

INTERNATIONAL CIVIL AVIATION ORGANIZATION
FOURTH MEETING OF DIRECTORS OF CIVIL AVIATION OF THE
CENTRAL CARIBBEAN

(Grand Cayman, Cayman Islands, 17-20 May 2000)

Agenda Item 2: Results of the CAR/SAM/3 RAN Meeting

RESULTS OF CNS ITEMS IN THE CAR/SAM/3 RAN MEETING

(Presented by the Secretariat)

Summary

This working paper presents to the Meeting the Third CAR/SAM Regional Air Navigation Meeting (CAR/SAM/3 RAN) results in respect of Communications, Navigation and Surveillance (CNS).

Reference: Preliminary Report of the CAR/SAM/3 RAN Meeting, Buenos Aires, October 1999

1. Introduction

1.1 The Third CAR/SAM Regional Air Navigation Meeting (CAR/SAM/3 RAN), held in Buenos Aires, Argentina from 5 to 15 October 1999 dealt in the CNS Committee, matters related with Communications, Navigation and Surveillance (CNS) under Agenda Items 9, 10 and 11. Also, the Implementation Working Group, under Agenda Item 13, dealt with some matters related to CNS Systems.

1.2 In accordance with the new format adopted by the CAR/SAM/3 RAN Meeting the results of the CNS matters are contained in two volumes: Volume I – CAR/SAM Air Navigation Plan (ANP) - Basic ANP; and Volume II – CAR/SAM Facilities and Services Implementation Document (FASID).

2. Discussion

2.1 The CAR/SAM/3 RAN Meeting discussed and approved CNS matters dealt by the CNS Committee, and by the Implementation Working Group. Those items are contained in the Report of this Meeting and mainly are:

A. COMMUNICATIONS

1. Aeronautical Fixed Service

- a) Application of modern digital communications techniques to upgrade the conventional AFS and to facilitate the introduction of the ATN
- b) AFTN Plan
 - Structure of the CAR/SAM AFTN Plan
 - Application of bit-oriented data link control procedures
 - Operational characteristics for the Main AFTN/COM Centres
 - AFTN traffic statistics
 - Operational availability of AFTN circuits
 - CAR/SAM AFTN message routing
- c) ATS speech circuits plan
 - Structure of the ATS speech circuits plan
 - Upgrading of the current ATS voice switched networks
 - Planning and technical principles for ATS speech switched networks
- d) Misuse of aeronautical mobile (route) service (AM(R)S) frequencies for the purpose of the AFS
- e) ATN
- f) WAFS telecommunication support

2. Aeronautical Mobile Service (AM(R)S)

- a) ITU WRC-2000
- b) Harmful interference to radio frequency bands allocated to aeronautical services
- c) AM(R)S planning principles
- d) Aeronautical Operational Control voice communications
- e) CAR/SAM AM(R)S Plan
- f) VHF frequency spectrum utilization
- g) ATIS/D-ATIS/OFIS/VOLMET
- h) Interpilot air-to-air communication channel
- i) Review of relevant recommendations and conclusions of the previous meetings

B. AERONAUTICAL RADIO NAVIGATION SERVICES

- a) Infrastructure and evaluation of radio navigation systems
- b) Aeronautical radio navigation aids plan
- c) Flight testing of radio navigation aids
- d) Radio frequency spectrum and interference issues
- e) review of the recommendations and conclusions of previous RAN meetings

C. SURVEILLANCE SERVICES

- a) Primary surveillance radar (PSR) and Secondary surveillance radar (SSR) systems
- b) Automatic dependent surveillance (ADS)
- c) Aeronautical surveillance plan
- d) 24-bit aircraft addresses assignment

2.2 In the **Attachment** to this working paper the text of the CNS Conclusions and Recommendations adopted by the CAR/SAM/3 RAN Meeting is presented.

3. Suggested actions

3.1 The Meeting is invited to take into account the information presented in this working paper and adopt the corresponding actions so that each State (or groups of States) and International Organizations in the Central Caribbean:

- a) implement the relevant conclusions and recommendations of the CAR/SAM/3 RAN Meeting;
- b) review the corresponding parts of the approved Basic ANP and FASID and in order to keep them updated, present to the ICAO Regional Office the necessary proposals for amendments, additions and deletions; and
- c) implement, so as to achieve the international requirements established in the CAR/SAM Regions Basic ANP and FASID, the necessary measures for improving the efficiency and safety of air navigation in the Central Caribbean Region.

