



Black Sea Research Programm NOAH Dolphin Counting

6th March 2015, Sofia

METHODOLOGY

- Deployed aircraft and gimbal cameras
- Segmentation of the areas
- Line spacing and coverage of the entire area by the videostream of the thermal camera
- Documentation of detected dolphins for subsequent counting and/or identification by the HD daylight video camera

DEPLOYED AIRCRAFT

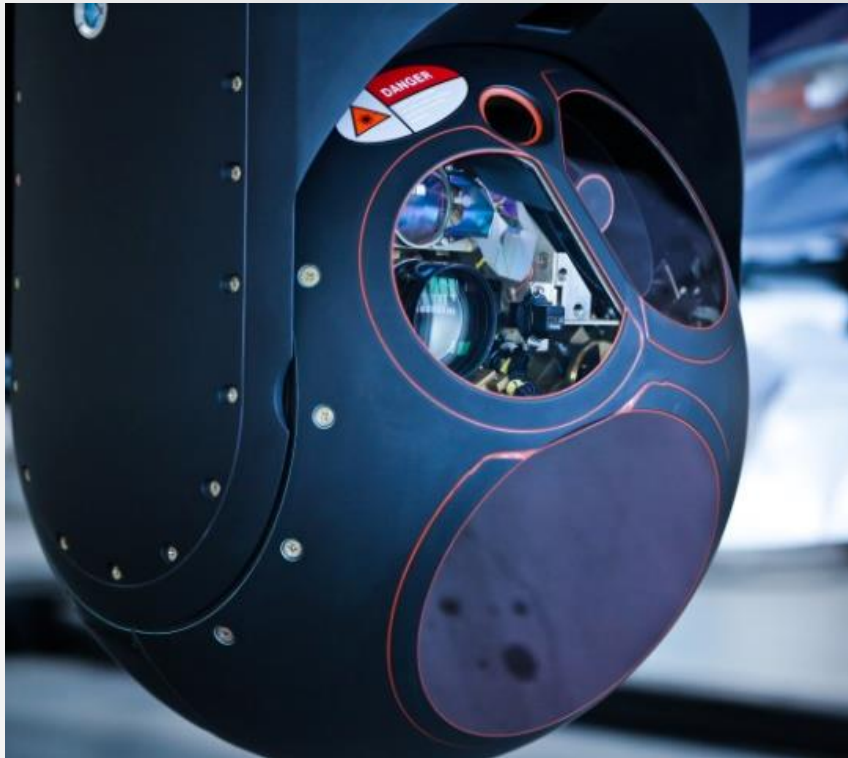


Vulcanair MMA



Tecnam MMA

