



# Presentation of ADS-B/VDL Mode 4 for General Aviation



**EGOA** – Enhanced General Aviation Operation by ADS-B



# Applications

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- **ADS-B**

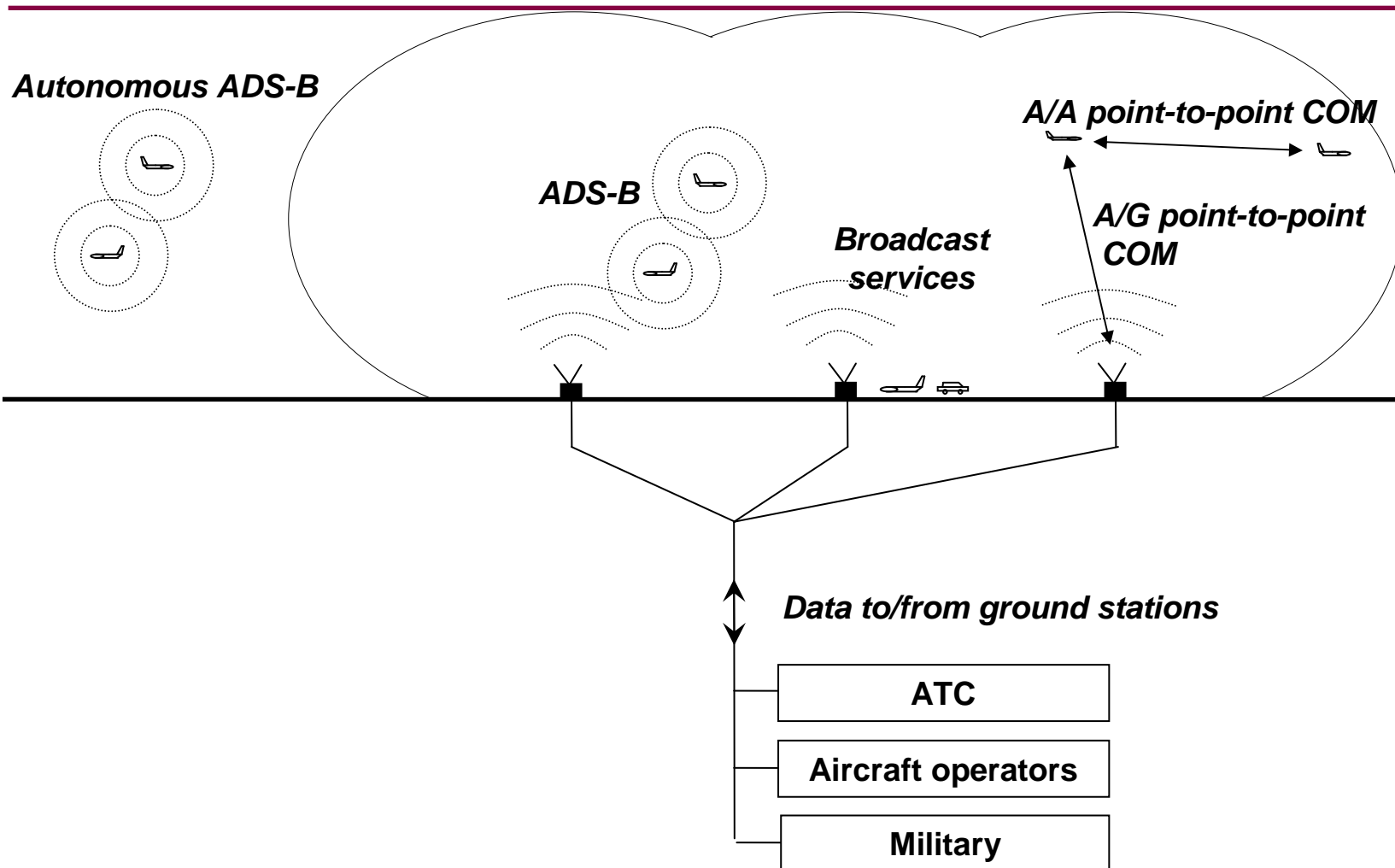
*Automatic Dependent Surveillance - Broadcast*

