



FINAL VERSION

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE**

**SPECIAL EASTERN CARIBBEAN COMMUNICATION,
NAVIGATION AND SURVEILLANCE MEETING**

(S-E/CAR CNS)

PORT OF SPAIN, TRINIDAD AND TOBAGO, 20 - 22 OCTOBER 2004

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HISTORICAL

ii.1 Place and Date of the Meeting

The Special E/CAR CNS Meeting (S-E/CAR CNS) was held at the Normandie Hotel, Port of Spain, Trinidad and Tobago, from 20 to 22 October 2004.

ii.2 Opening Ceremony

Mr. Trevor Dowrich, as Coordinator of the Meeting introduced the following officers to the Meeting: Mr. Ramesh Lutchmedial, Director General of Civil Aviation, Mr. Daniel Bhagwansingh, Executive Manager, Air Navigation Services both from Trinidad and Tobago and Mr. Aldo Martinez, Regional Officer CNS from the ICAO NACC Regional Office.

Mr. Aldo Martinez of the ICAO North American, Central American and Caribbean Office, thanked the Trinidad and Tobago Civil Aviation Authority for hosting the Meeting, explained the scope of the Meeting's Agenda and pointed out the need of continuing the efforts towards the development of air navigation systems in the Eastern Caribbean.

Mr. Ramesh Lutchmedial, Director General of Civil Aviation of Trinidad and Tobago welcomed the participants and provided interesting information on the TTCAA, mentioning important issues to be followed up for the development of the air navigation services in the Piarco FIR, and officially opened the Meeting.

ii.3 Organization of the Meeting

The Meeting was chaired by Mr. Trevor Dowrich and Mr. Aldo Martinez CNS Regional Officer from the ICAO NACC Regional Office, acted as Secretary.

ii.4 Working Languages

The working language of the Meeting was English. The papers and the Report of the Meeting were available to participants in English.

ii.5 **Agenda**

The Meeting adopted the following agenda:

Agenda Item 1: **CNS General Matters**

- 1.1 Valid CNS Conclusions/Decisions of previous E/CAR WG and E/CAR DCA Meetings
- 1.2 CNS Deficiencies
- 1.3 Other CNS general matters

Agenda Item 2: **Communication Developments**

- 2.1 Status and interoperability issues of the E/CAR AFS digital network
- 2.3 Development of ground-ground communications
- 2.2 Development of air-ground communication by voice and data links in Piarco FIR
- 2.4 Other communication matters

Agenda Item 3: **Navigation Developments**

- 3.1 GNSS Implementation

Agenda Item 4: **Surveillance Developments**

- 4.1 Surveillance Systems implementation
- 4.2 Radar data sharing among E/CAR States/Territories

Agenda Item 5: **Development of the Technical Infrastructure and Interoperability for ATS/ATM Automated Systems**

Agenda Item 6: **Other business**

- 6.1 Status of the E/CAR Regional ATM/CNS Committee

ii.6 **Schedule and Work Mode**

The Meeting agreed to hold its daily sessions from 09:00 to 15:30 hours, with two breaks. The Meeting also agreed to work as a whole.

ii.7 **Attendance**

The Meeting was attended by 16 E/CAR States/Territories and 6 International Organizations, making a total of 22 delegates as indicated in the list of participants on page iii-1 a iii-5.

ii.8 **Conclusions and Decisions**

The participants to the Special Eastern Caribbean CNS Meeting, recorded its activities as Draft Conclusions and Draft Decisions as follows:

DRAFT CONCLUSIONS: Activities proposing communications and actions to States/Territories/International Organizations to be addressed by E/CAR Directors of Civil Aviation.

DRAFT DECISIONS : Proposed internal activities to be addressed by the Directors of Civil Aviation of the Eastern Caribbean.

LIST OF DRAFT CONCLUSIONS

| No. | TITLE | PAGE NO. |
|------------|--|-----------------|
| 1 | Upgrade of the E/CAR AFS Network on Frame Relay Management System | 2-1 |
| 2 | Improving the Interconnection and Interoperability of the E/CAR AFS Digital Network with neighbouring Networks | 2-3 |
| 3 | Start of the Migration from AFTN to AMHS in the Eastern Caribbean | 2-5 |
| 4 | Study the Feasibility and update the Strategy Plan of Modernization of the voice and Data Circuit between Port of Spain and San Juan | 2-5 |
| 5 | Proposal of Amendment To The ATS Requirements for Speech Circuits Communications in the Table CNS 1C, FASID | 2-6 |
| 6 | Explanation of the Requirements and Operational Advantages of the Data Links in the Eastern Caribbean | 2-8 |
| 7 | E/CAR activities for GNSS implementation | 3-2 |
| 8 | Updated E/CAR Surveillance Plan | 4-1 |
| 9 | Requested information on E/CAR Radar Coverage | 4-3 |
| 12 | Requested Technical Information on Radar Stations | 4-3 |
| 13 | Compliance with the GREPECAS SAGASTERIX Assignment Plan | 4-4 |
| 15 | Requested Letter of Agreement Regarding the Provision of Radar Data to the DACOTA System | 4-4 |
| 16 | Preliminary Guidance on Technical Infrastructure as Support to the Evolutionary Implementation of ATS/ATM Automated Systems | 5-1 |
| 17 | Request to Support the E/CAR CNS activities by the E/CAR DCAS | 6-1 |

LIST OF DRAFT DECISIONS

| No. | TITLE | PAGE NO. |
|------------|--|-----------------|
| 10 | Transfer the Task related to Flight Plan and position reports to E/CAR ATM Committee | 4-3 |
| 11 | Transfer the Task related to Oceanic Surveillance to E/CAR Working Group | 4-3 |
| 14 | Follow up the Progress of the possible Radar Remoting to PIARCO ACC | 4-4 |

ii.9 List of Working and Information Papers

Working Papers

| NUMBER | AGENDA ITEM | TITLE | DATE | PRESENTED BY |
|---------------|--------------------|---|-------------|---------------------|
| WP/01 | 1 | Agenda, Explanatory Notes, Working Method, Organization and Schedule | 23/09/04 | Secretariat |
| WP/02 | 1.1 | Valid CNS Conclusions/Decisions of previous E/CAR WG and E/CAR DCA Meetings | 24/09/04 | Secretariat |
| WP/03 | 1.2 | Review of the ICAO Database of Communication, Navigation and Surveillance Deficiencies (CNS) in the Eastern Caribbean | 24/09/04 | Secretariat |
| WP/04 | 2.3 | Status of implementation of the AFS Communication Requirements Established by the FASID ANP and Development of ground-ground Communication in the Eastern Caribbean | 29/09/04 | Secretariat |
| WP/05 | 2.1 | Interconnection and Interoperability of the Eastern Caribbean AFS Digital Network | 29/09/04 | Secretariat |
| WP/06 | 2.2 | Development of Air-Ground Communication Systems in the Eastern Caribbean | 01/10/04 | Secretariat |
| WP/07 | 3.1 | Implementation of GNSS in the Eastern Caribbean | 01/10/04 | Secretariat |
| WP/08 | 2.1 | Actions being taken to upgrade the E/CAR Digital AFS Network | 01/10/04 | IACL |
| WP/09 | 6 | Status of the E/CAR Regional ATM/CNS Committee | 01/10/04 | IACL |
| WP/10 | 2.2 | Data Link Implementation Options | 06/10/04 | SITA |
| WP/11 | 4.1 | Development of Surveillance Systems in the Eastern Caribbean | 02/10/04 | Secretariat |
| WP/12 | 5 | Development of the Technical Infrastructure as a support to the Evolutionary Implementation of ATS/ATM Automated Systems in the Eastern Caribbean | 05/10/04 | Secretariat |
| WP/13 | 2.3 | The use of X.25 Service in the National Airspace System (NAS) | 14/10/04 | United States |
| WP/14 | 4.2 | Report of the Third Radar Data Sharing Task Force Meeting | 19/10/04 | Rapporteur RDSTF |

Information Papers

| Number | Agenda Item | Title | Date | Presented by |
|---------------|--------------------|---|----------------------------|---------------------|
| IP/01 | -- | General Information | 21/09/04 | Secretariat |
| IP/02 | -- | List of Working and Information Papers | 15/10/04 REVISED | Secretariat |
| IP/03 | 5 | FAA Telecommunications Infrastructure (FTI) | 15/10/04 REVISED | United States |
| IP/04 | 2.2 | Air Traffic Services use of Data Link | 06/10/04 | SITA |

List of Participants

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Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
List of Participants

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LIST OF PARTICIPANTS

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Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
List of Participants

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Agenda Item 1: CNS General matters

Review of actions taken on CNS valid Conclusions/Decisions of E/CAR WG and E/CAR DCA meetings

1.1 Based on the WP/02, the Meeting examined the status of implementation of E/CAR WG and E/CAR DCA Conclusions and Decisions related to the CNS systems. Consequently, the Meeting agreed to propose to the upcoming 19th E/CAR DCA Meeting that the following Conclusions and Decisions be considered completed or removed.

| CNS Conclusions and Decisions of the E/CAR WG Meetings that be completed or removed | |
|--|-----------------|
| Conclusions: | 24/17 (removed) |
| Decisions : | 28/13 a) and b) |

| CNS Conclusion of the E/CAR DCA Meetings that be completed | |
|---|-------|
| Conclusion: | 18/14 |

1.2 In addition, the Meeting considered that the following conclusions and decisions continued valid:

| CNS Conclusions and Decisions of the E/CAR WG Meetings that be continued Valid | |
|---|-----------------------------------|
| Conclusions: | 25/14, 27/20, 27/21, 27/22, 27/23 |
| Decisions : | 28/13 c) |

| CNS Conclusions and Decisions of the E/CAR DCA Meetings that be continued Valid | |
|--|--------------------------|
| Conclusions: | 18/2, 8/12, 18/13, 18/15 |
| Decisions : | |

1.3 In accordance with the above, **Appendix 1A** to this part of the report shows the status of E/CAR WG CNS Conclusions and Decisions and the **Appendix 1B** presents the status of the E/CAR DCA CNS Conclusions and Decisions.

Review of deficiencies in the CNS systems

1.4 The Meeting examined the lists of the CNS deficiencies classified with priority “U”, “A” and “B”, updating their status and sent them to 19th E/CAR DCA Meeting. **Appendix 1C** to this part of the report indicates the results of the review made by the Meeting with regard to the information contained in Appendix of WP/03 presented in this Meeting.

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APPENDIX 1A

OUTSTANDING VALID CNS CONCLUSIONS AND DECISIONS OF THE PREVIOUS E/CAR WG MEETINGS

| FIELD | CONCLUSIONS/ DECISIONS | ACTION BY: | COMMENTS | STATUS |
|-------|--|------------------------|--|--|
| CNS | DECISION 28/13 ACTION PLAN FOR RADAR DATA SHARING IN THE E/CAR That: a) the Radar Data Sharing Task Force attend the next GREPECAS CNS Committee Meeting to be held in September 2004; b) Barbados, Antigua and Trinidad and Tobago provide France with the required technical information on their radars; and c) the Radar Data Sharing Task Force present the action plan for radar data sharing in the E/CAR area in the 29 th E/CAR WG. | RDSTF | It is expected that the RDSTF will follow this task during its meeting scheduled for 18 and 19 October 2004. | a) Completed b) Completed c) Valid |
| CNS | CONCLUSION 27/20 RADAR IMPLEMENTATION IN ANTIGUA That, Antigua and Barbuda expedite the commissioning of the new radar in Antigua. | Antigua and Barbuda | DCA OECS reported that the radar has been flight-checked and the controllers have been trained, but still need to be certified. Antigua and Barbuda has continued with the efforts to commission the radar to be completed by the end of 2004. | Valid |
| CNS | CONCLUSION 27/21 REVIEW OF THE VHF AIR-GROUND VOICE COMMUNICATIONS COVERAGE That, States/Territories/International Organizations send to the ICAO NACC Regional Office information on their respective VHF air-ground voice communications stations using the form shown in Appendix E, and calculated theoretical graphic coverage and/or in-flight inspection measures, where available, by 30 November 2003 . | States/ Territories | Information was received from Barbados, French Antilles, Grenada and Trinidad and Tobago/IACL. France presented during the Meeting, updated information explaining how the VHF coverage is being improved. States/Territories are expected to provide the requested information by January 2005. | Valid |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix A to the Report on Agenda Item 1

