AURORA ATM SYSTEM

New technology in ACC Automation system
Implementation in Fiji Islands and French Guyana

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Who Is Adacel?

- Founded in 1987
- Offices in **Montréal, Canada**, Orlando, USA and Melbourne, Australia
- **ATM**: Providing Leading-Edge Aerospace Software with the Aurora ATM system that is widely used and provides advanced flight data processing capabilities
- **ATC Simulation**: Tower Simulation with MaxSim (360', VR), Radar
- **Advanced programs**: Training Solutions with voice recognition (ICE)

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History

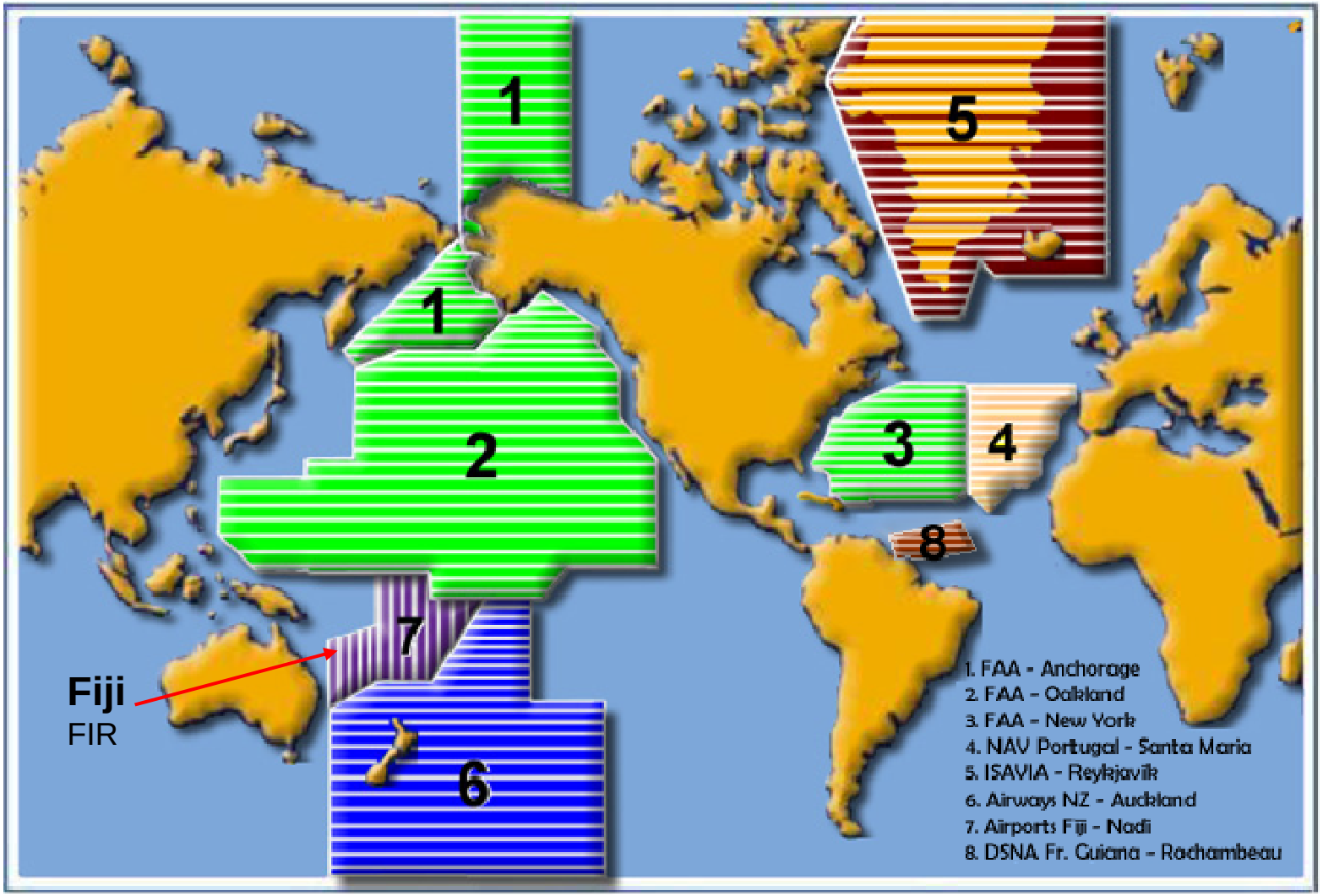
- Airports Fiji Limited (AFL) provides Air Traffic Management (ATM) services in the Nadi Flight Information Region (FIR).
- This includes the airspaces of Fiji, Tuvalu, New Caledonia, Kiribati and Vanuatu, covering a 6.0 million square kilometer area.
- AFL owns and manages Nadi International Airport, and manages Nausori and 13 other domestic outer island airports.

History

- Before the implementation of Aurora ATM the Fijian ATCO's had to rely on paper strip feed by the printer interfaced with AFTN and use the support of HFRO to communicate with the Oceanic traffic.

- The adjacent FIRs of Oakland California and Auckland New Zealand have being using Adacel's software with the integrated ADS-C/CPDLC, for many years.

Aurora: Advanced Air Traffic Management System



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Implementation

This is the story of how Adacel ATM implemented the Aurora system for the OCS, TMA and 2 Towers at the Fiji FIR:

- ✓ Visit of Operational and Technical teams to Nadi and Nausori
- ✓ Thorough review of the requirements
- ✓ Teamed up with ERA for the ADS-B/MLAT (Wise decision by AFL to acquire ADS-B/MLAT)
- ✓ Airways New Zealand, responsible to Adacel for controller training and responsible to ERA for airspace design, safety case and supply of the billing system

Fiji- Operational and Technical requirements

- Oceanic, Enroute Approach and 2 Control towers
- Surveillance (ADS-B and MLAT)
- Datalink (CPDLC and ADS-C)
- HFRO positions
- Training Operational and Technical
- Maintenance
- Field Service Representative
- Billing & AMHS

AURORA tailored made for Mixed Airspaces

Flight Data and Surveillance Processing integrating all available surveillance sources (ADS-B/MLAT, ADS-C, CPDLC, *Radar*), in a procedural environment

- 4 D profile
- Conflict detection
- All Safety Nets
- EFS (Electronic Flight Strips)
- Automatic or manual coordination

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Oceanic (OCS), Enroute (ENR) and Approach (APP)

- CNS/ATM technologies
- Surveillance sources
- 4-D profiles
- Automatic Conflict Detection
- Automatic or Manual Coordination
- Air Situation Display Tools

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Aurora's typical Controller and HFRO CWP

