Organización de Aviación Civil Internacional
Oficina Regional Sudamericana
Vigésimo Taller/Reunión del Grupo de Implantación (SAM/IG/206) - Proyecto Regional RLA/06/901
(Lima, Perú, 16 al 20 de octubre de 2017)

Cuestión 2 del Orden del Día: **Optimización del espacio aéreo SAM**

a) Avance en la implantación regional PBN

IMPLEMENTACIÓN CONCEPTO PBN EN LA FIR CURITIBA Y EN LAS TMA CURITIBA, FLORIANÓPOLIS Y PORTO ALEGRE

(Presentada por Brasil)

RESUMEN	
Esta nota de estudio tiene el objetivo de presentar la AIC sobre la implementación del concepto PBN en la FIR Curitiba y en las siguientes terminales: Curitiba, Florianópolis y Porto Alegre, proyecto denominado PBN SUL.	
REFERENCIAS: - Declaración de Bogotá, 06-12-2013. - Resolución A37-11 de la Asamblea de la OACI. - Talleres PBN SAM	
Objetivos estratégicos de la OACI:	*A - Seguridad operacional* *D - Desarrollo económico del transporte aéreo* *E – Protección del medio ambiente*

1. Introducción

1.1 A partir de 2010, la OACI ha intensificado sus esfuerzos para atender las necesidades mundiales relativas a la interoperabilidad del espacio aéreo de una manera más pragmática, manteniendo los aspectos relacionados con la seguridad operacional. Este trabajo ha sido consolidado en la 12ª Conferencia de Navegación Aérea, realizada en noviembre de 2012, con la aprobación de la 4ª edición del Plan Global de Navegación Aérea (Doc. 9750), la cual incorpora una nueva metodología de planeamiento para los Servicios de Navegación Aérea, denominada "*Evolución por Bloques del Sistema de Aviación*" (ASBU).

1.2 La metodología ASBU resalta la importancia de la armonización y de la interoperabilidad global que se espera conseguir con la implantación progresiva de sus Módulos a lo largo de los respectivos marcos temporales. Las Iniciativas del Plan Global (GPI) dejaron de ser relevantes para el planeamiento, dando lugar a los Módulos que componen la metodología ASBU.

1.3 Para facilitar la evolución del ATM Global, el proceso de planeamiento e implantación ha sido atribuido a las Regiones de la OACI, por medio de sus Grupos Regionales de Planeamiento e Implementación (PIRG). En la Región SAM, la responsabilidad de este proceso recae sobre del Grupo de

Implantación SAM (SAM/IG), que desarrolló el "Plan de Implantación de Navegación Aérea Basada en Desempeño para la Región SAM". Este Plan pretende atender las necesidades comunes a todos los Estados de la Región en lo que se refiere a la aviación civil internacional, así como hacer viable la interoperabilidad y la armonización con otras Regiones.

1.4 La implementación PBN en la Región Sudamericana es apoyada por el Proyecto Regional RLA/06/901, de acuerdo con la Resolución A36-23 de la OACI, que requiere a los Grupos Regionales de Planeamiento e Implementación y a los Estados desarrollar sus Planes Nacionales de Implementación del PBN.

1.5 Con miras a atender las necesidades nacionales y asegurar que esta evolución sea armónica e integrada a los planeamientos de la OACI, el DECEA ha concebido la DCA 351-2 (Concepto Operacional ATM Nacional) y el PCA 351-3 (Plan de Implementación ATM Nacional). Este es el reto del Programa SIRIUS, que representa, en el ámbito del SISCEAB, los proyectos y actividades requeridos para la implementación del Concepto Operacional ATM en Brasil, de manera de satisfacer las expectativas de toda la Comunidad ATM y justificar las inversiones requeridas por sus miembros.

1.6 De esta manera Brasil ha planificado para el día 12 de octubre 2017 la entrada en vigor del concepto PBN en la FIR Curitiba y en las siguientes terminales: Curitiba, Florianópolis y Porto Alegre, Proyecto denominado PBN SUL.

2. Discusión

2.1 Un Concepto de Espacio Aéreo describe las operaciones pretendidas dentro de un determinado espacio aéreo y surge de necesidades operacionales para satisfacer uno o más objetivos estratégicos, tales como:

a) mejora o mantenimiento de la seguridad operativa;
b) aumentar la capacidad de tráfico aéreo;
c) mejora de la eficiencia;
d) trayectorias de vuelo más precisas y eficientes; y
e) mitigación del impacto ambiental.

2.2 El Proyecto PBN SUL implica modificaciones en rutas, áreas de control terminal, procedimientos de llegada, aproximación y salida, y otros cambios de espacio aéreo que abarca un área de más de 1,8 millones de km^2.

2.3 En total, se elaboraron más de 335 cartas de ruta y procedimientos, que contendrán una media de más de 300 mil vuelos al año. Para implementar tales cambios, se han entrenado más de 500 ATCO, involucrando directa o indirectamente a más de 700 profesionales en el Proyecto, en un esfuerzo de casi 9.000 horas de trabajo. También se han realizado 143 horas de vuelo necesarias para validar los procedimientos elaborados.

2.4 Este proyecto tuvo un costo aproximado de US $ 805 mil, dirigidos principalmente para el entrenamiento de ATCO y reuniones de proyectos.

2.5 Un Concepto de Espacio Aéreo está fuertemente relacionado con la planificación del espacio aéreo, que debe ser amplio y tener en cuenta todos los aspectos y requisitos operacionales para establecer el alcance y los objetivos del concepto de espacio aéreo.

2.6 Otro factor importante es divulgar a los usuarios cómo debe ser la operación en este espacio aéreo seleccionado, a partir de la implantación del concepto PBN. Dentro de este concepto, presentamos en **Apéndice** la AIC A 20/17 del 2 de octubre 2017, sobre la circulación en los espacios aéreos seleccionados, después de la implantación del proyecto PBN SUL.

3. **Acción sugerida:**

3.1 Se invita a la Reunión a tomar conocimiento de la AIC A 20/17, que versa sobre la operación PBN en el proyecto PBN SUL, y de esta manera tener una base para la elaboración de su propia información.

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APÉNDICE A

AIC A 20/17

AIR TRAFFIC FLOW RESTRUCTURING WITHIN TERMINAL CONTROL AREAS (TMA) OF CURITIBA, FLORIANOPOLIS, PORTO ALEGRE AND ACC-CW, COMPLYING WITH PERFORMANCE-BASED NAVIGATION CONCEPT IN THE SOUTHERN REGION (PBN-SUL) AND ENTRANCE TO THE WEST SECTOR OF TMA-SAO PAULO

(Inglés solamente)

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AIC
A
20/17
02 OCT 2017

AIR TRAFFIC FLOW RESTRUCTURING WITHIN TERMINAL CONTROL AREAS (TMA) OF CURITIBA, FLORIANOPOLIS, PORTO ALEGRE AND ACC-CW, COMPLYING WITH PERFORMANCE-BASED NAVIGATION CONCEPT IN THE SOUTHERN REGION (PBN-SUL) AND ENTRANCE TO THE WEST SECTOR OF TMA-SAO PAULO

Period of validity: from 02 OCT 2017 to PERM.

1. PRELIMINARY ARRANGEMENTS

1.1 PURPOSE

This Aeronautical Information Circular (AIC) has the purpose of publicizing the air traffic flow restructuring of TMA-Curitiba, TMA-Florianopolis, TMA-Porto Alegre and ACC-CW, by applying new conventional procedures and new procedures based on the Performance-Based Navigation (PBN) concept, in addition to the prescribed by AIC N 24/13, and comprising the entrance to the West Sector of TMA-Sao Paulo.

1.2 SCOPE

This AIC applies to all those who, while on duty, make use of conventional or RNAV procedures of Standard Instrument Arrival (STAR), Standard Instrument Departure (SID) and Instrument Approach Chart (IAC) within TMA-Curitiba, TMA-Florianopolis, TMA-Porto Alegre and TMA-Sao Paulo, as well as inbound/outbound routes from/to those TMA and air traffic flow within FIR-Brasilia and FIR-Curitiba.

1.3 ATTACHMENTS

A - TERMINAL CONTROL AREA-CURITIBA
B - TERMINAL CONTROL AREA-FLORIANOPOLIS
C - TERMINAL CONTROL AREA-PORTO ALEGRE

1.4 ABBREVIATIONS

AMAN	Arrival Management Software
ANAC	National Civil Aviation Agency
ATS	Air Traffic Services
ATC	Air Traffic Control
ATCO	Air Traffic Controller
CCO	Continuous Climb Operation
CDO	Continuous Descent Operation
CFIT	Controlled Flight into Terrain
CO2	Carbon Dioxide
CTR	Control Zone

CTR-CT	Control Zone Curitiba
CTR-JV	Control Zone Joinville
CTR-NF	Control Zone Navegantes
DECEA	Department of Airspace Control
DME	Distance Measuring Equipment
FIR	Flight Information Region
FIR-AZ	Flight Information Region-Amazonic
FIR-BS	Flight Information Region-Brasilia
FIR-CW	Flight Information Region-Curitiba
FPL	Filed Flight Plan Message
GNSS	Global Navigation Satellite Systems
ILS	Instrument Landing System
LNAV	Lateral Navigation
NDB	Non-Directional Beacon
OACI	International Civil Aviation Organization
PBN	Performance-based Navigation
REA	Special Routes for Aircraft
REH	Special Routes for Helicopters
RNAV	Area Navigation
RNP	Required Navigation Performance
RPL	Repetitive Flight Plan
SID	Standard Instrument Departures
SISCEAB	Brazilian Airspace Control System
STAR	Standard Instrument Arrival
TMA	Terminal Control Area
TMA-CT	Terminal Control Area-Curitiba
TMA-FI	Terminal Control Area-Iguazu Falls
TMA-FL	Terminal Control Area-Florianopolis
TMA-NF	Terminal Control Area-Navegantes (will be deactivated)
TMA-PA	Terminal Control Area-Porto Alegre
TMA-RJ	Terminal Control Area-Rio de Janeiro
TMA-SP	Terminal Control Area-Sao Paulo
VNAV	Vertical Navigation
VOR	VHF Omni-Directional Beacon

2. PBN OPERATIONAL IMPLEMENTATION AT TMA-CT, TMA-FL AND TMA-PA

2.1 In order to meet national needs and ensure that this evolution is harmonized and integrated with ICAO planning, DECEA has designed the SIRIUS Program, which represents, within SISCEAB, the projects and activities required to implement the ATM Operational Concept in Brazil, so as to meet the expectations of the entire ATM Community and justify the investments required by its members.

2.2 The various developments contemplated by the SIRIUS Program relate to different areas of the ATM System. The “PBN Operational Implementation” project aims at achieving a number of operational benefits, such as increasing air navigation safety and airspace use efficiency, and ensuring air transport regularity.

2.3 The continued growth of aviation makes it necessary to increase capacity and optimize airspace use. The increase in operational efficiency derived, among others, from the application of Area Navigation (RNAV), was translated into the development of air navigation applications in all phases of flight.

2.4 The restructuring of the TMA flow intends to achieve a number of operational benefits, such as: reduced time and distance flown, increased airspace capacity and efficiency, reduced fuel consumption, use of optimum aircraft climb/descent profiles, increased safety and regularity of air operations, reduced CFIT and reduced airspace complexity.

3. SCOPE OF THE AIRSPACE

3.1 As a premise of the air traffic flow restructuring project in FIR-Curitiba, there is the need to modify the network of routes in the west sector of the São Paulo terminal, with a view to entering the TMA-Sao Paulo, to guarantee ideal air traffic flow in the aerodromes of this sector of the terminal

3.2 Based on the current and future demand statistics, inbound and outbound flows were defined for each TMA listed to enable more direct routes and gains in ATC capacity. The purpose of these routes is to link these TMA and provide access to the other regions of the country.

3.3 The network of routes was designed to optimize not only the flows between the terminals directly involved with the change, but also as a way to harmonize the air network, offering maximum capacity for the aeronautical community. Thus, taking into account the new airspace structure provided for in this AIC and the achievement of ICAO's objectives for the Region, flow streams will be defined in a collaborative way between users and DECEA, being managed by the CGNA, at the strategic, pre-tactical and tactical levels.

3.4 Users may obtain information referring to flow streams in the official publications, as well as through the CGNA Operational Portal (portal.cgna.gov.br).

4. RESTRUCTURING OF THE AIRSPACE

4.1 TMA-NAVEGANTES

4.1.1 The TMA-NF (SBXO) will no longer exist and will be partially merged into APP-CT and partially merged into APP-FL, as of the implementation of PBN in the Southern Region.

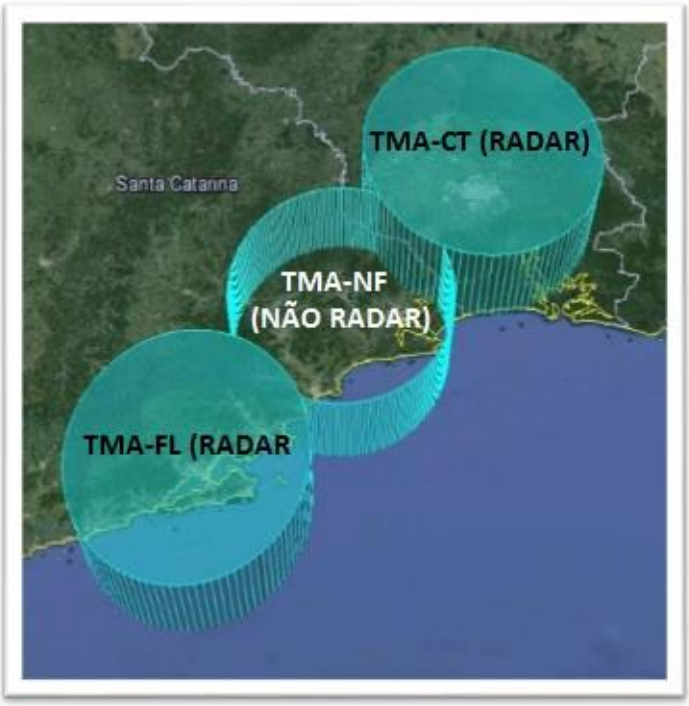


Figure 01 – Current TMA Configuration

Figure 02 – Configuration as of 12 OCT 17

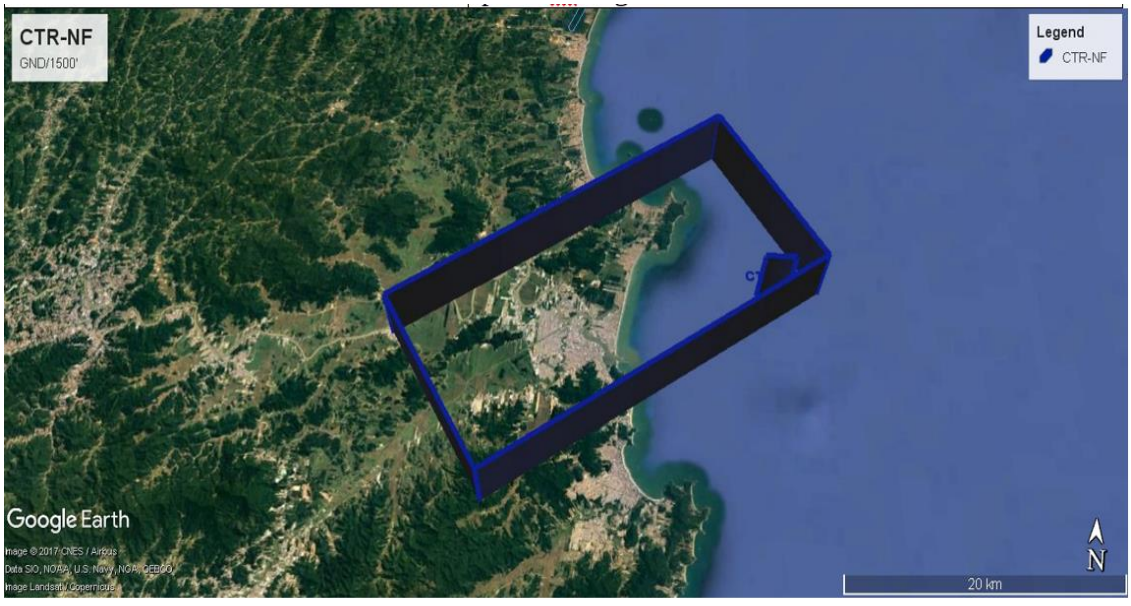
4.1.2 CTR-JV will be under the responsibility of APP-CT, and CTR-NF will be under the responsibility of APP-FL.

