



Agenda Item 2: Analysis of Version 02 of the SAM ATS route network

SAM ATS Route Network Optimisation

(Presented by Brazil)

Summary	
In this working paper, the Meeting is invited to analyse the proposals for implementation, realignment, and cancellation of RNAV 5 routes with a view to the optimisation of the SAM ATS route network, Phase 3, Version 2, supplementing or replacing the routes presented at the SAM/IG/9 meeting, and to make the modifications and improvements it may deem appropriate.	
References: <ul style="list-style-type: none">- Annex 11 to the ICAO Convention- Document 4444, ATM, Procedures for Air Navigation Services- Doc 9426, Air Traffic Services Planning Manual- SAM ATS Route Network Optimisation Programme SAM/IG/9 meeting report	
ICAO strategic objectives:	<i>A - Safety</i> <i>C – Environmental protection and sustainable development of air transport</i>

1 Background

1.1 As stated in the introduction to the ATS Route Network Optimisation Programme, at the request of the States and International Organisations, the ICAO regular programme, amongst other implementation projects, has focused its attention on the optimisation of the SAM ATS route network optimisation.

1.2 With a view to drafting Version 2 of the route network, the SAM/IG/8 meeting agreed to hire 2 experts for a period of 3 weeks to develop guidance material for the application of the flexible use of airspace concept and to conduct a detailed study of the SAM ATS route network.

1.3 Mr. Jorge Fernández and Mr. Tomás Yentz, the consultants hired through Regional Project RLA/06/901, prepared a preliminary report for the optimisation of the SAM ATS route network, Phase 3, Version 2, which appears in **Appendix A** to this working paper.

2 Discussion

2.1 The SAM/IG/9 meeting, in a very preliminary analysis of the study conducted by the experts, noted that the estimates of the savings resulting from this optimisation were very promising, even when they only considered point-to-point paths between terminals and not paths within terminal areas of States and standard departures and arrivals.

2.2 Upon reviewing the preliminary report on the analysis of the optimisation of the SAM ATS route network, Phase 3, Version 2, the SAM/IG/9 meeting deemed it appropriate to make recommendations to the States regarding the analysis of some routes and:

- a) eliminated the routes that users deemed unnecessary for the time being based on savings, traffic, and airline business plans.
- b) requested the support of the Project to hire 2 experts for 3 weeks to continue the initial work, enriched with the data to be provided by the States at the SAM ATSRO/4 meeting and traffic data to be obtained in August 2012.
- c) requested airline operators flying these routes to conduct the corresponding studies of the proposed routes, taking into account flight time over the mountain range, flight time with one engine inoperative, weather conditions, volcanic conditions, etc. that might affect them.
- d) requested airline operators to provide information to the SAM ATSRO/4 meeting on the routes that might be eliminated in addition to those defined in the study.
- e) requested the Secretariat to consider inviting the major operators of the Region to send their operations planning experts to attend the meetings for the development of the second stage of this route optimisation phase with a view to creating an extended optimisation group for the analysis and optimisation of the ATS route network.
- f) requested the States that may deem it relevant and advisable for their airspace planning to send an additional expert to work together with the hired experts and the operators.

2.3 The SAM/IG/9 meeting also emphasised the need for States to focus on this matter in order to complete the required analyses before July 2012 and submit them to the SAM ATS/RO/4 meeting.

2.4 Upon analysing the route optimisation plan, the SAM/IG/9 meeting made the adjustments it deemed necessary. It also deemed it advisable to encourage States to continue with that stated in item 2.48 and subsequent items of the report of the SAM ATSRO/3 meeting concerning routes pending implementation, taking into account the scope of the work to be conducted on the SAM ATS route network. Accordingly, it requested that States to conduct, prior to the SAM ATSRO/4 meeting, a feasibility study of the approved routes in order to enable their analysis, and to provide information on RNAV/RNP gateways in their terminal areas so as to be able to continue with the scheduled work.

2.5 In this regard, Brazil analysed the contents of the preliminary report on the optimisation of the SAM ATS route network, Phase 3, Version 2, shown in Appendix A to the final report of the SAM/IG/9 meeting, and proposed the modifications described in **Appendix A** to this working paper.

