MAZATLÁN OCEÁNICA MMFO

COMUNICACIONES
SECRETARÍA DE INFRAESTRUCTURA, COMUNICACIONES Y TRANSPORTES

SENEAM
SERVICIOS A LA NAVEGACIÓN EN EL ESPACIO AÉREO MEXICANO



2026 año de Margarita Maza

MAZATLÁN OCEÁNICA MMFO



ADJACENT FIR´s

2026 año de Margarita Maza

MAZATLÁN OCEÁNICA MMFO



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STATUS:

Since 2013, the possibility and need to assume control of the airspace defined in the MMFO FIR has been raised.
Since then, important steps have been taken towards that goal with notable advances.
Currently, a flight information and alert service is provided through a Communications link provided by ARINC communications company, which has HF and satellite ADS-C for communication with aircraft. At MMZT ACC there is an interface named (AVINET) which allow to communicate through messaging with ARINC and then the message is retransmitted to the aircraft.



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CLASS G TO CLASS A

At the time, the Project was divided into 3 (three) phases:

PHASE I, Class “G” / communications via ARINC (Voice Relay Service)

PHASE II, Class “A” / communications via ARINC (Voice Relay Service) and AVINET

PHASE III, Class “A” / communications via ARINC (Voice Relay Service) and AVINET ADSC-CPDLC



PHASE I.- CLASS G OPERATIONAL CONCEPT

- **Flight information service at EAS within the MMFO (Doc. 4444 – Chapter 9 Flight Information Service and Alert Service)**
- **Visualization in the TOPSKY system through Flight Plan Tracks.**
- **Pilot Controller Communication via ARINC (VOICE RELAY SERVICE)**
- **Exchange of automated messages in AIDC and/or ICAO protocol**

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PHASE I.- CLASS G LOA´s

- **ARINC (Aeronautical Radio Inc.)**
- **ARTCC OAK**
- **MHTG Centro America (COCESNA)**
- **MMEX ACC**
- **MMID ACC**



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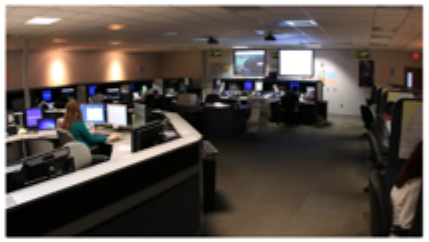
PHASE I.- CLASS G COMUNICATION

PILOT – CONTROLLER COMUNICATION

Through ARINC interface, via AFTN network or telephone.