DEPLOYED GIMBAL CAMERAS

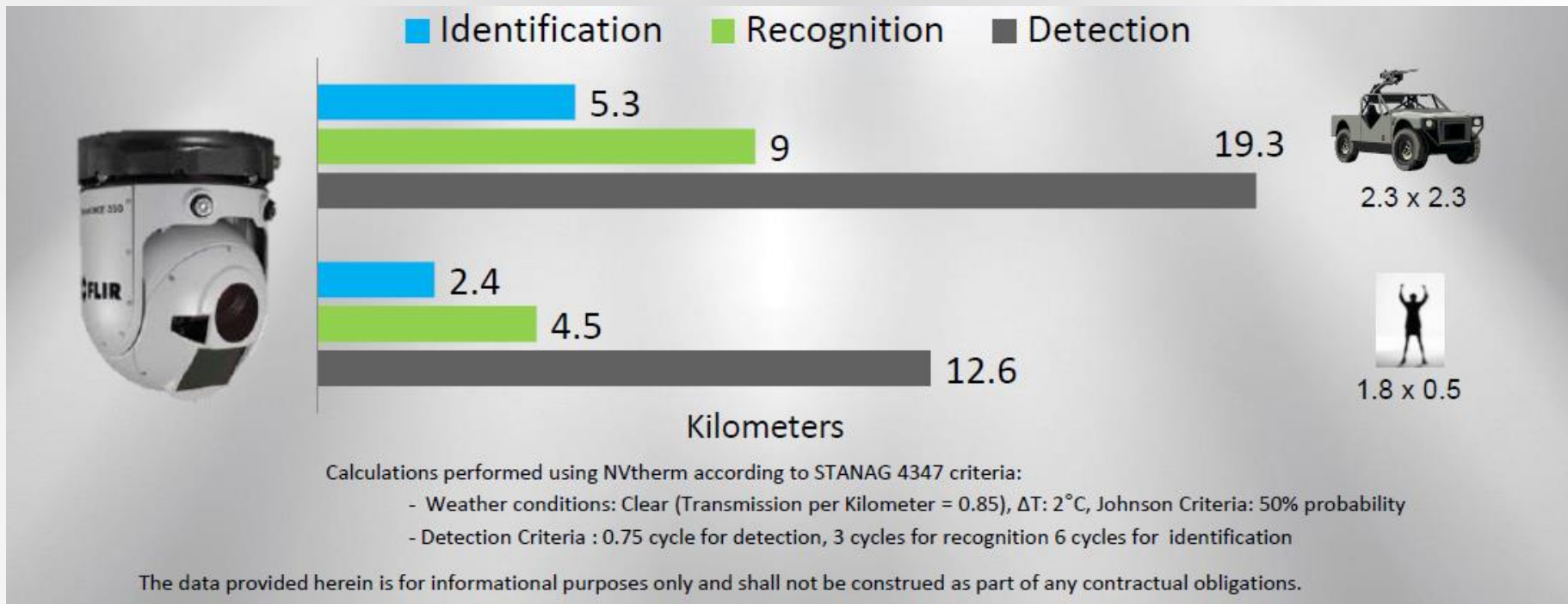


Wescam MX10-HDi



FLIR Ultraforce 350 HD

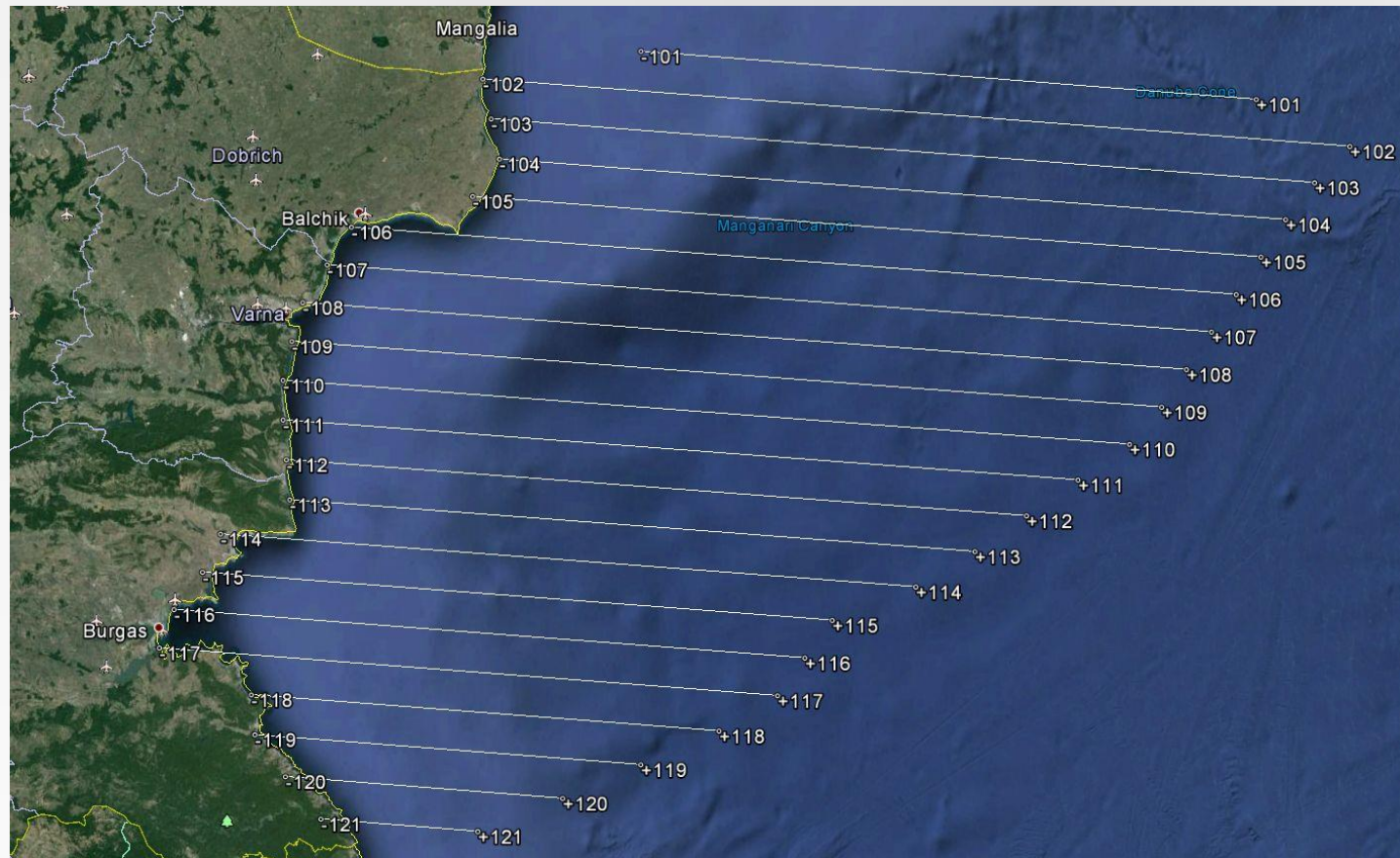
TYPICAL IR RANGE PERFORMANCE



AREA OF INTEREST



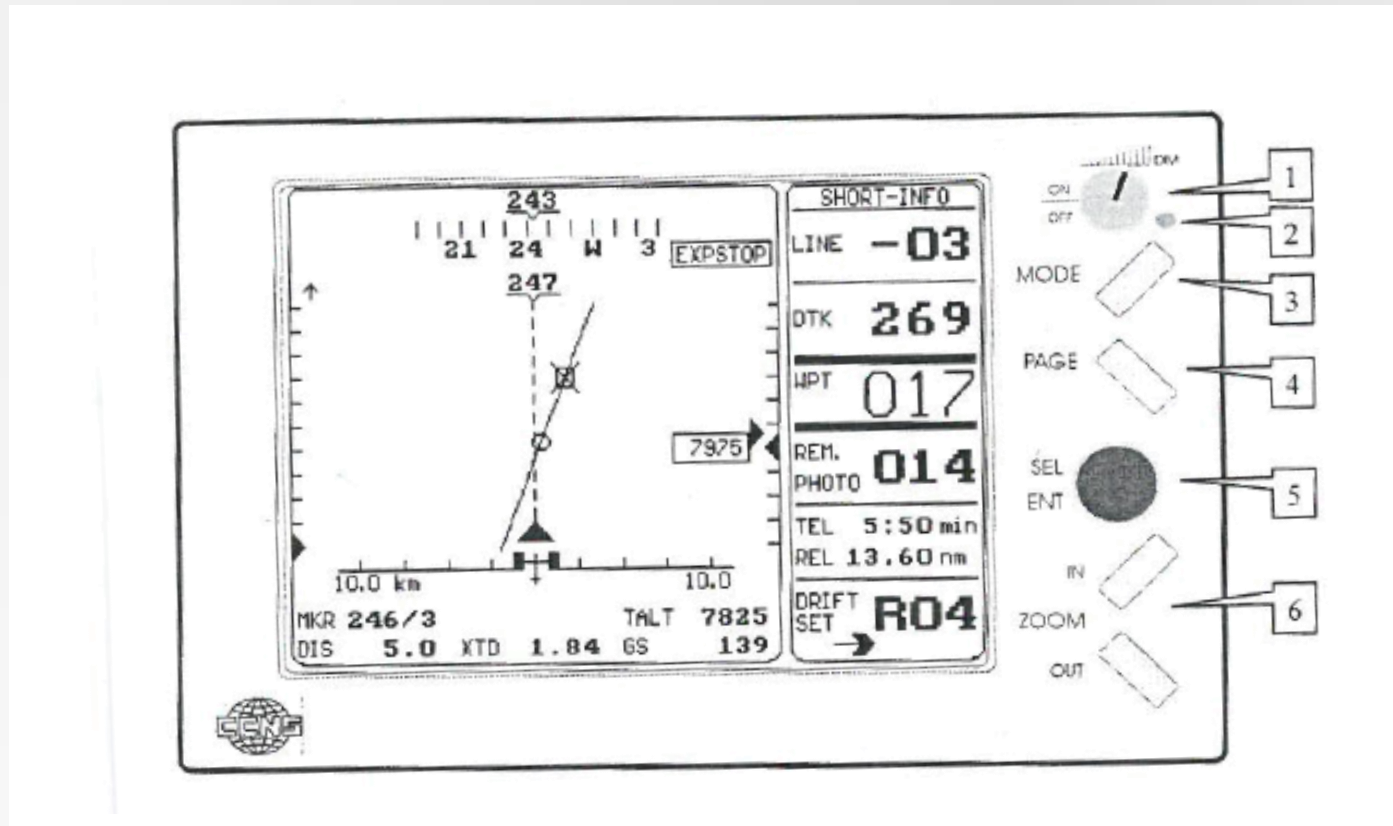
FLIGHT PLAN



Line spacing: 10km

Average length of flight lines: 180km

FLIGHT GUIDANCE AND NAVIGATION SYSTEM



Pilots command system to proceed along the flight lines within vertical and horizontal tolerance of +/- 50m