ATTACHMENT

**CNS CONCLUSIONES Y RECOMENDACIONES ADOPTED BY THE
CAR/SAM/3 RAN MEETING**

Recommendation 9/1 – Implementation of digital networks to improve the current AFS and to facilitate the introduction of the ATN

That:

- a) in order to meet, in a reliable and cost-effective manner, current and future AFS requirements for voice/data communications and to facilitate the introduction of ATN, States in CAR/SAM Regions make an effort to proceed with the process of implementing modern digital communication networks in a coordinated manner;
- b) In order to facilitate the above, GREPECAS develop, as a matter of urgency and before the forthcoming GREPECAS meeting, criteria and guidelines necessary for establishing, as far as feasible, inter-networking between various available and emerging digital networks, while meeting aeronautical operational requirements; and
- d) ICAO provide, as necessary, appropriate technical cooperation mechanism(s) for a) and b) above.

Recommendation 9/2 – Revised AFTN Plan for the CAR/SAM Regions

That Table CNS 1A and Chart CNS 1 constitute the new AFTN Plan for the CAR/SAM Regions and be included in the FASID as shown in Appendix 9-B.

Recommendation 9/3 – Application of X.25 protocol for communications between AFTN COM Centres

That, in order to ensure data integrity and to improve data transmission rate, States in the CAR/SAM Regions expedite the implementation of X.25 protocol for communication between AFTN COM Centres based on provisions contained in Annex 10, Volume III and the appropriate Regional Interface Control Document (ICD).

Recommendation 9/4 – Operational characteristics for Main AFTN COM Centres

That States responsible for the operation of Main AFTN COM Centres ensure that those facilities satisfy operational characteristics presented in Appendix 9-A, Part IV, paragraph 2.2.4.

Recommendation 9/5 – Monitoring of AFTN traffic

That States use the guidance material presented as Appendix 9-A, Part IV, Section 2.2.5 to:

- a) monitor AFTN traffic;
- b) maintain occupancy factor of AFTN circuits below 0.4; and
- c) prepare monthly AFTN traffic statistics.

Conclusion 9/6 – Operational availability of AFTN circuits

That States in the CAR/SAM Regions:

- a) be urged to take the necessary measures to ensure that end-to-end monthly operational availability of AFTN circuits does not fall below 98 per cent and, therefore, reliability and efficiency requirements for the provision of communication services to AIS, ATS, MET and SAR are met; and
- b) provide alternative measures to route AFTN traffic during circuit outages.

Recommendation 9/7 – Revised ATS speech circuits plan for the CAR/SAM Regions

That Table CNS 1C and Chart CNS 3 constitute the new ATS Speech Circuits Plan for the CAR/SAM Regions and be included in the FASID as shown in Appendix 9-B.

Conclusion 9/8 – Holding of a special informal meeting

That ICAO, in coordination with Colombia, Jamaica, Netherlands Antilles, Panama and COCESNA, organize a meeting to consider the advantages of implementing in Panama, Kingston, Curaçao and COCESNA, VSAT nodes of the Colombian digital network in order to meet AFS communication requirements.

Recommendation 9/9 – SARPs and guidance material on modern voice switching and signalling systems

That, in order to facilitate the application of modern technology in the planning and implementation of ATS voice circuits and networks, ICAO should make all efforts to expedite the process of developing and/or updating relevant SARPs and guidance material.

Conclusion 9/10 – ATS voice networks

That GREPECAS, based on the ICAO SARPs and guidance material on analogue and digital ATS voice networks, carry out the necessary studies to evaluate the application of digital voice switching and signalling systems in upgrading facilities shown in the CAR/SAM ATS Speech Circuits Plan.

Recommendation 9/11 – Planning and technical principles to be applied for ATS voice circuits networks

That States, for the planning, implementation and operation of ATS voice circuits networks, follow the set of planning and technical principles shown in Appendix 9-A, Part IV, paragraph 2.2.9.

Recommendation 9/12 – Misuse of AM(R)S frequencies

That States be urged to eliminate the use of AM(R)S frequencies for point-to-point communications by:

- a) implementing reliable circuits according to the ATS Speech Circuits Plan; and
- b) pending a) above, or during circuit outages, using IDD services as an alternative means of communication for AFS purposes with due regard to Annex 11 requirements.

Recommendation 9/13 – Initial plan for the ground portion of the ATN in the CAR/SAM Regions

That Table CNS 1B and Chart CNS 2 constitute the initial plan for the ground portion of the ATN in the CAR/SAM Regions and be included in the FASID as shown in Appendix 9-B.

Recommendation 9/14 – Telecommunication support for the WAFS in the CAR/SAM Regions

That the material corresponding to the WAFS telecommunication support in the CAR/SAM Regions be included in the Basic ANP and the FASID as shown in Appendix 9-A, Part IV, paragraph 2.2.11 and Appendix 9-B, Chart CNS 4, respectively.

Recommendation 9/15 – Support by States to the ICAO position for the ITU WRC-2000

That States, in their preparation for the ITU WRC-2000:

- a) work closely with ICAO in preparing their proposals and include the material contained in the ICAO position for that conference;
- b) coordinate with the corresponding State's telecommunication authority in order to obtain support for aviation requirements; and
- c) include representation from the civil aviation administration in their delegation to the WRC_2000.