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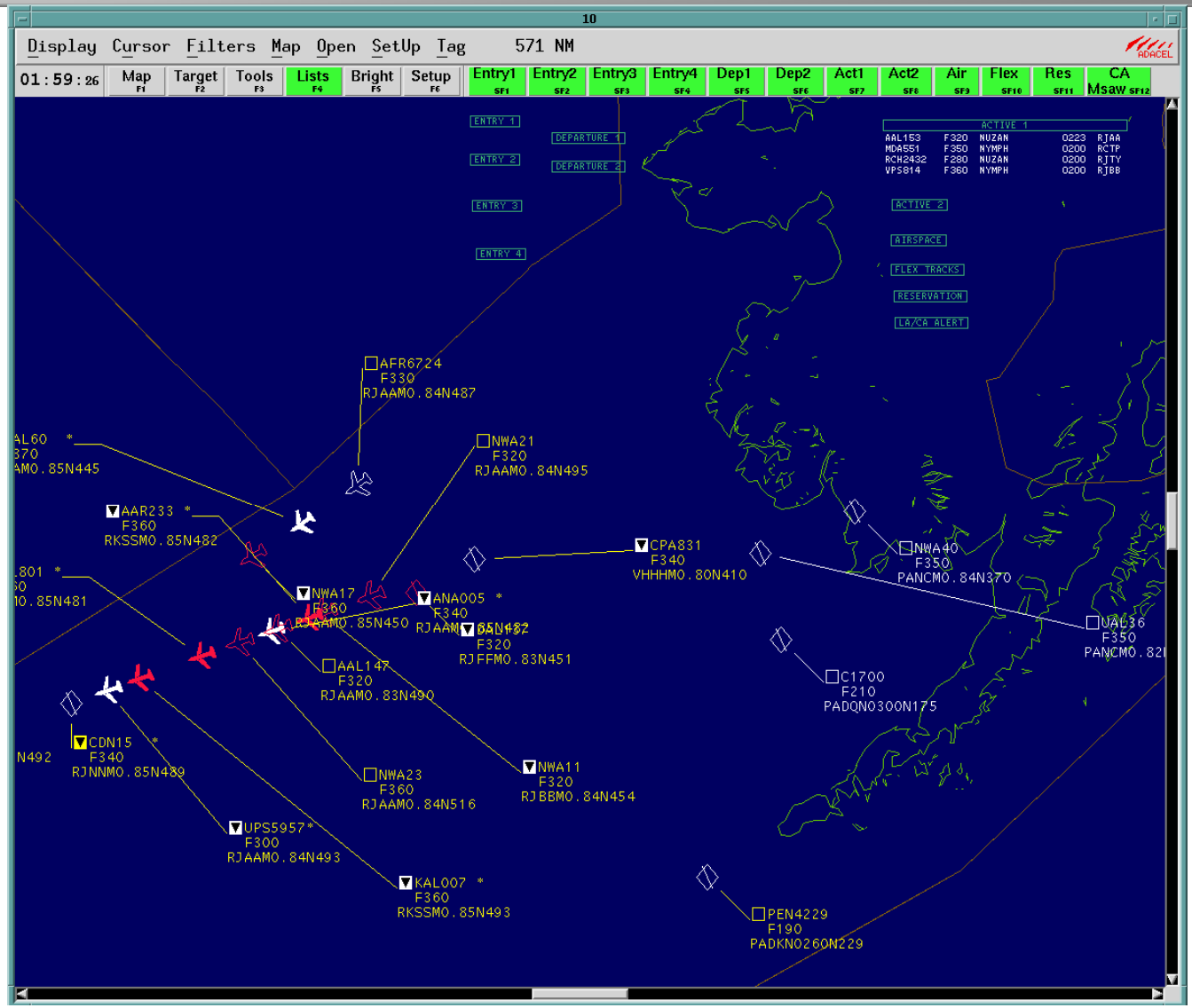
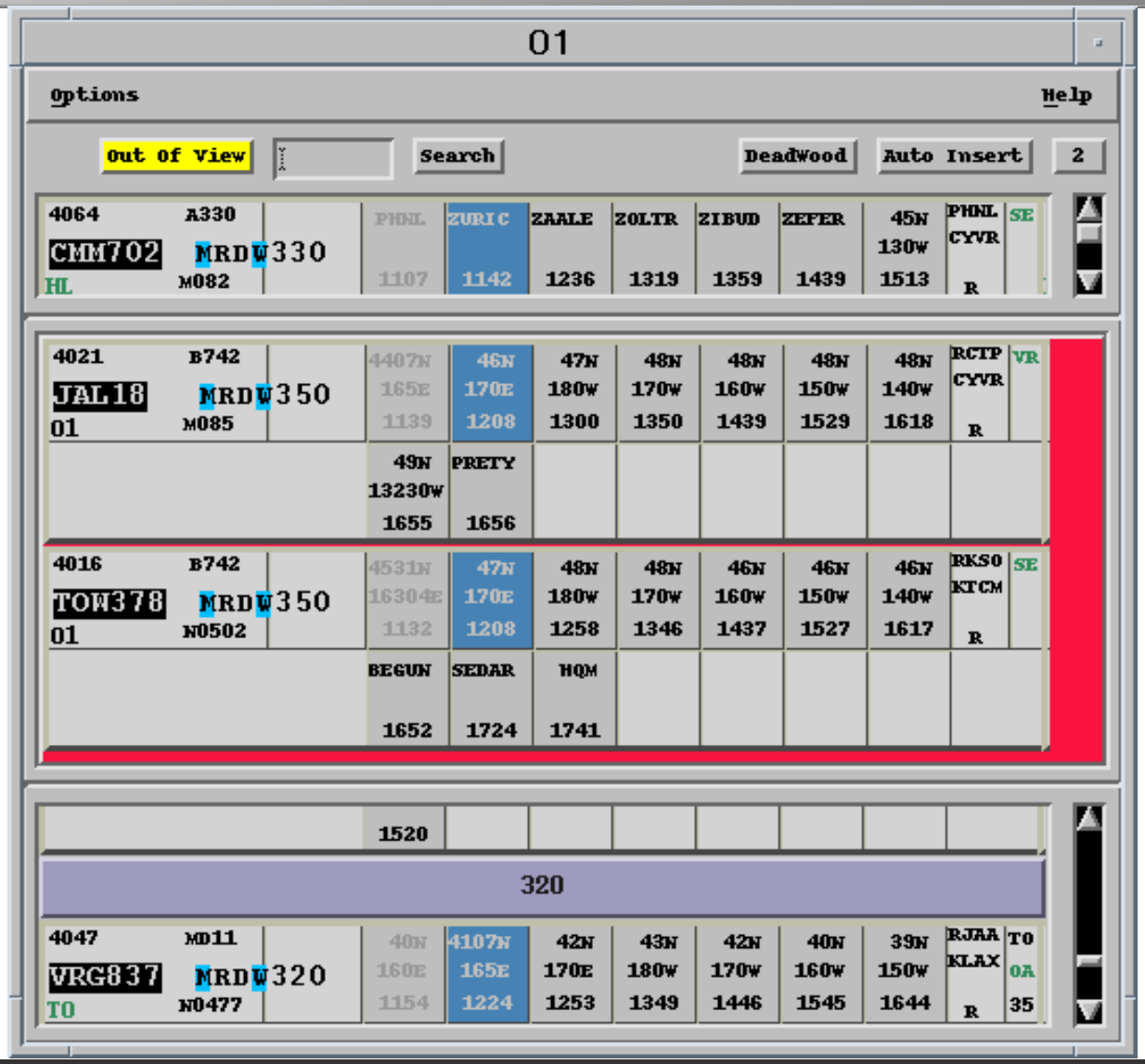
Aircraft Situation Display (ASD)