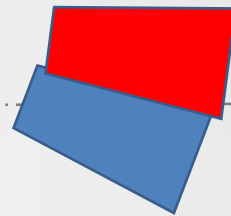
Flying altitude: 500m above sea level

COVERING THE ENTIRE AREA



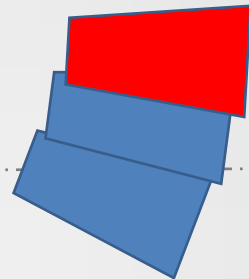
Scanning along the flight lines
HD or Thermal camera in „auto scan mode“

COVERING THE ENTIRE AREA



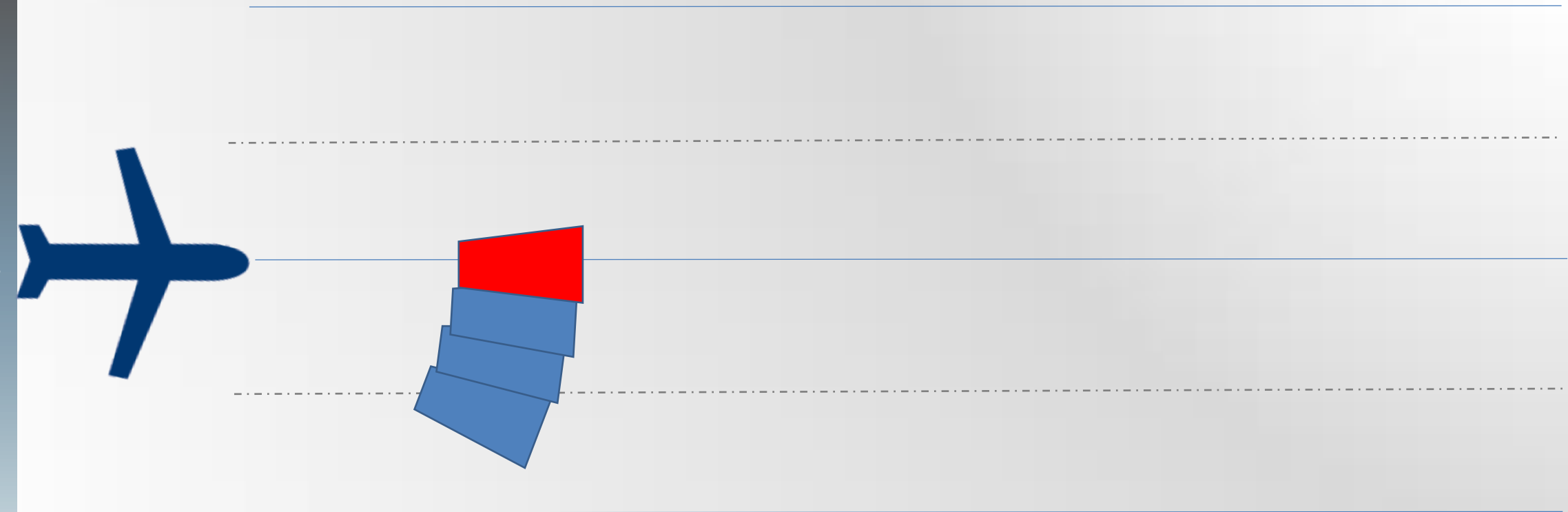
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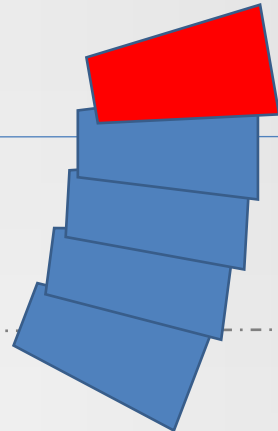
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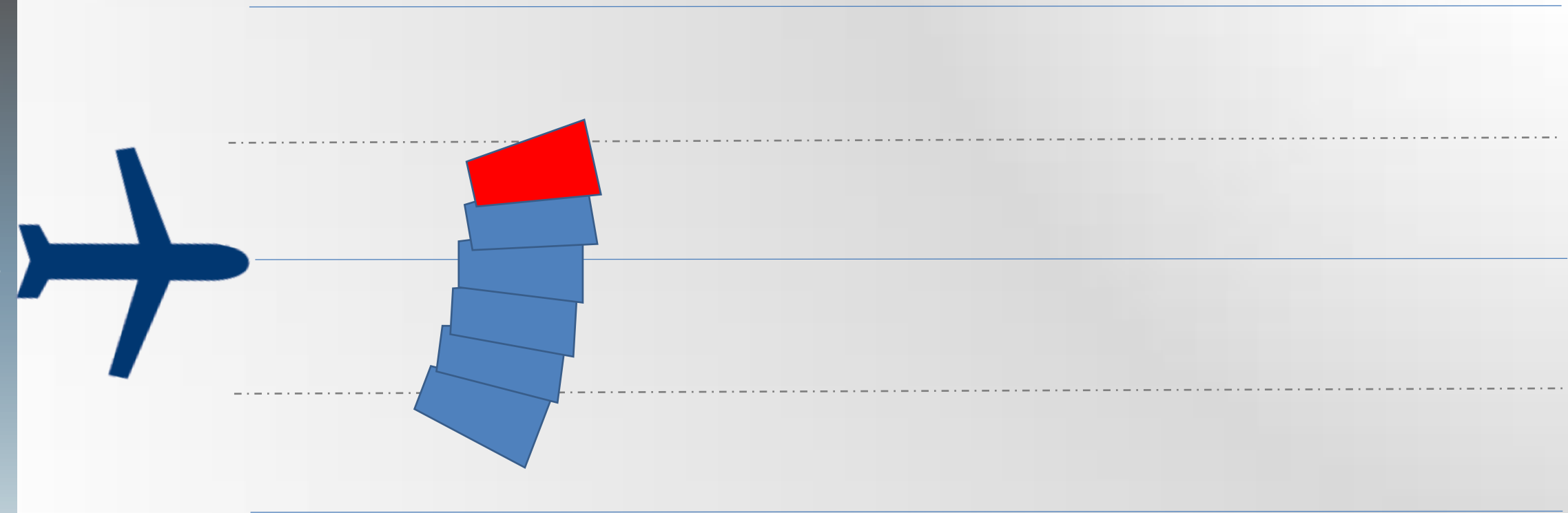