- **FIS-B**

*Flight Information Service - Broadcast*



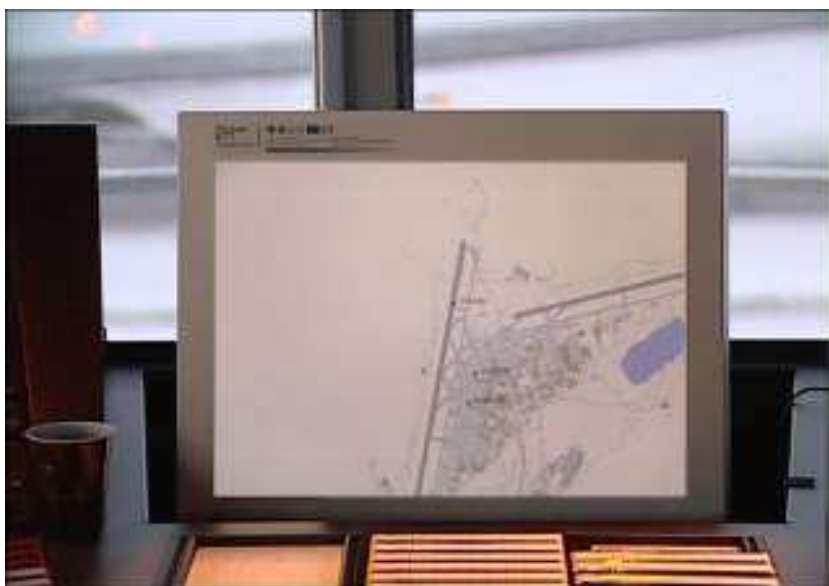
# ADS-B





# ADS-B

## How is the information used?



In ATC/TWR



In aircraft  
cockpit



# FIS-B

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## Flight Information Service – Broadcast

### Purpose:

To provide cockpit with airport specific information, such as current weather conditions, runways in use etc (ATIS, NOTAM)



# FIS-B

## Flight Information Service – Broadcast



In cockpit →



# Data link

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## What is VDL Mode 4?

