



A400M Flight Test Campaign

20th September 2011

Presented by
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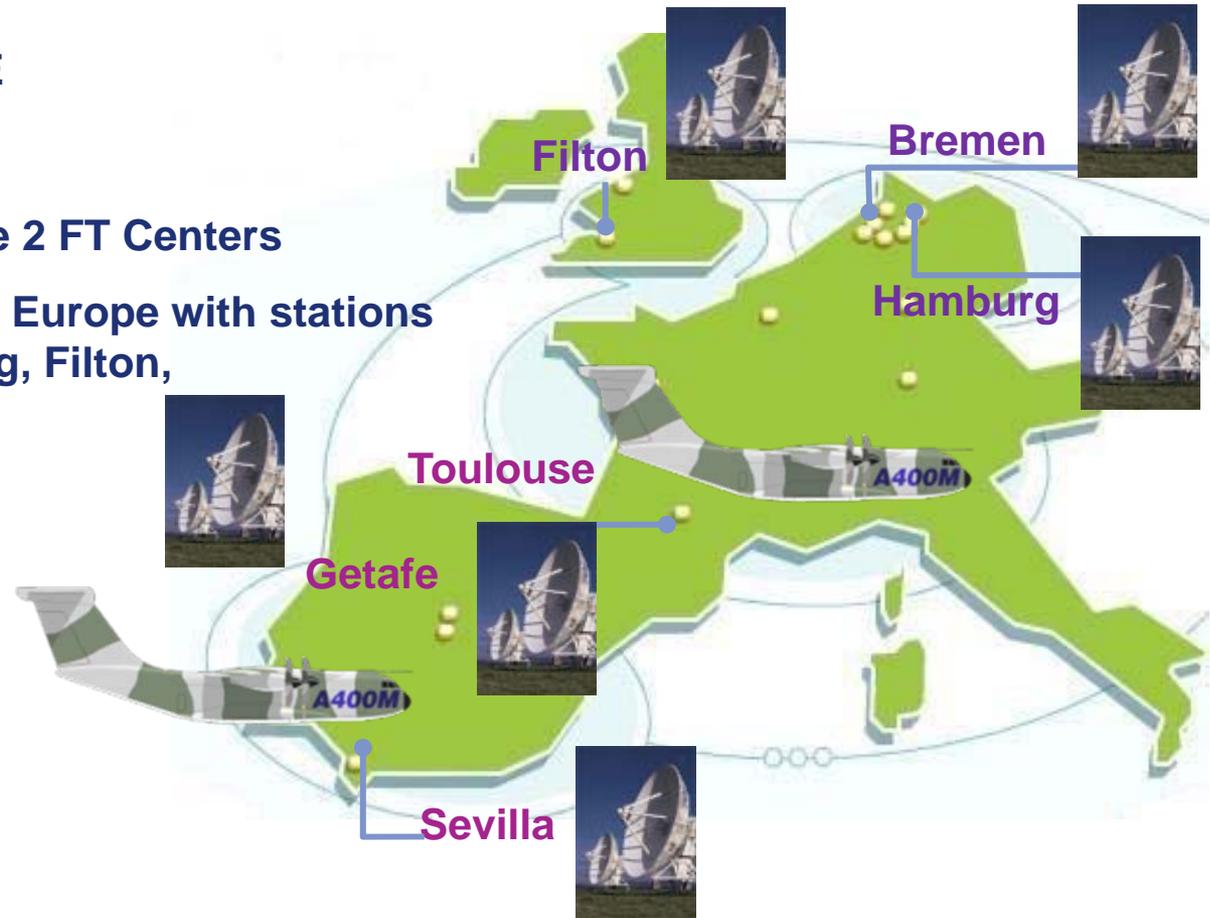
A400M - FLIGHT TEST

2 Flight Test Centers

- Toulouse FRANCE
- Sevilla SPAIN

Interoperability between the 2 FT Centers

Telemetry capability across Europe with stations in Getafe, Bremen, Hamburg, Filton, Toulouse and Sevilla



A400M - FLIGHT TEST PLAN

5 Flight Test Aircraft

TC

IOC /EIS

SOC1



Heavy Flight Test Instrumentation



Heavy FTI



Medium FTI



Medium FTI



Light FTI

Total 3700 Flight Test Hours

Since the First Flight in Sevilla on Dec 11th, 2009 ...