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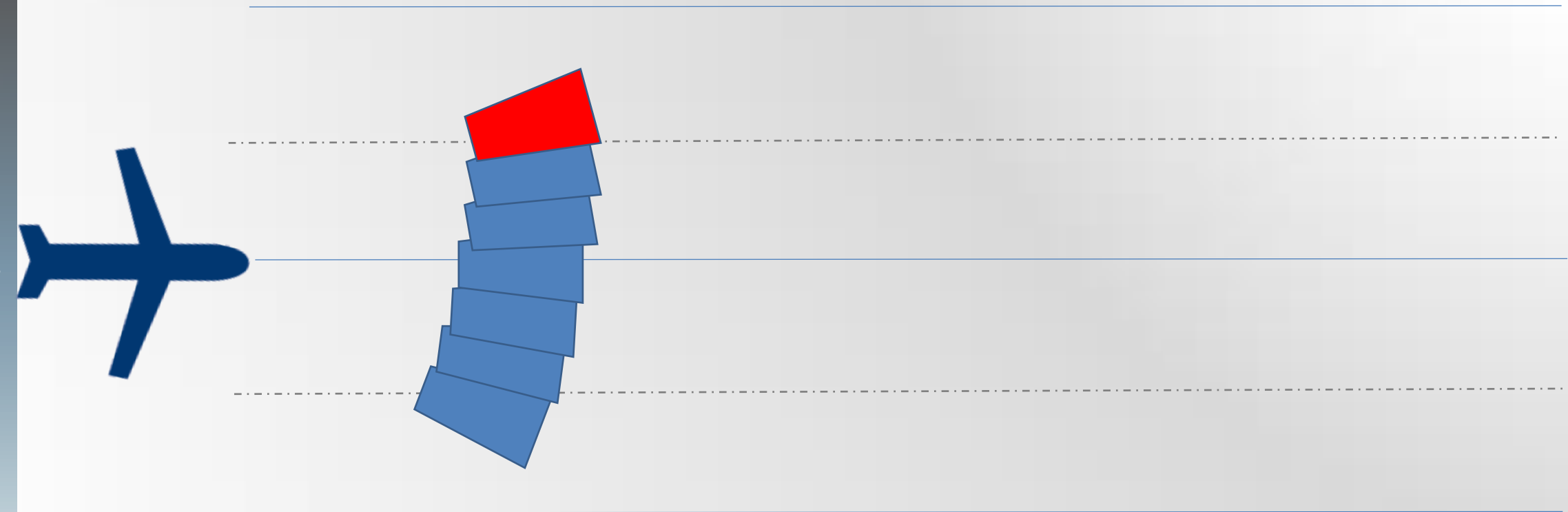
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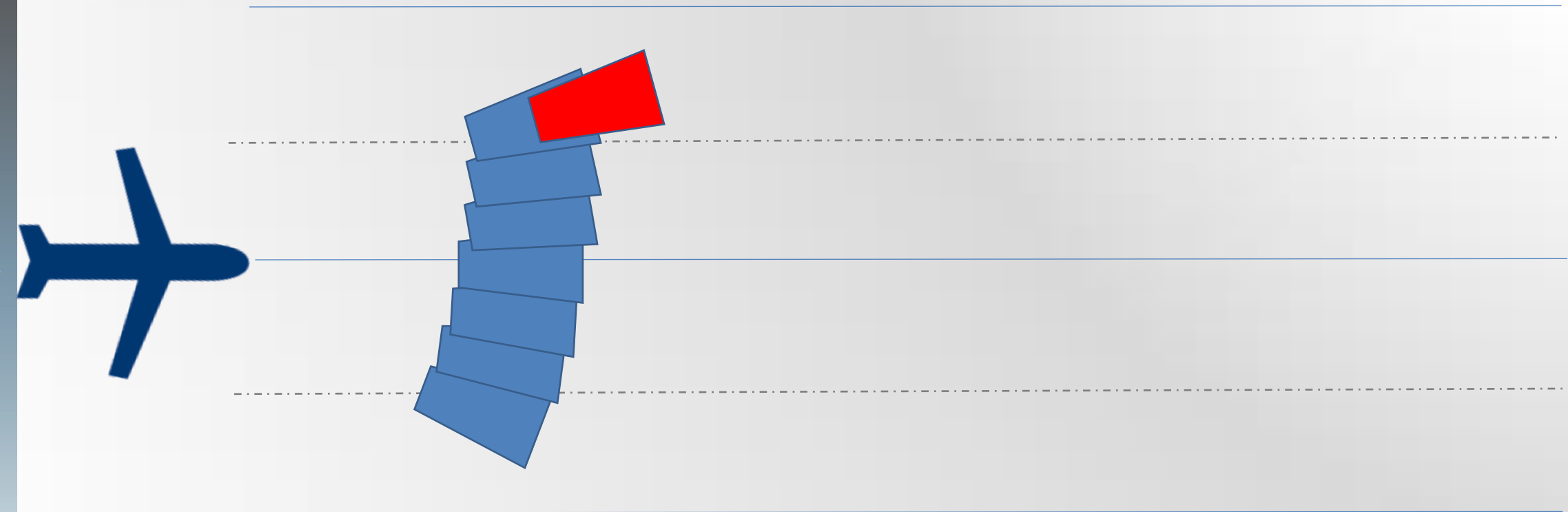
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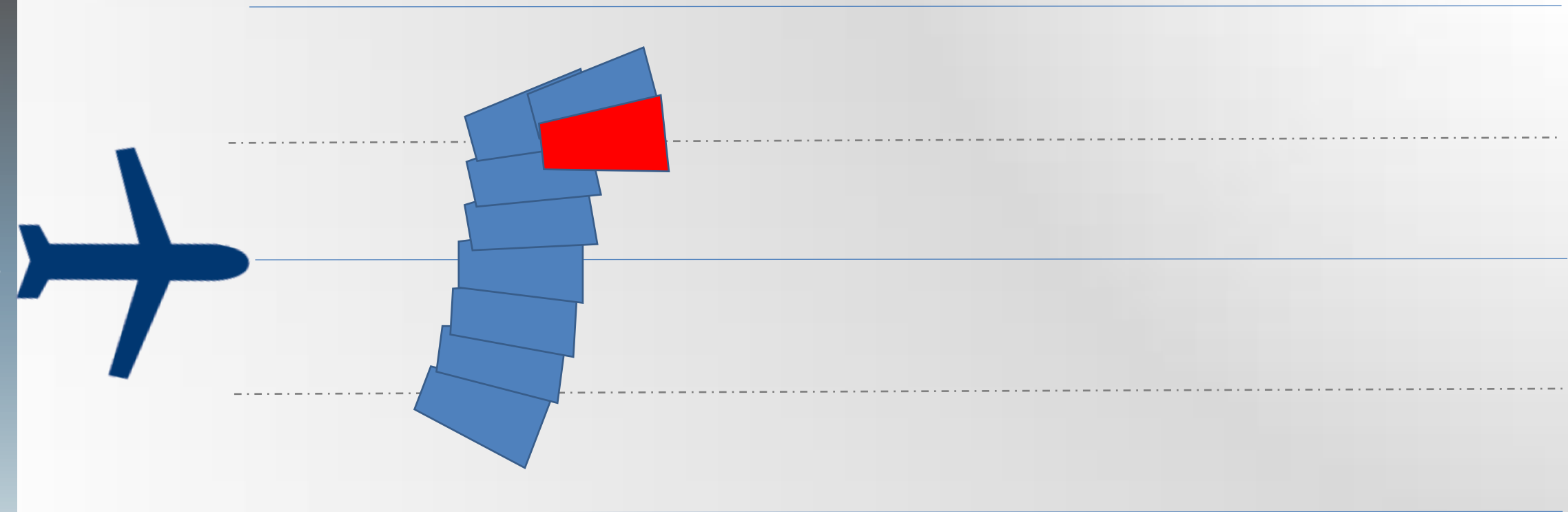
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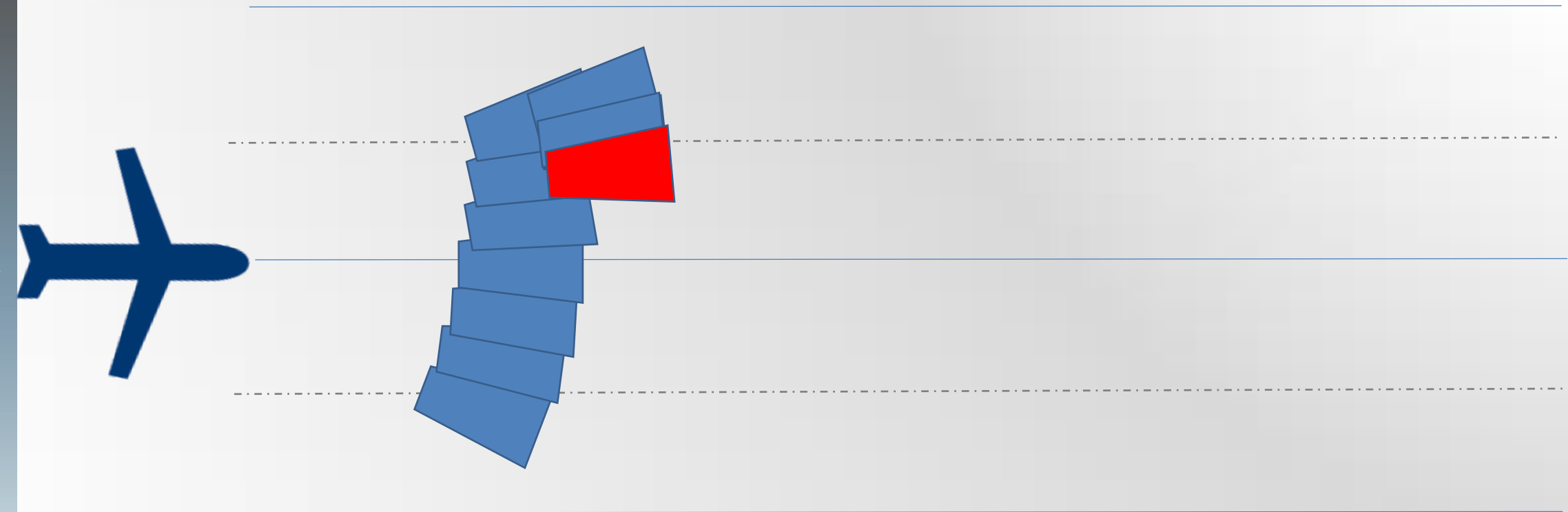
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COVERING THE ENTIRE AREA