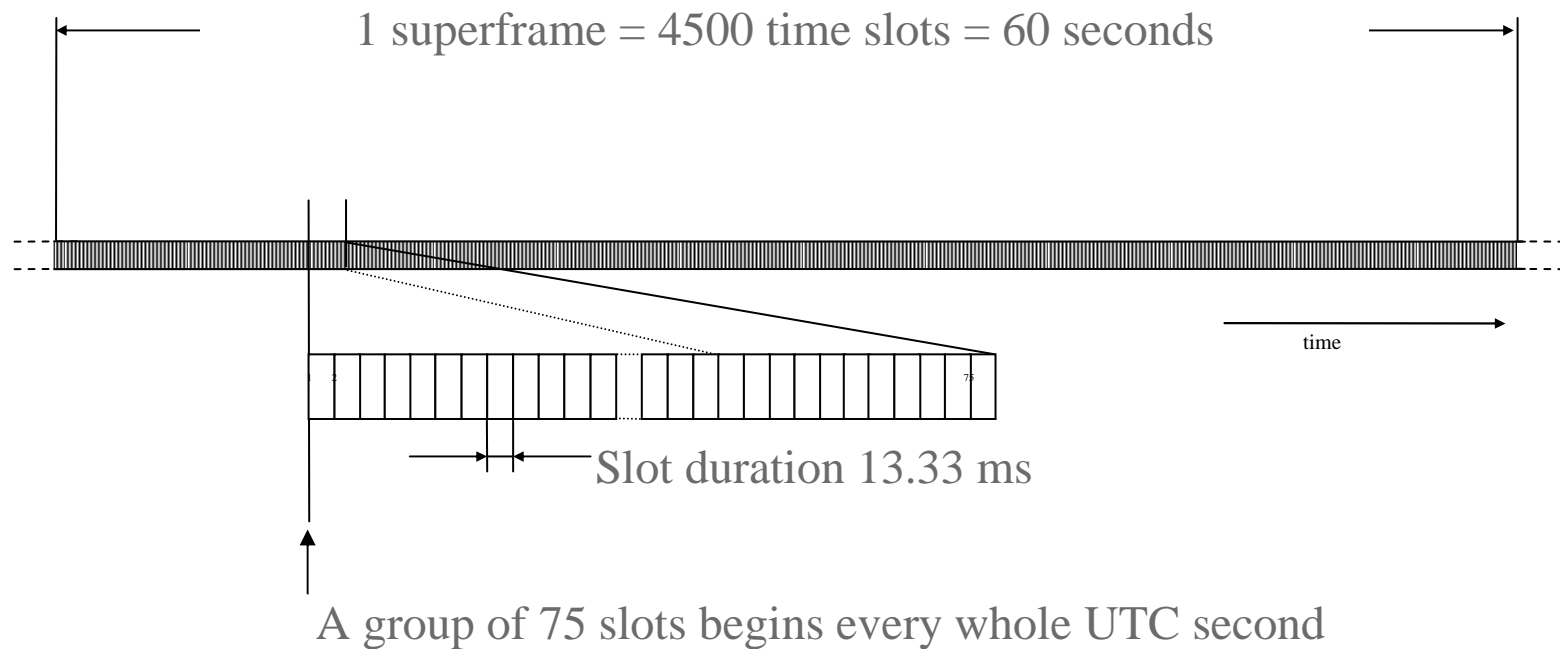
- Wireless data link
- Based on STDMA



# VDL Mode 4

## STDMA

- Self-organising Time Division Multiple Access







# VDL Mode 4

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## Self organizing

- Does not need a ground network to establish communication (i.e. can communicate aircraft to aircraft)...
- ...but a ground network can provide extra functionality



# VDL Mode 4

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## Performance

- Bandwidth 25 kHz
- Baudrate 19 200 bits/s
- Frequency band 108.00 - 136.975 MHz  
(Air VHF band)



# VDL Mode 4

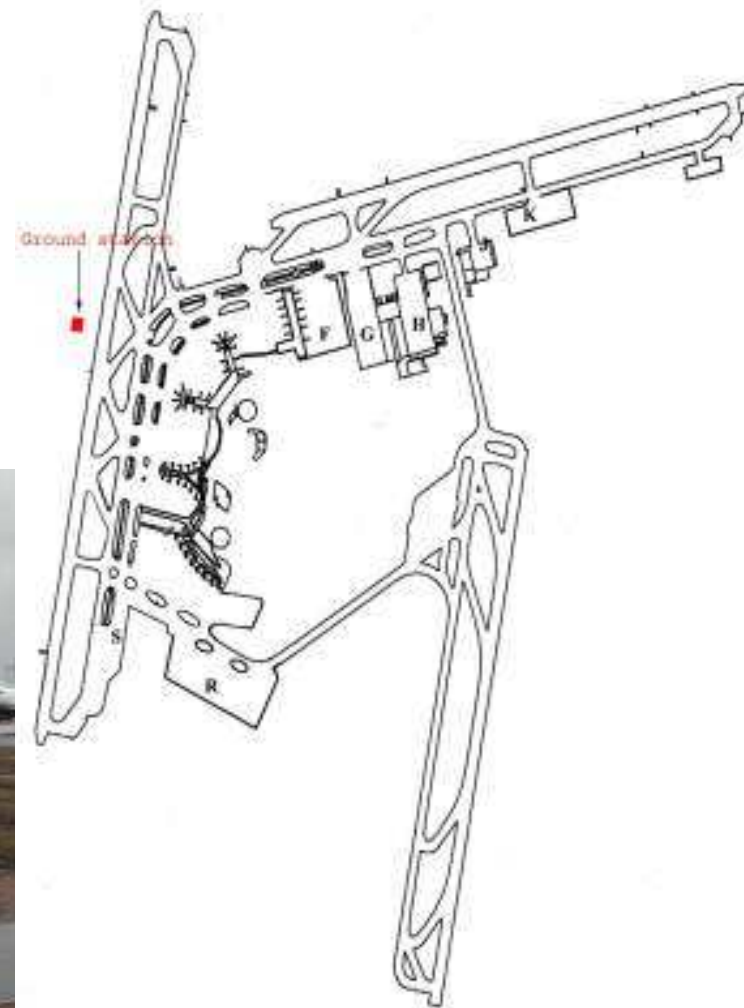
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## Summary

- VDL Mode 4 – Wireless data link
- Self organizing
- No risk for overload
- Can handle organized broadcast
- Can handle Point-to-Point communication
- No obligation to have a ground infrastructure