ARINC



MMZT ACC



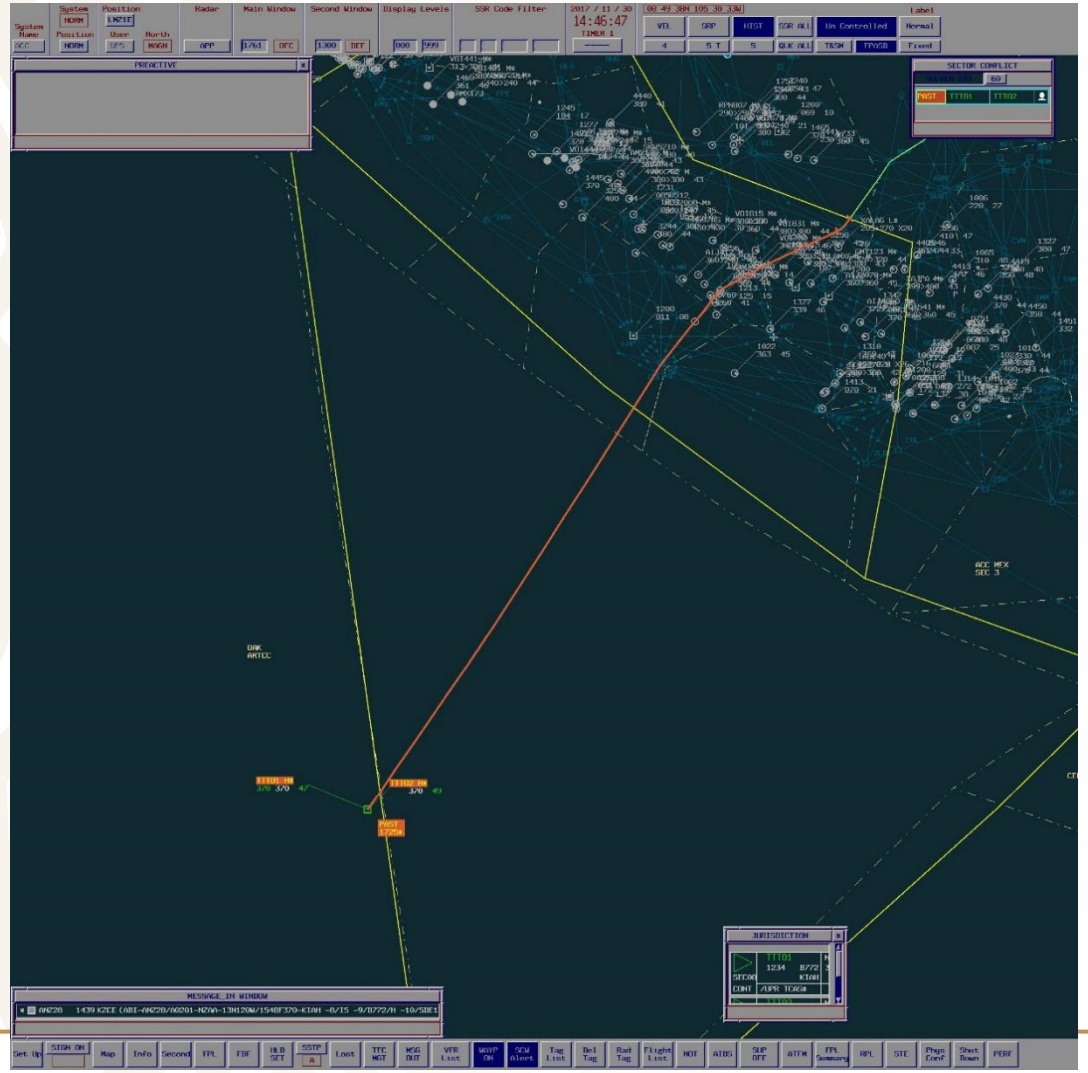
AVINET



AFTN



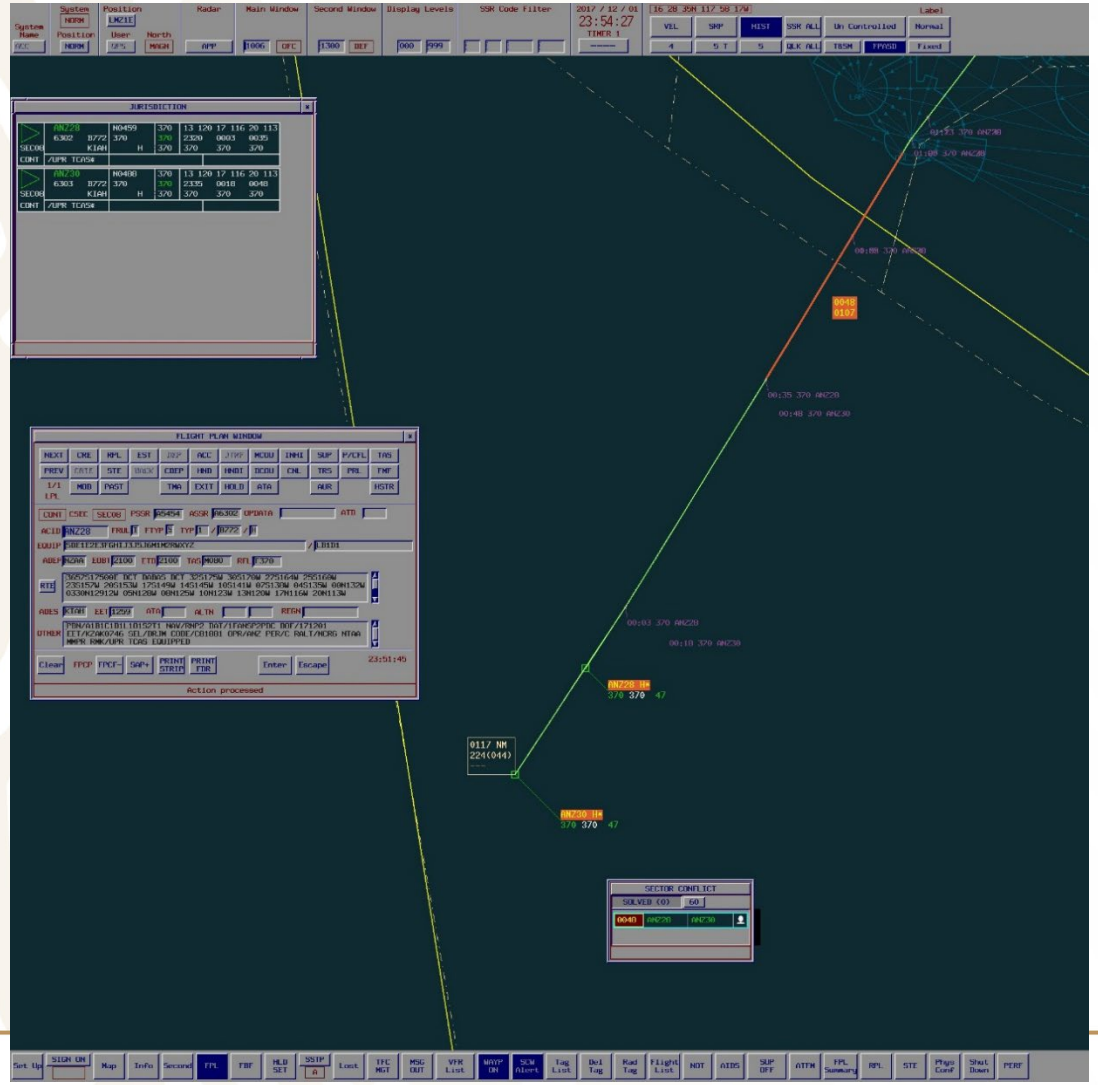
PHASE I.- CLASS G SURVEILLANCE



The yellow line defines the area of the FPCP alert in the TOPSKY System.

It is a Flight Plan alert with defined values for each of the areas in question.

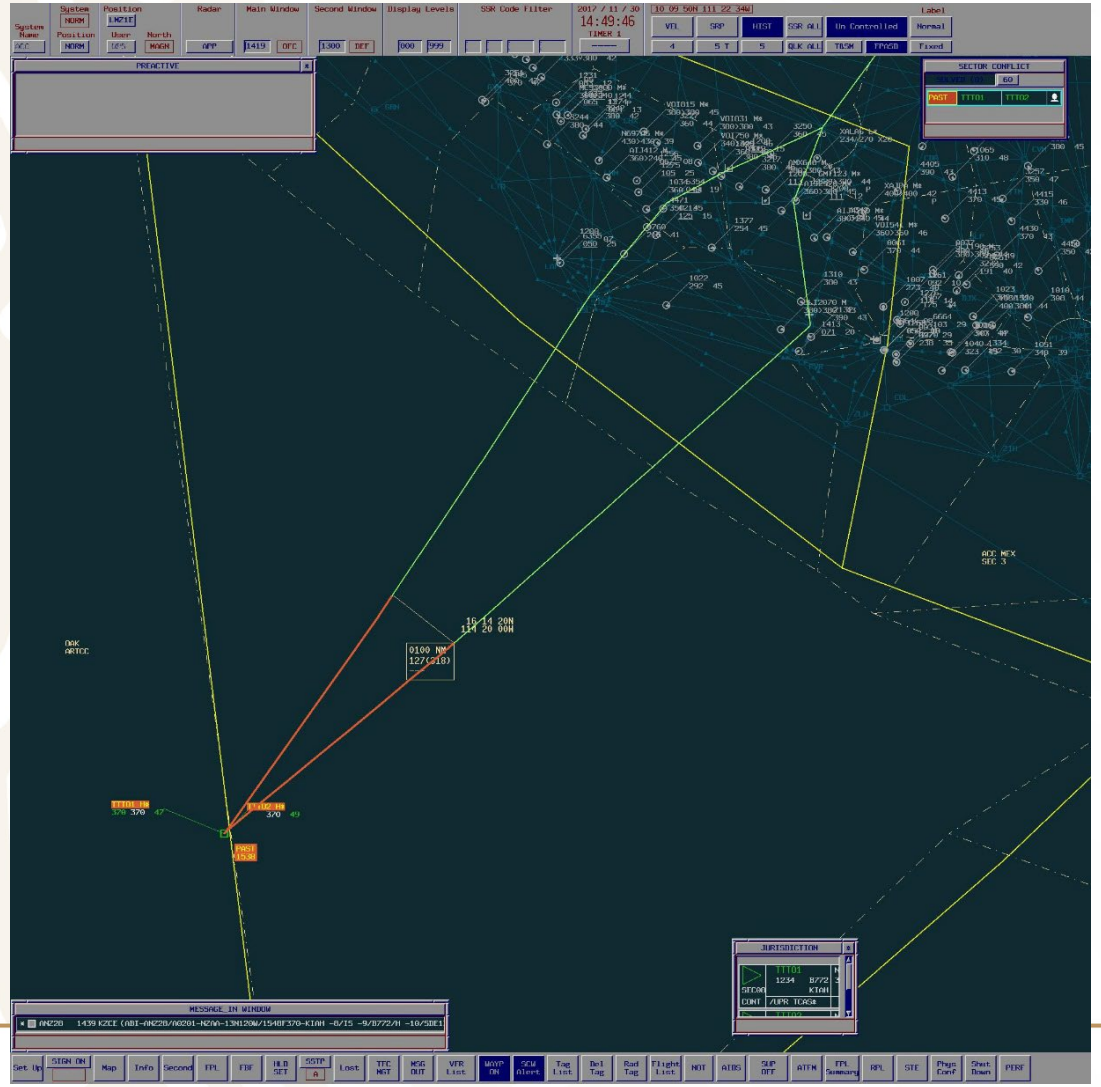
PHASE I.- CLASS G SURVEILLANCE



For this example, the System shows the alert where the longitudinal Separation is expected to be less than 10 minutes.