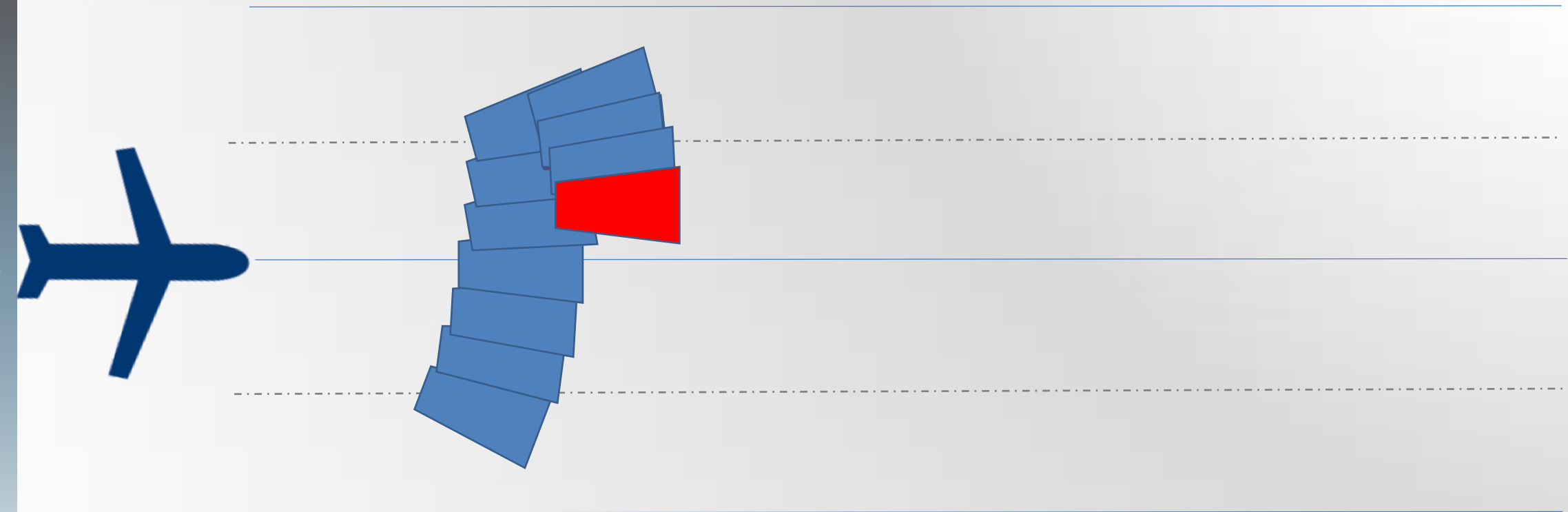
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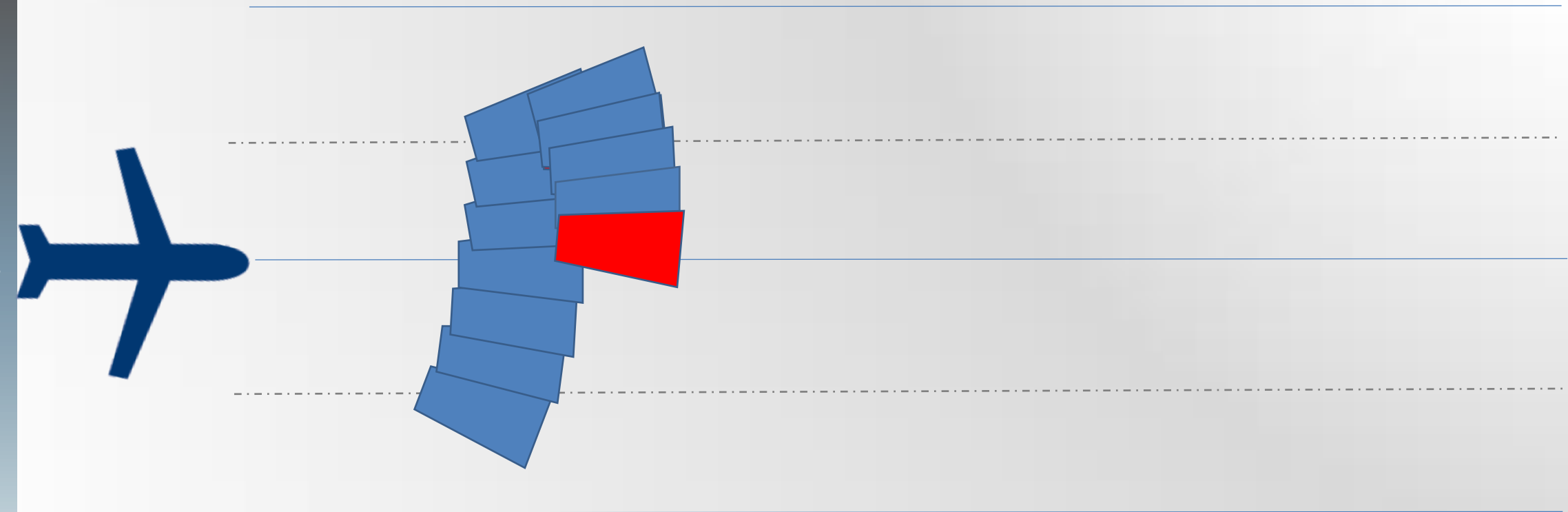
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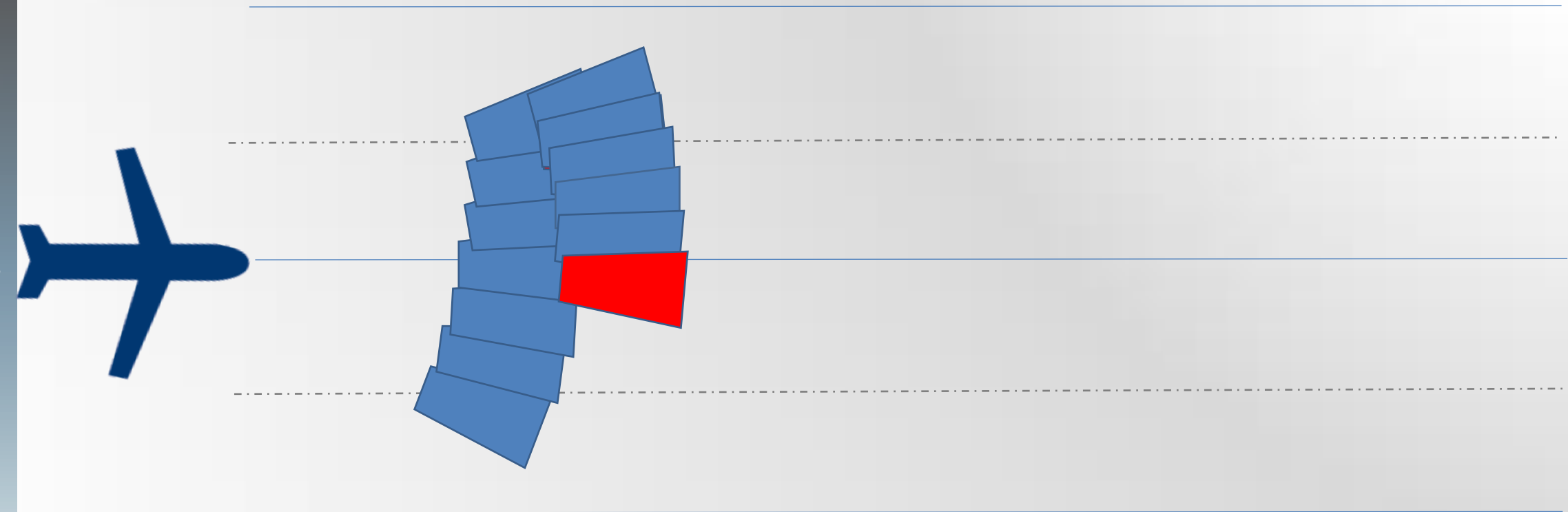
