



**Twenty-first Meeting of the CAR/SAM Regional Planning and Implementation Group  
 (GREPECAS/21)**

Santo Domingo, Dominican Republic, 15 to 17 November 2023

**Agenda Item 3: Global and Regional Developments**  
**3.2 Work report on the CAR/SAM Regional Air Navigation Plan Vol. III  
 and Regional Progress**

**UPDATE OF PART III (CNS) OF VOLUME II OF THE ANP CAR/SAM**

(Presented by the Secretariat)

**EXECUTIVE SUMMARY**

This working paper proposes that the information in the CNS tables of Part III of Volume II of the Regional Air Navigation Plan CAR/SAM be reviewed and consolidated by the CAR/SAM States, for subsequent approval by GREPECAS and publication in the ICAO iSTARS/SPACE application.

<b>Action:</b>	Suggested actions are presented in Section 4.
<i>Strategic Objectives:</i>	<ul style="list-style-type: none"> <li>Air Navigation Capacity and Efficiency</li> </ul>
<i>References:</i>	<ul style="list-style-type: none"> <li>Minutes of the Third Virtual Meeting of the Program and Project Review Committee (PPCR) of GREPECAS (ePPCR/3), August 2021.  <a href="https://www.icao.int/NACC/Documents/Meetings/2021/PPPR3/eCRPP03-Minute.pdf">https://www.icao.int/NACC/Documents/Meetings/2021/PPPR3/eCRPP03-Minute.pdf</a></li> <li>Twentieth Meeting of the Caribbean-South America Regional Planning and Implementation Group (GREPECAS/20), November 2022.  <a href="https://www.icao.int/NACC/Documents/Meetings/2022/GREPECAS20/GREPECAS20-FinalReport.pdf">https://www.icao.int/NACC/Documents/Meetings/2022/GREPECAS20/GREPECAS20-FinalReport.pdf</a></li> </ul>

**1. Introduction**

1.1 Volume II of the ANP contains dynamic elements of the plan, the modification of which does not require council approval. The ANP Volume II contains material related to:

- The assignment of responsibilities to States for the provision of aerodromes and air navigation facilities and services; and

- Current and medium-term mandatory regional requirements related to aerodromes and air navigation facilities and services to be implemented by States in accordance with regional air navigation agreements involving the relevant PIRG.

1.2 The approval of Volume II of the ANP is under the responsibility of the corresponding PIRG.

1.3 In the minutes of the Minutes of the Third Virtual Meeting of the Program and Project Review Committee of GREPECAS (eCRPP/3), the importance of updating Volumes I and II of the ANP was highlighted.

*3.5.8 Under NE/14, the Secretariat presented to the Meeting an excerpt of the procedures for amending the Regional Air Navigation Plan with the aim of having States take note of the need for Volumes I and II of the ANP to be duly updated to ensure their accuracy and validity, so as to ensure the preparation and implementation of the future Volume III of the Plan on an adequate basis.*

1.4 Likewise, in the Report of the GREPECAS/20 Meeting it was indicated that the States support the updating of the tables of Part III (CNS) of Volume II of the ANP CAR/SAM.

*2.3.34 The Meeting was invited to consider the adoption of regional approaches for the implementation of new systems, to support the updating of the tables of Part III (CNS) of Volume II of the Regional Air Navigation Plan CAR/SAM and to collaborate in the elaboration of Volume III of the ANP CAR/SAM.*

## **2. Analysis**

### *Subgroup CNS/ANP of the INTEROP TF*

2.1 To carry out the updating of the information of the CNS tables, referring to the States of the SAM Region, the CNS/ANP Subgroup of the Interoperability Task Group (INTEROP WG) was activated within the framework of the Implementation Group of the SAM Region (SAM / IG).

2.2 El Subgrupo CNS/ANP ha trabajado con las tablas del ANP CAR/SAM que están disponibles en la aplicación iSTARS/SPACE (<https://portal.icao.int/space/ANP/Pages/Home.aspx>). La Figura 1 muestra una pantalla de la aplicación *web* para consulta de los planes de navegación aérea.

2.3 The components of the CNS/ANP Subgroup have verified that some tables that are currently in Part III of Volume II of the ANP CAR/SAM, do not constitute planning information, being in some cases information that already appears in other documents.

2.4 Likewise, the tables available today are in Word text format (.docx), without the resources that other formats, such as electronic templates, can provide (filters, reorganization of information, increasing/decreasing order, etc.), which facilitates information handling.

2.5 The CNS/ANP Subgroup recognized that the complete updating of the document should be consolidated with the revision and updating of the information of the CAR States.