3 Suggested action

3.1 To urge the Meeting to review the adjustments and modifications made to the preliminary report on the optimisation of the SAM ATS route network, Phase 3, Version 2, shown in **Appendix A** to this working paper, and make the recommendations it may deem appropriate as requested.

Apéndice / Appendix A

Planilla de Rutas analizadas en la Región SAM involucrando el Espacio Aéreo Brasileño
Table of routes analysed in the SAM Region involving the Brazilian airspace

Ev	Tramo de Ciudades <i>Segment of Cities</i>	Ruta actual / <i>Current route</i> (FliteStar)	Trayectoria propuesta por SAM <i>Trajectory proposed</i> <i>by SAM</i>	Tramo de Ciudades propuesto por Brasil <i>Segment of cities proposed</i> <i>by Brazil</i>	Trayectoria propuesta por Brasil <i>Trajectory proposed</i> <i>by Brazil</i>	Notas/Notes
01	<u>Buenos Aires /Sao Paulo</u> (Unidireccional)	<u>UA 305 UN857</u> <u>UM671</u> <u>RONUT</u>	<u>Desde/From WPA1</u> <u>S34.38.54.59/W57.43.23.69</u> <u>a/to ASONO</u>	<u>Buenos Aires /Sao Paulo</u> (Unidireccional)	<u>VOR PTA, DORVO, 788A,</u> <u>MUMIL, OSAMU,</u> <u>RONUT, ANISE, NDB</u> <u>SAT, VOR SJC</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM798,</u> <u>UNIDIRECCIONAL</u>
02	<u>Sao Paulo/Buenos Aires</u> (Unidireccional)	<u>UM788, UN741</u>	<u>CURSE TMA SAO PAULO</u> <u>A PAPIX TMA</u>	<u>Sao Paulo/Buenos Aires</u> (Unidireccional)	<u>VOR CGO, 792B, PAKOV,</u> <u>DELAY, CLUMB, 792A,</u> <u>PAPIX, VOR EZE</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM792,</u> <u>UNIDIRECCIONAL</u>
03	<u>Rio/Buenos Aires</u> (Bidireccional)	<u>UN857,UM534,</u> <u>UN741</u>	<u>EZE/DORVO/BITAK/EFS</u>	<u>Buenos Aires /Rio de Janeiro</u> (Unidireccional)	<u>VOR PTA, DORVO, VOR</u> <u>POR, EKUBI, BITAK</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UN857,</u> <u>UNIDIRECCIONAL</u>
04	=	=	=	<u>Rio de Janeiro/Buenos Aires</u> (Unidireccional)	<u>VOR MIA, KOLBI,</u> <u>NANDU, OBLAD, VOR</u> <u>EZE</u>	<u>Nueva ruta/ New</u> <u>route UMXX2,</u> <u>UNIDIRECCIONAL</u>
05	<u>Montevideo/ Sao Paulo</u> (Unidireccional)	<u>UM540, UM671,</u>	<u>CRR/KILUM/WPU2/ANISE</u> <u>/RDE/CGO</u>	<u>Montevideo/ Sao Paulo</u> (Unidireccional)	<u>VOR CRR, AKPOD,</u> <u>CALVE, VOR POR,</u> <u>JUCE, 540A, 540B,</u> <u>RONUT, NDB SAT</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM540,</u> <u>UNIDIRECCIONAL</u>
06	=	=	=	<u>São Paulo/Montevideo</u> (Unidireccional)	<u>VOR SGO, CURSE,</u> <u>XX1M, VOR CRR</u>	<u>Nueva ruta</u> <u>UMXX3,</u> <u>UNIDIRECCIONAL</u>
07	<u>Montevideo/ Rio de Janeiro</u>	<u>UM540, UN857,</u>	<u>UM661 O UN857 luego de</u> <u>TELAKE a NEROK</u>	<u>Montevideo/ Rio de Janeiro</u> (Bidireccional)	<u>VOR CRR, KILUM,</u> <u>WPU1, TODAX, UGELO,</u> <u>VOR PTS, XX1K, XX1R,</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM671,</u> <u>BIDIRECCIONAL</u>
08	=	=	=	<u>Rio de Janeiro /Montevideo</u> (Bidireccional)	<u>XX1R, XX1K, VOR PTS,</u> <u>UGELO, TODAX, WPU1,</u> <u>KILUM, VOR CRR,</u>	

