

## *European Commission DG Research Project dedicated to SMEs Support Aeronautics and Space*

<b>Pre-project Acronym</b>	GUIDEKEEPER
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<b>Pre-project Administrative Overview</b>			
<b>AEROPORTAL Servicing Partner</b>	EURO CONSULTANTS	email : info@eurocons.co.il	
<b>Thematic priorities</b>	AAT.2008.6.2.2	AREA: 8.1.6.2	
<b>Type of Action</b>	Collaborative Project Level 1		
<b>Pre-project Full Name</b>	High Altitude Long Endurance Aircraft System (HALEAS) to Detect, Guide and Command a Pilot-Free Aircraft Flight with Total Automation		

<b>Pre-project abstract</b>			
<u>Strategic objectives addressed</u>			
To improve air traffic control and management in airports beyond the planned state-of-the-art.			
<u>Strategic expected achievements</u>			
To provide new technology for guidance and control of pilot-free flight of aircraft.			
<u>Proposal abstract</u>			
<p>The GUIDEKEEPER aims to provide CIVIL AVIATION with significant benefits beyond the today FAA planning and the EUROCONTROL SESAR Master Plan:</p> <ul style="list-style-type: none"> <li>a) to provide complete automation for guidance and control of Unmanned and Pilot-Free Aircraft that are expected to fly in the near future in CIVIL Non-Segregated Airspace;</li> <li>b) to provide a “very low altitude geo-stationary high resolution satellite platform” flying above airports with the option to transform the ATC (Air Traffic Control) and the ATM (Air Traffic Management) functions to ‘satellite’ control and management, and thus to increase significantly the affordability in airports in general, and in very heavy air traffic busy airports in particular;</li> <li>c) to increase significantly the security of flight by guiding and controlling piloted aircraft when the pilots are incapacitated or have been hi-jacked, or are impeded by extreme weather or emergency conditions around the airport;</li> <li>d) to increase the capacity for air traffic control and management in real time when fast air flight conditions and predicted trajectories change unexpectedly, or not identified flights suspiciously appear.</li> </ul> <p>The present GUIDEKEEPER proposal aims to concentrate in providing Europe with methodology and tools for a new approach to guide and control the flight of pilot-free aircraft with total automation including:</p> <ul style="list-style-type: none"> <li>(i) a long endurance high-altitude unmanned aircraft equipped with SAR (Synthetic Aperture Radar), MTI (Moving Target Indicator) and surveillance radar to detect, to track, and to guide and control a pilot-free aircraft flight along predicted trajectory;</li> <li>(ii) high rate data link transmitter and 28-31 GHz relay for deploying telecom backhaul in the sky in case of emergency, based on the CAPANINA STRATOSPHERIC BROADBAND EU funded program (<a href="http://www.capanina.org">www.capanina.org</a>);</li> </ul>			

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- (iii) airport/ground command centre system for controlling landing/taking off a pilot-free aircraft flight;
- (iv) to be in real time connected with airport ATC data (tracks) to exclude 'identified' targets and avoid false alarms, either ATM or Security related; and
- (v) ground station where information is collected from the GUIDEKEEPER, processed, fused/ distributed for ATC and ATM contexts.

Five operation modes will be analysed in depth in order to produce adequate/cost effective processing tools, including raw data calibration and critical objects (incoming/outgoing aircraft, moving vehicles, suspicious objects requiring emergent alarm, etc.) detection, recognition/characterisation by using modern signal/pattern recognition and fusion methods:

- a) Air-to-Air detection and tracking of aircraft
- b) Air-to Air Guidance and Control of pilot-free aircraft flight
- c) Air-to-Air commands to land a pilot-free aircraft flight
- d) Improving Air Flight Management by GUIDEKEEPER
- e) Airport-GUIDEKEEPER Flight Management Task Sharing

The processing tools developed in the project will be prospectively integrated in an air transport management system. The advantages of this new methodology will be demonstrated by means of:

- a) air-to-air tests for the first, second and third modes of operation
- b) air-to-field-to-air tests for the 2 other modes of operation.

GUIDEKEEPER will benefit of the:

- 1) Experience to be gathered in a large aircraft project of network of command and control;
- 2) USE HAAS project (EC Contract No516081) on "Developing Strategic Research Agenda for the High Altitude Aircraft Sector" (started in 2004 and completed beginning 2007);
- 3) CAPANINA Stratospheric Broadband EU funded project ([www.capanina.org](http://www.capanina.org), 2004-2007, partners in USE HAAS Consortium);
- 4) To exploit results of ATENAA, MINERVAA and NEWSKY EU FP6 funded projects ([www.atenaa.org](http://www.atenaa.org), [www.minervaa.org](http://www.minervaa.org), [www.newsky-fp6.eu](http://www.newsky-fp6.eu) ) dealing with avionics Ka-Band communication, with future aeronautical communication, and with integration of data links based on different aeronautical communication technologies;
- 5) To exploit results of the FAA funded NextGen project ([www.faa.gov/news/fact\\_sheet/news\\_story.cfm?newsId=8145](http://www.faa.gov/news/fact_sheet/news_story.cfm?newsId=8145)) dealing with ADS-B Automatic Dependent Surveillance Broadcast the future of air traffic control;
- 6) EUROCONTROL MoC dealing/of the FAA 17 To exploit results of the Action Plan with future communication.

<b>Project duration (in Months)</b>	36	<b>Total Eligible Cost (in Euro)</b>	3.95 M €	<b>EC Contribution requested (in Euro)</b>	2.45 M €
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**Targets and needs of the pre-project:**

Partnership size: 9 partners.

Budget objective: 3.95 MEuro.

Duration: 36 months.

Proposal submission: 7 May 2008.

**FOR INFORMATION, PLEASE CONTACT THE AEROPORTAL SERVICING PARTNER**

***AeroSME and SCRATCH have merged in AeroPortal Project***