



SURV123
350 H



Thierry TIN HIN
Airline CNS/ATM Support
Flight Operations Support & Services

 **AIRBUS** Solutions and Roadmap


FANS and ADS-B

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New Standards. Together



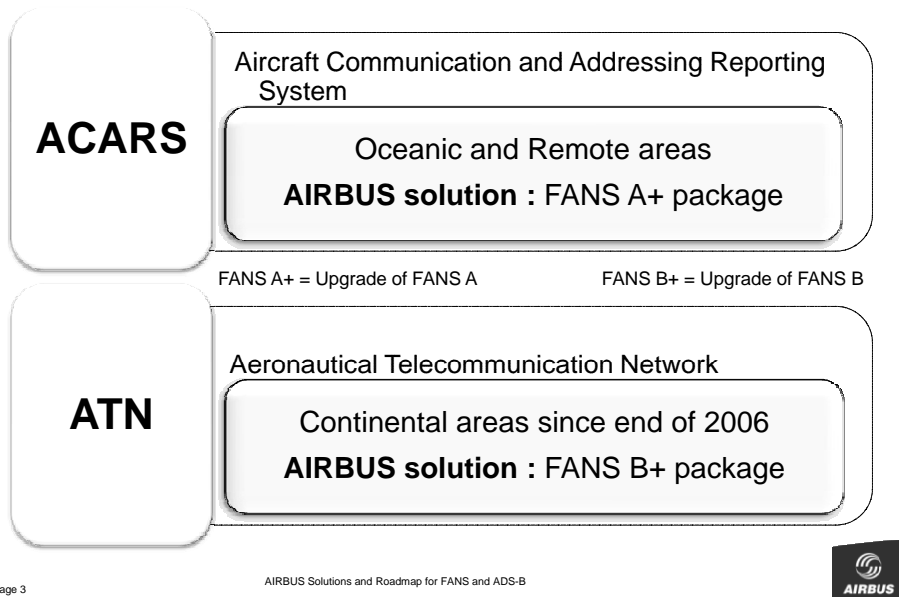
Contents

-  1 Data Link Communication Reminders
- 2 The Complete Range of AIRBUS FANS Solutions
- 3 ADS-B Reminders
- 4 The Complete Range of AIRBUS ADS-B Solutions
- 5 The AIRBUS Support