OCS, ENR, APP Electronic Flight Strips



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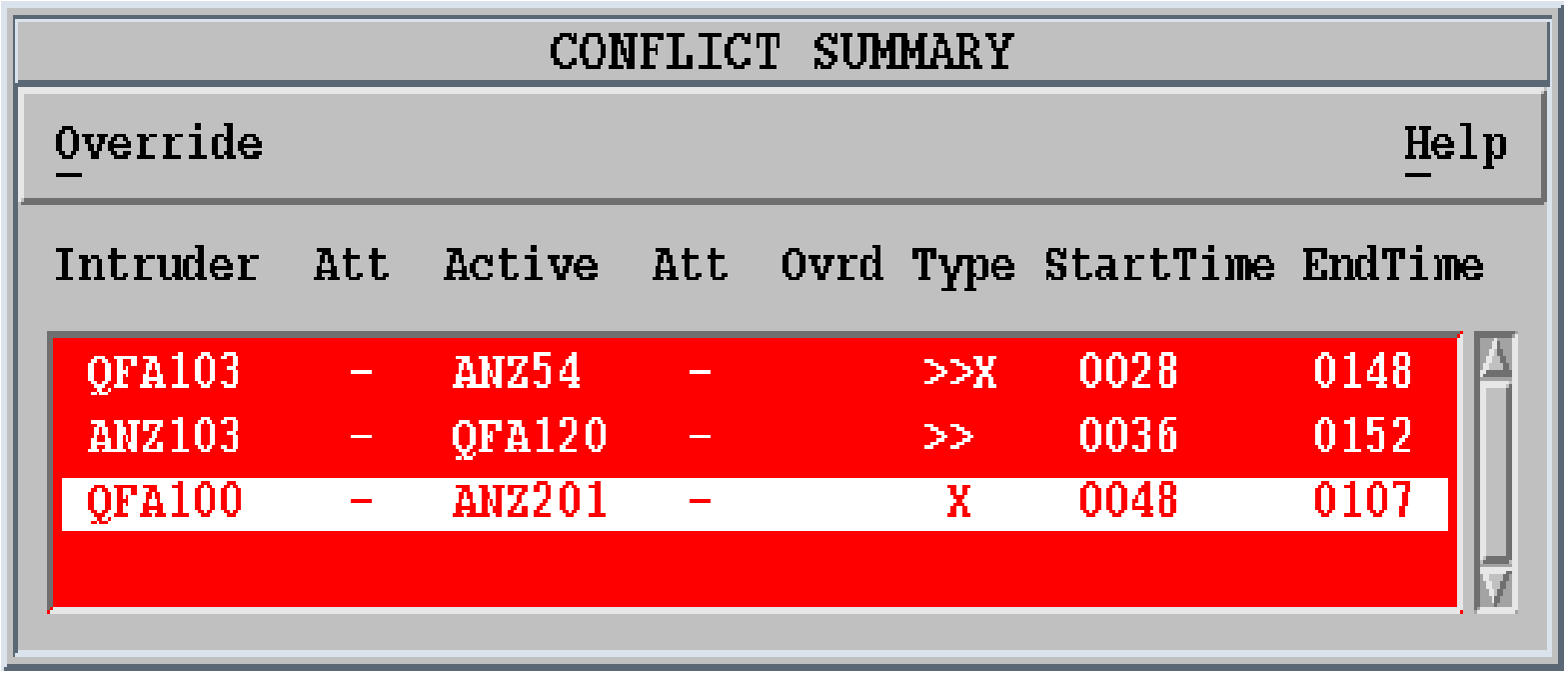