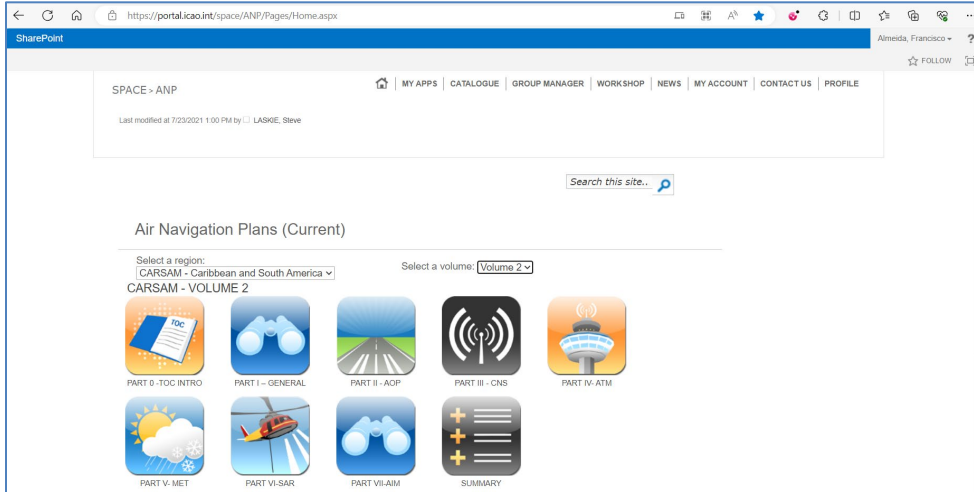


Figure 1 – Web application for consultation of ANPs.

### 3. Proposal

3.1 The proposal consists of the revision and updating of the initial text of Part III (CNS) of Volume II of the ANP CAR/SAM and associated tables, by the CAR/SAM States, obeying the following criteria:

- Assignment of Focal Points in each State to coordinate the update;
- Elimination of information that is not of a planning nature or that is related to other publications;
- Adoption of a new file format for CNS tables; and
- Following approval by GREPECAS, disclosure in the ICAO iSTARS/SPACE app, replacing the current content.

3.2 The **Appendix** to this working paper presents the draft initial text of Part III (CNS), to be reviewed by the CAR/SAM States.

3.3 The following tables would make up the new Part III (CNS):

- Table CNS II-1 – AERONAUTICAL MESSAGE SERVICE (AFTN/AMHS) PLAN;
- Table CNS II-2 – ATS DIRECT SPEECH CIRCUITS PLAN;
- Table CNS II-3 – ATS INTERFACILITY DATA COMMUNICATION (AIDC) PLAN;
- Table CNS II-4 – HF NETWORK DESIGNATORS APPLICABLE IN THE CAR/SAM REGIONS;
- Table CNS II-5 – CAR/SAM ATN IPV4 ADDRESSING PLAN;
- Table CNS II-6 – AERONAUTICAL MOBILE SERVICE AND AMSS PLAN;
- Table CNS II-7 – RADIO NAVIGATION AIDS PLAN;
- Table CNS II-8 – ASTERIX SAC CODE ASSIGNMENT PLAN; and
- Table CNS II-9 – SURVEILLANCE SYSTEMS PLAN.

3.4 The NACC and SAM Offices will provide sharing (SharePoint) of the files for the Focal Points to access and work on updates with the staff of each CNS area.

3.5 Updates should be submitted to the respective Regional Offices only through the Focal Points.

3.6 If necessary, virtual meetings (teleconferences) may be held to consolidate the information.

3.7 After approval by GREPECAS, the Regional Offices will forward the joint amendment proposal (PfA) and coordinate with ICAO headquarters for the publication of updates.

3.8 In this sense, the following proposal for a GREPECAS Conclusion is formulated:

<b>DRAFT CONCLUSION GREPECAS/21/XX</b>		<b>Update of the information of Part III (CNS) of Volume II of the Air Navigation Plan CAR/SAM</b>	
<b>What:</b> That the CAR/SAM States/Territories:		<b>Expected impact:</b>	
<ul style="list-style-type: none"> <li>a) in coordination with the NACC and SAM Regional Offices, update the information in Part III (CNS) of Volume II of the NPA CAR/SAM;</li> <li>b) assign ANP Focal Points to coordinate with Regional Offices; and</li> <li>c) adopt a new file format for CNS tables;</li> </ul>		<input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Interregional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Technical/Operational	
<b>Why:</b> To ensure that Part III (CNS) of Volume II of the ANP CAR/SAM is duly updated and published, so as to ensure the preparation and implementation of Volume III of the Plan on an adequate basis.			
<b>When:</b> April 2024		<b>Status:</b> <input checked="" type="checkbox"/> Valid / <input type="checkbox"/> Not valid / <input type="checkbox"/> Finalized	
<b>Who:</b> <input checked="" type="checkbox"/> CAR/SAM States/Territories <input checked="" type="checkbox"/> ICAO NACC and SAM <input checked="" type="checkbox"/> Other: COCESNA			

#### 4. Suggested actions

4.1 States/Organizations are invited to:

- a) note the information presented in this working paper;
- b) consider the proposed revision and updating of Part III of Volume II of the ANP CAR/SAM;
- c) discuss the draft GREPECAS Conclusion of item 3.8; and
- d) discuss any other related matter that the Meeting deems necessary.