# Ground station



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# Ground station

## Coverage

Alt (ft)	Coverage radius (km)
500	64
1000	85
2000	115
10000	241
20000	335





# Network

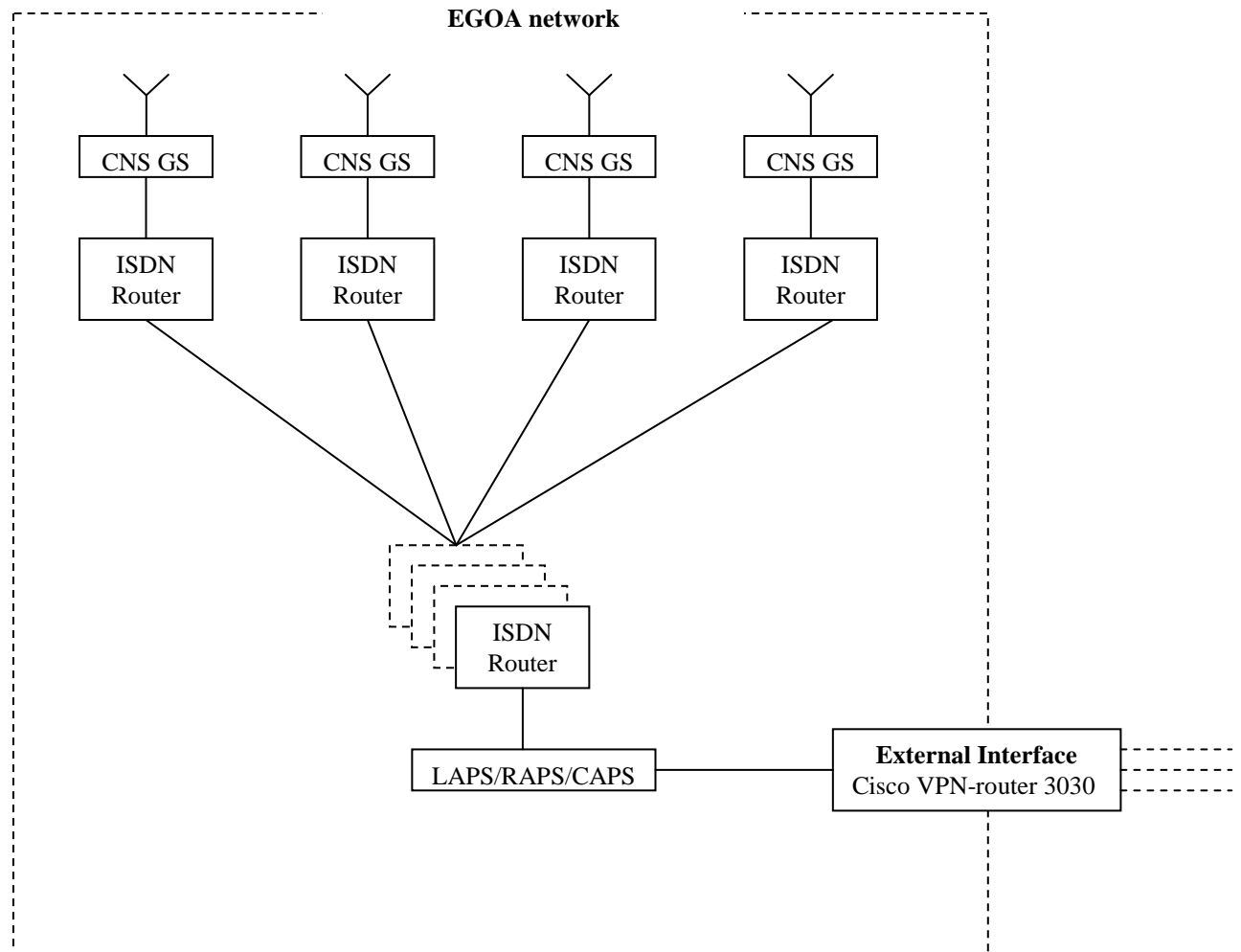
- *12 Ground Stations*
- *7+2 Installed*
- *Ongoing upgrade, 2008*





