



Agenda Item 2: Air navigation issues
2.1 Review of the Summary of Discussions of the Fourth C/CAR Working Group Meeting.

WGS-84 IMPLEMENTATION

(Presented by the Secretariat)

SUMMARY

In view that more than five years have elapsed since the promulgation of the application date of the WGS-84 System, and that in order to finalize its implementation it is necessary that the geographical coordinates of the boundaries of the FIRs be determined in this system, civil aviation authorities are hereby urged to take effective measures to achieve the total implementation of WGS-84 in the C/CAR area.

References:

- Report of the Fourth Central Caribbean Working Group Meeting (Santo Domingo, Dominican Republic, 9 to 13 February 2004)

1. Introduction

1.1 During the Fourth Meeting of the Central Caribbean Working Group (C/CAR WG/4, Santo Domingo, Dominican Republic, February 2004) WP/07 was discussed, which objective was to urge the Aviation Authorities to comply with the total implementation of the WGS-84 System. Most of the contents of that paper is transcribed in this Working Paper for consideration by the Meeting, and it is, basically, as follows:

1.2 The Council of ICAO adopted the WGS/84 geodetic system as the standardized global geodetic reference system for international civil aviation, and established 1 January 1998 as the application date in which geographical coordinates on which the air navigation systems are based were to be published by the States.

1.3 Consequently, some States, in an individual manner, and the international community together have made many efforts to implement the system in their respective countries and regions. Nevertheless, in the CAR Region the implementation of WGS-84 is still pending in view that several States do not yet comply with this international standard.

1.4 Likewise, in view of the importance of the issue of the implementation of the system, it has been discussed in different regional and subregional meetings such as the CAR/SAM/3 RAN, GREPECAS and Directors of Civil Aviation Meetings of the CAR Region. In these fora, aviation authorities have always agreed that WGS-84 is a high-priority matter.

1.5 Moreover, within the subject, the need of States/Territories with adjacent FIRs for coordination of the determination and publication of geographical coordinates in those neighbouring common points, as agreed upon at the C/CAR WG/1, has been specifically discussed.

2. Discussion

2.1 Since the first meeting of this Working Group, and during the Meetings of the C/CAR DCA, different conclusions have been adopted pointing towards the need of totally implementing the WGS-84 geodetic system, and the impact of this implementation on air navigation safety has also been emphasized. Notwithstanding this fact, and the efforts carried out by some States/Territories, the total implementation of the system is still pending after more than five years of its application date. This situation is a concern for the aeronautical community in view that there is no notice about a plan nor an estimated date for its total implementation in the CAR States that have not yet finalized the transformation of coordinates into WGS-84.

2.2 The implementation of this geodetic system is all the more important in these moments when RNAV and RNP systems are being developed, requiring accuracy and integrity in data and, therefore, availability of WGS-84 coordinates. Now that States/Territories/International Organizations have recognized the importance of progressing in the CNS/ATM system, in order to establish their Air Traffic Management Services with these systems, it is more urgent to transform the relevant geographical coordinates for air navigation into WGS-84 coordinates.

2.3 The Authorities have also recognized that the lack of implementation of this system entails the use of a diversity of coordinates data that has been determined based on other geodetic systems that may have a serious impact on air safety with regrettable consequences if no necessary measures are taken to carry out an effective implementation of the system.

2.4 Within this context, and in view that not all the States/Territories/International Organizations have implemented the system, there is also a situation preventing States that already have consolidated coordinates supporting air navigation in their corresponding territories to advance, as they cannot determine the common coordinates at the limits of the adjacent FIRs. This requires an agreement between States/Territories/International Organizations and a team work to facilitate the transformation of these border coordinates.

2.5 Based on the above, the C/CAR WG/4 Meeting formulated Draft Conclusion 4/12 – *Follow-Up to the Total Implementation of WGS-84*– for consideration by this 7th C/CAR DCA Meeting. In order to formulate the foregoing as a Draft Conclusion for the Directors, the Group considered that it was necessary to develop a programme establishing deadlines allowing States/Territories to reach an agreement on the determination of the geographical coordinates of the common points in the boundaries of the adjacent FIRs, and it was observed that in order to facilitate the determination of the aforementioned, the programme would include a table with information of the coordinates of the boundary points. **Appendix A** to this Working Paper shows examples of the table developed by the Rapporteur of the AIS/MAP Task Force, for consideration by the Meeting. For ease of reference of the Directors, Draft Conclusion 4/12 of the C/CAR WG/4 Meeting is transcribed as follows.