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## APPENDIX

## CAR/SAM ANP, VOLUME II

## PART III – COMMUNICATIONS, NAVIGATION AND SURVEILLANCE (CNS)

## 1. INTRODUCTION

1.1 This part of the Caribbean and South American ANP, Volume II, complements the provisions in ICAO SARPs and PANS 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(s) concerned to implement the requirement(s) specified.

## 2. GENERAL REGIONAL REQUIREMENT

**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), where applicable yet;
- d) the air traffic services (ATS) message handling services (AMHS); and
- e) 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 components of the Message Service are listed in the AMHS/AFTN Plan in **Table CNS II-1**.

*The Aeronautical Telecommunication Network (ATN)*

2.5 The ATN should be able to support:

- a) applications carried by the existing networks;
- b) gateways enabling inter-operation with existing networks; and

c) 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 other means 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.

#### *Network services*

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

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 Caribbean and South American Regions 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-2**.

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. The required AIDC plan is detailed under **Table CNS II-3**.

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 Caribbean and South American Regions 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 Caribbean and South American Regions 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 Performance -Based Communications and Surveillance (PBCS) Manual* (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 CAR and SAM PBN Regional Roadmap/Plans 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 Caribbean and South American Regions.

#### *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**

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

2.41 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.

### ***Frequency Management***

#### *Aeronautical Mobile Service (AMS)*

2.42 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 or 8.33 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.

2.43 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.

2.44 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.

2.45 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.

2.46 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)*

2.47 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.

2.48 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.

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

2.49 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

#### *Network services*

3.1 In the Caribbean and South American Regions, for the implementation of the IP ATN the States and Regional IPv4 addresses are defined in **Table CNS II-5**. The IPv6 addresses shall be defined later.

#### *VHF AMS Communications*

3.2 In the planning of the Aeronautical Mobile Service the Caribbean and South American Regions, the following should be taken into account:

- a) the Aeronautical Mobile Service and AMSS Plan is presented in **Table CNS II-6**;
- b) the progressive cost-benefit implementation of air-ground data link communications in the Caribbean and South American regions;
- c) communications data links, when implemented, should be used for routine air-ground communications;
- d) voice communications capability should be maintained for emergency purposes at the ATM units; and
- e) VHF communications, supported by extended range facilities where required, should be used to cover ATS routes to the maximum extent possible.

#### *Navigation*

3.3 To permit the transition to PBN, the ground navaids infrastructure to be implemented and later analysed for removal once users are equipped appropriately to attain a performance level equivalent to PBN is defined in **Table CNS II-7**.

#### *Surveillance*

3.4 The surveillance systems to be used in the Caribbean and South American Region(s) are:

- a) Secondary Surveillance Radars (SSR) Mode A, C and S in terminal and en-route continental airspace;
- b) Primary Surveillance Radars (PSR) mainly in terminal airspace;
- c) Automatic Dependent Surveillance – Broadcast (ADS-B) and Multilateration (MLAT) in terminal areas;
- d) ADS-B and Wide Area Multilateration (WAM) in most of the airspace;
- e) Automatic Dependent Surveillance – Contract (ADS-C) in some parts of the oceanic and remote continental airspace.

3.5 Surveillance data exchange is to be considered and the ASTERIX is to be used as the standard format for this exchange. The ASTERIX SAC Code Assignment Plan to the Caribbean and South American Regions is to be applied as shown in **Table CNS II-8**. The required Surveillance Systems applicable for the Caribbean and South American Regions are listed in **Table CNS II-9**.

#### *Frequency Management*

3.6 For VHF frequency allocations for ATS functions in the Caribbean and South American regions, Caribbean and South American States, to the extent possible, should use for VHF frequency assignments the geographical criteria outlined in **Table CNS II-CARSAM-6** and select frequencies from the VHF sub-bands indicated in **Table CNS II-CARSAM-7** for their AM(R)S allocations.

3.7 VHF frequency channels assignment for planned and operational air-to-ground communications should be managed by the CAR/SAM States, in coordination with the ICAO Regional Offices, using the application Frequency Finder, available at the following link: <https://www.icao.int/safety/FSMP/Pages/Documents.aspx?RootFolder=%2Fsafety%2FFSMP%2FDocuments%2FFrequencyFinder&FolderCTID=0x012000B1461A5DA8C64241AA4DE4F91CB1D9AF&View=%7BE11C4C29%2DDD83%2D4B87%2DAAAE%2D2330E3DE14D8%7D>.

— END —