1A-2

| FIELD | CONCLUSIONS/DECISIONS | ACTION BY: | COMMENTS | STATUS |
|-------|--|------------------------|---|--------|
| CNS | <p>CONCLUSION 27/22 GUIDANCE FOR THE WORK REGARDING THE VHF AIR-GROUND VOICE COMMUNICATIONS COVERAGE</p> <p>That, States/Territories with TMAs</p> <p>a) should calculate coverage for its terminal areas considering the minimum in-flight levels to be 4,000 ft and the maximum 12,000 ft and for control areas the minimum of 7,600 m (25,000 ft) and the maximum of 13,700 m (45,000 ft) flight level in accordance with the specifications of Annex 10, Volume III, Part II, Chapter II, on the required field intensity levels;</p> <p>b) propose corrective measures if range gaps are identified; and</p> <p>c) present this information at the 28th E/CAR IWG Meeting.</p> | States/ Territories | <p>France and IACL presented information study.</p> <p>ICL informed that new stations will be implemented at Tobago, Saint Lucia and Antigua islands in order to improve the VHF coverage.</p> <p>The S-E/CAR CNS Meeting agreed that States/Territories could provide the information requested to ICAO NACC Regional Office before 31 March 2005.</p> | Valid |
| CNS | <p>CONCLUSION 27/23 IMPROVEMENT TO AFTN CIRCUITS</p> <p>That, ICAO support Trinidad and Tobago by coordinating and facilitating the convening of bilateral meetings with the United States and Venezuela with the aim of agreeing to the details of implementation of the Caracas-Port of Spain AFTN circuit, utilizing 2400 bps or higher, and X.25.</p> | ICAO | <p>Trinidad and Tobago reported that resolution by the implementation of a VSAT REDDIG node at Piarco by the end of 2004.</p> | Valid |
| CNS | <p>CONCLUSION 25/14 TRANSITION PLAN FROM AFTN TO AMHS IN THE EASTERN CARIBBEAN</p> <p>That the E/CAR States/Territories:</p> <p>a) commence the development of an implementation Plan for the transition from AFTN to AMHS in the Eastern Caribbean, studying the impact of the AMHS on the E/CAR Digital Network, and</p> <p>b) review and improve the AMHS requirements included in the CNS 1B part of the CAR/SAM FASID table and formulate the relevant proposals for amendments.</p> | States/ Territories | <p>The E/CAR States/Territories should follow-up this conclusion and the work carried out by the CNS Committee of the ATM/CNS/SG of GREPECAS.</p> <p>Under the Agenda Item 2 of S-E/CAR CNS Meeting is shown an agreement stating the actions established by this conclusion.</p> | Valid |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix A to the Report on Agenda Item 1

1A-3

| FIELD | CONCLUSIONS/DECISIONS | ACTION BY: | COMMENTS | STATUS |
|-------|---|---|---|--------|
| CNS | CONCLUSION 24/17 SAN JUAN CERAP/PIARCO ACC CONNECTIVITY The proposal to establish an alternate route for the ATS Speech Circuit between San Juan CERAP/Piarco ACC submitted by United States was reviewed by the Informal E/CAR Working Group and although it was considered desirable, it was agreed to defer its study for a future date, to be reviewed at the 25 th E/CAR IWG Meeting. | Trinidad & Tobago and United States | There is established a digital circuit. | Remove |

- END -

APPENDIX 1B

OUTSTANDING VALID CNS CONCLUSIONS AND DECISIONS OF THE PREVIOUS E/CAR DCA MEETINGS

| FIELD | CONCLUSION/DECISION | ACTION FOR | COMMENTS AND FOLLOW UP | STATUS |
|-----------------------------|---|--|--|--------|
| ATM/ CNS/ AIS/ SAR | <p>CONCLUSION 18/2 TRAINING MET/ATS/CNS/AIS/SAR PERSONNEL FOR</p> <p>That, the Directors of Civil Aviation of the E/CAR organise a series of training activities for ATS/CNS/AIS/SAR and aeronautical meteorological personnel covering the following issues:</p> <ul style="list-style-type: none"> a) operational coordination procedures concerning the provision of aeronautical MET service; b) respective roles and responsibilities of ATS/CNS/AIS/SAR units and meteorological offices in the provision of aeronautical MET service; and c) interpretation of aeronautical meteorological products available to ATS/COM/AIS/SAR units and meteorological offices, in order to ensure the safety of aircraft operations. | States/Territories | <p>The S-E/CAR CNS Meeting was informed on the CNS training activities.</p> <p>This conclusion will be sent for its review to the MET Meeting which will be held in Barbados, December 2004.</p> | Valid |
| CNS/ ATM | <p>CONCLUSION 18/12 UPDATED INFORMATION FOR THE E/CAR ATM/CNS IMPLEMENTATION PLAN</p> <p>That States/Territories/International Organizations in the E/CAR provide electronic copies of or updated information on their respective latest National ATM/CNS Plans to the E/CAR Regional ATM/CNS Committee by no later than 15 February 2004 in order to update the E/CAR ATM/CNS Implementation Plan for presentation to the GREPECAS ATM/CNS Subgroup Meeting scheduled to be held in Rio de Janeiro, Brazil from 15 to 19 March 2004.</p> | States/Territories International Organizations | The E/CAR ATM/CNS implementation Plan was presented in ATM/CNS/SG/3 Meeting but this Meeting reviewed if the mentioned plan needed to be updated. | Valid |
| CNS | <p>CONCLUSION 18/13 E/CAR DIGITAL AFS NETWORK ACTION PLAN AND MONTHLY ACTIVITIES AND PROGRESS REPORTS</p> <p>That IACL provide by 17 December 2003 to each E/CAR Director of Civil Aviation an Action Plan, with appropriate timelines, on the process for the change over of the management of the E/CAR Digital AFS Network from TSTT to Cable and Wireless and thereafter Monthly Activities and Progress Reports.</p> | IACL | This issue was reviewed under the Agenda item 2 of this Meeting. | Valid |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix B to the Report on Agenda Item 1

1B-2

| FIELD | CONCLUSION/DECISION | ACTION FOR | COMMENTS AND FOLLOW UP | STATUS |
|-------|---|--------------------|---|-----------|
| CNS | CONCLUSION 18/14 SPECIAL E/CAR CNS MEETING The Directors of Civil Aviation agree to the holding of the Special E/CAR CNS Meeting to: a) deal with Communications, Navigation and Surveillance matters in the Eastern Caribbean, including inter-operational issues of the E/CAR Digital AFS Network with other networks, and b) be hosted by Trinidad and Tobago at a date in 2004 to be coordinated by the ICAO NACC Office. | States/Territories | The S-E/CAR CNS Meeting was held in Port of Spain, 20 to 22 October 2004 as planned. | Completed |
| GEN | CONCLUSION 18/15 ACTION PLANS FOR THE RESOLUTION OF DEFICIENCIES That, States/Territories prepare or complete, as applicable, Action Plans for the resolution of the outstanding air navigation deficiencies and submit these to the ICAO NACC Regional Office by 28 February 2004. | States/Territories | It is expected that the E/CAR States/Territories present their respective CNS deficiencies action plan. | Valid |

- END -

APPENDIX 1C

**COMMENTS FORMULATED BY THE SPECIAL EASTERN CARIBBEAN ON CNS DEFICIENCIES IN
APPENDIX OF THE WP/03**

| No. | Comments |
|------------|---|
| CNS 3C | It is implemented IA-5. The completion date is 31 December 2004. |
| CNS 2C | The completion date is 31 December 2004. |
| CNS 4C | The completion date is 31 December 2004. |
| CNS 5C | The completion date is 31 December 2004. |
| CNS 52C | The completion date is 31 December 2004. |
| CNS 53C | Trinidad and Tobago informed that the APP service at Crown Point Intl. Airport is provided by Piarco. Trinidad and Tobago will send a letter to ICAO proposing to remove this requirement for the mentioned airport contained in the Table CNS 2A of the FASID. |
| CNS 22C | Trinidad and Tobago informed that it is expected that the commissioning of the new equipment by January 2005. This is the completion date of this deficiency. |

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Agenda Item 2: Communication Developments

A) Status and interoperability issues of the E/CAR AFS Digital Network

2.1 Based on the WP/08 presented by IACL, the Meeting recalled that the E/CAR AFS Digital Network was designed in 1998 and implemented in 2000. Although the design was sound and effective, general performance did not meet the stringent requirements of Air Traffic Control due to the inadequate management capacity of the service provider. Faults, which occurred in the network, took extremely lengthy periods to resolve. The Dial-up Voice Network uses ISDN technology while the Data Network employed X.25 transport protocol.

2.2 Over the past two years the Eastern Caribbean began looking at the establishment of Sharing Radar Data imagery. Many ATS units have rebuilt their Control Towers, Approach Control Offices and AIS facilities and now require multiple AFTN terminals at the airports. Where there are aircraft hand-offs between adjacent TMA's under radar control there is a need for direct voice links. The AFS Network will need to be capable of handling the transition to AMHS.

2.3 The Meeting was informed that, in order to effectively correct the deficiencies of the E/CAR AFS network to ensure that it meets the present and near future ATS requirements, Cable & Wireless, as a new service provider with the necessary resources to manage the network, has been engaged and will provide the platform that can transport the various facilities protocol across the network and also take into consideration the need for establishing interconnectivity/interoperability with neighbouring networks.

E/CAR AFS Network on Frame Relay platform

2.4 Frame Relay was chosen as the network's transport protocol because of its ability to handle other older protocols such as X.25, Ethernet, etc. Also, the new service provider has an established modern Frame Relay Management System handling other international traffic. The E/CAR AFS Digital Network will provide an update on the Frame Relay platform at the end of December 2005. As a result, the Meeting agreed the following Draft Conclusion:

DRAFT CONCLUSION 1: UPGRADE OF THE E/CAR AFS NETWORK ON FRAME RELAY MANAGEMENT SYSTEM

That, IACL,

- a) be urged to provide the E/CAR AFS Network on Frame Relay Management System platform before the end of December 2005; and
- b) following the Conclusion 17/13 of the E/CAR DCA Meeting provide to the DCAs, as soon as possible, a report on the status of the implementation of the digital network, as well as an updated Project Plan related to this subject.

E/CAR AFS Network protocol

2.5 The Meeting noted that the new E/CAR AFS Network with Frame Relay transport protocol, will have the ability to accommodate other protocols such as ISDN for voice, X.25 for data, TCP/IP, Ethernet so that data integrity is maintained across the network. There will be a main hub in

Barbados and a backup in Trinidad; each hub connecting to all the islands and a T1 connecting the two hubs. Network management shall be conducted in Barbados.

Network interconnectivity/interoperability

2.6 The Meeting noted that actually, the E/CAR AFS digital network has only a digital interconnection point that provides interoperability with neighbouring networks through the FAA optical fiber link between Piarco and San Juan, Puerto Rico.

2.7 In this regard, the Meeting considered that it is necessary to fully meet the AFS requirements established in the ICAO FASID ANP CAR/SAM between Piarco ACC and SAM region, such as the ATS speech circuits requirements of Piarco ACC with Maiquetia ACC, Georgetown ACC, Paramaribo ACC and Rochambeau ACC and also the AFTN circuit requirements between Port of Spain and Caracas, the alternate path to NADIN II; this was done through the old analogue speech plus data network called the CM-5 which only exists between Port-of-Spain and Caracas and the required AFTN circuit Port of Spain/Georgetown. As the neighboring South American States and Territories are all on REDDIG, the Meeting confirmed that it would be recommended to implement a REDDIG VSAT node at Piarco ACC since is very feasible for Trinidad and Tobago to implement a REDDIG VSAT node at Piarco, which would provide the connectivity/interoperability required between E/CAR AFS network with REDDIG. The Digital Network of South America also uses Frame Relay, which simplifies connectivity with the E/CAR Network as Trinidad needs to communicate with Caracas, Georgetown, Paramaribo and Cayenne, which are in the REDDIG Network. In this regard, Trinidad and Tobago informed that it is expected that this will be implemented by the end of 2004.

2.8 The Meeting also took into account the ATS speech circuit requirements established in the FASID ANP CAR/SAM between Piarco ACC with New York ACC and Santa Maria ACC, and there may be other AFS requirements with the AFI region in the future. Likewise, since it is important to have a back up of the current circuits. The Meeting recommended that Trinidad and Tobago and United States study the need and the feasibility to implement another E/CAR Digital Network interconnection/interoperability point with other neighbouring networks.

2.9 In order to study the additional interconnection/interoperability point of the E/CAR Digital Network with other neighbouring networks, the Meeting agreed that the following essential aspects should be kept in mind:

- a) The requirements of voice and printed communications between Piarco ACC and neighbouring ACCs, as well as the requirements of the E/CAR TMA Units with other neighbouring centres. These requirements are contained in Tables CNS1A and CNS1C of the FASID and are shown as **Appendix 2A** and **Appendix 2B** to this report.
- b) The infrastructure and the available logistical support in the proposed interconnection site.
- c) The “*Guidance material to initiate the analysis of digital network interconnection in the CAR/SAM Regions*” recommended by the Conclusion 10/27 of the GREPECAS, that is presented in **Appendix 2C**.