A400M - Flight Test Status on September 19th, 2011

60 Pilots have flown the A400M

- Airbus pilots
- EASA and CQP pilots
- Pilots from Customer Air Forces

Germany

UK

France

Turkey



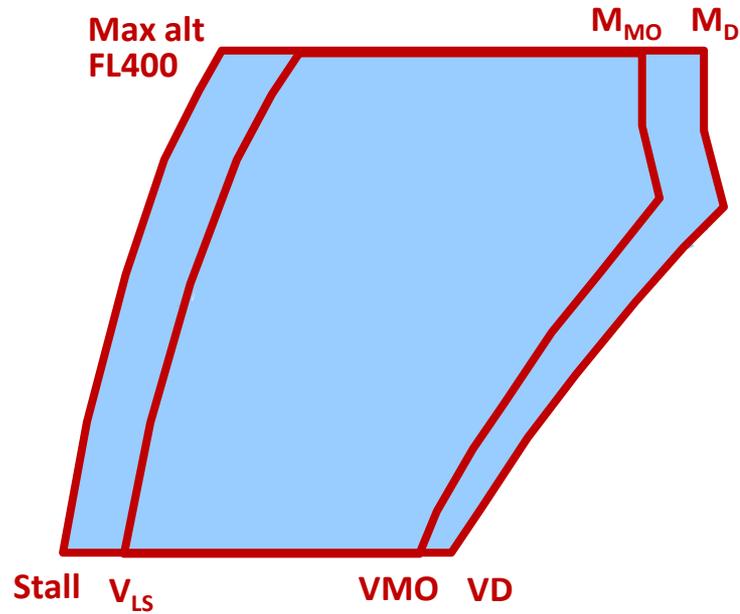
© AIRBUS MILITARY 2010 - A400M at Farnborough

Total A400M = 2180 hours / 710 Flights

1515 Take-off and Landings

A400M – FT campaign Achievements

Flight Envelope and Handling Qualities



- No aero or structural change required to clear the Flight Envelope
- Handling Qualities praised by all pilots
- Agility and stability



A400M - Flight Test Achievements

Aero Identification

- Various aero configurations tested to optimise local flow characteristics:
 - Sponsons, MLG doors, NLG doors and Paratroopers doors Air deflector



A400M - Flight Test Achievements

Artificial Ice Shapes Testing

- Handling and Performance with artificial Ice Shapes
- High AOA Protection validated



- Handling Qualities remain outstanding despite the severe ice shapes in normal and failure conditions



A400M - Flight Test Achievements

Performance

- Aero configuration optimization completed
- Flight Manual Performance testing
- Braking performance certification
- VMU, VMCG & VMCA/VMCL tests completed
- Cruise Performance tests completed
- Stall certification tests completed
- Certification testing since Dec 2010
- High Energy RTO done (16/0911)



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A400M - VMU tests



A400M - High Energy Rejected Take-off at MTOW - high speed



A400M - Flight Test Achievements

Structure

- Flight Loads campaign completed
- Ground Loads campaign started
- Testing against Civil and Military requirements



**Structural model validated
No significant structural modification required**

A400M - Flight Test Achievements

Basic Aircraft Systems

- Good progress on development tests of all systems :
 - Hydraulics
 - Electrics
 - Bleed, Pressurization and Air Conditioning
 - APU tests completed incl. Hot t tests
 - Fuel tests completed except Hot fuel tests
 - Landing gear and brakes
 - Autopilot and Auto Thrust
 - Flight Management System
- Systems Certification tests under way
- Emergency Electrical Configuration validated
- EMI tests completed for EASA certification
- Cargo & Cockpit: MEDEVAC configuration done and Emergency evacuation tests done 07/09/11. Evacuation done in 90 seconds
 - 115 military troops
 - 114 paratroopers fully equipped