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PHASE I.- CLASS G SURVEILLANCE



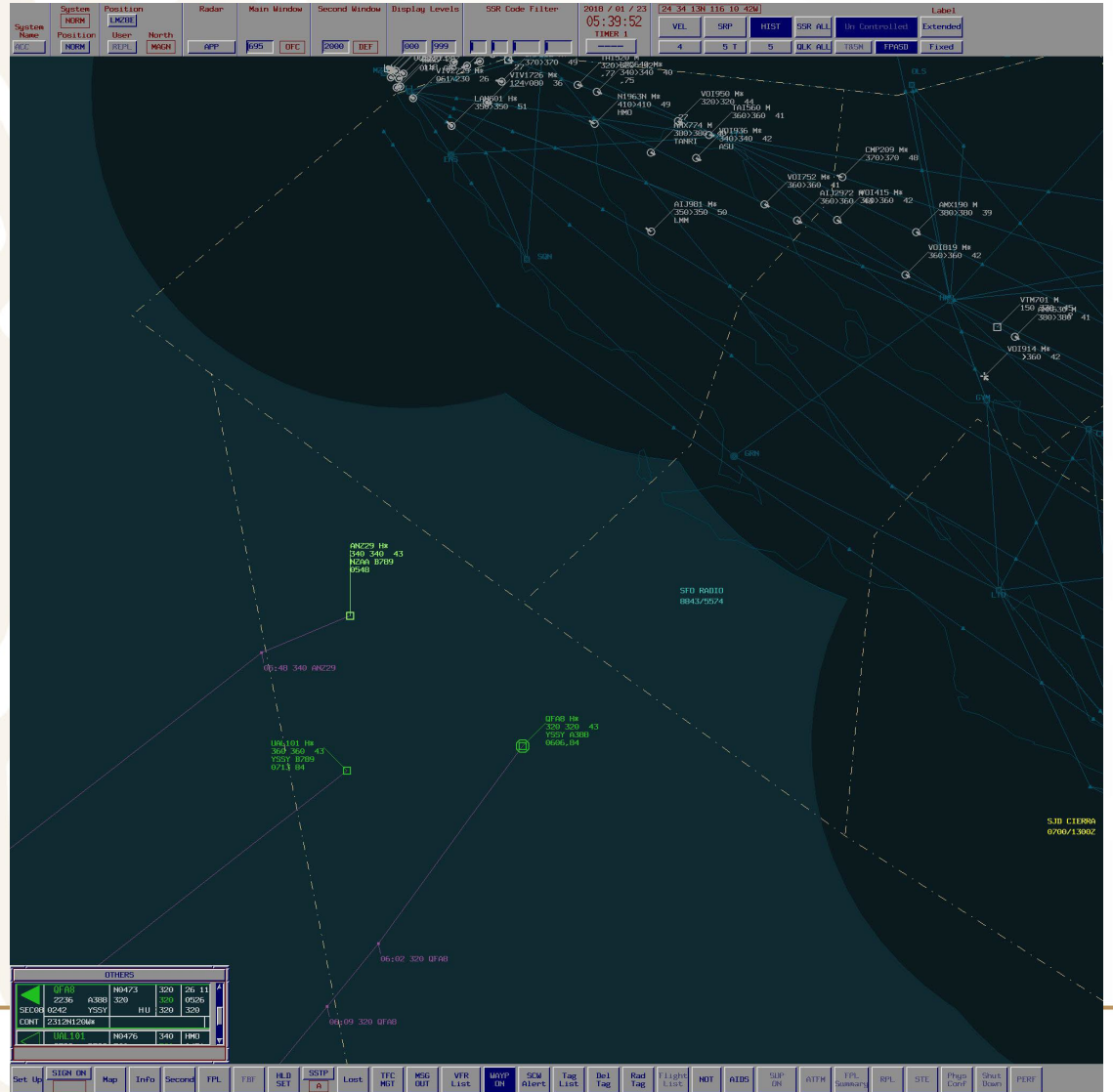
In this image, the System shows us the alert where the lateral separation is expected to be 100 NM or greater.

Which would allow the Controller to authorize the same level or, a crossing of levels in ascent or descent. The red line indicates that they are NOT laterally separated.



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PHASE I.- CLASS G SURVEILLANCE



The image corresponds to a day with traffic in the MMFO FIR.

ANZ28 B789, From KDFW to NZAA
QFA8 A388, from KDFW to YSSY
UAL101 B789, from KDFW to YSSY



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PHASE III.- CLASS A OPERATIONAL CONCEPT



COMMUNICATION

CPDLC
(CONTROLLER –PILOT DATALINK COMMUNICATIONS)

NAVIGATION

UPR (USER PREFERRED ROUTE)
PBN (RNAV 10)

SURVEILLANCE

ADS-C (AUTOMATIC DEPENDENT SURVEILL
- CONTRACT)



