

**ICAS – International Council of the Aeronautical Sciences
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Unmanned Aircraft Systems Pan-European ATM Network Integration

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EUROCONTROL



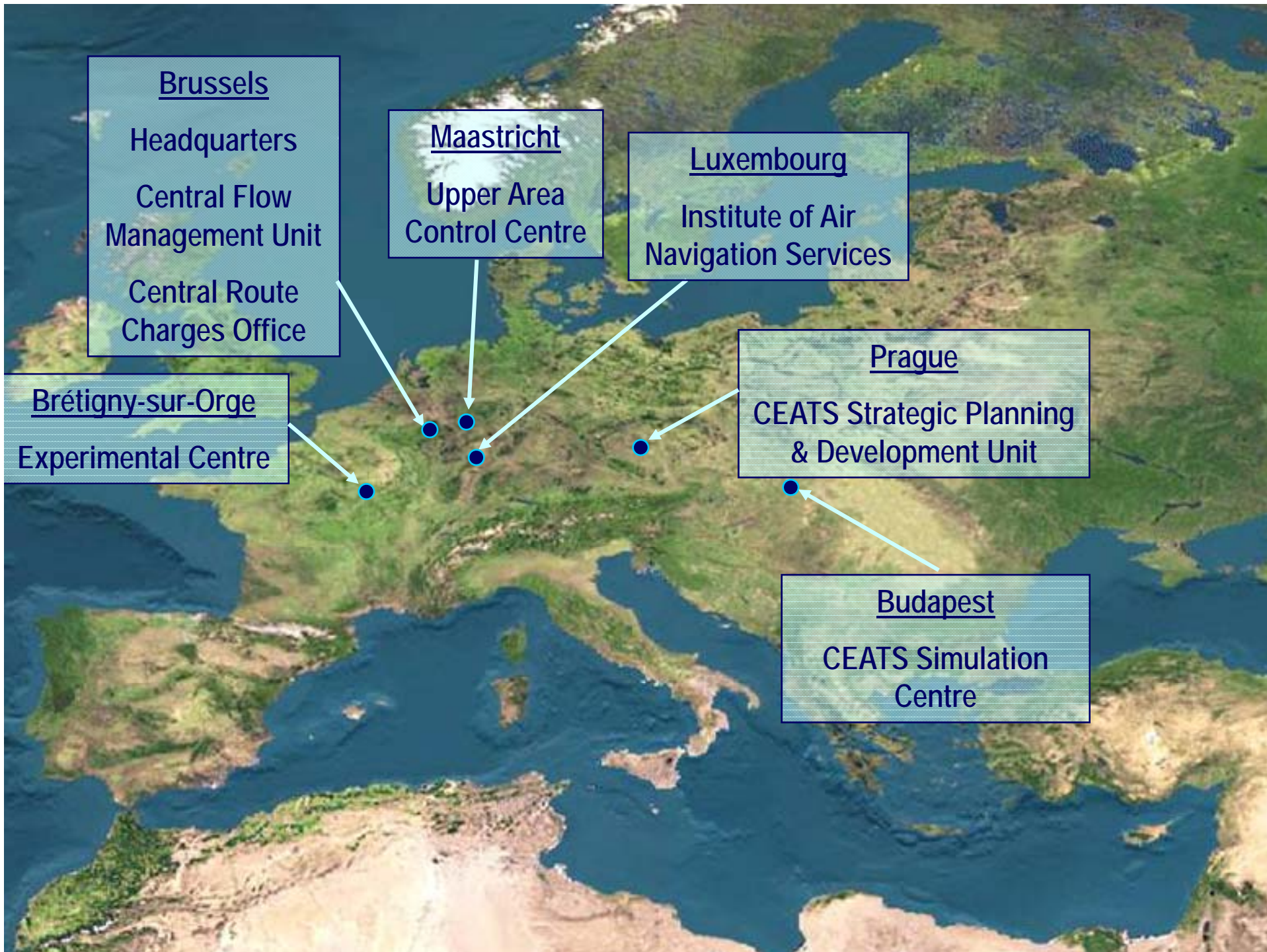
EUROCONTROL

“The European Organisation for the Safety of Air Navigation”

Mission: To **harmonise** and **integrate** Air Navigation Services in Europe, aiming at the creation of a **uniform** Air Traffic Management System for **civil** and **military** users, in order to achieve the **safe, orderly, expeditious** and **economic** flow of traffic throughout Europe.
(Article 1 of the EUROCONTROL Revised Convention)