Ev	Tramo de Ciudades Segment of Cities	Ruta actual / Current route (FliteStar)	Trayectoria propuesta por SAM Trajectory proposed by SAM	Tramo de Ciudades propuesto por Brasil Segment of cities proposed by Brazil	Trayectoria propuesta por Brasil Trajectory proposed by Brazil	Notas/Notes
09	<u>Sao Paulo/ Santiago</u> (Unidireccional)	<u>UL310, UM400,</u> <u>UA307,</u> <u>UA306</u>	<u>Ruta Unidireccional, sentido</u> <u>DORMI a UMKAL/</u> <u>Unni-directional route,</u> <u>direction DORMI to</u> <u>UMKAL</u>	<u>Sao Paulo/ Santiago</u> (Unidireccional)	<u>VOR CGO, 310A(LF),</u> <u>UNKAL</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UL310,</u> <u>UNIDIRECCIONAL</u>
10	<u>Santiago/ Sao Paulo</u> (Unidireccional)	<u>UA307, UM400,</u> <u>UW6,</u> <u>UM548, UW47</u>	<u>Ruta Unidireccional, de</u> <u>NEBEG a ASONO/</u> <u>REKIR/ UM400</u> <u>Uni-directional route from</u> <u>NEBEG to ASONO.</u>	<u>Santiago/ Sao Paulo</u> (Unidireccional)	<u>ARULA, VOR CTB,</u> <u>NEGUS, VOR RDE.</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UZ36,</u> <u>UNIDIRECCIONAL</u>
11	=	=	=	<u>Santiago/ Rio de Janeiro</u> (Bidireccional)	<u>VOR CBA, BITAK</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM400,</u> <u>BIDIRECCIONAL</u>
12	=	=	=	<u>Rio de Janeiro/Santiago</u> (Bidireccional)	<u>BITAK, VOR CBA</u>	
13	<u>Lima/ Sao Paulo</u> (Unidireccional)	<u>UM415, UW50,</u> <u>UA304,</u> <u>UA320</u>	<u>EGLAS, VIRU VIRU,</u> <u>BAURU a TMA Sao Paulo</u>	<u>Lima/ Sao Paulo</u> (Unidireccional)	<u>VOR VIR, VOR GRD,</u> <u>NDB RCL, VOR BGC,</u> <u>VOR SJC</u>	<u>Nueva ruta</u> <u>UMXX6,</u> <u>UNIDIRECCIONAL</u>
14	<u>Sao Paulo/Lima</u>	<u>UW50, UM415,</u> <u>UA304,</u> <u>UA320</u>	<u>VOR SCB a VOR ASIA</u>	<u>Sao Paulo/Lima</u> (Unidireccional)	<u>VOR SCB, VOR ASIA</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM415,</u> <u>UNIDIRECCIONAL</u>
15	<u>Sao Paulo/Bogotá</u>	<u>UM782, UL655</u>	<u>Reorganizar flujo de</u> <u>tránsito utilizando rutas</u> <u>existentes /Reorganize air</u> <u>traffic flow using routes</u>	<u>Sao Paulo/Bogotá</u> (Unidireccional)	<u>MEVIL, VOR CIA,</u> <u>ISUGO, PRIMA, VOR SJE</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM782,</u> <u>UNIDIRECCIONAL</u>
16	<u>Sao Paulo/ Caracas</u>	<u>UL304, UW27,</u> <u>UM417</u>	<u>UM417, MIQ, TUY, BRU</u>	<u>Sao Paulo/ Caracas</u> (Unidireccional)	<u>NDB RPR, LUVTA,</u> <u>304A1, VOR CBC (CABO</u> <u>CORDERA)</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UL304,</u> <u>UNIDIRECCIONAL</u>
17	=	=	=	<u>Caracas/São Paulo</u> (Unidireccional)	<u>VOR MIQ, VOR TUY,</u> <u>+FIR AZ, NILBU, ISOPA,</u> <u>PASTE, SANSU,</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM417,</u> <u>UNIDIRECCIONAL</u>
18	<u>Lima/Foz Iguacu</u>	<u>UA320, UM548</u>	<u>VAMUT/BITUR</u>	<u>Lima/Foz Iguacu</u>	<u>VAMUT/BITUR</u>	<u>DE ACUERDO A</u> <u>LA PROPUESTA</u>
19	<u>Buenos</u> <u>Aires/Bogotá</u>	<u>UB689, UA301,</u> <u>UL417, UW8,</u>	<u>VOR ROSARIO/Posición</u> <u>MORRO</u>	=	<u>Aguardando definición de la</u> <u>trayectoria</u>	<u>FIR AZ</u>

