INTERNATIONAL CIVIL AVIATION ORGANIZATION

CAR/SAM 01/01 INFORMAL MEETING
(Bogotá, 9 to 11 October 2001)

Agenda Item 2: **Status of implementation of CAR/SAM digital networks and their interconnection**

PROGRESS ACHIEVED IN THE IMPLEMENTATION OF DIGITAL NETWORKS AND THEIR INTERCONNECTION

(Presented by the Secretariat)

Summary

This working paper presents information on the status of implementation of the digital networks implemented or being implemented in the CAR/SAM regions, with particular attention to the area of coverage of the meeting and the perspectives of their interconnection. Likewise implementation of the Conclusion 9/8 formulated by the CAR/SAM/3 RAN Meeting is also analized.

References:

- CAR/SAM/3 RAN Meeting report, Doc. 9749;
- CAR/SAM Air Navigaiton Plan (FASID);
- Summary of Discussions and Conclusions of the CAR/SAM 01/00-CNS Informal Meeting;
- GREPECAS/9 Meeting report; and
- Reports of REDDIG mechanism and MEVA Management Group.

1. Background

1.1 The subject of development of digital networks has been dealt with since States/International Organizations required modern technology and more reliable and efficient means for a cost/effective use of aeronautical communications. In addition, there was the need to establish, due to the CNS/ATM systems concept, appropriate, reliable and efficient means for the exchange of digital data through bit-oriented procedures. These clearly defined items for the aeronautical fixed service lead to the development of digital network projects to satisfy voice and data requirements, as well as, in some cases, to plan the capacity for other applications, such as synthetic video transmission for Secondary Surveillance Radar (SSR) data exchange. Some of these digital networks are mentioned in the plans considered in the CAR/SAM FASID.

2. Status of implementation of digital networks

2.1 In the area of coverage of the meeting, many digital networks with a variety of capacities and different institutional agreements have already been developed or are in the implementation process. Following is a list of regional/inter-regional networks with a short description of their characteristics.

MEVA A SCPC/DAMA/PAMA VSAT network using the PAS-5 satellite, establishing physical point-to-point connections among its users for voice and data. DAMA access is used for voice switching functions. It also has PAMA access for voice non-switching circuits and for data circuits. Its users are mainly located in the Central Caribbean. MEVA is currently being re-configurated and it is probable that it would adopt an open architecture.

E-CAR ATN compatible terrestrial optic fibre ISDN open network. The E-CAR users are mainly located in the Eastern Caribbean and has one node in the SAM region (Caracas), which will facilitate its interconnection with the REDDIG.

REDDIG A multisystem/multiprotocol open system design for voice, data and video communications, ATN compatible, based on Frame Relay and will use as main physical media VSAT technology with TDMA access method and ISDN terrestrial backup. Its users will be all SAM States, with the exception of Panama. It is expected to be implemented by 2002.

CAMSAT ATN compatible Frame Relay VSAT network for voice and data. Its users are located in Central America. It uses Intelsat 805 satellite.

2.2 Moreover, Colombia operates a SCPC/DAMA/PAMA network using INTELSAT 805 satellite, to which the CAR/SAM/3 RAN meeting has recommended it be expanded to improve voice/data communications with Panama, Kingston and Netherlands Antilles (Conclusion 9/8).

3. Analysis of the implementation of Conclusion 9/8

3.1 The CAR/SAM 01/01-CNS Informal Meeting was convened to consider the implementation of the Conclusion 9/8 formulated by the CAR/SAM/3 RAN Meeting, which is transcribed below for the reference of the meeting:

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.

3.2 In this regard, it should be noted that the CAR/SAM 01/00-CNS Informal Meeting discussed this matter and Colombia, supported by a Power Point presentation, presented a proposal to implement the CAR/SAM/3 RAN Meeting Conclusion 9/8 (WP/7). The mentioned WP/7, proposed the installation of VSAT nodes at Panama ACC, COCESNA ACC, Kingston ACC and Curacao ACC. The communication channels between the above mentioned ATS Units with Colombia were considered to be implemented as part of a 64 Kbps IBS circuit to be leased by the corresponding aeronautical authorities. Costs of the equipment node and the corresponding commissioning were also submitted at that opportunity.

3.2.1 The CAR/SAM 01/00-CNS Informal Meeting studied the Colombian proposal, which was analyzed together with other proposals to interconnect the digital networks in the CAR/SAM regions boundaries. After a detailed discussion, it was concluded (Conclusion 1/1) that the identified alternatives and options should be completed showing cost-benefits studies for a future consideration by a second Informal Meeting to be convened for the same purpose. This second CAR/SAM Informal Meeting, on digital networks interconnection, has not yet been convened and it is expected that the CAR/SAM 01/01-CNS Informal Meeting may study and give due consideration to the proposal of Colombia concerning the Colombian VSAT digital network in the framework of the above mentioned CAR/SAM/3 Conclusion 9/8.

3.2.1.1 From the time of the CAR/SAM 01/00-CNS Informal Meeting, some events have occurred that could support CAR/SAM/3 Conclusion 9/8. In this regard, the concrete proposal for the implementation of the nodes of the Colombian VSAT network are being presented under Agenda Item 3 for this meeting. From the technical point of the Secretariat, the implementation of CAR/SAM/3 Conclusion 9/8 will allow that all communication requirements (voice and/or data) recommended in the FASID and to be implemented by Panama, Jamaica, Curacao and COCESNA with Colombia be met. Likewise, it should be noted also:

a) due to the operation of a node of the Colombian VSAT network at Guayaquil, the corresponding voice circuit Guayaquil ACC-CENAMER ACC could be implemented;

b) the digital circuit for the SBAS augmentation test between the TRS reference station to be implemented by COCESNA and the Brazilian TMS master station could be implemented through the Colombian network or other networks and the REDDIG; and

c) the Colombian VSAT network could be a back-up system for the current MEVA architecture in relation to the communication requirements of Panama, CENAMER, Jamaica and Curacao.

4. Interconnection of the Digital Networks

4.1 From the regional point of view, there are three digital networks (E/CAR, MEVA and REDDIG) required to be interconnected. In this regard, it should be noted that the current status in this regard is as follows:

1) **E/CAR with REDDIG.** This interconnection is being planned and the E/CAR Nodes of San Juan and Piarco were identified to be interconnected with the E/CAR node to be implemented in Caracas.

2) **E/CAR with MEVA.** It is understood that both networks are interconnected in the respective nodes implemented in Miami and San Juan.

3) **MEVA with REDDIG.** This is the most challenging interconnection and should be made in a reliable, effective and efficient way. Initial plans are outlined and guidance material has already been developed by GREPECAS mechanism to use terrestrial links. However, it is expected that MEVA would be restructured in such a way that the same technology of the REDDIG satellite segment would be adopted. In this case, if both networks use the same satellite and the networks synchronization systems are integrated with geographic redundancy, a seamless network environment could be created. Plans on the last idea should be further developed by the MEVA Technical Management Group and the REDDIG States.

5. Action suggested

5.1 The meeting is invited to consider the information provided in this working paper in order to examine the status of implementation of the CAR/SAM digital networks and its interconnection.

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