



Agenda Item 2: Review of Air Navigation Matters
2.2 Air Navigation specific activities:
2.2.2 Communications, Navigation and Surveillance (CNS)

**CURRENT STATUS OF DIGITAL NETWORKS IN THE CAR REGION
AND MEVA II / REDDIG INTERCONNECTION**

(Presented by the Secretariat)

SUMMARY	
This paper presents the status and activities carried out by the VSAT networks in the CAR Region, and the follow-up of implementation of the interconnection of the MEVA II and the REDDIG VSAT Networks.	
References: • Final Report of the E/CAR/DCA/21 Meeting (Tortola, British Virgin Islands, February 2008) • Final Report of the NACC/WG/2 Meeting (Ocho Rios, Jamaica, May 2008) • Final Report of the GREPECAS/15 Meeting (Rio de Janeiro, Brazil, October 2008) • Final Report of the MEVA TMG/20 Meeting (Mexico City, June 2009) • Final Report of the MR/7 Meeting (Mexico City, June 2009)	
Strategic Objectives	<i>This working paper is related to Strategic Objectives A and D.</i>

1. Introduction

1.1 Digital communication networks based on very small aperture terminal (VSAT) are being used in the provision of aeronautical ground-ground communications in areas where terrestrial communication systems are unavailable, unreliable or uneconomical. VSAT networks are generally flexible, scalable, versatile, easy to implement/operate and cost-effective in certain areas, terrains or conditions.

1.2 A wide variety of often incompatible architectures, configurations, access techniques, management, operation schemes and protocols are used in different VSAT networks. Moreover, almost all VSAT networks available in the market employ some proprietary products. As a result, in general, non-identical VSAT networks are not interoperable.

1.3 ICAO has promoted ALLPIRG Conclusion 5/16 – *Implementation of very small aperture terminals (VSATs)* that urges the PIRGs to discourage the proliferation of VSAT networks where one/some of the existing ones can be expanded to serve the new areas of interest, work towards integrated regional/interregional digital communication networks with a single (centralized) operational control and preferably based on the Internet Protocol (IP) and give due consideration to managed network services (e.g. a virtual private network [VPN]), subject to availability and cost-effectiveness, and has set the VSAT networks performance guidelines to manage the end-to-end performance of digital communication networks, irrespective of the technologies and protocols utilized. The ALLPIRG Conclusion 5/16 is available on the ICAO NACC Regional Office Website under the CNS e-Document section (http://www.mexico.icao.int/CNS_references.html).

2. Digital Networks in the CAR Region

MEVA Network

2.1 The MEVA network is a VSAT network that has been in operation since 1996, improving the quality and effectiveness of the telecommunication services for the Central Caribbean subregion members. By 2006, the network was upgraded to meet new CNS/ATM services and the integration of the current VSAT telecommunication networks.

2.2 Based on the assessment of the performance and operation of the MEVA Network after the first years of its upgrade, conducted by the MEVA II member administrations, the results achieved were found highly satisfactory during the Twentieth MEVA II Technical Management Group Meeting (MEVA TMG/20) held from 8 to 9 June 2009. An increase on the use of the network bandwidth was identified and several actions were agreed for the implementation of the Contingency Plan; the MEVA II website (www.mevaii.net), action plans for equipment upgrade, plan for the satellite transition from IS 1R to IS-14, assessment/preparation for new services such as radar data sharing and the implementation of AMHS; and progress in the interconnectivity activities of the MEVA II/REDDIG networks.

2.3 The MEVA Network is a time division multiple access (TDMA) satellite-based frame relay network, equipped with MEMOTEC Switch equipment, uses satellite IS 1R in C band and vertical linear polarization. MEVA II nodes are in Aruba, Curaçao, Jamaica, Grand Cayman, Puerto Rico, Dominican Republic, Haiti, Honduras, Panama, Freeport and Nassau in the Bahamas, Miami, and Cuba.