4.1.3 The new configuration of the CTR-JV and CTR-NF was established as indicated below:

CTR-JV Limits (APP-CT Jurisdiction)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**

GND / 1500’ (exclusive) CLASS D	From 2605.53S/04849.90W; 2616.74S/04834.42W; 2624.55S/04841.40W; 2613.36S/04856.86W; to the point of origin.

CTR-NF Limits (APP-FL Jurisdiction)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
GND / 1500’ (exclusive) CLASS C	From 2654.22S/04849.39W; 2644.67S/04833.75W; 2651.30S/04828.72W; 2700.82S/04844.37W; to the point of origin.



4.2 TMA-CURITIBA

4.2.1 SECTORIZATION

4.2.1.1 The limits of the TMA-CT (TMA-CT 1) were planned to meet the inbound and outbound flows, prioritizing the sectors with greater demand and enabling better air traffic flow management in STAR. The airspace portion in which there is no departure or arrival procedure was reduced.

4.2.1.2 New airspace portions were created, called TMA-CT 2 and TMA-CT 3, with a view to protecting IFR routes of PBN procedures and also the controlled parts of the Special Routes for Aircraft (REA).

4.2.1.3 The new configuration of TMA-CT was established as indicated below:

<table>
<tr><th colspan="2">TMA-CT 1 Limits</th></tr>
<tr><th>VERTICAL LIMIT</th><th>HORIZONTAL LIMIT</th></tr>
<tr><td>5500’(inclusive)/FL145(exclusive)
CLASS C</td><td rowspan="2">From 2542.54S/05002.01W; 2510.86S/04949.29W; ARPOK; 2452.84S/04937.06W; 2445.84S/04916.44W; EVNUN; 2445.63S/04851.35W; 2502.07S/04835.26W; 2517.99S/04837.47W; 2520.65S/04815.57W; 2550.43S/04823.33W; 2600.19S/04816.76W; 2609.79S/04818.14W; 2606.12S/04827.54W; 2629.37S/04833.58W; 2655.09S/04915.77W; 2619.49S/04927.90W; to the point of origin.</td></tr>
<tr><td>FL145(inclusive)/FL195(exclusive)
CLASS A</td></tr>
<tr><th colspan="2">TMA-CT 2 Limits</th></tr>
<tr><th>VERTICAL LIMIT</th><th>HORIZONTAL LIMIT</th></tr>
<tr><td>4500’(inclusive)/5500’(exclusive)
CLASS C</td><td>From 2510.57S/04920.46W; 2523.83S/04854.91W; 2552.50S/04903.45W; 2541.95S/04933.96W; 2521.51S/04928.55W; 2513.08S/04922.86W; to the point of origin.</td></tr>
<tr><th colspan="2">TMA-CT 3 Limits</th></tr>
<tr><th>VERTICAL LIMIT</th><th>HORIZONTAL LIMIT</th></tr>
<tr><td>1500’(inclusive)/5500’(exclusive)
CLASS D</td><td>From 2550.75S/04849.06W; 2548.66S/04839.94W; 2558.99S/04825.65W; 2606.12S/04827.54W; 2622.07S/04831.68W; 2627.68S/04836.16W; 2631.65S/04842.24W; 2612.62S/04908.52W; to the point of origin</td></tr>
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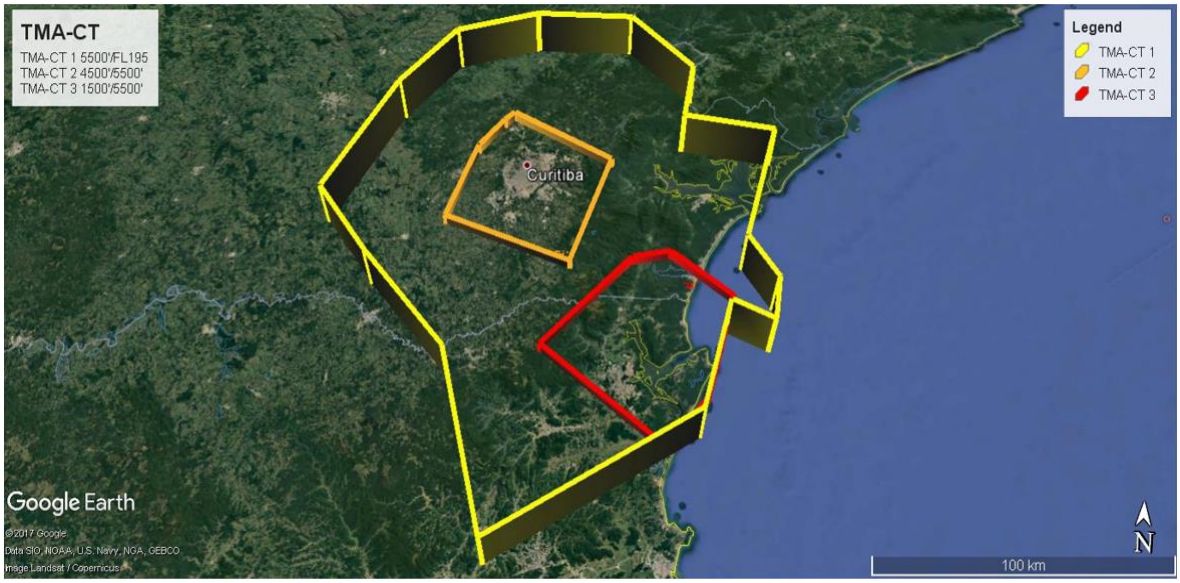


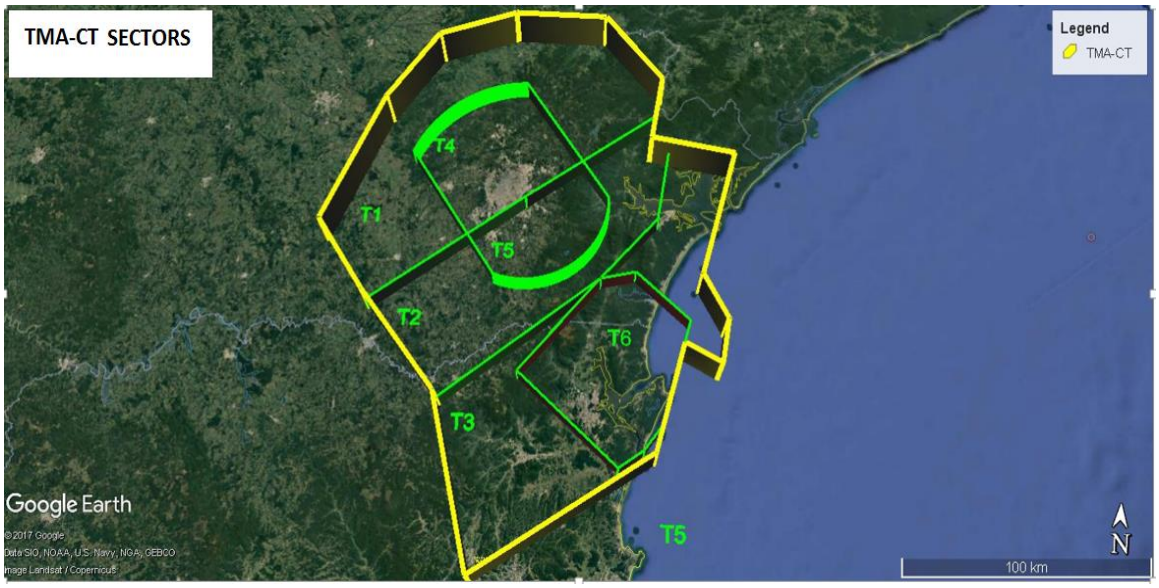
4.2.1.4 CTR-CT was adjusted to protect the traffic circuits, the Departure and Approach IFR routes for each threshold of the SBCT aerodrome (RWY 15/33 and RWY 11/29) and the Bacacheri aerodrome (RWY 18/36). This adjustment was needed for the implementation of Special Routes for Helicopters (REH) at the Curitiba-Bacacheri aerodromes.

CTR-CT Limits (Jurisdição APP-CT)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
GND / 4500' (exclusive) CLASS C	From 2517.53S/04913.36W; 2518.85S/04911.14W; 2529.46S/04909.96W; 2529.71S/04900.82W; 2534.47S/04900.97W; 2536.01S/04901.78W; 2539.58S/04905.65W; 2534.18S/04911.71W; 2534.05S/04916.41W; 2530.10S/04916.27W; 2528.54S/04918.03W; 2526.19S/04915.18W; 2519.47S/04918.33W; to the point of origin.

4.2.1.5 The TMA-CT Sectors were configured to meet the traffic flows to SBCT/SBBI

independently from the traffic flows to SBJV. The traffic characteristics were taken into account, such as: arrival, departure or approach. The new limits and functions are described in the Table below:

TMA-CT Sectors			
SECTOR	**LIMITS**	**FUNCTION**	**FREQUENCIES**
T1	Lateral: according to ARC and AIP Vertical: GND to FL195	CT NORTH FEEDER	119.95MHz 119.70MHz
T2	Lateral: according to ARC and AIP Vertical: GND to FL195	CT SOUTH FEEDER	129.55MHz 119.70MHz
T3	Lateral: according to ARC and AIP Vertical: 5500’ to FL195	JV FEEDER	120.95MHz 133.15MHz
T4	Lateral: according to ARC and AIP Vertical: GND to FL080	FINAL CT RWY15/11	120.65MHz 119.70MHz
T5	Lateral: according to ARC and AIP Vertical: GND to FL080	FINAL CT RWY33/29	120.65MHz 119.70MHz
T6	Lateral: according to ARC and AIP Vertical: GND to 5500’	FINAL JV	133.15MHz 120.95MHz



4.2.2 STAR AND SID PROCEDURES

4.2.2.1 Arrival and departure procedures were designed aiming to allow more direct and independent traffic flows between the SBCT, SBBI and SBJV airports, also considering relief factors and ATC capacity.

4.2.2.2 The arrival procedures were structured so that runway changes had the least possible impact to the air traffic flow both for arrival and departure procedures.

4.2.2.3 At SBCT and SBBI there is the possibility of using the AMAN tool to manage arrivals at these airports. The arrival/departure at/from SBJV shall be carried out independently of the SBCT/SBBI aerodromes with lateral/vertical separations provided for in the procedures.

4.2.2.4 Figures 3 and 4 represent the structure of arrival and departure procedures, respectively, of the SBCT airport; Figures 5 and 6 represent the structure of arrival and departure procedures, respectively, of the SBBI airport; Figures 7 and 8 represent the structure of arrival and departure procedures, respectively, of the SBJV airport.