EUROCONTROL



Brussels

Headquarters
Central Flow Management Unit
Central Route Charges Office

Maastricht

Upper Area Control Centre

Luxembourg

Institute of Air Navigation Services

Brétigny-sur-Orge

Experimental Centre

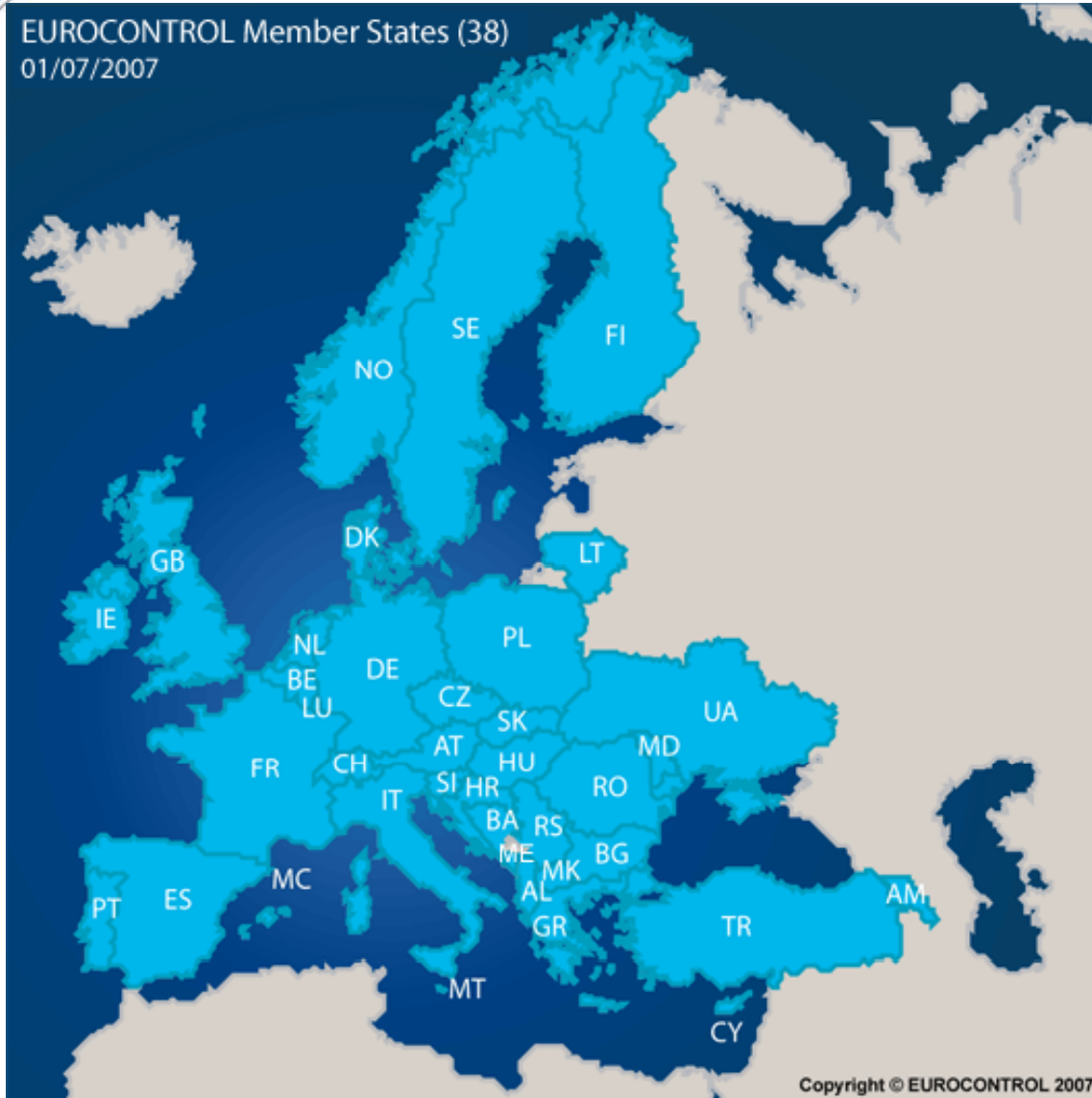
Prague

CEATS Strategic Planning & Development Unit

Budapest

CEATS Simulation Centre

EUROCONTROL – A Civil/Military International Organisation



EUROCONTROL – A Civil/Military International Organisation

EUROCONTROL's “4 Pillars”

Regional ATC Services



Pan-European Functions



Support to Regulation



ATM Network Design





Pillar 1 - Regional ATC Services

Maastricht UAC

Upper Airspace – D, B, NL, L

1.6 million flights annually

Constant efficiency improvements

Excellent Safety Performance





Pillar 2 - Pan-European Functions

CFMU

“Central Flow Management Unit”

Since 1995

40 % increase in traffic

Delays below 2 min.