# Ground network

## Physical structure



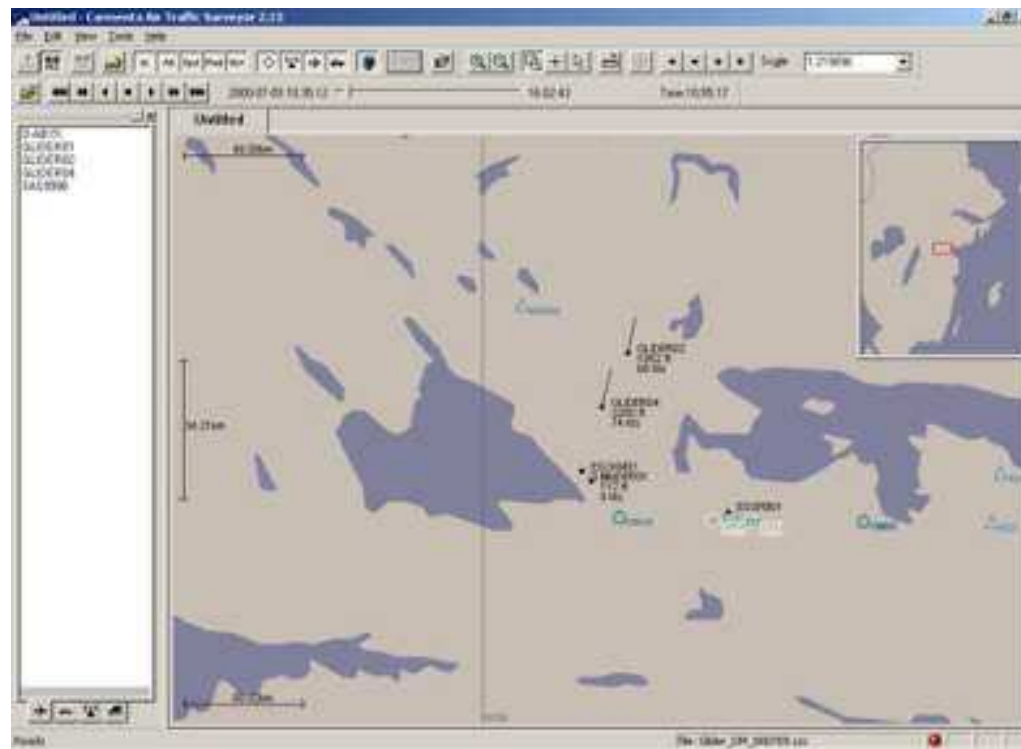


# Presentation equipment

## Ground presentation for GA flying clubs, schools etc.

Program for "fleet management", logging and follow-up.

- Runs on PC with Windows.
- Connection to CAPS via internet.