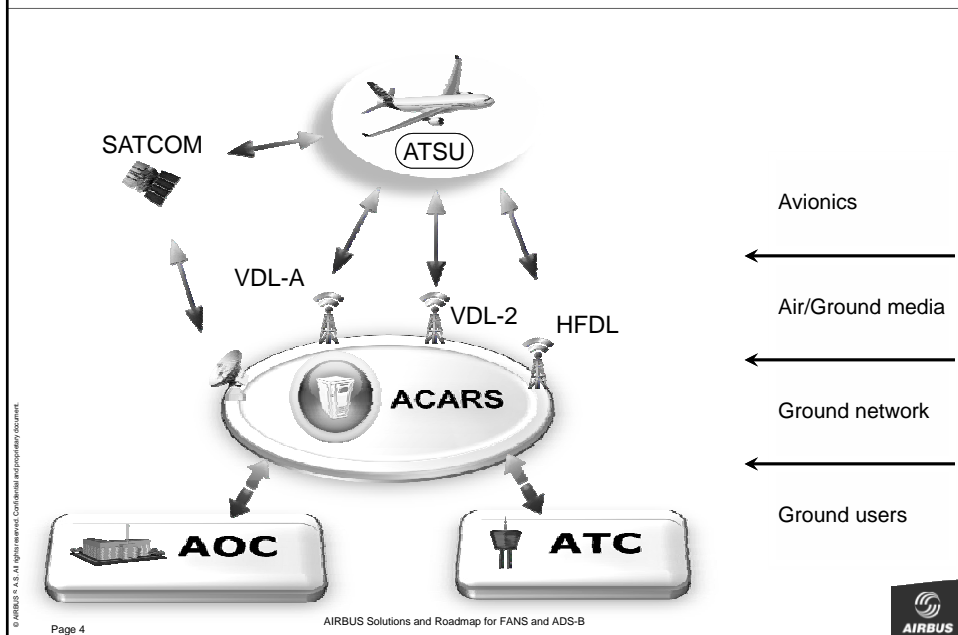
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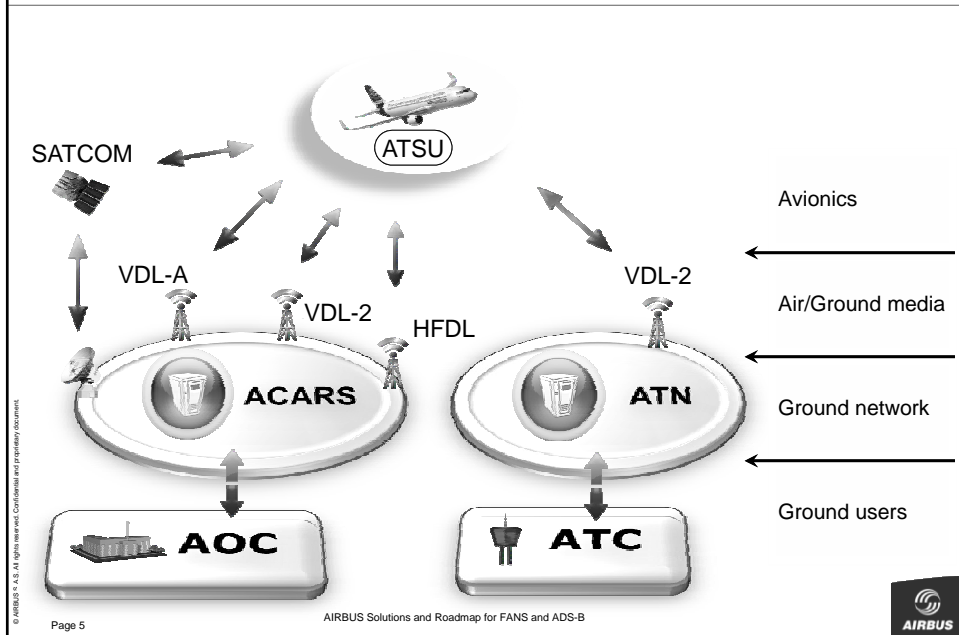
FANS concept – Ground networks



Architecture in ACARS Environment – FANS A+



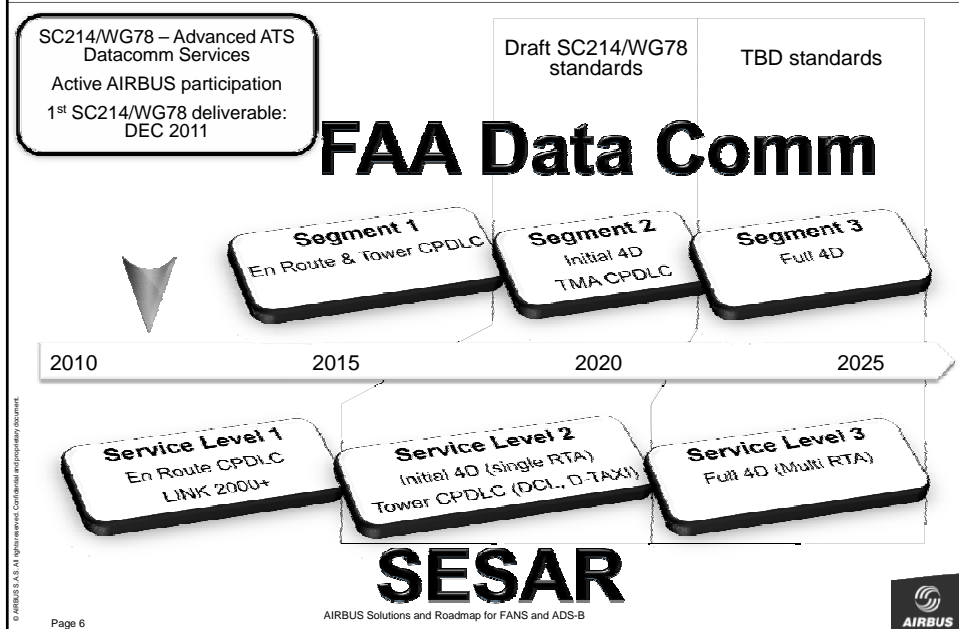
Architecture in ATN Environment – FANS B+