CRCO

“Central Route Charges Office”

Efficient cost recovery

On behalf of 32 States

Reduction of the Admin Unit Rate





Pillar 3 - Support to Regulation

SES

“The Single European Sky”

14 Mandates from the EC

Implementing Rules

Inter-operability

**Safety
Regulation**

ESARRs

European Community Law

UAS required Levels of Safety



EUROCONTROL

Pillar 4 - ATM Network Design

The logo for EATM (European ATM Network) is displayed in a large, stylized font. The letters are dark blue with a red outline, set against a white circular background with a blue border. The background of the slide features a blue globe on the left and a large blue arc on the right.

EATM

Co-operative Stakeholder Process

Strategies, Concepts, Roadmaps

Unmanned Aircraft Systems

Institute Air Navigation Services

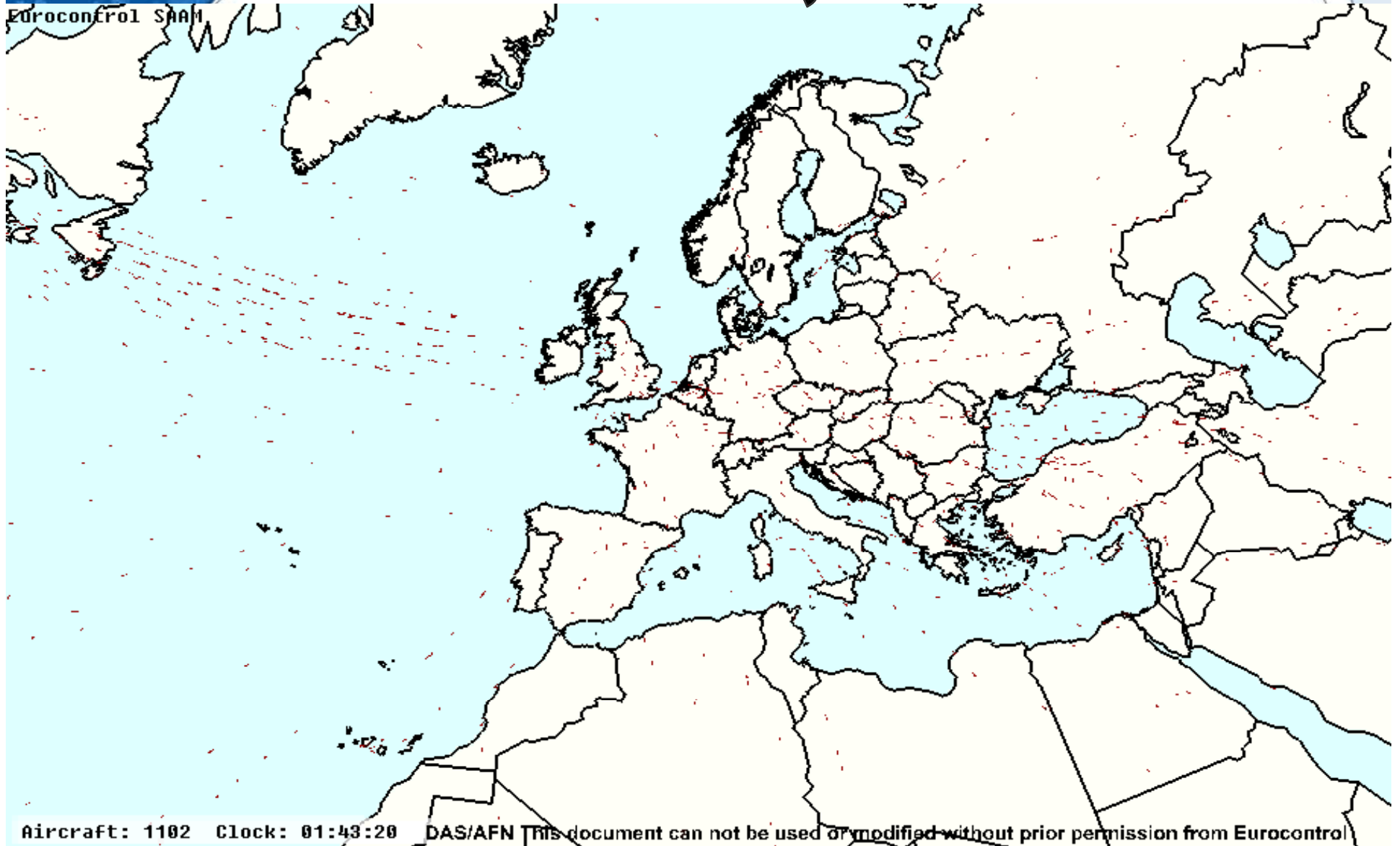
EUROCONTROL Experimental Centre

Integration of UAS into the pan-European ATM Network

- ✓ Safety
- ✓ Security
- ✓ Environment
- ✓ Airspace Capacity
- ✓ Flight Efficiencies
- ✓ Airspace Access