2.10 Based on the above comments, the Meeting agreed to the following Draft Conclusion:

DRAFT CONCLUSION 2: IMPROVING THE INTERCONNECTION AND INTEROPERABILITY OF THE E/CAR AFS DIGITAL NETWORK WITH NEIGHBOURING NETWORKS

That, in order to fully meet the current AFS requirements and future new communication services providing interconnection/interoperability of the E/CAR AFS digital network with neighbouring networks:

- a) Trinidad and Tobago be urged to implement a REDDIG VSAT node at Piarco ACC before the end of 2004;
- b) Trinidad and Tobago, United States and IACL study the feasibility to implement an additional interconnection/interoperability point of the E/CAR Digital Network with other neighbouring networks;
- c) as mentioned in paragraph b) above, a meeting is proposed to be held in San Juan, Puerto Rico before the end of January 2005, reporting the results to the next E/CAR WG Meeting; and
- d) in order to meet the study mentioned in the paragraph b) above, take into account the,
 - 1) updated AFS requirements contained in Tables CNS1A and CNS1C of the FASID that are shown as Appendices 2A and 2B of this report;
 - 2) infrastructure and the available logistical support in the proposed interconnection site; and
 - 3) “Guidance material to initiate the analysis of digital network interconnection in the CAR/SAM Regions” recommended by the Conclusion 10/27 of the GREPECAS shown in the Appendix 2C of this report.

B) Development of ground-to-ground communications

AFTN COM requirements implementation

2.11 The Meeting noted that the Eastern Caribbean States, Territories and IACL, are taking advantage of the facilities offered by the new E/CAR AFS aeronautical communications digital network, and this had been a significant development in the improvement of AFTN circuits by being connected to the AFTN COM Centre of Port of Spain, Trinidad and Tobago and increasing their speed to 1200 bps, installing the X.25 protocol and the IA-5 code. Furthermore, recently there has been a growing demand for multi-AFTN Terminals at airports, especially where new Control Towers have been installed and located away from the AIS. With the new AFTN Switch at Piarco having recently been installed, there are plans to increase circuit speed to 2400 bps and its expanded capacity and ability to handle asynchronous, X.25 and TCP/IP protocol, the provision of multiple AFTN terminals at airports is now feasible. The choice of transmission protocol is TCP/IP facilitating the establishment of Local Area Networks at the airport where terminals can be placed in the Control Towers, Approach Control, AIS and MET offices. This design is more manageable and easy to expand.

2.12 Appendix 2A to this part of the Report contains the Table CNS 1B – AFTN Plan FASID ANP CAR/SAM with the amendments approved by the GREPECAS/12 meeting for the Eastern Caribbean and updated by this Meeting.

2.13 The Meeting also noted that the status of the AFTN Plan implementation is the following:

- a) In relation to the required circuits by Trinidad and Tobago with the adjoining States of the SAM Region, the AFTN trunk circuit Port-of-Spain/Caracas, Venezuela and Port of Spain/Georgetown, Guyana have some deficiencies, but the implementation of a REDDIG node in Piarco should bring a solution to these deficiencies. The AFTN automatic communication centre is fully implemented.
- b) The Port of Spain AFTN COM centre is currently being modernized by implementing new AFTN switching equipment that was installed on 5th October 2004.
- c) AFTN circuits between Piarco, Trinidad and Tobago and other E/CAR States and Territories have some deficiencies. It is expected that by upgrading the E/CAR AFS Digital Network, these deficiencies will be resolved.

2.14 In view of the above, **Appendix 2D** summarizes AFTN circuits and AFTN COM centres in the Eastern Caribbean where deficiencies have been detected, as well as measures that have been recommended by the Meeting to resolve these problems and to continue with the development of the said plan.

Review and updating of the E/CAR AFTN Plan and its topology

2.15 Based on the Chart CNS 1 of the FASID (Rationalized AFTN Plan for CAR/SAM Regions) the AFTN traffic in the Eastern Caribbean is dependent on a main AFTN centre (Piarco) and a main international AFTN circuit (AFTN circuit San Juan/Piarco), so a failure in the mentioned AFTN main centre and AFTN international circuit could affect all E/CAR States/Territories. On the other hand, the Meeting considered that upgrading the E/CAR AFS Digital Network through the implementation of the Frame Relay would help improve the AFTN plan and its topology.

AMHS Implementation

2.16 Bearing in mind these facts and considerations, the meeting proposed the appropriate actions to study the improvement of the AFTN Plan and its topology evolving towards the implementation of the ATS message handling systems (AMHS) of the ATN. Furthermore, Eastern Caribbean aeronautical administrations should consider conducting studies to replace their AFTN switching centres with AMHS or implement directly AMHS servers. The AFTN system should be interconnected through AMHS gateway.

2.17 The Meeting was also informed by United States about FAA's efforts to modernize its telecommunication infrastructure (FTI) programme taking into account all the current and future requirements to support ATS efficiently and in a cost effective manner by the gradual migration from X.25 to TCP/IP protocol. The **Appendix 2E** of this report shows the summarized information on the FTI programme, including some considerations on the advantages of the mentioned migration. Therefore, the Meeting formulated the following Draft Conclusion:

**DRAFT CONCLUSION 3: START OF THE MIGRATION FROM AFTN TO AMHS
IN THE EASTERN CARIBBEAN**

That, based on the need for the migration from the AFTN to AMHS, the States and Territories that consider implementing or upgrading their AFTN switching, include in the capabilities the use of X.25 and TCP/IP protocols in the equipment.

2.18 Barbados's delegate recalled the necessity to organize an AMHS seminar and proposed to include educational issues in each meeting.

Updating of the Voice and Data circuits between San Juan and Piarco

2.19 The Meeting was informed that discussions are in progress between the FAA and IACL/Cable & Wireless regarding the means of connectivity for voice and data circuits with San Juan. Currently, the AFTN uses FAA certified X.25 and the voice is on an ISDN service.

2.20 The Meeting, based on the United States and the global developments, as well as the studies being carried out by ICAO noted that the long-term strategy could involve all voice and data services into a converged network architecture based on TCP/IP protocol and based on the fact that the new AFTN switching has the capability to accommodate the TCP/IP protocol. The Meeting recommended updating the modernization strategy plan of voice and data circuit between Port of Spain, Trinidad and Tobago and San Juan, Puerto Rico by the migration from X.25 to TCP/IP protocol. Based on this, the Meeting formulated the following Draft Conclusion:

**DRAFT CONCLUSION 4: STUDY THE FEASIBILITY AND UPDATE THE
STRATEGY PLAN OF MODERNIZATION OF THE
VOICE AND DATA CIRCUIT BETWEEN PORT OF
SPAIN AND SAN JUAN**

That, based on the global development and the capabilities of the new AFTN switching of Piarco, Trinidad and Tobago, United States and IACL,

- a) study the feasibility, and update the strategy plan of modernization of the voice and data circuit between Port of Spain, Trinidad and Tobago and San Juan, Puerto Rico by the migration from X.25 to TCP/IP protocol; and
- b) report the results of the study mentioned in the above paragraph to the 29th E/CAR Working Group Meeting.

ATS speech circuits implementation

2.21 With respect to the ATS coordination speech communications, these are normally met through dedicated or switched circuits. According to the requirements and to the deficiencies detected by the Meeting, there are ATS/COM requirements among pairs of ACC units not implemented or presenting deficiencies in their operation. The results of the Meeting's review on this matter are the following:

- a) Piarco ACC has communication requirements with the CAR/SAM ACCs of Georgetown, Maiquetia, Paramaribo, Rochambeau and San Juan. Requirements with Georgetown, Maiquetia and San Juan are met through dedicated systems and IDD with Paramaribo and Rochambeau.

- b) Some ATS speech circuits connecting Piarco ACC with TMA Units, within Piarco FIR have some deficiencies, but it is expected that by upgrading the E/CAR AFS network this will be resolved.

2.22 Likewise, the Meeting was informed by IACL that the E/CAR ATS speech circuits are already established by the dial-up voice on the E/CAR AFS Digital Network and would be implemented as needed. Nevertheless, the Meeting noted that commencement of a radar control service between adjacent TMAs calls for the improvement of ATS speech circuits. The Meeting proposed to add to the Table CNS 1C, the following new ATS requirements for speech communication circuits:

| PROPOSED NEW ATS REQUIREMENTS FOR SPEECH COMMUNICATIONS | | |
|---|--|--------|
| Terminal I | Terminal II | Type |
| Adams APP, Barbados | E.T. Joshua APP, St. Vincent Point Salines APP, Grenada | A A |
| Fort de France APP, Martinique | E.T. Joshua APP, St. Vincent | A |
| Point Salines APP, Grenada | E.T. Joshua APP, St. Vincent | A |
| Piarco ACC, Trinidad and Tobago | Dakar ACC, Senegal | A |

2.23 The Meeting noted that in order to include the aforementioned proposal in the FASID Table CNS 1C – *ATS speech circuit plan*, and according to the procedure established by ICAO it is necessary that an Amendment be circulated and approved. **Appendix 2B** presents the updated Table CNS 1C of the FASID. Based on this, the meeting formulated the following Draft Conclusion:

DRAFT CONCLUSION 5: PROPOSAL OF AMENDMENT TO THE ATS REQUIREMENTS FOR SPEECH CIRCUITS COMMUNICATIONS IN THE TABLE CNS 1C, FASID

That, based on Appendix 2B of this part of the Report, ICAO NACC Regional Office establishes the appropriate amendment in order to include in the Table CNS 1C of the FASID the ATS requirements for speech circuits communications in accordance with the table shown above.

Radar Data transmission

2.24 The Meeting recalled that the first implementation of the E/CAR Radar Data Sharing will take place between Martinique and St. Lucia APP providing radar imagery. The new E/CAR AFS network shall provide a direct circuit between Martinique and the two airports in St. Lucia, each one in separate circuits. The network routers on either end of the circuits shall be equipped with an Ethernet Card that interfaces with the Local Area Networks used by the radar data processing equipment and shall provide the transport of the radar data using the prescribed protocol across the Frame Relay Network.

2.25 The Meeting was informed that the hub of the Radar Data sub-network is planned to be installed in Martinique and circuits will go out to St. Maarten, Antigua, Barbados, Trinidad, St. Lucia and to any other island that may wish to join the network. Also, direct circuits between any two islands are possible, bearing in mind that the Service Provider is only responsible for the safe transport of the Radar Data between the two points, across the Frame Relay Network and it will not be involved in the maintenance of the radar data processing equipment in the airports.

2.26 IACL indicated that with the intent to provide additional circuits for radar data, they require more technical details from the Radar Data Sharing Task Force. The meeting considered that with on-site visits, IACL could obtain the information requested.

C) Development of air-ground communication by voice and data links in Piarco FIR

Improvement of the VHF and HF air-to-ground coverage

2.27 The Meeting reviewed the information available of the VHF air – ground en-route and APP communication coverage status. In this regard, the Meeting was informed that France has been executing a project for improving the French Antilles VHF coverage; it is expected that after the project is completed the coverage should not contain any hole and the normal and redundant VHF coverage would be optimised.

2.28 IACL also informed that a new station was implemented in a high site of Tobago in order to take care of the blind spots and new equipment and antenna were installed at the relay stations in Antigua, Barbados and Saint Lucia in order to improve the VHF en-route coverage.

2.29 Regarding the HF air – ground communication in the oceanic area of the Piarco FIR, Trinidad & Tobago Civil Aviation Authority (TTCAA) informed the Meeting that the new HF communication equipment for the Piarco ACC will be commissioned in January 2005.

Implementation of air-to-ground data link

2.30 The Meeting recalled that Conclusion 12/42 of the GREPECAS recommended to the States, Territories, International Organizations and users to continue with the implementation of the applications feasible to be used with the Aircraft Communications Addressing and Reporting System (ACARS) data link and FANS-1A aircraft during the transition towards the implementation of the ATN bit oriented data links. Conclusion 12/43 of the GREPECAS recommended that States, Territories, International Organizations and users of the CAR/SAM Regions, based on the ICAO SARPs and Recommendation 7/3 of the Eleventh Air Navigation Conference (AN-Conf/11), to continue implementing air-ground data communications with VDL Mode 2 as a support infrastructure of the air-ground sub-network to enable the ATN applications evolutionary implementation according to the operational requirements.

2.31 The Meeting was also informed that VHF ACARS Stations are implemented in the following Eastern Caribbean Islands: Antigua, Barbados, Guadeloupe, Martinique, St. Lucia, Saint Vincent, and Trinidad which services are provided by ARINC and SITA.

2.32 The Meeting also recalled that the 28th E/CAR Working Group Meeting through its Decision 28/11 urged Eastern Caribbean States/Territories to develop an action plan to implement Data Link-Automatic Terminal Information Service (D-ATIS) and Pre-Departure Clearance (PDC) services in their international airports.

2.33 Based on the above, the Meeting began to study a strategy for the continuance of the implementation of air-to-ground data link in the Eastern Caribbean.

2.34 SITA proposed to the Meeting through its WP/10, to study different data link implementation approaches that can be taken for some data link applications. These approaches include “*Centralized Implementation Approach*” that serve multiple Air Traffic Service Providers (ATSPs) and “*Dedicated implementation approach*” to a specific ATSP.

