



Agenda Item 5: Operational implementation of new ATM automated systems and integration of the existing systems

Follow-up to the implementation of activities under the project on Improved ATM situational awareness in the SAM Region

(Presented by the Secretariat)

SUMMARY

This working paper presents information on the follow-up to the implementation of activities under the project on *Improved ATM situational awareness in the SAM Region* (Project C2) since the SAM/IG/16 meeting.

References

- Third meeting of the GREPECAS Programmes and Projects Review Committee (PPRC/3 – Mexico City, 21-23 July 2015).
 - Sixteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/16 - Lima, Peru, 19-23 October 2015).
 - Fourteenth Meeting of Civil Aviation Authorities (Santiago de Chile, Chile, 28-30 October 2015).
 - Ninth Meeting of the Coordination Meeting of Project RLA/06/901 (Lima, Peru, 1-3 December 2015).
- | | |
|------------------------------|--|
| • ICAO strategic objectives: | • A – Safety |
| | • B – Air navigation capacity and efficiency |

1 Background

1.1 At present, the activities under project (C2) *Improved ATM situational awareness in the SAM Region* of the *ATM automation and situational awareness programme* involve the drafting of guides to support the implementation of situational awareness improvements and the drafting of the ADS-B implementation action plan. The description of the project and the status of implementation of project C2 deliverables appear in **Appendix A** to this working paper.

1.2 All of the activities contemplated in project C2 have been completed, only leaving pending the drafting of the Guide on technical considerations to support ATFM implementation.

1.3 The SAM/IG/15 meeting was presented with the Guide on technical/operational considerations for the implementation of multilateration (MLAT), drafted by an expert in surveillance systems from Ecuador, with the support of project RLA/06/901. The guidance document was circulated to all SAM States, and comments were received from Bolivia, Chile, Brazil, and Ecuador. Accordingly, the SAM/IG/16 meeting approved the guide.

1.2 The purpose of the guide is to provide basic information on general aspects of aeronautical surveillance systems for air traffic control (ATC), especially the multilateration system (MLAT), and considerations for their implementation. The guide has three sections: the first contains a

summary of the surveillance issue; the second describes the characteristics of the MLAT system; and the third contains technical and operational considerations for the implementation of a multilateration system.

2 Discussion

2.1 The drafting of the “Guide on technical considerations to support ATFM implementation”, still pending, was approved by the Ninth meeting of the Review Committee of Project RLA/06/901, and involved a one-week mission by an expert in April 2016 to Lima, Peru, for the drafting of said guide. It is expected that the completed guide will be submitted to the SAM/IG/17 meeting.

2.2 **Appendix B** to this working paper contains the surveillance planning tables contemplated in Volume II of the eANP, such as table CNS II 6 (aeronautical mobile services, AMSS), table CNS II 8 CNS II-8 (ASTERIX SAC code assignment plan for the CAR/SAM Regions) and table CNS II 9 on surveillance systems.

2.3 These tables will be sent to all the States of the Region as a revision of Volume II of the eANP. The Meeting is initially invited to review the application of Mode S as contemplated in CNS II 6, as well as the implemented surveillance systems, especially ADS-B and MLAT systems, as contemplated in table CNS II 9.

2.4 RAAC/14 took note of CNS air navigation implementation activities planned for the period 2017-2019 (see **Appendix C** to this working paper) related to *ASBU* modules *B0 – SUR: Initial ground surveillance capability*, *B0-SURF: Safety and efficiency of surface operations (A-SMGCS Level 1-2)* and *B0 – TBO: Improved safety and efficiency through the initial application of data link en route*, and identified indicators and goals for the period 2017-2019. Activities for the period 2017-2019 were defined at the AN&FS2 and reviewed at the SAM IG/16 meeting.

3 Suggested action

3.1 The Meeting is invited to:

- a) take note of the information contained herein;
- b) review Appendix B based on existing and planned surveillance systems;
- c) review project C2, shown in Appendix A, regarding parties responsible for management, the implementation of activities, and new tasks, taking into account surveillance systems planned for the period 2017-2019, as shown in Appendix C; and
- d) discuss any other related issues it may deem appropriate.

APPENDIX A

C2 SAM PROJECT DESCRIPTION

SAM Region	PROJECT DESCRIPTION (PD)	PD N° C2	
Programme	Project Title	Starting Date	Ending Date
ATM Automation and Situational Awareness <i>(Programme Coordinator: Onofrio Smarrelli)</i>	Improve ATM Situational Awareness in the SAM Region <i>Project Coordinator: Paulo Vila (Peru)</i> <i>Contributing experts: José Rubira, Marcos Vidal and Jorge Otiniano (Peru); Javier Vittor (Argentina), Ivan Salas (Ecuador)</i>	October 2011	May 2016
Objective	Develop guidelines supporting the implementation of improvements in the situational awareness of ATS units in the South American Region		
Scope	Guidelines supporting the implementation of various applications, such as common traffic visualization, common meteorological conditions visualization and communications in general <ul style="list-style-type: none"> • Analysis of the current surveillance infrastructure and identification of necessary improvements to support en route and terminal airspaces, airspace classification, PBN and ATFM • Implementation of ADS-B, ADS-c and/or MLAT surveillance systems at selected airspaces • Minimum common electronic information and data bases required in support of decision-making process and alert systems towards an interoperable situational awareness among centralized ATFM units • Implement flight plan data process systems (new FPL format) and data communications tools among ACC's • Implement advanced automation support tools to contribute towards the sharing of aeronautical information 		
Metrics	Drafting of following documents: <ul style="list-style-type: none"> • Regional surveillance strategy for the implementation of systems in support of improvement of situational awareness – revised • Evaluation of the surveillance systems coverage in the SAM Region - completed • Guideline on technical/operational considerations for ADS-B implementation – completed • Guideline on technical/operational considerations for MLAT implementation - completed • Guideline on technical considerations in support of ATFM implementation – completed • Guideline for the presentation of MET products in graphic format – completed • Action plan for ADS-B implementation in the SAM Region 		

<p>Strategy</p>	<ul style="list-style-type: none"> • All tasks will be conducted by experts nominated by States and organizations of the SAM Region members of the Project <i>Improve ATM situational awareness in the SAM Region</i>, under management of the project coordinator. Communications among project members, as well as between the project coordinator and programme coordinator, shall be carried out through teleconferences and the Internet. • Once studies are completed, the results will be submitted to the ICAO programme coordinator as a final consolidated document for its analysis, review, approval and presentation at the GREPECAS PPRC
<p>Goals</p>	<ul style="list-style-type: none"> • Regional surveillance strategy for the implementation of systems in support to situational awareness improvement for July 2012 (completed) • Guideline on technical/operational considerations for ADS-B implementation for October 2012 (completed) • Guideline for the drafting of SIGMET in graphic format (December 2013) (completed) • Guideline for technical/operational considerations for MLAT implementation for March 2015 (completed) • Guideline for technical considerations in support of ATFM implementation (By May 2016) • Action plan for ADS-B implementation in the SAM Region (November 2014) (completed)
<p>Justification</p>	<ul style="list-style-type: none"> • Improve situational awareness has been identified as a great support for ATM, contributing in the increase of safety and in flight efficiency • In addition, a close relationship with the other programmes and their respective projects is necessary, with the aim of collecting the operational requirements demanded by the mentioned applications and their respective tentative implementation dates • This project contributes to the implementation of modules B0 ASUR, B0 SURV, B0 NOPS and B0 AMET of the <i>Air Navigation System Performance-Based Implementation Plan for the SAM Region (SAM PBIP)</i>
<p>Related Projects</p>	<ul style="list-style-type: none"> • Air Navigation Systems in Support of PBN • Automation • ATFM • ATN Ground-ground and Air-ground Applications

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation ¹	Delivery Date	Remarks
<i>Evaluation of surveillance infrastructure and identification of surveillance systems improvements</i>					
Evaluation of surveillance systems coverage in the SAM Region	PFF SAM CNS 04 ANRF B0 ASUR	Paulo Vila (Peru)		October 2012	The evaluation of coverage was carried out in connected to the drafting activities of the Guideline on technical/operational considerations for ADS-B implementation. The results are presented as Appendix A to the Guideline and can be downloaded from site http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS
<i>Drafting of regional plan for ADS-B and MLAT implementation</i>					
Guideline on technical/operational considerations for ADS-B implementation	PFF SAM CNS 04 ANRF B0 ASUR	José Rubira (Peru) Marco Vidal (Peru)		October 2012	The Guideline was approved for use in the interested States of the SAM Region, by the Eleventh Workshop/Meeting of the SAM Implementation group (SAM/IG/11) held in Lima from 13 to 17 May 2013 and can be downloaded from the following website http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS
Guideline on technical/operational considerations for MLAT implementation	PFF SAM CNS 04 ANRF B0 ASUR	Ivan Salas (Ecuador)		October 2015	The Guideline was presented in the Fifteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/15) held in Lima from 11 to 15 May 2015 for initial review and was circulated to all SAM Region States. The final approval is foreseen for the Sixteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/16) to be held in Lima from 19 to 23 October 2015.