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					<u>Waiting for definition of trajectory</u>	
<u>20</u>	Buenos Aires/ GUAYAQUIL/Quito	UW5, UL550, UG436, UL780	VOR ROSARIO/ Posición CANOA	=	<u>Aguardando definición de la trayectoria/ Waiting for definition of trajectory</u>	<u>FIR AZ</u>
<u>21</u>	Santiago/Bogotá	UG551, UL300	VOR TABON/ Posición MORRO	=	<u>Aguardando definición de la trayectoria Waiting for definition of trajectory</u>	<u>FIR AZ</u>
<u>22</u>	São Paulo/Quito	UM776, UA321, UB554, UZ8, UL201,	QUITO/BAURÚ	<u>São Paulo/Quito</u>	<u>NDB BRU, TOSAR, KOGMI, UBSIM, ARTIK, LIMPO, VOR IQT, VOR QIT</u>	<u>São Paulo/Quito (Unidirecional) Tramo: NDB BRU/LIMPO; (Bidirecional) tramo: LIMPO/ VOR QIT</u>
<u>23</u>	-	-	-	<u>Quito/São Paulo</u>	<u>LIMPO/ILTERG/VOR CIA /UZ8/UL201</u>	<u>Nueva ruta UMXX7, UNIDIRECIONAL TRAMO LIMPO/ VOR CIA</u>
<u>24</u>	Panamá/BS AS	UA558, UW8	REPAL/VOR PAR	=	<u>Aguardando definición de la trayectoria / Waiting for definition of trajectory</u>	<u>FIR AZ</u>
<u>25</u>	Santiago/Caracas	UL216, UL309	TABON/DAVEX	=	<u>Aguardando definición de la trayectoria/ Waiting for definition of trajectory</u>	<u>FIR AZ</u>
<u>26</u>	Caracas/BSAS	UL793	DAVEX/PAR	=	<u>Aguardando definición de la trayectoria/ Waiting for definition of trajectory</u>	<u>FIR AZ</u>
<u>27</u>	-	-	-	<u>Europa/ Fortaleza/ Buenos Aires (Unidirecional)</u>	<u>....., VOR FLZ, ESMEM, GAXEV, APINO, ASTOB, EDMAR, 741A, TORON</u>	<u>Realineamiento/ Realignment ruta/route UN741, UNIDIRECIONAL</u>
<u>28</u>	-	-	-	<u>Buenos Aires Europa/ via Fortaleza/ (Unidirecional)</u>	<u>VOR EZE, GAMOT, SAMSU, GOLFO, VOR MSS</u>	<u>Realineamiento/ Realignment ruta/route UM654,</u>

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						<u>UNIDIRECIONAL</u>
<u>29</u>	-	-	-	<u>Brasília, Buenos Aires</u> (Bidireccional)	<u>KUKOL, TILKI, 532A,</u> <u>532B, CUARA</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM532,</u> <u>BIDIRECCIONAL</u>
<u>30</u>				<u>Santiago/Europa/Santiago</u> (Bidireccional)	<u>VOR CAT, VINOS,</u> <u>AKNEL, EGIMO,</u> <u>MAUMU, MOXOB, VOR</u> <u>PMS, ESTEP, TENAR,</u> <u>CLARK, EGIMI, MOVGA</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM799,</u> <u>BIDIRECCIONAL</u>
<u>31</u>				<u>Sta Cruz/Europa/Sta Cruz</u> (Bidireccional)	<u>VOR VIR, 540A, ISOMU,</u> <u>OPLUG, KOKPU, EGIMI</u>	<u>Realineamiento/</u> <u>Realignment</u> <u>ruta/route UM540,</u> <u>BIDIRECCIONAL</u>