2.35 For the above, the Meeting considered that the States, Territories and International organizations need to have more information on the requirements and advantages of the implementation of the data links. The Meeting agreed the following Draft Conclusion:

DRAFT CONCLUSION 6: **EXPLANATION MATERIAL OF THE REQUIREMENTS
AND OPERATIONAL ADVANTAGES OF THE DATA
LINKS IN THE EASTERN CARIBBEAN**

That the ICAO NACC Regional Office considers presenting the explanatory material on the requirements and operational advantages of the use of data link applications to the 19th E/CAR DCA meeting.

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APPENDIX 2A
TABLE CNS 1A – AFTN PLAN

EXPLANATION OF THE TABLE

Column

| | |
|----------|---|
| 1 | <p>The AFTN Centres/Stations of each State are listed alphabetically. Each circuit appears twice in the table. The categories of these facilities are as follows:</p> <p>M C Main AFTN COM Centre T C Tributary AFTN COM Centre S C AFTN Station</p> |
| 2 | <p>Category of circuit:</p> <p>M C Main trunk circuit connecting Main AFTN communication centres. T C Tributary circuit connecting Main AFTN communication centre and Tributary AFTN Communications Centre. S C AFTN circuit connecting an AFTN Station to an AFTN Communication Centre.</p> |
| 3 and 7 | <p>Type of circuit provided:</p> <p>LTT/a C Landline teletypewriter, analogue (e.g. cable, microwave) LTT/d C Landline teletypewriter, digital (e.g. cable, microwave) LDD/a C Landline data circuit, analogue (e.g. cable, microwave) LDD/d C Landline data circuit, digital (e.g. cable, microwave) SAT/a/d C Satellite link, with /a for analogue or /d for digital</p> |
| 4 and 8 | Circuit signalling speed, current or planned in bits/s. |
| 5 and 9 | Circuit protocols, current or planned. |
| 6 and 10 | <p>Data transfer code (syntax), current or planned:</p> <p>ITA-2 C International Telegraph Alphabet No. 2 (5-unit Baudot code). IA-5 C International Alphabet No. 5 (ICAO 7-unit code). CBI C Code and Byte Independency (ATN compliant).</p> |
| 11 | <p>Target date of implementation</p> <p>TBD C To be determined</p> |
| 12 | Remarks |

Note. C Due to loading factor considerations, 150 bits/s is required as minimum.

MEVA C Central Caribbean MEVA Satellite Digital Network
E/CAR C Eastern Caribbean Digital Network
REDDIG C SAM Digital Network

Appendix 2A to the Report on Agenda Item 2

[illegible]

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix 2A to the Report on Agenda Item 2

2A-3

| State/Station État/Station Estado/Estación | Category Catégorie Categoría | Current Actuel Actual | | | | Planned Prévu Planificado | | | | Target date implementation Date cible de mise en œuvre Fecha de implantación | Remarks Remarques Observaciones |
|--|------------------------------------|-----------------------------|---|------------------------------------|----------------|---------------------------------|---|------------------------------------|----------------|---|---------------------------------------|
| | | Type Tipo | Signalling speed Débit de signalisation Velocidad señalización | Protocol Protocole Protocolo | Code Código | Type Tipo | Signalling speed Débit de signalisation Velocidad señalización | Protocol Protocole Protocolo | Code Código | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Saint Lucia-S Port of Spain | M | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| SAINT VINCENT AND THE GRENADINES Saint Vincent -S Port of Spain | M | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | ECAR |
| SAINT MAARTEN Saint Maarten-S United States | M | SAT/d | 2400 | X25 | IA-5 | | | | | | MEVA |
| TORTOLA Tortola United States | M | | | | | LTT | 2400 | X25 | IA-5 | TBD | |
| TRINIDAD AND TOBAGO Port of Spain-M Anguilla | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Antigua | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Barbados | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Caracas | M | LTT/a | 300 | None | IA-5 | LTT/d | 2400 | X25 | IA-5 | TBD | REDDIG |
| Dominica | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Fort-de-France | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Georgetown | S | LTT/a | 1200 | None | IA-5 | | 2400 | X25 | IA-5 | TBD | REDDIG |
| Grenada | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Montserrat | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Pointe-à-Pitre | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Saint Kitts and Nevis | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Saint Lucia | S | LTT/d | 1200 | X.25 | IA-5 | | 2400 | | | 12/04 | E/CAR |
| Saint Vincent United States | S M | LTT/d LTT/d | 1200 1200 | X.25 X.25 | IA-5 IA-5 | | 2400 | | | 12/04 | E/CAR |
| TURKS AND CAICOS ISLANDS Grand Turk-T United States | M | LLT/d | 2400 | X25 | IA-5 | | | | | | |
| UNITED STATES United States -M Grand Turk | T | LLT/d | 2400 | X25 | IA-5 | | | | | | |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix 2A to the Report on Agenda Item 2

2A-4

| State/Station Etat/Station Estado/Estación | | Current Actuel Actual | | | | Planned Prévu Planificado | | | | | Remarks Remarques Observaciones |
|--|------------------------------------|-----------------------------|---|------------------------------------|----------------|---------------------------------|---|------------------------------------|----------------|---|---------------------------------------|
| | Category Catégorie Categoría | Type Tipo | Signalling speed Débit de signalisation Velocidad señalización | Protocol Protocole Protocolo | Code Código | Type Tipo | Signalling speed Débit de signalisation Velocidad señalización | Protocol Protocole Protocolo | Code Código | Target date implementation Date cible de mise en œuvre Fecha de implantación | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Port of Spain Saint Maarten Tortola | M S S | LTT SAT/d | 1200 2400 | X.25 X25 | IA-5 IA-5 | LTT/d | 2400 | X25 | IA-5 | TBD | MEVA E/CAR |
| VIRGIN ISLANDS Tortola-S | | | | | | | | | | | |
| United States | M | | | | | | 2400 | X25 | IA-5 | TBD | E/CAR |

- - - - -

APPENDIX 2B
Table CNS 1C – Tableau CNS 1C – Tabla CNS 1C
ATS SPEECH CIRCUITS PLAN

EXPLANATION OF THE TABLE

Column

- 1 and 2 Circuit terminal stations are listed alphabetically by the Terminal I.
- 3 A – indicates ATS requirement for the establishment of voice communication within 15 seconds.
D – indicates requirements for instantaneous communications.
- 4 Type of service specified:
- LTF – landline telephone (landline, cable, UHF, VHF, satellite).
RTF – radiotelephone.
- 5 Type of circuits; Direct (DIR) or Switched (SW).
- D – indicates a direct circuit connecting Terminals I and II.
S – indicates that a direct circuit does not exist and that the connection is established via switching at the switching centre(s) indicated in column 6.
IDD – International direct dialling by public switch telephone network.
- Note 1.– Number of D and/or S circuits between Terminals I and II are indicated by numerical prefix, i.e. 2 D/S means 2 direct circuits and one switched circuit.*
- Note 2.– Pending the implementation of proper ATS voice circuits, and provided that aeronautical operational requirements are met, IDD services may be used for the ATS voice communications in low traffic areas.*
- 6 Location of switching centre(s). Alternate routing location, if available, is indicated in brackets.
- Note 3.– The following networks have been identified in the table for providing the connection between terminals:*
- CAMSAT – COCESNA Satellite Communication Network
E/CAR – Eastern Caribbean Network
MEVA – Central Caribbean MEVA Satellite Digital Network
REDDIG – SAM Digital Network
- 7 Status of Implementation. Following codes are used in this column:
- a) I – if the circuit is implemented.

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)

Appendix B to the Report on Agenda Item 2

2B-2

CNS

IV-CNS 1C-5

| ATS requirements for speech communications Besoins de HATS en communications vocales Requisitos ATS para comunicaciones orales | | | Circuit Circuito | | | Status of implementation État de mise en œuvre Estado de implantación | Remarks Remarques Observaciones |
|--|---------------------------------|--------------|---------------------|-----|--|--|---------------------------------------|
| Terminal I Tête de ligne I | Terminal II Tête de ligne II | Type Tipo | Service Servicio | D/S | To be switched via/ Commutation via/ A ser conmutado via | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ANGUILLA (United Kingdom) | | | | | | | |
| Anguilla TWR | Juliana APP | A | LTF | D | | I | |
| ANTIGUA AND BARBUDA | | | | | | | |
| V.C. Bird APP | Blackburne TWR | A | LTF | S | E/CAR | I | |
| | Golden Rock TWR | A | LTF | S | E/CAR | I | |
| | Juliana APP | A | LTF | S | E/CAR | I | |
| | Piarco ACC | A | LTF | S | E/CAR | I | |
| | Pointe-a-Pitre APP | D | LTF | D | | I | |
| | San Juan ACC | A | LTF | S | E/CAR | I | |
| BARBADOS | | | | | | | |
| Adams APP | E.T. Joshua APP | A | LTF | S | E/CAR | I | |
| | Fort-de-France APP | D | LTF | D | | I | |
| | Piarco ACC | D | LTF | D | | I | |
| | Saint Lucia APP | A | LTF | S | E/CAR | I | |
| | Point Salines APP | A | LTF | S | E/CAR | P | |
| DOMINICA (Non-Contracting State) | | | | | | | |
| Canefield TWR | Pointe-a-Pitre APP | A | LTF | D | | I | |
| Melville Hall TWR | Pointe-a-Pitre APP | A | LTF | D | | I | |
| FRENCH ANTILLES (France) | | | | | | | |
| Fort-de-France APP | Adams APP | D | LTF | D | | I | E/CAR |
| | E.T. Joshua APP | A | LTF | S | | P | E/CAR |
| | George Charles TWR | D | LTF | D | | I | E/CAR |
| | Piarco ACC | D | LTF | D | | I | E/CAR |
| | Pointe-a-Pitre APP | D | LTF | D | | I | E/CAR |
| | Saint Lucia APP | D | LTF | D | | I | E/CAR |
| Pointe-a-Pitre APP | Canefield TWR | A | LTF | D | | I | E/CAR |
| | Fort-de-France APP | D | LTF | D | | I | |
| | Melville Hall TWR | A | LTF | D | | I | E/CAR |
| | Piarco ACC | D | LTF | D | | I | E/CAR |
| | San Juan ACC | D | LTF | D | | I | E/CAR |
| | V.C. Bird APP | D | LTF | D | | I | E/CAR |
| Saint Barthelemy AFIS | Juliana APP | A | LTF | D | | I | E/CAR |
| Saint Martin Grand Case AFIS | Juliana APP | A | LTF | D | | I | E/CAR |
| GRENADA | | | | | | | |
| Point Salines APP | Adams APP | A | LTF | S | E/CAR | P | |
| | E.T. Joshua APP | A | LTF | S | E/CAR | P | |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)
Appendix B to the Report on Agenda Item 2

2B-3

CNS

IV-CNS 1C-7

| ATS requirements for speech communications Besoins de HATS en communications vocales Requisitos ATS para comunicaciones orales | | | Circuit Circuito | | | Status of implementation État de mise en œuvre Estado de implantación | Remarks Remarques Observaciones |
|--|---------------------------------|--------------|---------------------|-----|--|--|---------------------------------------|
| Terminal I Tête de ligne I | Terminal II Tête de ligne II | Type Tipo | Service Servicio | D/S | To be switched via/ Commutation via/ A ser conmutado via | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| MONTSERRAT (United Kingdom) | Piarco ACC | A | LTF | D | | I | E/CAR |
| Gerald's TWR | V.C. Bird APP | A | LTF | D | | I | |
| NETHERLANDS ANTILLES (Netherlands) | | | | | | | |
| Juliana APP | Anguilla TWR | A | LTF | D | | I | |
| | Golden Rock TWR | A | LTF | D | | I | |
| | St. Barthelemy AFIS | A | LTF | D | | | |
| | San Juan ACC | A | LTF | D | | I | |
| | Saint Martin Grand case AFIS | A | LTF | | | | |
| | V.C. Bird APP | A | LTF | D | | I | |
| PUERTO RICO (United States) | | | | | | | |
| San Juan ACC | Beef Island TWR | A | LTF | D | | I | |
| | Curacao ACC | A | LTF | S | MEVA | I | |
| | Golden Rock TWR | A | LTF | D | | I | |
| | Juliana APP | D | LTF | D | | I | |
| | Maiquetia ACC | A | LTF | D | | I | |
| | Miami ACC | D | LTF | D | MEVA | I | |
| | New York ACC | D | LTF | D | | I | |
| | Piarco ACC | A | LTF | D | | I/P | E/CAR |
| | Pointe-a-Pitre APP | D | LTF | D | | I | MEVA |
| | Santo Domingo ACC | D | LTF | D | | I | |
| | V.C. Bird APP | A | LTF | D | | | |
| SAINT KITTS AND NEVIS (Non-Contracting State) | | | | | | | |
| R.L. Brshaw TWR | Juliana APP | A | LTF | D | | I | |
| | San Juan ACC | A | LTF | D | | I | |
| | V.C. Bird APP | A | LTF | D | | I | |
| SAINT LUCIA | | | | | | | |
| George Charles TWR | Fort-de-France APP | D | LTF | D | | I | E/CAR |
| Saint Lucia APP | E.T. Joshua APP | A | LTF | D | | I | E/CAR |
| | Fort-de-France APP | D | LTF | D | | I | E/CAR |
| | Grantley Adams APP | A | LTF | D | | I | E/CAR |
| | Piarco ACC | D | LTF | D | | I | E/CAR |
| SAINT VINCENT AND THE GRENADINES | | | | | | | |
| E.T. Joshua APP | Adams APP | A | LTF | D | | I | E/CAR |
| | Fort-de-France APP | A | LTF | S | | P | E/CAR |
| | Piarco ACC | A | LTF | D | | I | E/CAR |
| | Point Salines APP | A | LTF | S | | P | E/CAR |
| | Saint Lucia APP | A | LTF | D | | I | E/CAR |
| TRINIDAD AND TOBAGO | | | | | | | |