¹ **Gray:** Activity has not started
Green: Activity has or will deliver planned milestone as scheduled
Yellow: Activity is behind schedule on milestone, but still within acceptable parameters to deliver milestone on time
Red: Activity has failed to deliver milestone on time, mitigation measures need to be identified and implemented

Project Deliverables	Relationship with Performance Based Regional Plan aligned with ASBU	Responsible	Status of Implementation ¹	Delivery Date	Remarks
Guideline on technical considerations in support of ATFM implementation	PFF SAM ATM 05 B0 NOPS	Pending designation		May 2016	The guideline will be supported with the CAR/SAM ATFM Manual approved through GREPECAS Conclusion 16/35.
Guideline for the presentation of MET products in graphical format	PFF SAM MET 03 ANRF B0 AMET	Jorge Otiniano (Peru)		October 2014	The document guideline was delivered to the Secretariat (MET) of SAM Region for its review by the corresponding meteorology specialists. The Guideline was review by the OPMET information exchange Meeting of SAM Region (27 – 29 October 2014) and will be used as guideline for the implementation of SIGMET graphic in Argentina, Chile, Ecuador, Paraguay and Peru by the second half of 2015 sponsored by the technical cooperation regional project RLA/06/901- http://www.icao.int/SAM/Pages/eDocumentsDisplay.aspx?area=CNS
Action plan for ADS-B implementation in SAM Region	ANRF B0 ASUR	Paulo Vila (Peru)		November 2014	The action plan for the regional implementation of the ADS B was presented an approved in the Fourteenth Workshop/Meeting of the SAM Implementation Group (SAM/IG/14) Lima, Peru, from 10 to 14 November 2014. The document can be downloaded from the website
Resources necessary	Experts in the carrying out of the deliverables				

APPENDIX B / APÉNDICE B

TABLE CNS II-6

AERONAUTICAL MOBILE SERVICE AND AMSS

EXPLANATION OF THE TABLE

Column

- 1 The name of the State and the locations within the same where the service is provided.
- 2 The required services or functions are provided. Suitable abbreviations for these services or functions are listed below.

ACC-L	Area control service for flights up to FL 250.
ACC-SR-I	Area radar control service up to FL 250.
ACC-SR-U	Area radar control service up to FL 450.
ACC-U	Area control service up to FL 450.
AFIS	Aerodrome flight information service.
APP	Approach control service.
APP-L	Approach control services below FL 120.
APP-I	Approach control service below FL 250.
APP-PAR	Precision approach radar service up to FL 40.
APP-SR-I	Surveillance radar approach control service up to FL 250.
APP-SR-L	Surveillance radar approach control service up to FL 120.
APP-SR-U	Surveillance radar approach control service up to FL 450.
APP-U	Approach control service below FL 450.
ATIS	Automatic terminal information service.
D-ATIS	Data link-automatic terminal information service.
CLRD	Clearance delivery.
FIS	Flight information service.
VHF-ER	VHF Extended range.
GP	Facility providing VHF or HF en-route general purpose system (GPS) communication. These facilities provide air-ground radiotelephony for all categories of messages listed in Annex 10, Volume II, 5.1.8. This system of communication is normally indirect, i.e. exchanged through the intermediary of a third person who is usually a communicator at an aeronautical station.
SMC	Surface movement control up to limits of aerodrome.
TWR	Aerodrome control service.

- VOLMET VOLMET broadcast.
- 3 Number of voice VHF channels for the corresponding services indicated in column 2.
 - 4 Number of VHF channels for data communication for the corresponding services indicated in column 2.
 - 5 HF network designators for the corresponding services indicated in column 2.
 - 6 Requirement for HF data link (x) for the corresponding services indicated in column 2.
 - 7 Requirement for satellite voice communications (x) for the corresponding services indicated in column 2.
 - 8 Requirement for satellite data communications (x) for the corresponding services indicated in column 2.
 - 9 Requirement for Mode S data communications (x) for the corresponding services indicated in column 2.
 - 10 Remarks.

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
ANGUILLA (United Kingdom)									
TOPF THE VALLEY/Wall Blake, Anguilla I.	TWR	1							
ANTIGUA AND BARBUDA									
TAPA SAINT JOHNS/ V.C. Bird Antigua I.	APP TWR SMC APP-SR-I D-ATIS	1 1 1 1 1							
ARGENTINA									
SAEU BUENOS AIRES	ACC GP	11 2	2	SAM-1 SAM-2	X	X	X		
SABE BUENOS AIRES/ Aeroparque Jorge Newbery	APP TWR ATIS GP	5 5 1 1							
SAEZ BUENOS AIRES/ Ezeiza, Ministro Pistarini	APP ATIS TWR GP	5 1 5 1							
SADF BUENOS AIRES/San Fernando	APP TWR	3 3							
SARI CATARATAS DEL IGUAZU/My. Carlos Eduardo K.	APP TWR ATIS	2 2 1							
SAVF COMODORO RIVADAVIA	ACC GP	3 1	1	SAM-1	X	X	X		
SAVC COMODORO RIVADAVIA/General Mosconi	APP TWR GP	4 4 1							
SACF CORDOBA	ACC-U GP	6 1	1	SAM-1					
SACO CORDOBA/Ing. A. Taravella	APP TWR GP	6 6 1							
	ATIS	1							
SARF FORMOSA/Formosa	APP TWR	2 2							
SASJ JUJUY/Gobernador Guzmán	APP TWR	2 2							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
SAZM MAR DEL PLATA/ Brig. Gral. B. de la Colina	APP TWR ATIS	5 5 1							
SAMF MENDOZA	ACC GP	3 1	1	SAM-1					
SAME MENDOZA/EI Plumerillo	APP TWR ATIS GP	4 4 1 1							
SAZN NEUQUEN/Presidente Perón	APP TWR ATIS	1 1 1							
SARP POSADAS/Libertador Gral. D. José de San Martín	APP TWR	2 2							
SARR RESISTENCIA	ACC GP	3 1	1	SAM-1	X				
SARE RESISTENCIA/ Resistencia	APP TWR ATIS GP	3 3 1 1							
SAWG RIO GALLEGOS/ Piloto Civil N. Fernández	APP TWR ATIS GP	3 3 1 1							
SAWE RIO GRANDE/ Rio Grande	APP TWR	3 3							
SAAR ROSARIO/Rosario	APP TWR ATIS	2 2 1							
SASA SALTA/Salta	APP TWR GP	2 2 1							
SAZS SAN CARLOS DE BARILOCHE/San Carlos de Bariloche	APP TWR ATIS GP	3 3 1 1							
SANT TUCUMAN/Tte. Benjamin Matienzo	APP TWR GP	2 2 1							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
SAWH USHUAIA/Malvinas Argentinas	APP TWR GP	3 3 1							
ARUBA									
TNCA ORANJESTAD/ Reina Beatriz, Aruba I.	APP-SR-L APP-L TWR SMC D-ATIS	1 1 1 1 1							
BAHAMAS									
MYBS ALICE TOWN/ South Bimini, Bimini I.	TWR	1							
MYSM COCKBURN TOWN/ San Salvador I.	TWR	1							
MYGF FREEPORT/Intl., Grand Bahama I.	APP-U APP-L TWR SMC	1 1 1 1							
MYEG GEORGETOWN/ Georgetown, Exuma Intl.	APP-L TWR	1 1							
MYEM GOVERNOR=S HARBOUR/ Governor=s Harbour, Eleuthera I.	APP-L TWR	1 1							
MYNA NASSAU	ACC-U GP ACC-L	3 1 1							
MYNN NASSAU/Intl., New Providence I.	APP-I TWR SMC APP-SR-I D-ATIS	1 1 1 1 1							
MYEH NORTH ELEUTHERA/ New Providence I.	TWR	1 1							
MYLS STELLA MARIS/Long Island I.	TWR	1							
MYAT TREASURE CAY/ Treasure Cay, Abaco I.	TWR APP-L	1 1							
MYGW WEST END/West End, Grand Bahama I.	TWR	1							
BARBADOS									
TBPB BRIDGETOWN/ Grantley Adams Intl.	APP-U APP-I TWR SMC APP-SR-U D-ATIS	1 5 1 1 1 1							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
BELIZE									
MZBZ BELIZE/Intl.	APP-I APP-I TWR SMC D-ATIS	1 1 1 1 1							
BERMUDA									
TXKF BERMUDA/ L. F. Wake Intl.	APP CLRD D-ATIS SMC TWR	2 1 1 1 2							
BOLIVIA									
SLCB COCHABAMBA/Jorge Wilsterman	TWR APP-I SMC	1 2 1	1	SAM-1 SAM-2	X				
SLLP LA PAZ	ACC-U ACC-U GP ACC-L	1 1-ER 1 1							
SLLP LA PAZ/EI Alto Intl.	APP-I TWR SMC	3 1 1							
SLVR SANTA CRUZ/Viru-Viru Intl.	APP-I TWR SMC	3 1 1							
SLTJ TARIJA/Oriel Lea Plaza	APP-I TWR	1 1							
SLTR TRINIDAD/Tte. Av. Jorge Henrich Arauz	APP-I TWR SMC	2 1 1	TBD	SAM-2			X		
BRAZIL									
SBAZ.. AMAZONICA	ACC-SR-U VOLMET	24 8		SAM-2 SAT-1 SAT-2					
SBAO.. ATLANTICO	ACC-U								
SBBE BELEM/Val de Cães Intl.	APP-SR-I TWR SMC ATIS	4 1 1 1	TBD						
SBCF BELO HORIZONTE/ Tancredo Neves Intl.	APP-SR-I TWR SMC CLRD ATIS	4 1 1 1 1	TBD	SAM-2					