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SERVICIOS A LA NAVEGACIÓN EN EL ESPACIO AÉREO MEXICANO

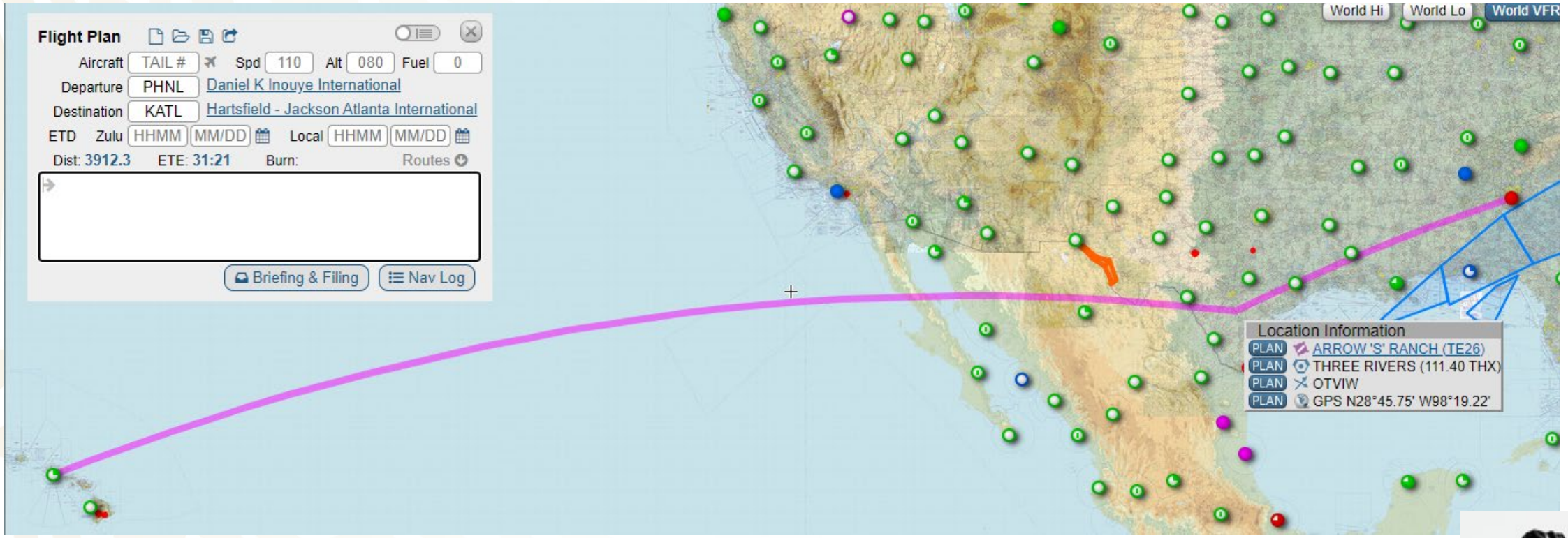
PHASE III.- CLASS A AIM





NOVEMBER 30 2022 (CADENA CANSO MEETING)

DALTA STARTS TO LOOK FOR NEW ROUTES PHNL TO KATL



SENEAM
SERVICIOS A LA NAVEGACIÓN EN EL ESPACIO AÉREO MEXICANO

NOVEMBER 30 2022 (CADENA CANSO MEETING)

DALTA STARTS TO LOOK FOR NEW ROUTES PHNL TO KATL



PHNL MKK5 CODDY DCT FOMAS DCT 26N135W DCT 27N120W DCT DUTES DCT SAT J27 LFK DCT DPATY DCT MERDN DCT ORRKK DCT HOBTT HOBTT2 KATL

NOVEMBER 30 2022 (CADENA CANSO MEETING)

DALTA STARTS TO LOOK FOR NEW ROUTES PHNL TO KATL

PHNL-KATL

DELTA´S A350		
ACTUAL USED ROUTES		
	TIME	BURN
ROUTES GEN.0	7+30	94,827
1	7+43	95,959
2	7+59	99,488
3	8+17	103,482
PROPOSED SENEAM NEW ROUTES PHNL KATL		
1	7+30	92,490
2	7+30	92,320

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SAVINGS 2,337 Pounds per leg

858 USD

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UP TO DATE DATA.....