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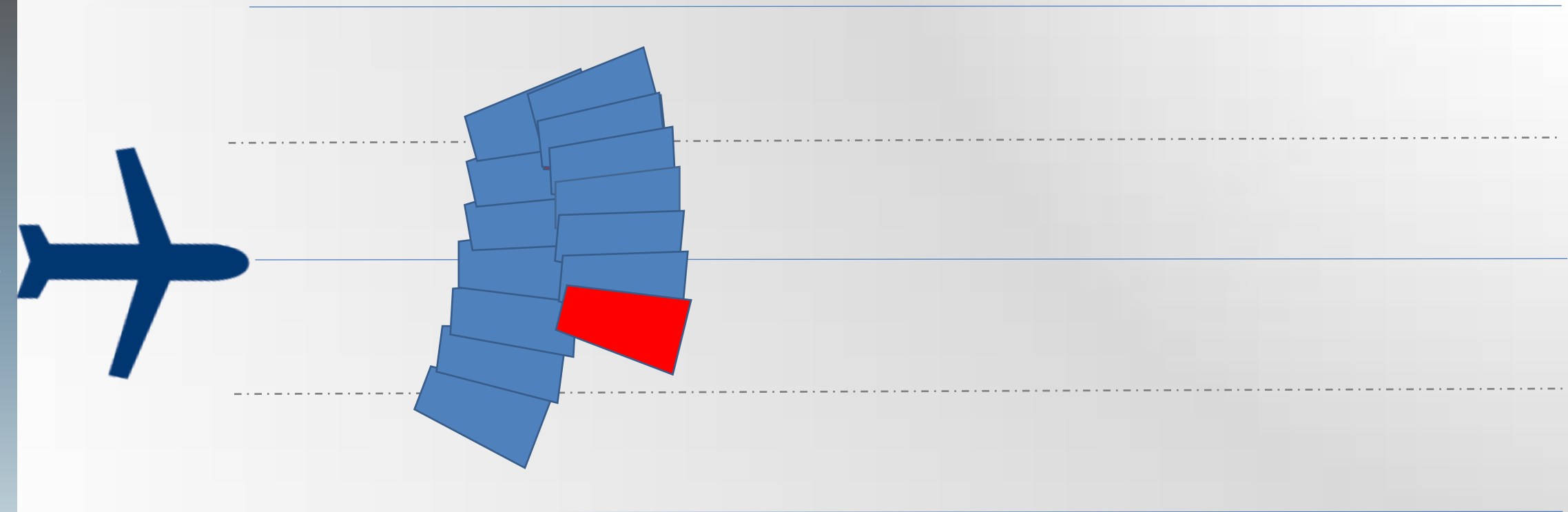
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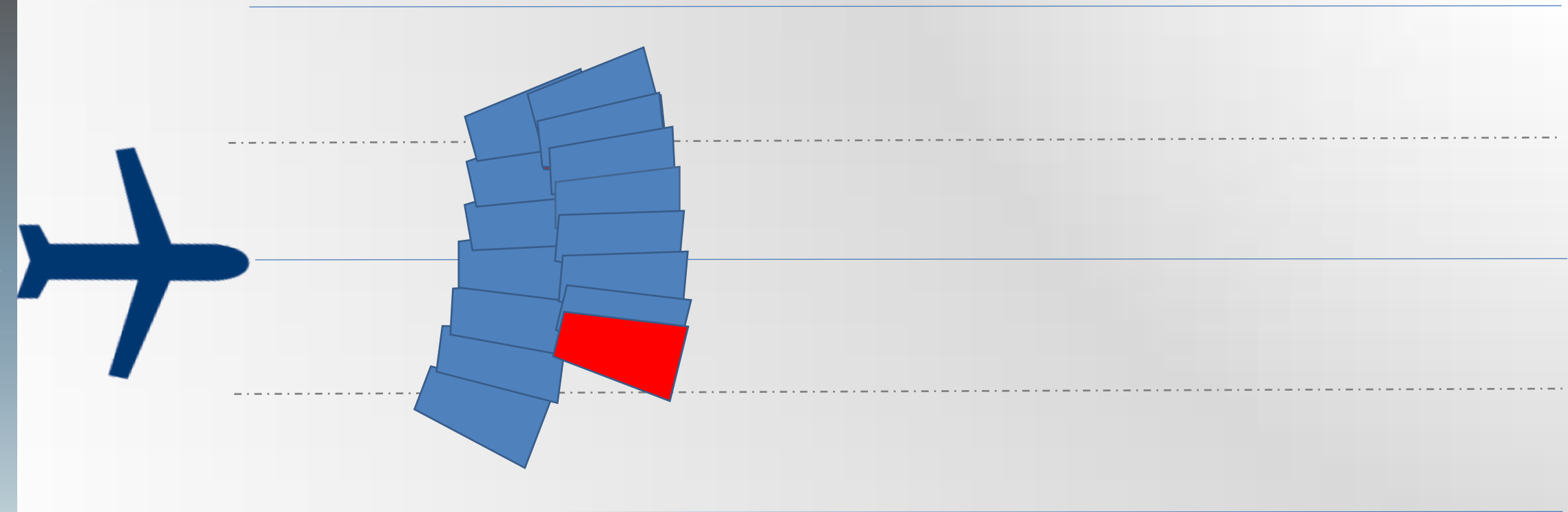
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HD or Thermal camera in „auto scan mode“

