congo
GA Mali
GB Gambia
GF Sierra Leone
GG Guinea-Bissau
GL Liberia
GO Senegal
GQ Mauritania
GS Western Sahara
GU Guinea

FI Mauritius
FJ British Indian Ocean Territory
FK Cameroon
FL Zambia
FM Madagascar
FM Comoros
FM Réunion (France)
FN Angola
FO Gabon
FP Sao Tome and Principe
FQ Mozambique
FS Seychelles
FT Chad
FV Zimbabwe
HA Ethiopia
HB Burundi
HC Somalia
HD Djibouti
HH Eritrea
HK Kenya
HR Rwanda
HS Sudan
HT United Republic of Tanzania
HU Uganda

SB Brazil
VO India

LOWER AIRSPACE		UPPER AIRSPACE	
Designator Type 1	**Significant Points 2**	**Designator Type 1**	**Significant Points 2**
		UA214	(Pekanbaru) BUSUX (0355S 06000E) GITOP (0400S 05901E) Praslin
		UA302	Dakar Vitoria
A327	Plaisance KALBI 02826S 07500E Phuket	UA327	Plaisance KALBI 02826S 07500E Phuket
A400	Abidjan Sao Tome Luanda Luena Kaoma *Note (FL) EVOLU 1543S 02638E Lusaka *Note (FL) Chileka	UA400	Abidjan Sao Tome Luanda Luena *Note 1 (FL) Kaoma EVOLU 1543S 02638E *Note 1 (FL) Lusaka Antananarivo Moramanga Plaisance
A401	Dar es Salaam Moroni Mahajanga Ankazobe Antananarivo Moramanga Saint Denis Plaisance	UA401	Entebbe Dar es Salaam Moroni Mahajanga Ankazobe Antananarivo Moramanga Saint Denis Plaisance
A402	Durban Johannesburg	UA402	Cape Town Durban *Note (FAS) Tolagnaro Plaisance
A403	Kadra Gheriat Sebha TUMMO N'Djamena Berberati Brazzaville	UA403	Kadra Gheriat Sebha TUMMO N'Djamena Berberati Brazzaville
A404	Chileka Tete Harare Maun Windhoek Walvis Bay	UA404	Chileka Tete Harare Maun Windhoek Walvis Bay

A405	Harare Masvingo Greefswald Hartebeespoortdam Johannesburg	UA405	Hargeisa Mandera Wajir *Note 3 (HK) Nairobi Mbeya Harare *Note 1 (Harare Hartebeespoortdam) Masvingo Greefswald Hartebeespoortdam Johannesburg Cape Town ETOBO (233900S 0100000W) (Recife)
A406	Kinshasa Lubumbashi Ndola Mfuwe Lilongwe	UA406	Kinshasa Lubumbashi Ndola Mfuwe Lilongwe
		UA407	Lusaka Dar es Salaam Mombasa Mogadishu
A408	Harare Kalemie Bujumbura Kigali Entebbe	UA408	Harare Kalemie Bujumbura Kigali Entebbe Lodwar Addis Ababa Saleh (Hodeidah)
		UA409	Kalemie Mansa Ndola Lusaka Gabarone
A410	Brazzaville Bangui Khartoum	UA410	Brazzaville Bangui Khartoum
		UA416	(Sanaa) PARIM Djibouti
A451	TOKAR 1806N 03748E Asmara Assab PARIM 1230N 04328E (Aden)	UA451	TOKAR 1806N 03748E Asmara Assab PARIM 1230N 04328E (Aden)
		UA452	GOLEM (1157N 06722E) ELKEL (0149N 06911E) Diego Garcia
		UA474	Plaisance MURUS (Mumbai)
		UA557	Cape Town MUNES

			(La Plata)
		UA559	Cape Town ITMET (34 12 00S 015 00 00E) ETULA (34 21 00S 010 00 00E) GERAM (34 03 00S 000 00 00W) ITGIV (32 56 00S 010 00 00W) Brasilia FIRB (Rio de Janeiro)
		UA560	Accra (Vitoria)
		UA572	Freetown (Vitoria)
A600	Agadir El Aaiun Villa Cisneros Nouadhibou Nouakchott Kayes Bamako Niamey	UA600	Agadir El Aaiun Villa Cisneros Nouadhibou Nouakchott Bamako Niamey
A601	Dakar Tambacounda Bamako Bobo-Dioulasso Tamale Cotonou	UA601	Dakar Tambacounda Bamako Bobo-Dioulasso Tamale Cotonou Malabo
A602	(Sal) TITOR 1300N 1800W Bissau	UA602	(Sal) TITOR 1300N 1800W Bissau
A603	Gao Accra	UA603	Gao Accra
A604	Mostaganem El Bayadh El Golea Tamanrasset Douala Franceville Brazzaville	UA604	Mostaganem El Bayadh El Golea Tamanrasset Douala Franceville Brazzaville
		UA605	(ETOIL 3944N 0710E) Constantine Djanet Maiduguri
A607	Ghadames *Note 4 (DA) Dirkou N’Djamena Bangui	UA607	Ghadames *Note 4 (DA) Dirkou N’Djamena Bangui Lubumbashi N’Dola Harare
A608	Niamey Cotonou	UA608	El Bayadh Niamey *Note 4 (DR) Cotonou
A609	Accra Lomé	UA609	Accra Lomé

	Cotonou Lagos Mamfe Foumban Bangui Buta Bunia Entebbe Nairobi Mombasa		Cotonou Lagos Mamfe Foumban Bangui Buta Entebbe Nairobi Mombasa Antsiranana Plaisance
A610	Kilimanjaro Mombasa	UA610	Yaoundé Kisangani Entebbe Kilimanjaro *Note 2 (HT, HK) Mombasa Praslin
A611	Kinshasa Luanda	UA611	Kinshasa Luanda ILGER 1727S 01000W (Rio de Janeiro)
A612	Conakry Bamako Mopti Gao	UA612	Conakry Bamako
		UA613	Kinshasa Kindu Bujumbura
		UA614	Timimoun Abidjan
A616	Sao Tomé Libreville		
		UA617	Kinshasa Windhoek
		UA618	Lubumbashi Bukavu SAGBU Malakal
		UA620	Malakal N'Djamena
		UA861	Lagos Garoua
		UB335	Plaisance PEDPI 1317S 07500E (Pekanbaru)
		UB344	(Medan) LELED 1116.5S 07500.0E Plaisance
B400	Lilongwe Harare	UB400	(ODAKA 1434N 05234E) ALULA 1207N 05105E Mogadishu Dar es Salaam Lilongwe Harare Bulawayo Francistown

			Gaborone Mandera
		UB403	ATUKO (081704N 0460635E) UBTEN (120816N 0495648E) (ODAKA) (1434N 05234E) BOSKI (1607.3N 05416.8E)
B404	(ODAKA) IMRUB Hargeissa	UB404	(ODAKA) (1434N 05234E) IMRUB Hargeissa
B413	Port Sudan (DANAK) Hodidar Taiz Aden	UB413	Port Sudan (DANAK) Hodidar Taiz Aden (ZIZAN) (GAGDO) Praslin
		UB459	(Mumbai) CLAVA (0134N 06000E) *Note 2 (FS) Praslin NORSI MIROV
		UB504	Johannesburg Francistown Victoria Falls Livingstone
		UB525	ITGEV Addis Ababa *Note 3 (HA) ALEBA Luxor
		UB526	Khartoum Kassala Asmara (Hodeidah)
B527	Khartoum Kenana Malakal Juba Kigali Bujumbura Kalemie Lubumbashi	UB527	Khartoum Kenana Malakal Juba Kigali Bujumbura Kalemie Lubumbashi
B528	Luena Livingstone Bulawayo KURLA	UB528	Luena Livingstone Bulawayo KURLA
B529	Lusaka Fylde Masvingo KURLA 2157S 03146E *Note 1 (Masvingo-Maputo) Maputo Durban	UB529	Lusaka Fylde Masvingo KURLA 2157S 03146E *Note 1 (Masvingo-Maputo) Maputo Durban
		UB530	NDOLA S 12 59.9 E 028 40.0 KASAMA S 10 12.9 E 031 08.6 TUNDA S 09 17 42 E 032 45 06

MBEYA (MB) S 08 54 52.53 E 033 27 29.65

B531	Kisangani Goma Kigali	UB531	Kisangani Goma Kigali Mwanza Kilimanjaro
		UB532	Kindu Kigali Nairobi
		UB533	Nairobi Dar es Salaam
B534	Carolina Matsapha	UB534	Carolina Matsapha
B535	(Aden) TORBA 1210N 04402E Djibouti Addis Ababa Juba Kisangani Kinshasa	UB535	(Aden) TORBA 1210N 04402E Djibouti Addis Ababa Juba Kisangani Kinshasa
		UB536	Maputo Morandava Antananarivo
		UB540	Hartebeepoortam Francistown Victoria Falls Livingstone
B600	Las Palmas/Gran Canaria Villa Cisneros Nouadhibou Dakar Banjul Bissau Conakry Monrovia Abidjan Accra	UB600	Las Palmas/Gran Canaria Villa Cisneros Nouadhibou Dakar Banjul Bissau Conakry Monrovia Abidjan Accra Libreville
		UB601	El Aaiun Nouakchott Dakar
B607	(Sitia) El Daba New-Valley NUBAR Goma Bujumbura	UB607	(Sitia) El Daba New-Valley *Note 1 (New Valley-Dongola) NUBAR Dongola *Note 3 (HS) El Obeid Goma Bujumbura Dar-es-Salaam
		UB612	ORNAT 2000N 02500E El Obeid Malakal Nakuru
B614	Conakry Freetown Monrovia	UB614	Conakry Freetown Monrovia

B726	Zemmouri Bou-Saada El Golea Niamtougou Accra	UB726	Zemmouri Bou-Saada El Golea Niamtougou Accra
B727	Freetown *Note 2 (GF) Bamako	UB727	Freetown *Note 2 (GF) Bamako Tombouctou Tessalit Tamanrasset Zarzaitine/In-Amenas
		UB728	Atar Tambacounda Conakry
		UB729	Conakry Abidjan
B730	El Golea Bordj Omar Driss Djanet Dirkou	UB730	El Golea Bordj Omar Driss Djanet Dirkou *Note 1 (Djanet-Djamena) N'Djamena
		UB731	TOBUK 2156N 00913E Agades Sokoto Gwasero Lagos
B732	Port Gentil Pointe Noire Brazzaville		
		UB733	Kinshasa Luena Maun Gaborone
		UB735	Timimoun Bamako
B737	Sao Tomé Malabo Douala	UB737	Sao Tomé Douala
		UB790	St-Denis Dzaoudzi
		UB791	Jos N'Djamena Jeddah
		UB796	El Obeid AVONO (0920.3N 03356.0E)
		UB980	Luena N'Djamena
		UG200	Cocos Island Plaisance
		UG300	Mandera TIKAT (1224.3N 03538.2E)