MMFO JANUARY 2022 TOTAL OPS 47

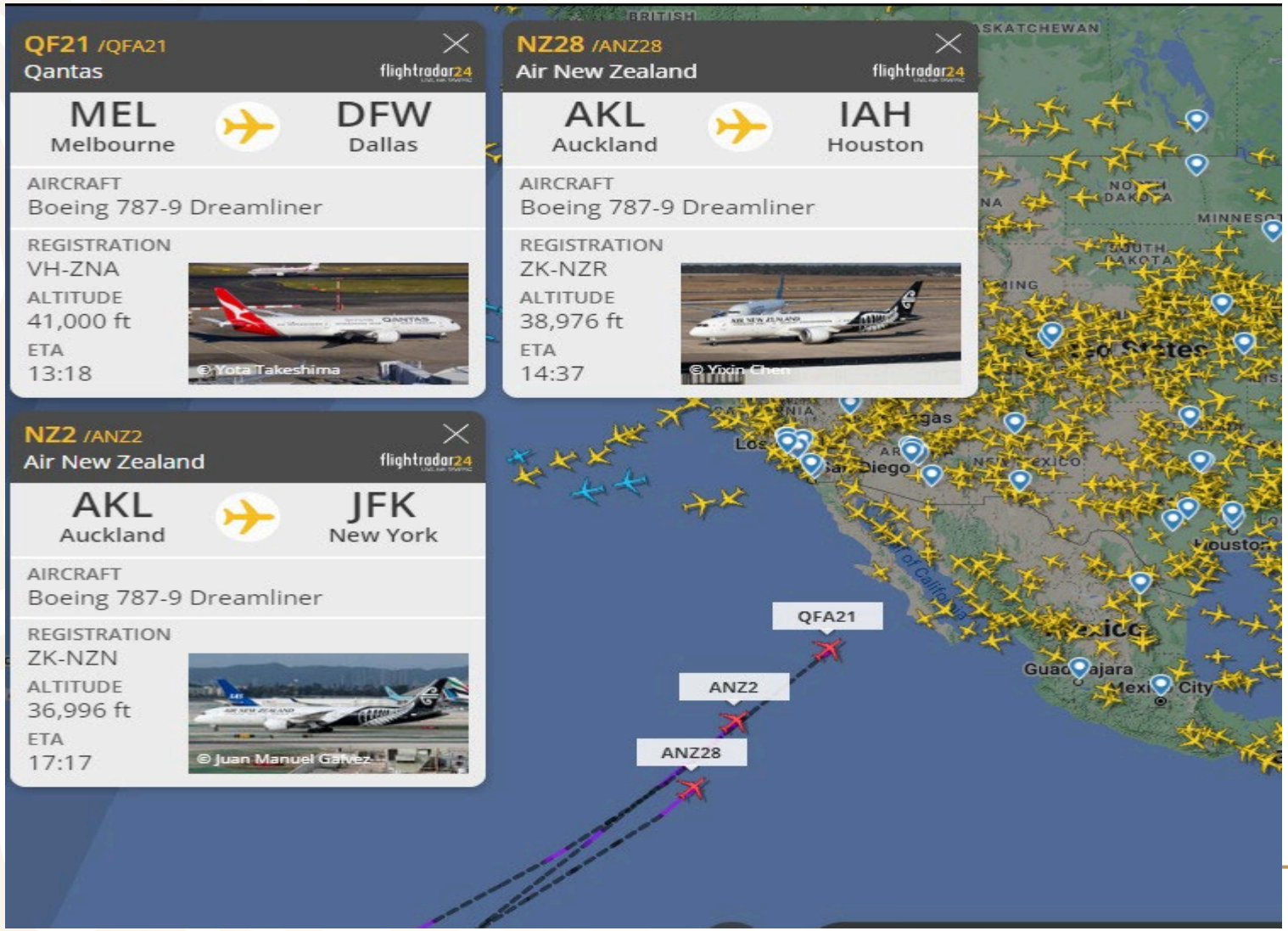
MMFO JANUARY 2023 TOTAL OPS 264

dom	01-ene-2023	0	0	0	1	0	2	2	1	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	0	11
lun	02-ene-2023	0	0	1	0	0	1	1	1	0	0	0	1	1	0	0	0	1	1	2	0	1	0	0	0	11
mar	03-ene-2023	0	0	0	1	0	2	0	0	1	0	0	1	1	0	0	0	0	1	0	2	0	0	0	0	9
mié	04-ene-2023	0	0	0	0	0	2	1	0	0	0	0	1	1	0	0	0	0	0	3	0	3	0	0	0	11
jue	05-ene-2023	0	0	0	0	1	2	1	0	0	0	1	0	0	1	0	0	1	1	2	0	1	1	0	0	12
vie	06-ene-2023	0	0	0	0	1	0	1	1	1	0	1	0	0	1	0	0	0	0	3	0	0	1	0	0	10
sáb	07-ene-2023	0	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	3	0	0	0	0	0	0	0	6
dom	08-ene-2023	0	0	0	1	0	2	1	1	0	1	0	0	0	1	0	1	0	0	1	1	0	0	0	0	10
lun	09-ene-2023	0	0	0	0	0	3	0	1	0	0	0	1	1	0	0	0	3	1	1	0	1	0	0	0	12
mar	10-ene-2023	1	0	0	1	1	1	1	0	0	1	2	0	0	1	0	0	0	0	2	3	1	0	0	0	15
mié	11-ene-2023	0	0	0	0	0	2	1	0	0	0	2	0	0	0	1	1	0	1	1	0	0	1	0	0	10
jue	12-ene-2023	1	0	0	0	1	2	0	1	1	1	1	0	1	1	0	0	2	1	0	1	0	0	0	1	15
vie	13-ene-2023	0	0	2	0	0	2	1	1	1	1	0	0	1	0	0	0	0	0	1	1	1	0	0	0	12
sáb	14-ene-2023	0	0	0	0	0	1	2	0	0	0	0	0	2	0	0	1	1	2	3	0	0	0	0	0	12
dom	15-ene-2023	0	0	0	0	1	2	1	2	0	0	0	0	2	0	0	0	0	2	1	0	0	0	1	0	12
lun	16-ene-2023	0	0	0	0	0	2	1	1	0	0	0	0	1	0	0	0	2	1	1	0	0	0	0	0	9
mar	17-ene-2023	0	0	0	0	1	1	2	0	0	0	0	0	1	0	0	0	1	0	1	1	0	0	0	0	8
mié	18-ene-2023	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	1	1	0	0	0	0	7
jue	19-ene-2023	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	1	1	0	2	0	0	0	0	7
vie	20-ene-2023	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
sáb	21-ene-2023	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	1	1	1	0	1	0	0	0	0	7
dom	22-ene-2023	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	1	0	1	0	0	0	0	5
lun	23-ene-2023	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	6
mar	24-ene-2023	0	0	0	0	0	1	0	0	1	0	2	0	0	0	0	0	1	0	0	1	0	0	0	0	6
mié	25-ene-2023	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	1	0	0	1	0	0	5
jue	26-ene-2023	0	0	0	0	0	1	0	0	0	0	2	0	1	0	0	0	1	1	0	1	0	0	0	0	7
vie	27-ene-2023	0	0	0	0	0	2	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	5
sáb	28-ene-2023	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	3
dom	29-ene-2023	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	5
lun	30-ene-2023	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	6
mar	31-ene-2023	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	6
																										264



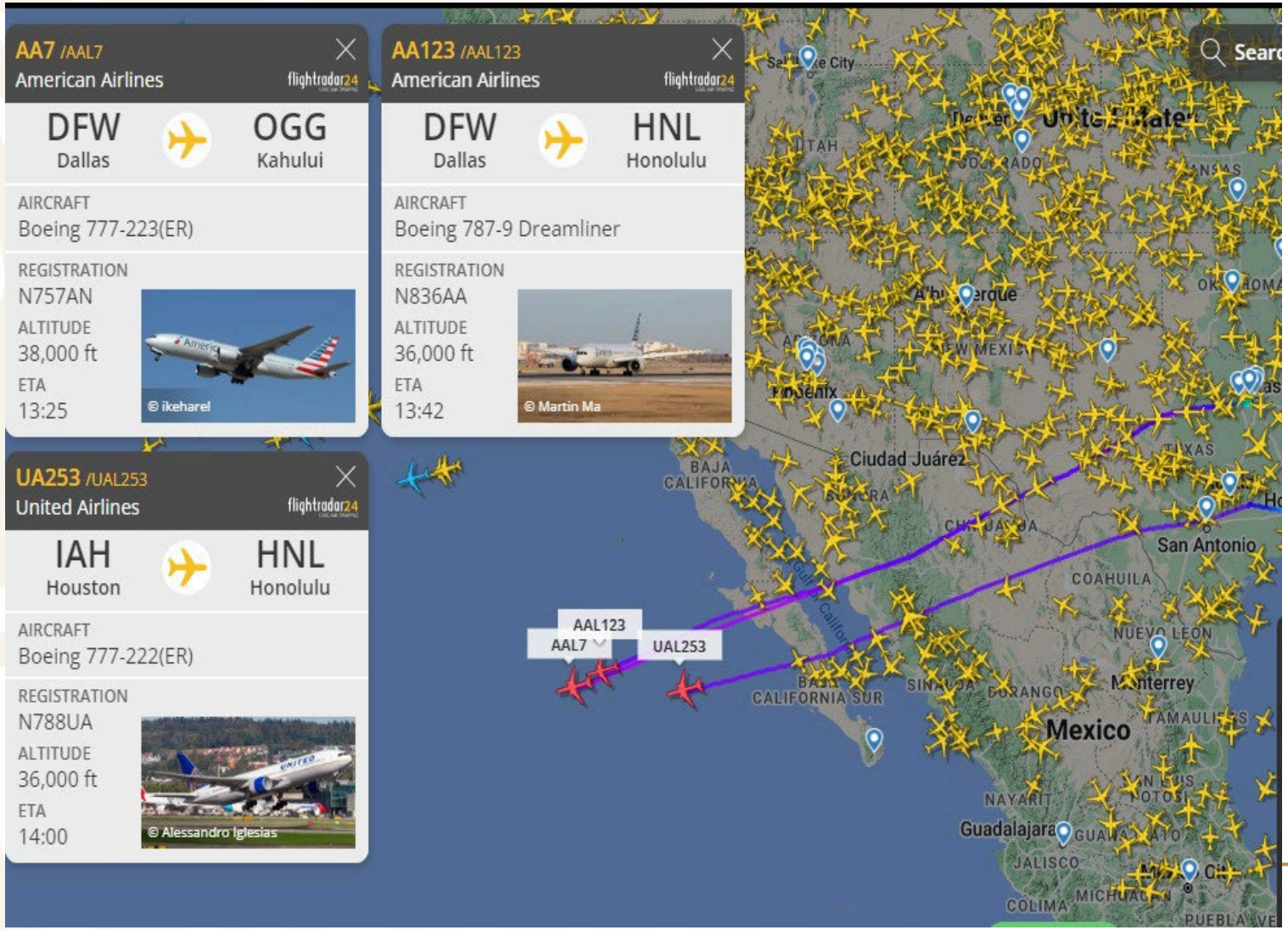
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JANUARY 16 2023 NORTH WEST BOUND