Page 5

AIRBUS Solutions and Roadmap for FANS and ADS-B

Datalink Roadmap for the Future

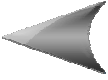


Page 6

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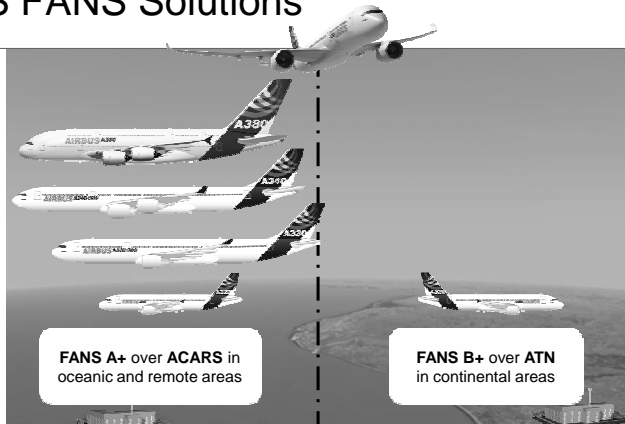
Contents

- 1 Data Link Communication Reminders
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AIRBUS FANS Solutions



FANS A+ applications
COM : CPDLC
SURV : ADS-C
ATS 623 applications
› Digital ATIS – D-ATIS
› Departure Clearance – DCL
› Oceanic Clearance – OCL

FANS B+ applications
COM : CPDLC
ATS 623 applications
› Digital ATIS – D-ATIS
› Departure Clearance – DCL

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Introduction to FANS A+

FANS A

- **1st AIRBUS product capable of CPDLC over ACARS**
- Certified in 2000 on A330/A340
- Initial CPDLC & ADS-C operations in the Pacific

FANS A+

- **Upgrade of FANS A**
- Certified in 2004 on A330/A340 aircraft, later on A320 Family aircraft and A380 aircraft
- Enhancement (in-service experiences) for FANS 1/A operations all over the world

FANS A+ Options

- HF Data Link (HFDL)
- VHF Data Link Mode 2 (VDL 2): Higher data rate compared to VDL Mode A
- ATS 623 Departure & Oceanic Clearances, D-ATIS

FANS A+ DR

- **Upgrade of FANS A+**
- Certification planned in 4Q2011 on A320/A330/A340
- Data link recording by CVR (FAA/EASA)
- Enhancement based on in-service experiences (e.g. frequency loading into RMP)

A380 FANS A+ already capable of data link recording by CVR

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Page 9

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Introduction to FANS B+

FANS B

- **1st AIRBUS product capable of ATN/VDL2 for CPDLC**
- Certified in OCT 2006 on A320 Family
- LINK 2000+ Pioneer phase

FANS B+

- **Upgrade of FANS B**
- Certified in NOV 2010 on A320 Family
- Eligible to LINK 2000+ **Incentive & Mandate phases**
- **Protected Mode (PM):** Voice read-back no longer required

FANS B+ Options

- Frequency loading into RMP
- Data link recording by CVR (FAA, EASA)
- ATS 623 Departure Clearance & D-ATIS

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Page 10

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AIRBUS FANS in A320/A330/A340 Cockpit

DCDU: Datalink Control & Display Unit

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Page 11

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AIRBUS FANS in A380 Cockpit

A350 will apply the same with integrated HMI for FANS A+ and FANS B+, to be retrofitted on A380 afterwards.

