

# CAR/SAM Automated ACC Interconnection Plan

# Objetivo

La interconexión de sistemas automatizados de las Instalaciones de Control de Tránsito Aéreo en las Regiones CAR/SAM tiene el objetivo de:

- establecer la transmisión automatizada de información de planes de vuelo y de vigilancia de los vuelos que están en transición desde una FIR a otra adyacente
- mejorar el proceso de coordinación de control de tránsito aéreo de vuelos entre los Centros de Control de Tránsito Aéreo afectados.





# Agenda

- Activities
- ACC-Amazonico and ACC-Maiquetia Interconnection
- Document Hierarchy
- Radar Interfaces
- System Radar Interfaces
- Flight Plan Interfaces
- Automation Systems
- SICD
- Surveillance interconnection Levels
- Flight Plan interconnection Levels
- Interconnection Plan
- Schedule

# Activities

- Elaboration of a questionnaire on automation system installed in the ATS dependencies and their interfaces.
- Performed interconnection tests between the automated systems of Manaus-ACC (FIR Amazonica), in Brazil and Maiquetía-ACC (FIR Maiquetía) in Venezuela.
- Missions to States, for Data Gathering with the purpose of assessing the current situation of the automated air traffic control systems installed in the Area Control Centres of CAR/SAM States.

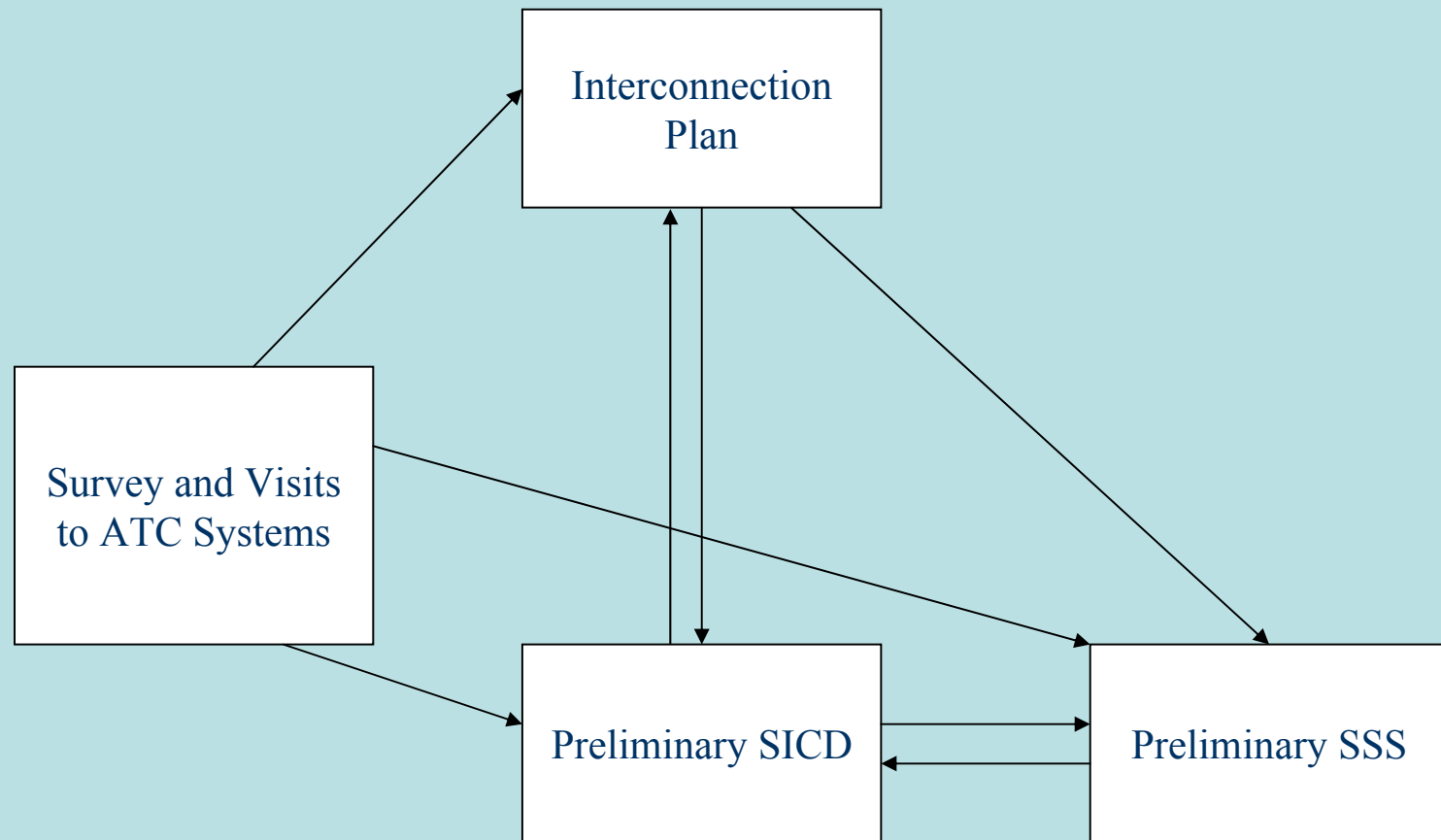
On site technical visits were accomplished in Peru, Ecuador, Venezuela, Colombia, Panama, COCESNA, Chile, Uruguay, Argentina and Brazil.