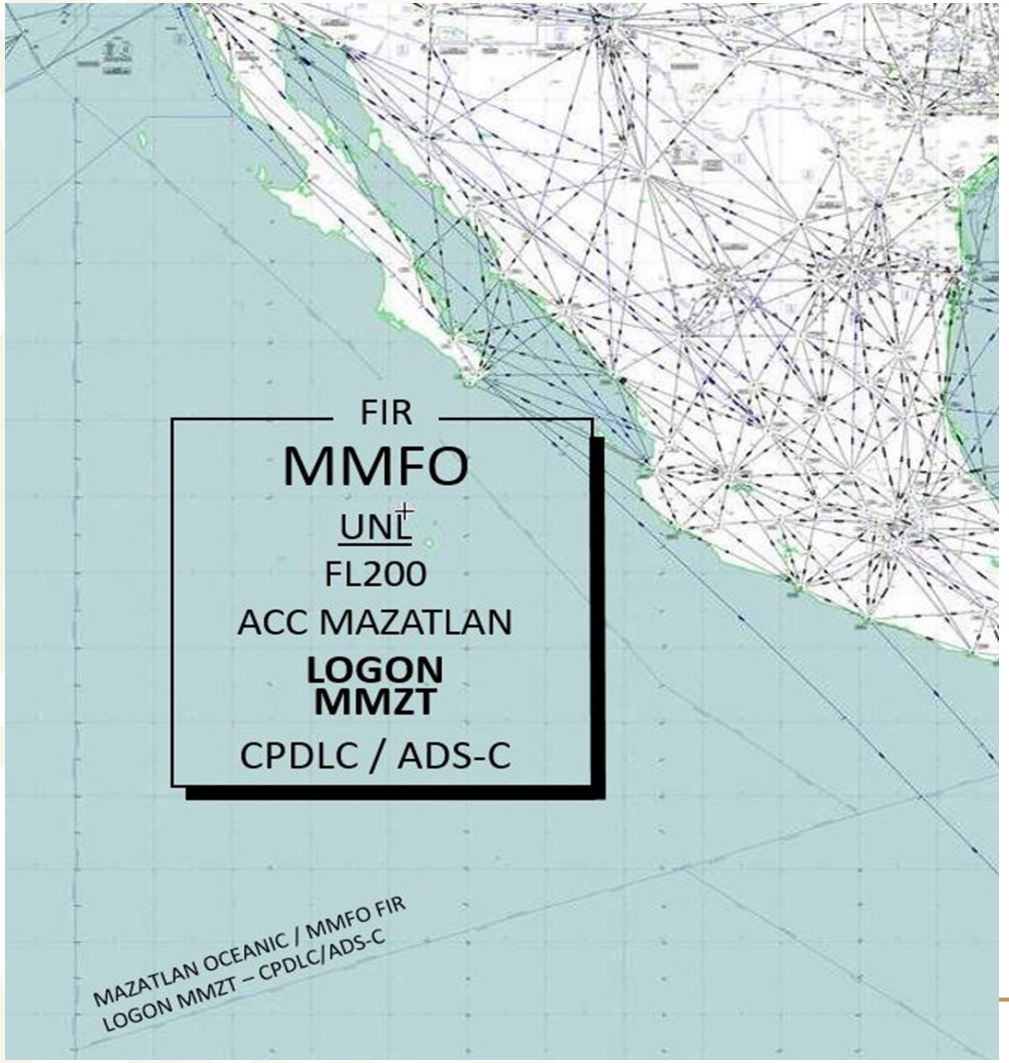


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JANUARY 2023 SOUTH EAST BOUND



PHASE III.- CLASS A AIP



AIP/PIA
CPDLC / ADS-C

CLASS A AIR SPACE

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PROJECT PROGRESS



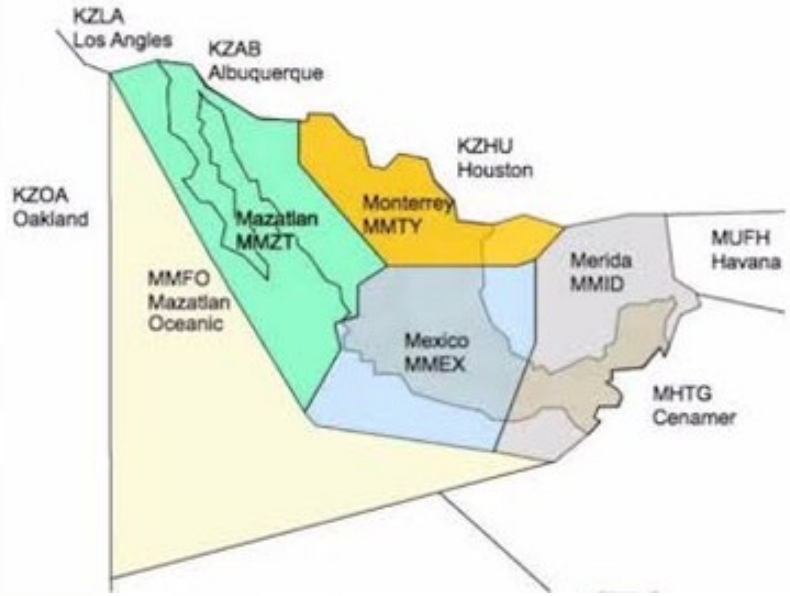
PROJECT PROGRESS

Objective:

- To implement CPDLC in Mexico ATC systems

Mexico is divided into 4 ACCs each one with their respective APP centers and/or RTWRs

- MMZT (MAZATLÁN)
- MMEX (MÉXICO)
- MMTY (MONTERREY)
- MMID (MÉRIDA)



PROJECT PROGRESS

SENEAM's ATM systems are divided as follows:

1. Mexico ACC is working with Topsky He system
2. Merida ACC is working with Topsky V3 system
3. Monterrey ACC is working with Topsky V2 system
4. Mazatlan ACC is working with Topsky V2 system

Mexico ACC is the biggest center in the country, with the most APP centers connected to it (10), significant arguments to be selected for being the first system with CPDLC service



PROJECT PROGRESS

- ARINC is going to provide Datalink and CPDLC service to SENEAM
- The service will be installed at SENEAM's Gerencia Regional Centro (GRC) building in CDMX
- In Mexico ACC is installed the newest Topsky system (Topsky HE) and is fully compatible with CPDLC
- MMFO will be operated by Mazatlan's ATCOs