Commonality with A320/330/340 operating principles

A380 Cockpit interactivity = More efficient workflow

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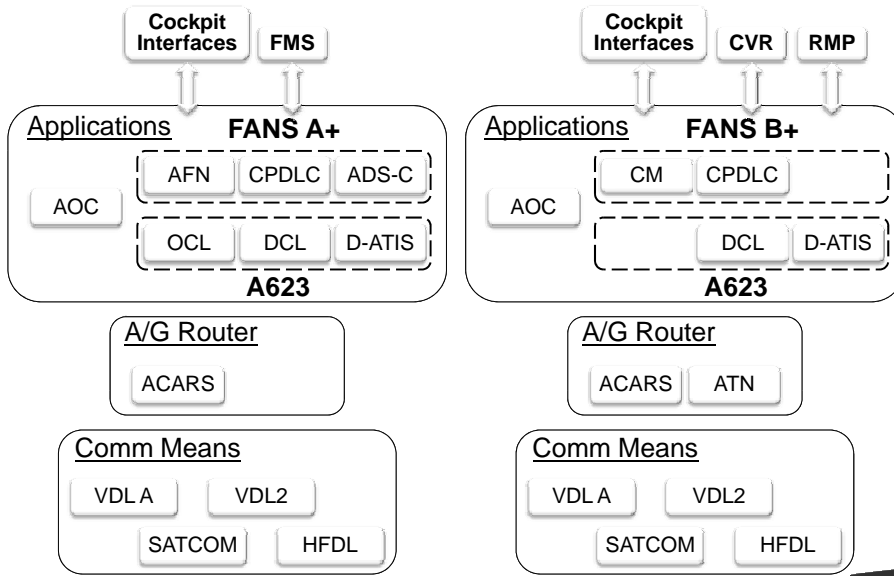
Page 12

AIRBUS Solutions and Roadmap for FANS and ADS-B

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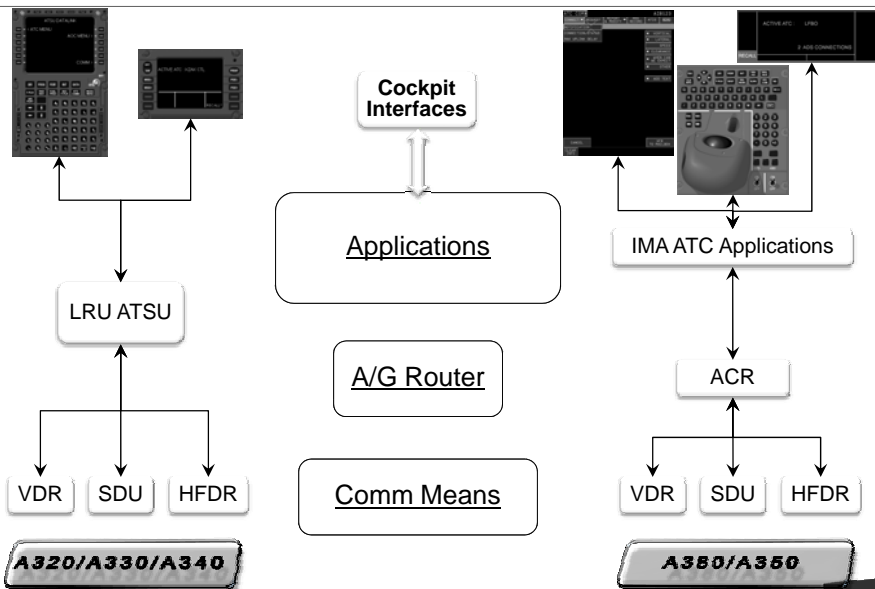
Functional Architecture of Current Solutions



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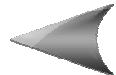
System Architecture of Current Solutions



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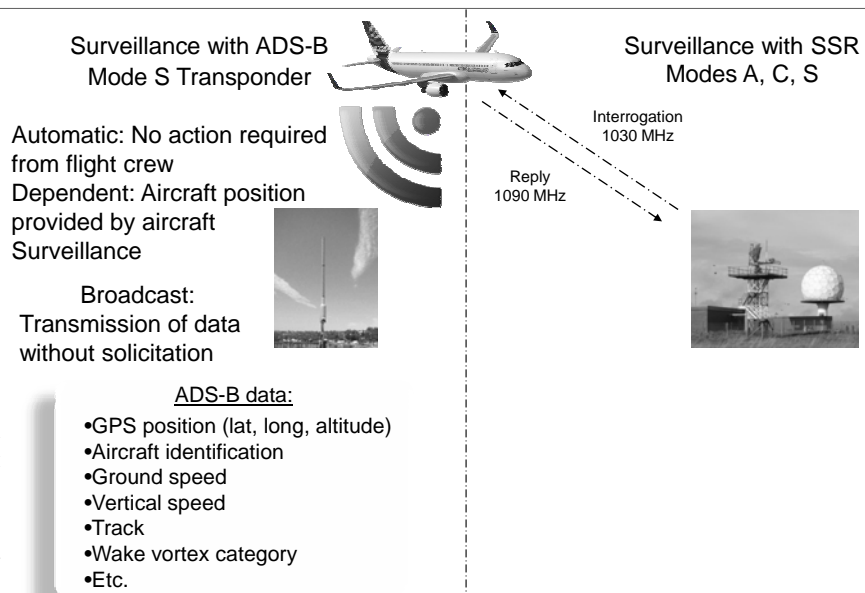
Contents