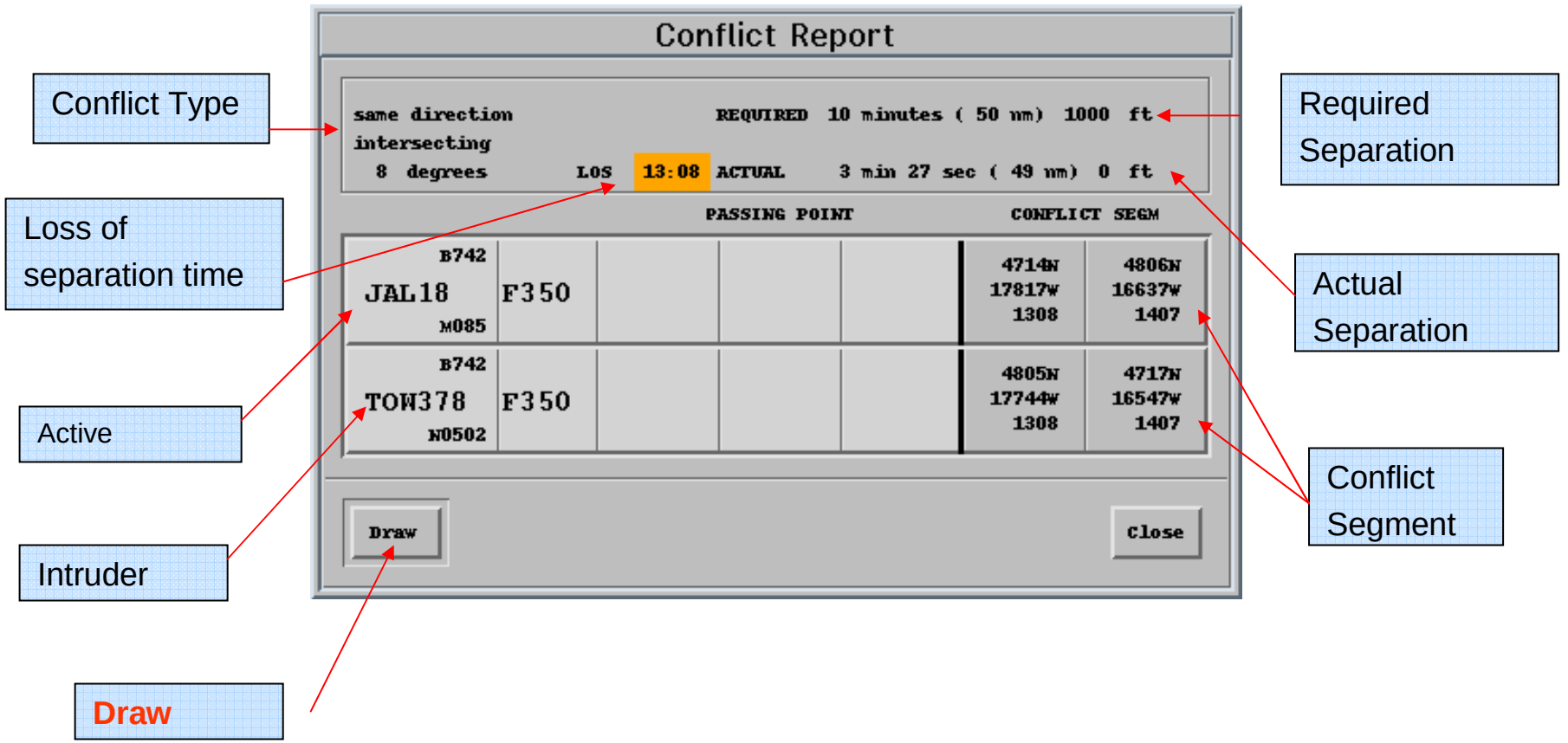
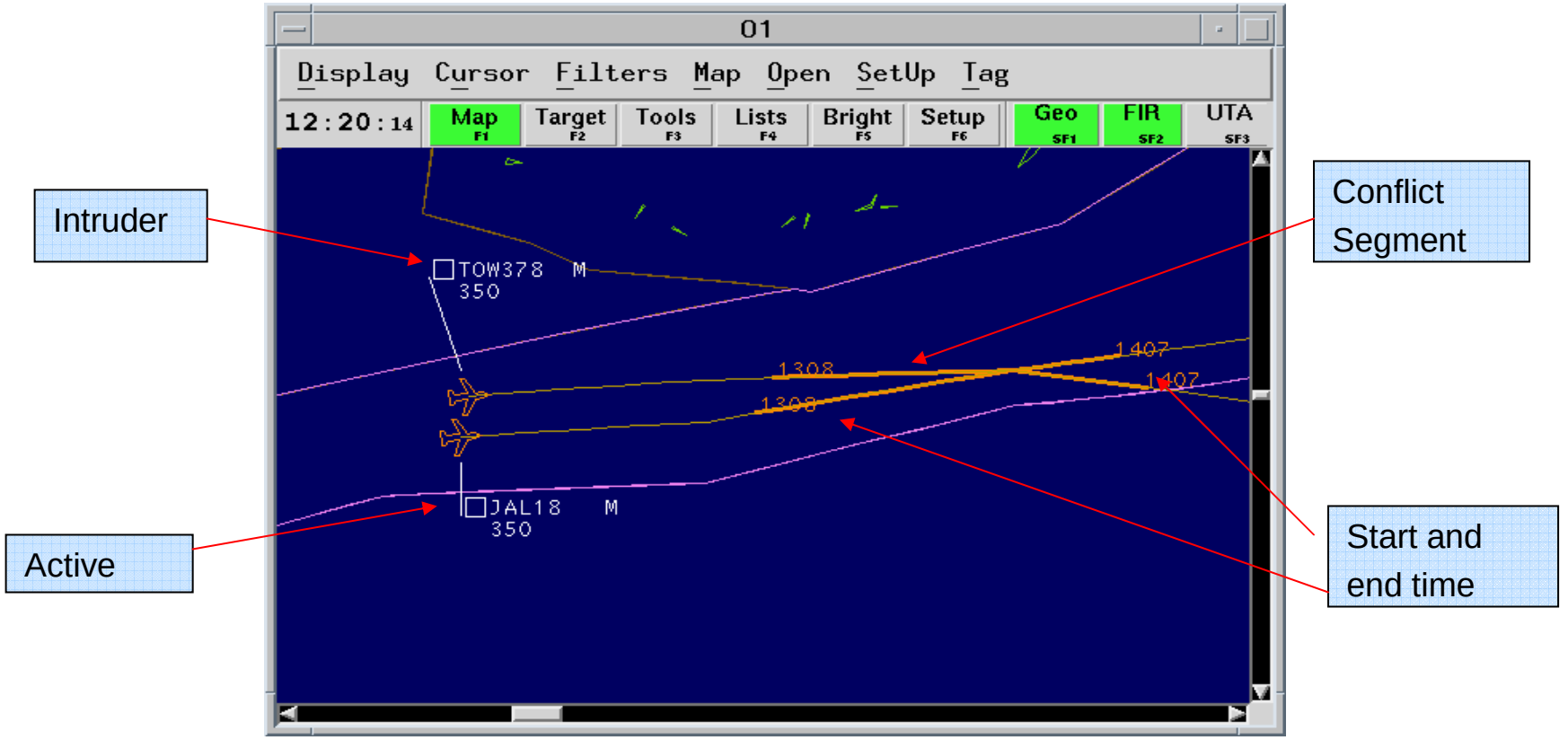
Conflict Prediction & Reporting