Special Eastern Caribbean Communication, Navigation and Surveillance Meeting (S-E/CAR CNS)

Appendix B to the Report on Agenda Item 2

2B-4

IV-CNS 1C-6

CAR/SAM FASID

| ATS requirements for speech communications Besoins de HATS en communications vocales Requisitos ATS para comunicaciones orales | | | Circuit Circuito | | | Status of implementation État de mise en œuvre Estado de implantación | Remarks Remarques Observaciones |
|--|---------------------------------|--------------|---------------------|-------|--|--|---------------------------------------|
| Terminal I Tête de ligne I | Terminal II Tête de ligne II | Type Tipo | Service Servicio | D/S | To be switched via/ Commutation via/ A ser conmutado via | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Piarco ACC | Dakar ACC | A | LTF | D | | P | |
| | E.T. Joshua APP | A | LTF | D | | I | E/CAR |
| | Fort-de-France APP | D | LTF | D | | I | E/CAR |
| | Georgetown ACC | A | LTF | D | | I/P | REDDIG |
| | Adams APP | D | LTF | D | | I | E/CAR |
| | Maiquetía ACC | A | LTF | D | | I/P | REDDIG |
| | New York ACC | A | LTF | D | | I | |
| | Paramaribo ACC | A | LTF | D | | P | REDDIG |
| | Pointe-a-Pitre APP | D | LTF | D | | I | E/CAR |
| | Pointe Salines APP | A | LTF | D | | I | E/CAR |
| | Rochambeau ACC | A | LTF | IDD/D | | I/P | REDDIG |
| | Saint Lucia APP | D | LTF | D | | I | E/CAR |
| | San Juan ACC | A | LTF | D | | I | E/CAR |
| | Santa María ACC | A | LTF | D | | I | E/CAR |
| | V.C. Bird APP | A | LTF | D | | I | E/CAR |
| TURKS AND CAICOS ISLANDS (United Kingdom) | | | | | | | |
| Providenciales TWR | Miami ACC | A | LTF | D | | I | |
| UNITED STATES | | | | | | | |
| New York ACC | Piarco ACC | A | LTF | D | | I | |
| VIRGIN ISLANDS (United Kingdom) | | | | | | | |
| Beef Island TWR | San Juan ACC | A | LTF | D | | I | |

APPENDIX 2C

GUIDANCE MATERIAL TO INITIATE THE ANALYSIS OF DIGITAL NETWORK INTERCONNECTION IN THE CAR/SAM REGIONS

1. Background

1.1 This material was elaborated to present proposals to discuss the interconnection of digital networks in the CAR/SAM regions, where digital networks for the aeronautical fixed service (AFS) have been established or are in implementation. As necessary, these networks could require an interconnection, in order that users of final or end systems, of different network environment, that have requirements to be connected by the aeronautical fixed service, can do it. The final user could be a person or a determined application programme operating a communications system terminal or is a resident.

Communications networks

2.1 When speaking about communications networks, this idea is immediately linked to means to communicate users and its end systems. In the past, this was related with specific services such as the telephone, telex, etc. Nowadays, the situation has evolved and the networks move towards multiprotocol/multiservice network concepts in which, in a same network, various services are offered using the same switching/multiplexed system in their nodes. This presents advantages with respect to the savings in exploitation and equipment costs.

2. We can distinguish three basic elements in a network: the final user with its end systems, the node with its network functions (switching and routing) and the physical means for the information transmission and connection of the nodes. Figure 1-1 below shows this subject taking into account the connection of any two nodes in a network.

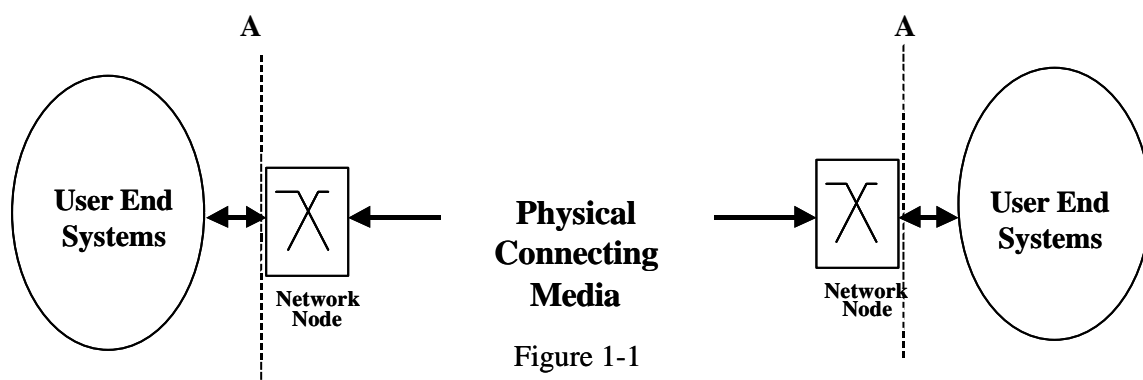


Figure 1-1

2.2.1 The user systems are all those final systems such as automatic switches or AFTN terminals, PABX, connections to LANs, routers, voice switching systems for air traffic consoles (VSCS), network management systems, etc.

2.2.2 The network nodes are composed of:

- a) interphases for user systems (A-A dotted line in Figure 1-1)
- b) interphases for connection to the physical media; and
- c) network protocol (Frame Relay ISDN, ATM) for switching and routing functions.

Note: The network protocol should, as possible, provide support to voice and data to achieve an effective and efficient integration of the communications services.

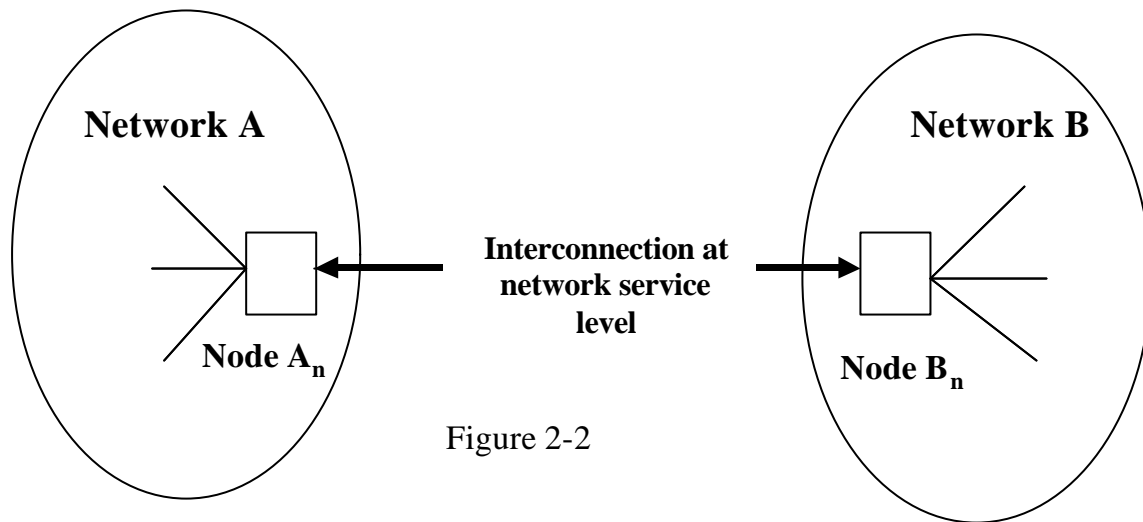
2.2.2.1 The physical interphases are those necessary to connect the network nodes to the agreed physical media, such as: UHF, microwave, optic fiber, satellite, copper wires, etc.

2.2.3 A digital network is established within a community of users under an institutional agreement reflecting the interests of those users to implement the communications services. This institutional agreement establishes the framework for the technical development of the network and the manner of its exploitation, administration, operation and maintenance. On the other hand, the network, as a communications structure, uses routing procedures and schemes established by the user community to which it provides the communications services.

2.3 There are many network topologies for the electric connection of the nodes such as: mesh, star, ring, etc. In the CAR/SAM Regions, since they are extensive networks covering States/Territories, their nodes are normally connected with a mesh/star topology.

3. **Digital network interconnection**

3.1 One should start from the fact that the networks, upon being established as mentioned in paragraph 2.2.3, are normally different communications structures even though, from the functional point of view, the same objective is achieved. In this sense, we can have networks of different physical media and protocols, such as networks based on VSAT technology, Frame relay, ISDN, etc. Taking into consideration this matter, the network interconnection should start taking into account the fact of keeping the independence of the network environments and the need that an effective and efficient integration of services should exist at the interconnection points that could involve the connection of one or more nodes of the two networks in question. Upon observing Figure 1-1, it can be noted that if the interconnection is made at the network services level, advantages could be obtained in the use of the network protocols of both networks, while the independence of the same are maintained. This would mean connecting the nodes to the same service level that the user interphases obtain at the A-A points in Figure 1-1. Figure 2-2 shows this matter.



3.1.1 The interconnection advantages through the method shown in Figure 2-2 are the following:

- a) Independence of the physical means used by the networks. A VSAT network can be interconnected with one of optic fiber or microwave, or two dissimilar VSAT networks can be interconnected without having to carry out the co-location of nodes to avoid problems with speech communications mentioned in 3.1.2;
- b) institutional agreements with regard to management, maintenance, etc., and the routing method of the communications in each network is maintained;
- c) The interconnection media can be independent and different to the means employed in the network environments to be interconnected;
- d) The interconnection media can be established in a flexible and economical manner. Services offered by the public/private carriers could be used; and
- e) If necessary, the inter-networking of the communications services would be possible.

3.1.2 The inter-connection of digital networks is greatly facilitated when the networks have an open architecture.

3.1.3 As a matter of importance for the interconnection of digital networks, it is necessary to note that data interconnection, be it for the AFTN and/or ATN inter-network, is guaranteed, since the communications ports of the user end systems can be connected to one or another network at the A-A interphases indicated in Figure 1-1. The most critical aspect to be taken into consideration and that can define how to make the networks interconnection, is the interconnection of voice channels. This interconnection must maintain the quality of the voice and the degree of the service, where the delay due to the use of geostationary satellites and the digital voice signaling process play an important role. In this respect, the one-way end-to-end delay should be less than 400 ms.

4. **Network interconnection in the CAR/SAM region**

4.1 In the CAR/SAM regions, there has been a development of digital networks that established clearly defined network environments. In this regard, note should be taken of the following:

- MEVA SCPC/DAMA/PAMA VSAT network using PAS-5 satellite, that establishes point-to-point connections between its users for voice and data. The DAMA access is used for voice switching. It also has PAMA access for non-switched voice circuits and for data circuits. Its users are mainly located in the Central Caribbean. MEVA is currently being reconfigured and it is most likely that it can adopt an open network architecture. The network is exploited by a communications provider in charge of the technical support and the administration of the system.
- E-CAR ATN compatible ground ISDN optic fiber network. The E-CAR network has its users located mostly in the Eastern Caribbean and one node in the SAM Region (CARACAS) that will facilitate its interconnection with the REDDIG. The network is exploited by a communications provider in charge of the technical support and the administration of the system.
- REDDIG An open network design system, multiservice/multiprotocol, for voice, data and video communications, compatible with the ATN, based on Frame Relay and will use, as main physical media, VSAT technology with TDMA access method and ISDN ground backup to connect its nodes. Its users will be all SAM States with the exception of Panama. It is expected to be implemented by 2002. The network will be operated by the SAM States, with a system administration to be established by these States through a regional agreement. .
- CAMSAT COCESNA's ATN compatible Frame Relay VSAT network. Its users are in Central America. It uses the Intelsat 805 satellite.
- COLOMBIAN Likewise, Colombia has operated for one year a SCPC/DAMA/PAMA network using the VSAT INTELSAT 805 satellite, servicing 36 nodes with two geographically redundant HUBs located in Bogota and Barranquilla. The CAR/SAM/3 RAN meeting recommended that a study be made on the benefits of the use of this network to improve voice/data communications with Jamaica, Netherlands Antilles, Panama and COCESNA (Conclusion 9/8).
- NETWORK

4.2. As it can be observed, the CAR/SAM network environments were established with different institutional agreements for its exploitation, administration, operation and maintenance. It is necessary to note that currently VSAT networks interconnection solutions have been implemented through node co-location, such is the case of CAMSAT and MEVA. However, this trend is not always applicable since on one hand the solution could be very expensive and on the other, there would be a proliferation node co-location for the VSAT networks, practice that has been taken with certain reserve by some States. In this regard, it would be convenient, as it has been analyzed in Informal Meetings on interconnection of digital networks and in the RLA/98/019 Project (REDDIG), to develop a case by case interconnection approach based, as possible, on the network services of the nodes to be interconnected, as indicated in above paragraph 3.