- Elaboration of the Interface Control Document (SICD).
- Elaboration of an Interconnection Plan.
- Elaboration of the System/Subsystem Specification (Not initiated yet).

# ACC-Amazonico and ACC-Maiquetia Interconnection



# Document hierarchy



# Radar Types Allocation 1/2

Radar Type	Radar	Interface ID	Argentina	Brazil	Chile	COCESNA	Colombia	Ecuador	Panama	Peru	Uruguay	Venezuela
3D PSR + MSSR	TPS-B-4 Lockheed Martin	R001		√								
2D PSR + MSSR	LP-23 + RSM 870 THALES	R002	√				√				√	
2D PSR + MSSR	ASR9 + MMSSR	R003							√			
2D PSR + SSR	LP-23 + RSM 970 THALES	R004		√	√							
3D PSR + MSSR	TRS2230 + RSM 970 THALES	R005		√								
2D PSR + MSSR	Tracker 2000 + RSM 970 THALES	R006			√							
2D PSR + MSSR	ATCR33M/S + SIR-M (7) ALENIA	R007	√				√					
2D PSR + MSSR	ATCR33DPC + SIR-S ALENIA	R008					√	√				
2D PSR + MSSR	ATCR22M + SIR-M ALENIA	R009					√					
2D PSR + MSSR	SKYTRACKER + IRS20MPL	R010					√					
3D PSR + MSSR	TPS70	R011					√					
2D PSR + MSSR	STAR2000 + RSM 970 THALES	R012		√	√			√				
2D PSR + MSSR	TA-10 + RSM 970 THALES	R013		√							√	
2D PSR + SSR	TA-10 + RSM770 THALES	R014					√					
2D PSR + MSSR	ASR 23 SS/16 + MSSR Condor MK2 RAYTHEON	R015		√								√
2D PSR+ MSSR	ASR12SS + MSSR (CD-2)	R016								√		

# Radar Types Allocation 2/2

Radar Type	Radar	Interface ID	Argentina	Brazil	Chile	COCESNA	Colombia	Ecuador	Panama	Peru	Uruguay	Venezuela
MSSR	RSMA INVAP	R017	√									
MSSR	CARDION	R018			√							
MSSR	SIR-7 Alenia	R019		√								
MSSR	SIR-S SELEX	R020										√
MSSR	CONDOR	R021		√								
MSSR	ISIR-M ALENIA	R022				√						
MSSR	IRS-20MP/L INDRA	R023				√		*				
MSSR	RSM 970 THALES	R024					√					

# System Radar Interface to Adjacent Centers Allocation

Surveillance Interface to Adjacent Centers	Interface ID	Argentina	Brazil	Chile	COCESNA	Colombia	Ecuador	Panama	Peru	Uruguay	Venezuela
AMS Interface	IR025					√	√				
Inter-CINDACTA	IR026		√								√*
INDRA Interface	IR027	√**								√**	

√\* - With minor software changes used in the Essay Brazil-Venezuela

√\*\*- As verified in the SSS, but this requirement has not been tested yet

# Flight Plan interface with Adjacent Centers

Flight Plan Interface	Interface ID	Argentina	Brazil	Chile	COCESNA	Colombia	Ecuador	Panama	Peru	Uruguay	Venezuela
ICAO 4444 & Hand-off Coordination	IF028 IF032		√								√*
ICAO 4444 without Hand-off Coordination	IF029	√		√	√	√	√	√	√	√	
OLDI	IF030	√*		√**	√*	√*	√*	√*		√*	
AIDC	IF031	√***									

√\* - Not configured

√\*\* - Only for APP and ACC interconnection

√\*\*\* - To be implemented

# ACC ATCS Automation Systems

ATCS Automation System Supplier	Version	Argentina	Brazil	Chile	COCESNA	Colombia	Ecuador	Panama	Peru	Uruguay	Venezuela
ATECH	X-4000		√								√
ATECH/ RAYTHEON	SCO		√								
THOMSON	MITRA		√*								
THALES	EUROCAT1000			√							
INDRA	AIRCON2000				√	√		√			
INDRA	AIRCON2010									√	
INDRA	AIRCON2100	√									
ALENIA/ MARCONI	CMS					√	√				
NORTHROP GRUMMAN	AMS2000								√		

