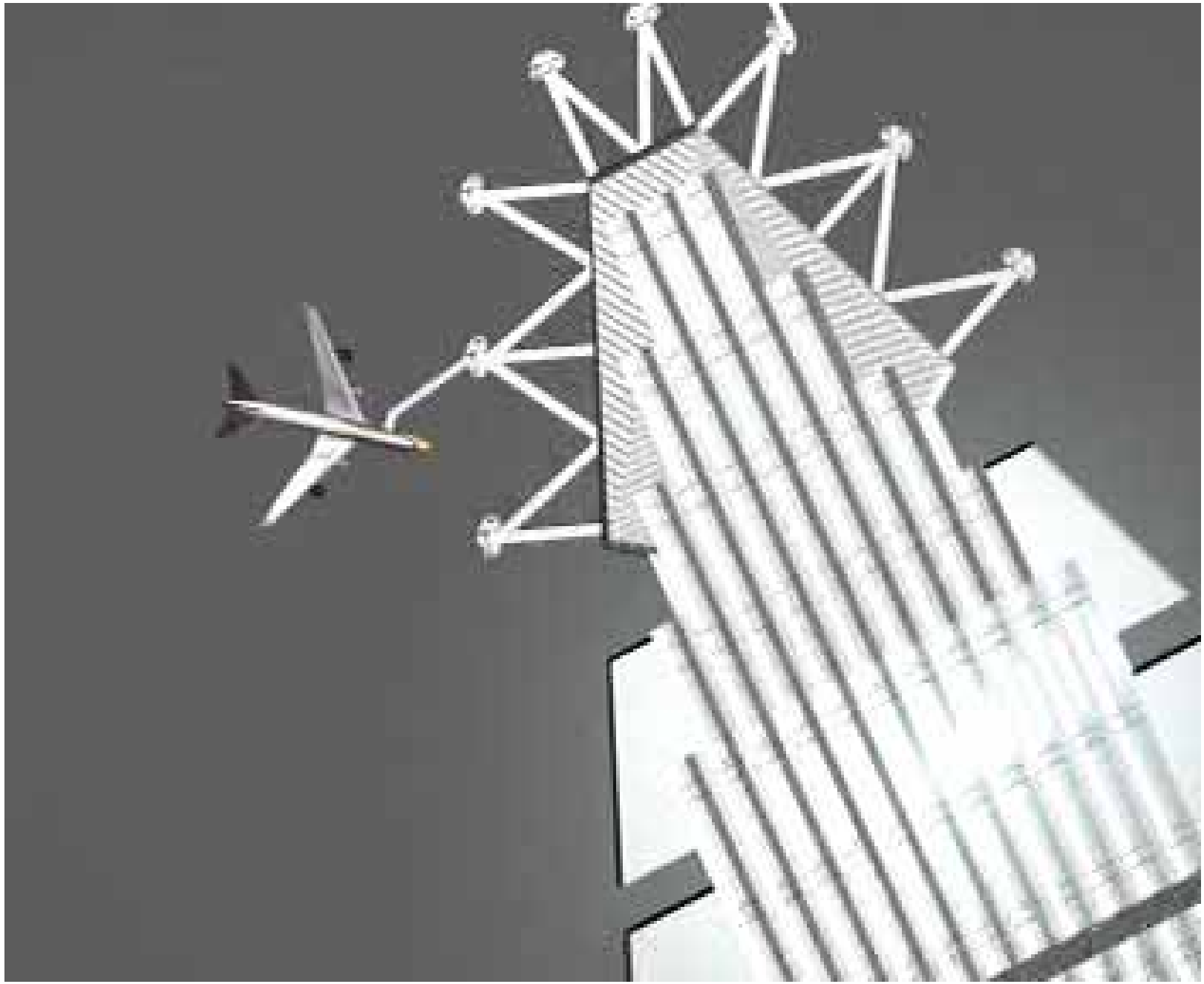
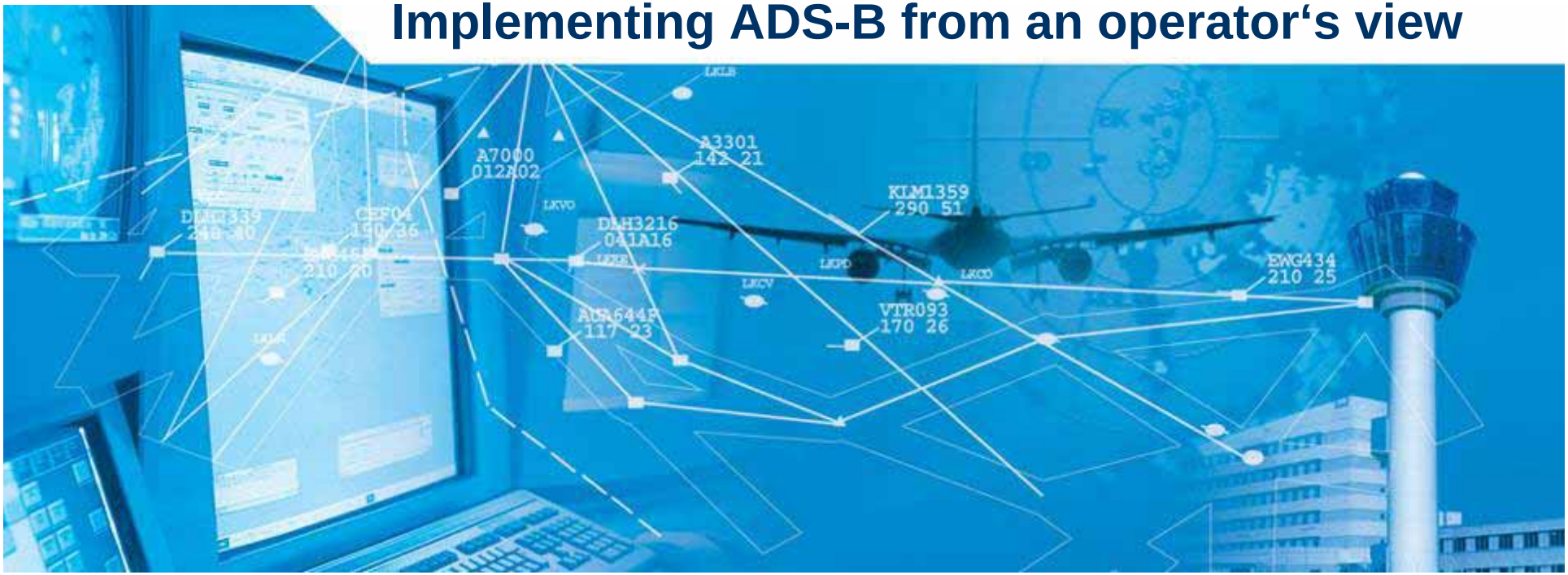