APPENDIX 2D

**AFTN CIRCUITS AND CENTRES IN THE CAR/SAM REGIONS THAT NEED TO BE IMPLEMENTED OR
IMPROVED TO COMPLY WITH THE AFTN PLAN**

| States/International Organizations | AFTN Circuits or AFTN Centre | Remarks/Solution |
|---|-------------------------------------|---|
| Trinidad and Tobago/ Venezuela | Port of Spain (M) – Caracas (M) | It is implemented at 300 baud, IAT-2, it presents low availability and problems in the software. The implementation of a REDDIG VSAT station in Piarco, Port of Spain that will be connected through the REDDIG is foreseen by the end of 2004. |
| Trinidad and Tobago/ Guyana | Port of Spain (M) – Georgetown (S) | It is out of service due to failure in the commercial line of AFTN circuit. The implementation of a RADDIG VSAT station in Piarco will resolved the deficiency. The AFTN traffic was temporary rerouted through Caracas. |
| Trinidad and Tobago | Port of Spain COM AFTN Center (M) | This Center will be updated during 2004 by the implementation of a new AFTN automatic switch. |

APPENDIX 2E

SUMMARY INFORMATION ON THE FAA TELECOMMUNICATIONS INFRASTRUCTURE (FTI) PROGRAM AND ADVANTAGES ON THE MIGRATION FROM X.25 TO TCP/IP PROTOCOL

1. Presently, the Federal Aviation Administration (FAA) provides X.25 data services in the National Airspace System (NAS) through the National Data Interchange Network (NADIN II). NADIN II is a nationwide X.25 packet switched network in the continental United States. This Network is integrated with the NADIN Message Switched Network (MSN), the FAA equivalent to the Aeronautical Fixed Telecommunications Network (AFTN) used by many International Civil Aviation Agencies.
2. The FAA is modernizing their entire telecommunications network through the FAA Telecommunications Infrastructure (FTI) program. FTI was awarded in July 2002 and is in the early stages of long transition process that migrates over 20,000 NAS services to the new network infrastructure. Part of the services planned to transition to FTI are NADIN II X.25 services. The FTI network provides a broad range of telecommunication services, but the heart of the data network is based on IP technology. The long-term strategy of FTI is to evolve all voice and data services into a converged network architecture based on IP protocol.
3. X.25 services will continue to be offered for the next few years, but the X.25 network will be consolidated into a smaller number of X.25 nodes. Additionally, major X.25 service users are in the process of making IP interfaces available to other users that are capable of using IP. Over time, a gradual migration to IP is envisioned as users modernize and upgrade their own communications capabilities. Migration to IP provides many technical and cost benefits compared to X.25 legacy technology.
4. It is a concern of the FAA that X.25 technology is becoming obsolete. It has become increasingly difficult for the FAA and other X.25 users to operate and maintain their existing X.25 networks and equipment. As more and more X.25 suppliers vanish from the marketplace, the operations and maintenance costs increase higher and higher.
5. To mitigate the obsolescence risk, the FTI program office will encourage users to evolve to IP technology. Many will do this on their own, as they will want to stay abreast with current trends, technology, and benefits. The FAA has taken the initiative to make more FAA owned and leased end user systems capable of providing services via a native IP interface.
6. The FAA has already begun this process with large X.25 end user systems such as the Weather Message Switching Center Replacement (WMSCR) and NADIN I. The FAA is working to make an IP service available to other end systems and users of WMSCR and NADIN I who can only use X.25 to gain access today. A gradual migration away from X.25 to IP is envisioned over the next 3 years.
7. Looking beyond three years, the pace of the migration from X.25 to IP is expected to increase. In five years the FAA expects their X.25 network services to shrink even more, and plans further consolidation in the number of X.25 network nodes in the FTI architecture.
8. All new and emerging NAS systems are using IP as their native network architecture protocol. Coupled with the planned migrations, the FAA foresees a complete elimination of X.25 service support in the future.

9. The migration from X.25 to IP is a natural evolution that occurs in many technological arenas. Although the evolution can be difficult and strain resources in some cases, it is prudent for any new or emerging system or network service to consider the current environment as well as the evolutionary developments that are likely to occur. In some instances, support for legacy systems and services may be required temporarily to support gradual evolution. But the capability to support existing or future technologies should also be considered because the consequences can be costly.

10. IP technology is an existing and well-proven technology with widespread acceptance that will keep it around for the foreseeable future. To provide a new network service today without IP capability in this environment is risky from both a technology and cost perspective. Legacy systems may also need to be supported for some time, but the alternative to migrate to IP should be a mandatory requirement for any new system or network initiative.

- END -

Agenda Item 3: Navigation Developments

GNSS Implementation

3.1 The Meeting noted that some Eastern Caribbean States/Territories have been implementing the use of GNSS en-route and support for non-precision approach operations subject to conditions defined by appropriate national regulatory authorities or service providers and completing the GNSS training available.

3.2 The Meeting recalled the Recommendation 6/1 formulated by the Eleventh Air Navigation Conference, 2003 (An-Conf/11), encouraging inter alia, that:

- a) air navigation service providers move rapidly in coordination with airspace users, with a view to achieve, as soon as possible, worldwide capability to at least APV1 performance; and
- b) States and airspace users take note of the available and upcoming SBAS navigation services providing for APV operations, and take necessary steps towards the installation and certification of SBAS capable avionics.

3.3 Also the Meeting recalled that GREPECAS formulated Conclusion 12/45 recommending to CAR/SAM States/Territories/International Organizations to take into account the new “*Regional guidelines for the transition to the global navigation satellite systems (GNSS)*” and the “*Regional strategy for the introduction and application of non visual aids to approach, landing and departure*”, presented in Appendices S and T, respectively to the Agenda Item 3 of the GREPECAS/12 Report shown in **Appendix 3A** and **Appendix 3B** respectively of this part of the report. GREPECAS/12 Meeting also formulated Conclusion 11/46 – *CAR/SAM Regional Activities for the SBAS and GBAS Implementation* associated with a regional strategy and guidance shown in **Appendix 3C**.

3.4 The Meeting was informed that the Amendment 79 of the Annex 10, Volume I, with a date of applicability of 25 November 2004, presents changes to GNSS SARPs and related guidance material concerning performance specifications for approach specifications with vertical guidance (APV); global positioning system (GPS) selective availability (SA) discontinuation and clarification of signal power level; specifications for modernized Global Navigation Satellite System (GLONASS-M); frequency planning criteria for ground-based augmentation system (GBAS) and a number of other enhancements.

3.5 The Meeting noted that in accordance with paragraph 3.7.2.2 of Annex 10, Volume I; the GNSS navigation services shall provide position and time data to the aircraft using various combinations of the following elements installed on the ground, on satellites and/or on board the aircraft: Global Positioning System (GPS) that provides the Standard Positioning Service (SPC), Global Navigation Satellite System (GLONASS) that provides the Channel of Standard Accuracy (CSA) navigation signal; aircraft-based augmentation system (ABAS); satellite-based augmentation system (SBAS), ground-based augmentation system (GBAS) and aircraft GNSS receiver.

3.6 The Meeting also noted that the ICAO Annex 10, Volume I, Table 3.7.2.4-1 establishes the signal-in space performance requirements for the following typical operation:

- a) En-route (oceanic/continental low density).
- b) En route (continental).
- c) En route, Terminal.
- d) Non-precision approach (NPA), Departure.
- e) Approach operations with vertical guidance (APV-I).
- f) Approach operations with vertical guidance (APV-II).
- g) Category I precision approach (*Note*).

Note: GNSS performance requirements for Category II and III precision approach operations are under review and will be included in the Annex 10 at a later date.

3.7 In order to continue implementing the GNSS in the Eastern Caribbean, the Meeting recommended actions to review and update the Eastern Caribbean GNSS implementation plan as part of the CNS/ATM implementation plan and the related national plans. Therefore, the following Draft Conclusion was formulated:

DRAFT CONCLUSION 7: E/CAR ACTIVITIES FOR GNSS IMPLEMENTATION

That, the E/CAR States/Territories/International Organizations be encouraged to continue their activities towards the GNSS implementation, taking into consideration:

- a) the new “*Regional guidelines for the transition to the global navigation satellite systems (GNSS)*” and the “*Regional strategy for the introduction and application of non visual aids to approach, landing and departure*” shown in Appendix 2A and Appendix 2B to this part of the report;
- b) the new SARPs on the GNSS containing in the ICAO Annex 6 and Annex 10, Volume I; and
- c) based on the “*CAR/SAM regional strategies and rules to define the SBAS architecture and the introduction of GBAS*”, that is shown in Appendix 2C, follow-up the CAR/SAM regional activities for the SBAS and GBAS trials and planning implementation.

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APPENDIX 3A

(Appendix S to the Agenda Item 3 of the GREPECAS/12 Report)

**GUIDELINES FOR TRANSITION TO SATELLITE NAVIGATION SYSTEMS IN THE
CAR/SAM REGIONS**

1. GNSS should be introduced in an evolutionary manner, with improvements in GNSS capability generating increasing benefits, and culminating in GNSS supporting all phases of flight. As GNSS evolves, the planning for the removal of ground-based navigation aids should take account of the issues described below:
2. The ground infrastructure for current navigation systems must remain available during the transition period.
3. States/regions can consider segregating traffic according to navigation capability and granting preferred routes to aircraft with better navigation performance where this can be done without reducing airspace capacity.
4. Before any existing ground infrastructure is considered for removal, users shall be given reasonable transition time to allow them to equip with GNSS to attain equivalent navigation service.
5. As GNSS is introduced for en-route operation, States/regions should coordinate to ensure that harmonized separation standards and procedures are developed and introduced concurrently in all flight information regions along major traffic flows to allow for a seamless transition to GNSS-based navigation
6. In planning the transition to GNSS, the following issues must be considered:
 - a) maintaining or improving the current level of safety;
 - b) schedule for provision and/or adoption of a GNSS service, including aircraft and operator approval processes;
 - c) extent of existing ground-based radio navigation services;
 - d) strategy for transition schedule to GNSS capability (i.e. benefits-driven or mandatory);
 - e) appropriate level of user equipage with GNSS capability;
 - f) provision of other air traffic services (i.e. surveillance and communications);
 - g) density of traffic/frequency of operations;
 - h) mitigation of risks associated with radio frequency interference failures and ionospheric issues;
 - i) design and implementation of procedures; and
 - j) over-all economics and lead times to introduce aircraft avionics requirements.

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APPENDIX 3B

(Appendix T to the Agenda Item 3 of the GREPECAS/12 Report)

**STRATEGIES FOR THE INTRODUCTION AND APPLICATION OF NON VISUAL AIDS IN
APPROACH, LANDING AND DEPARTURE IN THE CAR/SAM REGION**

- a) Maintain the ILS as the ICAO standard precision approach and landing system as long as necessary and as long as it remains operationally acceptable and economically beneficial, doing everything possible to not deny access to airports to aircraft equipped only with ILS;
- b) implement GNSS with augmentation as required for APV and Category I operations where operationally required and technically feasible and economically beneficial, taking into account GNSS evolution;
- c) promote the development and use of a multi-modal airborne landing capability;
- d) promote the use of APV operations, particularly those using GNSS vertical guidance, to enhance safety and accessibility; and
- e) identify and resolve operational and technical feasibility issues for GNSS with ground-based augmentation system (GBAS) to support Category II and III operations; Implement GNSS for Category II and III operations where operationally required and economically beneficial.

