



EUROPEAN COMMISSION SPONSORED DEMONSTRATION

NUP phase II: North European ADS-B network Update Programme

The programme has established a European ADS-B network based on global standards, supporting certified applications and equipment in synergy with European ATM concepts providing benefits to ATM stakeholders.

NUP Phase II uses a “bottom-up” approach, taking the input from local “Tiger Teams” consisting of pilots, controllers and engineers to define a range of applications for ADS-B and VDL Mode 4. Applications will be developed following EUROCAE WG-53 methodology. Nineteen Tiger Teams have been grouped into five Clusters. Each cluster represents a common operational domain in which ADS-B can be utilised.

EXPECTED RESULTS

Step one: ADS-B out from the aircraft.

In the first step ADS-B is used on the ground (e.g. ATC and airports), so that the benefit comes from the use of improved aircraft information in ATC and planning systems. Local ATC implementations and certified aircraft and helicopter installations are foreseen.

Step two: ADS-B into the aircraft, enabling air-to-air applications and including:

- Introduction of airborne situation awareness and automation for air-to-air applications including delegation of separation responsibility.
- Development of service bulletins (including technical installation and operational use) and ground infrastructure.
- Business justification via simulations and technical/operational analyses.

PARTNERS

Swedish Civil Aviation Administration (Co-ordinator) (S), Airbus France (F), AustroControl (A), AVTECH (S), Finnish Civil Aviation Administration (FIN), Lufthansa (D), Naviair (DK), AVINOR (N), SAS (S), Belgocontrol (B), DFS (D), Direction de la Navigation Aérienne (F), EUROCONTROL, ADS-B Scatsta (UK), TERN (IS), Tyrolean Airways (A)

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EVP (European ATM Reference Validation Platform)

OBJECTIVES

EVP validates EATMP Medium Term Conflict Detection, Arrival and Departure Management, and Airborne Separation Assurance Concepts

APPROACH

EVP provides infrastructure for simulation and live trials based on ESCAPE/ACE, and performs validation exercises

EVP aims to:

- Apply the MAEVA Validation Methodology to assess usability, human involvement and commitment, capacity, safety and environmental impact of future concepts
- Speed up introduction of new ATC tools by actively involving controllers and other end users in the validation process through "shadow mode".

EVP brings new systems into the operations room for use directly by controllers who can quickly identify limitations or opportunities of the proposed system, and provide early feedback to developers

RESULTS

MTCD and AMAN Validation Simulations and Trials, ASAS Cockpit Experiments Studies performed at Malmö, Stockholm, Rome and Maastricht ACCs and the EUROCONTROL Experimental Centre.

PARTNERS

EUROCONTROL, Luftfartsverket (LFV) and Ente Nazionale di Assistenza al Volo (ENAV)

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CoSpace

(A new Controller – Pilot Cooperation Enabled by ADS-B)

OBJECTIVES

Motivation is to increase controller availability through a reorganisation of spacing tasks between air and ground. Guiding principles are the use of new “spacing” instructions but with no modification of responsibility for separation provision.

APPROACH

Constraints retained are to consider current roles and working methods (human perspective), and keep things as simple as possible (system perspective). Applications evaluated include sequencing of arrival flows from cruise to final approach (Package I, sequencing & merging). The enablers exploited include airborne surveillance (ADS-B) and cockpit automation (ASAS). Validation objectives are to assess acceptability, impact on controller and flight crew activity, impact on effectiveness and impact on safety.

RESULTS

After an initial air-ground experiment, two streams of air and ground experiments were conducted: five ground experiments with in total 34 controllers over 14 weeks; four air experiments with in total 31 test and airline pilots over 25 days.

Main findings are:

- Controller: workload reduction and anticipation in sequence building;
- Pilot: spacing accuracy $\pm 5s$ at acceptable workload and gain in awareness;
- ATC perspective: more regular flows at initial and final approach.

PARTNERS

AGC and ADS programmes of EUROCONTROL EATMP, NUPII and EVP programmes of EC DG TREN

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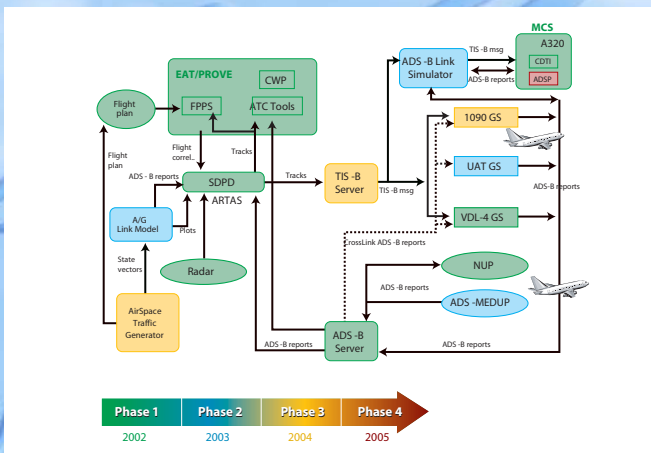
AVT: ADS-B Validation Testbed

- AVT is a flexible ADS-B/TIS-B surveillance test platform supporting validation of Ground & Airborne Surveillance Applications and their expected Safety, Capacity & Efficiency benefits.
- Adapted versions of AVT will be implemented at several locations in Europe for the benefit of validation trials as well as in support of national and European Commission projects.
- AVT is one of the key deliverables of the EUROCONTROL ADS Programme



COMPLETE SYSTEM CHAIN FROM PILOT TO CONTROLLER

- Replicates the future surveillance architecture, including radars, multi-link ADS-B and TIS-B, Aircraft Derived Data components etc.
- Uses an open architecture with standard interfaces such as ASTERIX
- Allows integration with Controller Working Positions, aircraft simulators and live traffic to provide the complete system chain from pilot to controller.



PARTNERS

AVT is developed at the EUROCONTROL Experimental Centre, funded by the ADS Programme, with support from the European Commission.