PROJECT PROGRESS

The next table shows the activities performed before implementation

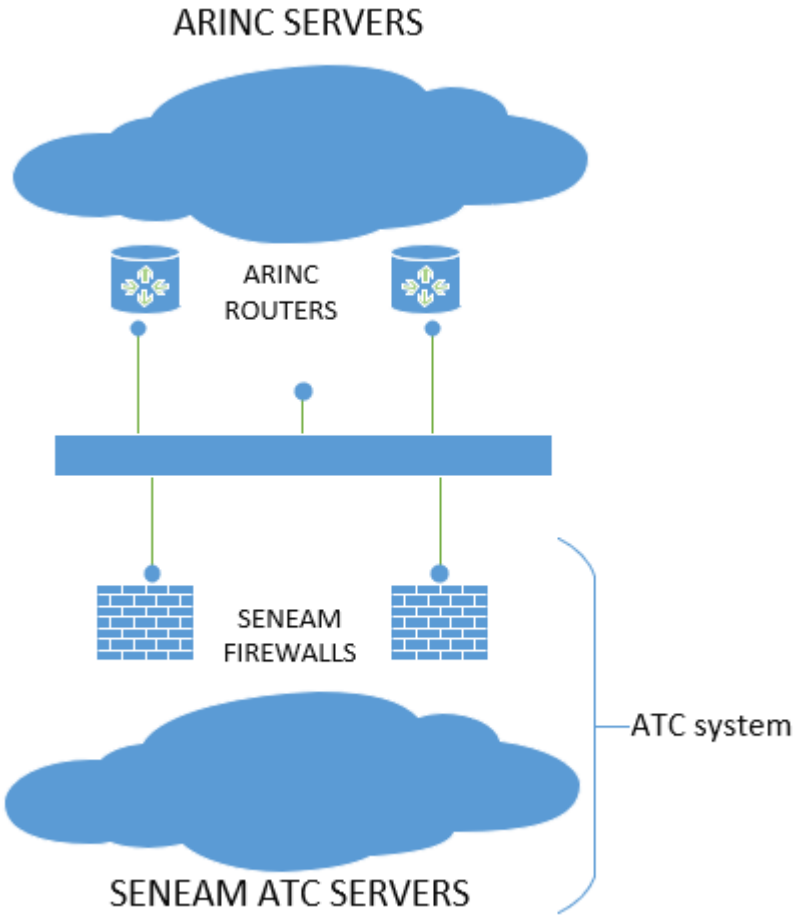
To validate compatibility between SENEAM's ATC system and ARINC CPDLC service	
ATM system provider specifies full compatibility with ARINC service	x
CPDLC service provider ARINC specifies full compatibility with ATM provider	x
To establish communication between SENEAM and ARINC	
To define people involved in the project	x
To solve ARINC requirements (general doubts)	x
To fill ARINC's technical information format	x
To confirm that ARINC is satisfied with the technical information provided	x
To establish communication between SENEAM and ATM provider	
To define people involved in the project	x
To solve ATM provider requirements (general doubts)	x
To visit Mexico ACC with ATM provider Ingenier to solve doubts about HW interfaces	x
To confirm that ATM provider is satisfied with the information provided	x
To establish communication between ARINC and ATM provider with SENEAM participation	
To establish videoconference between ARINC and ATM provider	x
To follow up confidentiality agreements between ARINC and ATM provider	x
To define technical requirements for the system interfaces	x

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PROJECT PROGRESS

Generic Interconnection Diagram

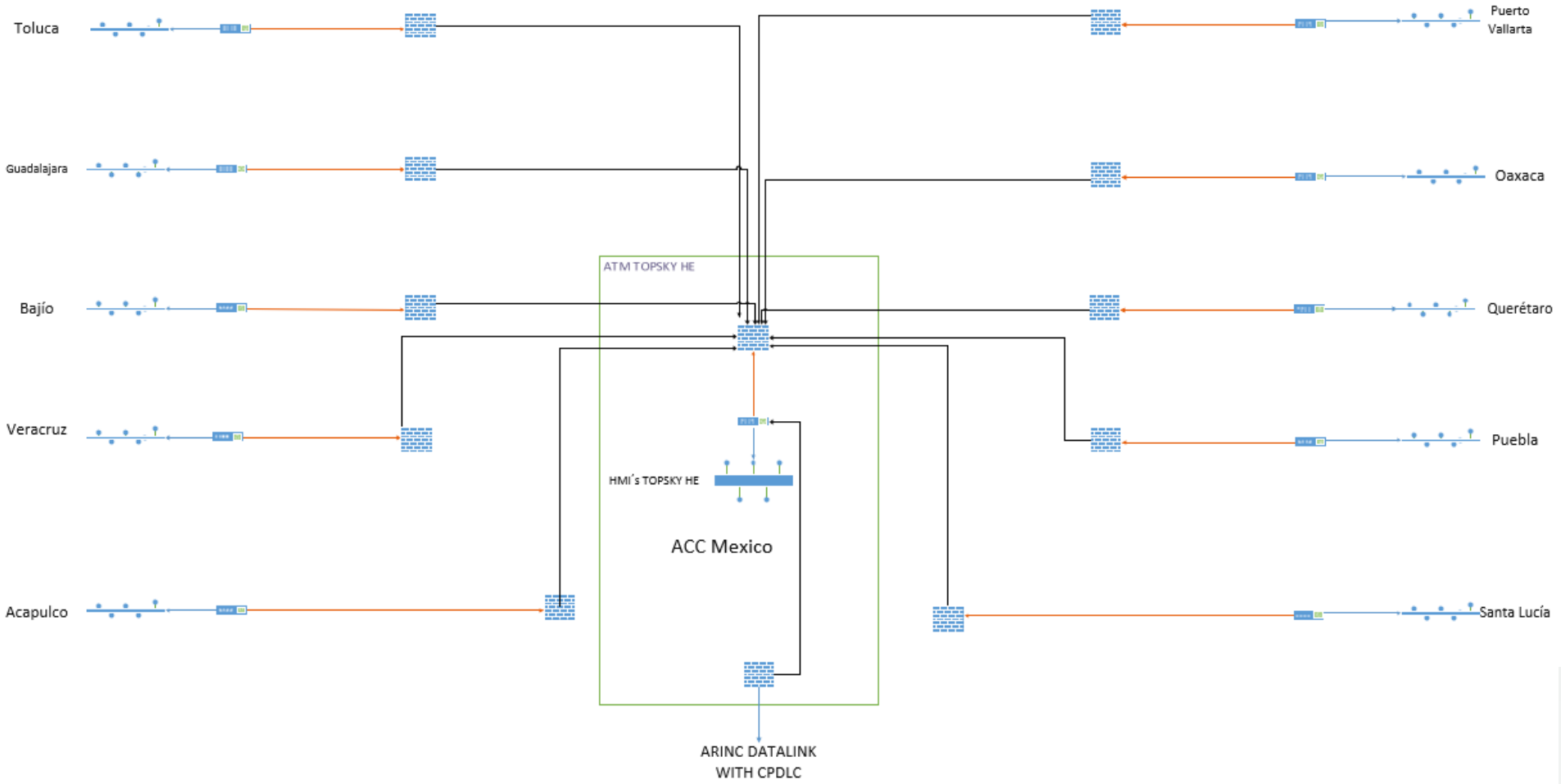
- ARINC will install Hardware in SENEAM GRC building (routers) to provide Datalink with CPDLC service
- SENEAM will be responsible for connecting from the ARINC rack to the ATM provider rack
- ATM provider will be responsible for configuring the Topsky HE system