FIGURE STAR/SID at CT, BI and JV

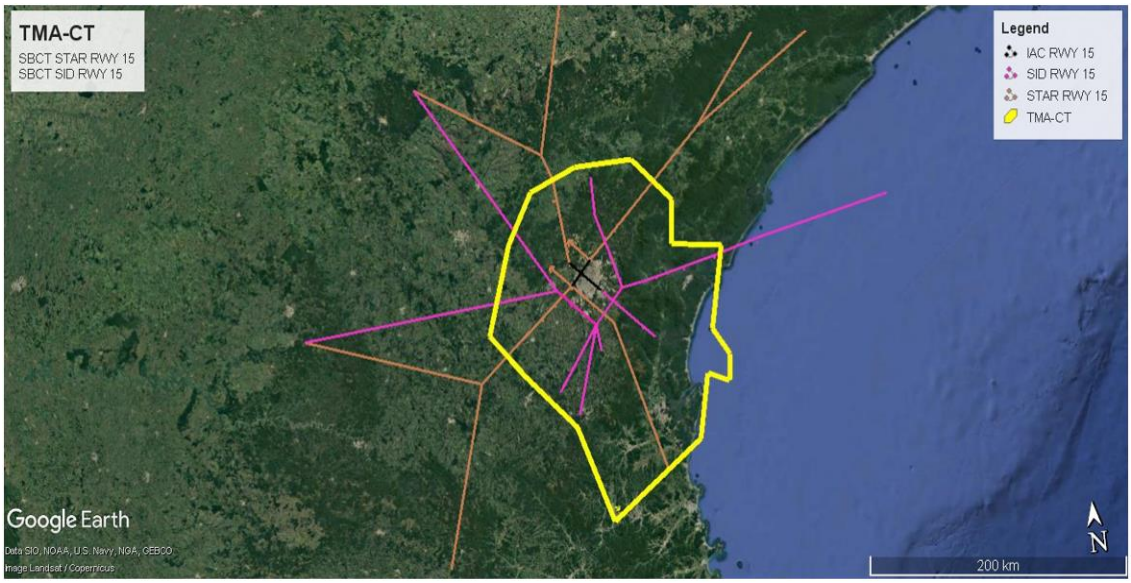


Figure 03 – SBCT STAR/SID RWY 15

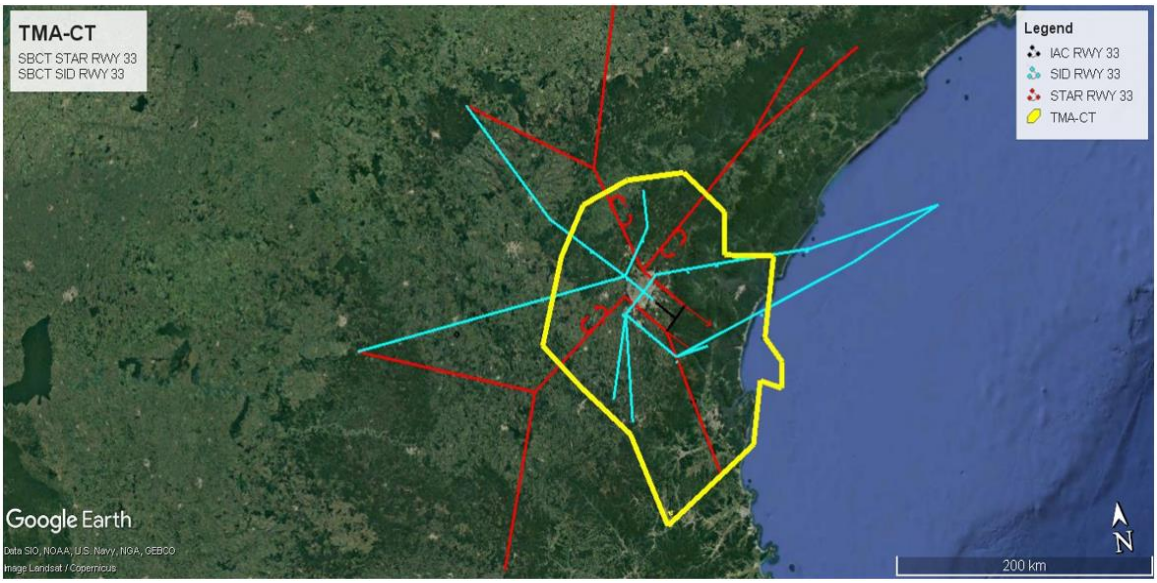


Figure 04 – SBCT STAR/SID RWY 33

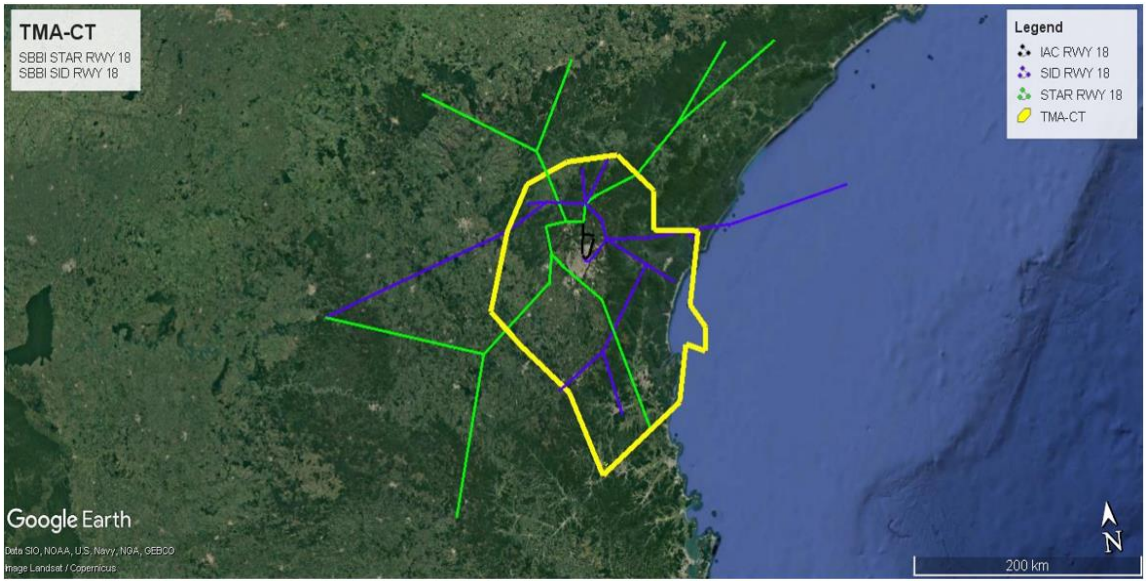


Figure 05 – SBBI STAR/SID RWY 18

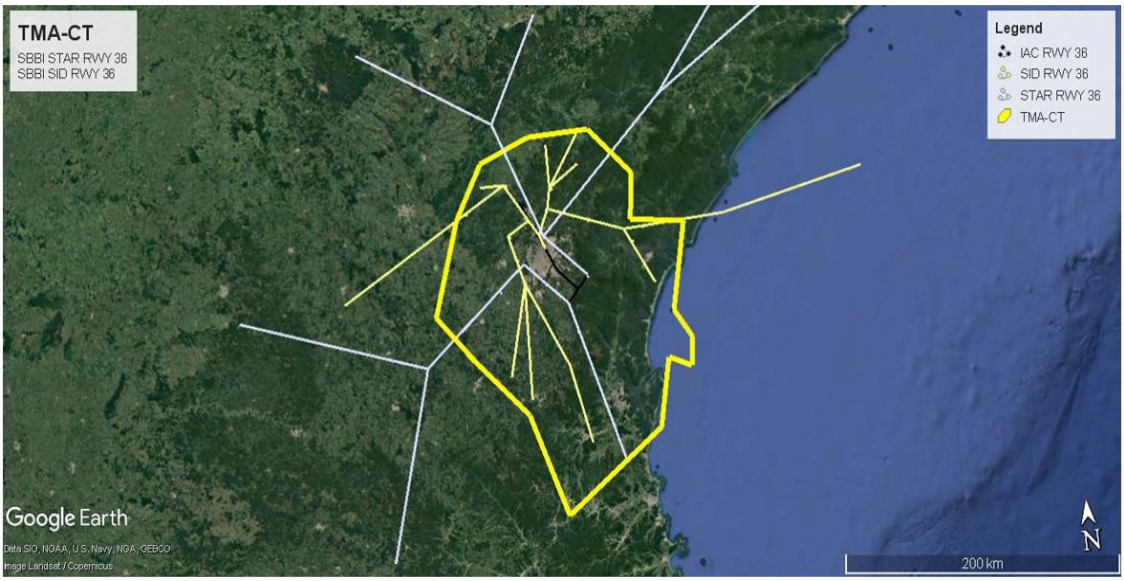


Figure 06 – SBBI STAR/SID RWY 36

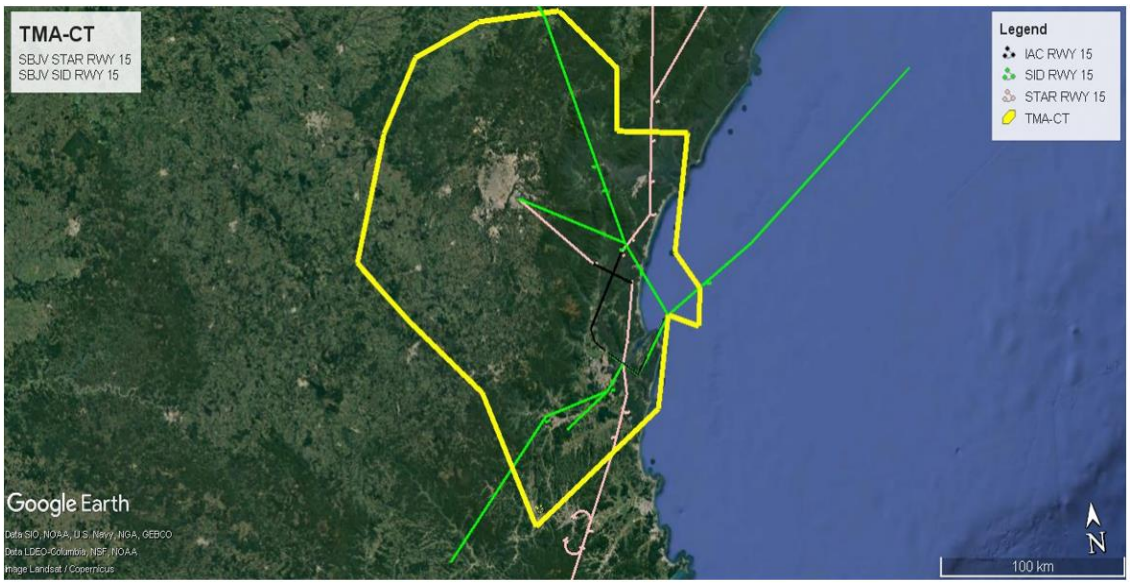


Figure 07 – SBJV STAR/SID RWY 15

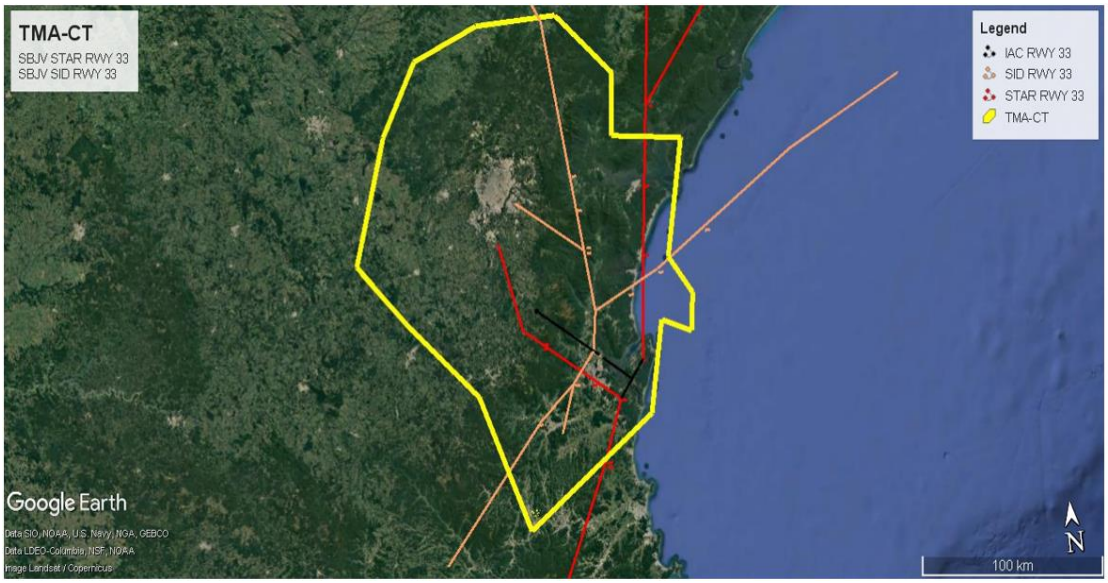


Figure 08 – SBJV STAR/SID RWY 33

4.3 TMA-FLORIANOPOLIS

4.3.1 SECTORIZATION

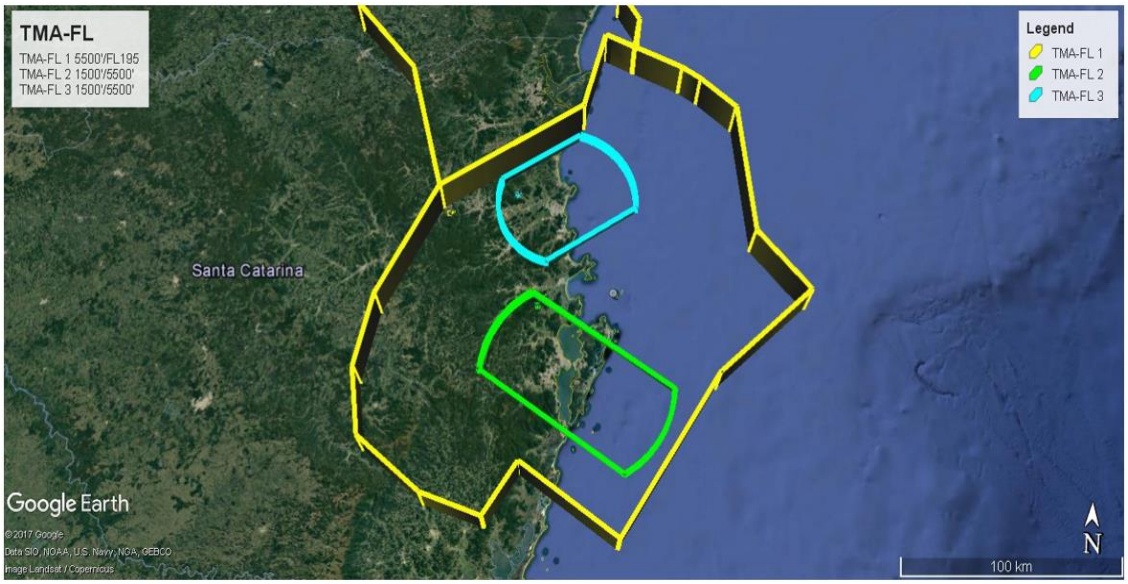
4.3.1.1 The boundaries of the TMA-FL (TMA-FL 1) were planned to meet the inbound and outbound flows, prioritizing the sectors with greater demand and enabling better air traffic flow management in STAR. The airspace portion in which there is no departure or arrival procedure was reduced.

4.3.1.2 New airspace portions were created, called TMA-FL 2 and TMA-FL 3, with a view to protecting IFR routes of PBN procedures and also the controlled parts of the Special Routes for Aircraft (REA), which will be published in due time.

4.3.1.3 The new configuration of TMA-FL was established as indicated below:

TMA-FL 1 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
5500’(inclusive)/FL145(exclusive) CLASS C	From.2655.09S/04915.77W;2629.37S/04833.58W, 2606.12S/04827.54W;2609.79S/04818.14W; 2615.74S/04802.89W;2619.09S/04757.07W; 2627.33S/04746.06W;2650.62S/04742.97W; 2703.13S/04741.29W;2717.86S/04726.00W; 2740.04S/04752.84W;2818.13S/04819.56W; 2802.75S/04847.20W;2815.01S/04855.93W; 2810.57S/04912.69W;2758.75S/04931.03W; 2743.01S/04934.54W;2724.92S/04931.13W: to the point of origin.
FL145(inclusive)/FL195(exclusive) CLASS A	
TMA-FL 2 Limits	

VERTICAL LIMIT	HORIZONTAL LIMIT
1500’(inclusive)/5500’(exclusive) CLASS C	From 2718.54S/04846.59W; 2721.32S/04841.42W; 2734.38S/04817.13W; 2741.22S/04804.29W by clockwise arc within a 25NM radius centered on coordinates 2740.19S/04832.42W (VOR/DME FLN); 2801.92S/04818.35W; 2755.03S/04831.17W; 2750.58S/04839.43W; 2739.12S/04900.55W by clockwise arc within a 25NM radius centered on coordinates 2740.19S/04832.42W (VOR/DME FLN); to the point of origin.
TMA-FL 3 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
1500’(inclusive)/5500’(exclusive) CLASS C	From 2647.27S/04858.06W; 2632.75S/04834.25W by clockwise arc within a 20NM radius centered on coordinates 2652.45S/04838.74W 2652.35S/04816.37W; 2707.34S/04841.09W by clockwise arc within a 18NM radius centered on coordinates 2652.45S/04838.74W to the point of origin.



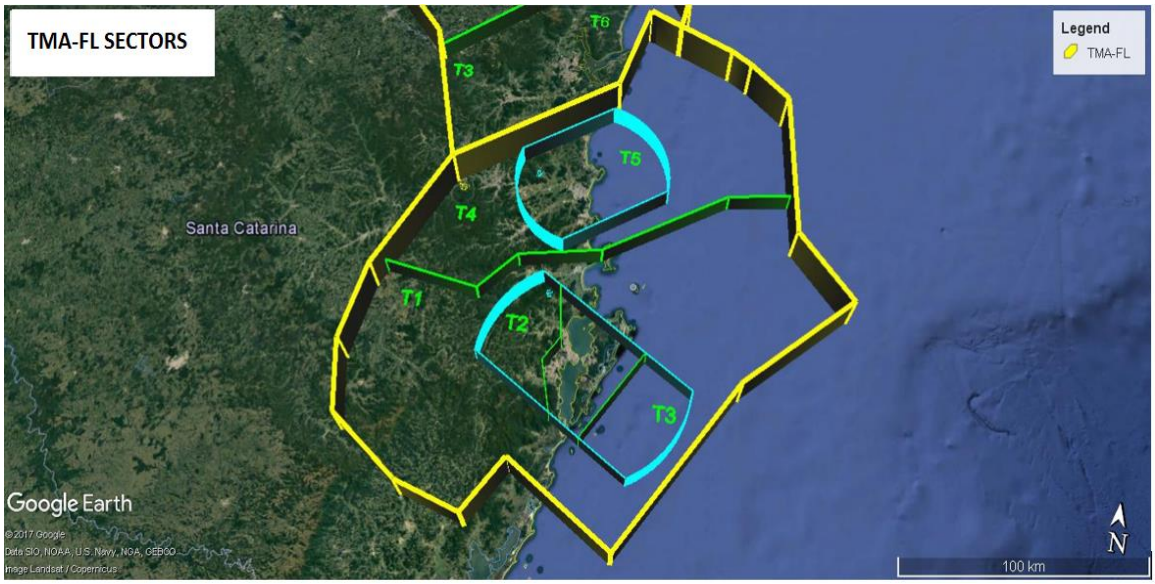
4.3.1.4 CTR-FL was adjusted to protect the traffic circuits, the departure and approach IFR routes for each threshold of the SBFL aerodrome (RWY 14/32). This adjustment was needed for the implementation of the special routes for aircraft (REA) of the TMA-FL.

CTR-FL Limits (APP-FL Jurisdiction)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**

GND / 1500’ (exclusive) CLASS C	From 2732.35S/04838.43W; 2741.31S/04821.83W; 2748.16S/04826.49W; 2739.22S/04843.12W; 2733.54S/04839.24W; to the point of origin.

4.3.1.5 The TMA-FL Sectors were configured to meet the SBFL and SBNF traffic flows independently. The traffic characteristics were taken into account, such as: arrival, departure or approach. The new limits and functions are described in the Table below:

TMA-FL Sectors			
SECTOR	**LIMITS**	**FUNCTION**	**FREQUENCIES**
T1	Lateral: according to ARC and AIP Vertical: GND to FL195	FLORIANOPOLIS FEEDER	128.95 Mhz 129.45 Mhz
T2	Lateral: according to ARC and AIP Vertical: GND to 5500’	FINAL FLORIANÓPOLIS RWY14	119.65 Mhz 129.45 Mhz
T3	Lateral: according to ARC and AIP Vertical: GND to 5500’	FINAL FLORIANÓPOLIS RWY32	119.65 Mhz 129.45 Mhz
T4	Lateral: according to ARC and AIP Vertical: GND to FL195	NAVEGANTES FEEDER	119.50 Mhz 129.60 Mhz
T5	Lateral: according to ARC and AIP Vertical: GND to 5500’	FINAL NAVEGANTES	129.60 Mhz 119.50 Mhz



4.3.2 STAR AND SID PROCEDURES

4.3.2.1 Arrival and departure procedures were designed aiming to allow more direct and independent traffic flows between the SBFL and SBNF airports, also considering relief factors and ATC capacity.