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ADS-B Concept – ADS-Broadcast

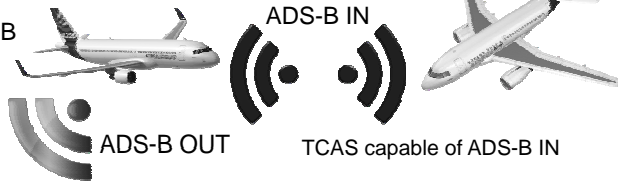


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ADS-B Concept – ADS-B Applications

Surveillance with ADS-B
Mode S Transponder



ATSAW (AIRBUS) :
Air Traffic Situational Awareness
Display of enriched traffic
information in the cockpit

ADS-B OUT: Capability to transmit ADS-B data

- ADS-B NRA: Non Radar areas
- ADS-B RAD: Radar areas
- ADS-B APT: Airport surfaces

ADS-B IN: Capability to receive ADS-B data

- ATSA AIRB: Airborne operations
- ATSA ITP: In Trail Procedure
- ATSA VSA: Visual Separation on Approach
- ATSA SURF: Airport Surfaces

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Page 17

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ADS-B concept – Operational benefits

ADS-B OUT

Ground perspective

- ADS-B NRA (Non Radar Areas)
 - Provides SSR-like surveillance services (e.g. 5 NM longitudinal separation)
 - With cheaper installation
 - Where SSR does not exist or is not justified by traffic volumes.
- ADS-B RAD (Radar)
 - Provides SSR surveillance services
 - Decommissioning of redundant SSR
 - In combination with other surveillance sensors (WAM, SSR, or PSR).
- ADS-B APT (Airport)
 - New tool for surface movement surveillance.

ADS-B IN

Cockpit perspective

- ATSA SURF
 - Enhanced traffic awareness during surface operations (taxi, take-off, landing) = safety enhancement.
- ATSA AIRB
 - Enhanced traffic awareness during airborne operations.
- ATSA – ITP (In Trail Procedure) : more FL change opportunities (optimum FL, turbulences) = fuel savings, safety enhancement.
- ATSA VSA (Visual Separation on Approach) : more successful landing, less go-arounds = approach throughput, fuel savings, etc.

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Page 18



ADS-B concept – Operational benefits

ADS-B OUT
Ground perspective

ADS-B IN
Cockpit perspective

- Flight efficiency
- Safety
- Fuel burn
- Environmental emissions

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Page 19



Contents

- 1 Data Link Communication Reminders
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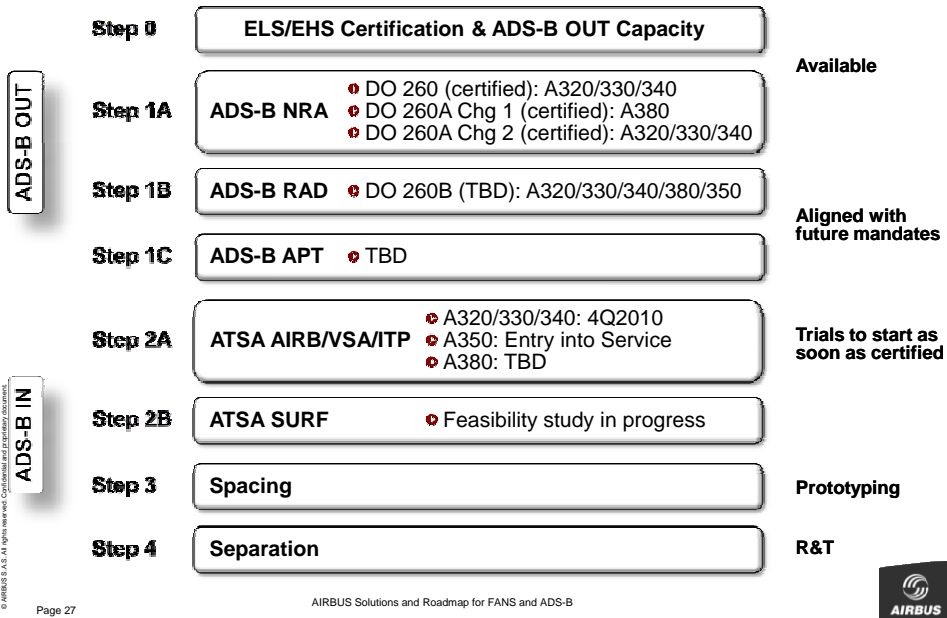
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Page 26