CAMSAT Network

2.4 The VSAT network that operates for the six Central American countries and members of COCESNA is known as the CAMSAT Network. It currently has 16 operating stations with aeronautical voice and data communications, administrative communications and an Intranet service (WAN). The CAMSAT network became operable in 2002 as a result of the need to modernize the digital ground OKI network as well as to develop new sites whose ground implementation (microwave) was highly onerous, and to comply with the new provisions of the Regulatory Entities of the Central American radiofrequency spectrum.

2.5 The CAMSAT network is based on Frame Relay technology and the central part of the system is formed by MEMOTEC's model CX1000e switch equipment.

Other VSAT networks

2.6 Other VSAT networks currently operating in the CAR region have a domestic coverage, such as the Mexican VSAT network and some VSAT stations of the Colombian network.

2.7 **Appendix A** to this paper presents a general overview of the VSAT Networks operating in the CAR Region.

E/CAR Digital Network

2.8 The backbone of the present E/CAR terrestrial network, a 256Kbps circuit, forms a triangle encompassing the islands of Trinidad, Barbados and Antigua which function as hubs. This configuration provides seamless alternate routing of circuits in the event of a major backbone link failure between any two hubs. The hubs in Barbados and Antigua provide connectivity to the other islands via 64 Kbps and 128Kbps branch circuits respectively. Redundant connectivity to San Juan is provided by a 128 Kbps circuit from Trinidad and another from Antigua. AFTN data passes through San Juan to the FAA's NADIN network for onward transport to Atlanta. Full redundancy of the equipment at the airports is provided.

2.9 The E/CAR network is configured to handle direct and switched voice circuits, AFTN and RADAR data. Voice circuits are digitally compressed 8 Kbps using LD-CELP protocol. AFTN traffic is carried at 9600 bps using X.25 interface protocol on the NADIN link to Atlanta and 2400 bps, X.25 protocol between the AFTN switch and Eastern Caribbean island end user workstations. The switched voice network provides connectivity among users via bandwidth utilization on demand.

2.10 The network is administered and monitored 24/7 from a Central Network Management Centre located in Port of Spain, Trinidad. **Appendix B** to this paper presents a general overview of the E/CAR network.

2.11 The E/CAR terrestrial Network which has been in service since 1999, has undergone one upgrade since then and is in the process of a second upgrade. NET was sub-contracted to maintain the end user multiplexing equipment with effect from 1st July 2009. The software and partial hardware upgrade is expected to be completed by mid November 2009.

2.12 Notwithstanding the terrestrial E/CAR network upgrade, in order to be technically responsive to support new and evolving digital communications requirements the E/CAR region is reviewing and analyzing the most operationally efficient and cost effective manner to meet its communication goals over the next decade. Under consideration is the option of a VSAT network to replace the terrestrial E/CAR network in the near term.

3. Interconnection/ Integration of the VSAT MEVA II and REDDIG Networks

3.1 To comply with certain ANP requirements in a cost-effective manner, taking into account current and future interoperability communications requirements among the CAR, NAM and SAM regions, the members of the MEVA II and REDDIG VSAT digital networks agreed to integrate/interconnect both networks, for which an Action Plan for the MEVA II / REDDIG Interconnection was prepared. Based on this plan, the interconnection is to be completed in 2009.

3.2 The integration phase for these networks was agreed to be implemented after a five-year period, once the interconnection is operational.