- **Systems Type Definition frozen**
- **Certification tests in progress**
- **Latest equipment upgrades available in Summer 2011 compatible with TC target**

A400M - Emergency evacuation test & MEDEVAC configuration done in Sevilla week 36 on MSN6



A400M - Flight Test Achievements

Powerplant

- Propeller stress survey completed
- Engine calibration completed
- Engine transients completed
- Nacelle cooling tests and modifications validated
- Lapse rate take off tests for AFM power management
- Inflight relight envelope (windmilling & starter assisted)
- Hot temperature & Mid altitude tests completed
- FADEC standard FFS 2.1 tests completed



A400M - Flight Test Achievements

Military Systems and Operations

- Ramp and door operation
- Paratroop doors operation and aerodynamics

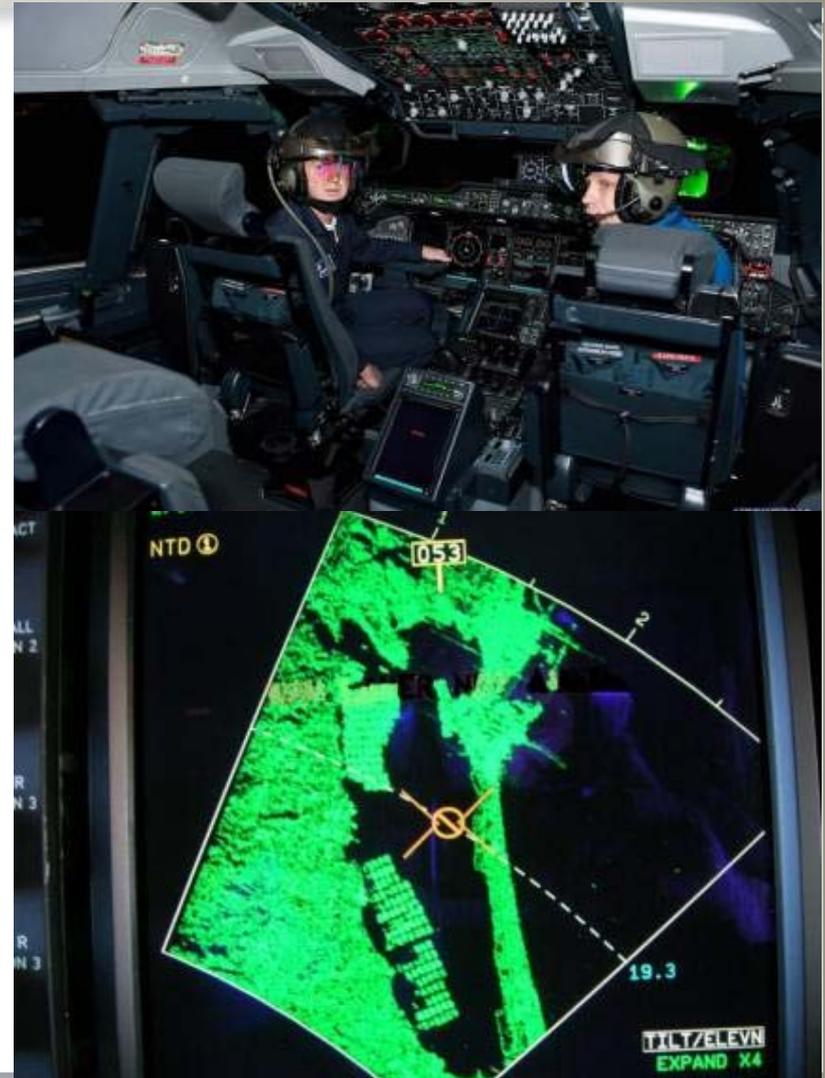


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A400M - Flight Test Achievements