DRAFT**CONCLUSION 4/12 FOLLOW-UP TO THE TOTAL IMPLEMENTATION OF WGS-84**

That, considering that the RNAV and RNP systems, including RVSM, are in an advanced implementation phase, and that for their efficient application the strict accuracy and integrity of data on which they are based is required, the States/Territories of the C/CAR agree to:

- a) carry out a greater and more effective follow-up to the total implementation of the WGS-84 System;*
- b) establish 30 November 2004 as the deadline for the total implementation of WGS-84 in the C/CAR area;*
- c) develop technical assistance agreements of which the experience obtained by the States that have already implemented the system in their territories may be taken advantage;*
- d) prepare a work programme among States with adjacent FIRs to determine the deadlines for the electronic exchange of the data related to geographical coordinates of the common points in the boundaries of the FIRs, their coordination, standardization and publication;*
- e) charge the ICAO NACC Regional Office with the preparation of the programme and the follow-up of its compliance, as well as with the implementation of such coordinates, to that end, the C/CAR AIS/MAP TF, based on that programme, will comply with the task and will inform the forthcoming C/CAR DCA/7 Meeting; and*
- f) in case of discrepancy among States, impossible to resolve by the C/CAR AIS/MAP/TF, the ICAO NACC Regional Office will act as conciliator in order to achieve a prompt resolution to the discrepancy.*

2.6 Based on this Draft Conclusion, the Meeting is informed that Cuba, Jamaica and United States have succeeded in establishing a more practical procedure to determine the coordinates in the limits of their respective FIRs, and in order to render feasible and effective the action to be taken by the Authorities in this regard, the Meeting should analyze the convenience of following the example established by these States to attain the bilateral agreements of the corresponding coordinates. It should be noted that in the case of those agreements, the development of the proposed timetable was obviated as it was not essential for the development of the work.

3. Conclusion

3.1 Bearing in mind that through Conclusion 4/6 - *Completion of the Implementation of the WGS/84 System and Development and Publication of Aeronautical Chart*, of the C/CAR DCA/4 Meeting and Conclusion 5/6 - *Total Implementation of WGS-84 in the Central Caribbean States/Territories* of the C/CAR DCA/5 Meeting, which are included in **Appendix B** for ease of reference, States/Territories were urged to establish agreements in order to complete the implementation of the system and to coordinate the determination of the common points coordinates in the adjacent FIRs, the Meeting should consider the need for reactivating these initiatives so that the C/CAR States/Territories may make more efforts, follow-up and establish the real purpose of the definite implementation of the WGS-84 System in the Central Caribbean.

3.2 In line with the above, and with the experience obtained by Cuba, Jamaica and United States, as indicated in paragraph 2.6 of this Working Paper, Aviation Authorities should consider to follow these examples and assign this task to the C/CAR WG so that it may be carried out through its AIS/MAP Task Force, in close coordination and follow-up by ICAO.

4. Suggested Action

4.1 Based on the information of this Working Paper, on Draft Conclusion 4/12 of the C/CAR WG Meeting and on the experience of Cuba, Jamaica and United States on this matter, the Meeting is invited to:

- a) note the contents of this paper; and
- b) when considering the adoption of Draft Conclusion 4/12 and, to render feasible the action stipulated in the aforementioned Draft Conclusion, a new Draft Conclusion be approved with the suggested modification:

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CONCLUSION 7/X

FOLLOW-UP TO THE TOTAL IMPLEMENTATION OF WGS-84

That, considering that the RNAV and RNP systems, including RVSM, are in an advanced implementation phase, and that for their efficient application the strict accuracy and integrity of data on which they are based is required, the States/Territories of the C/CAR agree to:

- a) carry out a greater and more effective follow-up to the total implementation of the WGS-84 System;
- b) establish **30 November 2004** as the deadline for the total implementation of WGS-84 in the States/Territories of the C/CAR;
- c) develop technical assistance agreements of which the experience obtained by the States that have already implemented the system in their territories may be taken advantage;
- d) designate the C/CAR WG to carry out the task of preparing and completing the tables included in the Appendix to this part of the report (Appendix A to this Working Paper), through its AIS/MAP Task Force, so that States/Territories with adjacent FIRs determine bilaterally the geographical coordinates of the common points at the boundaries of the FIRs, as well as its standardization and publication by 30 November 2004;
- e) establish electronic means or any other suitable communication means to carry out this task, in order to take quick actions in the exchange of data among States/Territories.