4.3.2.2 The arrival procedures were structured so that runway changes had the least possible impact to the air traffic flow both for arrival and departure procedures.

4.3.2.3 The arrival/departure at SBFL shall be carried out independently of the SBNF aerodrome with lateral/vertical separations provided for in the procedures.

4.2.2.4 Figures 9 and 10 represent the structure of arrival and departure procedures, respectively, of the SBFL airport; Figures 11 and 12 represent the structure of arrival and departure procedures, respectively, of the SBNF airport.

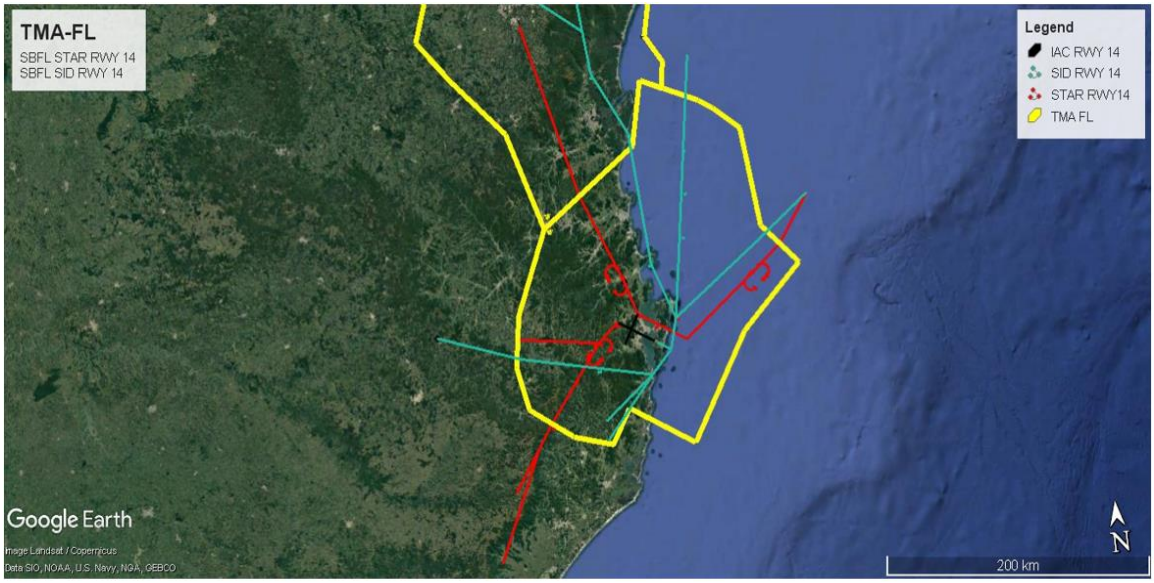


Figure 09 – SBFL STAR/SID RWY 14

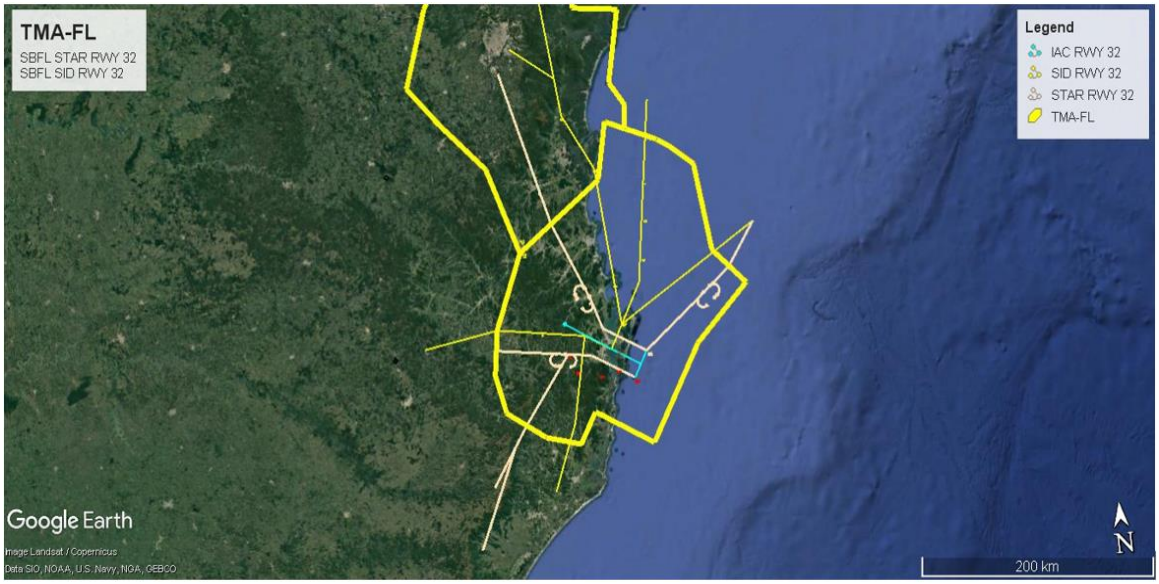


Figure 10 – SBFL STAR/SID RWY 32

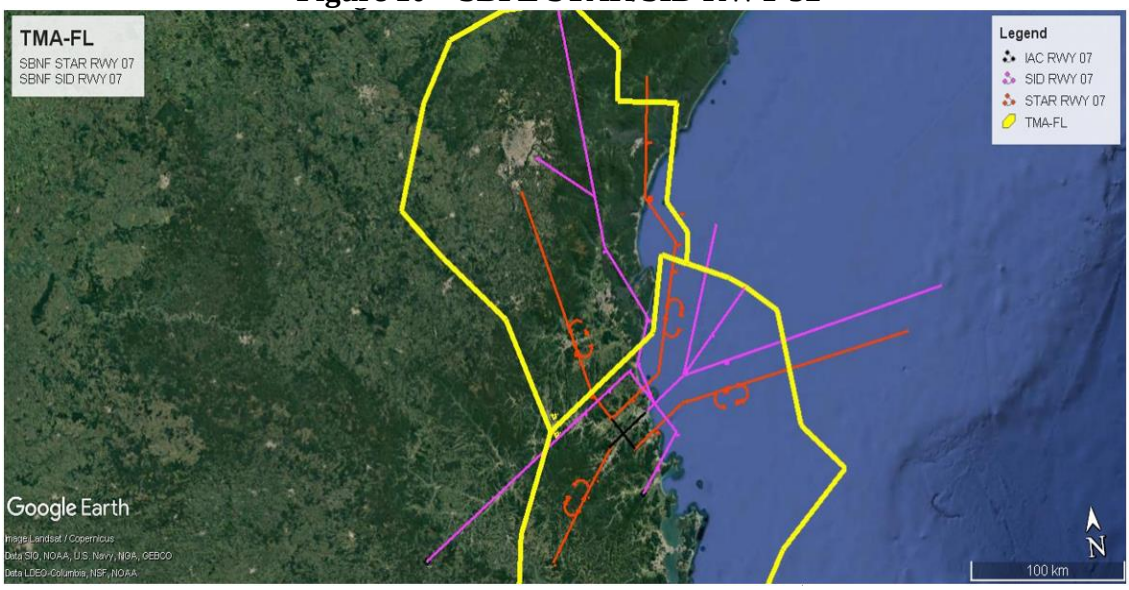


Figure 11 – SBNF STAR/SID RWY 07

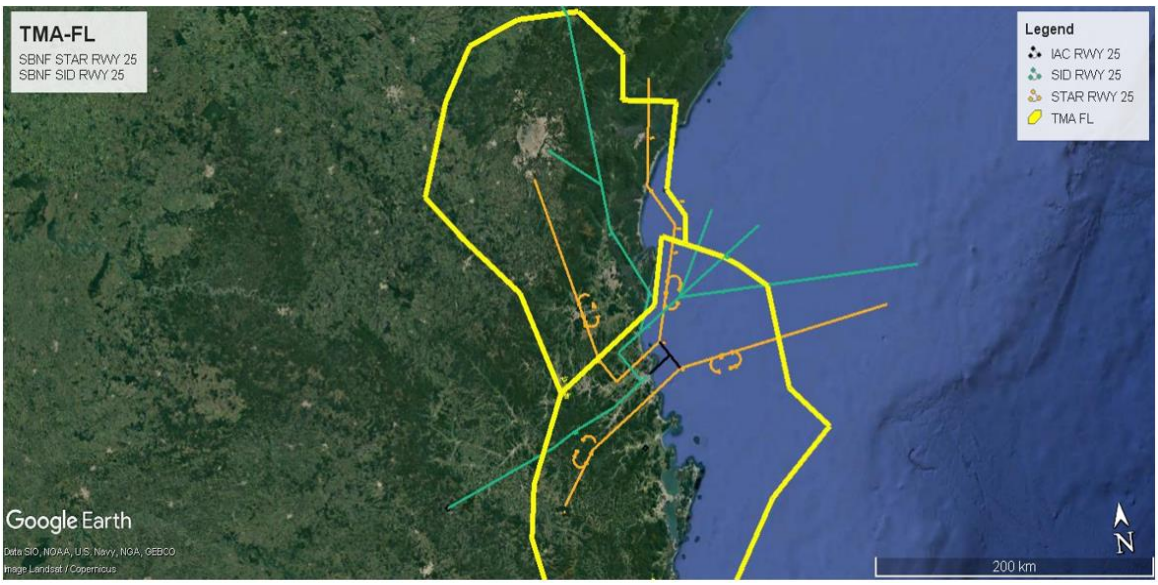
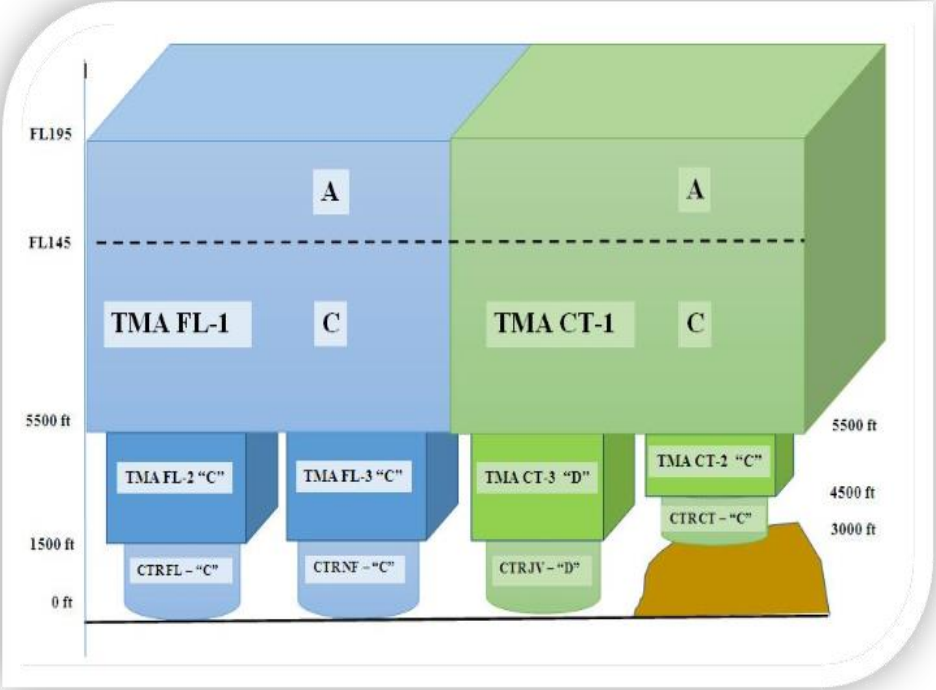


Figure 12 – SBNF STAR/SID RWY 25



4.4 TMA-PORTO ALEGRE

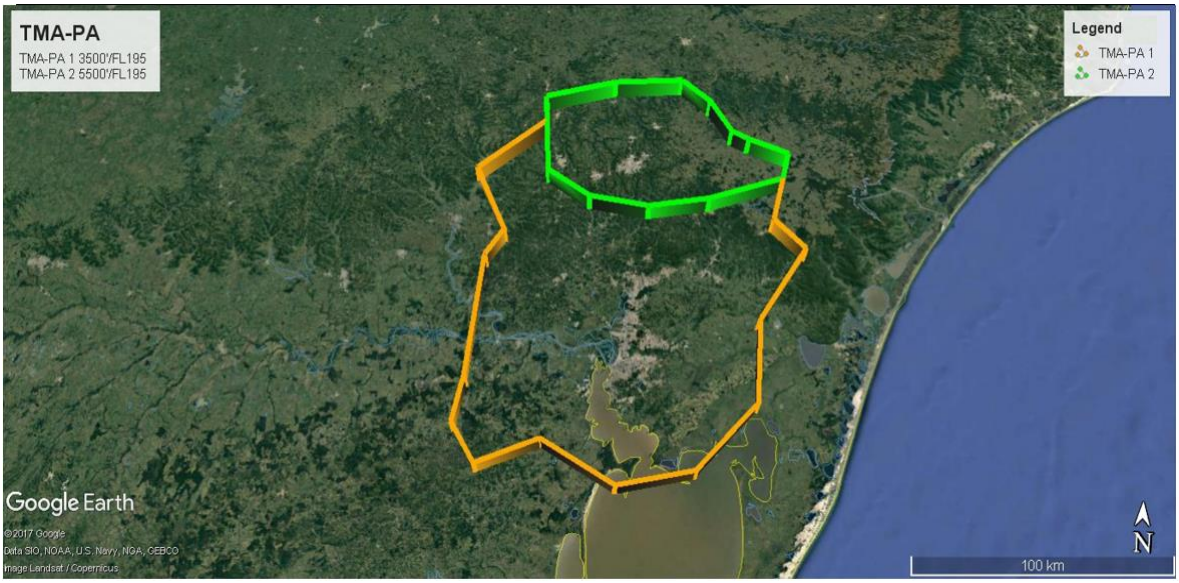
4.4.1 SECTORIZATION

4.4.1.1 The TMA-PA limits (TMA-PA 1 and TMA-PA 2) were planned to meet the inbound and outbound flows, prioritizing the sectors with greater demand and enabling better air traffic flow management in STAR. The airspace portion in which there is no departure or arrival procedure was reduced.