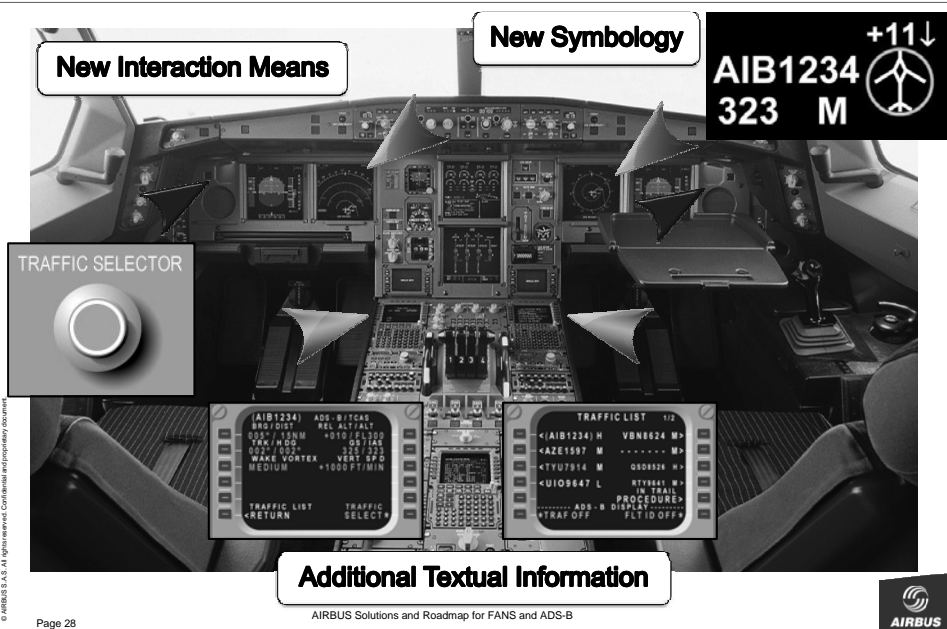
AIRBUS Solutions and Roadmap for FANS and ADS-B