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
SBBV BOA VISTA/ Boa Vista Intl.	APP-I TWR SMC	1 2 1							
SBKP CAMPINAS/Viracopos Intl.	APP-SR-I TWR SMC	1 1 1							
SBCG CAMPO GRANDE/ Campo Grande Intl.	APP-SR-I TWR ATIS SMC	1 1 1 1							
SBCR CORUMBA/ Corumba Intl.	AFIS APP-I	1 1							
SBCZ CRUZEIRO DO SUL/ Cruzeiro do Sul Intl.	AFIS	1							
SBCY CUIABA/Marechal Rondon Intl.	APP-SR-I TWR	1 1							
SBCW CURITIBA	ACC-SR-U VOLVMET	10 2	TBD	SAM-2					
SBCT CURITIBA/ Afonso Peña Intl.	APP-SR-I TWR ATIS SMC CLRD	3 2 1 1 1							
SBFL FLORIANÓPOLIS/ Hercílio Luz Intl.	APP-SR-I TWR SMC ATIS	3 2 1 1							
SBFZ FORTALEZA/ Pinto Martins Intl.	APP-SR-I TWR SMC CLRD ATIS	2 1 1 1 1							
SBFI FOZ DO IGUAÇU/ Cataratas Intl.	APP-SR-I TWR	2 1							
SBMQ MACAPA/ Macapa Intl.	APP-I TWR	1 1							
SBEG MANAUS/Eduardo Gomes Intl.	APP-SR-I TWR SMC ATIS	4 1 1 1							
SBNT NATAL/Augusto Severo Intl.	APP-SR-I TWR SMC CLRD ATIS	4 2 1 1 1							
SBPP PONTA PORÃ/ Ponta Porã Intl.	AFIS	1							

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
SBPA PORTO ALEGRE/ Salgado Filho Intl	APP-SR-I TWR SMC CLRD ATIS	4 1 1 1 1							
SBRE RECIFE	ACC-SR-U VOLMET	16	TBD	SAT-2					
SBRF RECIFE/Guararapes Intl.	APP-SR-I TWR SMC ATIS CLRD	4 1 1 1 1							
SBGL RIO DE JANEIRO/ Galeão Antonio Carlos Jobim Intl.	APP-SR-I TWR SMC CLRD ATIS DATIS	6 2 1 1 1 1	TBD X						
SBSV SALVADOR/Deputado Luis Eduardo Magalhães Intl.	APP-SR-I TWR SMC ATIS	4 1 1 1							
SBSN SANTAREM/ Santarem Intl.	APP-I TWR	2 1							
SBSL SÃO LUIS/Marechal Cunha Machado Intl.	APP-I TWR	1 1							
SBGR SÃO PAULO/ Guarulhos Intl.	TWR SMC CLRD ATIS DATIS	3 1 1 1 1	TBD 1						
SBTT TABATINGA/ Tabatinga Intl.	AFIS	1							
SBUG URUGUAIANA/ Rubem Berta Intl.	AFIS	1							
CAYMAN ISLANDS (United Kingdom)									
MWCB CAYMAN BRAC/ Gerrard Smith Intl.	TWR SMC	1 1							
MWCR GEORGETOWN/ Owen Roberts Intl.	APP-I TWR SMC D-ATIS	1 1 1 1							
CHILE									
SCFA ANTOFAGASTA/ Cerro Moreno	APP-SR-I TWR SMC	2 1 1		SAM-1					Both APP frequencies are ER

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
MUHG HOLGUIN/Frank Pais	APP-SR-L TWR	1 1							
MUCU SANTIAGO DE CUBA/ Antonio Maceo	APP-SR-I TWR SMC	1 1 1							
MUVR VARADERO/Juan Gualberto Gomez	APP-SR-L TWR SMC	1 1 1							
CURACAO									
TNCF Curacao	ACC-U GP	3-ER 1	2		X	X	X		
TNCC WILLEMSTAB/Hato, Curacao I.	APP-I TWR SMC APP-SR-I D-ATIS	1 1 1 1 1							
DOMINICAN REPUBLIC									
MDBH BARAHONA/ Maria Montes Intl.	TWR SMC	1 1							
MDCY EL CATEY/ El Catey Intl.	TWR APP SMC D-ATIS	2 1 1 1							
MDEH EL HIGÜERO/ Dr. Joaquín Balaguer Intl.	TWR APP SMC	2 1 1							
MDLR LA ROMANA/ La Romana Intl.	APP-L TWR SMC	1 1 1							
MDPP PUERTO PLATA/ Gregorio Luperon	APP-SR-I TWR SMC	1 1 1							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
MDPC PUNTA CANA/Punta Cana Intl.	APP-L TWR SMC	1 1 1							
MDST SANTIAGO/Cibao Santiago Intl.	APP-L TWR SMC	1 1 1							
MDCS SANTO DOMINGO	ACC-U ACC-SR-U GP	4 1 1	1						
MDSO SANTO DOMINGO/ De las Américas Intl.	APP-SR-I TWR SMC D-ATIS CLRDR	1 1 1 1 1							
ECUADOR									
SEGU GUAYAQUIL	ACC-U ACC-U FIS APP-	1 5-ER 5-ER		SAM- 6					
SEGU GUAYAQUIL/ Simón Bolívar	SR-I APP-I TWR SMC ATIS	2 1 1 1 1							
SELT LATACUNGA/Cotopaxi	TWR SMC	1 1							
SEMT MANTA/Eloy Alfaro	APP-I TWR SMC	1 1 1							
SEQU QUITO/Mcal. Sucre	APP-SR-I TWR SMC ATIS	2 1 1 1							
EL SALVADOR									
MSLP SAN SALVADOR/ El Salvador Intl.	APP-I APP-I APP-SR-I TWR SMC GP D-ATIS	1 1 1 1 1 1 1							
MSSS SAN SALVADOR/ Ilopango Intl.	APP-I TWR TWR SMC	1 1 1 1							
FRENCH ANTILLES (France)									
TFFF FORT-DE-FRANCE Le Lamentin, Martinique	APP-U APP-I TWR	1 1 1							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
	APP-SR-I	1							
	D-ATIS	1							
	SMC	1							
TFFR POINTE-A-PITRE/ Le Raizet, Guadeloupe	APP-U	1							
	APP-I	2							
	TWR	1							
	APP-SR-I	1							
	D-ATIS	1							
	SMC	1							
TFFJ SAINT-BARTHELEMY/ Saint-Barthelemy	AFIS	1							
TFFG SAINT MARTIN/ Grand Case, Guadeloupe	AFIS	1							
FRENCH GUIANA (France)									
SOOO CAYENNE	ACC-U	2							
	GP	1		CAR-A					
				SAM-2					
				SAT-2					
SOCA CAYENNE/ Rochambeau	APP-SR-I	1							
	TWR	1							
	SMC	1							
	ATIS	1							
GRENADA									
TGPZ LAURISTON/ Carriacou	TWR	1							
TGPY SAINT GEORGES/ Point Salines	APP-L	1							
	TWR	1							
	SMC	1							
GUATEMALA									
MGFL FLORES/Flores	APP-L	1							
	TWR	1							
MGGT GUATEMALA/ La Aurora	APP-SR-I	1							
	TWR	1							
	SMC	1							
	D-ATIS	1							
	GP	1							
MGPB PUERTO BARRIOS/ Puerto Barrios	TWR	1							
MGSJ SAN JOSE/San José	TWR	1							
GUYANA									
SYGC GEORGETOWN	ACC-U	1	1	CAR-A					
				SAM-2	X				
	ACC-U	1-ER							
	GPS	1							
	ACC-L	1							