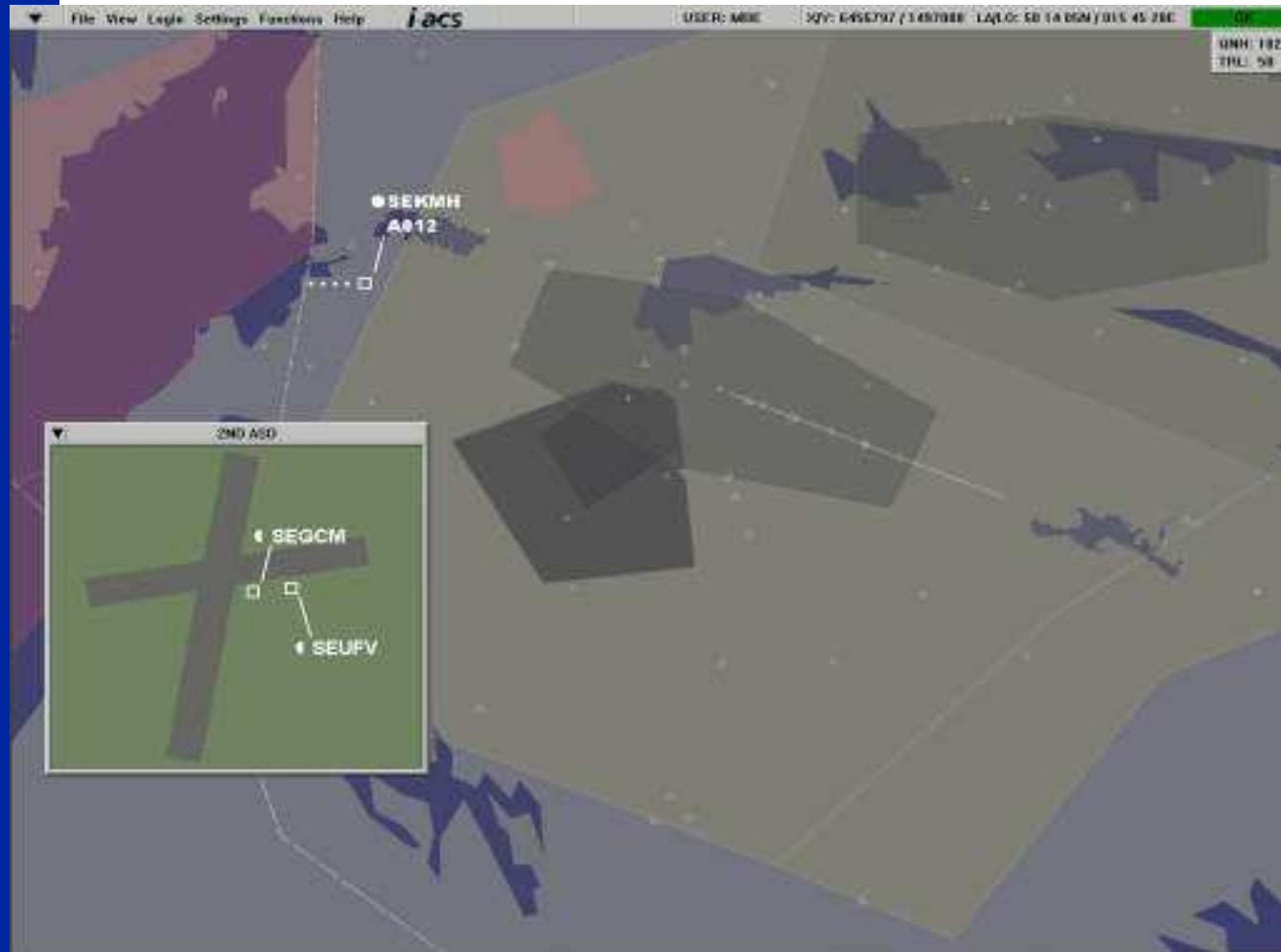
# Challenges

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GA is a divergent group of airspace users.