4.4.1.2 The new configuration of TMA-PA was established as indicated below:

TMA-PA 1 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
3500'(inclusive)/FL145(exclusive) CLASS C	From 2915.13S/05029.60W; 2926.38S/05032.38W; 2933.38S/05024.14W; 2951.49S/05036.49W; 3010.48S/05037.48W; 3025.50S/05052.50W; 3029.50S/05111.50W; 3020.82S/05130.02W; 3026.61S/05145.37W; 3018.28S/05151.83W; 3008.32S/05150.03W; 2944.53S/05148.59W; 2939.56S/05148.29W; 2932.80S/05143.92W; 2916.60S/05152.93W; 2902.25S/05135.15W; 2916.24S/05133.64W; 2922.93S/05121.86W; 2924.81S/05105.86W; 2921.88S/05049.63W; to the point of origin.
FL145(inclusive)/FL195(exclusive) CLASS A	

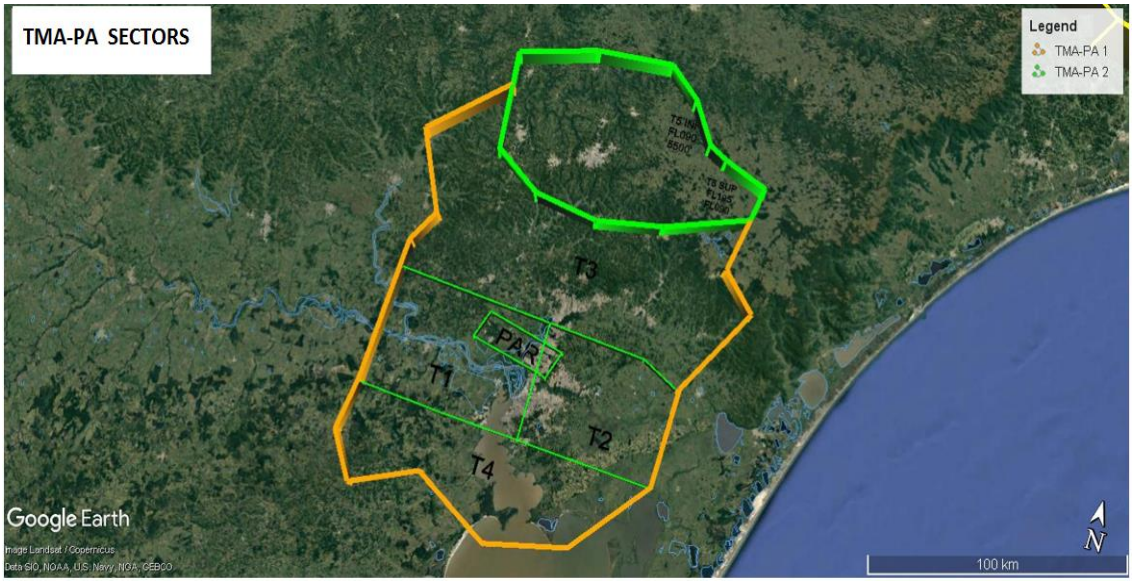
TMA-PA 2 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
5500’(inclusive)/FL145(exclusive) CLASS C	From 2855.01S/05135.93W;2849.77S/05116.63W; 2848.00S/05057.48W; 2854.01S/05049.37W; 2902.56S/05043.35W; 2904.64S/05038.62W; 2907.99S/05027.84W; 2915.13S/05029.60W; 2921.88S/05049.63W; 2924.81S/05105.86W; 2922.93S/05121.86W; 2916.24S/05133.64W; to the point of origin.
FL145(inclusive)/FL195(exclusive) CLASS A	



4.4.1.3 The TMA-PA Sectors were configured to meet the SBPA and SBCO traffic flows independently. The traffic characteristics were taken into account, such as: arrival, departure or approach. The new boundaries and functions are described in the Table below:

TMA-PA Sectors			
SECTOR	**LIMITS**	**FUNCTION**	**FREQUENCIES**
T1	Lateral: according to ARC and AIP Vertical: GND to FL195	FINAL RWY 11	119.00MHz 120.10MHz
T2	Lateral: according to ARC e AIP Vertical: GND to FL195	FINAL RWY 29	119.00MHz 120.10MHz
T3	Lateral: according to ARC and AIP Vertical: 3500’ to FL195	NORTH FEEDER	120.10MHz 119.00MHz
T4	Lateral: according to ARC and AIP	SOUTH FEEDER	120.10MHz 119.00MHz

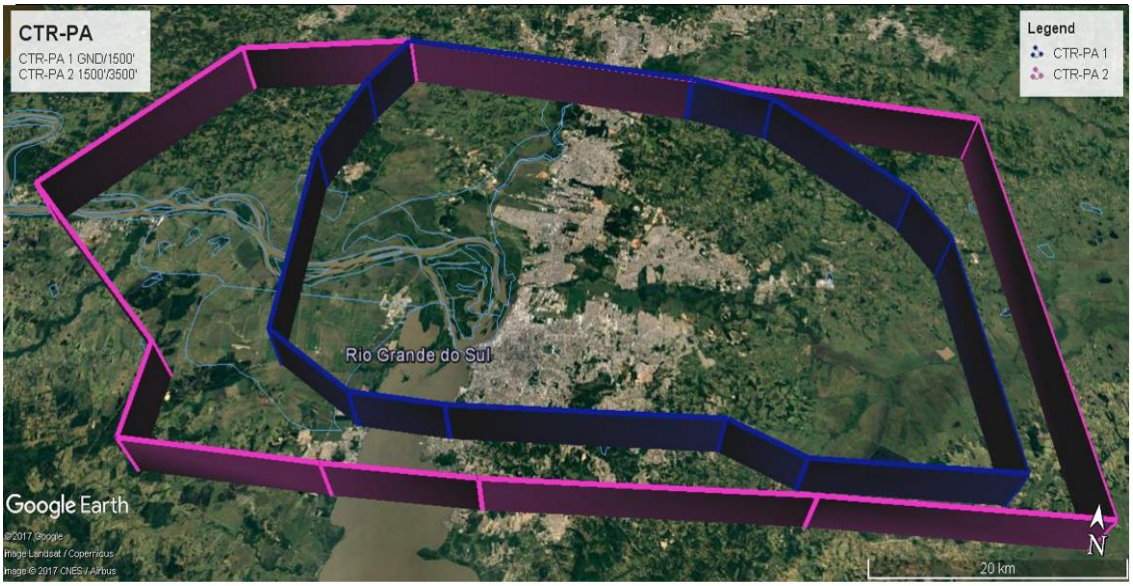
	Vertical: 3500’ to FL195		
T5 INF	Lateral: according to ARC and AIP Vertical: 5500’ to FL090 (inclusive)	CAXIAS LOWER	120.55MHz 119.00MHz
T5 SUP	Lateral: according to ARC and AIP Vertical: FL090 (exclusive) to FL195	CAXIAS UPPER	120.10MHz 119.00MHz
T6	Lateral: according to ARC and AIP Vertical: GND to 3000’	FINAL PAR CANOAS	128.90MHz 120.55MHz
T7	Lateral: according to AIC 02/17 Vertical: according to AIC 02/17	REA PALEGRE	120.10MHz 120.55MHz



4.4.1.4 CTR-PA was adjusted to protect the traffic circuits, the departure and approach IFR routes for each threshold of the SBPA aerodrome (RWY 11/29) and the SBCO aerodrome (RWY 12/30). This adjustment was needed for the implementation of the special routes for aircraft (REA) of the TMA-PA.

CTR-PA 1 Limits (APP-PA Jurisdiction)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**

GND / 1500’ (exclusive) CLASS C	From 2945.92S/05121.12W; 2946.78S/05103.27W; 2947.61S/05058.32W; 2952.62S/05050.56W; 2955.13S/05048.61W; 3006.18S/05046.50W; 3006.66S/05056.80W; 3005.40S/05100.70W; 3006.24S/05114.36W; 3006.15S/05119.18W; 3003.72S/05124.05W; 2953.73S/05124.70W; 2949.00S/05122.99W; to the point of origin.
CTR-PA 2 Limits (APP-PA Jurisdiction)	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
1500’(inclusive) / 3500’ (exclusive) CLASS C	From 294555.45S/0512107.38W, 294734.12S/0504605.45W, 300736.84S/0504249.67W, 300809.13S/0505624.42W, 300907.84S/0511207.59W, 300917.31S/0511937.67W, 300913.61S/0512933.79W, 300453.53S/0512945.07W, 295724.56S/0513947.79W, 294733.29S/0513126.92W, to the point of origin.



4.4.2 STAR AND SID PROCEDURES

4.4.2.1 Arrival and departure procedures were elaborated aiming to allow more direct and independent traffic flows between the SBPA and SBCO airports, also considering relief factors and ATC capacity.

4.4.2.2 The arrival procedures were structured so that runway changes had the least possible impact to the air traffic flow both for arrival and departure procedures.

4.4.2.3 The arrival/departure at SBPA shall be carried out independently of the SBCO aerodrome with lateral/vertical separations provided for in the procedures.

4.4.2.4 Figures 13 and 14 respectively represent the structure of arrival and departure procedures of RWY 11 and 29 of the SBPA airport.

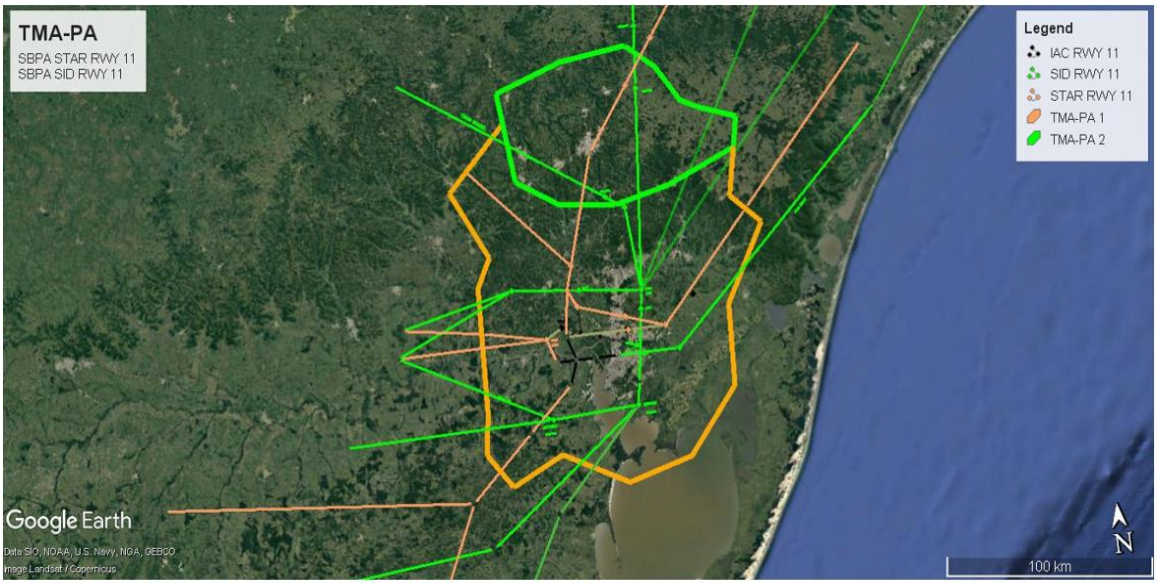


Figure 13 – SBPA STAR/SID RWY 11

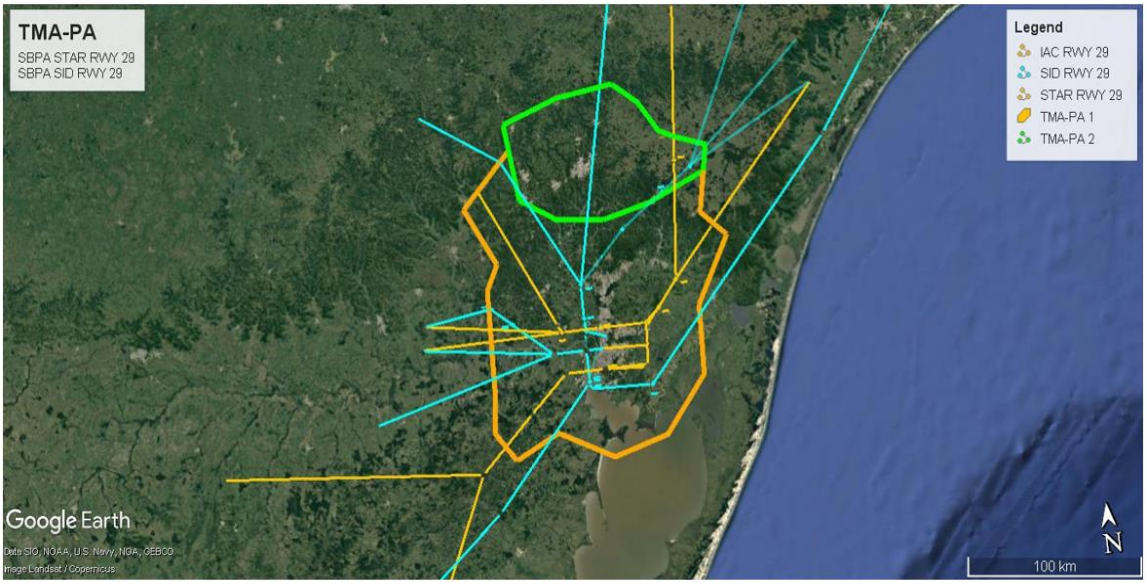
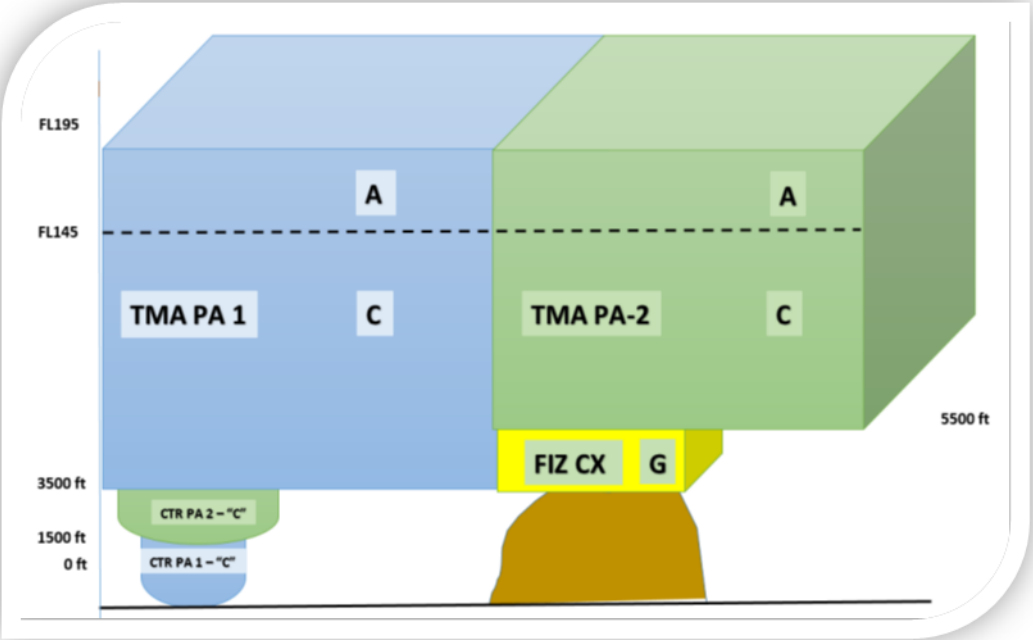