UG402	Gao TYE Sao Tome
UG404	Casablanca Niamey
UG424	(Mumbai) (ALATO 1340.7N 06344.0E) VUTAS 0912.0N 060000.0E Dar es Salaam Lubumbashi
UG433	Monrovia/Roberts (Vitoria)
UG450	Luanda Tshikapa Kananga Bujumbura Mwanza Nairobi Mogadishu (Mumbai)
UB454	(Colombo) BOBOD (0600S 07155E) Plaisance
UG465	(Rio de Janeiro) AXODA (2912S 01000W) Johannesburg Beira Praslin *Note 2 (FS) (Male)
UG615	Nouckchott Mopti
UG616	RIPOL Kano
UG617	GAMUS N’djamena
UG619	URSUT Maiduguri
UG620	Bosso N’djamena
UG622	Khartoum RIPOL Zinder Kano Bosso Nimir
UG624	Bangui Garoua
UG625	Libreville Moros Bangui
UG626	Jos Maiduguri

		UG627	Ruacana Namibe BOSNI
		UG628	ANVAG Lubango
		UG634	Plaisance SOLIT, 2355S 07500E
		UG635	Plaisance MABAD, 2648.4S 07500E (Perth)
G650	(Jeddah) Asmara Addis Ababa Nakuru Nairobi	UG650	(Jeddah) Asmara Addis Ababa Nakuru Nairobi
UG653	Windhoek Gaborone Johannesburg Carolina Maputo	UG653	Windhoek Gaborone Johannesburg Carolina Maputo Toliara Saint-Denis
		UG654	Durban Note (FAS) Toliara
G655	Johannesburg Maseru	UG655	Tebessa FARES (3210.3N 01056.9E) Sebha GARIN Faya Largeau Buta Kisangani Kindu Lubumbashi *Note (FZ, FL) Lusaka Bulawayo *Note (FAS) Johannesburg *Note (FAS) Maseru
G656	Juba TORNO (02330N 03158E) Entebbe	UG656	Juba TORNO (02330N 03158E) Entebbe Mbeya Lilongwe Tete Maputo
G657	Maseru Vrede Manzini Maputo	UG657	Maseru Vrede Manzini Maputo Beira Dar es Salaam Mombasa Mandera Hargeisa
		UG658	Nairobi

			Praslin
G660	Niamey GULEN Kano Maiduguri KELAK N'Djamena Geneina El Fasher El-Obeid Khartoum Port Sudan *Note (HS, OE) (Jeddah)	UG660	Niamey GULEN Kano Maiduguri KELAK N'Djamena Geneina El Fasher El-Obeid Khartoum Port Sudan *Note (HS, OE) (Jeddah)
		UG661	Dar es Salaam Mauritius
G727	(GIANO 3854N 01226E) *Note 2 (LI) INDOR Cap Bon Monastir Jerba	UG727	(GIANO 3854N 01226E) *Note 2 (LI) INDOR Cap Bon Monastir Jerba *Note 2 (DT) Nalut *Note (HL) Dirkou Maiduguri Garoua Ngaoundere Brazzaville
G740	Abidjan Kumasi	UG740	Abidjan Kumasi
G745	Johannesburg Nelspruit Maputo	UG740	Johannesburg Nelspruit Maputo
G851	(Porto Santo) Tenerife MIYEC (2342N 01259W) Zouerate Bamako Bouake Abidjan	UG851	(Porto Santo) Tenerife MIYEC (2342N 01259W) Zouerate Bamako Bouake Abidjan
		UG852	El Golea Bamako Monrovia/Roberts
G853	Luanda Kuito Cuito Cuanavale Maun Hartebeespoortdam Johannesburg Durban	UG853	Las Palmas/Gran Canaria *Note (GC) DEMAR 0539N 01100W DEVLI 0400N 00730W Luanda Kuito Cuito Cuanavale Maun Hartebeespoortdam Johannesburg Durban
G854	Conakry Bobo-Dioulasso Ouagadougou Niamey Zinder	UG854	Conakry Bobo-Dioulasso Ouagadougou Niamey Zinder

	N'Djamena		N'Djamena
G855	Tripoli Ghadames	UG855	Tamanrasset Niamey Tamale Abidjan
G856	Libreville Brazzaville	UG856	Lagos Libreville Brazzaville
G857	N'Djamena Maroua Garoua Foumban Douala Bata Libreville Port Gentil	UG857	N'Djamena Foumban Douala Libreville
		UG858	Kano DEKIL Sebha
G859	Anaba *Notes (LI), 4 (DT) Constantine Biskra Ghardaia El Golea In Salah Tessalit Gao Ouagadougou Abidjan	UG859	Anaba Constantine Biskra Ghardaia El Golea In Salah Tessalit Gao Ouagadougou Abidjan
G860	Bamako Ouagadougou	UG860	Bamako Ouagadougou
		UG861	Douala Pointe Noire
		UG862	Bunia ONUDA 0809N 2251E *Note 4 (FT) Dirkou
		UL211	(KILOS) MUNES Cape Town
		UL244	(OPERA) ITGIV Cape Town
		UL303	MAGUD N052041.28 E060 00 00.91 MOGDU N 02 00 24 E 045 17 36 KESOM N 00 07 48 E 041 00 06 NAIROBI S011759.65 E0357 15.22
		UL307	ONTAR S 09 37 44 E 011 23 07 ABAPU S 17 49 38 E 019 02 02 AVOGU S200107.67 E 021 00 00.88 UVLUK S 24158.83 E 024 42 54.01 GABORONE S243551.77 E02549 56.84
		UL311	HARGEISA N 09 31 12 E 044 05 30 DAROT N 09 11 24 E 047 21 12 AXINA N 06 49.80 E 055 00.00

		MAGUD N 05 20.70 E 060 00.00
	UL313	DJIBOUTI N 11 32.90 E 043 05.60 EGROV N 11 20.70 E 045 58.90 ORLID N 11 17.10 E 060 00 .10
	UL316	DULGO S 25 00.00 E 013 59.80 KEETMANSHOOP S 26 32.20 E 018 06.80 UTANI S 27 13 46.73 E 021 00 34.80 AVUSA S 27 29.90 E 022 13.50
	UL375	(LOKIM) S112000 W0150000 ETAXO S155124 W0100000 BUTOG S165336 W0081030 USENA S182748 W0060712 BOLUM S192000 W0050000 OSEPA S230000 W0000000 DABUR S262000 E0050000 ASONI S292000 E0100000 BUXIR S320000 E0150000 RIV S334800 E0182130
CTV (FACT-Cape Town) S335806 E0183612		
	UL435	(PAKER) N152000 W0400000 IRELA N140000 W0372600 DIGUN N093930 W0312200 BUXON N082848 W0294642 ASEBA N071836 W0281300 IRAVU N065124 W0273706 MAROA N062606 W0270336 BUVUK N053000 W0255000 ASOBU N042318 W0241236 BITEX N012012 W0194736 MIGED S001924 W0172418 ATANI S031906 W0130506 EKAGO S034630 W0122642 BUTEM S053000 W0100000 URAPI S095130 W0035336 BODEX S123300 E0000200 EGOLI S133306 E0012800 ILDIR S180000 E0100000 DETUX S200000 E0141830 AKETE S213336 E0175448 BOPAN S222412 E0200000 GBV S243554 E0255000 NESEK S250112 E0263700 HBV S254036 E0275000
FAJS (Johannesburg) S260800 E0281436		
	UL612	Goma El Dhaba (Paleohora)
	UL682	N'DJAMENA 12 08 30.1N 015 02 17.9E DENAT 11 52 58.40N 017 34 32.67E ERESA 11 38 21.22N 019 46 44.51E KURAM 11 02 03.91N 022 56 13.65E TETAL (10 18 48.16N 031 16 06.35E) UVAKI (10 3 21.26N 034 14 23.18E) Addis Ababa
	UL683	TAMALE N 09 34 24.59 W 000 50 49.68 GANDA N 09 28 46.26 E 003 10 00.60 ILGAM N 09 04 51.58 E 006 26 38.13 ABUJA N 09 02 16.06 E 007 17 06.35
	UL684	MIYEC N 23 42.0 W 012 59.0 OSVOR N 23 27 18.39 E 012 12 25.07 GAO N 16 14.3 W 000 01.6 ODMAP 12 27 05.87 E 003 37 49.52

			ABUJA N 09 02 1.06 E 007 17 06.35
		UL685	IBLOK S 18 47.60 E 011 40.50 APKEL S 22 14 24.61 E 017 04 51.02 WINDHOEK S 22 28.60 E 017 28.20
		UL686	WINDHOEK S 22 28.60 E 017 28.20 EGNOR S 27 29 55.15 E 020 39 40.57 UDLON S27 43 50.57 E 020 48 47.32 UPINGTON S 28 24.10 E 021 15.60
		UL688	BRNO N 49 09.0 E 016 41.6 ATMUL N 22 00.0 E 029 05.4
L689	Kilimanjaro Nairobi Lodwar GABTA (03 59 33.94N 035 23 43.27E) DUKNA (05 11 42.54N 035 06 0.32E) EGMER UMTES (09 39 42.22N 034 0 11.75E) APLOM (10 29 3.42N 033 48 4.59E) IXETA (13 54 49.03N 032 56 49.03E) Khartoum Merowe NUBAR	UL689	Kilimanjaro Nairobi Lodwar GABTA (03 59 33.94N 035 23 43.27E) DUKNA (05 11 42.54N 035 06 0.32E) EGMER UMTES (09 39 42.22N 034 0 11.75E) APLOM (10 29 3.42N 033 48 4.59E) IXETA (13 54 49.03N 032 56 49.03E) Khartoum Merowe NUBAR
		UM104	Timimoun Abidjan
		UM108	Timimoun Bamako
		UM114	Lagos Ghardaia Alger
		UM117	Casablanca Ouarzazate *Note 4 (DA) Gao
		UM122	Agadir BULIS (2740N 0090854W) Bamako
		UM214	Johannesburg ETMIT 2312.8S 02737.7E FTV VOR 2109.8S 02728.4E AVOMU 1714.0S 02626.9E MBY VOR 0606.8S 02333.8E EDLAN 0005.8S 02251.3E KEDOT 0335.1N 02144.4E IPANI 0633.1N 02100.0E ERESA 1138.3N 01946.7E ILDOR 2009.6N 01801.3E GARIN 220000.00N 0170636.00E SEB VOR 265944.21N 0142735.05E
		UM215	Johannesburg TAVLA 2237.4S 02817.6E DANAM 2139.1S 02826.0E VBU VOR 2001.7S 02838.6E RETAR 1637.7S 02828.3E VLS VOR 1519.6S 02825.2E MOTAM 1200.0S 02735.8E LUB VOR 1136.1S 02730.3E KIN VOR 0255.0S 02554.0E KGI VOR 0029.7S 02518.8E