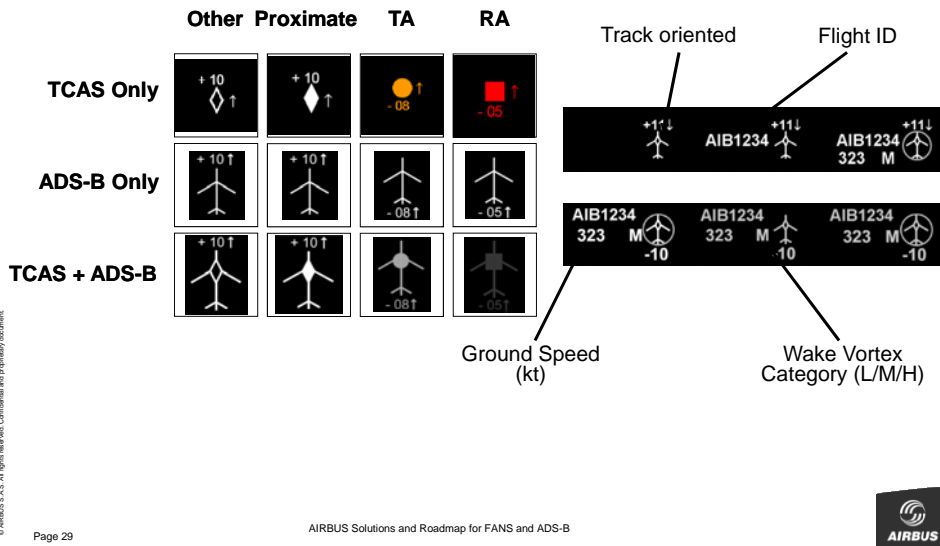
AIRBUS ADS-B Roadmap



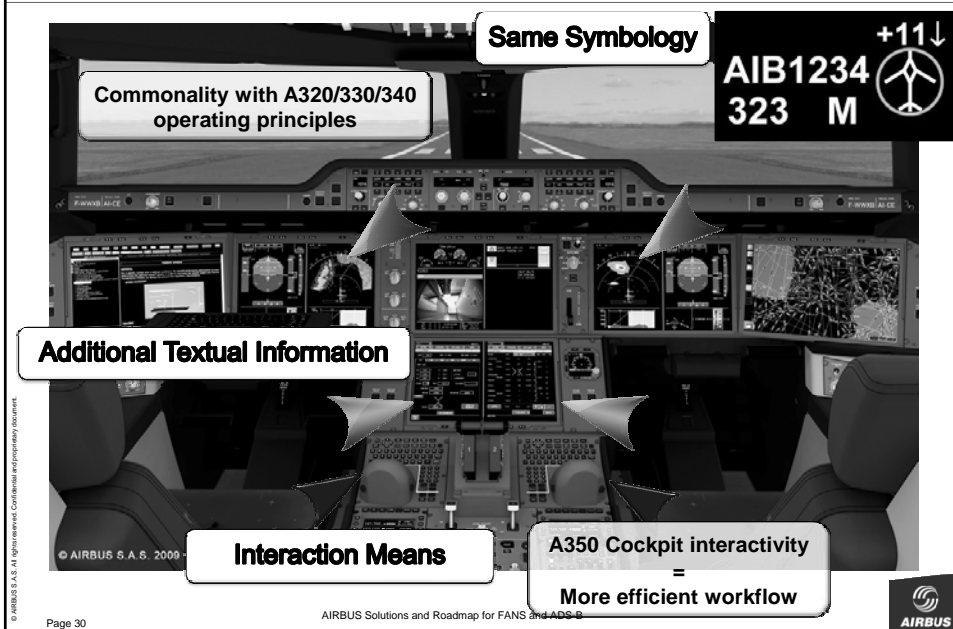
ATSAW in A320/330/340 Cockpit



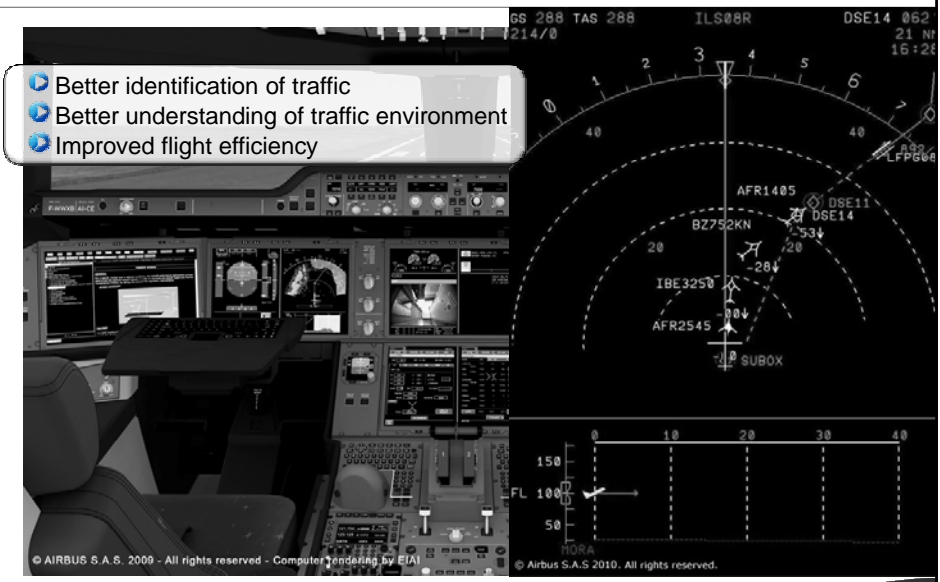
TCAS and ATSAW Symbols



ATSAW in A350 Cockpit

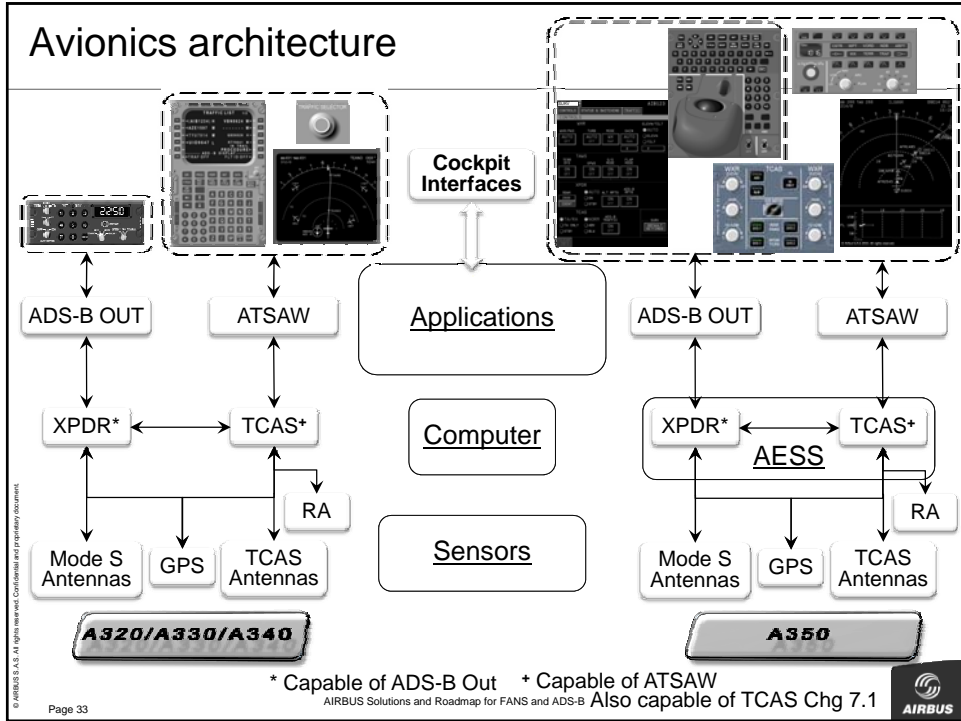


ATSAW display samples



ATSAW display samples





Contents

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AIRBUS Support to Airlines for FANS and ADS-B

Engineering

- Support to aircraft definition
- In-service support: Technical assistance to avionics configuration, investigation on in-service issues, technical briefing

Flight Operations

- Flight operations expertise
- Routine support, assistance to EIS and operational approval
- Academic training

Documentation

- AFM, FCOM, MMEL, AMM
- Airworthiness certification document for FANS/ADS-B/ATSAW
- Getting to Grips with FANS and Surveillance

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Page 35

AIRBUS Solutions and Roadmap for FANS and ADS-B



