



Agenda Item 3: Activities for the development of the air navigation systems/services
3.3 Communications, Navigation and Surveillance (CNS)

**ACTIONS PROPOSAL FOR A FASTER IMPLEMENTATION OF RADAR DATA SHARING IN
THE CENTRAL CARIBBEAN**

(Presented by Cuba)

SUMMARY

This working paper presents the follow-up of the radar data sharing task in the Central Caribbean Working Group and a proposal to the Meeting for actions aimed at promoting the plan development and execution.

References:

- GREPECAS/12 Report (Havana, Cuba, June 2005).
- C/CAR WG/5 Report (Mexico City, Mexico, February 2005).

1. Introduction

1.1 The C/CAR WG/3 Meeting recommended actions to the States/Territories/International Organizations and to the Radar Data Sharing Task Force to continue working on the planning and implementation for the exchange of radar data between the Central Caribbean ATS Units, considering the “*Revised Regional Guidelines for the Exchange of SSR Radar Data*” published by GREPECAS through its Conclusion 11/47. Likewise, the C/CAR WG/4 Meeting by the Decision 4/10 indicated to the mentioned Task Force to develop an action plan for the radar data sharing implementation.

1.2 The C/CAR WG/5 Meeting, through its Draft Conclusion 5/16 indicated that the States/Territories/International Organizations in charge of the air traffic services provision in the C/CAR interested in the radar data sharing, provide adequate experts to assist the work of the Radar Data Sharing Task Force in order to help the Task Force to advance expeditiously in the execution of its tasks and by its Draft Conclusion 5/21 expressed that the States/Territories/International Organizations who can benefit from radar data sharing start negotiations on a bilateral or multi-lateral basis to implement a radar data exchange programme, awaiting the further development of the system.

1.3 Based on the background and as a member of the C/CAR Radar Data Sharing Task Force, Cuba presents this review of the tasks follow-up and some proposals to contribute in an expedite manner to its execution.

2. Discussion

2.1 Taking into consideration that during the C/CAR WG/4 Meeting, through its Decision 4/10, the Radar Data Sharing Task Force was requested to prepare an action plan for the radar data sharing implementation and in the C/CAR WG/5 the mentioned Task Force Group reported the work carried out and the results were reviewed, stating various facts that may consider the need and feasibility to develop in the C/CAR subregion the awaited radar data sharing. This working paper expects to formulate an action plan proposal for the mentioned implementation to be considered for its approval in the C/CAR WG/6 Meeting if pertinent, by the Central Caribbean Directors General of Civil Aviation in its Eight Meeting.

2.2 Based on the General Regional Guidelines for the radar data sharing related to the identification of the ATS units that could obtain operational and important economic benefits when sharing its radar data, as well as the ATS units which do not have radar facilities and that could benefit with the data availability provided by the secondary surveillance radar (SSR) system from the neighbouring ATS units. Based in the CAR/SAM Regional Plan for the surveillance systems contained in the Table CNS 4A of the FASID, a table is presented in the **Appendix A** to this working paper, which identifies the relation between the tentative operational needs and the radar coverage available in the States/Territories/International Organizations of the C/CAR Region.

2.3 As identified by the C/CAR WG/5, the use of the ASTERIX protocol facilitates the surveillance data exchange goal in an efficient manner. Nevertheless, it should be recognized that the radars that do not support their data transmission in this protocol should not be excluded only for this reason, from the radar data sharing with neighbouring ATS units.

2.4 In any case, the States/Territories/International Organizations interested in the radar data sharing should provide the other parties interested in supporting this data sharing, the technical documentation required for the radar data output (that is, the format of the radar information and the communication protocol, the radar performance, as well the radar data implementation in ASTERIX format, which could vary from one radar manufacturer to another). The information exchanged between the parties should include a radar data recording with tools based on PCs in order to facilitate the analysis and investigation related to the radar control service.