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
SYCJ TIMEHRI/ Cheddi Jagan Intl.	APP-L TWR SMC FIS	1 1 1 1							
HAITI									
MTCH CAP HAITIEN/Intl.	APP-L TWR	1 1							
MTEG PORT-AU-PRINCE	ACC-SR-U GP	2 1	1						
MTPP PORT-AU-PRINCE/Intl.	APP-SR-I APP-I TWR SMC D-ATIS	1 1 1 1 1							
HONDURAS									
MHRO COXEN HOLE/Juan Manuel Gálvez Intl.	TWR SMC	1 1							
MHLC LA CEIBA/ Golosón Intl.	APP-L TWR SMC	1 1 1							
MHLM SAN PEDRO SULA/ La Mesa Intl.	APP-I TWR SMC GP D-ATIS	1 1 1 1 1							
MHTG TEGUCIGALPA (CENAMER)	ACC-SR-U GP	7 1	3	CAR-A SAM-1	X	X	X		
MHTG TEGUCIGALPA/ Toncontin	APP-I TWR SMC GP D-ATIS	1 1 1 1 1							
JAMAICA									
MKJK KINGSTON	ACC-SR-U ACC-U GP	1 5 1	2		X	X	X		
MKJP KINGSTON/Norman Manley Intl.	APP-SR-1 APP-I TWR SMC D-ATIS	1 1 1 1 1							
MKJS MONTEGO BAY/ Sangster Intl.	APP-SR-I APP-I TWR SMC D-ATIS	1 1 1 1 1							
MEXICO									

Country and location 1	Service or function 2	VHF voice 3	VHF data 4	HF voice 5	HF data 6	Satellite voice 7	Satellite data 8	Mode S 9	Remarks 10
MMAA ACAPULCO/Gral. Juan Alvarez Intl.	APP-SR-I APP-SR-L D-ATIS SMC TWR GP	1 1 1 1 1 1							
MMAS AGUASCALIENTES/ Jesus Teran Intl.	TWR	1							
MMBT BAHIAS DE HUATULCO/ Bahias de Huatulco	TWR	1							
MMSL CABO SAN LUCAS/	TWR	1							
MMCP CAMPECHE/ Ignacio Alberto Acuña Ongay Intl.	TWR	1							
MMUN CANCUN/ Cancún Intl.	APP-L APP-I SMC TWR D-ATIS CLRD GP	1 1 1 1 1 1 1							
MMCM CHETUMAL/ Chetumal Intl.	TWR	1							
MMCT CHICHEN-ITZA/ Chichen-Itza Intl.	TWR	1							
MMCU CHIHUAHUA/ Gral. Roberto Fierro Villalobos Intl.	APP-I TWR D-ATIS GP	1 1 1 1							
MMMC CIUDAD ACUÑA/ Ciudad Acuna Intl.	AFIS	1							
MMCE CIUDAD DEL CARMEN/ Ciudad del Carmen Intl	TWR	1							
MMCS CIUDAD JUAREZ/ Abraham González Intl.	APP-I TWR	1 1							
MMCN CIUDAD OBREGON/ Ciudad Obregon Intl.	TWR	1							
MMCV CIUDAD VICTORIA/ Gral. Pedro Jose Mendez Intl.	TWR	1							
MMCB CUERNAVACA/ Gral. Mariano Matamoros Intl.	TWR	1							
MMCZ COZUMEL/ Cozumel Intl.	TWR	1							
MMCL CULIACAN/ Fidel Bachigualato	APP-I TWR GP	1 1 1							
MMDO DURANGO/ Pte.Guadalupe Victoria, Intl.	TWR	1							

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
MMMT MINATITLAN/ Minatitlan Int.	TWR	1							
MMAN MONTERREY/ Aeropuerto Del Norte Intl.	TWR	1							
MMMY MONTERREY/ Gral. Mariano Escobedo Intl.	ACC-SR-L	2	3		X	X	X		
	ACC-SR-U	2							
	APP-SR-I	1							
	APP-SR-L	1							
	D-ATIS	1							
	GP	1							
	SMC	1							
TWR	1								
MMMM MORELIA/ Gral. Francisco Mujica Intl.	APP-L	1							
	TWR	1							
MMNG NOGALES/ Nogales Intl.	AFIS	1							
MMNL NUEVO LAREDO/ Quetzalcoatl Intl.	APP-L	1							
	TWR	1							
MMOX OAXACA/ Oaxaca Intl.	TWR D-	1							
MMPG PIEDRAS NEGRAS/Intl.	ATIS	1							
MMPA POZA RICA/ Tajin Intl.	TWR	1							
MMPB PUEBLA/ Hermanos Serdan Intl.	TWR	1							
MMPS PUERTO ESCONDIDO/ Puerto Escondido Intl.	TWR	1							
MMPE PUERTO PEÑASCO/ Puerto Peñasco Intl.	TWR	1							
MMPR PUERTO VALLARTA/ Lic. Gustavo Diaz Ordaz Intl.	APP-SR-I	1							
	APP-SR-L	1							
	D-ATIS	1							
	SMC	1							
	TWR	1							
MMQT QUERETARO/ Queretaro Int.	TWR	1							
MMRX REYNOSA/ Gral. Lucio Blanco Intl.	APP-L	1							
	TWR	1							
MMIO SALTILLO/ Plan de Guadalupe Intl.	TWR	1							
MMSC SAN CRISTOBAL DE LAS CASAS/ San Cristobal de las Casas Intl	TWR	1							
MMSF SAN FELIPE/ San Felipe Intl.	AFIS	1							

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
NICARAGUA									
MNMG MANAGUA/Augusto César Sandino Intl.	APP-I	1							
	TWR	1							
	SMC	1							
	GP	1							
	D-ATIS	1							
MNPC PUERTO CABEZAS/ Puerto Cabezas	TWR	1							
PANAMA									
MPBO BOCAS DEL TORO/ Bocas del Toro	AFIS	1							
MMPCH CHANGUINOLA/ Cap. Manuel Niño	TWR	1							
MPDA DAVID/Enrique Malek	TWR	1							
	SMC	1							
MPMG PANAMA/Marcos A. Gelabert	TWR	1							
	SMC	1							
	CLRD	1							
MPZL PANAMA	ACC-U	2							
	ACC-SR-U	1							
	APP-SR-I	3							
	GP	1							
MPTO PANAMA/Tocumen	TWR	1							
	SMC	1							
	ATIS-D	1							
	CLRD	1	1	CAR-A SAM-1	X	X	X		
PARAGUAY									
SGFA ASUNCION	ACC-U	1							
	ACC-U	1	1-ER						
	GP	1							
SGAS ASUNCION/ Silvio Pettirossi	APP-SR-I	1							
	APP-I	2							
	TWR	1							
	SMC	1							
SGES CIUDAD DEL ESTE/ Guarani	APP-SR-I	1	1	SAM-1 SAM-2	X				
	TWR	1							