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APPENDIX 3C

(Appendix W to the Agenda Item 3 of the GREPECAS/12 Report)

CAR/SAM REGIONAL STRATEGIES AND RULES TO DEFINE THE SATELLITES BASED AUGMENTATION SYSTEM (SBAS) ARCHITECTURE AND THE INTRODUCTION OF GROUND BASED AUGMENTATION SYSTEM (GBAS) AND TO LEAD THEIR IMPLEMENTATIONS

1. Based on the AN-Conf/11, Recommendation 6/9 — *Support and participation in SBAS pre-operational implementation activities*, the States/International Organizations participating in SBAS pre-operational implementation activities including RLA/00/009 and RLA/03/902 projects, to study the feasibility of leading to the CAR/SAM Regions extension of the WASS and EGNOS augmentation systems respectively, CAR/SAM Regions own SBAS with an increment of the integrity functions and other estimated feasible alternatives.
2. To perform the above-mentioned studies, bear in mind the GNSS evolutionary development derive from the implementation phases of the new multiple signals and multiple constellations, as well as the SARPs, so that the implementation be gradual and progressive by two consecutive implementation stages, in which the required actions be defined, aim at satisfying the Table CNS 3 – *Radio navigations aids*, contained in the FASID, Part IV, according to the following Table:

| Phases of the SBAS and GBAS -GNSS implementation | | |
|--|----------------|--|
| Phase | Date | Minimal performance to be satisfied |
| Phase I (Initial GNSS-SBAS introduction) | Current – 2010 | <ul style="list-style-type: none"> • En-route Navigation and en-route terminal; • Capacity of non-precision approach (NPA); and • Approach capacity, which is not a precision with vertical guidance - APV-I (in equatorial areas this capacity may not be obtained). |
| Phase II: (Final GNSS-GBAS Introduction) | 2010 - 2015 | <ul style="list-style-type: none"> • APV II and Precision approach (PA) Category I. • PA Cat II and Cat III. |

Note: These phases would be conditional to the come into service of different constellations and new GNSS signals, according to the AN-Conf/11 foreseen periods.

3. The SBAS and GBAS introduction would be in accordance with the CAR/SAM Regions guidelines for the transition of the navigations systems and the regional strategy for the system's implementation in support of the approach, landing and departure operations.
4. During Phase I, the SBAS-GNSS initial implementation should be aim at resolving problems on the air space and to increase the instrument flights, as well as to facilitate the improvement of the access, terminal area operations and the RNAV coverage flexibility, particularly in the mountainous areas (with a number of obstacles or with other limitations (e.g. noise reduction requirements) and to achieve the GNSS benefits in operations and safety matters, including the system's advanced capacities. This service should be achieved with small investments and with the coordinately States/International organizations participation. Also during this phase the system should satisfied APV-I performance requirements, with the exception of the equatorial areas.
5. Additionally, during

Phase I conventional ground radio aids will be kept as a backup to the GNSS or integrated to it. Resulting from the rapid and large ionosphere changes taking place at the equatorial zone, including the ionospheric scintillation, the GNSS signals interruption should be mitigated making a better use of the ground navigation radio aids, as well as with support from radar surveillance and other techniques, in conformity with AN-Conf/11, Recommendation 6/2 - *Guidelines on mitigation of GNSS vulnerabilities*.

6. During Phases II it is expected that the effects caused by the ionosphere quick and big changes be minimized due to the availability of the multiple new signals and constellations. The results should be observed on the studies carried out by Brazil, other States and the ICAO guidance texts. The final GNSS will essentially consist in the level of services increment to achieve APV-II performances and precision approach (PA) Category I. Moreover, the GBAS introduction should be carried out in order to contribute to obtain the Category I, II and III in general.

- END -

Agenda Item 4: Surveillance Developments

A) Surveillance System Developments

4.1 The Meeting noted that taking the RVSM implementation will make more critical the need for improving the surveillance systems; likewise, the development of the surveillance systems contributes to the ATM automation development, the Eastern Caribbean States and Territories are carrying out a remarkable development in surveillance systems by the implementation of new secondary surveillance radar (SSR) Mode A/C using monopulse technique and by implementing the radar data sharing. In addition, Trinidad and Tobago informed on its plan of implementation of ADS-B initially in the oceanic airspace of the Piarco FIR.

4.2 Taking into account the aforementioned development, the Meeting reviewed and updated the Table CNS 4A – *Surveillance Plan* of the FASID as shown in the **Appendix 4A** of this part of the report. But the Meeting recalled that in the process of surveillance systems implementation, the following main lines of development could be identified: increasing implementation of SSR facilities with monopulse techniques; extended use of Mode A/C; consideration of Mode S in controlled airspace with high air traffic density. In oceanic airspace with low density, and in other airspace of high density consider the implementation of ADS-C or ADS-B. Therefore, the Meeting agreed the following Draft Conclusion:

DRAFT CONCLUSION 8: UPDATED E/CAR SURVEILLANCE PLAN

That, based on the Appendix 4A of this part of the report, ICAO update the E/CAR part of the Table CNS 4 A – *Surveillance Plan* of the FASID CAR/SAM ANP.

B) Radar data sharing among E/CAR States/Territories

4.3 The Rapporteur of the Radar Sharing Task Force (RSTF) presented for the consideration of the Meeting, a summary of the report of the 3^d Meeting of the E/CAR RSTF. The main topics reviewed were the following:

- review the status of the Conclusions of the RSTF/2 Meeting.
- the E/CAR common seamless radar image;
- the remoting of Martinique radar image in Saint Lucia;
- the training of staff with respect to radar projects identified by the RSTF;
- the E/CAR AFS Digital Network, managed by IACL to be used inter-alia in regional radar projects, and
- the need for immediate radar image remoting to Piarco ACC.

Review the status of the Conclusions of the RSTF/2 Meeting.

4.4 The Meeting noted the status of the conclusions of the RSTF/2 Meeting reviewed by the RSTF/3 Meeting that is shown in the **Appendix 4B** of this part of the report.

E/CAR common seamless radar image

4.5 The Meeting was informed by the RSTF on the progress of the common seamless radar image project. The major topics of discussion were the following:

- Current status of the project:
 - Martinique and Guadeloupe integration in DACOTA System.
 - Commencement Barbados radar assessment .
- An envisaged schedule for integration of the diverse data coming from the radar antennae of the region (Antigua, Barbados, and/or Saint Maarten, Trinidad and Tobago).
- The standard for raw radar data transmission: ASTERIX CAT 1 & 2 format to be sent using LAP/B protocol.
- A formal agreement request letter concerning the acceptance by the States/Territories of remoting their radar data antenna to Martinique. The mentioned Draft Letter is shown in **Appendix 4C** of this part of the report.
- Information to the Meeting by OECS of the status of the Antigua and Barbuda radar antenna.

Radar image remoting to Saint Lucia

4.6 The Meeting was informed on the progress of the project to remoting in Saint Lucia the Martinique radar image:

- The main LOA was signed in November 2003 between OECS and France.
- The equipment installation specifications have been assessed during a technical visit to Saint Lucia's facilities.
- The local radar network schematic was approved.
- The Meeting was informed of the project planning, especially the forecasted completion date in early 2006.

Radar training matters

4.7 The Meeting was reminded of the technical and ATC training required by the regional radar projects. The Meeting agreed that the training should be completed just before the equipment/procedures come into force. The details of the technical training program for the Radar image implementation in Saint Lucia were discussed and the completion date was agreed to be November 2005.

4.8 The Meeting was informed that ICAO has just certified the Barbados ATC School for the provision of TRAINAIR courses.

E/CAR AFS Digital Network

4.9 The Meeting was informed that the formal signing of the contract for the new E/CAR AFS Digital Network management should occur within 30 days. The new Network installation will start within 90 days and should be completed before December 2005. Technical assessment of the current equipment used in E/CAR ATC facilities should occur very shortly after the signing.

4.10 IACL informed that the mentioned network used for Saint Lucia radar image remoting tests was assured to be compliant with the Frame Relay Network intended to be managed by Cable and Wireless, as new network provider.

4.11 Fruitful exchanges between RSTF technical experts and IACL/Cable & Wireless representatives allowed for a much clearer understanding of technical radar data transmission between Martinique and the E/CAR radar station operators.

Immediate radar image remoting to Piarco ACC

4.12 Trinidad and Tobago informed the Meeting that their SSR station is out of service due to a lightning strike since July 2004.

4.13 RSTF informed that the need to provide surveillance of the major part of Piarco UTA/CTA caused the Meeting to agree on the positive impact that an immediate remoting to Piarco ACC of the current DACOTA system and Barbados radar images would have. France provided the specifications of the DACOTA system output. Two sets of bilateral discussions between Piarco and the radar data operators should start as soon as possible.

4.14 This perspective is today independent of the common seamless E/CAR radar image although Trinidad and Tobago re-affirmed its full interest for the common radar image planned in the Eastern Caribbean.

4.15 The Draft Conclusions and the Draft Decisions proposed by the RSTF/3 Meeting and reviewed by the S-E/CAR CNS Meeting were as follows:

DRAFT CONCLUSION 9: REQUESTED INFORMATION ON E/CAR RADAR COVERAGE

That, Antigua and Barbuda, Barbados, Trinidad and Tobago be committed to provide through the ICAO NACC Office radar paper coverage charts at 3000, 5000, 10000 and 20000 feet.

DRAFT DECISION 10: TRANSFER THE TASK RELATED TO FLIGHT PLAN AND POSITION REPORTS TO E/CAR ATM COMMITTEE

That the task to analyze the transmission of Flight Plan data and updated position reports on airborne flights to be used for ATM purposes be transferred to E/CAR ATM Committee.

DRAFT DECISION 11: TRANSFER THE TASK RELATED TO OCEANIC SURVEILLANCE TO E/CAR WORKING GROUP

That the task related to oceanic surveillance be transferred to the E/CAR WG.

DRAFT CONCLUSION 12: REQUESTED TECHNICAL INFORMATION ON RADAR STATIONS

That,

- a) Antigua / OECS provide to French STNA/ALENIA to obtain technical specifications; and
- b) Trinidad and Tobago, Barbados and Antigua and Barbuda provide the rapporteur with their ICD with their global radar architecture.

**DRAFT CONCLUSION 13: COMPLIANCE WITH THE GREPECAS SAC-ASTERIX
ASSIGNMENT PLAN**

That, the E/CAR States/Territories be urged to become compliant with the GREPECAS SAC-ASTERIX assignment Plan recommended by Conclusion 12/48 of GREPECAS by the end of 2005.

**DRAFT DECISION 14: FOLLOW UP THE PROGRESS OF THE POSSIBLE
RADAR REMOTING TO PIARCO ACC**

That the Radar Sharing Task Force be kept informed of the progress regarding the possible remoting of Barbados and current DACOTA images system to Piarco ACC.

**DRAFT CONCLUSION 15: REQUESTED LETTER OF AGREEMENT REGARDING
THE PROVISION OF RADAR DATA TO THE DACOTA
SYSTEM**

That, States and Territories listed hereunder, be informed through the ICAO NACC Regional Office of the need for their agreement to provide radar data to the DACOTA System in Martinique, in accordance with the Draft Letter shown in Appendix 4C of this part of the Report.

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|---|
| Antigua and Barbuda, Barbados, Netherlands Antilles (Saint Maarten), and Trinidad and Tobago. |
|---|

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APPENDIX 4A

Table CNS 4A of the FASID

(Eastern Caribbean Part)

SURVEILLANCE SYSTEMS

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 | PSR/Status — Primary surveillance radar/Status of implementation |
| 6 | SSR/MSSR/Function — Secondary surveillance radar/Monopulse secondary surveillance radar/Function E — En-route area control centres T — Terminal |
| 7 | SSR/MSSR/Modes — Modes A, C or S |
| 8 | Coverage of secondary surveillance radar in nautical miles |
| 9 | SSR/MSSR/Status — Secondary surveillance radar/Monopulse secondary surveillance radar/Status of implementation |
| 10 | ADS/Type — Automatic dependent surveillance/Type |
| 11 | ADS/Status — Automatic dependent surveillance/Status of implementation |
| 12 | Remarks |

Note.— The following codes are used in columns 5, 9, 11 and 12:

- | | |
|-------------|---|
| 5, 9 and 11 | I — Implemented using conventional SSR I* — Implemented using monopulse SSR NI — Not implemented I/P — (Implemented/Planned) Indicates the implemented radar system and enlargement and/or replacement of the radar system at short term (2 years) P — Planned using SSR P* — stands for future plan using monopulse SSR NP — (Not planned) Indicates that the State has no plans for radar implementation R — Recommended |
| 12 | * MSSR — Monopulse SSR < - Year — Planned commissioning year > - Year — Planned decommissioning year |

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APPENDIX 4A

Table CNS 4A - SURVEILLANCE SYSTEMS (Updated)

| State(Territory)/Location Estado(Territorio)/Ubicación | ATS Unite Served Unidad ATS Servida | PSR | | | SSR | | | | ADS | | Remarks Observaciones |
|--|---|--------------------|-------------------------------|---------------------------|--------------------|----------------------------|-------------------------------|---------------------------|--------------|---------------------------|--------------------------|
| | | Funtion Función | Coverage Cobertura (NM) | Status Impl. Estado | Funtion Función | Modes Modos (A,C& S) | Coverage Cobertura (NM) | Status Impl. Estado | Type Tipo | Status Impl. Estado | |
| 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| ANGUILA (UK) | | | | | | | | NP | | | |
| ANTIGUA & BARBUDA Airport (4 NM North) | V.C. Bird APP | | | | T | A/C | 180 | I* | | | *MSSR |
| BARBADOS Airport | Adams APP | | | | T | A/C | 250 | I* | | | *MSSR |
| DOMINICA | | | | NP | | | | NP | | | |
| FRENCH ANTILLES Fort-de-France Point-à-Pitre | Fort-de-France APP Point-à-Pitre APP | | | | T T | A/C A/C | 250 250 | I* I* | | | *MSSR *MSSR |
| GRENADA | Point Salines APP | | | | | | | N/P | | | |
| MONSTERRAT (United Kingdom) | | | | | | | | N/P | | | |
| NETHERLANDS ANTILLES (Netherlands) Willemstad Saint Maarten | Curaçao ACC Curaçao APP Juliana APP | E/T T | 120 60 | I I | E/T T | A/C A/C | 256 256 | I* I* | | | *MSSR *MSSR |
| PUERTO RICO (United States) Pico del Este San Juan | San Juan ACC San Juan APP | E/T | | I | E T | A/C A/C | | I I | | | |
| SAINT KITTS AND NEVIS | | | | | | | | NP | | | |