COVERING THE ENTIRE AREA



Scanning along the flight lines
HD or Thermal camera in „auto scan mode“

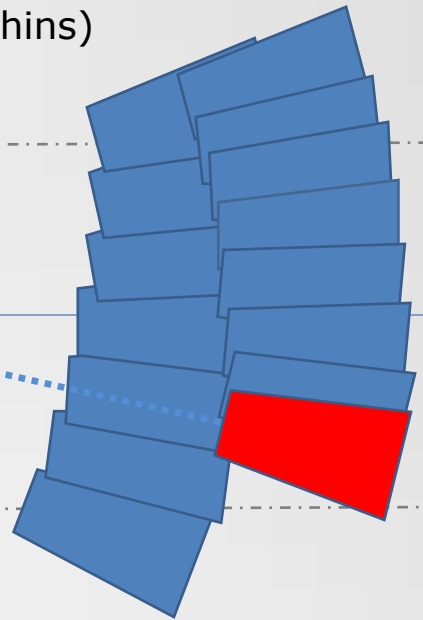
COVERING THE ENTIRE AREA



Scanning along the flight lines
HD or Thermal camera in „auto scan mode“

COVERING THE ENTIRE AREA

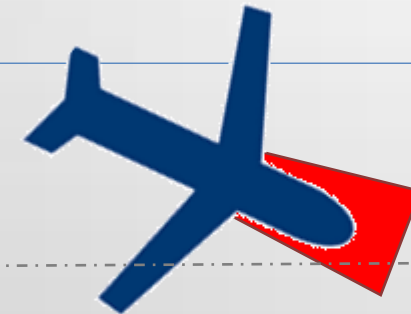
Hot targets spotted
(possibly dolphins)