2.5 On the other hand, a thorough analysis of the ASTERIX format implementation in various SSR installed or planned in the C/CAR, concludes that the radar data exchange supported in ASTERIX format should be open and hence be used in different ASTERIX categories, whether in CAT 001 and 002 for radars where the possibility of Mode S, CAT 034 and 048 has not been contemplated, for radars where this information transmission in Mode S is already foreseen, CAT 021 for the potential reception of surveillance information from the 1090ES aircrafts transmissions expected to be implemented in the Region, and even CAT 030 and CAT 062 and 063 for the data sharing coming from the Surveillance Data Process Systems (SDPS). As recognized in the C/CAR WG/5, the capacity for the transmittal information of aircrafts identification (managed through data transmission in ASTERIX CAT 030 and 062 format), would have a positive effect in the data integration between multiple surveillance radar systems in the C/CAR area.

2.6 In the tendency of working with no ASTERIX radar data formats converted into ASTERIX or by different ASTERIX radar format Categories, the Cuban experts have been working during the last years relying on its SDPS by using the protocols based in the ASTERIX format for the radar data exchange within the Cuban Republic and that this data leads from a unique system to the different Cuban ATS units, using the Cuban Civil Aviation Data Network (REDAC), as a previous pre-ATN step. With the experience acquired, the Cuban CNS experts are willing to provide technical training for the radar data exchange to the States/Territories/International Organizations of the Sub-region.

2.7 Also, recognizing the level of development in the automated ATM field and the implementation status of the radar surveillance systems in the majority of the C/CAR States/Territories/International Organizations and considering the availability of the MEVA II Network for the radar data transmission, currently in its implementation process in the C/CAR. It is considered that the most feasible way to exchange radar data in the initial phase is to be based on the coordination of bilateral agreements, with short term actions allowing the mutual support of entire centres between adjacent FIRs, providing as such a high redundancy in the ATC C/CAR system and significantly improving the air traffic control harmonization in this area, if the exchange is based as far as possible in the co-related information from the SDPS.

2.8 In previous Meetings it has been expressed the need to take practical steps to achieve in the shortest term bilateral or multilateral agreements. A proposal of an action plan is suggested to the Meeting to coordinate a bilateral agreement between interested units to support the radar data exchange, shown in the **Appendix B** to this working paper.

2.9 Taking into account that it is essential that the steps proposed in the action plan are necessary and should be executed with the necessary moderation and organization, it is our belief that the best way to achieve at any moment a sharing radar image between the C/CAR States/Territories/International Organizations is to begin with the initial coordination of bilateral agreements among the most interested units and as the experience becomes successful and demonstrates the advantages and feasibility of the radar data sharing, these bilateral agreements could be extended to a Central Caribbean multilateral agreement and subsequently could be associated to other similar agreements in the CAR/SAM Regions and should be accordingly considered.

2.10 After considering the benefits of the radar data sharing in bilateral and multilateral plans at a subregional level, it should be recognized the improvement that would be obtained in terms of Air Traffic Flow Management (AFTM).

3. Suggested actions

3.1 The Meeting is invited to:

- a) take note of the contents of this Working Paper;
- b) review the table on the tentative Guide for the analysis of the radar data sharing presented in Appendix A to this paper, evaluating the correspondence between the operational needs and the available radar coverage in the C/CAR, aimed at adopting it as an initial base for the radar data sharing feasibility studies;
- c) update the required information on the SSR stations of the C/CAR States/Territories/International Organizations to support the analyses of radar data sharing feasibility;

- d) consider the offer from Cuba to provide training in the radar data sharing field; and
- e) review the action plan proposal shown in Appendix B to this working paper and consider it if pertinent that the Meeting adopts the following Draft Conclusion:

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CONCLUSION 6/XX:

**ACTION PLAN FOR THE ACHIEVEMENT OF
BILATERAL AGREEMENTS BETWEEN ATS
UNITS INTERESTED IN SUPPORTING THE
RADAR DATA SHARING**

That the C/CAR States/Territories/International Organizations interested in the coordination of bilateral agreements between ATS units for the radar data sharing, execute the Action Plan contained in Appendix XX to this Report on the agenda item.