√\* - To be changed to ATECH X-4000 this year

# SICD

## 3.1.2 Interface Definition (R002)

Type:	Serial - synchronous
Description	HDLC, Simplex – one way transmission
Data Type:	Radar data
Format:	ASTERIX
Message Definition:	ASTERIX messages types <b>001      <i>Radar target report</i></b> <b>002      <i>Radar service message</i></b> <b>008      <i>Mono-radar derived weather information</i></b>
Data Rate:	9.6 kbps
Electrical Characteristics:	RS 232c V24/V28
Physical Connection:	‘D’ type 25 pin at input to Radar Distribution Unit (RDU)
Reference	G630621

# Surveillance Interconnection levels

<b>Surveillance Interconnection Level</b>	<b>Interface</b>	<b>Notes</b>
<b>1</b>	<b>Intercenter ASTERIX cat 62,63</b>	<b>Ecuador</b>
<b>2</b>	<b>Intercenter Proprietary ICD</b>	<b>Brazil, Venezuela</b>
<b>3</b>	<b>ASTERIX ICD Radar</b>	<b>-</b>
<b>4</b>	<b>Proprietary ICD</b>	<b>Uruguay, Argentina</b>
<b>5</b>	<b>No data sharing</b>	<b>-</b>

# Flight Plan Interconnection levels

<b>Flight Plan Interconnection Level</b>	<b>Interface</b>	<b>Countries</b>	<b>Notes</b>
<b>1</b>	<b>AIDC</b>	<b>Argentina</b>	<b>Not used yet.</b>
<b>2</b>	<b>OLDI</b>	<b>Ecuador, Colombia, Panama, COCESNA, Uruguay, Chile e Argentina</b>	<b>Used by Chile only for ACC and APP interconnection</b>
<b>3</b>	<b>ICAO 4444 Coordination</b>	<b>Brazil, Venezuela</b>	<b>Used by Brazil only for internal ACC interconnection. Venezuela (Essay)</b>
<b>4</b>	<b>ICAO 4444</b>	<b>Peru</b>	

# Argentina 1/2

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
CORDOBA INSTAL.	ASUNCIÓN				A					A
	LA PAZ				A					A
	EZEIZA	<b>P*</b>	<b>P*</b>		A	<b>P*</b>		<b>P*</b>		A
	MENDOZA				A					A
	RESISTENCIA				A					A
	ANTOFAGASTA		<b>P*</b>		A			<b>P*</b>		A
RESISTENCIA (NON-AUTO)	ASUNCION				A					A
	CORDOBA				A					A
	CURITIBA				A				<b>S</b>	A
	EZEIZA				A					A
	MONTEVIDEO				A					A

# Argentina 2/2

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
EZEIZA	RIVADAVIA				A					A
	MENDOZA				A					A
	PUERTO MONTT		P*		A			P*		A
	CORDOBA	P*	P*		A	P*		P*		A
	RESISTENCIA				A					A
	JOHANNESBURG				A					A
	MONTEVIDEO		P*		A	P*			A	
MENDOZA (NON AUTO)	EZEIZA				A					A
	SANTIAGO				A					A
	CORDOBA				A					A
RIVADAVIA (NON-AUTO)	EZEIZA				A					A
	PUNTA ARENAS				A					A
	PUERTO MONTT				A					A

# Brasil 1/2

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
AMAZONICO	BRASILIA			A				A		
	BOGOTA				A			P		A
	GEORGETOWN				A				S	A
	LA PAZ				A				S	A
	LIMA				A				S	A
	MAIQUETIA			P	A		P			A
	PARAMARIBO				A				S	A
	RECIFE			A				A		
	ROCHAMBEAU				A				S	A
	ATLANTICO				A					A
BRASILIA	AMAZONICO			A				A		
	CURITIBA			A				A		
	LA PAZ				A				S	A
	RECIFE			A				A		
	ATLANTICO				A					A

# Brasil 2/2

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
CURITIBA	ASUNCION				A				S	A
	BRASILIA			A				A		
	LA PAZ				A				S	A
	MONTEVIDEO				A			P		A
	RESISTENCIA				A				S	A
	ATLANTICO				A					A
RECIFE	AMAZONICO			A				A		
	BRASILIA			A				A		
	ATLANTICO				A					A
ATLANTICO (NON-AUTO)	AMAZONICO				A					A
	BRASILIA				A					A
	CURITIBA				A					A
	DAKAR				A					A
	JOHANNESBURG				A					A
	LUANDA				A					A
	MONTEVIDEO				A					A
	RECIFE				A					A
	ROCHAMBEAU				A					A