Recommendation 9/16 – Support for ICAO during the ITU WRC-2000

That ICAO, in preparation for the ITU WRC-2000:

- a) arrange for the required support and facilities to be provided at the conference to enable coordination between aviation experts and delegations; and
- b) ensure adequate participation of the Secretariat personnel in the conference in order to present the ICAO position and to carry out the necessary coordination work.

Conclusion 9/17 - Elimination of interference on AMS frequencies

That States:

- a) develop, in coordination with frequency spectrum management authorities and considering relevant ITU procedures, suitable mechanisms for detection and elimination of unauthorized transmission of causing interference to the aeronautical service;
- b) in cases where the application of relevant ITU procedures and the mechanism mentioned in a) above prove ineffective, notify the appropriate ICAO Regional Office for further coordination, utilizing the form in Attachment D of Appendix 9-A; and
- c) report to ICAO and to ITU all cases of serious and persistent harmful interference to aeronautical services.

Conclusion 9/18 – Measures to reduce harmful interference from VHF broadcast services

That States:

- a) take action to develop with the appropriate national bodies, and assist in the development by the appropriate ITU bodies, technical criteria to avoid harmful interference to the aeronautical services operating in the frequency band 108-137 MHz from broadcast services operating in the adjacent frequency band 100-108 MHz; and
- b) establish national regulations to protect aeronautical communication and radio navigation services operating in the VHF bands from harmful interference emanating from broadcast services in adjacent VHF bands.

Recommendation 9/19 - AM(R)S planning principles

That the principles outlined in Attachment E of Appendix 9-A be considered for the planning of the AM(R)S in the CAR/SAM Regions.

Conclusion 9/20 - Aeronautical operational control (AOC) voice communications

That for aeronautical operational control purposes:

- a) when an aircraft in flight is within the coverage of an appropriate VHF aeronautical station, channels from the relevant VHF sub-band be used;
- b) where communications cannot be established in accordance with a) and the flight lies wholly within an RDARA, an assigned HF frequency from the relevant RDARA allocation be used; and
- c) if the flight extends beyond RDARA limits and communications cannot be established in accordance with b) above, an appropriate worldwide HF frequency be used.

Recommendation 9/21 – AM(R)S Plan

That Tables CNS 2A, CNS 2B and Chart CNS 5, constitute the new aeronautical mobile (R) service for the CAR/SAM Regions and be included in the FASID as shown in Appendix 9-B.

Recommendation 9/22 – Geographical separation criteria for VHF air-ground communications

That geographical separation criteria shown in Attachment F of Appendix 9-A be used for international VHF frequency assignment in the CAR/SAM Regions.

Recommendation 9/23 – VHF frequency allocations for ATS Functions in the CAR/SAM Regions

That CAR/SAM States, to the extent possible, select frequencies from the VHF sub-bands indicated in Appendix 9-A, Part IV, Section 2.3.6 for their AM(R)S allocations.

Recommendation 9/24 – Channel spacing plan for assignable VHF air-ground communications

That States in the CAR/SAM Regions complete their transition to the new 25 KHz VHF channel spacing environment by the end of the year 2000.

Conclusion 9/25 - Maintenance of ICAO COM List 3 – “Frequency Assignments in the Band 117.975 - 137.000 kHz”

That States:

- a) in order to support the frequency management functions of the ICAO Regional Offices (including the publication of the COM List No. 3), expeditiously notify the appropriate ICAO Regional Office of any changes to their VHF AM(R)S frequency assignments; and
- b) release any assigned VHF AM(R)S frequency which is not intended for operational use in the near future and notify the appropriate ICAO Regional Office accordingly.

Conclusion 9/26 - Provision of ATIS, D-ATIS, OFIS, and VOLMET broadcasts in the VHF aeronautical bands

That States:

- a) use the sub-bands 127.600 _ 127.900 MHz / 132.050 - 132.950 MHz or available VOR frequencies for the provision of automatic terminal information service (ATIS), operational flight information service (OFIS), and meteorological broadcast (VOLMET); and
- b) provide data link-automatic terminal information service (D-ATIS) in support of ATM automation and as part of the implementation of VHF digital links.

Conclusion 10/1 – Planning principles for radio navigation aids

That States, in planning the implementation of radio navigation services, consider the principles shown in Attachment A of Appendix 10-A.

Recommendation 10/2 – Aeronautical Radio Navigation Aids Plan

That table CNS 3 constitute the Aeronautical Radio Navigation Aids Plan for the CAR/SAM Regions and be included in the FASID as shown in Appendix 10-B

Conclusion 10/3 – Maintenance of ICAO COM List No. 1 “List of Facilities Operating on Frequencies in the LF/MF Band (190 - 1750 kHz)” and ICAO COM List No. 2 “Record of VHF Frequencies Assignments to Caribbean and South American VOR and ILS Radio Navigation Aids”.