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
PERU									
SPQU AREQUIPA/	APP-SR-I	1							
Rodríguez Ballón Intl.	TWR SMC	1 1							
SPHI CHICLAYO/ Cap. José Quiñones Gonzáles	TWR SMC	1 1							
SPZO CUZCO/Velazco Astete	APP- I TWR ATIS	1 1 1							
SPQT IQUITOS/Cnel. FAP	APP-SR-I	1							
Francisco Secada Vignetta	TWR SMC	1 1							
SPIM LIMA	ACC-SR-U	4 -ER		SAM-1					
SPIM LIMA-CALLAO/Jorge Chávez Intl.	APP-SR-I TWR SMC CLRD ATIS	3 1 1 1 1							
SPSO PISCO/Pisco	APP-I TWR SMC	1 1 1							
SPTN TACNA/Cnel. FAP Carlos Ciriani Santa Rosa	APP-I TWR	1 1							
SPRU TRUJILLO/Cap. Carlos Martínez de Pinillos	APP-I TWR	1 1							
PUERTO RICO (United States)									
TJBQ AGUADILLA/Rafael Hernández Intl.	TWR	1							
TJFA FAJARDO/Diego Jiménez Torres	TWR	1							
TJMZ MAYAGUEZ/Mayaguez	SMC TWR	1 1							
TJPS PONCE/Mercedita	TWR SMC APP-L	1 1							
TJZS SAN JUAN	ACC-U GP-U	11	4	CAR-A CAR-B NAT-A	X	X	X		
TJSJ SAN JUAN, PUERTO RICO/Luis Muñoz Marín Intl.	D-ATIS TWR	1 2							

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
	SMC	1							
	APP-SR-I	2							
TJVQ VIEQUES/Antonio Rivera	TWR	1							
SAINT KITTS AND NEVIS									
TKPK BASSETERRE/Golden Rock, Saint Kitts I.	APP-L	1							
	TWR	1							
TKPN CHARLESTOWN/Newcastle, Nevis I.	TWR	1							
SAINT LUCIA									
TLPC CASTRIES/Vigie	TWR	1							
	SMC	1							
TLPL VIEUX-FORT/Hewanorra Intl.	APP-L	1							
	TWR	1							
	SMC	1							
SAINT VINCENT AND THE GRENADINES									
TVSV BEQUIA/J. F. Mitchel	TWR	1							
TVSC CANOUAN/Canouan	TWR	1							
TVSV KINGSTOWNE/E.T. Joshua	APP-L	1							
	TWR	1							
TVSM MUSTIQUE/Mustique	TWR	1							
TVSU UNION ISLAND/Union Island	TWR	1							
SINT MAARTEN									
TNCM PHILISBURG/Princess Juliana, St. Maarten I.	APP-I	1							
	TWR	1							
	SMC	1							
SURINAME									
SMNI NEW NICKERIE/Maj. Fernandes	TWR	1							
	SMC	1							
SMPM PARAMARIBO	ACC-U	1							
	GP	1							
SMZO PARAMARIBO/Zorg en Hoop	TWR	1							
	SMC	1							
SMJP ZANDERY/Johan A. Pengel	APP-I	1							
	TWR	1							
	SMC	1							
TRINIDAD AND TOBAGO									
TTZP PIARCO	ACC-SR-U	3							
	ACC-U	4	2	CAR-A	X	X	X		
	GP	1		CAR-B					
				SAM-2					

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
TTPP PORT OF SPAIN/ Piarco Intl., Trinidad I.	APP-I	1							
	APP-SR-I	2							
	TWR	1							
	SMC	1							
	ATIS	1							
TTCP SCARBOROUGH/ Crown Point, Tobago I.	APP-I	1							
	TWR	1							
	SMC	1							
TURKS AND CAICOS ISLANDS (United Kingdom)									
MBGT GRAND TURK/ Grand Turk Intl.	APP-L	1							
	TWR	1							
MBPV PROVIDENCIALES/ Intl.	APP-L	1							
	TWR	1							
MBSC SOUTH CAICOS/Intl.	APP-L	1							
	TWR	1							
UNITED STATES									
KZNY NEW YORK	GP-U	1-ER	1	CAR-A CAR-B	X	X	X		
URUGUAY									
SUCA COLONIA/ Departamental de Colonia	TWR	1							
SULS MALDONADO C/C Carlos A. Curbelo Intl Laguna del Sauce	TWR	1							
	SMC	1							
	ATIS	1							
SUAA MONTEVIDEO/Angel S. Adami Intl.	TWR	1							
SUEO MONTEVIDEO	ACC-U	3	1	SAM-1 SAM-2 SAT-X*	X	X	X		
SUMU MONTEVIDEO/ Carrasco Intl. Gral. Cesareo Berisso	APP-SR-I	1							
	APP-I	1							
	SMC	1							
	TWR	1							
	ATIS	1							
SURV RIVERA/Cerro Chapeau Intl.	TWR	1							
SUSO SALTO/Intl. Nueva Hesperides	TWR	1							
VENEZUELA									
SVBC BARCELONA/Gral. José Antonio Anzoátegui Intl.	APP-SR-I	2							
	TWR	2							
	SMC	1							
	ATIS	1							
	GP	1							
SVZM MAIQUETIA	ACC-SR-U	6							
	GP	1			CAR-A SAM-2				

Country and location	Service or function	VHF voice	VHF data	HF voice	HF data	Satellite voice	Satellite data	Mode S	Remarks
1	2	3	4	5	6	7	8	9	10
SVMI CARACAS/Maiquetía, Simón Bolívar	APP-SR-L TWR SMC ATIS CLRD	2 2 2 1 1	1						
SVMC MARACAIBO/ La Chinita Intl.	APP-SR-I TWR SMC ATIS GP	2 1 1 1 1							
SVMG MARGARITA/Intl. Del Caribe, General Santiago Marino	APP-SR-I TWR SMC ATIS GP	1 1 1 1 1							
SVJC PARAGUANA/Josefa Camejo	APP TWR SMC ATIS	1 1 1 1							
SVSA SAN ANTONIO DEL TACHIRA/San Antonio del Tachira	APP TWR SMC	1 1 1							
SVVA VALENCIA/Zim Valencia	APP TWR SMC ATIS GP	1 1 1 1 1							
VIRGIN ISLANDS (United Kingdom)									
TUPJ ROADTOWN/ Beef Island	APP-L TWR ATIS	1 1 1							
TUPW VIRGIN GORDA/ Virgin Gorda	TWR	1							
VIRGIN ISLANDS (United States)									
TISX SAINT CROIX/Henry E. Rohlsen, St. Croix	APP-I TWR SMC	1 1 1							
TIST SAINT THOMAS/ Cyril E. King	APP-I TWR SMC D-ATIS	1 1 1 1							