	BUT VOR 0249.1S 02448.6E MERON 0455.0N 02402.7E ONUDA 0809.7N 02251.1E BULGO 1119.9N 02140.0E ARBEG 131314.39N 0195842.98E TONBA 2135.3N 01951.2E Dahra (DHR VOR N 2928.0N 01755.9E
UM216	Hargeisa 093112.00N 440530.00E AXAPO 0915.54N 434512.68E EGMEP 081442.79N 423019.99E ETLOT 071549.20N 411827.02E OKNUL 061336.21N 400220.96E IMKIT 054110.90N 392303.00E RUDOL 040009.20N 372213.76E LOV-VOR 030627.00N 353645.86E PATAR 022731.06N 345700.00E NABRO 014935.00N 341500.00E NM-VOR 000311.11N 322617.06E EGREK 010111.00S 301447.49E OVPAP 011934.41S 293526.65E XIBKI 012916.27S 291426.90E BULNA 013323.59S 290017.60E KIN-VOR 025500.00S 255400.00E RAPOL 040236.00S 231236.00E LINUD 052458.84S 202435.57E NANIB 054927.39S 193328.12E MIPKU 062608.16S 181821.96E KINPA 064441.13S 173954.59E UNDOP 070407.61S 165911.49E UTIVO 075939.60S 150322.23E VNA-VOR 085043.72S 131450.94E ONTAR 094000.00S 112400.00E
UM220	Abu Simbel Lodwar
UM372	(Faro) Casablanca Marrakech BULIS 2740N 00915W Conakry
UM426	ADDIS ABEBA N 09 06.4 E 038 46.2 MASLO N 07 25.0 E 039 03.2 IMKIT N 05 41.2 E 039 23.2 ALEMU N 04 00.2 E 039 39.9
UM429	DUGRA S 11 39 36 E 011 20 34 APGAL S 13 20 25 E 012 29 41 ANVAG S 17 23 30 E 015 49 22 OTAVI S 19 09.21 E 017 03 29
UM431	NEVEP S 20 20 00 E 012 14 04.44 OKPIS S 22 19 41.19 E 017 05 10.46 WINDHOEK S 22 28.60 E 017 28.20
UM432	CLAVA N 01 40.60 E 060 00.10 ETONI N 01 07 16.13 E 052 21 40.78 EGLOM N 00 44.90 E 047 24.20 RAGGS N 00 19 30 E 044 09 36 KESOM N 00 07 48 E 041 00 06
UM433	KEETMANSHOOP S 26 32.20 E 018 06.80 AVORU S 26 32.60 E 017 40.30 APGAS S 26 33.90 E 015 50.70 NIGAM S 26 33.90 E 014 37.20
UM562	KISANGANI N 00 29 42.00 E 025 18 48.00

			GUROT N 00 38 38.37 E 022 18 24.62 BATVU N 00 35 27.98 E 017 53 24.83 GODAL N 00 32 55.71 E 014 33 18.02 LIBREVILLE N 00 28.80 E 009 24.10
		UM563	MALAKAL N 09 33.8 E 031 39.2 LAGOS N 06 42.5 E 003 19.6
		UM564	ERKEL N 20 58 00 E 007 42 00 GITEP N 18 56 27.97 E 007 08 21.57 OSLEK N 16,00 00.00 E 006 21 21.98 BIRNI N 13 45 59.40 E 005 45 57.20
		UM565	INISA N 17 26.6 E 011 30.0 TANAD N 14 20.9 E 013 52.1 N'DJAMENA N 12 08.5 E 015 02.3
		UM566	TAMALE N 09 34 24.59 W 000 50 49.68 LIPUS N 09 13 30 W 000 00 42 KELEX N 07 51 47.45 E 002 21 25.67 OPALA N 07 24 00.00 E 002 45 00.00
		UM567	Lagos Jos Garoua KAFIA IBSUN (08 45 14.83N 024 20 52.50E) TEVOL (08 58 47.45N 033 35 38.91E) EGMER Addis Ababa
		UM608	El Bayadh Niamey
M651	(Aden) Hargeisa	UM651	(Aden) Hargeisa Praslin
M652	Brazzaville Kinshasa Saurimo NIDOS 1304S 02651E Lusaka Harare	UM652	Brazzaville Kinshasa Saurimo NIDOS 1304S 02651E Lusaka Harare Beira Toliara AXOTA (Perth)
		UM665	Plaisance Mandera Addis Ababa Merowe
		UM725	Sorrento Tunis Tebessa Ghardaia Timimoun Dakar
		UM731	Carbonara OSMAR Tunis Jerba FARES Dirkou N'Djamena Berberati

	Saurimo Johannesburg
UM739	Cap Bon SONAK 3637N 01130E (Lampedusa)
UM863	(KING ABDULAZIZ) N 21 42 37 E 039 09 48 ASKOL N 15 48 54.51 E 024 00 05.35 KITOB N 15 21 43.64 E 022 58 45.75 N'DJAMENA
UM974	Niamey Dakar
UM997	Wajir Dire Dawa Djibouti
UM998	(Martigues) BALEN Constantine Bordj Omar Driss Tobuk INISA (1733.5N 01130.0E) Maiduguri Garoua Kinshasa Luena Maun Gaborone
UN181	WALVIS BAY ETUSO S 23 12 39.35 E 015 30 03.26 GABSI TETUS JOHANNESBURG
UN182	GABORONE S 24 35.9 E 025 49.9 UTRIS AXODO S 22 43.0 E 018 19.6 WINDHOEK APGEK S 21 57 04.98 E 014 17 55.10 ETUDU S 21 40 00 E 012 43 21.18
UN183	GABORONE S 24 35.9 E 025 49.9 XORAK WALVIS BAY NIBEK S 22 58.50 E 013 12.90
UN184	EGNAB S 14 25 30 E 011 17 24 EVUVI S 17 24 01 E 014 21 22 OTAVI S 19 09 21 E 017 03 29 DUPKI S 21 43 38.41 E 021 00 31.04 GABORONE S 24 35 51.77 E 025 49 56.84 ETOSA JOHANNESBURG S 26 09.4 E 028 13.9
UN185	WINDHOEK USUKI CAPE TOWN
UN186	CAPE TOWN EKBAT WINDHOEK OMATA S 20 49.0 E 017 15.7 KINSHASA. S 04 24 08.75 E 015 25 06.75

UN187	WINDHOEK UTSEX S 21 59 54.57 E 017 18 22.44 APNUM S 18 22 43.45 E 016 05 28.39 ANVAG S 17 22.00 E 015 45.60 LUANDA S 08 50.7 E 013 14.8
UN188	WALVIS BAY XUDAN CAPE TOWN
UN189	WINDHOEK AKAZU KINSHASA
UN190	WALVIS BAY APGEK S 21 57 04.98 E 014 17 55.10 IXEPA S 19 39 21.10 E 013 32 48.32 OKDOL S 17 07.80 E 012 44.70 OKBIK S 16 35.8 E 012 34.7 NAMIBE S 15 15 12.8 E 012 09 54
UN303	Hargeissa PARIM
UN550	KANO N 12 02.2 E 008 29.8 LUKRO N 08 13.3 E 008 04.3
UN551	TAMALE N 09 34 24.59 W 000 50 49.68 BANGUI N 04 22.6 E 018 31.5
UN552	GAO N 16 14.3 W 000 01.6 BATIA N 11 00.0 E 001 27.3 LOSIN S 03 08.0 E 036 07.3
UN553	LODWAR N 03 06 27.00 E 035 36 45.86 PATAR N 02 26 52.54 E 034 58 31.45 OVGAT N 02 14 48.92 E 033 53 04.94 NALOS N 01 47 18.40 E 030 59 44.64 BUNIA N 01 33 58.62 E 030 13 25.37
UN554	RUDOL N 03 59 49.06 E 037 25 03.18 KAMAS N 01 37 14.57 E 035 51 03.56 AKUMU S 01 00 29.90 E 034 01 35.58 MWANZA S 02 26 18.09 E 032 55 20.39
UN555	ABUJA N 09 02 1.06 E 007 17 06.35 AMPAS N 06 40.0 W 007 49.0 LUNGI N 08 37.0 W 013 11.5
UN556	JUBA N 04 53.3 E 031 34.9 GONGU N 01 13 32.02 E 034 47 32.34 NAIROBI S 01 17 59.65 E 036 57 15.22
UN557	EPMES S 13 00.00 E 011 19 24 EVUKU S 13 54 36 E 012 23 42 LUBANGO S 14 55 26 E 013 35 52
UN558	ORLID N 11 17.10 E 060 00.10 AVEDA N 09 13 29 30 E 049 40 06 DAROT N 09 11 24 E 047 21 12 HARGEISA N 09 31 12 E 044 05 30
UN559	ANTEP S 24 00.00 E 013 36.40 APDOV S 24 42 18.80 E 019 59 59.18 EPMON S 24 54 58.97 E 022 37 42.67
UN560	ETUDU S 21 40 00 E 012 43 21.18 WALVIS BAY S 22 58.90 E 014 38.70
UN561	Addis Ababa

			NEVIM (08 47 34.80N 033 28 55.19E) GESOB (08 15 28.80N 024 28 44.40E) ONUDA MISRU AKLIS LAG (Lagos)
		UP312	Riyan PARKER Hargeissa
P557	KATAB N 29 25.0 E 29 05.1 MISUK N 29 05.1 E 029 06.3 ALKED N 22 21.9 E 031 30.9 NUBAR N 22 00.00 E 031 38.10 AMUDO N 12 42 42.81 E 036 43 30.62 BAHIR DAR N 11 36.4 E 037 19.0 LABLA N 10 32.4 E 037 53.9 ADDIS ABEBA N 09 06.4 E 038 46.2	UP557	KATAB N 29 25.0 E 29 05.1 MISUK N 29 05.1 E 029 06.3 ALKED N 22 21.9 E 031 30.9 NUBAR N 22 00.00 E 031 38.10 AMUDO N 12 42 42.81 E 036 43 30.62 BAHIR DAR N 11 36.4 E 037 19.0 LABLA N 10 32.4 E 037 53.9 ADDIS ABEBA N 09 06.4 E 038 46.2
		UP676	NAIROBI S 01 17 59.65 E 036 57 15.22 MAGAD S 02 10 52.49 E 036 09 04.31 ESRES S 08 12 51.66 E 030 40 44.85 LUBUMBASHI S113607.85 E02730 20.32
		UP677	BESHO S 12 00.0 E 027 49.9 GEPET S 12 56.50 E 030 20.00 MFUWE S 13 15.60 E 031 54.90
		UP678	LUANDA S 08 50 43 E 013 14 51 UTSAG S 08 49 33 E 011 13 39
		UP679	ETLOV S 16 00 00 E 011 15 24 OKBIK S 16 35 48 E 012 34 42 EVUVI S 17 24 01 E 014 21 22
		UP680	GAMBELLA N 08 08.0 E 034 33.9 DATSU N 07 49 21.34 E 033 08 00.97 ASKON N 06 17 44.81 E 026 25 36.56 GOPUR N 04 48 24.00 E 020 15 30.00 ABAVO N 04 26 24.00 E 018 46 48.00 BANGUI N 04 22.6 E 018 31.5
		UP681	VUTAS N 09 12.10 E 060 00.10 UNRED N 09 13 43.23 E 058 04 34.97 AVEDA N 09 13 29 30 E 049 40 06 DAROT N 09 11 24 E 047 21 12 HARGEISA N 09 31 12 E 044 05 30
		UP682	GABORONE S 24 35 51.77 E 025 49 56.84 EPMON S 24 54 58.97 E 022 37 42.67
		UP683	LUANDA S 08 50 43 E 013 14 51 ANSUS S 10 31 00 E 012 07 24 DUGRA S 11 39 36 E 011 20 34
		UP684	EPMON S 24 54 58.97 E 022 37 42.67 IMLAN S 24 59 07.98 E 020 19 41.19 DULGO S 25 00.00 E 013 59.80
		UP685	BAMAKO N 12 32 46.00 W 007 55 49.70 BEPOM N 10 54 12.70 W 006 06 24.61 INPOS N 10 22 41.18 W 005 31 49.74 ANUVO N07 50 59.01 W 002 48 04.42 DOUALA N 03 55 38.00 E 009 44 36.48
		UP686	CASABLANCA N 33 31.30 W 007 40.60 TADOX N 32 53.0 W 007 26.7 OUARZAZATE N 30 56.40 W 006 54.30 GAO N 16 14.3 W 000 01.6