Figure 14 – SBPA STAR/SID RWY 29

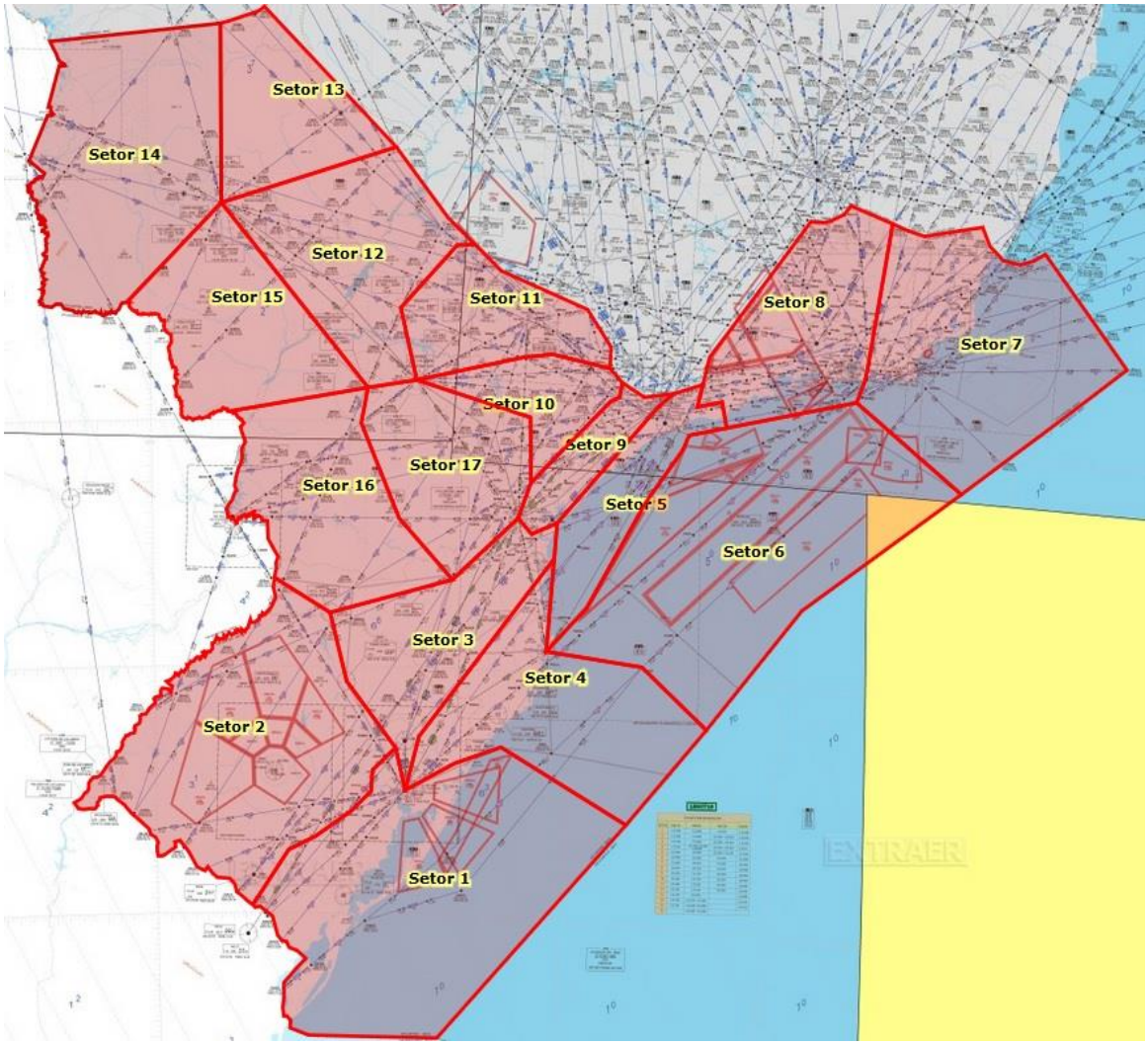


4.5 FIR-CW

4.5.1 SECTORIZATION

4.5.1.1 FLIGHT INFORMATION REGION-CURITIBA (FIR-CW)

4.5.1.2 It will be comprised by 17 control sectors, and their lateral and vertical limits may be found in AIP-Brasil, as follows:



4.5.2 FREQUENCIES

ACC-CW	
SECTOR	**FREQ VLR**
S01 PRIMARY	126.750
S01 SPARE	127.400
S02 PRIMARY	135.900
S02 SPARE	123.725
S03 PRIMARY	126.100
S03 SPARE	127.500
S04 PRIMARY	128.450
S04 SPARE	135.850
S05 PRIMARY	125.400
S05 SPARE	124.400
S06 PRIMARY	128.400
S06 SPARE	127.050
S07 PRIMARY	133.400
S07 SPARE	133.600
S08 PRIMARY	125.350
S08 SPARE	124.000
S09 PRIMARY	132.800

S09 SPARE	126.500
S10 PRIMARY	126.950
S10 SPARE	128.250
S11 PRIMARY	135.100
S11 SPARE	125.075
S12 PRIMARY	133.500
S12 SPARE	124.275
S13 PRIMARY	129.250
S13 SPARE	123.700
S14 PRIMARY	128.150
S14 SPARE	124.850
S15 PRIMARY	128.350
S15 SPARE	135.800
S16 PRIMARY	124.900
S16 SPARE	133.800
S17 PRIMARY	125.800
S17 SPARE	127.200

4.5.3 SECTOR CONFIGURATION

SECTOR	MAIN CHARACTERISTICS
S01/S02	a) The main features of sectors 01 and 02 include: integrating the air traffic overflights between Argentina/Uruguay/Southern Brazil and TMA-SP, TMA-RJ, Northeastern Brazil and Europe; and feeding the TMA-PA through the South/Southwest. b) In these sectors there is considerable demand for military operations, as they encompass SUA for training activities of the Santa Maria and Canoas air bases. c) This sector was resized to enable better distribution of the VHF frequencies at the existing stations, to achieve better quality of service in the aeronautical mobile service. d) In spite of the presence of primary and secondary frequencies in sectors 01 and 02, these ATC sectors are mainly grouped.
S03	a) This sector has as main features: integrating the traffic flow to the TMA-PA; and accommodating air traffic overflights destined to Argentina and Montevideo. b) This sector will also include the initial phase of the SBPA flights destined to SBCT, SBKP and SBBR.
S04	a) This sector was established with the following objectives: dedicated integration of the outbound flow from TMA-PA to TMA-FL, TMA-RJ, TMA-SP, Northeastern Brazil and Europe; and accommodating air traffic overflights from Argentina, Uruguay and Southern Brazil to TMA-FL, TMA-SP, TMA-RJ and Northeastern Brazil. b) Approaches to SBPA, from TMA-RJ and TMA-FL, will happen in this sector.

SECTOR	MAIN CHARACTERISTICS
S05	a) This sector is characterized as a pre-feeder of the TMA-SP (Sector 8). b) In this new sector configuration, the routes were realigned and it was resized to facilitate traffic sequencing to TMA-SP.
S06	a) This sector was planned to integrate the traffic flows between Southern Brazil and TMA-RJ, as well as air traffic overflights to Northeastern Brazil and Europe.
S07	a) This sector was not modified by the PBN SOUTH project, and it was only renamed from Sector 11 to Sector 07.
S08	b) This sector was not modified by the PBN SOUTH project, and it was only renamed from Sector 12 to Sector 08.
S09	a) This sector was planned to integrate the departures from the TMA-SP to SBCT, SBJV, SBNF, SAEZ and SUMU, in addition to crossings from TMA-RJ to SBFI and to FIR-Resistência. b) The sector was resized to feed TMA-CT, considering the concepts of the AMAN tool in relation to space for vectoring.
S10	a) This sector was planned to separate the feeds to Terminal-Londrina (TMA-LO) and to SBKP, and it is characterized by mixed air traffic flow, since it will also receive overflights from aircraft destined to Northwest and West sectors of FIR-CW. b) The traffic to SBBU, SBML, SBDN, SBCG and vicinity, via upper and lower airspace, will continue to depart through VOR SCB. c) The sector was sized to enable departures from SBKP to TMA-LO to remain within their lateral boundaries. d) This sector will also receive air traffic overflights from FIR-BS to Southern Brazil; and from TMA-SP to SBCG and to FIR-La Paz.
S11	a) This sector was planned to feed traffic by the Northwest Sector of the TMA-SP integrating traffic from North America, Central America and part of the FIR-AZ flights to SBSP, SBKP and SBGR. b) The sector will also receive traffic from FIR-BS to Southern Brazil.
S12	a) This sector was planned as a pre-feeder sector of sector 11, aiming at balancing and adjusting the traffic demand from North America, Central America and Northern Brazil to SBSP, SBKP and SBGR. b) The sector will also accommodate the departures and arrivals from the TMA-Campo Grande through the East-Southeast sectors, and it is adjusted so that the UW19 airway is within its lateral boundaries, so that the departures and arrivals to SBCG are under the jurisdiction of the same ATCO.
S13	a) This sector has as its main feature the air traffic overflight from North America, Central America and Northern Brazil to SBSP, SBKP and SBGR.

SECTOR	MAIN CHARACTERISTICS
S14	a) The sector has as its main feature the provision of Flight and Alert Information Service for airspace traffic class “G”. b) This sector was resized to enable better distribution of the VHF frequencies at the existing stations, to achieve better quality of service in the aeronautical mobile service. c) In spite of the presence of primary and secondary frequencies in sectors 14 and 15, these ATC sectors are mainly grouped.
S15	a) The sector has as its main feature the provision of Flight and Alert Information Service for traffic in airspace class “G”. b) This sector was resized to enable better distribution of the VHF frequencies at the existing stations, to achieve better quality of service in the aeronautical mobile service. c) In spite of the presence of primary and secondary frequencies in sectors 14 and 15, these ATC sectors are mainly grouped.
S16	a) The main features of this sector are the integration of traffic flows from the TMA-FI, overflights to/from FIR-Asuncion, and provision of the Flight and Alert Information Service for traffic in airspace class “G”.
S17	a) The main features of this sector include the integration of traffic flow from TMA-CT by the North/Northwest sector, overflights to/from FIR-Asuncion and TMA-FI.

4.5.3.1 FIR-CW limits were planned to meet demands of inbound/outbound flows from/to TMA-PA, TMA-CT, TMA-FL and TMA-SP. FIR-CW was extended in its portion to the North of TMA-BU, favoring an arrival to the West of TMA-SP.

4.5.3.2 The new FIR-CW configuration will improve management and balancing of traffic in STAR for each TMA in the Southern Region.

4.6 TMA-SAO PAULO

4.6.1 AIRSPACE CLASSIFICATION AND LIMITS TMA-SP is subdivided in TMASP 1, 2 and 3, as described below:

TMA-SP 1 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
5500’(inclusive)/FL145(exclusive) CLASS C	From 2258.92S/04537.69W; UTGER; LIVED; 2227.88S/04659.10W; NIKNI; 2242.04S/04734.46W; PADAV; ARMIP; 2309.03S/04734.40W; 2332.39S/04734.30W; MUBIP; 2418.34S/04609.90W;

FL145(inclusive)/FL195(exclusive) CLASS A	2403.78S/04603.78W; 2354.41S/04522.70W; to the point of origin.
TMA-SP 2 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
3600'(inclusive)/5500'(exclusive) CLASS C	From 2245.79S/04710.63W; 2259.58S/04651.55W; 2259.10S/04644.91W; 2309.16S/04633.28W; 2315.40S/04612.71W; 2322.93S/04608.20W; 2349.51S/04626.59W; 2351.13S/04639.26W; 2334.01S/04704.33W; 2314.41S/04706.28W; 2301.75S/04723.93W by a clockwise arc within a 15NM radius centered on coordinates 2300.43S/04708.05W to the point of origin.
TMA-SP 3 Limits	
VERTICAL LIMIT	**HORIZONTAL LIMIT**
FL105(inclusive)/FL145(exclusive) CLASS C	From 2337.77S/04411.08W; ESORU; 2241.02S/04417.96W; 2258.92S/04537.69W; 2354.41S/04522.70W; to the point of origin.
FL145(inclusive)/FL195(exclusive) CLASS A	

NOTE**:** The ATS, within the airspace overlying TMA-SP3 (CTA CURITIBA T-8 and CTA CURITIBA T-8 U), will be provided by APP-SP according to their sectors.

4.6.2 SECTORIZATION

TMA-SP sectors were designed with the purpose of maintaining the air traffic controller's attention, as far as possible, regarding similar navigation patterns. For that, sectors focus on arrival or departure, excepting T3 and T5 sectors, responsible for navigation of aircraft approaching or taking off.

NOTE**:** The sectorization of Terminal Control Area-Sao Paulo, containing its specific characteristics, is described as follows:

TMA-SP Sectors			
SECTOR	**LIMITS**	**FUNCTION**	**FREQUENCIES**
T1	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	SBSP and SBGR FEEDER SECTOR S	129.00MHz 134.90MHz
T2	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	DEPARTURES SECTOR S05 and S09 FIR-CW	119.60MHz 122.75MHz

T3	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	ARRIVALS SBKP SECTOR W/NW DEPARTURES SECTOR S10 FIR-CW and TMA-YS	120.05MHz 135.75MHz
T4	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	ARRIVALS N/NW to SBSP and SBGR	119.80MHz 129.00MHz
T5	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	ARRIVALS SBKP SECTOR E/SE DEPARTURES SECTOR S01 FIR-BS and TMA-YS	120.25MHz 132.10MHz
T6	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	ARRIVALS to GR SECTOR NE of TMA-SP	120.85MHz 123.25MHz
T7	Lateral: according to ARC and AIP Vertical: 5500FT to FL195	DEPARTURES to SECTOR E/NE of TMA-SP	120.45MHz 129.05MHz
T8	Lateral: according to ARC and AIP Vertical: FL105 to FL195	AREA CONTROL RJ-SP Axis	121.35MHz 124.70MHz
T9	Lateral: according to ARC and AIP Vertical: 5500FT to FL105	FINAL SBGR	119.15MHz 129.75MHz
T10	Lateral: according to ARC and AIP Vertical: 5500FT to FL105	FINAL SBSP	119.05MHz 133.85MHz
T11	Lateral: according to ARC and AIP Vertical: 5500FT to FL105	FINAL SBKP	119.25MHz 121.40MHz
T12	Lateral: according to ARC and AIP Vertical: 5500FT to FL085	FINAL SBSJ	119.25MHz 121.40MHz
T13	Lateral: according to ARC and AIP Vertical: FL105 to FL195	AREA CONTROL RJ-SP Axis	123.90MHz 125.60MHz
T14	Lateral: according to ARC and AIP Vertical: FL105 to FL195	AREA CONTROL RJ-SP Axis	119.25MHz 121.40MHz 123.90MHz 125.60MHz

IMAGE 1 – SECTORIZATION OF TMA-SP

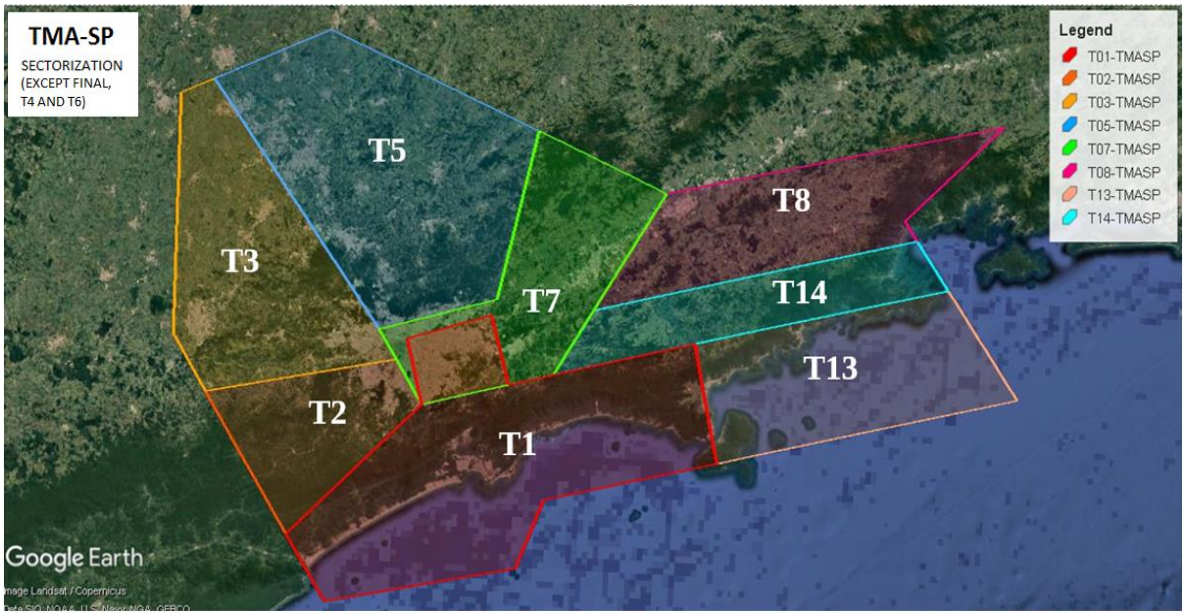


IMAGE 2 – T4 AND T6 VERTICALIZED SECTORS

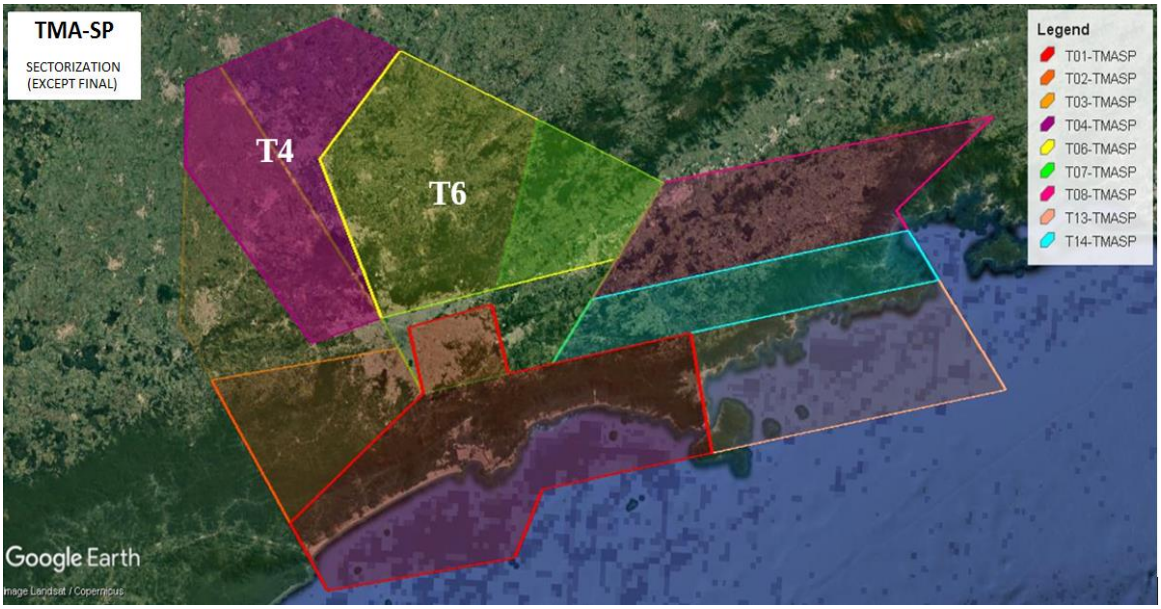


IMAGE 3 – SECTORIZATION OF TMA-SP WITH FINAL APPROACHES (T9/T10/T11/T12)