# Controller's screen



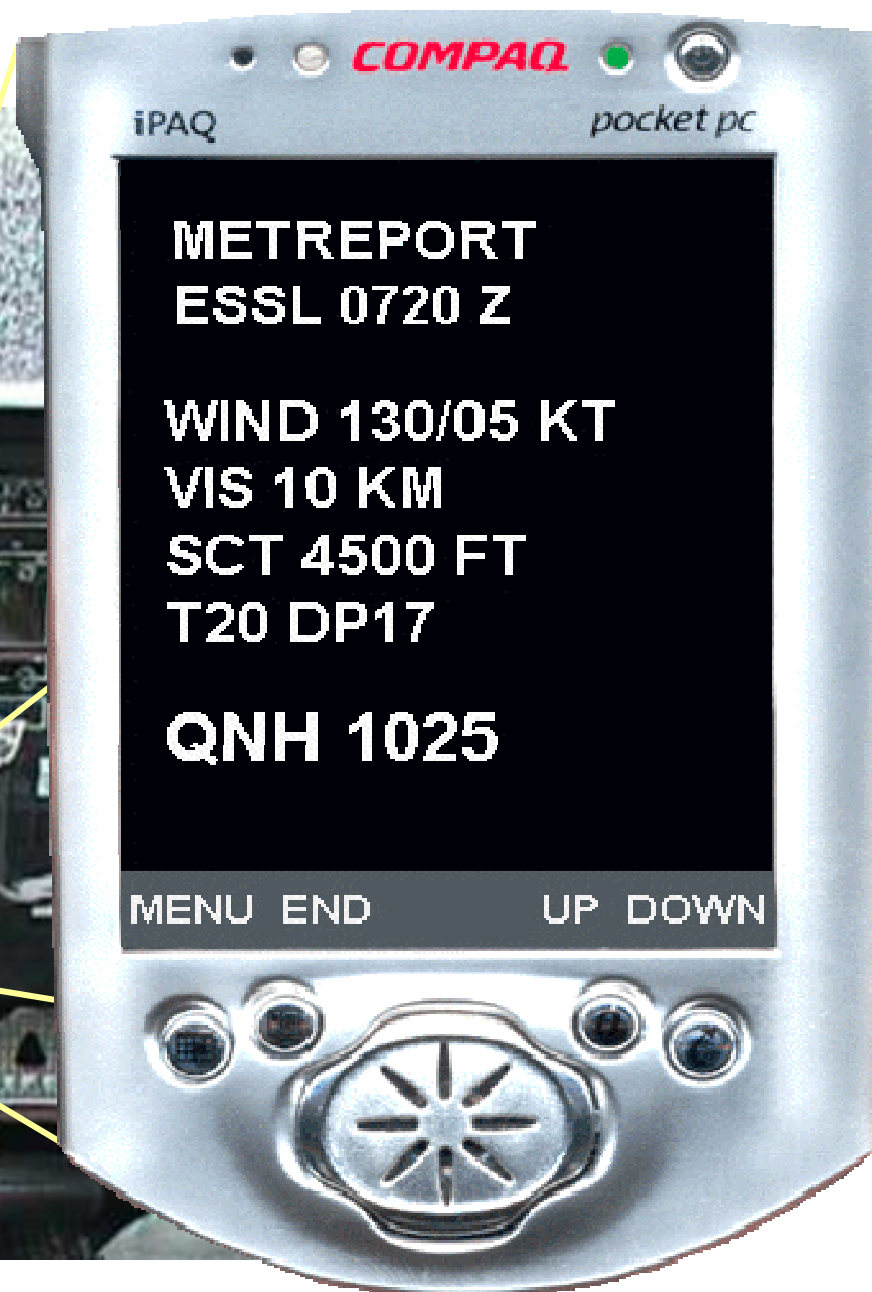


# CTR incursion



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# Evaluation- Flying schools display



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# Cockpit Situational Awareness...

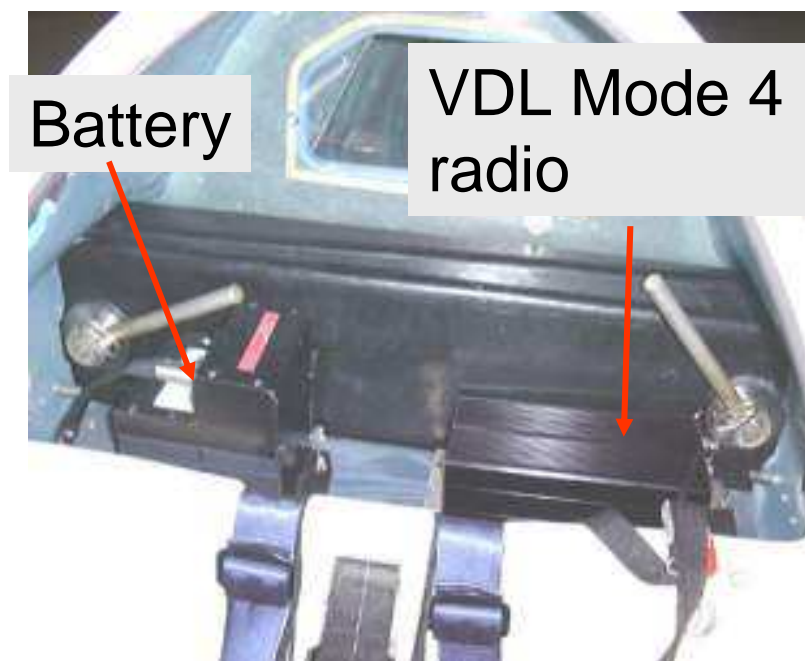




# Even the smallest thing..



Picture showing an ADS-B equipped DG505 glider.