		UP688	GOPDA (16 11 12.00N 032 51 29.99E) IXETA (13 54 49.03N 032 56 49.03E)
R212	Praslin PERRY 06000.0S 06000.0E Diego Garcia GUDUG 0704.6S 07500.0E PIBED 0520.2S 09044.0E	UR212	Praslin PERRY 06000.0S 06000.0E Diego Garcia GUDUG 0704.6S 07500.0E PIBED 0520.2S 09044.0E
R329	Plaisance Diego Garcia (Gan)	UR329	Plaisance Diego Garcia (Gan)
R348	KADAP (0200.0S 08409.6E LATEP (0610.3S 7500.0E) Diego Garcia	UR348	KADAP (0200.0S 08409.6E LATEP (0610.3S 7500.0E) Diego Garcia Antananarivo
		UR400	Abu Simbel *Note 4 (HS) Kassala Bahir Dar *Note 4 (HA) Mogadishu Praslin Plaisance
		UR401	Saint-Denis Praslin KADER (15 06 00N 055 00 00E) DATRA (16 42 00N 055 30 00E) Haima
R409	Masvingo Lilongwe	UR409	Lilongwe Dodoma Nairobi
		UR410	Masvingo Chileka Lilongwe
R525	Harare KURLA 2157S 03146E Maputo	UR525	Kaoma Harare KURLA 2157S 03146E Maputo
		UR526	Luanda Libreville
R603	Lagos São Tomé	UR603	Lagos São Tomé
R611	(Caraffa) Benina DITAR AMTUL Merowe Khartoum Addis Ababa *Note 1 (Addis Ababa-Garisa-Lake Awasa)	UR611	(Caraffa) Benina DITAR AMTUL Merowe Khartoum Addis Ababa *Note 3 (HK) Wajir Mombasa
		UR620	Bissau Atar

R722	(Faro) Casablanca Marrakech	UR722	(Faro) Casablanca Marrakech BULIS 2740N 00915W Conakry
R723	(ETOIL 3944N 00710E) *Note 5 (LF) Cap Bon	UR723	(ETOIL 3944N 00710E) *Note 5 (LF) Cap Bon
R329	(Aden) Seychelles		
R775	Luxor (Jeddah) (DANAK 1608N 04129E) RAGAS 1218N 04218E *Note (HF) Djibouti Hargeisa Belet Ven Mogadishu	UR775	Luxor (Jeddah) (DANAK 1608N 04129E) ATBON 1543N 04134E RAGAS 1218N 04218E *Note (HF) Djibouti Hargeisa Belet Ven Mogadishu Mahajanga
R778	(VELOX 3349N 03405E) *Note 3 (HE) Port Said *Note 3 (HE) Cairo Fayoum KATAB 2925N 02905E *Note 3 (HE) Kufra *Note 2 (FT, DR) Kano Kaduna Vida Lagos	UR778	(VELOX 3349N 03405E) *Note 3 (HE) Port Said *Note 3 (HE) Cairo Fayoum KATAB 2925N 02905E *Note 3 (HE) Kufra *Note 2 (FT, DR) Kano Kaduna Vida Lagos
R779	Lusaka Livingstone Maun	UR779	Mbeya Lusaka Livingstone Maun
		UR780	Asmara Dire Dawa Mogadishu Saint-Denis
		UR782	Lusaka Chipata Lilongwe Lichinga Moroni Praslin
		UR784	Lubumbashi Mwanza
R765	Nouakchott Conakry	UR765	Nouakchott Conakry
R866	BULIS 2740N 00915W Ouagadougou	UR866	BULIS 2740N 00915W Ouagadougou
R975	Fes Casablanca Agadir	UR975	Fes Casablanca Agadir

	ECHED (2740N 0103100W) Zouerate Atar Nouakchott Dakar		ECHED (2740N 0103100W) Zouerate Atar Dakar
R976	Dakar Sal	UR976	Dakar Sal (NAT)
		UR977	Agadir BULIS (2740N 0090854W Bamako Accra
		UR978	(BALEN 4057N 00541E) Constantine El-Oued Bordj Omar Driss Agades
		UR979	Dakar Abidjan Libreville
R981	Gao Niamey Lagos	UR981	Casablanca Marrakech BULLIS Gao Niamey Lagos
R982	Ouagadougou Tamale Accra	UR982	Ouagadougou Tamale Accra
R983	Lomé PAMPA (0840N 00034E) Ouagadougou	UR983	Lomé PAMPA (0840N 00034E) Ouagadougou
R984	Ouagadougou Lagos Port Harcourt Douala Yaoundé Berberati Bangui Kasama Lilongwe	UR984	Ouagadougou Lagos Port Harcourt Douala Yaoundé Berberati Bangui Kasama Lilongwe
R986	Tunis Ghadames In Amenas Djanet Kano	UR986	Tunis Ghadames In Amenas Djanet Kano Foumban Yaoundé Franceville
R987	Libreville Pointe Noire Cabinda Luanda Ondangwa Windhoek Kertmanshoop Cape Town	UR987	Niamey Port Harcourt Libreville Pointe Noire Cabinda Luanda Ondangwa Windhoek Kertmanshoop Cape Town

R988	Franceville Pointe Noire	UR988	Franceville Pointe Noire
		UR991	DEMAR 0539N 01100W ARLEM 0023N 00720W ILDIR 1800S 01000E Gaborone
		UR993	Djibouti ASMARA
		UR995	Addis Ababa Merowe

Allocation and Assignment of Secondary Surveillance Radar (SSR) Codes in the AFI Region

3.2 The AFI SSR Code Management Plan provides States in the ICAO AFI Region with means to select and coordinate the use of SSR codes based on the provisions of the ICAO Doc 4444 and the principles of the Originating Region Code Assignment Method (ORCAM).

3.3 The SSR Code Allocation Plan of the AFI Region at Table ATM II-AFI 2, reflects the assignment of SSR codes to AFI States, based on the number of aircraft to be handled simultaneously within a specified area and for a determined period of protection during traffic peaks.

3.4 AFI States should inform ICAO ESAF or WACAF Regional Offices promptly of any deviation from the Plan or proposed changes considered necessary with respect to their code allocation, relevant to ATS infrastructure developments and other guidance material as may be provided by ICAO from time to time.

Special purpose codes

Series 00	Code 0000 is available as a general purpose code for domestic use by any of the AFI States.
Series 10	Code 1000 reserved for use as a conspicuity code Mode S.
Series 20	Code 2000 shall be used by flight crews in the absence of any Air Traffic Control (ATC) instructions or regional agreements unless the conditions for the use of codes: 7000, 7500, 7600 and 7700 apply.
Series 70	Code 7000 shall be used by flight crews not receiving ATS service in order to improve detection of suitably equipped aircraft in areas specified by States, unless otherwise instructed by ATS.
Series 75	Code 7500 is reserved for use in the event of unlawful interference.
Series 76	Code 7600 is reserved for use in the event of radio communications failure.
Series 77	Code 7700 is reserved for use in the event of emergencies and interception. Code 7776 and Code 7777 are reserved for SSR ground transponder monitoring.
Codes 7601 - 7612	Reserved for humanitarian flights

TABLE ATM II-AFI-2 - AFI SSR CODE ALLOCATION LIST

State/FIR	Domestic Codes	Domestic Codes	Transit Codes	Transit Codes
Accra	3000-3077	3100-3177	4600-4677	-
	5700-5777	6600-6677	-	-
	6700-6700	7001-7077	-	-
Addis Ababa	1300-1377	-	2400-2477	-
Antananarivo	1300-1377	-	0200-0277	-
Asmara	3100-3177	-	4600-4677	-
Beira	3100-3177	5700-5777	7400-7477	-
Brazzaville	0400-0477	1200-1277	5100-5177	-
	5200-5277	5300-5377	-	-
Bujumbura	-	-	-	-
Cape Town	0500-0577	-	-	-
Dakar	1300-1377	-	5000-5077	-
Dar es Salaam	0400-0477	1200-1277	0300-0377	-
	5200-5277	5300-5377	-	-
Djibouti	-	-	-	-
Entebbe	3000-3077	3100-3177	4200-4277	-
Gaborone	1300-1377	-	4300-4377	-
Gillot APP	-	-	-	-
Harare	0400-0477	1200-1277	3600-3677	-
	5200-5277	5300-5377	-	-
Johannesburg	0600-0677	0700-0777	2600-2677	1101-1177
	0700-0777	-	-	-
Kano	0500-0577	-	1700-1777	-
Khartoum	1200-1277	5200-5277	0100-0177	-
	5300-5377	-	-	-
Rwanda/Kigali	-	-	-	-
Kinshasa	1300-1377	-	6100-6177	-
Lilongwe	1300-1377	-	3300-3377	-
Luanda	3000-3077	3100-3177	6200-6277	-
Lusaka	0600-0677	0700-0777	1500-1577	-
Maseru	-	-	-	-
Matsapha	-	-	-	-
Mauritius	0500-0577	0600-0677	4400-4477	-
	0700-0777	-	-	-
Mogadishu	0400-0477	1200-1277	3400-3477	-
	5200-5277	5300-5377	-	-
Nairobi	0500-0577	0600-0677	1400-1477	-
	0700-0777	-	-	-
N'djamena	3000-3077	3100-3177	4100-4177	-
	5700-5777	7001-7077	-	-
Roberts	0500-0577	0600-0677	1500-1577	-
	0700-0777	-	-	-
Sal	0500-0577	0600-0677	3700-3777	-
	0700-0777	-	-	-
Seychelles	3000-3077	3100-3177	1600-1677	-
	5700-5777	7001-7077	-	-
Windhoek	0400-0477	1200-1277	7100-7177	-
	5200-5277	5300-5377	-	-

AFI ANP, VOLUME II

PART V – METEOROLOGY (MET)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in the ICAO SARPs and PANS related to aeronautical meteorology (MET). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of MET facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to the MET facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the States concerned to implement the requirements specified.

2. GENERAL REGIONAL REQUIREMENTS

Meteorological offices

2.1 In the AFI Region, meteorological watch offices (MWO) have been designated to maintain continuous watch on meteorological conditions affecting flight operations within their area(s) of responsibility, as indicated at **Table MET II-1**.

Meteorological observations and reports

2.2 In the AFI Region, routine observations, issued as a METAR, should be made throughout the 24 hours of each day at intervals of one hour or, for RS and AS designated aerodromes [1], at intervals of one-half hour at aerodromes as indicated in **Table MET II-2**. For aerodromes included on the VHF VOLMET broadcast as indicated in **Table MET II-3**, routine observations, issued as METAR, should be made throughout the 24 hours of each day, at intervals of one-half-hour if applicable.