THALES

Implementing ADS-B from an operator‘s view



Matthew Parry
ATM Systems Specialist

ADS-B Meeting & Seminar – October 2005

What is Needed?

What does an operator need

- Visibility of the source(s) of the track
- Visibility of the accuracy of the track
- Integrated track
  - One track per aircraft
  - Full Alert functionality regardless of source of data
  - The best available data presented to the operator
- Ability to separate and view source data (supervisor function)

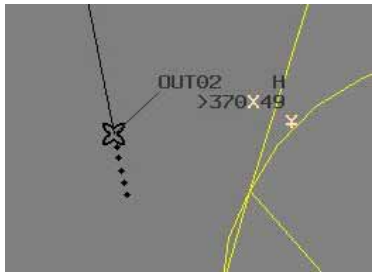
What is Needed?

Visibility of the source of the track

- Combined ADS-B and radar track
- ADS-B track
- Radar track
- ADS-C track
- Flight plan track

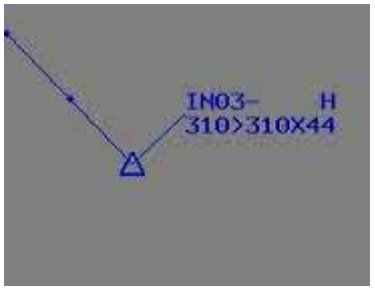
Combined ADS-B and radar track

ADS-B tracks

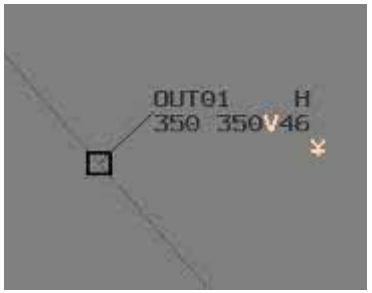


Radar tracks

ADS-C tracks



Flight plan tracks



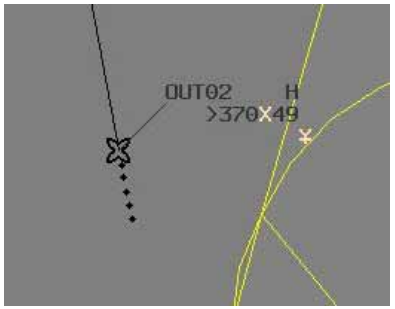
THALES

What is Needed?