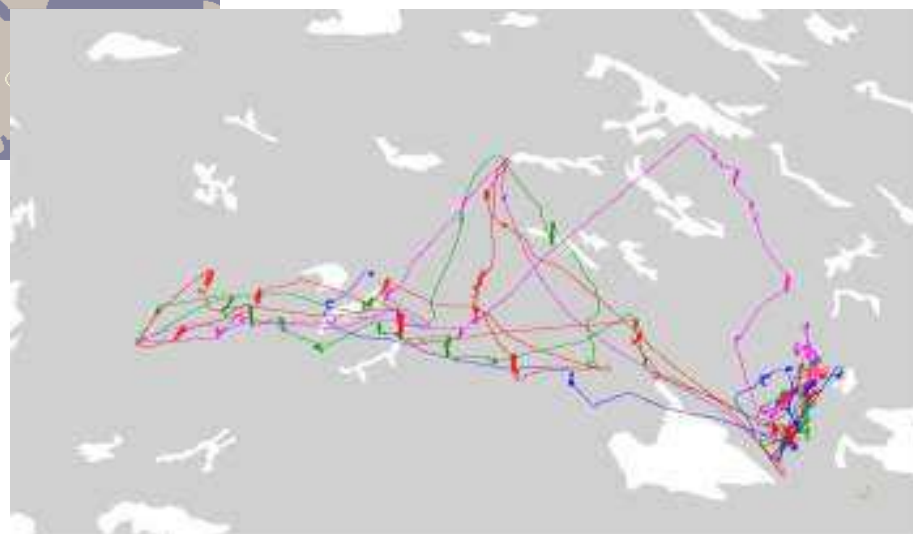




# Glider championships..



ATC follow up for flexible  
use of airspace

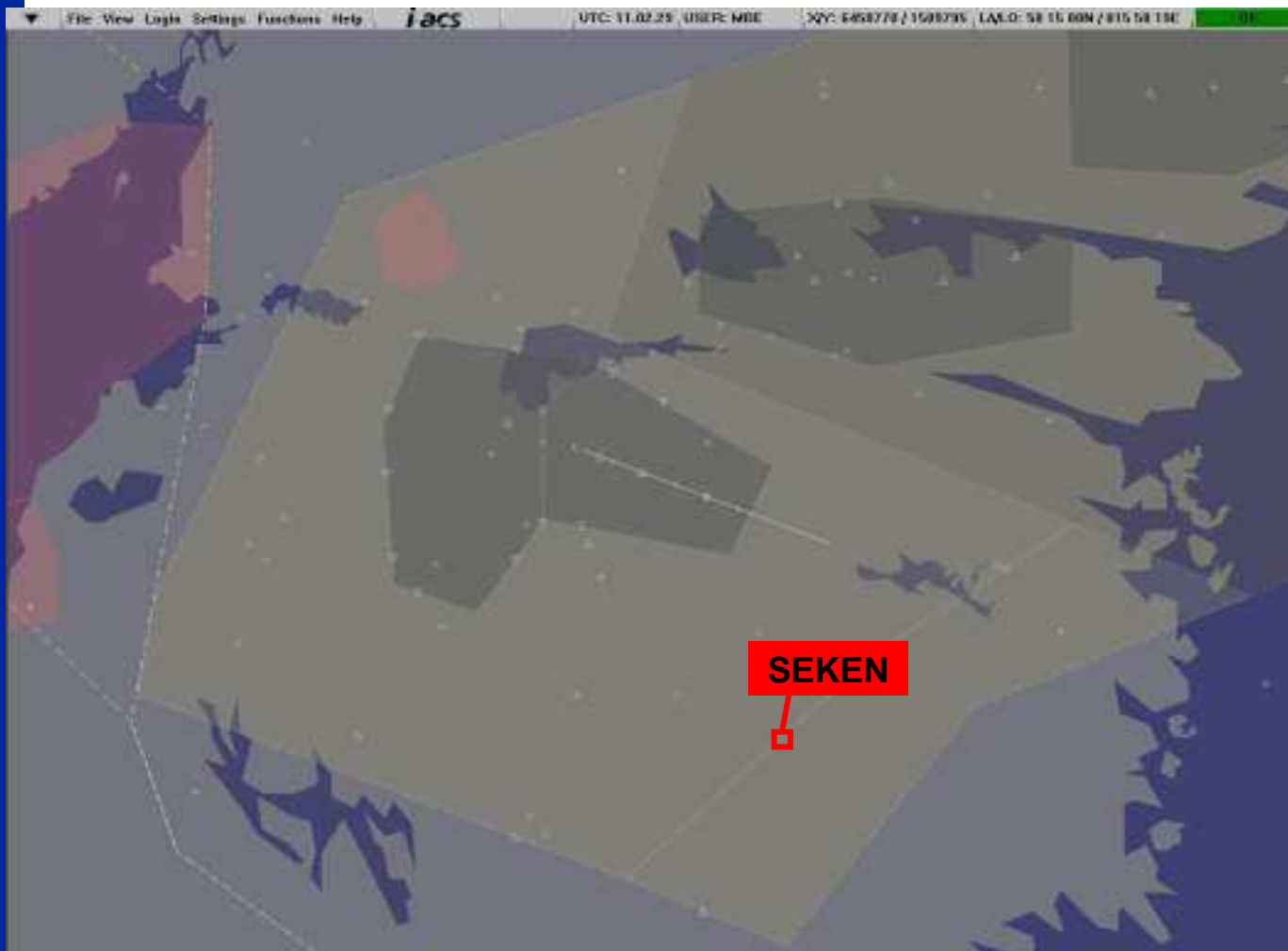


On-line flight following for  
Participants/audience





# "ELT"- last position





Thank You for your  
attention!