APPENDIX A**TENTATIVE GUIDE FOR THE ANALYSIS OF THE RADAR DATA SHARING IN THE
CENTRAL CARIBBEAN**

State	ATS Units	Usable coverage or potential improvement in the radar data redundancy
Netherlands Antilles	Curacao ACC	Usable radar data from Aruba, Colombia, Jamaica, Puerto Rico (United States), Santo Domingo and Venezuela.
Aruba	Aruba APP	Usable radar data from Curacao.
Bahamas	Nassau APP	Usable radar data from Cuba and Miami (United States)
COCESNA	CENAMER ACC	Usable radar data from Cuba and Mexico.
Cuba	Havana ACC	Usable radar data from Mexico, Jamaica and Miami (United States).
United States	Miami ACC San Juan ACC	Usable radar data from Cuba and Bahamas. Usable radar data from Santo Domingo.
Haiti	Port-au-Prince ACC	Usable radar data from Jamaica. and Santo Domingo
Cayman Islands	Georgetown APP	Usable radar data from Cuba, Jamaica and COCESNA
Jamaica	Kingston ACC	Usable radar data from Cuba and COCESNA
Mexico	Mérida ACC	Usable radar data from Cuba and COCESNA.
Dominican Republic	Santo Domingo ACC	Usable radar data from Netherlands Antilles and Puerto Rico (United States).

APPENDIX B

ACTION PLAN FOR THE ACHIEVEMENT OF BILATERAL AGREEMENTS IN SUPPORTING THE RADAR DATA SHARING BETWEEN INTERESTED ATS UNITS

1. Develop and coordinate a letter of agreement between the interested parties in supporting the radar data sharing, defining the sharing scope, in accordance with the requirements and technical capabilities of each part and to define each one responsibilities in the radar data sharing, in the part providing the radar data as the one utilizing it for its ATS service.

In this letter of agreement responsibilities must be clearly expressed regarding the quality control of the radar data (availability, integrity, precision and service continuity), as per the data provider part and the part using it, defining the double control need in both units and the procedures to detect the standards deviation of the radar signal used in the data sharing.

In any case, each part's responsibility should be expressed on the correspondent cost payment of this radar data sharing, mainly in the mentioned communication services payment.

2. Each part identification of the required staff to carry out the work and also the training needs of these staff, in the technical and operational aspects.
3. To conduct a detailed survey for the necessary equipment's implementation for the radar data sharing, including the communication needs for this implementation. This includes the exchange of technical and operational information concluding that the radar data sharing will allow to efficiently obtain the operational requirements pursued, in relation to the costs.
4. A joint evaluation of the integration of new radar to the SDPS system. This evaluation includes both, the radar evaluation and the created multiradar track evaluation, as well as the simultaneous recording of radar data from the previously existent sources with the radar source integrated and the evaluation of the adaptations to the SDPS software consider necessary in order to integrate the new signal. These tests are necessary, whether if the radar signal sharing will be used with redundancy purposes or if it has the intention to use the radar signal sharing as the only radar source for the ATS services provision.
5. Temporary implementation of a radar signal sharing in a pre-operational environment, which allows the execution of the technical tests considered appropriate and convenient.
6. Maintenance personnel training in both units in order to establish the correct detection procedures to the new demands in the surveillance field.
7. Survey on the operational aspects which have achieved improvement with the introduction of radar sharing between the units and evaluation of these improvements in relation to the real costs derived from the implementation, in financial and human resources.
8. ATC operational personnel training, considering the new service improvements due to the radar data sharing.
9. Final adjustments, validation and certification of the radar data sharing use by the relevant aeronautical authorities.
10. At the initiation of the radar data sharing project, amend if necessary, the approved letters of agreement between ATS units, taking into account the objectives and the technical and operational compliance achieved during the project's process.
11. Operational execution of the ATS services considering the radar data sharing.