- f) request the C/CAR WG to inform the ICAO NACC Regional Office on the progress of the agreements obtained among the different States/Territories so that it may follow-up the corresponding implementation; and
- h) request the Regional Office to act as conciliatory for the quick resolution of the cases where some discrepancy impossible to resolve by the C/CAR AIS/MAP/TF may arise.

APPENDIX A

EXAMPLES OF THE TABLE WITH INFORMATION OF THE COORDINATES OF THE
BOUNDARY POINTSHarmonization of WGS-84 boundary coordinates
FIR/CTA HAVANA – FIR/CTA MIAMI

No.	Significant point name	JEPPESEN COORD	CUBAN COORD	HARMONIZED COORD	RESULTING CHANGES
1	BORDO	24 00 00 N 078 27 30 W	24 00 01 N 078 27 29 W	24 00 00 N 078 27 30 W	
2	CANOA	24 00 00 N 083 03 00 W	24 00 02 N 083 04 00 W	24 00 00 N 083 03 00 W	VINKA-CANOA 108 NM 065°/245°
3	MAXIM	24 00 00 N 082 31 06 W	24 00 02 N 082 31 06 W	24 00 00 N 082 31 06 W	
4	TADPO	24 00 00 N 081 13 00 W	24 00 02 N 081 12 59 W	24 00 00 N 081 13 00 W	
5	TANIA	24 01 48 N 079 31 42 W	24 01 49 N 079 31 38 W	24 01 48 N 079 31 42 W	
6	URSUS	24 00 00 N 079 04 12 W	24 00 01 N 079 04 10 W	24 00 00 N 079 04 12 W	
7	BYGON	These two coordinates were harmonized by e-mail between FAA and IACC as at 17 March 2004.		20 30 20 N/ 073 49 57 W	
8	UMO-ZIN FIR crossing point			20 51 02 N/ 074 06 47 W	

**Harmonization of WGS-84 boundary coordinates
FIR/CTA HAVANA – FIR/CTA KINGSTON – TMA CAYMAN**

No.	Significant point name	CAYMAN COORD (AIP 27 DEC 2001)	KINGSTON COORD.	CUBAN COORD.	HARMONIZED COORD. WITH KINGSTON	RESULTING CHANGES
1	KARUL	20 00 05 N 081 48 04 W	20 00 00 N 081 48 01 W	20 00 00 N 081 48 00 W	20 00 00 N 081 48 01 W	GERONA-KARUL 121 NM 153°/333°
2	ATUVI	20 00 26 N 081 25 17 W	20 00 00 N 081 25 15 W	20 00 00 N 081 25 30 W	20 00 00 N 081 25 15 W	
3	RIKEL	20 00 34 N 081 02 23 W	20 00 00 N 081 02 40 W	20 00 00 N 081 03 00 W	20 00 00 N 081 02 40 W	DEBOR-RIKEL 207°/27°
4	KANEX	19 59 43 N 080 43 19 W	20 00 00 N 080 43 04 W	20 00 00 N 080 43 12 W	20 00 00 N 080 43 04 W	
5	LESOM	20 00 00 N 080 07 28 W	20 00 00 N 080 07 28 W	20 00 00 N 080 07 24 W	20 00 00 N 080 07 28 W	CAYOLARGO- LESOM 124 NM
6	KATAL	19 59 49 N 079 38 05 W	20 00 00 N 079 38 18 W	20 00 00 N 079 38 00 W	20 00 00 N 079 38 18 W	
7	GAXER				20 00 00 N 079 09 30 W	
8	GONIS		20 00 00 N 078 56 11 W	20 00 00 N 078 57 36 W	20 00 00 N 078 56 11 W	AVILA-GONIS 188°/008°
9	PUTUL		19 58 34 N 078 17 36 W	19 58 36 N 078 17 36 W	19 58 34 N 078 17 36 W	AVILA-PUTUL 125 NM
9	TOTON		19 32 26 N 077 34 02 W	19 32 30 N 077 34 06 W	19 32 26 N 077 34 02 W	
10	MATOS		19 29 23 N 077 28 26 W	19 29 30 N 077 28 30 W	19 29 23 N 077 28 26 W	
11	BEMOL		19 20 26 N 077 05 36 W	19 19 30 N 077 05 48 W	19 20 26 N 077 05 36 W	MANAZANILLO- BEMOL 58 NM
12	PULKA				19 16 20 N 076 57 38 W	
13	GELOG				18 33 42 N 075 10 42 W	