# Bolivia

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
LA PAZ (NON- AUTO)	AMAZONICO				A				S	A
	ASUNCION				A					A
	BRASILIA				A				S	A
	CURITIBA				A				S	A
	CORDOBA				A					A
	LIMA				A					A
	ANTOFAGASTA				A					A

# Chile

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
SANTIAGO	ANTOFAGASTA		A					A		
	PUERTO MONTT		A					A		
	MENDOZA				A					A
	PACIFICO				A					A
ANTOFAGASTA	SANTIAGO		A					A		
	CORDOBA		<b>P*</b>		A			<b>P*</b>		A
	LA PAZ				A					A
	LIMA				A					A
	PACIFICO				A					A
PUNTA ARENAS	PUERTO MONTT		A					A		
	COM RIVADAVIA				A					A
PUERTO MONTT	PUNTA ARENAS		A					A		
	COM RIVADAVIA				A					A
	EZEIZA				A					A
	SANTIAGO		A					A		

# Colombia

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
BOGOTA	AMAZONICO				A			<b>P</b>	<b>S</b>	A
	GUAYAQUIL		<b>P</b>		A			<b>P</b>		A
	LIMA				A					A
	MAIQUETIA				A			<b>P</b>		A
	PANAMA		<b>P</b>		A			<b>P</b>		A
	BARRANQUILLA		<b>P</b>		A			<b>P</b>		A
BARRANQUILLA	MAIQUETIA				A			<b>P</b>		A
	PANAMA		<b>P</b>		A			<b>P</b>		A
	BOGOTA		<b>P</b>		A			<b>P</b>		A
	KINGSTON				A					A
	CURAÇAO				A					A

# Ecuador

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
GUAYAQUIL	BOGOTA		<b>P</b>		A	<b>P</b>		<b>P</b>		A
	LIMA				A					A
	CENAMER		<b>P</b>		A					A

# French Guyana

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
ROCHAMBEAU	AMAZONICO				A				<b>S</b>	A
	PARAMARIBO				A					A
	PIARCO				A					A
	ATLANTICO				A					A

# Guyana

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
GEORGETOWN	AMAZONICO				A				<b>S</b>	A
	PIARCO				A					A
	MAIQUETIA				A					A
	PARAMARIBO				A					A

# Panama

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
PANAMA	BOGOTA		<b>P</b>		A			<b>P</b>		A
	BARRANQUILLA		<b>P</b>		A			<b>P</b>		A
	CENAMER		<b>P</b>		A			<b>P</b>		A

# PARAGUAY

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
ASUNCION (NON AUT)	LA PAZ				A					A
	CURITIBA				A					A
	RESISTENCIA				A					A
	CORDOBA				A					A

# Peru

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
LIMA	AMAZONICO				A				<b>S</b>	A
	BOGOTA				A				<b>P</b>	A
	ANTOFAGASTA				A					A
	GUAYAQUIL				A					A
	LA PAZ				A					A

# Suriname

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
PARAMARIBO	AMAZONICO				A				<b>S</b>	A
	GEORGETOWN				A					A
	PIARCO				A					A
	ROCHAMBEAU				A					A

# Venezuela

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
MAIQUETIA	AMAZONICO			<b>P</b>	A		<b>P</b>			A
	BOGOTA				A			<b>P</b>		A
	BARRANQUILLA				A			<b>P</b>		A
	PIARCO				A			<b>P</b>		A
	GEORGETOWN				A					A
	CURAÇAO				A					A
	SAN JUAN				A					A

# Uruguay

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
MONTEVIDEO	CURITIBA				A				S	A
	EZEIZA		P		A	P*		P	A	
	RESISTENCIA				A					A
	ATLANTICO				A					A
	JOHANNESBURG				A					A

# COCESNA

ACC	ACC ADJ	FLIGHT PLAN				SURVEILLANCE				
		INTERCONNECTION LEVELS				INTERCONNECTION LEVELS				
		1	2	3	4	1	2	3	4	5
CENAMER	GUAYAQUIL		<b>P</b>		A					A
	KINGSTON				A					A
	LA HABANA				A					A
	MERIDA				A					A
	PANAMA		<b>P</b>		A					A
	MEXICO				A					A







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- establecer la transmisión automatizada de información de planes de vuelo y de vigilancia de los vuelos que están en transición desde una FIR a otra adyacente
- mejorar el proceso de coordinación de control de tránsito aéreo de vuelos entre los Centros de Control de Tránsito Aéreo afectados.

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