The pan-European Network

June 15, 2007



Civil Aviation Today – Europe

Employed: 4,000,000 citizens

Economy: 220,000,000,000 €/yr.

(2005): 9,200,000 Flights
27% of global flights

(2025): 22,000,000 Flights (240 % growth)

37% of European flights are international !



Role of EUROCONTROL

Ensure ATM meets requirements of all legitimate airspace users

“legitimate”: certification, equipment carriage, + operational approval

“certification”: for UAS, the missing element



EUROCONTROL Integration of UAS into the ATM Network

**Non-Segregated
Airspace**

UAS as legitimate airspace users

Civil and Military UAS

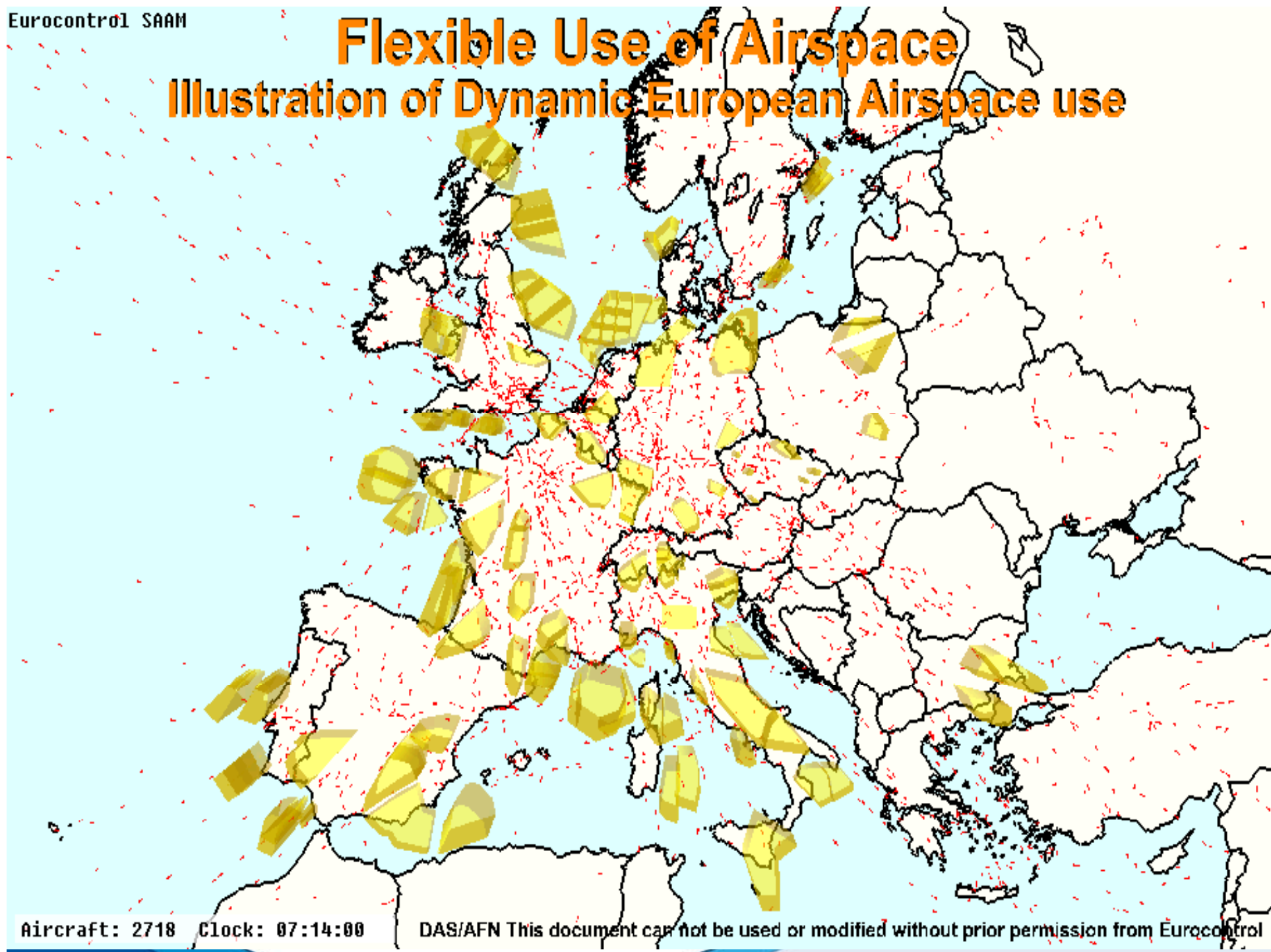
Optimum Use of the Airspace

Further Segregation not an option



Flexible Use of Airspace

Illustration of Dynamic European Airspace use



ANT - ATM Requirements for UAS as GAT

- ✓ ANT: EUROCONTROL “Airspace and Navigation Team”
- ✓ GAT: “General Air Traffic” – Civil Aircraft and [Military]
- ✓ Requirement: UAS as GAT shall perform at least as well as manned aircraft
- ✓ Principle of *ATM transparency*
- ✓ UAS certification as the basis for ATM transparency.
- ✓ The pursuit of ATM transparency through certification.....

Addressing civil UAS Certification

EUROCAE WG-73

EUROCONTROL/EUROCAE Consultation

EUROCONTROL Lead/Chair of WG-73

Broad EUROCONTROL Participation

RTCA Coordination

Addressing civil UAS Certification

The EASA logo is a circular emblem with a blue and white border. Inside the circle, the word "EASA" is written in a bold, blue, sans-serif font with a red outline.

EASA

WG 73 as European UAS Expert Group

Partners in a “phased UAS Integration”

Permits to Fly

Restricted Certificates of Airworthiness



Addressing civil UAS Certification

The ICAO logo is a circular emblem with a white center and a blue border. The letters "ICAO" are written in a bold, dark blue font with a red outline. The background of the slide features a stylized blue globe on the left side.

ICAO

EUROCONTROL submissions to EANPG

Air Navigation Commission Briefing (2003)

ICAO UAS Informal Working Group (2006)

ICAO UAS Study Group (2007)