Accuracy of the track

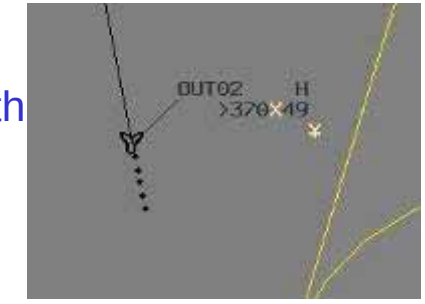
- ADS-B track with high quality (quality is based on FOM and Ground Station reliability)
- ADS-B track with low quality
- Primary radar track
- Secondary radar track

ADS-B track with high Quality

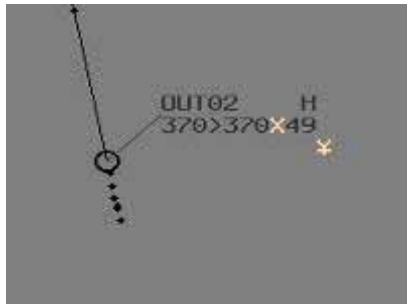


Primary radar track

ADS-B track with low Quality



Secondary radar track



What is Needed?

Integrated track – one track per aircraft

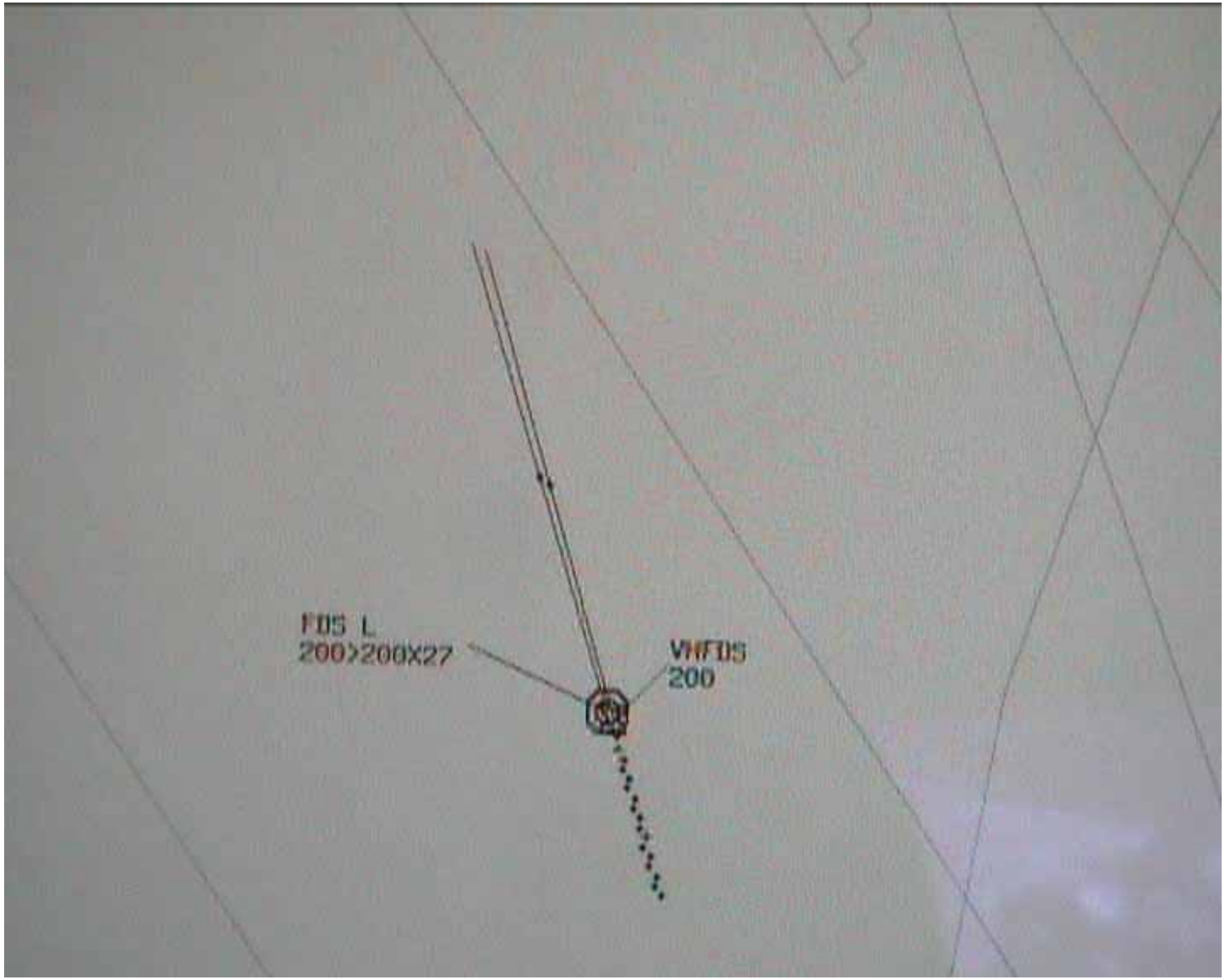
- Comprised of
  - Position data
  - Velocity data
  - Alert data
- Important to reduce clutter on screen
- Tolerances for coupling of track need to be configurable
  - Need to show operator two tracks if position data different
  - Need to show worst case emergency data