Military Systems

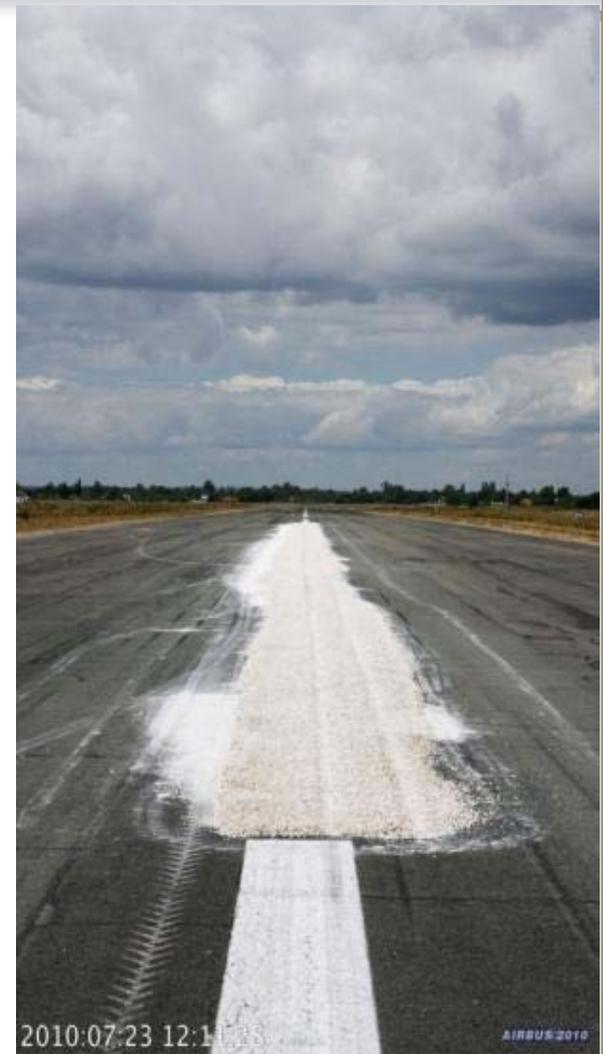
- Night vision goggles operation
- Enhanced Vision System
- Military radar



A400M - Flight Test Achievements

Military Operations

- Preliminary unprepared runway operations



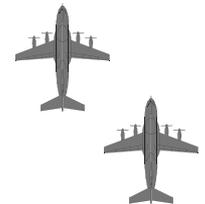
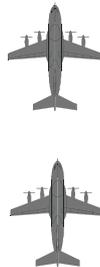
A400M - Flight Test Achievements

Formation Flight

- Check of different formation position with both A400M MSN1 & 2, to check AAR formation as receiver
- Step by step approach – in snake, column, then in close formation in echelon



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A400M - Flight Test Achievements

AAR dry contacts behind RAF VC10

- Handling qualities check of A400M as receiver
- 15 dry contacts



A400M - Flight Test Achievements

Cold Weather in Kiruna

- Powerplant and systems operation in low temperatures
- 1st campaign with a 27H coldsoak down to -21°C
- 2nd campaign with a 24H coldsoak down to -38°C



A400M Cold Weather campaign Kiruna



Summary

- Good Progress of the Flight Test Campaign
- Type Definition for Civil Certification frozen
- Final systems upgrades at TC definition in progress
- Certification Flight Test Campaign well underway targeting an EASA TC by end 2011
- Good performance of Military Systems
- Good suitability for Military Operations

- **A400M handling characteristic praised by all pilots having flown the a/c**
- **Flight Test Program on track to reach TC by end 2011**
- **The A400M will deliver the expected Performance and Military Capabilities**

Thank you





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