**Table CNS II-8 ASTERIX SAC CODE ASSIGNMENT PLAN TO
THE CAR/SAM REGIONS**

State/Territory	SAC Code Format								Hexadecimal SAC Code
	B7	B6	B5	B4	B3	B2	B1	B0	
Anguilla (United Kingdom)	1	1	1	0	0	0	0	0	E0
Antigua & Barbuda	1	1	1	0	0	0	0	1	E1
Argentina	1	1	1	0	0	0	1	0	E2
Aruba (Netherlands)	1	1	1	0	0	0	1	1	E3
Bahamas	1	1	1	0	0	1	0	0	E4
Barbados	1	1	1	0	0	1	0	1	E5
Belize	1	1	1	0	0	1	1	0	E6
Bolivia	1	1	1	0	0	1	1	1	E7
Brazil	1	1	1	0	1	0	0	0	E8
Cayman Islands (United Kingdom)	1	1	1	0	1	0	0	1	E9
Chile	1	1	1	0	1	0	1	0	EA
Colombia	1	1	1	0	1	0	1	1	EB
Costa Rica	1	1	1	1	1	1	0	0	EC
Cuba	1	1	1	0	1	1	0	1	ED
Dominica	1	1	1	0	1	1	0	1	EE
Dominican Republic	1	1	1	0	1	1	1	1	EF
Ecuador	1	1	1	1	0	0	0	0	F0
El Salvador	1	1	1	1	0	0	0	1	F1
Guadeloupe, French Antilles (France)	1	1	1	1	0	0	1	0	F2
Martinique, French Antilles (France)	1	1	1	1	0	0	1	1	F3
French Guiana (France)	1	1	1	1	0	1	0	0	F4
Grenada	1	1	1	1	0	1	0	1	F5
Guatemala	1	1	1	1	0	1	1	0	F6
Guyana	1	1	1	1	0	1	1	1	F7
Haiti	1	1	1	1	1	0	0	0	F8
Honduras	1	1	1	1	1	0	0	1	F9
Jamaica	1	1	1	1	1	0	1	0	FA
Mexico	1	1	1	1	1	0	1	1	FB
Montserrat (United Kingdom)	1	1	1	1	1	1	0	0	FC
Netherlands Antilles (Netherlands)- Curacao	1	1	1	1	1	1	0	1	FD
Nicaragua	1	1	1	1	1	1	1	0	FE
Panama	1	1	1	1	1	1	1	1	FF
Paraguay	1	1	0	1	0	0	0	0	D0
Peru	1	1	0	1	0	0	0	1	D1
Puerto Rico (United States)	1	1	0	1	0	0	0	1	D2
Saint Kitts and Nevis	1	1	0	1	0	0	1	1	D3
Saint Lucia	1	1	0	1	0	1	0	0	D4
Saint Vincent and Grenadines	1	1	0	1	0	1	0	1	D5
Saint Maarten	1	1	0	1	0	1	1	0	D6
Suriname	1	1	0	1	0	1	1	1	D7
Tortola	1	1	0	1	1	0	0	0	D8
Trinidad and Tobago	1	1	0	1	1	0	0	1	D9
Turks and Caicos Is. (United Kingdom)	1	1	0	1	1	0	1	0	DA
United States (For sharing with CAR Region)	1	1	0	1	1	0	1	1	DB
Uruguay	1	1	0	1	1	1	0	0	DC
Venezuela	1	1	0	1	1	1	0	1	DD
Virgin Islands (United Kingdom)	1	1	0	1	1	1	1	0	DE
Virgin Islands (United States)	1	1	0	1	1	1	1	1	DF

TABLE CNS II-9**SURVEILLANCE SYSTEMS PLAN****EXPLANATION OF THE TABLE***Column*

- 1 Name of State/Territory and location of the radar station
- 2 Air traffic services unit served by the facility
- 3 PSR/Function - Primary surveillance radar/Function
E - En-route area control centres
T - Terminal
- 4 Coverage of primary surveillance radar in nautical miles
- 5 SSR/MSSR/Function - Secondary surveillance radar/ Monopulse secondary surveillance radar/Function
E - En-route area control centres
T - Terminal
- 6 SSR/MSSR/Modes - Modes A, C or S
- 7 Coverage of secondary surveillance radar in nautical miles
- 8 ADS-B/Function — Automatic dependent surveillance-Broadcast/ Function
E — En-route area control centres
T — Terminal
- 9 ADS-C/Function — Automatic dependent surveillance-Contract/ Function
C — Continental Airspace
O — Oceanic Airspace
- 10 MLAT/Function — Multilateration /Function
E — En-route area control centres
T — Terminal
- 11 Remarks

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
ANGUILLA (UK)										
ANTIGUA & BARBUDA										
	V.C. Bird APP			T	A/C	180				*MSSR
ARGENTINA										
Bahía Blanca, Airport	Ezeiza ACC Bahía Blanca TMA			E/T	A/C/S	200				*MSSR
Córdoba, Airport	Córdoba ACC Ezeiza ACC Córdoba APP	T	80	E	A/C	180				
Ezeiza, Airport	Ezeiza ACC Buenos Aires APP Cordoba ACC	T	90	E	A/C	220				
La Rioja, Airport	La Rioja, Airport La Rioja TMA			E/T	A/C/S	200				*MSSR
Mar de Plata, Airport	Ezeiza ACC Mar del Plata TMA	T	90	E	A/C	180				
Mendoza, Airport	Mendoza TMA Cordoba ACC	T	60	E	A/C	180				
Neuquen	Ezeiza ACC Neuquen TMA			E/T	A/C/S	200				*MSSR
Paraná, Airport	Ezeiza ACC Córdoba ACC			E	A/C	180				
Quilmes	Ezeiza ACC Cordoba ACC Buenos Aires APP			E/T	A/C/S	200				
San Carlos de Bariloche, Airport	Ezeiza ACC Bariloche TMA Ezeiza ACC			E/T	A/C/S	200				
Salta	Cordoba ACC Salta TMA			E/T	A/C/S	200				*MSSR
San Luis, Airport	Córdoba ACC Ezeiza ACC			E	A/C/S	200				*MSSR
Santa Rosa, Airport	Santa Rosa TMA Ezeiza ACC Cordoba ACC			E/T	A/C/S	200				*MSSR
Tucumán, Airport	Córdoba ACC Tucuman TMA			E/T	A/C/S	200				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
ARUBA	Reina Beatrix APP	T	80	T	A/C	256				*MSSR
BAHAMAS Nassau	Miami ACC Nassau APP	E/T		E/T	A/C	200				
BARBADOS Aiport	Adams APP			T	A/C	250				*MSSR
BELIZE Belize	Belize APP			E/T	A/C	250				*MSSR
BERMUDA	Bermuda TWR			T	A/C	250				
BOLIVIA Cochabamba	Cochabamba APP La Paz ACC			E/T	A/C					
La Paz	La Paz ACC La Paz APP			E T	A/C A/C					
BRASIL										
Barcelos	Manaus ACC	E	180	E	A/C	220				*MSSR
Barra do Carcas	Brasilia ACC	E	180	E	A/C	220				*MSSR
Belém	Manaos ACC	T	60	E	A/C	220				*MSSR
Belém	Belem APP	E	180	T	A/C	220				*MSSR
Boa Vista	Manaus ACC			E	A/C	220				*MSSR
Bom Jesus da Lapa	Recife ACC	T	60	E	A/C	220				*MSSR
Brasília	Brasilia APP			T	A/C	220				*MSSR
Cachimbo	Manaus ACC	T	60	E	A/C	220				*MSSR
Campinas	Campinas APP	T	60	T	A/C	220				*MSSR
Campo Grande	Campo Grande APP	E	180	T	A/C	220				*MSSR
Cangucu	Curitiba ACC	E	180	E	A/C	220				*MSSR
Catanduvas	Curitiba ACC	E	180	E	A/C	220				*MSSR
Chapada Dos Guimaraes	Brasilia ACC	E	180	E	A/C	220				*MSSR
Conceição do Araguaia	Manaus ACC	T	60	E	A/C	220				*MSSR
Confins	Confins APP	T	60	T	A/C	220				*MSSR
Congonhas	São Paulo APP	E	180	T	A/C	220				*MSSR
Cruzeiro do Sul	Manaus ACC	T	60	E	A/C	220				*MSSR
Cuiabá	Cuiabá APP	T	60	T	A/C	220				*MSSR
Curitiba	Curitiba APP	T	60	T	A/C	220				*MSSR
Eduardo Gomes	Manaus APP	E	180	T	A/C	220				*MSSR
Eirunepé	Manaus ACC			E	A/C	220				*MSSR
Fernando Noronha	Recife ACC	T	60	E	A/C	220				*MSSR
Florianópolis	Florianópolis APP	E	180	T	A/C	220				*MSSR
Fortaleza	Recife ACC	T	60	E	A/C	220				*MSSR
Fortaleza	Fortaleza APP	T	60	T	A/C	220				*MSSR
Foz do Iguazu	Foz do Iguacu APP	T	60	T	A/C	220				*MSSR
Galeão	Galeão APP	E	180	T	A/C	220				*MSSR
Gama	Brasília ACC	E	180	E	A/C	220				*MSSR
Guajaramirim	Manaus ACC	T	60	E	A/C	220				*MSSR
Guarulhos	Sao Paulo APP			T	A/C	220				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Imperatriz	Manaus ACC			E	A/C	220				*MSSR
Jacarcacanga	Manaus ACC			E	A/C	220				*MSSR
Jaraguari	Curitiba ACC	E	180	E	A/C	220				*MSSR
Macapa	Manaus ACC	E	180	E	A/C	220				*MSSR
Maceió	Recife ACC	E	180	E	A/C	220				*MSSR
Manaus	Manaus ACC	E	180	E	A/C	220				*MSSR
Manaus	Manaus APP	T	60	T	A/C	220				*MSSR
Manicoré	Manaus ACC			E	A/C	220				*MSSR
Mombaça	São Paulo APP	T		T	A/C	220				*MSSR
Morro da Igreja	Curitiba ACC	E	60	E	A/C	220				*MSSR
Natal	Recife ACC		180	E	A/C	220				*MSSR
Natal	Natal APP	E	180	T	A/C	220				*MSSR
Palmas	Brasília ACC	T	60	E	A/C	220				*MSSR
Petrolina	Recife ACC	E	180	E	A/C	220				*MSSR
Pico do Couto	Brasília ACC			E	A/C	220				*MSSR
Porto Alegre	Porto Alegre APP	E	180	T	A/C	220				*MSSR
Porto Espiridiao	Manaus ACC	T	60	E	A/C	220				*MSSR
Porto Seguro	Recife ACC	E	180	E	A/C	220				*MSSR
Porto Velho	Manaus ACC	E	180	E	A/C	220				*MSSR
Recife	Recife APP	E	180	T	A/C	220				*MSSR
Río Branco	Manaus ACC	T	60	E	A/C	220				*MSSR
Río de Janeiro	Galeão APP	E	180	T	A/C	220				*MSSR
Salvador	Recife ACC	T	60	E	A/C	220				*MSSR
Salvador	Salvador APP	E	180	T	A/C	220				*MSSR
Santa Teresa	Brasília ACC	T	60	E	A/C	220				*MSSR
Santarém	Manaus ACC	E	180	E	A/C	220				*MSSR
Santiago	Curitiba ACC	E	180	E	A/C	220				*MSSR
Sao Felix do Aragonia		E	180	E	A/C	220				*MSSR
S. Feliz do Xingu				E	A/C	220				*MSSR
Sao Gabriel Cachoeira	Manaus ACC	E	180	E	A/C	220				*MSSR
Sao Luiz	Manaus ACC	E	180	E	A/C	220				*MSSR
Sao Roque	Brasilia ACC	E	180	E	A/C	220				*MSSR
Sinop	Brasilia ACC	E	180	E	A/C	220				*MSSR
Tabatinga	Manaus ACC	E	180	E	A/C	220				*MSSR
Tanabi	Brasília ACC	E	180	E	A/C	220				*MSSR
Tefé	Manaus ACC	E	180	E	A/C	220				*MSSR
Tirios	Manaus ACC			E	A/C	220				*MSSR
Tres Marias	Brasilia ACC	E	180	E	A/C	220				*MSSR
Vilhena	Manaus ACC	E	180	E	A/C	220				*MSSR
CHILE										
Antofagasta	Santiago ACC			E/T	A/C	250				MSSR
	Antofagasta APP			T						
	Iquique APP			T						
Atacama	Santiago ACC			E	A/C	250				MSSR
	Antofagasta APP			T						
Aysen	Puerto Montt ACC			E	A/C	250				MSSR
	Punta Arenas ACC			E						
	Santiago ACC			E						
Cautin	Santiago ACC			E	A/C	250				MSSR
	Puerto Montt ACC			E/T						