What is Needed?

Full Alert functionality regardless of source of data

- All alerts to be available on all tracks
  - RAM, DAIW, TDAW, STCA, MSAW, CLAM
- Important for controller to have the same alerts regardless of source of data
- Parameters need to be configurable
  - Tolerances should be configurable for all alerts (e.g. RAM tolerance)
  - Different tolerances should be able to be used for different source's of data (RAM tolerance different between ADS-B and radar)
- Controller should not have to interpret which source has produced alert

Velocity Data – ADS-B And Radar

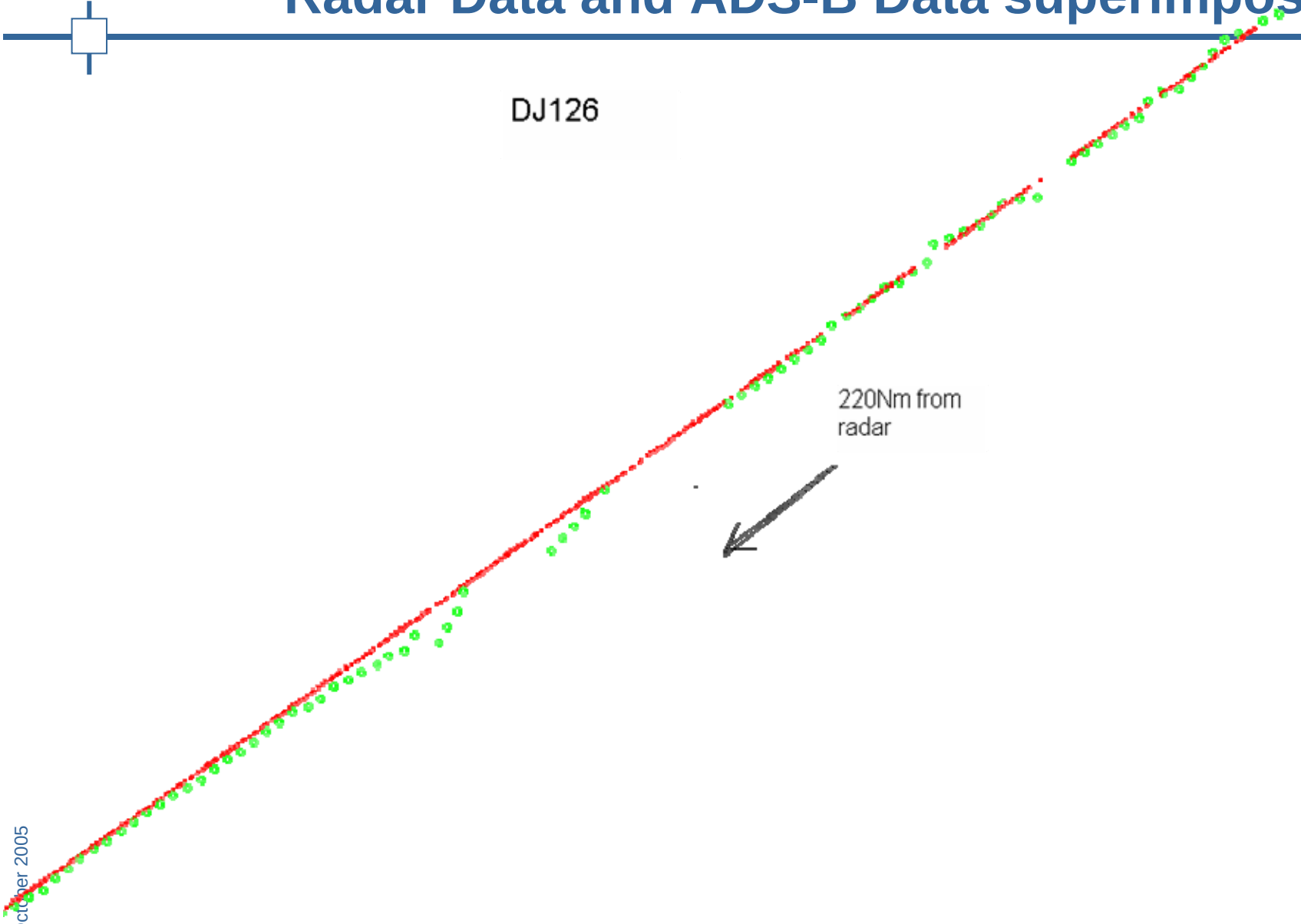


About Data Fusion

The best available data presented to the operator