Conflict Reporting



Conflict Reporting

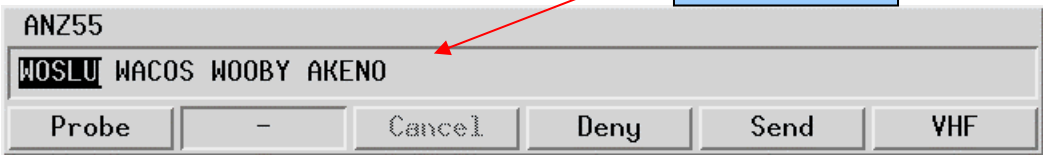


Clearance widows

Complexe

FL

Reroute



Probe

Quick access, Altitude and Speed clearance window

180	300
100	250
050	180
040	150
030	120

180	290
100	280
050	270
040	260
030	250

050	530
040	520
030	510
020	500
010	490

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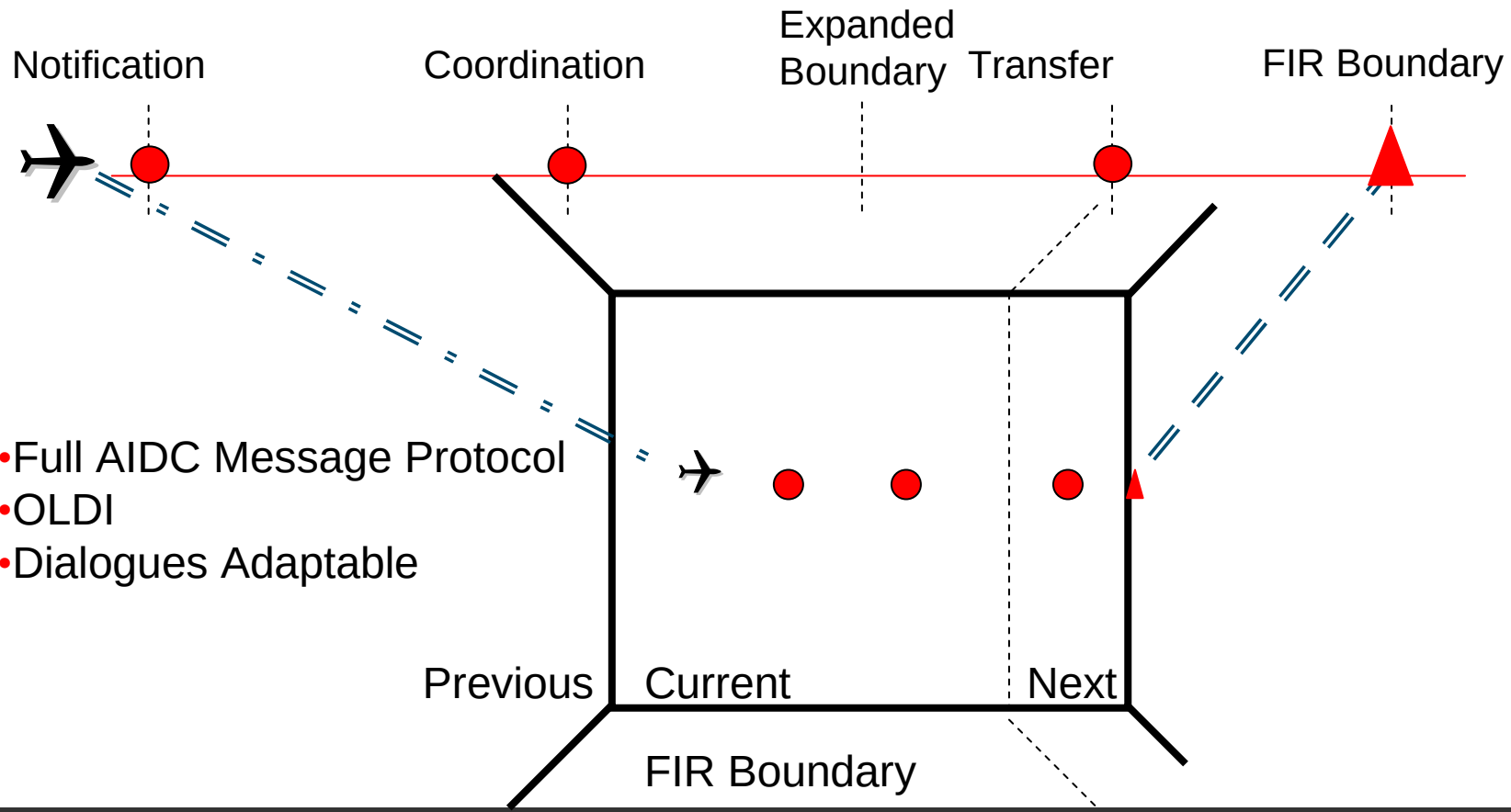
Automatic Coordination



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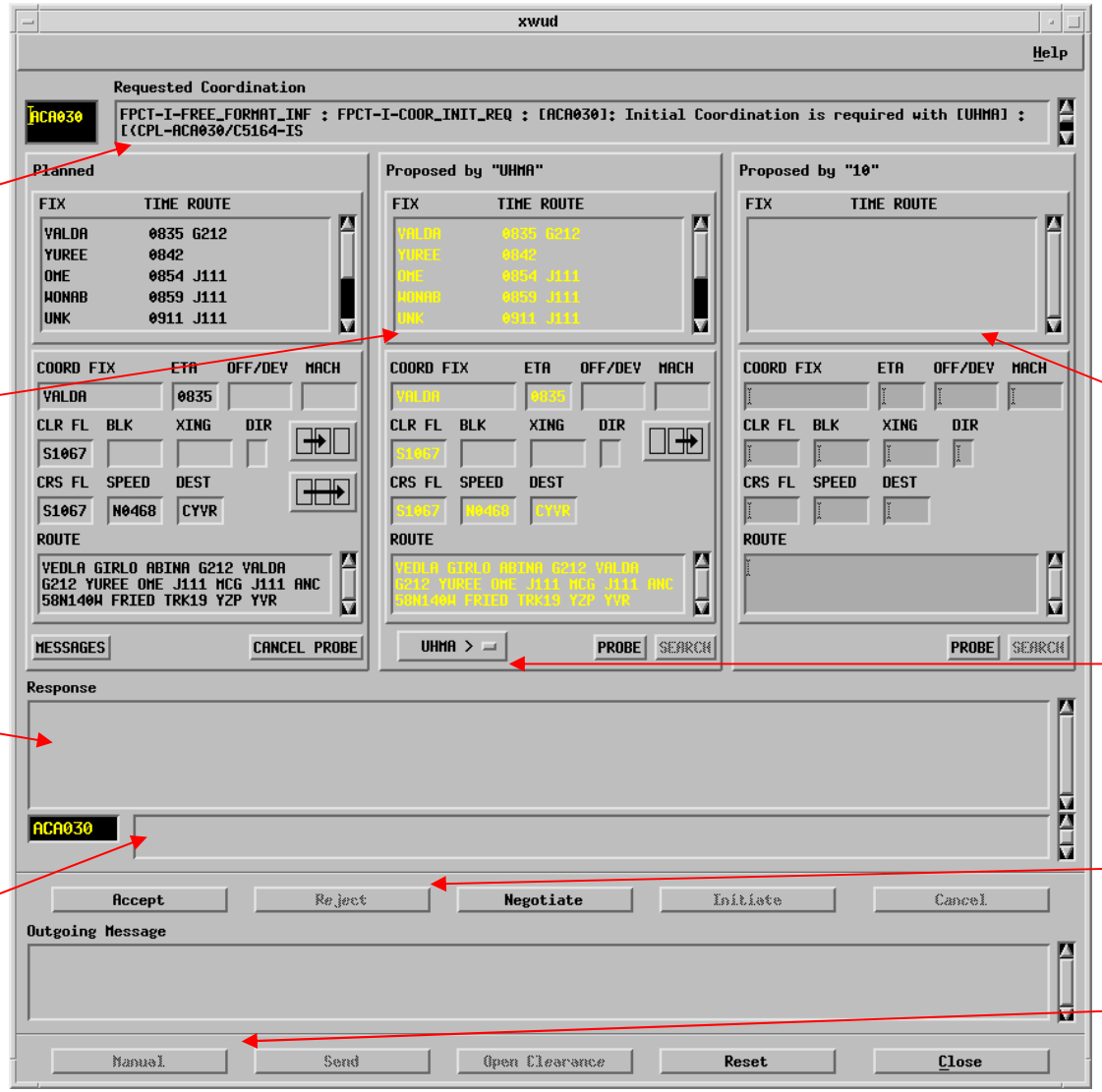
Coordination window