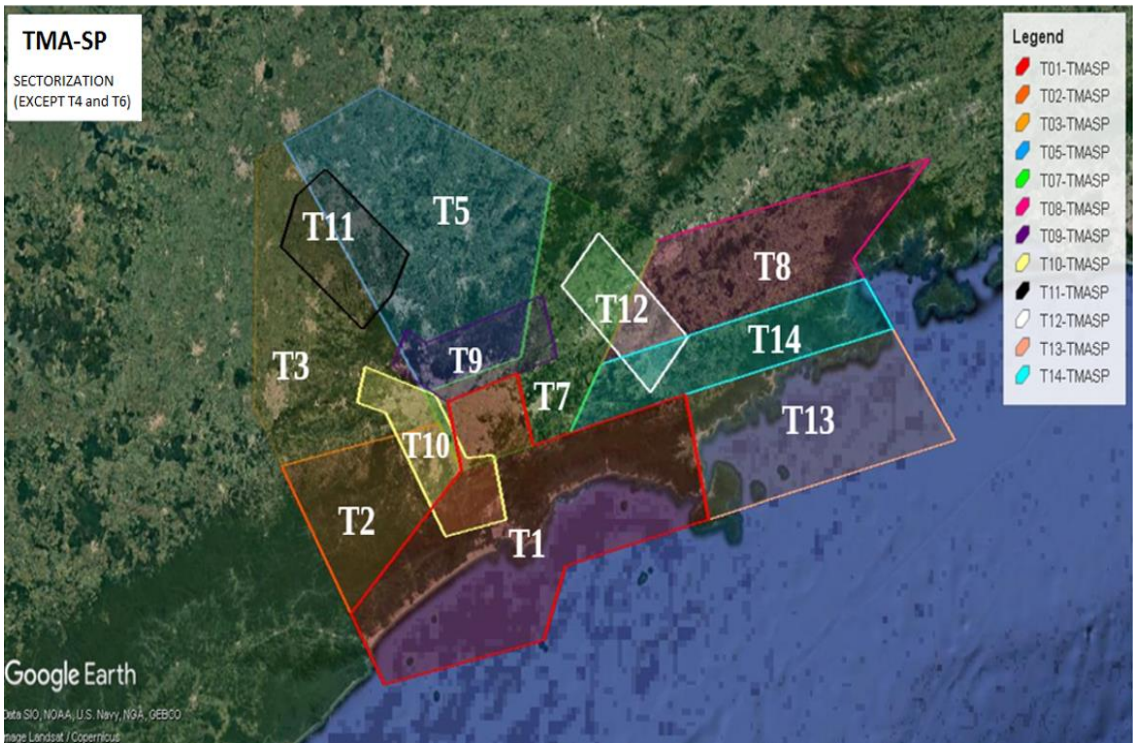


IMAGE 4 – TMA-SP PLAINVIEW SCHEMATIC REPRESENTATION

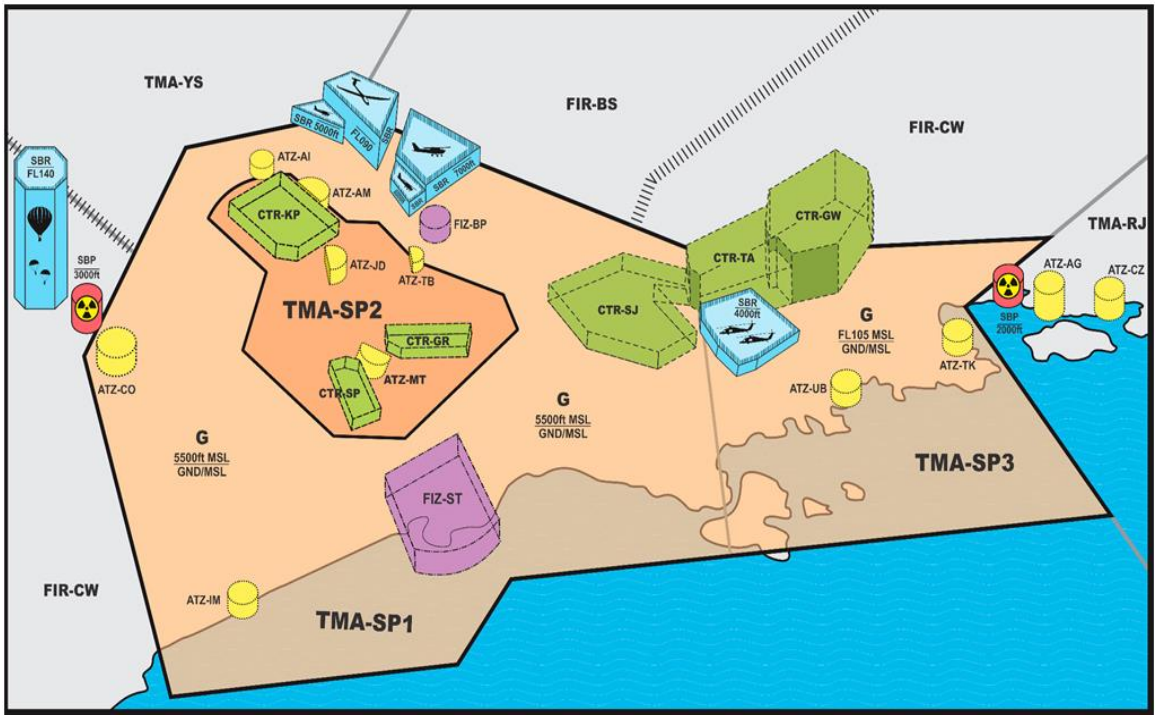
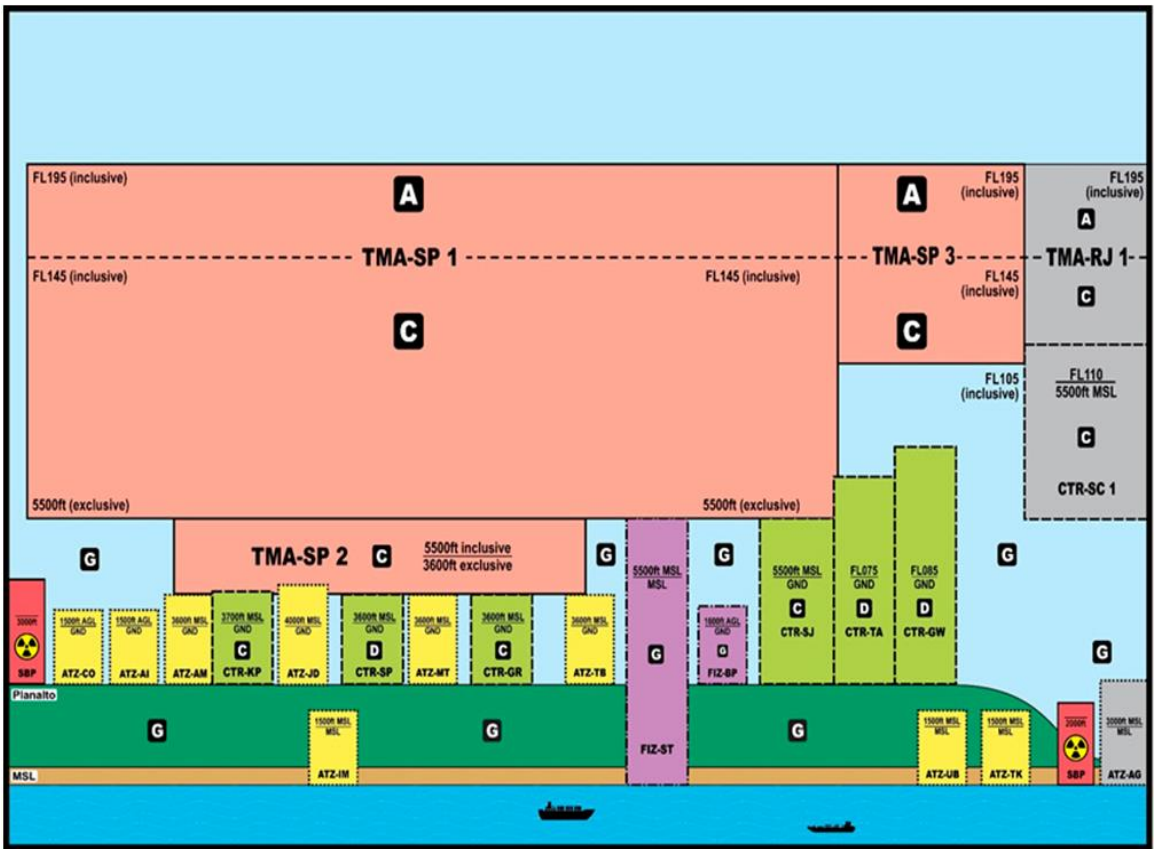


IMAGE 5 – TMA-SP PROFILE VIEW SCHEMATIC REPRESENTATION



5 SPECIFIC PROCEDURES

5.1 APPLICATION OF OPEN AND CLOSED STAR CONCEPTS

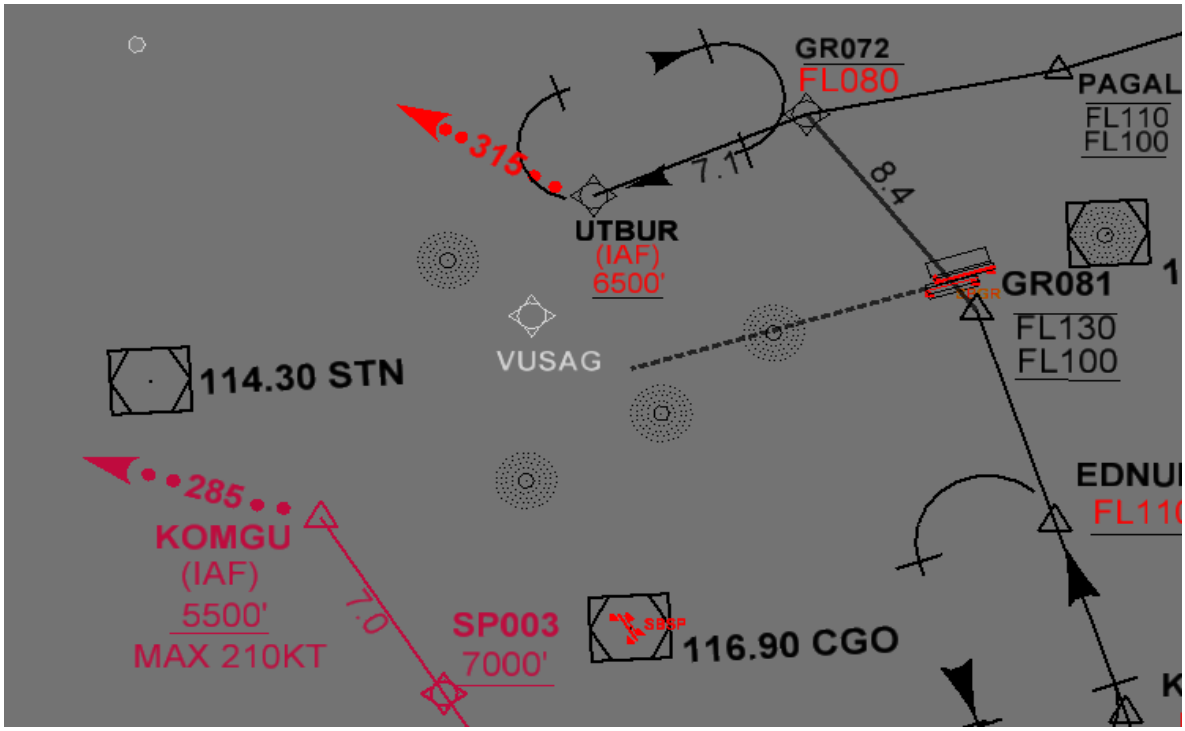
5.1.1 By implementing the PBN Concept, STAR were designed in accordance with the concepts of OPEN STAR and/or CLOSED STAR.

5.1.2 All STAR procedures for SBPA, SBCT, SBJV, SBNF, SBFL, SBGR, SBSP, SBKP and SBSJ aerodromes were designed as closed STAR. In this way, a STAR waypoint/fix matches the Initial Approach Fix (IAF), and the aircraft, after the arrival procedure, may start the approach procedure, as authorized by the ATC unit.

5.1.3 Some procedures at SBPA, SBBI, SBCT, SBKP, SBSP, SBGR aerodromes can show, on the same chart, the possibility of an open or a closed STAR. The open STAR procedure will be used when it is not possible to authorize an approach procedure any more, due to the need of air traffic sequencing.

5.1.4 In all procedures in which there is possibility of open STAR, the procedure, in the last waypoint/fix, presents a defined trajectory, generally parallel to the runway and contrary to the landing direction, from which the aircraft will wait vectoring instruction from the ATC unit, to intercept the final approach.

NOTE: Since final approaches SBGR RWY 09 and SBSP RWY17 are close, the vectoring trajectory published in Open STAR is not parallel to the extended centerline of final approach to those airports.



5.1.5 The publication of procedures based on the open STAR concept enables, when traffic flow is intense, to preset initial heading and limits for communication failure, in order to reduce time spent in Air-Ground communication, maintaining the safety of air operations.

5.1.6, An aircraft can be vectored at any STAR point, whenever necessary, according to the legislation in force, independently of an open or closed STAR concept.

5.2 PROCEDURES TO TMA-SAO PAULO

5.2.1 Aircraft executing performance-based navigation procedures will have priority over aircraft executing conventional navigation procedures.

5.2.2 Aircraft approaching SBSP, for RWY17, executing KOMGU2A STAR, in case they are vectored when passing KOMGU position, may be authorized to retake navigation direct LUVDI position (IAF, also, foreseen in SBSP IAC).

5.2.3 Aircraft in IFR flight which intended to fly VFR within TMA-SP1 or TMA-SP2, shall:

a) in case they are inbound from S09 or S10 of FIR-CW, plan their flights to enter TMA-SP at altitudes and positions foreseen in special routes for aircraft, and when it is not possible to cancel IFR flight, the ACC-CW will instruct aircraft to fly SCB, coordinating the descent with APP-SP;

b) in case they are inbound from TMA-YS, plan their flights to overfly PUPSI fix, being mandatory to pass this fix at or below FL120, to cancel IFR flight and enter special routes for aircraft (according to altitudes and positions foreseen in specific legislation) or, when it is not possible, the aircraft will be instructed, by APP-YS, to fly after PUPSI direct SCB in descent FL100;

NOTE: Due to SBKP SID ISEVU1A RWY33, aircraft shall not cross this route below FL100, unless authorized by APP-SP.

c) in case they are inbound from FIR-CW S11, plan their flight to execute procedure foreseen in paragraph “b” of this item;

d) in case they are inbound from FIR-BS above FL190, plan their flights to overfly MOXEP fix, being mandatory to pass this fix at or below FL120, then direct BGC, where it is compulsory to overfly at or below FL070, to cancel IFR flight and enter special routes for aircraft;

e) inbound from FIR-BS at or below FL190, plan their flights to execute procedure foreseen in paragraph "b" or "d" of this item, according to authorization issued by ACC-BS to balance traffic in sectors of this FIR.