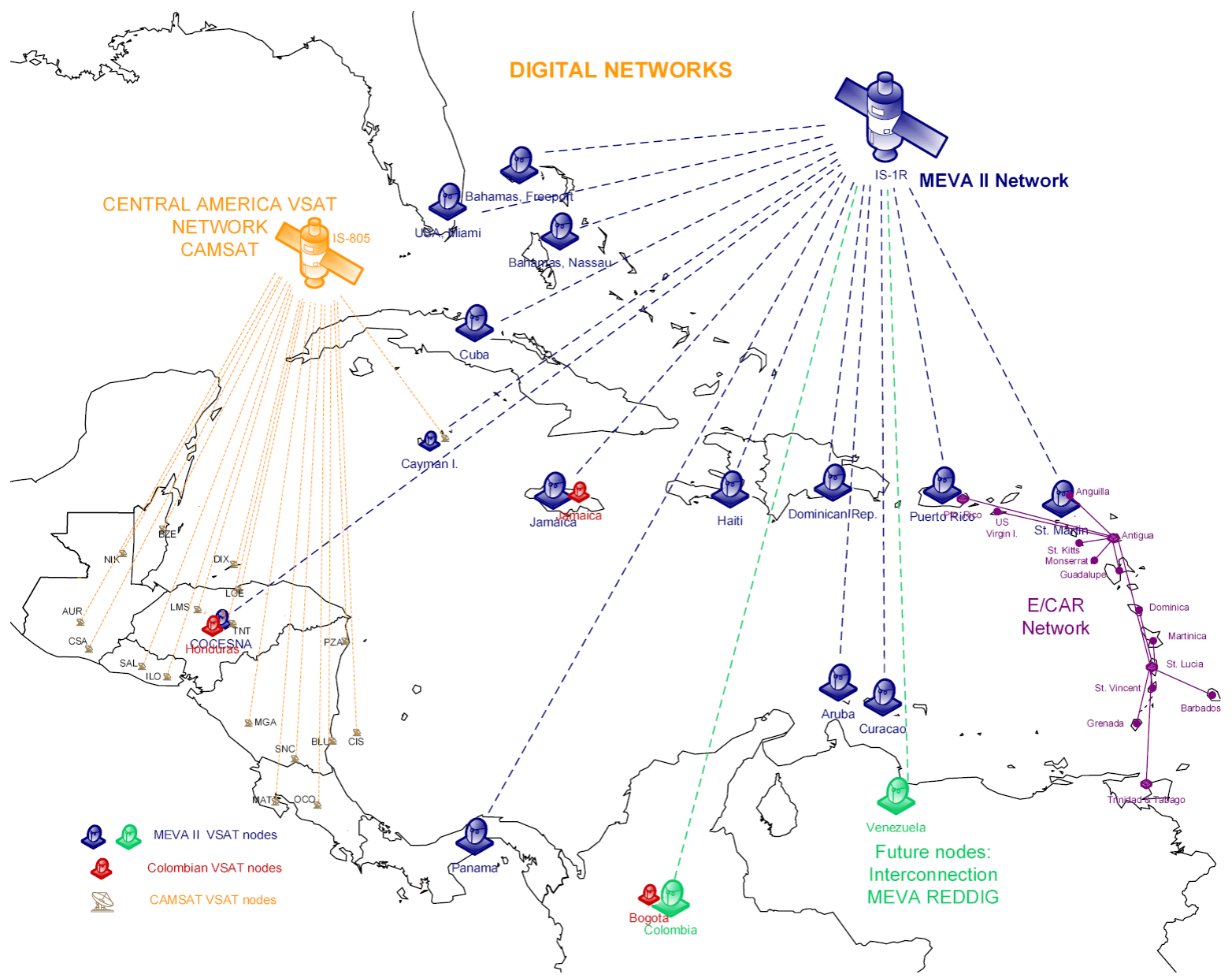
4. Suggested action

4.1 The Meeting is requested to:

- a) take note of the information contained in this working paper;
- b) take into account the availability of the existing VSAT networks for the implementation of services and communications, in case they are technically and economically feasible;
- c) analyze the current status of improvements to the E/CAR Network and define an action plan for resolving deficiencies, including planning of the replacement/renewal of the E/CAR Network; taking into consideration paragraphs 2.8 to 2.12; and
- d) agree to any other actions as deemed appropriate.

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APPENDIX A



Eastern Caribbean Digital Integrated AFS Network