**Harmonization of WGS-84 boundary coordinates
FIR/CTA HAVANA – FIR/CTA CENAMER**

No.	Significant point name	CENAMER COORD	CUBAN COORD	HARMONIZED COORD	RESULTING CHANGES
1	BISTO		20 22 32 N 083 39 00 W		
2	PISIS		20 12 17 N 082 54 04 W		
3	SELEK		20 05 50 N 082 23 48 W		
4	PABEL			20 27 12 N 083 57 06 W	GERONA-PABEL NO CHANGES

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**Harmonization of WGS-84 boundary coordinates
FIR/CTA HAVANA – FIR/CTA MIAMI OCEANIC-FIR/CTA NASSAU**

No.	Significant point name	JEPPESEN COORD	NASSAU COORD	CUBAN COORD	HARMONIZED COORD	RESULTING CHANGES
1	DINAH			23 57 00 N 077 56 47 W		
2	ENAMO			23 34 14 N 077 22 14 W		

**Harmonization of WGS-84 boundary coordinates
FIR/CTA HAVANA – FIR/CTA MERIDA**

No.	Significant point name	CENAMER COORD.	CUBAN COORD	HARMONIZED COORD	RESULTING CHANGES
1	ALURU		22 28 14 N 086 00 00 W		
2	EMOSA		21 49 32 N 085 54 42 W		
3	LENUK		22 37 56 N 086 00 00 W		
4	NOSAT		21 57 50 N 085 58 54 W		
5	NUDAL		21 15 32 N 085 37 06 W		
6	NUKAN		21 29 32 N 085 44 18 W		

APPENDIX B
CONCLUSION 4/16 OF THE C/CAR DCA/4 AND CONCLUSION 5/6 OF THE C/CAR DCA/5
MEETINGS

CONCLUSION 4/16: **COMPLETION OF THE IMPLEMENTATION OF THE WGS/84**
SYSTEM AND DEVELOPMENT AND PUBLICATION OF
AERONAUTICAL CHARTS

The Directors of the States/Territories of the Central Caribbean agreed to the following:

- a) consider the need of establishing bilaterally or collectively, agreements with other States/Organizations to fully accomplish the implementation of the System WGS-84;*
- b) continue with the evaluation and surveys in all the airports of the Region, including the obstacles and navigation aids, so that these are completed as soon as possible, in order to meet the ICAO requirements;*
- c) coordinate bilaterally or multi-laterally with adjacent FIR's States/Territories/Organizations in order to determine the common WGS-84 coordinate points and their consequent publication;*
- d) establish procedures for the WGS-84 data survey management;*
- e) that in order to perform an effective application of WGS-84, development of instrument procedures and publication of aeronautical charts in the AIP is essential;*
- f) identify all training opportunities for personnel in the area of instrument procedures development. **Attachment H** to this part of the Report details some of these training opportunities; and*
- g) that the C/CAR Working Group supervise the progress of this conclusion and coordinate the action which will contribute to the proposed objectives.*

CONCLUSION 5/6 **TOTAL IMPLEMENTATION OF WGS84 IN THE CENTRAL**
CARIBBEAN STATES/TERRITORIES

That Central Caribbean States/Territories:

- a) establish Technical Cooperation Agreements to complete the WGS-84 System Implementation and coordinate the common points of the adjacent FIRs determination in the WGS-84 System for later publication; and*
- b) publish their coordinates in their corresponding AIP regarding its effective application by users and to complete the establishment of WGS-84 System.*

- END -