2.3 At aerodromes that are not operational throughout 24 hours, METAR should be issued at least 3 hours prior to the aerodrome resuming operations in the AFI Region.

Forecasts

2.4 In the AFI Region, an aerodrome forecast, issued as a TAF, should be for the aerodrome indicated in **Table MET II-2**.

2.5 In the AFI Region, an aerodrome forecast, issued as a TAF, should be for the aerodrome indicated in **Table MET II-2**.

2.6 In the AFI Region, the forecast maximum and minimum temperatures expected to occur during the period of validity together with their corresponding day and time of occurrence, should be included in TAF at aerodromes indicated in **Table MET II-2**.

2.7 In the AFI Region(s), landing forecasts (prepared in the form of a trend forecast) should be provided at aerodromes indicated in **Table MET II-2**.

Requirements for and use of communications

2.8 Operational meteorological information prepared as METAR, SPECI and TAF for aerodromes indicated in **Table MET II-2**, and SIGMET and AIRMET (if applicable) messages prepared for flight information regions or control areas indicated in **Table MET II-1**, should be disseminated to the international OPMET databanks designated for the AFI Region (namely Dakar and Pretoria OPMET databanks) and to the centre designated for the operation of the Internet-based service (Secure SADIS FTP) in the AFI Region. The data will be forwarded to other international databanks and to the WIFS Provider State in accordance with international agreements.

2.9 SIGMET messages should be disseminated to other meteorological offices in the AFI Region in accordance with the AFI meteorological bulletin exchange scheme (AMBEX).

2.10 Special air-reports that do not warrant the issuance of a SIGMET should be disseminated to other meteorological offices in the AFI Region, in accordance with the AFI meteorological bulletin exchange scheme (AMBEX).

2.11 In the AFI Region, meteorological information for use by aircraft in flight should be supplied through VOLMET broadcasts.

2.12 In the AFI Region, the aerodromes for which METAR and SPECI are to be included in VOLMET broadcasts, the sequence in which they are to be transmitted and the broadcast time, is indicated in **Table MET II-3**.

3. SPECIFIC REGIONAL REQUIREMENTS

Meteorological observations and reports

3.1 For the AFI Region, routine observations, issued as METAR, should be made throughout the 24 hours of each day at intervals of one half-hour

3.2 In the AFI Region, information on the sea-surface temperature and the State of the sea or the significant wave height from aeronautical meteorological stations established on offshore structures in support of helicopter operations should be included as supplementary information in METAR and SPECI as indicated in Table MET-II-AFI.

3.3 In the AFI Region, information on the state of the runway should be included as supplementary information in METAR and SPECI as indicated in Table MET II-2.

OPMET information

3.4 In the AFI Region, the details of the exchange scheme to be used the OPMET information is given in the AMBEX Handbook.

Service for operators and flight crew members

3.5 In the AFI Region, scheduled VOLMET broadcasts should contain TAF and SIGMET.

3.6 In the AFI Region, METAR, SPECI and TAF should be available for uplink to aircraft in flight via D-VOLMET.

TABLE MET II-1 - METEOROLOGICAL WATCH OFFICES

EXPLANATION OF THE TABLE

Column

1 Name of the State where meteorological service is required

2 Name of the flight information region (FIR) or control area (CTA) where meteorological service is required

Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

3 ICAO location indicator of the FIR or CTA

4 Name of the meteorological watch office (MWO) responsible for the provision of meteorological service for the FIR or CTA

Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

5 ICAO location indicator of the responsible MWO

6 Requirement for SIGMET information (excluding for volcanic ash and for tropical cyclones) to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

7 Requirement for SIGMET information for volcanic ash to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

8 Requirement for SIGMET information for tropical cyclone to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

9 Requirement for AIRMET information to be provided by the MWO for the FIR or CTA concerned, where
Y – Yes, required
N – No, not required

State	FIR or CTA Where Meteorological Service is Required		Responsible Meteorological Watch Office		Meteorological Service To Be Provided			
	Name	ICAO Location Indicator	Name	ICAO Location Indicator	SIGMET (WS)	SIGMET (WV)	SIGMET (WC)	SIGMET (WA)
1	2	3	4	5	6	7	8	9
ANGOLA	LUANDA	FNAN	LUANDA/4 de Fevereiro	FNLU	Y	Y	N	N
BOTSWANA	GABORONE/ SIR SERETSE KHAMA INT	FBGR	GABORONE/Sir Sereste Khama	FBSK	Y	Y	Y	N
BURUNDI	BUNJUMBURA	HBBA	BUNJUMBURA	HBBA	Y	Y	N	N
CAPE VERDE	SAL OCEANIC	GVSC	SAL/Gran Canary	GVAC	Y	Y	N	N
CHAD	N'DJAMENA	FTTT	N'DJAMENA	FTTJ	Y	Y	N	N
CONGO	BRAZZAVILLE/MAYA-MAYA	FCCC	BRAZZAVILLE/MAYA-MAYA	FCBB	Y	Y	N	N
DEMOCRATIC REP. OF CONGO	KINSHASA/N'DJILI	FZAA	KINSHASA/N'DJILI	FZAA	Y	Y	N	N
ETHIOPIA	ADDIS ABABA	HAAA	ADDIS ABABA/Bole Int	HAAB	Y	Y	N	N
ERITREA	ASMARA	HHAA	ASMARA	HHAS	Y	Y	N	N
GHANA	ACCRA	DGAC	ACCRA/Kotoka Int	DGAA	Y	Y	N	N
KENYA	NAIROBI	HKNA	NAIROBI/Jomo Kenyatta Int	HKJK	Y	Y	Y	N
LIBERIA	ROBERTS	GLRB	ROBERTS/Roberts Int	GLRB	Y	Y	N	N
MADAGASCAR	ANTANANARIVO	FMMM	ANTANANARIVO/Ivato	FMMI	Y	Y	Y	N
MALAWI	LILONGWE	FWLL	LILONGWE/Lilongwe Int	FWLI	Y	Y	Y	N
MAURITIUS	MAURITIUS	FIMM	MAURITIUS/Sir Seewoosagur Ramgoolam Int	FIMP	Y	Y	Y	N
MOZAMBIQUE	BEIRA	FQBE	MAPUTO/Maputo Int	FQMA	Y	Y	Y	N
NAMIBIA	WINDHOEK	FYWH	WINDHOEK/Hosea Kutako	FYWH	Y	Y	N	N
NIGER	NIAMEY	DRRR	NIAMEY/Diori Hmani Int	DRRN	Y	Y	N	N
NIGERIA	KANO	DNKK	KANO/Mallam Aminu Kano Int.	DNKN	Y	Y	N	N
RWANDA	KIGALI	HRYR	KIGALI/ Kigali International	HRYR	Y	Y	N	N
SENEGAL	DAKAR	GOOO	DAKAR-DIASS/Blaise Diagne	GOBD	Y	Y	N	N
SEYCHELLES	SEYCHELLES	FSSS	SEYCHELLES Int.	FSIA	Y	Y	Y	N
SOMALIA	MOGADISHU	HCSM	MOGADISHU	HCMM	Y	Y	N	N

State	FIR or CTA Where Meteorological Service is Required		Responsible Meteorological Watch Office		Meteorological Service To Be Provided			
	Name	ICAO Location Indicator	Name	ICAO Location Indicator	SIGMET (WS)	SIGMET (WV)	SIGMET (WC)	SIGMET (WA)
1	2	3	4	5	6	7	8	9
SOUTH AFRICA	CAPE TOWN	FACA	O.R. TAMBO Int	FAOR	Y	Y	N	N
	JOHANNESBURG	FAJA			Y	Y	Y	N
	JOHANESBURG OCEANIC	FAJO			Y	Y	N	N
TOGO	LOME	DXXX	GNASSINGBE EYADEMA INT.	DXXX	Y	Y	N	N
UGANDA	ENTEBBE	HUEC	ENTEBBE Int	HUEN	Y	Y	N	N
UNITED REPUBLIC OF TANZANIA	DAR-ES-SALAAM	HTDC	DAR-ES-SALAAM	HTDA	Y	Y	Y	N
ZAMBIA	LUSAKA	FLFI	KENETH KAUNDA	FLKK	Y	Y	N	N
ZIMBABWE	HARARE	FVHA	HARARE Int	FVHA	Y	Y	Y	N

TABLE MET II-2 - AERODROME METEOROLOGICAL OFFICES

EXPLANATION OF THE TABLE

Column

1 Name of the State where meteorological service is required

2 Name of the AOP aerodrome where meteorological service is required

Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

3 ICAO location indicator of the AOP aerodrome

4 Designation of AOP aerodrome:
RG - international general aviation, regular use
RS - international scheduled air transport, regular use
RNS - international non-scheduled air transport, regular use
AS - international scheduled air transport, alternate use
ANS - international non-scheduled air transport, alternate use

5 Name of the aerodrome meteorological office responsible for the provision of meteorological service

Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

6 ICAO location indicator of the responsible aerodrome meteorological office

7 Requirement for METAR/SPECI from the aerodrome concerned, where:
Y – Yes, required
N – No, not required

8 Requirement for information on the state of the runway provided by the appropriate airport authority to be included as supplementary information in METAR/SPECI from the aerodrome concerned, where:
Y – Yes, required
N – No, not required

9 Requirement for trend forecast to be appended to METAR/SPECI from the aerodrome concerned, where
Y – Yes, required
N – No, not required

10 Requirement for TAF from the aerodrome concerned, where
C - Requirement for 9-hour validity aerodrome forecasts in TAF code (9H)
T - Requirement for 18/24-hour validity aerodrome forecasts in TAF code (18/24H)
X - Requirement for 30-hour validity aerodrome forecasts in TAF code (30H)
N – No, not required

11 Requirement for maximum and minimum temperature (expected to occur during the period of validity of the TAF) to be included in TAF from the aerodrome concerned, where:
Y – Yes, required
N – No, not required

12 Availability of METAR/SPECI and TAF from the aerodrome concerned, where:
F – Full availability : OPMET information as listed issued for the aerodrome all through the 24-hour period
P – Partial availability: OPMET information as listed not issued for the aerodrome for the entire 24-hour period