- The best available data may not be from one source. E.g.
  - Position data from radar
  - Velocity data from ADS-B
  - Combined position data from ADS-B and multiple radars
- Should data be combined to provide the controller with the most accurate data? Implications for separation standards.
- Need to have complex, configurable data fusion
  - Different priorities for different data (e.g. velocity/position data may have different priorities between sources)
  - Different methods (Priority, Multi Sensor Track Fusion)

Radar Data and ADS-B Data superimposed



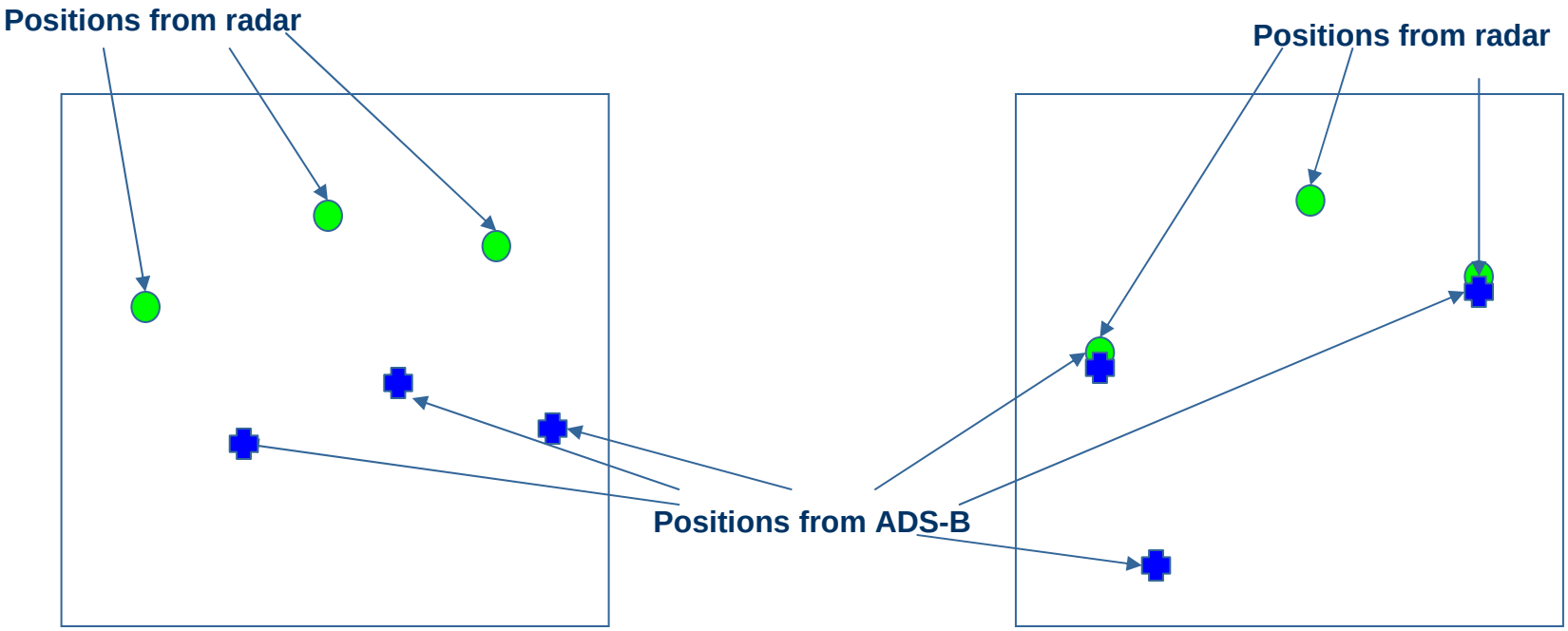
Slide courtesy Airservices Australia

What is Needed?