Inbound Message

Inbound coord. profile

Response Area

Annotations Restrictions

Outbound Coord. profile

Next Sector Button

Coord. Message Buttons

Manual, Send, Other Buttons

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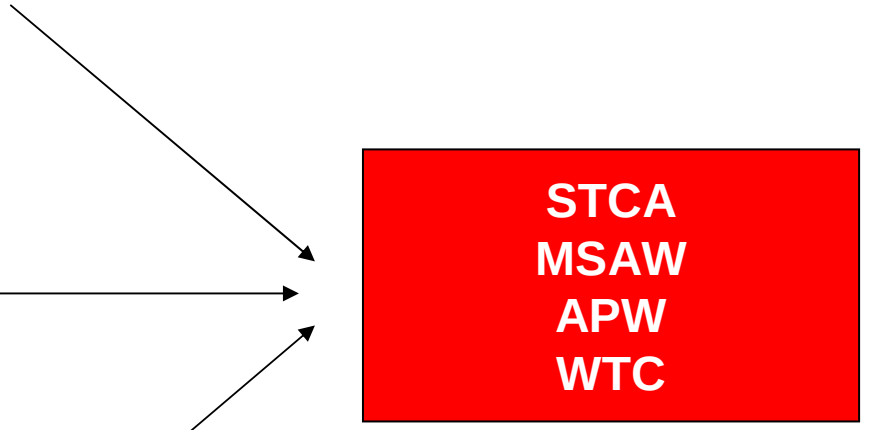
Safety Nets

Aurora processes:

- the Surveillance Data
  - Radar
  - ADS-B
  - MLAT
- the Flight Data
  - RVSM status
  - CFL
  - WTC
- the Environment Data
  - Reserved Airspace



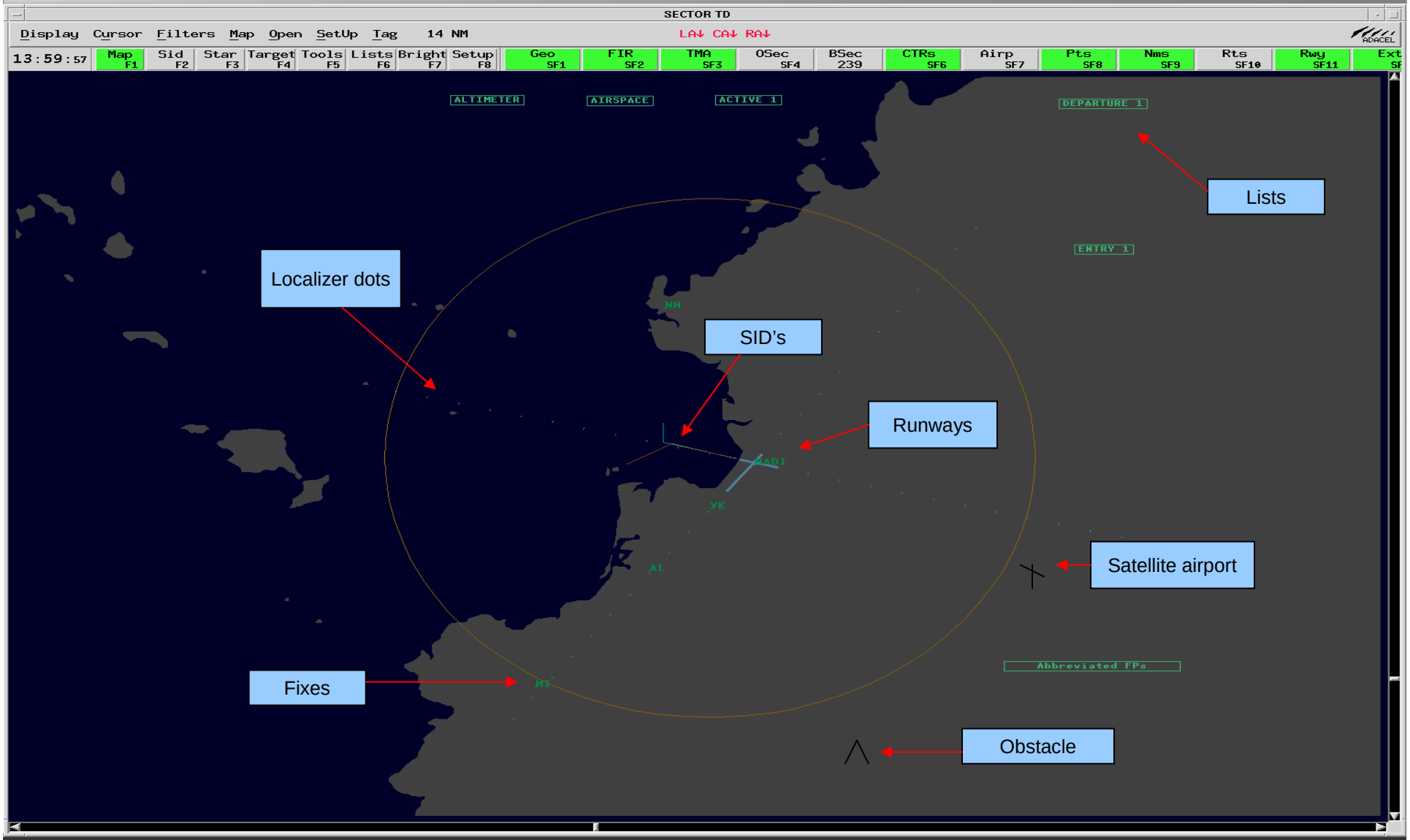
OCS, ENR and APP Summary

- Provides surveillance
- Improves communications and coordination
- Provides conflict free trajectories
- Provides all Safety Nets
- Reduces aircraft separation
- Reduces controller workload

TOWERS Nadi and Nausori

- Air Situation Display (ASD)
- Electronic Flight Strip (EFS**)**

NADI TOWER ASD



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NADI Tower EFS (Electronic Flight Strip)