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Coquimbo	Antofagasta APP Santiago ACC			E/T E	A/C	250				MSSR
Iquique	Antofagasta APP Iquique APP Santiago ACC			E/T T E	A/C	250				MSSR
Puerto Montt	Puerto Montt ACC Punta Arenas ACC Santiago ACC	E/T	80	E/T E E	A/C	220				MSSR
Punta Arenas	Punta Arenas ACC	E/T	80	E/T	A/C	220				MSSR
Santiago	Santiago ACC Oceanico Santiago TWR	E/T	80	E/T	A/C					MSSR Pre operacional A- SMGCS
Santiago, Yerbas Buenas	Santiago ACC			E/T	A/C	250				MSSR
COLOMBIA										
Araracuara	Bogotá ACC Villavicencio APP			E/T	A/C	250				*MSSR
Bucaramanga	Barranquilla ACC Bogotá ACC Bucaramanga APP Cúcuta APP			E/T	A/C	250				* <2005
Cali	Bogotá ACC Cali APP	T	80	T	A/C	250				*MSSR
Carepa	Barranquilla ACC Bogotá ACC Rio Negro APP	E/T	80	E/T	A/C/S	250				*MSSR
Carimagua	Bogotá ACC Villavicencio APP	E/T	200	E/T	A/C	200				*MSSR
Cerro Maco	Barranquilla ACC Barranquilla APP Bogotá ACC Cartagena TWR Rio Negro APP	E/T	165	E/T	A/C	250				
Cerro Verde (Rio negro)	Barranquilla ACC Barranquilla APP Bogotá ACC Cali APP Pereira APP Rio Negro APP	E/T	60	E	A/C	200				*MSSR
El Dorado	Bogotá ACC Bogotá APP	E/T	60	E/T	A/C	200				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Villacencio APP									
Espinal	Bogotá ACC Bogotá APP			E/T	A/C	250				
Leticia	Bogotá ACC Leticia APP Villavicencio APP	E/T	200	E/T	A/C	250				*MSSR
Leticia (MIL)	Villavicencio APP	T	240	T	A/C	240				
Marandúa	Bogotá ACC Villavicencio APP	E/T	240	E/T	A/C	240				
Pereira	Bogotá ACC Bogotá APP Cali APP Pereira APP Rio Negro APP			E/T	A/C	250				*MSSR
Riohacha	Barranquilla ACC	E	240	E	A/C	240				
S. J. Guaviare	Bogotá ACC Villavicencio APP	E/T	240	E/T	A/C	240				
San Andrés	Barranquilla ACC San Andrés APP			E/T	A/C	250				*MSSR
San Andrés (MIL)	Barranquilla ACC San Andrés APP	E/T	240	E/T	A/C	240				
Santa Ana	Bogotá ACC Cali ACC/APP Pereira APP	E/T	165	E/T	A/C	250				*MSSR
Tablazo	Bogotá ACC Bogotá APP Cali APP Pereira APP Rio Negro APP Villavicencio APP	ET	80	E/T	A/C	250				*MSSR
Tubará (Barranquilla)	Barranquilla ACC Barranquilla APP San Andrés APP	E/T	80	E	A/C	250				*MSSR
Villavicencio	Villavicencio APP	T	80	E/T	A/C	150				
COSTA RICA										
El Coco	El Coco APP	E/T	60	E/T	A/C	250				*MSSR
Volcan Poas	El Coco APP CENAMER ACC			E/T	A/C/S	250				*MSSR Mode S
CUBA										

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Camagüey	Habana ACC Camagüey APP	T	60	T	A/C	200	E/T			*MSSR
Habana	Habana TMA Habana APP			T	A/C	200	T			*MSSR
Holguín	Habana ACC Santiago de Cuba TMA Holguín APP			E/T	A/C	200	E/T			*MSSR
Menocal	Habana ACC Habana TMA Habana APP Varadero APP			E/T	A/C	200	E/T			*MSSR
Varadero	Varadero APP			E	A/C	200			T	*MSSR
San Julián	Habana ACC			E	A/C	200	E			*MSSR
Sta. Clara	Habana ACC			E	A/C	200	E			*MSSR
Gran Piedra	Santiago de Cuba TMA			E/T	A/C	200	T			
DOMINICA										
DOMINICAN REPUBLIC										
Puerto Plata	Puerto Plata APP	T	70							
Punta Cana	Santo Domingo ACC Punta Cana APP	T	70	E/T	A/C	250				*MSSR
Santo Domingo	Santo Domingo ACC Santo Domingo APP	E/T	70	E/T	A/C	250				*MSSR
ECUADOR										
Guayaquil	Guayaquil ACC Guayaquil APP	T	50	E T	A/C A/C	250 250				*MSSR *MSSR
Quito APP	Guayaquil ACC Quito APP	T	50	E T	A/C A/C	250 250				*MSSR *MSSR
San Cristobal	Guayaquil ACC			E	A/C	250				*MSSR
EL SALVADOR										
El Salvador	El Salvador APP	T	80	T	A/C	200				*MSSR
Ojo de Agua	El Salvador APP			E/T	A/C	250				*MSSR
FRENCH ANTILLES										