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	State of the runway	Trend forecast	TAF	Temperature Tx/Tn	
1	2	3	4	5	6	7	8	9	10	11	12
Angola	HUAMBO/ ALBANO MACHADO	FNHU	RS	LUANDA/ 4 DE FEVEREIRO	FNLU					N	F
	LUANDA/4 DE FEVEREIRO	FNLU	RS	VEREIRO	FNLU		Y	Y	X	N	F
Benin	CARDINAL BERNARDIN GANTIN DE CADJEHOUN INTERNATIONAL	DBBB	RS	CARDINAL BERNARDIN GANTIN DE CADJEHOUN INTERNATIONAL	DBBB		Y	Y	X	N	F
Botswana	FRANCISTOWN	FBFT	RS	GABORONE/SIR SERETSE KHAMA INT'L	FBSK					N	F
	GABORONE/SIR SERETSE KHAMA INT'L	FBSK	RS	GABORONE/SIR SERETSE KHAMA INT'L	FBSK		Y	Y	X	N	F
	KASANE	FBKE	RS	GABORONE/ SIR SERETSE KHAMA INT'L	FBSK					N	F
	MAUN	FBSP	RS	GABORONE/ SIR SERETSE KHAMA INT'L	FBSK					N	F
	SELIBE-PHIKWE	FBSP		GABORONE /SIR SERETSE KHAMA INT'L	FBSK					N	F
Burkina Faso	BOBO DIOULASSO	DFOO	RS	OUAGADOUGOU/ AEROPORT	DFFD					N	
	OUAGADOUGOU/AEROPORT	DFFD	RS	OUAGADOUGOU/ AEROPORT	DFFD					N	
Burundi	BUNJUBURA	HBBA					Y	Y	T	N	F
Cameroon	DOULALA/ AEROPORT	FKKD	RS	DUALA/ AEROPORT	FKKD		Y	Y	X	N	F
	GAROUA	FKKR	AS	GAROUA	FKKR			Y		N	F
	MAROUA/ SALAK	FKKL	RS	DOUALA/ AEROPORT	FKKD					N	F
	N'GAOUNDERE	FKKN	RS	DOUALA/	FKKD					N	F

				AEROPORT							
	YAOUNDE/NSIMALEN	FKYS	RS	YAOUNDE/ NSIMALEN	FKYS		Y	Y	T	N	F
Cape Verde	AMICAR CABRAL/SAL ISLAND	GVAC	RS	AMICAR CABRAL/ SAL ISLAND	GVAC		Y	Y	X	N	F
	PRAIA/NELSON MANDELA	GVNP	RS	AMICAR CABRAL/ SAL ISLAND	GVAC					N	F
Central Africa Republic	BANGUI/M'POKO	FEFF	RS	BANGUI/M'POKO	FEFF		Y	Y	X	N	F
	BERBEATI	FEFT		BANGUI/M'POKO	FEFF						F
Chad	N'DJAMENA/ AERPORT	FTTJ	RS	N'DJAMENA/ AERPORT	FTTJ		Y	Y	X	N	F
Comoros	ANJOUAN/OUANI	FMCV									
	MORONI/PRINCE SAID IBRAHIM	FMCH	RS	MORONI/ PRINCE SAID IBRAHIM	FMCH		Y	Y	T	N	F
Congo	BRAZZAVILLE/MAYA -MAYA	FCBB	RS	BRAZZAVILLE/ MAYA-MAYA	FCBB		Y	Y	X	N	F
	POINTE NOIRE	FCPP	RS	POINTE NOIRE	FCPP			Y	T	N	F
Côte d'Ivoire	ABIDJAN/FELIX HOUPHOUET BOIGNY	DIAP	RS	ABIDJAN/ FELIX HOUPHOUET BOIGNY	DIAP	Y	N	Y	X	N	F
Democratic Republic of the Congo	GOMA	FZNA	RS	KINSHASA/ N'DJILI	FZAA						P
	KINSHASA/N'DJILI	FZNA	RS	KINSHASA/ N'DJILI	FZAA		Y	Y	X	N	F
	KISANGANI-BANGOKA	FZIC	AS	KINSHASA/ N'DJILI	FZAA					N	P
	LUBUMBASHI	FZQA	AS	KINSHASA/ N'DJILI	FZAA					N	F
	MBUJI-MAJI	FZWA	AS	KINSHASA/ N'DJILI	FZAA					N	P
Djibouti	AMBOULI	HDAM	RS	AMBOULI	ADAM		Y	Y	T	N	F
Equatorial Guinea	MALABO	FGSL	RS	MALABO	FGSL		Y	Y	X	N	F

Eritrea	ASMARA AIS/APP/COM/ MET/TWR ASSAB	HHAS HHSB	RS RS	ASMARA AIS/APP/ COM/MET/ TWR ASSAB	HHAS HHSB	Y	Y Y	T	N N	F F
Ethiopia	ADDIS ABABA/BOLE COM/MET/NOF	HAAB	RS	ADDIS ABABA/ BOLE COM/MET/NOF	HAAB	Y	Y	X	N	F
	DIRE DAWA	HADR	RS	ADDIS ABABA/ BOLE COM/MET/NOF	HAAB				N	F
Gabon	FRANCEVILLE/ MVENGUE	FOON	RS	LIBREVILLE/ LEON M'BA	FOOL				N	F
	LIBREVILLE/ LEON M'BA	FOOL	RS	LIBREVILLE/ LEON M'BA	FOOL	Y	Y	X	N	F
	PORT-GENTIL	FOOG	RS	LIBREVILLE/ LEON M'BA	FOOL	Y		T	N	F
Gambia	BANJUL INTERNATIONAL	GBYD	RS	BANJUL INTERNATIONAL	GBYD	Y		X	N	F
Ghana	ACCRA/KOTOKA INTERNATIONAL	DGAA	RS	ACCRA/KOTOKA INTERNATIONAL	DGAA	Y	Y	X	N	F
	KUMASI	DGSI	RS	ACCRA/KOTOKA INTERNATIONAL	DGAA			T	N	F
	TAMALE	DGLE	RS						N	F
Guinea-Bissau	BISSAU/ OSWALDO VIEIRA INTL	GGOV	RS	BISSAU/ OSWALDO VIEIRA INTL	GGOV	Y	Y	T	N	F
Kenya	ELDORET/INT. AIRPORT	HKEL	RS	ELDORET/INT. AIRPORT	HKEL	Y	Y	T	N	F
	MOMBASA	HKMO	RS	MOMBASA	HKMO	Y	Y	T	N	
	NAIROBI/ JOMO KENYATTA INTL. TWR/APP/NOF/ MET/CIVIL AIRLINES	HKJK	RS	NAIROBI/JOMO KENYATTA INTL. TWR/APP/NOF/ MET/CIVIL AIRLINES	HKJK	Y	Y	X	N N	F
Lesotho	MASERU MOSHOESHOE	FXMM	RS	MASERU MOSHOESHOE I	FXMM	Y	Y	T	N	F
Liberia	MONROVIA/ ROBERTS INT	GLRB	RS	MONROVIA/ ROBERTS INT	GLRB	Y	Y	T	N	F

Madagascar	ANTANANARIVO/ IVATO	FMMI	RS	ANTANANARIVO/I VATO	FMMI					N	
	ANTSIRANANA/ ARRACHART	FMNA								N	
	DZAOUDZI	FMCZ	RS						C	N	F
	MAHAJANGA/ PH.TSIRANANA	FMNM	RS	MAHAJANGA /PH.TSIRANANA	FMNM		Y	Y	T	N	F
	NOSY-BE	FMNN	RS	MAHAJANGA/ PH.TSIRANANA	FMNM					N	F
	SAINTE-MARIE	FMMS	RS	TOAMASINA	FMMT					N	F
	TOAMASINA	FMMT	RS	TOAMASINA	FMMT		Y	Y	T	N	F
	TOLAGNARO	FMSD	RS	ANTANANARIVO/I VATO	FMMI					N	F
Malawi	BLANTYRE/ CHILEKA	FWCL	RS	BLANTYRE/ CHILEKA	FWCL			Y		N	F
	LILONGWE/ KAMUZU INTL	FWKI	RS	LILONGWE/ KAMUZU INTL	FWKI		Y	Y	X	N	F
Mali	BAMAKO/ SENOU	GABS	RS	BAMAKO/ SENOU	GABS		Y	Y	X	N	F
	GAO	GAGO	RS	BAMAKO/ SENOU	GABS				T	N	F
	KAYES	GAKD	RS	BAMAKO/ SENOU	GABS					N	F
	KIDAL	GAKL	RS	BAMAKO/ SENOU	GABS					N	F
	MOPTI/ AMBODEDO	GAMB	RS	BAMAKO/ SENOU	GABS					N	F
	NIORO	GANR	RS	BAMAKO/ SENOU	GABS					N	F
	TOMBOUCTOU	GATB	RS	BAMAKO/ SENOU	GABS					N	F
Mauritania	ATAR	GQPA	RS	NOUAKCHOTT/ OUMTOUNSY	GQNO	Y				N	F
	NEMA	GQNI	RS	NOUAKCHOTT/ OUMTOUNSY	GQNO	Y				N	F
	NOUADHIBOU	GQPP	RS	NOUAKCHOTT/ OUMTOUNSY	GQNO	Y	Y	Y	T	N	F
	NOUKCHOTT/ OUMTOUNSY	GQNO	RS	NOUAKCHOTT/ OUMTOUNSY	GQNO	Y	Y	Y	T	N	F
	ZOUERATT/ AZADIT	GQPZ	RS	NOUAKCHOTT/ OUMTOUNSY	GQNO	Y				N	

Mauritius	SIR SEEWOOSAGUR RAMGOOLAM INTERNATIONAL AIRPORT	FIMP	RS	SIR SEEWOOSAGUR RAMGOOLAM INTL AIRPORT	FIMP		Y	Y	X	N	F
Mozambique	BEIRA	FQBR	RS	BEIRA	FQBR		Y	Y	T	N	F
	MAPUTO	FQMA	RS	MAPUTO	FQMA		Y	Y	T	N	F
Namibia	HOSEA KUTAKO INTL AIRPORT	FYWH	RS	HOSEA KUTAKO INTL AIRPORT	FYWH		Y	Y	X	N	F
	KEETMANSHOOP	FYKT	RS	HOSEA KUTAKO INTL AIRPORT	FYWH					N	F
	WALVIS BAY	FYWB	RS	HOSEA KUTAKO INTL AIRPORT	FYWH					N	F
Niger	AGADES SUD	DRZA	RS	NIAMEY					T	N	F
	NIAMEY	DRRN	RS	NIAMEY			Y	Y	X	N	F
	ZINDER	DRZR	RS	NIAMEY					T	N	F
Nigeria	ABUJA/ NNAMDI AZIKIWE	DNAA	RS	KANO/ MALLAM AMINU KANO	DNKN		Y	Y	X	N	F
	KANO/MALLAM AMINU KANO	DNKN	RS	KANO/ MALLAM AMINU KANO	DNKN		Y	Y	X	N	F
	LAGOS/ MURTALA MUHAMMED	DNMM	RS	LAGOS/ MURTALA MUHAMMED	DNMM		Y	Y	X	N	F
	PORT HARCOURT	DNPO	RS	LAGOS/ MURTALA MUHAMMED	DNMM		Y	Y	X	N	F
Reunion (FRANCE)	LA REUNION-ROLAND GARROS	FMEE	RS	LA REUNION-ROLAND GARROS	FMEE		Y	Y	X	N	F
Rwanda	KIGALI INTL AIRPORT	HRYR	RS	KIGALI INTL AIRPORT	FRYR		Y	Y	T	N	F
Sao Tome and Principe	SAO TOME/INTL, SAO TOME ISLAND	FPST	RS	SAO TOME/ INTERNATIONAL SAO TOME ISLAND	FPST		Y	Y	X	N	F
Senegal	CAP SKIRING	GOGS	RS	DAKAR/YOFF	GOOY				T	N	F
	DAKAR/DIASS	GOBD	RS	DAKAR-DIASS	GOBD	Y	Y	Y	X	N	F
	SAINT LOUIS	GOSS	RS	DAKAR/YOFF	GOOY				T	N	F
	TAMBACOUNDA	GOTT	RS	DAKAR/YOFF	GOOY					N	F