Ability to separate and view source data

- The supervisor needs the ability to see what data is contributing to the combined track, but also needs to be able to view the data separately
  - Required in order to check accuracy
  - Needs to be able to verify data consistency
- The supervisor needs to be able to diagnose problems with track data
  - Is ADS-B data incorrect?
    - Possible aircraft position problem
    - Possible aircraft velocity problem
  - Is radar data incorrect?
    - Possible radar problem
      - Data from a radar should be removed from the system

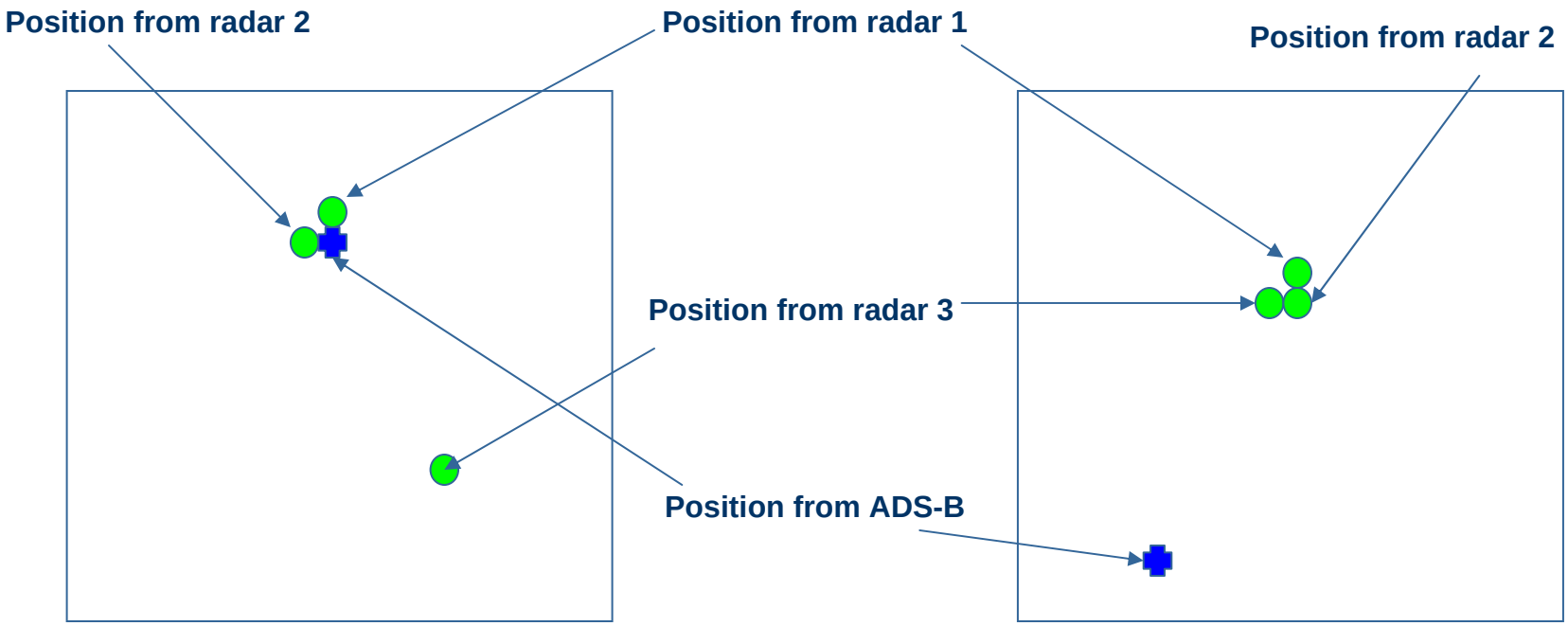
Multi ADS-B and single radar environment



Potential problem with radar

Potential problem with aircraft data

Single ADS-B and multiple radar environment



Potential Problem with radar 3

Potential problem with aircraft data

THALES

Questions?