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| State(Territory)/Location Estado(Territorio)/Ubicación | ATS Unite Served Unidad ATS Servida | PSR | | | SSR | | | | ADS | | Remarks Observaciones |
|---|--|--------------------|-------------------------------|---------------------------|--------------------|----------------------------|-------------------------------|---------------------------|--------------|---------------------------|--|
| | | Funtion Función | Coverage Cobertura (NM) | Status Impl. Estado | Funtion Función | Modes Modos (A,C& S) | Coverage Cobertura (NM) | Status Impl. Estado | Type Tipo | Status Impl. Estado | |
| 1 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| SAINT LUCIA | Saint Lucia APP | | | | | | | NP* | | | * Radar data sharing with Martinique planned/ Proyecta compartir datos radar con Martinique. |
| SAINT VINCENT & THE GRENADINES | E.T.Joshua APP | | | | | | | NP | | | |
| TRINIDAD & TOBAGO Piarco (18 NM Northwest) | Piarco ACC | | | | E/T | A/C | 250 | I* | B | P | *MSSR |
| TURKS & CAICOS IS. (United Kingdom) Grand Turks | Miami ACC | | | | E | A/C | | I | | | |

APPENDIX 4B
CONCLUSIONS OF THE PREVIOUS RSTF MEETINGS

| Conclusion | Status | Observation |
|---|-------------------------|----------------------------------|
| RSTF1 | | |
| Conclusion 1/3 (RSTF1, §2.2) : Radar coverage | SUPERSEDED. | (Conclusion 2/4 of the 2nd RSTF) |
| Conclusion 1/4 (RSTF1, §2.3) Collection of the radar references | SUPERSEDED | (Conclusion 2/5 of the 2nd RSTF) |
| Conclusion 1/5 (RSTF1, §2.4) Radar messages format It was reported that French technical experts have planned to upgrade the DACOTA software to support cat 034 and 048. France will provide the meeting with a schedule for this software upgrade as soon as it is available. | VALID | |
| Conclusion 1/6 (RSTF1, §3.1) First Stage of remoting The meeting agreed to adopt a method similar to the French one before the implementation of radar approach services. For the calculation of the MRSAs, there is need to utilize digital mapping of the islands. Presently only Guadeloupe, Dominica, Martinique and St. Lucia digital charts are available. The meeting agreed that each State/Organization to make available the appropriate data for its country. | VALID SUPERSEDED | See conclusion RSTF 3/1. |

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| | | |
|---|--|--|
| <p>Conclusion 1/7 (RSTF1, §3.2.1) St Lucia It was also recognized that direct French/St. Lucian (with OECS) contact could help in the resolution of this item, all technical progress being reported to the task force.</p> | COMPLETED | The Saint Lucia radar remoting project has been included in the Working program of the RSTF. |
| <p>Conclusion 1/8 (RSTF1, §3.2.2) Trinidad and Tobago The task force agreed that based on versatility and technical capabilities of PC based displays, it would be advantageous for Trinidad and Tobago to consider implementing this technology as soon as possible.</p> | VALID | This conclusion is linked to the replacement of radar in Trinidad and Tobago. |
| <p>Conclusion 1/9 (RSTF1, §3.3) Other Units needs b) The task force agreed to analyze at its next meeting the most efficient way to provide Grenada and St. Vincent with radar coverage. c) It was agreed by the task force that any interim installation should be compatible with the final radar and display system. d) The US representative underlined that FAA is continuing internal discussions to determine if a requirement exists to use E/CAR radar data for FAA ATC purposes.</p> | <p>VALID</p> <p>VALID</p> <p>VALID</p> | |

| | | |
|---|------------------------------------|---|
| <p>Conclusion 1/9 (RSTF1, §3.3) Other Units needs (end) e) However, the task force was indicated that there was already a requirement for transmission of flight plan data and updated position reports on airborne flights, to be used for ATM purposes (i.e. Flow control management).</p> | SUPERSEDED | See conclusion RSTF 3/2. |
| <p>Conclusion 1/10 (RSTF1, §3.4) Final goal The final goal is to build a common seamless image for the E/CAR region. This multiradar image will be processed by the DACOTA Surveillance Data Processing and Distribution (SDPD) with the information received under ASTERIX format from any available antenna of the region (Trinidad ad Tobago, Barbados, Martinique, Guadeloupe, Antigua and Barbuda St. Martin and Puerto Rico). The result of this processing will be made available under ASTERIX format, through the new IACL digitized network, to any interested ATS unit of the E/CAR region.</p> | SUPERSEDED | RSTF2, Conclusion 2/2 |
| <p>Conclusion 1/11 (RSTF1, §3.5.1) Operational training a) The task force underlined also the need to implement periodical medical checks b) Training available in the region.</p> | <p>COMPLETED</p> <p>SUPERSEDED</p> | <p>a) No compulsory medical checks needed referring to ICAO annexes. See item 9.3 of the RSTF/3 final report.</p> <p>b) (RSTF2 conclusion 2/10)</p> |

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| | | |
|--|--|--|
| <p>Conclusion 1/13 (RSTF1, §4.1) States agreements</p> <p>a) It was agreed by the task force that agreements committing Radar antenna operators to provide their radar data to the DACOTA system will be needed prior to defining the final architecture of the E/CAR radar system.</p> <p>b) Barbados, Netherlands Antilles for St. Martin, OECS for Antigua and Barbuda, Trinidad and Tobago and United States of America shall provide the addresses of their respective appropriate authority</p> <p>c) The task force identified the need for a legal entity to coordinate and operate this radar system. This issue will be discussed at the next meeting of the task force and a proposal submitted to the E/CAR DCAs.</p> | <p>VALID</p> <p>VALID</p> <p>VALID</p> | <p>See item 7.1 of the RSTF/3 final report</p> |
| <p>Conclusion 1/14 (RSTF1, §4.2) LOAs</p> <p>Participants will review the proposed draft LOA and present their draft version to the next meeting. Three of them are expected :</p> <ul style="list-style-type: none"> * Legal entity / Trinidad * Legal entity / Barbados * Legal entity / Antigua | <p>VALID</p> | |
| <p>RSTF2</p> | | |
| <p>Conclusion 2/1 Compliance with GREPECAS guidelines</p> <p>That the meeting complies with the amended GREPECAS guidelines</p> | <p>COMPLETED</p> | |

| | | |
|--|------------|---|
| <p>Conclusion 2/2 Continuation of the RSTF objectives That the TASK FORCE carries on its task as mandated by the DCAs.</p> | SUPERSEDED | See Conclusion RSTF 3/3. |
| <p>Conclusion 2/3 Training needs assessment That States/Territories/Organizations assess the needs related to personnel and training with view to implement radar services</p> | VALID | OECS and / or St Lucia to present the result of their assessment. |
| <p>Conclusion 2/4 Radar coverage That Trinidad and Tobago and OECS (and Barbados partially) commit themselves to transmit coverage charts by the end of February 2003 as requested in Conclusion 1/3 (§ 2.2. of RSTF 1 Report).</p> | SUPERSEDED | See Conclusion RSTF 3/1. |
| <p>Conclusion 2/5 Trinidad WGS84 antenna coordinates That Trinidad and Tobago transmit their antenna coordinates in WGS84 and integrate GPS stamping in their equipment.</p> | VALID | <p>The WGS84 coordinates are not available.</p> <p>Considering the plans of Trinidad and Tobago for a new radar, the transmission of this information is postponed.</p> |
| <p>Conclusion 2/6 Integration of a new radar in the DACOTA RDPS That States/Territories/Organizations comply with elements included in appendix 4 to this report.</p> | VALID | Valid until the completion of the first integration. |
| | | |

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| | | |
|---|------------|--|
| Conclusion 2/7 Provision of technical requirements That the requirements, contacts, documentation and block diagrams hereabove quoted be transmitted not later than February 2003. | SUPERSEDED | See conclusions RSTF3/4. |
| Conclusion 2/8 2 nd DACOTA cost/benefice analysis That a cost/benefit analysis concerning the implementation of an alternate DACOTA be done by the French STNA. | COMPLETED | |
| Conclusion 2/9 Legal organization of the E/CAR Radar sharing That the attached documents be presented for the approval of the DCAs. | VALID | Were not presented because of some reservation of French legal experts |
| Conclusion 2/10 ATC training program That Barbados provide the TASK FORCE with the radar courses outlines and duration | COMPLETED | Barbados is now TRAINAIR certified. |

APPENDIX 4C

| |
|---|
| Draft Letter to be sent to E/CAR States regarding request for States' agreement to provide radar data to the DACOTA System. |
|---|

TEXT

The primary purpose of the Radar Data Sharing process, in addition to the enhancement of aviation safety, is to provide States and Territories of the Eastern Caribbean with a seamless radar image of Air Traffic Control.

The process involves transmitting the radar data from the islands of Trinidad, Barbados, Guadeloupe, Antigua and Saint Maarten to Martinique.

From the Martinique hub, a seamless image would then be retransmitted to any of the E/CAR States and Territories for the provision of Air Traffic Control in their areas of responsibility.

Conclusion 1/13 of the 1st Radar Sharing Task Force Meeting (June 1999, Martinique) recognized the need for radar operators in the Eastern Caribbean Region to provide their radar data to the French DACOTA Surveillance Data Processing and Distribution System.

The DACOTA System has now been tested, commissioned and is operational between the French Territories of Martinique and Guadeloupe. Martinique is currently using the output of DACOTA in the provision of Air Traffic Control, and a project for the remoting of radar data to Saint Lucia has begun. Tests have been conducted for connecting the Barbados radar to the system.

The agreement of the States of the Eastern Caribbean Region to formalize the provision of their radar data to the DACOTA system will be required in order to define the final architecture of the E/CAR radar system.

Accordingly, your State is encouraged to indicate its agreement to provide radar data to the DACOTA system in Martinique, to be used in the regional radar data sharing project.

- END -

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APPENDIX

| PRELIMINARY GUIDANCE ON TECHNICAL INFRASTRUCTURE AS SUPPORT OF THE EVOLUTIONARY IMPLEMENTATION OF ATS/ATM AUTOMATED SYSTEMS | | |
|--|--|--|
| Phase | Function | Technical Infrastructure available/ necessary |
| Phase I | Flight data processing (FDPS, FLP, RPL) | - AFTN |
| Phase II | ATS radar data processing system (RDPS); Mono-radar; Multi-radar/multitracking; Radar data sharing. | - AFTN - Communication circuit through the Frame Relay digital networks. |
| Phase III | Automated digital communication (Automated traffic hand off, AIDC, CPDLC and other. | - AFTN + Regional Interphase Control Document (ICD). - Communication circuit through the Frame Relay digital networks. - AMHS. - ATN Sub-networks ground -to-ground and air-to-ground, using some applications. |
| Phase IV | Implementation of CDM aspects. | - ATN Sub-networks ground -to-ground and air-to-ground. |

- END -

Agenda Item 6: Other business

Status of the E/CAR Regional CNS Committee

6.1 Based on the WP/9 presented by IACL, the Meeting noted that all attempts to convene a CNS Committee Meeting as mandated by the E/CAR WG, have failed.

6.2 IACL, as Rapporteur of the aforementioned Committee informed that three attempts were made during October 2003, January 2004 and May 2004, for States and Territories to submit updates and/or amendments to their respective National Plan and Timetable, in order to update the E/CAR CNS/ATM Plan. This was a pre-requisite for the convening of a meeting to review the E/CAR CNS/ATM Plan. Nevertheless, due to the general lack of response, the meeting did not take place.

6.3 The Meeting discussed the possible reasons of the States and Territories for the apparent lack of interest in forwarding amendments to their the National Plan and New Timetable. Based on this, the meeting formulated the following Draft Conclusion:

**DRAFT CONCLUSION 17: REQUEST TO SUPPORT THE E/CAR CNS ACTIVITIES
BY THE E/CAR DCAs**

That,

- a) E/CAR States and Territories consider to review the organizational structure of their aviation administrations with a view to ensuring that suitably trained personnel are assigned to specific responsibility for CNS matters; and
- b) ICAO NACC Regional Office informs the 19th E/CAR DCA Meeting, of the need for CNS planning in the E/CAR, and to have personnel appropriately trained, assigned and fully supported to carry out the CNS tasks.

- END -