	ZIGUINCHOR	GOGG	RS	DAKAR/YOFF	GOOY				N	F
Seychelles	SEYCHELLES INTL AIRPORT	FSIA	RS	SEYCHELLES INTL AIRPORT	FSIA	Y	Y	T	N	F
Sierra Leone	FREE TOWN/LUNGI	GFLL	RS	FREE TOWN/LUNGI	GFLL	Y	Y	X	N	F
Somalia	BERBERA	HCMI	AS	MOGADISHU	HCMM				N	F
	BURAO	HCMV	RS	MOGADISHU	HCMM				N	F
	EGAL INTL AIRPORT	HCMH	RS	MOGADISHU	HCMM				N	F
	KISIMAYU	HCMK	AS	MOGADISHU	HCMM				N	F
	MOGADISHU	HCMM	RS	MOGADISHU	HCMM	Y	Y	T	N	F
South Africa	BRAM FISCHER INTL AIRPORT	FABL	RS	BRAM FISCHER INTL AIRPORT	FABL	Y	Y	T	Y	F
	CAPE TOWN INTL AIRPORT	FACT	RS	CAPE TOWN INTL AIRPORT	FACT	Y	Y	X	Y	F
	O.R. TAMBO INTL AIRPORT)	FAOR	RS	O.R. TAMBO INTL AIRPORT	FAOR	Y	Y	X	Y	F
	LANSERIA INTL AIRPORT	FALA	RS	O.R. TAMBO INTL AIRPORT	FAOR	Y	Y	T	Y	F
	MAFIKENG AD	FAMM	AS	O.R. TAMBO INTL AIRPORT	FAOR		Y		Y	F
	GATEWAY INTL AIRPORT	FAPP	AS	O.R. TAMBO INTL AIRPORT	FAOR		Y		Y	F
	PORT ELIZABETH INTL AIRPORT	FAPE	AS	O.R. TAMBO INTL AIRPORT	FAOR		Y	T	Y	F
	UPINGTON INTL AIRPORT	FAUP	AS	O.R. TAMBO INTL AIRPORT	FAOR		Y	T	Y	F
	KING SHAKA INTL AIRPORT	FALE	RS	O.R. TAMBO INTL AIRPORT	FAOR		Y	X	Y	F
Swaziland	MANZINI/MATSAPHA	FDMS	RS	MANZINI/ MATSAPHA	FDMS	Y	Y	T	N	F
Togo	LOME/GNASSINGBE EYADEMA	DXXX	RS	LOME/ GNASSINGBE EYADEMA	DXXX	Y	Y	X	N	F
	NIAMTOUGOU	DXNG	RS				Y	T	N	F
Uganda	ENTEBBE (INT)	HUEN	RS	ENTEBBE (INT)	HUEN	Y	Y	X	N	F
United Republic of Tanzania	DAR ES SALAAM APP,TWR,NOF,MET,COM,CIVIL AIRLINES	HTDA	RS	DAR ES SALAAM APP,TWR,NOF, MET,COM,CIVIL AIRLINES	HTDA	Y	Y	X	N	F
	KILIMANJARO APP,TWR,AIS,MET,	HTKJ	RS	KILIMANJARO APP,TWR,AIS,MET	HTKJ	Y	Y	T	N	F

	INTL AIRLINES			INTL AIRLINES						
	ZANZIBAR-KISAUNI	HTZA	RS	ZANZIBAR-KISAUNI	HTZA	Y	Y	T	N	F
Zambia	HARRY NKUMBULA INTERNATIONAL	FLHN	RG	KENNETH KAUNDA	FLKK		Y	X	N	P
	KENNETH KAUNDA	FLKK	RG	KENNETH KAUNDA	FLKK	Y	Y	X	N	F
	MFUWE	FLMF	AS	KENNETH KAUNDA	FLKK				N	P
	SIMON KAPWEPWE	FLSK	RG & AS	KENNETH KAUNDA	FLKK		Y	X	N	P
Zimbabwe	HARARE INTERNATIONAL	FVHA	RS	HARARE INTERNATIONAL	FVHA	Y	Y	X	N	F
	J.M. NKOMO	FVBU	RS	J.M. NKOMO	FVBU				N	F
	VICTORIA FALLS	FVFA	RS	HARARE INTERNATIONAL	FVHA				N	F

TABLE MET II-3 - VOLMET BROADCASTS

EXPLANATION OF THE TABLE

The transmitting station appears at the top of each block.

Names in lower case letters indicate aerodromes for which reports (routine or selected special) are required.

Names in upper case letters indicate aerodromes for which forecasts are required.

Brazzaville	**Antananarivo**
15–25	25–30

45–55	55–60
Brazzaville Douala Libreville Bangui N'Djamena Kinshasa Pointe-Noire Port-Gentil Yaoundé Luanda Sao Tomé Lagos Kano Garoca	Antananarivo Mahajanga Toamasina Moroni Saint-Denis Mauritius Nosy-Bé

AFI ANP, VOLUME II

PART VI - SEARCH AND RESCUE (SAR)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in Standards, Recommended Practices and Procedures (SARPs) related to search and rescue (SAR). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of SAR facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to the SAR facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

2.1 The Rescue Coordination Centres (RCCs) and Rescue Sub-Centres (RSCs) for the AFI Region are listed in Table SAR II-1 and depicted in Chart SAR I-1.

2.2 In cases where the minimum SAR facilities are temporarily unavailable, alternative suitable means should be made available.

2.3 In cases where a SAR alert is proximate to a search and rescue region (SRR) boundary (e.g. 50 NM or less), or it is unclear if the alert corresponds to a position entirely contained within an SRR, the adjacent RCC or RSC should be notified of the alert immediately.

3. SPECIFIC REGIONAL REQUIREMENTS

3.1. The details of the facilities and/or services to be provided to fulfill the basic requirements of the plan are in **Table SAR II-1**. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

TABLE SAR II-1 – RESCUE COORDINATION CENTRES (RCCs) AND RESCUE SUB-CENTRES (RSCs) IN THE AFI REGION

EXPLANATION OF THE TABLE

Column

1 State

2 Name of the Rescue Coordination Centre (RCC) and Rescue Sub-Centre (RSC).

3 SAR points of contact (SPOC). Name of the SPOC.

4 Remarks. Supplementary information such as the type of RCC (e.g. maritime or aviation or joint).

RCC and Rescue Units		SPOC	Remarks
1	2	3	4
ANGOLA RCC	LUANDA RCC	RCC Luanda	
BENIN RSC	COTONOU RSC	RSC Cotonou	
BOTSWANA RCC RSC RSC RSC	BOTSWANA RCC RSC FREETOWN RSC MAUN RSC KASANE	RCC Gaborone RSC Freetown RSC Maun RSC Kasane	
BURKINA FASO RSC	OUAGADOUGOU RSC	RSC Ouagadougou	
BURUNDI RCC	BUJUMBURA RCC	RCC Bujumbura	
CAMEROON RSC	DOUALA RSC	RSC Douala	
CAPE VERDE RCC	SAL RCC	RCC SAL	
CENTRAL AFRICAN REPUBLIC RSC	BANGUI RSC	RSC Bangui	
CHAD RCC	N'DJAMENA RCC	RCC N'Djamena	
COMOROS RSC	MORONI RSC	RSC Moroni	
CONGO RCC	BRAZZAVILLE RSC	RSC Brazzaville	
COTE D'IVOIRE RSC	ABIDJAN RCC	RCC Abidjan	
DEMOCRATIC REPUBLIC OF CONGO RCC	KINSHASA RCC	RCC Kinshasa	
DJIBOUTI RSC	DJIBOUTI RSC	RSC Djibouti	
EQUATORIAL GUINEA RSC	BATA RSC	RSC Malabo	
ERITREA RCC	ASMARA RCC	RCC Asmara	
ETHIOPIA RCC	ADDIS ABABA RCC	RCC Addis Ababa	
GABON RSC	LIBREVILL RSC	RSC Libreville	
GAMBIA RSC	BANJUI RSC	RSC Banjui	
GHANA RCC	ACCRA RCC	CAA Ghana	
GUINEA RSC	CONAKRY RSC	RSC Conakry	

GUINEA-BISSAU RSC	BISSAU RSC	CAA Guinea-Bissau	
KENYA RCC	NAIROBI RCC	CAA Kenya	
LESOTHO RSC	MASERU RSC	CAA Lesotho	
LIBERIA RCC	ROBERTS RCC	CAA Liberia	
MADAGASCAR RCC	ANTANANARIVO RCC	CAA Madagascar	
MALAWI RCC	LILONGWE RCC	RCC Lilongwe	
MALI RSC	BAMAKO RSC	RSC Bamako	
MAURITANIA RSC	NOUAKCHOTT RSC	RSC Nouakchott	
MAURITIUS RCC	MAURITIUS RCC	CAA Mauritius	
MOZAMBIQUE RCC	BEIRA RCC	CAA Mozambique	
NAMIBIA RSC	WINDHOEK RSC	CAA Namibia	
NIGER RCC	NIAMEY RCC	RCC Niamey	
NIGERIA RCC	KANO RCC	RCC Kano	
REUNION (FRANCE) RSC	REUNION RSC	RSC Reunion	
RWANDA RCC	KIGALI RCC	RCC Kigali	
SAO TOME AND PRINCIPE RSC	SAO TOME RSC	CAA Sao Tome	
SENEGAL RCC	DAKAR RCC	RCC Dakar	
SEYCHELLES JRCC	SEYCHELLES JRCC	JRCC Seychelles	
SIERRA LEONE RSC	FREETOWN RSC	CAA Sierra Leone	
SOMALIA RCC	MOGADISHU RCC	CAA Somalia	
SOUTH AFRICA ARCC	JOHANNESBURG ARCC	ARCC Johannesburg	
SOUTH SUDAN RSC	JUBA RSC	RSC Juba	
SWAZILAND RSC	SWAZILAND RSC	RSC Swaziland	
TOGO RSC	LOME RSC	RSC Lomé	
UGANDA RCC	ENTEBBE RCC	RCC Entebbe	
UNITED REPUBLIC OF TANZANIA RCC	DAR ES SALAAM RCC	RCC Dar es Salaam	
ZAMBIA RCC	LUSAKA RCC	CAA Zambia	
ZIMBABWE RCC	HARARE RCC	CAA Zimbabwe	

CHART SAR I-1 – RESCUE COORDINATION CENTRES (RCCs) AND RESCUE SUB-CENTRES (RSCs) IN THE AFI REGION

To be inserted

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AFI ANP, VOLUME II

PART VII - AERONAUTICAL INFORMATION MANAGEMENT (AIM)

1. INTRODUCTION

1.1 This part of the AFI ANP, Volume II, complements the provisions in ICAO SARPs and PANS related to AIS/AIM and aeronautical charts (MAP). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of AIS/AIM facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to the AIS/AIM facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the State(s) concerned to implement the requirement(s) specified.