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Maza

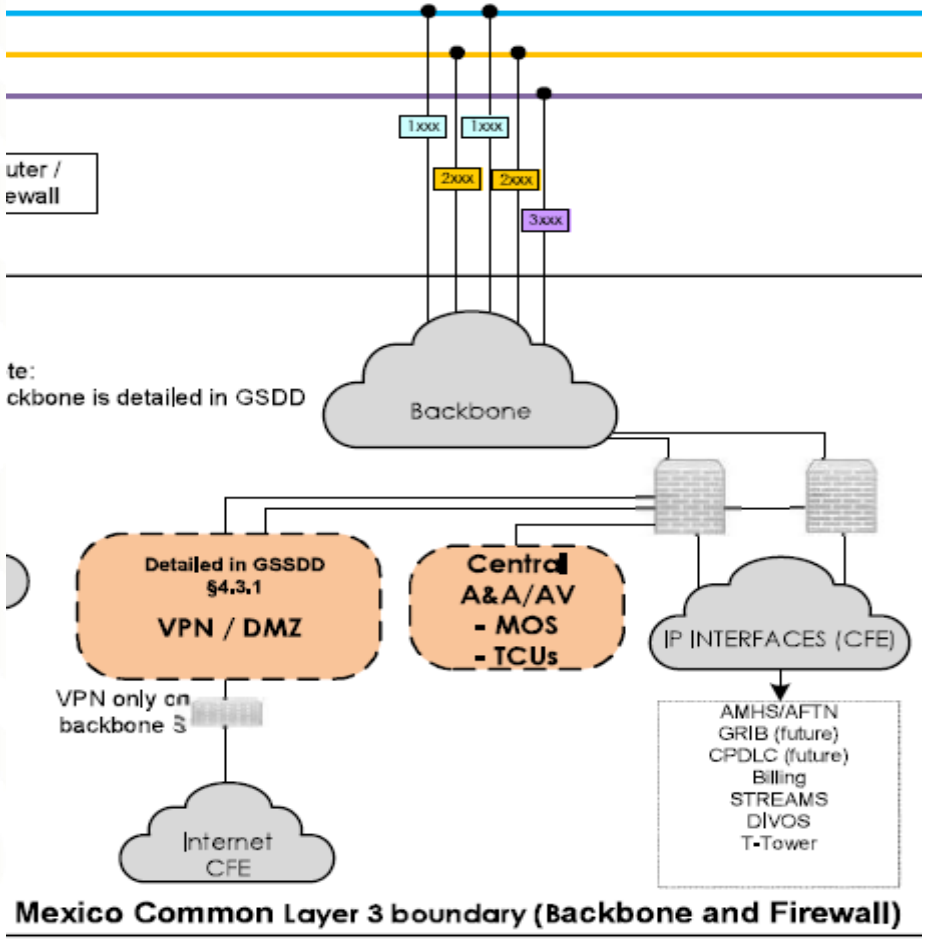
PROJECT PROGRESS

- Interconnection of CPDLC in Topsky HE system



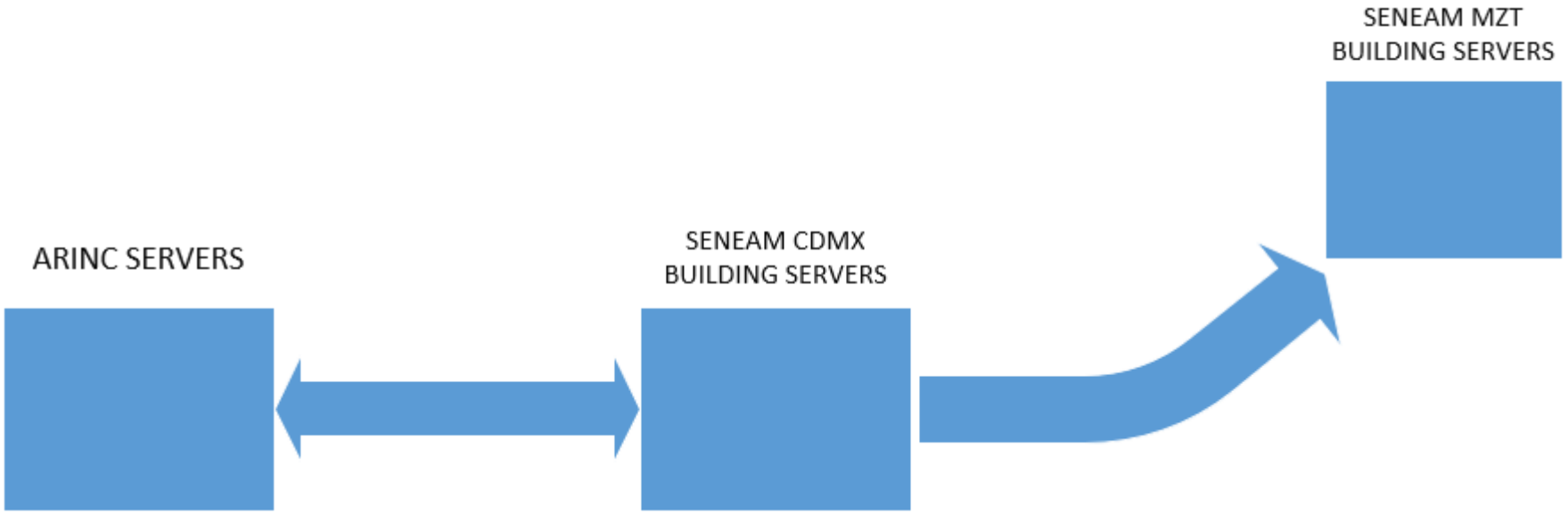
PROJECT PROGRESS

- Interconnection of CPDLC in Topsky HE system



PROJECT PROGRESS

Physical Hardware locations at SENEAM for MMFO project



- Topsky HE installed in CDMX is going to receive Datalink and will process all the CPDLC information
- 2 HMI's control positions from Topsky HE system will be installed at MZT ACC
- The complete ATC service is going to be performed at MZT by ATCO's located there

PROJECT PROGRESS

Pending Activities

ACTIVITY	Scheduled
To install ARINC hardware and Datalink at CDMX SENEAM building	TBD
To configure Topsky HE system by ATM provider	TBD
Topsky T&E platform	
To interconnect ARINC with T&E Topsky HE platform	TBD
To perform technical tests with SENEAM Test&Evaluation platform	TBD
To perform operational tests with SENEAM Test&Evaluation platform connected to ARINC Datalink with CPDLC test system	TBD
To accept tests by technical and operational people at SENEAM	TBD
Topsky MOS system	
To interconnect ARINC with MOS Topsky HE system	TBD
To perform technical tests with SENEAM Topsky MOS system	TBD
To perform operational tests with SENEAM Topsky MOS system connected to ARINC CPDLC test system	TBD
To perform operational tests with SENEAM Topsky MOS system connected to real aerolines *	TBD
To accept tests by technical and operational people at SENEAM	TBD

*Not coordinated yet, it is a possibility

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PROJECT PROGRESS

CURRENT STATUS OF THE PROJECT

- Some coordination efforts are being carried out by SENEAM
- Different areas within SENEAM are involved in negotiations with the intention of beginning to implemet the CPDLC system
- There are agreements that must be signed before the project can proceed (e.g. NDA)

DEPLOYMENT

- Once administrative issues are solved, SENEAM and ARINC estimate to complete the implemetation (Hardware & Software) in about 8 to 10 weeks.
- Once the Datalink CPDLC service is operating with Topsky HE system, operational tests will be performed by SENEAM ATCO's. This time period will be defined later





THANK YOU

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