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TOWER Summary

- Same ASD functionalities as in the ACC

- Advanced EFS using touch screen technology

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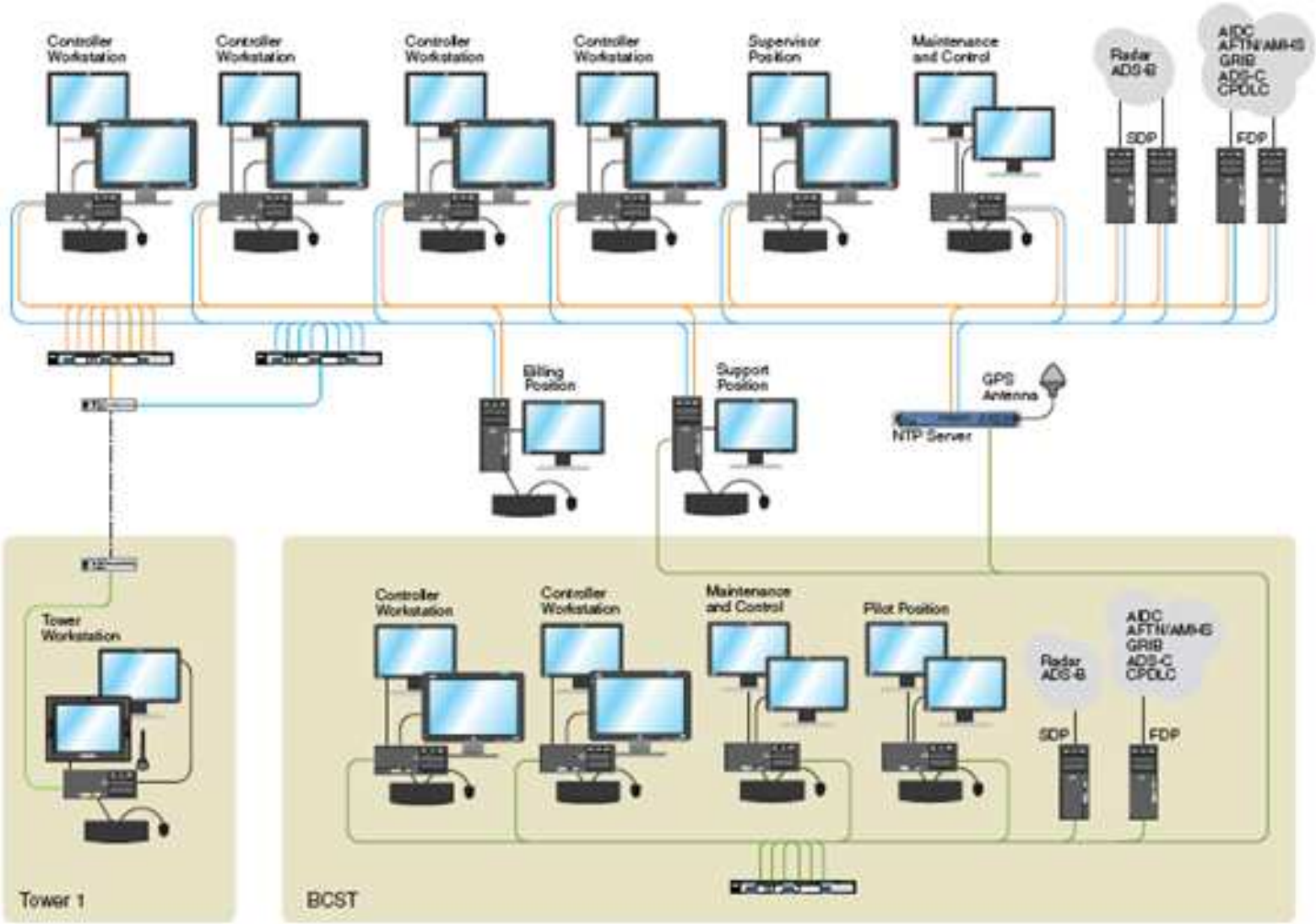
System architecture



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Training

- In-depth Factory Training
  - ATCO’s and ATSEP’s

- Adacel’s Training Personnel
  - theoretical knowledge
  - practical experience

Maintenance

- Online customer support
- Post warranty support

FSR

- Field Service Representative
  - Maintenance
  - Training

AMHS and Billing

- **AMHS** (ATS Message Handling System) or AFTN
  - a COTS product designed to provide ATS Messaging capabilities to the world's Air Navigation Service Providers (ANSP's).

- **Billing**
  - a COTS product designed to improve billing operations and processes for the (ANSP's) and airports.

- **Aurora supports any third party system**

Conclusion

- Supports all ATC domains: OCS, ENR, APP, TWR
- Flight Data and Radar Processing incorporating all available surveillance sources (Radar, ADS-B/MLAT ADS-C, CPDLC)
- 4 D profile
- Conflict detection (Procedural) and Safety Nets (Surveillance)
- EFS
- Automatic or manual coordination
- Low cost workstations
- Factory training
- Field Support Representative
- Maintenance
- Billing and AFTN/AMHS integration

French Guyana CPDLC and ADS-C

- **Requirements for Datalink on a stand-alone position**

- **Solutions with ADS-C and CPDLC**
  - ADS-C to receive automatic position reports
  - CPDLC to transmit the ATC clearances

- **How its done**
  - AFTN feeds our FDPS
  - Built a 4D trajectory
  - Display on an ASD and EFS
  - on Linux

Process- French Guyana

- June 2010
  - Contract signed with DSNA??
- July
  - Software integration
- September
  - FAT plus Operational and Technical training
- October
  - System’s installation in F-G
- November
  - Final Operational and Technical training
- December
  - SAT after the SITA link integration

ICAO New Flight Plan
Adacel Converter

Adacel Inc.

Introduction

- During late 2003, the Air Navigation Commission authorized the establishment of the ICAO Flight Plan Study Group (FPLSG) to assist the Secretariat.
- The primary work of the FPLSG was to develop a proposal for amendment of the flight plan provisions, including the ICAO model flight plan form and associated operating practices, so that they would meet future needs of aircraft with advanced capabilities and the requirements of automated air traffic management (ATM) systems, while taking into account compatibility with existing systems, human factors, training, cost and transition aspects.
  - The changes were announced by ICAO in State letter AN 13/2.1-08/50 dated 25 June 2008 and will become applicable on

    15 November 2012, with a transition starting in 2011.

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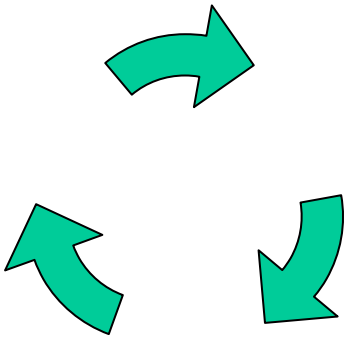
Rationale for ICAO New Flight Plan (INFPL)

Flight Plan Study Group (FPLSG) mandate was to update the ICAO model flight plan form to:

- Show aircraft advanced CNS capabilities in more detail
- Meet evolving requirements of automated ATM systems