2. GENERAL REGIONAL REQUIREMENTS

2.1 The responsibility for the provision of AIS/AIM facilities and services in the AFI Region, is reflected in the AFI **Table AIM II-1,** which shows the list of designated international NOTAM Office (NOF), designated State for AIP production, designated State for aeronautical charts (MAP) production, designated State for the provision of the authoritative Integrated Aeronautical Information Database (IAID) and designated State for the provision of the pre-flight information services.

2.2 States should designate and implement an authoritative Integrated Aeronautical Information Database (IAID) where data sets are integrated and used to produce current and future AIS/AIM products and services, which is a fundamental step in the transition to AIM. The designation of authoritative databases should be clearly stated in the Aeronautical Information Package AIP.

2.3 The national plans for the transition from AIS to AIM identifying clearly the timelines for the implementation of the different elements of the ICAO Roadmap for the transition from AIS to AIM should be submitted by States to the ICAO ESAF and WACAF Regional Offices. States should also inform the ICAO ESAF and WACAF Regional Offices of any update.

2.4 States should take necessary measures to ensure that aeronautical information and data they provide meet the regulatory Aeronautical Data quality requirements.

2.5 The Quality Management System (QMS) in AIS/AIM should define procedures to meet the safety and security objectives associated with the management of aeronautical data and information.

2.6 Recognizing the need to maintain or enhance existing safety levels of operations, States should ensure that any change to the existing systems or the introduction of new systems used for processing aeronautical data and/or information are preceded by a safety assessment.

2.7 Technical services responsible for origination of the raw aeronautical information should be acquainted with the requirements for promulgation and advance notification of changes that are operationally significant as established in Annexes 11 and 14 and other relevant ICAO documentation. They should take due account of the time needed by AIS/AIM for the preparation, production and issue of the relevant material, including the compliance with the AIRAC procedures.

2.8 AIS/AIM personnel should be involved in the air navigation planning processes. This should ensure the timely preparation of appropriate AIS documentation and that the effective dates for changes to the air navigation system and procedures are satisfied.

2.9 States should produce relevant aeronautical charts required for civil air operations employing visual air navigation independently or in support of other forms of air navigation. The production responsibility for sheets of the World Aeronautical Chart (WAC) — ICAO 1: 1 000 000 or Aeronautical Chart — ICAO 1: 500 000 (*as an alternative to the World Aeronautical Chart — ICAO 1:1 000 000)* is set out in **Table AIM II-2**.

3. SPECIFIC REGIONAL REQUIREMENTS

None

TABLE AIM II-1 - RESPONSIBILITY FOR THE PROVISION OF AIS/AIM FACILITIES AND SERVICES IN THE AFI REGION

EXPLANATION OF THE TABLE

Column:

1 Name of the State or territory

2 Designated international NOTAM Office (NOF)

3 Designated State for AIP production

4 Designated State for aeronautical charts (MAP) production

5 Designated State for the provision of the authoritative Integrated Aeronautical Information Database (IAID)

6 Designated State for the provision of pre-flight information services

7 Remarks — additional information, as appropriate.

State	NOF	AIP	MAP	IAID	Pre-flight briefing	Remarks
1	2	3	4	5	6	7
Angola	Luanda	Angola	Angola	Angola	Angola	
Benin	Dakar	ASECNA	ASECNA	ASECNA	Benin	
Burkina Faso	Dakar	ASECNA	ASECNA	ASECNA	Burkina Faso	
Botswana	Gaborone	Botswana	Botswana	Botswana	Botswana	
Burundi	Bujumbura	Burundi	Burundi	Burundi	Burundi	
Cameroon	Brazzaville	ASECNA	ASECNA	ASECNA	Cameroon	
Cape Verde	Sal	Cape Verde	Cape Verde	Cape Verde	Cape Verde	
Central African Republic	Brazzaville	ASECNA	ASECNA	ASECNA	Central African Republic	
Chad	Brazzaville	ASECNA	ASECNA	ASECNA	Chad	
Comoros	Antananarivo	ASECNA	ASECNA	ASECNA	Comoros	
Congo	Brazzaville	ASECNA	ASECNA	ASECNA	Congo	
Cote d'Ivoire	Dakar	ASECNA	ASECNA	ASECNA	Cote d'Ivoire	
Democratic Republic of Congo (RDC)	Kinshasa (BNI)	AIP-RDC	MAP-RDC	RVA-RDC	RVA-RDC	RVA is the AIM Provider
Djibouti	Addis Ababa	Djibouti	Djibouti	Djibouti	Djibouti	
Equatorial Guinea	Brazzaville	ASECNA	ASECNA	ASECNA	Equatorial Guinea	
Eritrea	Asmara	Eritrea	Eritrea	Eritrea	Eritrea	
Ethiopia	Addis Ababa	Ethiopia	Ethiopia	Ethiopia	Ethiopia	
Gabon	Brazzaville	ASECNA	ASECNA	ASECNA	Gabon	
Gambia	Dakar	Gambia	Gambia	Gambia	Gambia	Outsourced To Jeppesen Map Production Company.
Ghana	ACCRA	GHANA	Outsource to map production company	GHANA	Ghana	Ghana in the process of installing software for the provision of PIB. common point of access to integrated aeronautical information not implemented.
Guinea	Robertsfield/ Monrovia	Roberts FIR Secretariat	State Level	Roberts FIR Secretariat	Guinea	
Guinea Bissau	Dakar	ASECNA	ASECNA	ASECNA	Guinea Bissau	
Kenya	Nairobi	Kenya	Kenya	Kenya	Kenya	

State	NOF	AIP	MAP	IAID	Pre-flight briefing	Remarks
1	2	3	4	5	6	7
Lesotho	Maseru	Lesotho	Lesotho	Lesotho	Lesotho	Aerodrome AIS Unit
Liberia	Robertsfield/ Monrovia	Roberts FIR Secretariat	Aerodrome AIM unit outsource to MAP production Company	Roberts FIR Secretariat	Liberia	Upgrade of the PIB and post flight information bulletin is ongoing in accordance with DOC 8126 specification.
Madagascar	Antananarivo	ASECNA	ASECNA	ASECNA	Madagascar	
Malawi					Malawi	
Mali	Dakar	ASECNA	ASECNA	ASECNA	Mali	
Mauritania	Dakar	ASECNA	ASECNA	ASECNA	Mauritania	
Mauritius	Plaisance	Mauritius	Mauritius	Mauritius	Mauritius	
Mozambique	Maputo	Mozambique	Mozambique	Mozambique	Mozambique	
Namibia	Windhoek	Namibia	Namibia	Namibia	Namibia	
Niger	Dakar	ASECNA	ASECNA	ASECNA	Niger	
Nigeria	Lagos	Nigeria	Nigeria	Nigeria	Nigeria	
Rwanda	Kigali	Rwanda	Rwanda	Rwanda	Rwanda	
Sao Tome and Principe	Brazzaville	Sao Tome and Principe	Sao Tome and Principe	Sao Tome and Principe	Sao Tome and Principe	
Senegal	Dakar	ASECNA	ASECNA	ASECNA	Senegal	
Seychelles	Mahe	Seychelles	Seychelles	Seychelles	Seychelles	
Sierra Leone	Roberts FIR/Monrovia	Roberts FIR Secretariat	Outsourced at State Level	Roberts FIR Secretariat	Sierra Leone	
Somalia	Mogadishu	Somalia	Somalia	Somalia	Somalia	
South Africa	Johannesburg	South Africa	South Africa	South Africa	South Africa	
South Sudan	Juba	South Sudan	South Sudan	South Sudan	South Sudan	
Swaziland	Manzini	Swaziland	Swaziland	Swaziland	Swaziland	
Togo	Dakar	ASECNA	ASECNA	ASECNA	Togo	
Uganda	Kampala	Uganda	Uganda	Uganda	Uganda	
United Republic of Tanzania	Dar-es-Salaam	Tanzania	Tanzania	Tanzania	United Republic of Tanzania	
Zambia	Lusaka	Zambia	Zambia	Zambia	Zambia	
Zimbabwe	Harare	Zimbabwe	Zimbabwe	N/A	Zimbabwe	IAID not yet implemented

TABLE AIM II-2 - PRODUCTION RESPONSIBILITY FOR SHEETS OF THE WORLD AERONAUTICAL CHART — ICAO 1:1 000 000 OR AERONAUTICAL CHART — ICAO 1: 500 000

EXPLANATION OF THE TABLE

Column:

1 Name of the State accepting production responsibility.

2 World Aeronautical Chart — ICAO 1:1 000 000/Aeronautical Chart — 1: 500 000 sheet number(s) for which production responsibility is accepted.

3 Remarks.

Note — In those instances where the production responsibility for certain sheets has been accepted by more than one State, these States by mutual agreement should define limits of responsibility for those sheets. This should be reflected in the Remarks column.

State	Sheet number(s)	Remarks
1	2	3
Angola		IGCA Instituto Nacional Geodetic de Angola
Benin	2816-2783	Ghana-Nigeria
Burkina Faso	2695	ASECNA
Botswana		
Burundi		
Cameroon		
Cape Verde		
Central African Republic	2786-2812-2813	ASECNA
Chad	2664-2671-2692-2785	ASECNA
Comoros	3052-3156	ASECNA
Congo	2906-2935	ASECNA
Cote d'Ivoire	2781-2817	ASECNA
Democratic Republic of Congo	Nil	Jeppesen assistance
Djibouti		
Equatorial Guinea	2905	ASECNA
Eritrea		
Ethiopia	2688,2789,2788,2790,2809,2810	Ethiopia
Gabon	2936	ASECNA
Gambia	NIL	Coordination with Jeppesen for production before end of 2013
Ghana	1:1 000 000	1:500 000, 1: 250 000
Guinea	NIL	Awaiting autonomous administration
Guinea Bissau	2697	ASECNA
Kenya	Lake Turkana (2910), Kilimanjaro (2931)	
Lesotho		Staff shortage and training obstruct effective ops of AIS/AIM and financial constraints is one of the main issue for us staff recruitment and training is concerned
Liberia	NIL	Contacted outsource Mapping Company
Madagascar	3156-3173-3174-3278-3297	ASECNA
Malawi		
Mali	2660-2696	ASECNA

State	Sheet number(s)	Remarks
1	2	3
Mauritania	2574-2658-2659	ASECNA
Mauritius		
Mozambique		
Namibia		
Niger	2570-2662-2663-2693-2694	ASECNA
Nigeria		
Rwanda		
Sao Tome and Principe		
Senegal	2697	ASECNA
Seychelles		
Sierra Leone	NIL	Agency contacted (ANSP)
Somalia		
South Africa	Bulawayo (3275), Inhambane (3276), Vryburg (3301), Johannesburg (3300), Maputo (3299), Calvinia (3396), Bloemfontein (3397), Durban (3398), Cape Town (3422), Port Elizabeth (3421)	1:1 000 000 – WAC 1:500 000 – Southern Africa 1:250 000 – Topo-Cadastral
South Sudan		
Swaziland		
Togo	2782-2817	Ghana
Uganda	2909	
United Republic of Tanzania	Lake Victoria, 2932, Lake Tanganyika 3030, Zanzibar Island 3031, Ruvuma 3053	
Zambia		
Zimbabwe		

— END —