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Fort-de-France	Fort-de-France APP			T	A/C	200				*MSSR
Point-à-Pitre	Point-à-Pitre APP			T	A/C	250				*MSSR
GRENADA	Point Salines APP									
GUATEMALA										
C. Guatemala	La Aurora APP	T	80	T	A/C	250				*MSSR
San José Escuintla	San José APP			T	A/C	250				*MSSR
Santa Elena	Tikal APP			T	A/C	250				*MSSR
GUYANA	Georgetown ACC									
HAITI										
	Port-au-Prince ACC			E/T	A/C	250				*MSSR
	Port-au-Prince APP			T	A/C	250				*MSSR
HONDURAS										
San Pedro Sula	La Mesa APP			T	A/C	250				*MSSR
JAMAICA										
Kingston	Kingston APP	T	60	E/T	A/C	250				*MSSR
Montego Bay	Montego Bay APP	T	60	T	A/C	250				*MSSR
Mount Denham	Kingston ACC	E	120	E	A/C	250				*MSSR
MEXICO										
Acapulco	Acapulco APP			T	A/C	240				*MSSR
Bajío Gto	México ACC			E/T	A/C/S	240				*MSSR
	Bajío APP									
Cancún Cerro	Mérida ACC	E/T	60	E/T	A/C	240				*MSSR
	Cancún APP									
Cerro Gordo	México ACC			E/E	A/C	240				*MSSR
	Monterrey ACC									
Potosí Cerro	Monterrey ACC			E	A/C	240				*MSSR

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Tijuana	Tijuana APP			T	A/C	240				*MSSR
Toluca	México ACC	E/T	80	E/T	A/C	240				*MSSR
	Toluca APP									
Veracruz	México ACC			E	A/C	240				*MSSR
	Mérida ACC									
Villahermosa	México ACC			E	A/C/S	240				*MSSR
	Merida ACC									
MONTSERRAT (United Kingdom)										
CURACAO										
Willemstad	Curaçao ACC	E/T	120	E/T	A/C	256				
	Curaçao APP									
SINT MAARTEN										
Saint Maarten	Juliana APP	T	60	T	A/C	256				
NICARAGUA										
Managua	Managua APP			T	A/C/S	250				*MSSR Mode S
Bluefields	Bluefields TWR			T	A/C	250				
PANAMA										
Panamá	Panamá ACC	T	60	E/T	A/C	200				
	Panamá APP									
PARAGUAY										
Asunción	Asunción ACC	T	60	E/T	A/C/S	250				*MSSR Mode S
Roque Alonso	Roque Alonso Aeródromo						E/T			
Mcal Estigarribia	Mcal Estigarribia						E/T			
Bahía Negra	Bahía Negra						E/T			
Concepción	Concepción						E/T			
Minga Guazú	Guaraní						E/T			
San Juan Bautista	San Juan Bautista						E/T			
Ciudad del Este	Ciudad del Este	T	60	E/T						

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
Carrasco	Montevideo ACC	E/T	80	E/T	A/C	180				
	Carrasco APP									
Durazno	Montevideo ACC			E/T	A/C	256				*MSSR
	Carrasco APP									
VENEZUELA										
Barcelona	Barcelona APP	E/T	60	E/T	A/C	250				*MSSR
	Maiquetia ACC									
Barquisimeto	Barquisimeto APP	E/T	60	E/T	A/C	250				*MSSR
	Maiquetia ACC									
San Carlos de Rio Negro	Maiquetia ACC			E	A/C	250				*MSSR
Isla Margarita	Margarita APP	E/T	60	E/T	A/C	250				*MSSR9
	Maiquetia ACC									
Las Coloradas	Maiquetia ACC			E	A/C	250				*MSSR
Maiquetía	Maiquetia ACC	E/T	80	E/T	A/C	250				
	Maiquetia APP									
Maracaibo	Maracaibo APP	E/T	60	E/T	A/C	250				*MSSR
Puerto Ayacucho	Maiquetia ACC									
	Maiquetia ACC	E/T	200	E/T	A/C	250				*MSSR
Puerto Ordaz	Puerto Ordaz APP	E/T	200	E/T	A/C	250				*MSSR
	Maiquetia ACC									
Santa Elena de Uairen	Maiquetia ACC			E/T	A/C	250				*MSSR
VIRGIN IS. (United Kingdom)										
VIRGIN IS. (United States)										
Saint Thomas	San Juan ACC	E/T	60	E/T	A/C	180				
	San Juan APP									
COCESNA										
Cerro Santiago, Guatemala	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Grand Cayman, Cayman I.	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S

State(Territory)/Location Estado(Territorio)/Ubicación	ATS Unit Served Unidad ATS Servida	PSR		SSR			ADS-B	ADS-C	MLAT	Remarks Observaciones
		Function Función	Coverage Cobertura (NM)	Function Función	Modes Modos (A,C&S)	Coverage Cobertura (NM)	Function	Function	Function	
1	2	3	4	5	6	7	8	9	10	11
	Owen Roberts TWR									
Mata de Caña, Costa Rica	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Puerto Cabezas, Nicaragua	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Dixon Hill, Honduras	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S
Monte Crudo, Honduras	CENAMER ACC			E/T	A/C/S	250				*MSSR-Mode S

APPENDIX C

AIR NAVIGATION IMPLEMENTATION PLAN - PERIOD 2017- 2019

<i>B0 – SUR: Initial ground surveillance capability</i>						
ELEMENTS	SCOPE	INDICATORS / METRICS	GOALS: %/ Date			STATUS
			2017	2018	2019	
Implementation of ADS-B and MLAT	All States	Indicator: % of ADS B and/or multilateration implemented for higher air navigation levels Goal to 2019: 10% domestic implementation of coverage ADS-B and/or Multilateration for higher air navigation levels	6%	8%	10%	Current status 5% of ADS B and/or Multilateration ADS B Systems installed in Colombia (13), Guyana (1) and Paraguay (6) Multilateration in Colombia and Ecuador (2)
Surveillance interconnection systems	All States	Indicator: % of coverage in flight transferring control area between adjacent AAC of the Region Goal to 2019: 30% of coverage in flight transferring control area between adjacent AAC of the Region	10%	20%	30%	5% of coverage in flight transferring control area between adjacent AAC of the Region There is radar coverage in the radar transferring between AAC Montevideo and AAC Ezeiza
Implementation of the ACC automation system	All States	Indicator: % of ACC automation systems implemented Goal: 100% of ACC automation systems implemented 2019	95%	10%		90% of automated systems implemented in AAC

B0-SURF: Safety and efficiency of surface operations (A-SMGCS Level 1-2)						
ELEMENTS	SCOPE	INDICATORS / METRICS	GOALS: %/ Date			STATUS
			2017	2018	2019	
A-SMGCS Level 1*		Indicator: % of applicable international aerodromes that have implemented A-SMGCS Level 1 Support metrics: Number of applicable international aerodromes that have implemented A-SMGCS Level 1 4 A-SMGCS Level 1* by the end of 2019		2	2	New implementation
A-SMGCS Level 2*		Indicator: % of applicable international aerodromes that have implemented A-SMGCS Level 2 Support metrics: Number of applicable international aerodromes that have implemented A-SMGCS Level 2 2 A-SMGCS Level 2* by the end of 2019			2	New implementation

<i>B0 – TBO: Improved safety and efficiency through the initial application of data link en-route</i>						
ELEMENTS	SCOPE	INDICATORS / METRICS	GOALS: %/ Date			STATUS
			2017	2018	2019	
Implementation of ADS C	All States with oceanic FIRS	Indicator: % of oceanic FIRs with ADS C requirement implemented Goal to 2019: 100% of oceanic FIRs with ADS C implemented	90%	100%		To date 82% ADS C implemented in oceanic FIRS
Implementation of CPDLC	All States	Indicator: % of CPDLC systems implemented in FIRs oceanic and continental areas Goal to 2019: 100% of CPDLC systems implemented in oceanic FIRs 5% of CPDLC implemented in continental area		2		To date 82% of oceanic FIRs with CPDLC implemented 0% of CPDLC implemented in continental area