Summary 1/2

CPDLC

FANS A+ over ACARS
on
A320/330/A340/A380

FANS A+ DR over ACARS
on A320/A330/A40
from 4Q2011

FANS B+ over ATN
on A320

FANS A+ & FANS B+
on A350 at EIS

ADS-C

FANS A+

FANS A+ DR

FANS A+ A350

ADS-B OUT

NRA – DO 260/260 A
on
A320/A330/A340/A380

RAD – DO 260B
To be available on
A320/A330/A340/A380
/A350

ATSAW

AIRB/VSA/ITP
on A320/A330/A340,
A350 at EIS

SURF
Feasibility study in
progress



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Page 36

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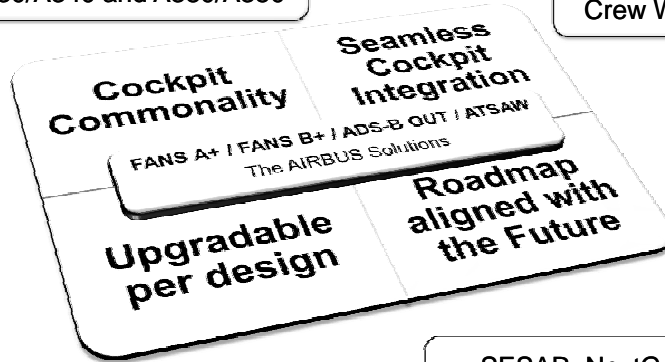


Summary 2/2

AIRBUS is ready to support its operators for FANS, ADS-B, ATSAW EIS

Same operating principles across A320/A330/A340 and A380/A350

Optimized Flight Crew Workflow



Designed to cope with future requirements with minimum hardware changes

SESAR, NextGen Standard Applications

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Page 37

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