Achieving ATM Transparency

EUROCAE/RTCA MASPS/MOPS

UAS Categorisation

Establish Required Safety Levels – EUROCONTROL SRC

ATM Transparency Shortcomings/Enhancements

ATM mitigation or adaptation

EASA

Airworthiness Codes

Means of Compliance

Restricted Certificates with ATM risk mitigation



EUROCONTROL

Achieving ATM Transparency

ICAO

Global UAS Policy and Guidance

Global UAS SARPs

Global Inter-operability

EUROCONTROL

UAS Airspace Impact Assessments

ATM Security

Environment

Civil-Military Interoperability



EUROCONTROL

ATM will evolve – UAS as Drivers for Change

UAS Systems can improve ATM for all airspace users

Detect, Sense and Avoid

Improved Air-Ground Communications Links

Autonomous Flight

Future ATM Concepts

SESAR - UAS to be fully considered

EUROCONTROL Experimental Centre – UAS R+D

ICAO ATM Operational Concept (2025) - UAS



EUROCONTROL

Immediate UAS ATM Initiatives

UAS – ATC Real-Time Simulation – First Half 2008

UAS airspace flight performance ATM integration assessments

Human factors – UAS Ground Control Station

ATC Interface

Support to Specific National Civil Applications – Civil UAS “First Steps”

Promote and support civil UAS in non-segregated airspace

ATM Integration

Phased Integration - Permits to Fly

EUROCONTROL UAS “Next Steps” (1/3)

Establish Cross-Domain UAS Activity

Short-term - UAS phased Integration

UAS “Proof of Concept”

Medium term - UAS Full ATM Integration

Long term R+D – Enhanced ATM for all

EUROCONTROL UAS “Next Steps” (2/3)

European UAS Market Outlooks

EUROCONTROL/FAA MoC Action Plan 24

**Spectrum, Spectrum, Spectrum.....
EUROCONTROL, FAA, EUROCAE, RTCA,
ICAO, Industry**

SESAR



EUROCONTROL UAS “Next Steps” (3/3)

UAS Required Levels of Safety

Human Factors Studies

EUROCAE, EASA, ICAO, Industry

ATC UAS Real-Time Simulations

Support to Specific National Civil Applications – Civil UAS “First Steps”



Conclusion

**UAS have
arrived!**

**They will be
legitimate
airspace
users**

**ATM will
meet UAS
airspace
requirements**

**EUROCONTROL
will remain
fully engaged**



EUROCONTROL

A “Turning Point” in Aviation



Thank-you !