Solutions

- Upgrade your current FDPS to the new format
- Replace your current FDPS



- Interface the Adacel's INFPL Converter in your system

Converter Solution

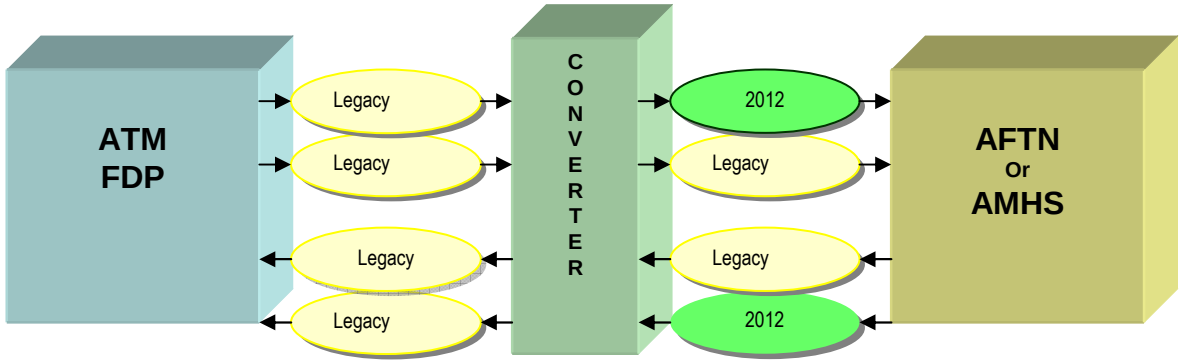
- The Adacel Converter is the solution to ANSP's:
  - who wishes to maintain their present FDPS until it as completed its life cycle.
  - that do not require an ATM system supporting PBN,RVSM,ADS,etc

- To Flight planning/briefing offices that need to forward the new format via the AFTN/AMHS circuits.

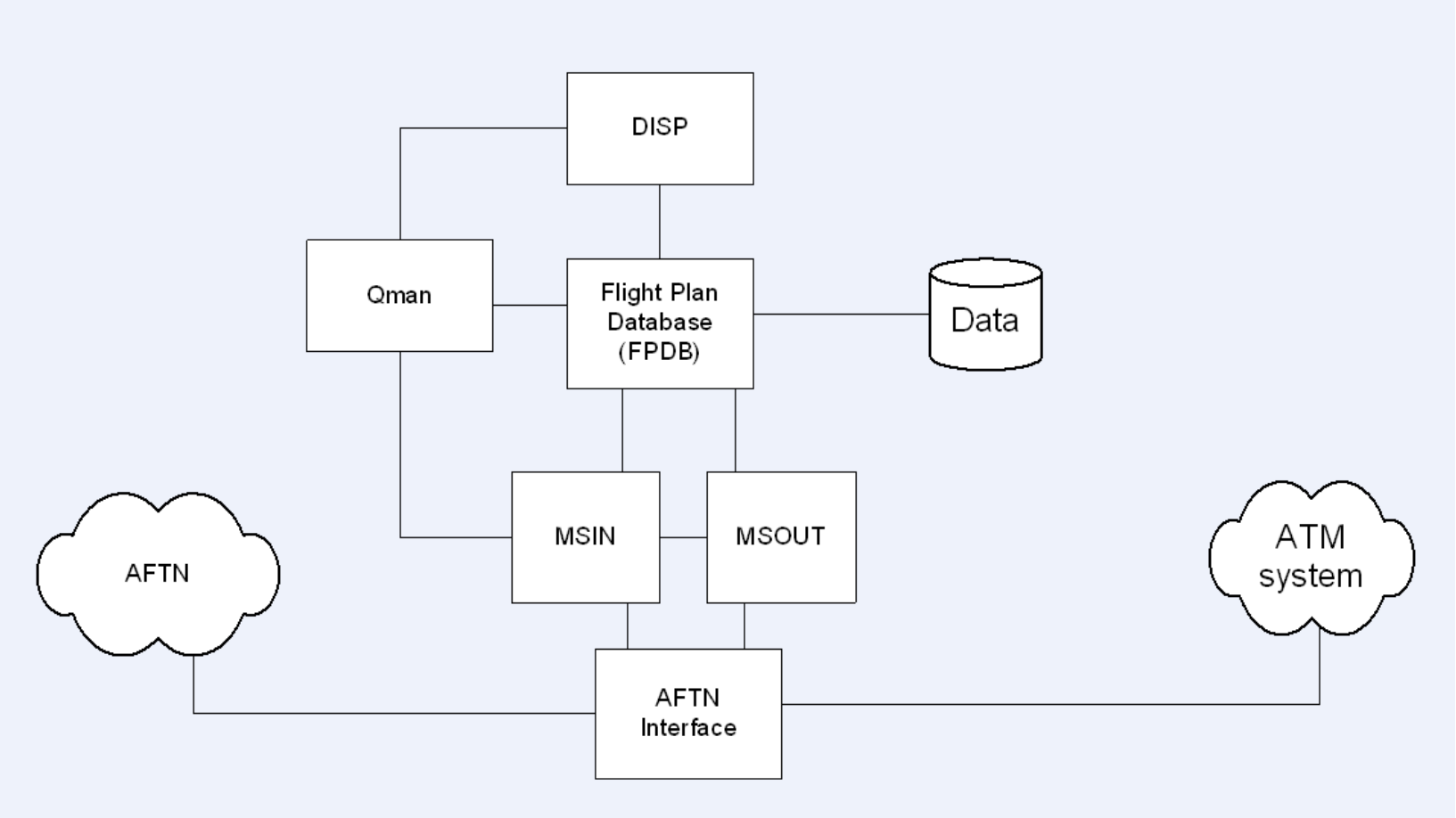
- To the "Bureau de Piste" (BDP) that requires to forward the new format via the AFTN/AMHS circuits.

How does it work

- The Converter interfaces with the AFTN/AMHS circuit and your ATM/FDP system and provides a conversion from the new format to the legacy or old flight plan format and vice-versa



INFPL Architecture



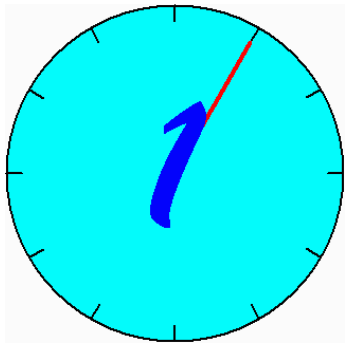
Information available on the Graphical User Interface (GUI)

- **All ICAO messages**
- FPL messages
- CHG messages
- SPL Message
- RPL listing form
- Aircraft Identification
- Flight Rules and Type of Flight
- Equipment
- Serviceable COM/NAV/approach aid
- Surveillance
- Departure aerodrome and time
- Route
- Destination Aerodrome and Total Estimated Elapsed Time, Alternate Aerodromes
- Other Information

Benefits

The Adacel's INFPL Converter provides your facility with:

- Full compliance with Amendment 1 to PANS ATM, DOC4444
- Interface with any ATM/FDP systems
- Interface with AFTN
- Interface with AMHS
- Takes you trough the transition and beyond



Thank you

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