That States:

- a) in order to support the frequency management functions of the ICAO Regional Offices (including the publication of the COM Lists Nos. 1 and 2), notify the relevant Regional Office of all changes to their frequency assignments; and
- b) release any assigned frequency which is not included in firm plans for operational use in the near future and notify accordingly the relevant ICAO Regional Office.

Recommendation 10/4 – Flight testing of radio navigation aids

That States:

- a) make every effort to maintain their radio navigation aids operational at all times;
- b) perform flight test of navigation aids periodically in accordance with Annex 10 requirements and at intervals indicated in ICAO Doc 8071; and
- c) be encouraged to establish bilateral and/or multilateral agreements on sharing of flight test capabilities.

Recommendation 10/5 – Revision of Doc 8071 – Manual on Testing of Radio Navigation Aids

That ICAO expedite the revision and publication of the Manual on Testing of Radio Navigation Aids (Doc 8071).

Recommendation 10/6 – Termination of the use of the band 1 559 - 1 610 MHz (allocated to the RNSS) by fixed services

That, considering the incompatibility of sharing of the band 1 559 - 1 610 MHz allocated to the RNSS with the fixed services, States coordinate with the corresponding national frequency management authority in order to:

- a) determine if any fixed service stations operate in the band 1 559 - 1 610 MHz and, if so, either cease their operation or relocate them to other fixed-service bands before GNSS_based operations are approved; and
- b) establish plans to avoid any future implementation of fixed service stations to operate in the band 1 559 - 1610 MHz.

Recommendation 11/1 – Planning and implementation of surveillance radar systems

That:

- a) GREPECAS refine and complete the regional guidelines on surveillance radars; and
- b) CAR/SAM States, during the planning and implementation of new surveillance radar systems, or in improving existing facilities, consider the guidelines mentioned in a) above.

Recommendation 11/2 – Planning and implementation of ADS

That:

- a) GREPECAS refine and complete the regional ADS guidelines; and
- b) CAR/SAM States, in coordination with airspace users, consider the implementation of ADS for providing surveillance in areas in which the provision of radar is not feasible or economical.

Recommendation 11/3 – CAR/SAM Aeronautical Surveillance Plan

That:

- a) Table CNS 4A constitute the initial Aeronautical Surveillance Plan for the CAR/SAM Regions and be included in the FASID as shown in Appendix 11-B and;
- b) GREPECAS refine and complete the Aeronautical Surveillance Plan in conformance with the CAR/SAM CNS/ATM Plan.

Recommendation 11/4 – Further studies on the sharing of radar information in the CAR/SAM Region

That GREPECAS:

- a) review the CAR/SAM Aeronautical Surveillance Plan and identify the ATS units that could obtain significant operational and economical benefits through the sharing of their radar data; and
- b) consider a common radar data format and a common communication protocol for radar data exchange in the CAR/SAM Regions.

Recommendation 11/5 – Sharing of radar data

That, in order to facilitate the implementation of surveillance radar service in a safe, efficient and cost-beneficial manner, CAR/SAM States consider:

- a) the possibility of bilateral/multilateral arrangements for sharing of radar data between the ATC centres in neighbouring States; and
- b) use of a common radar data format and a common communication protocol for radar data exchange in the CAR/SAM Regions to be adopted by GREPECAS.

Conclusion 11/6 – Application of procedures for 24-bit aircraft address assignment

That those CAR/SAM States which have not already done so establish, as a matter of urgency, application of the ICAO procedures for the assignment of 24-bit aircraft addresses.

**Conclusion 13/24 Study of possible enhancements of to the final
CNS/ATM configuration**

That GREPECAS continue to study possible contributions that could enhance the final configuration of CNS/ATM systems.

Conclusion 13/28 AFS implementation meeting

That, the regional offices coordinate the conduct of an implementation meeting between Colombia, Curaçao, Jamaica, Panama, Trinidad and Tobago, Venezuela and COCESNA to deal with AFS problems, to be carried out in the last quarter of 1999 or early in the year 2000.

**Conclusion 13/29 CAR/SAM communications implementation informal
meeting**

That the ICAO Regional Offices organize during the year 2000 an informal communications meeting to review and spell out the operational requirements and necessities, study the existing infrastructure and propose alternative for the interconnection of the present and emerging network, ensuring appropriate reliability and availability to provide air navigation services.

Recommendation 13/30 SIP on digital networks interoperability and integration

That ICAO urgently consider the possibility of establishing a SIP to study and propose solutions aimed at the interoperability of the existing networks and to establish technical guidelines and economic viability for the integration of the national, subregional, regional and interregional networks.