5.2.4 Aircraft taking off from SBGR and SBSP executing Conventional SID, starting route at S03 of FIR-BS, may be authorized for SID with SCB TRNS, then direct RCL to intercept AWY.

5.2.5 SBGR SID (CGO1C/CGO1E/CGO1F/CGO2F) with RCL TRNS is conditioned to previous authorization from APP-SP and will be used in case of contingency, meteorological degradation or operational need of flow in TMA-SP and in FIR-BS.

5.3 PROCEDURE FOR AIRCRAFT DESTINED TO OR COSSING TMA-YS.

5.3.1 Aircraft at or below FL180, destined to aerodromes located in TMA-YS (Sector T1 and Sector T6) shall execute:

a) If took off from SBGR/SBSP: Move away from SCB on RDL290/25NM, then DCT OBLUG DCT.

b) If took off from SBKP: SID RAXEG TRNS DCT OBLUG DCT;

5.3.2 Aircraft with final levels FL160 or FL180, destined to aerodromes located in TMA-YS (Sector T3), TMA-UR or TMA-UL shall execute:

a) If took off from SBGR/SBKP: SID UKBEV TRNS DCT KP701 DCT MUKNU DCT;

b) If took off from SBSP: Move away from SCB on RDL290/25NM, then DCT OBLUG DCT.

5.3.3 Aircraft at or below FL160, exclusive, destined to aerodromes located in TMA-YS (Sector T3), TMA-UR, TMA-UL or for crossing of these TMA shall execute:

a) If took off from SBGR: SID BGC TRNS DCT MOTLO DCT PCL DCT MUKNU DCT;

b) If took off from SBSP: Move away from SCB on RDL290/25NM, then DCT OBLUG DCT.

c) If took off from SBKP: SID UKBEV TRNS DCT MOTLO DCT PCL DCT MUKNU DCT.

5.4 <u>SPECIFIC PROCEDURES FOR AIRCRAFT INBOUND FROM RJ-SP AXIS DESTINED TO NORTHERN/NORTHWESTERN REGION OF TMA-YS</u>

5.4.1 Aircraft at or below FL180 (only even levels will be used in this route) shall execute the following procedures, when areas SBR-417 (ENSAIOS 1), SBR-418 (ENSAIOS 2), SBR-423 (ENSAIOS 3), SBR-431 (XAVANTE A), SBR-421 (XAVANTE B) and SBR-456 (COLIBRI):

a) are NOT being used: GGT DCT PCL DCT ZANET DCT;

b) are being used: SCP DCT UTGER DCT ZANET DCT.

5.4.2 Aircraft inbound from SBSJ to SBGP shall execute the following trajectory: NILBI DCT RCL DCT MEVUT DCT at or above FL160.

5.4.3 Aircraft inbound from SBGP to SBSJ shall execute the following trajectory: DCT OPRUT DCT MOXEP STAR in use.

6 EFFECTIVE PERIOD

6.1 The air traffic flow restructuring of TMA-Curitiba, TMA-Florianopolis, TMA-Porto Alegre, TMA-São Paulo, ACC-Brasilia and ACC-Curitiba will come into force on 12 OCT 2017, at 04:00 UTC.

6.2 With the purpose of keeping backup files of some conventional procedures, some charts will be stored for a period of time until full implementation of PBN-SUL project.

7 FINAL ARRANGEMENTS

7.1 DECEA provides a communication channel to send questions, suggestions, commentaries, criticisms, compliments and notification of errors, via the Customer Service Portal, which can be accessed by clicking on the following link: http://servicos.decea.gov.br/sac/index.cfm

7.2 Other legislation remain in force and are applicable to the PBN Concept, except regarding procedures described in this AIC.

7.3 The approval of this AIC was published in DECEA Internal Bulletin No. , dated 2017.

7.4 The cases not foreseen in this AIC shall be submitted to the Head of DECEA Operations Subdepartment.

ATTACHMENT A

TERMINAL CONTROL AREA-CURITIBA

NAME LATERAL LIMITS VERTICAL LIMITS ATS AIRSPACE CLASSIFICATION	**UNIT WHICH PROVIDES THE SERVICE**	**CALL SIGN (LANGUAGE) OPERATING HOURS**	**FREQUENCY PURPOSE**	**RMK**
1	2	3	4	5
TERMINAL CONTROL AREA-CURITIBA 1 From 2542.54S/05002.01W; 2510.86S/04949.29W; ARPOK; 2452.84S/04937.06W; 2445.84S/04916.44W; EVNUN; 2445.63S/04851.35W; 2502.07S/04835.26W; 2517.99S/04837.47W; 2520.65S/04815.57W; 2550.43S/04823.33W; 2600.19S/04816.76W; 2609.79S/04818.14W; 2606.12S/04827.54W; 2629.37S/04833.58W; 2655.09S/04915.77W; 2619.49S/04927.90W; to the point of origin. FL 195 FL145 AIRSPACE 'A' FL145 5500FT AIRSPACE 'C'	APP CT	CURITIBA CONTROL PT-EN H24	119.95 MHZ (1) 119.70 MHZ (6,7,9,10) 120.65 MHZ (4,5) 120.95 MHZ (3) 129.55 MHZ (2) 133.15 MHZ (8)	**(1) T1** ATS Surveillance Ser **(2) T2** ATS Surveillance Ser **(3) T3** ATS Surveillance Ser **(4) T4** ATS Surveillance Ser (5) **T5** ATS Surveillance Ser (6)ALTN **T1** ATS Surveillance Ser (7)ALTN **T2** ATS Surveillance Ser (8)ALTN **T3** ATS Surveillance Ser (9)ALTN **T4** ATS Surveillance Ser (10)ALTN **T5** ATS Surveillance Ser

NAME LATERAL LIMITS VERTICAL LIMITS ATS AIRSPACE CLASSIFICATION	**UNIT WHICH PROVIDES THE SERVICE**	**CALL SIGN (LANGUAGE) OPERATING HOURS**	**FREQUENCY PURPOSE**	**RMK**
1	2	3	4	5
TERMINAL CONTROL AREA-CURITIBA-2 From 2510.57S/04920.46W; 2523.83S/04854.91W; 2552.50S/04903.45W; 2541.95S/04933.96W; 2521.51S/04928.55W; 2513.08S/04922.86W; to the point of origin. 5500FT 4500FT AIRSPACE 'C'	APP CT	CURITIBA CONTROL PT-EN H24	119.95 MHZ (1) 119.70 MHZ (5,6,7,8) 120.65 MHZ (3,4) 129.55 MHZ (2)	(1) **T1** ATS Surveillance Ser (2) **T2** ATS Surveillance Ser (3) **T4** ATS Surveillance Ser (4) **T5** ATS Surveillance Ser (5) ALTN **T1** ATS Surveillance Ser (6) ALTN **T2** ATS Surveillance Ser (7) ALTN **T4** ATS Surveillance Ser (8) ALTN **T5** ATS Surveillance Ser

NAME **LATERAL LIMITS** **VERTICAL LIMITS** **ATS AIRSPACE** **CLASSIFICATION**	**UNIT WHICH PROVIDES THE SERVICE**	**CALL SIGN (LANGUAGE) OPERATING HOURS**	**FREQUENCY PURPOSE**	**RMK**
1	2	3	4	5
TERMINAL CONTROL AREA-CURITIBA-3 From 2550.75S/04849.06W; 2548.66S/04839.94W; 2558.99S/04825.65W; 2606.12S/04827.54W; 2622.07S/04831.68W; 2627.68S/04836.16W; 2631.65S/04842.24W; 2612.62S/04908.52W; to the point of origin. 5500FT 1500FT AIRSPACE 'D'	APP CT	CURITIBA CONTROL PT-EN FROM 06 h TO 00 h	133.15 MHZ (1) 120.95 MHZ (2)	(1) **T6** APP Conventional Ser (2) ALTN **T6** APP Conventional Ser

ATTACHMENT B

TERMINAL CONTROL AREA-FLORIANOPOLIS

NAME **LATERAL LIMITS** **VERTICAL LIMITS** **ATS AIRSPACE CLASSIFICATION**	**UNIT WHICH PROVIDES THE SERVICE**	**CALL SIGN (LANGUAGE) OPERATING HOURS**	**FREQUENCY PURPOSE**	**RMK**
1	2	3	4	5
TERMINAL CONTROL AREA-FLORIANÓPOLIS-1 From 2655.09S/04915.77W; 2629.37S/04833.58W; 2606.12S/04827.54W; 2609.79S/04818.14W; 2615.74S/04802.89W; 2619.09S/04757.07W; 2627.33S/04746.06W; 2650.62S/04742.97W; 2703.13S/04741.29W; 2717.86S/04726.00W; 2740.04S/04752.84W; 2818.13S/04819.56W; 2802.75S/04847.20W; 2815.01S/04855.93W; 2810.57S/04912.69W; 2758.75S/04931.03W; 2743.01S/04934.54W; 2724.92S/04931.13W: to the point of origin. FL195 FL145 A FL145 5500 ft C	APP-FLORIANÓPOLIS	FLORIANÓPOLIS CONTROL PT-EN H24	119.50 MHZ(4,10) 119.65 MHZ (2,3) 128.95 MHZ (1) 129.45 MHZ (6,7,8) 129.60 MHZ (5,9)	**(1) T1** ATS SURVEILLANCE SER **(2) T2** ATS SURVEILLANCE SER **(3) T3** ATS SURVEILLANCE SER **(4) T4** ATS SURVEILLANCE SER (5) **T5** ATS SURVEILLANCE SER (6) ALTN **T1** (7) ALTN **T2** (8) ALTN **T3** (9) ALTN **T4** (10) ALTN **T5**
TERMINAL CONTROL AREA-FLORIANÓPOLIS-2 From 2718.54S/04846.59W; 2721.32S/04841.42W; 2734.38S/04817.13W; 2741.22S/04804.29W by a clockwise arc within a 25NM radius centered on coordinates 2740.19S/04832.42W (VOR/DME FLN); 2801.92S/04818.35W; 2755.03S/04831.17W; 2750.58S/04839.43W; 2739.12S/04900.55W by a clockwise arc within a 25NM radius centered on coordinates 2740.19S/04832.42W (FLN VOR/DME); to the point of origin. 5500ft 1500 ft C	APP-FLORIANÓPOLIS	FLORIANOPOLIS CONTROL PT-EN H24	119.65 MHZ (2,3) 128.95 MHZ (1) 129.45 MHZ (4,5,6)	(1) T1 ATS SURVEILLANCE SER (2) T2 ATS SURVEILLANCE SER (3) T3 ATS SURVEILLANCE SER (4) ALTN T1 (5) ALTN T2 (6) ALTN T3

TERMINAL CONTROL AREA-FLORIANÓPOLIS-3 From 2647.27S/04858.06W; 2632.75S/04834.25W by a clockwise arc within a 20NM radius centered on coordinates 2652.45S/04838.74W 2652.35S/04816.37W; 2707.34S/04841.09W by a clockwise arc within a 18NM radius centered on coordinates 2652.45S/04838.74W to the point of origin. 5500ft 1500 ft C	APP- FLORIANÓPOLIS	FLORIANOPOLIS CONTROL PT-EN H24	119.50 MHZ (1,4) 129.60 MHZ (2,3)	(1) T4 ATS SURVEILLANCE SER (2) T5 ATS SURVEILLANCE SER (3) ALTN T4 (4) ALTN T5

ATTACHMENT C

TERMINAL CONTROL AREA-PORTO ALEGRE

NAME LATERAL LIMITS VERTICAL LIMITS ATS AIRSPACE CLASSIFICATION	UNIT WHICH PROVIDES THE SERVICE	CALL SIGN (LANGUAGE) OPERATING HOURS	FREQUENCY PURPOSE	RMK
1	2	3	4	5
TERMINAL CONTROL AREA PORTO ALEGRE – 1 From 2915.13S/05029.60W; 2926.38S/05032.38W; 2933.38S/05024.14W; 2951.49S/05036.49W; 3010.48S/05037.48W; 3025.50S/05052.50W; 3029.50S/05111.50W; 3020.82S/05130.02W; 3026.61S/05145.37W; 3018.28S/05151.83W; 3008.32S/05150.03W; 2944.53S/05148.59W; 2939.56S/05148.29W; 2932.80S/05143.92W; 2916.60S/05152.93W; 2902.25S/05135.15W; 2916.24S/05133.64W; 2922.93S/05121.86W; 2924.81S/05105.86W; 2921.88S/05049.63W; to the point of origin. FL195 FL145 AIRSPACE ‘A’ FL145 3500FT AIRSPACE ‘C’	APP PA	PALEGRE CONTROL PT-EN H24	119.00 MHZ (1,3,6,8,10,12) 120.10 MHZ (5,7,9,2,4,15)) 128.90 MHZ (13) 120.55 MHZ (11, 16,14)	(1) **T1** ATS Surveillance Ser (2) ALTN **T1** ATS Surveillance Ser (3) **T2** ATS Surveillance Ser (4) ALTN **T2** Vigilância ATS Ser (5) **T3** ATS Surveillance Ser (6) ALTN **T3** ATS Surveillance Ser (7) **T4** ATS Surveillance Ser (8) ALTN **T4** ATS Surveillance Ser (9) **T5 SUP** ATS Surveillance Ser (10) ALTN **T5 SUP** ATS Surveillance Ser (11) **T5 INF** Vigilância ATS Ser (12) ALTN **T5 INF** ATS Surveillance Ser (13) **T6** ATS Surveillance Ser (14) ALTN **T6** ATS Surveillance Ser (15) **T7** ATS Surveillance Ser (16) ALTN **T7** ATS Surveillance Ser

NAME LATERAL LIMITS VERTICAL LIMITS ATS AIRSPACE CLASSIFICATION	UNIT WHICH PROVIDES THE SERVICE	CALL SIGN (LANGUAGE) OPERATING HOURS	FREQUENCY PURPOSE	RMK
1	2	3	4	5
TERMINAL CONTROL AREA PORTO ALEGRE - 2 From 2855.01S/05135.93W; 2849.77S/05116.63W; 2848.00S/05057.48W; 2854.01S/05049.37W; 2902.56S/05043.35W; 2904.64S/05038.62W; 2907.99S/05027.84W; 2915.13S/05029.60W; 2921.88S/05049.63W; 2924.81S/05105.86W; 2922.93S/05121.86W; 2916.24S/05133.64W; to the point of origin. FL195 FL145 AIRSPACE ‘A’ FL145 5500FT AIRSPACE ‘C’	APP PA	PALEGRE CONTROL PT-EN H24	119.00 MHZ (1,3,6,8,10,12) 120.10 MHZ (5,7,9,2,4,15)) 128.90 MHZ (13) 120.55 MHZ (11, 16,14)	(1) T1 ATS Surveillance Ser (2) ALTN T1 ATS Surveillance Ser (3) T2 ATS Surveillance Ser (4) ALTN T2 ATS Surveillance Ser (5) T3 ATS Surveillance Ser (6) ALTN T3 ATS Surveillance Ser (7) T4 ATS Surveillance Ser (8) ALTN T4 ATS Surveillance Ser (9) T5 SUP ATS Surveillance Ser (10) ALTN T5 SUP ATS Surveillance Ser (11) T5 INF ATS Surveillance Ser (12) ALTN T5 INF ATS Surveillance Ser (13) T6 ATS Surveillance Ser (14) ALTN T6 ATS Surveillance Ser (15) T7 ATS Surveillance Ser (16) ALTN T7 ATS Surveillance Ser