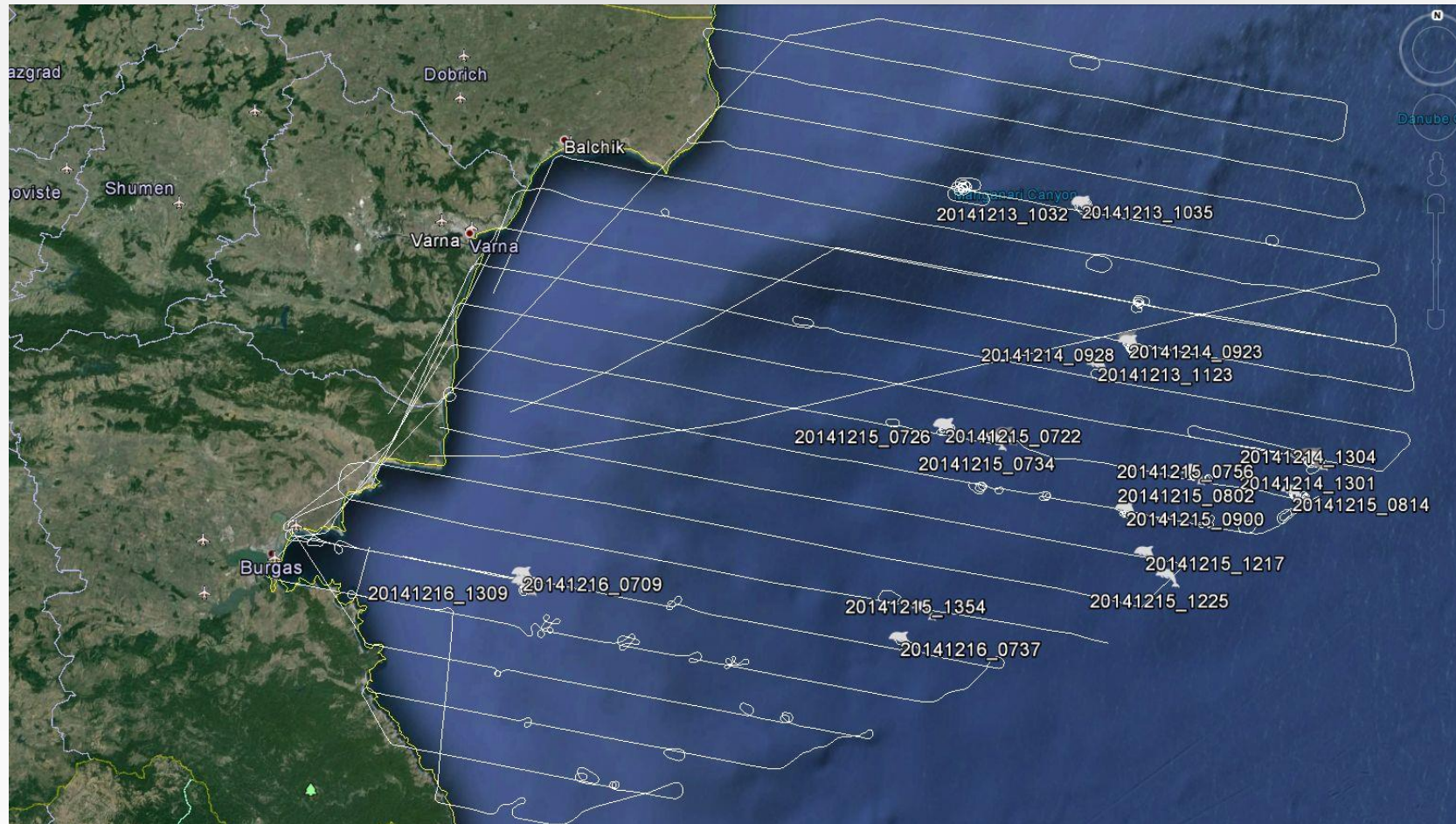
Fly to hot targets -
recording time and position
to flight log



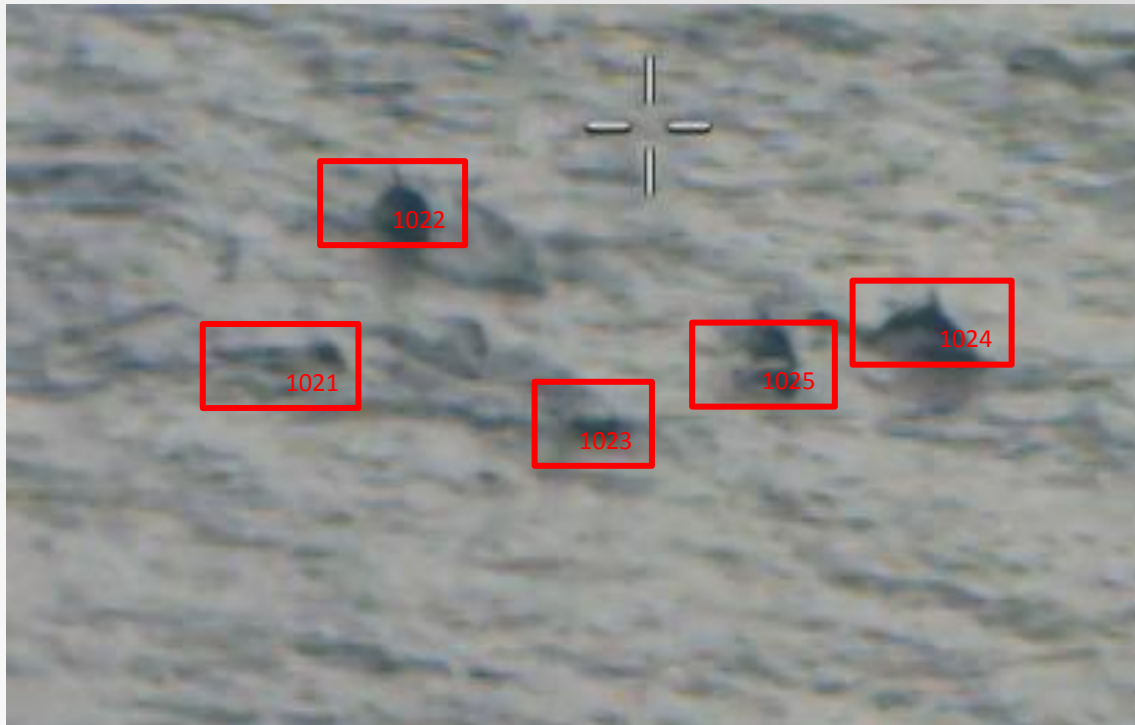
Recording of dolphins with
close camera zoom
(detailed daylight HD video)



DOLPHIN SIGHTINGS OVERVIEW



DATA ANALYSIS / ANIMAL COUNTING



Videostream of recorded dolphins is mapped - including time of observation -for subsequent counting and identification.

Video

DETAILED DOCUMENTATION



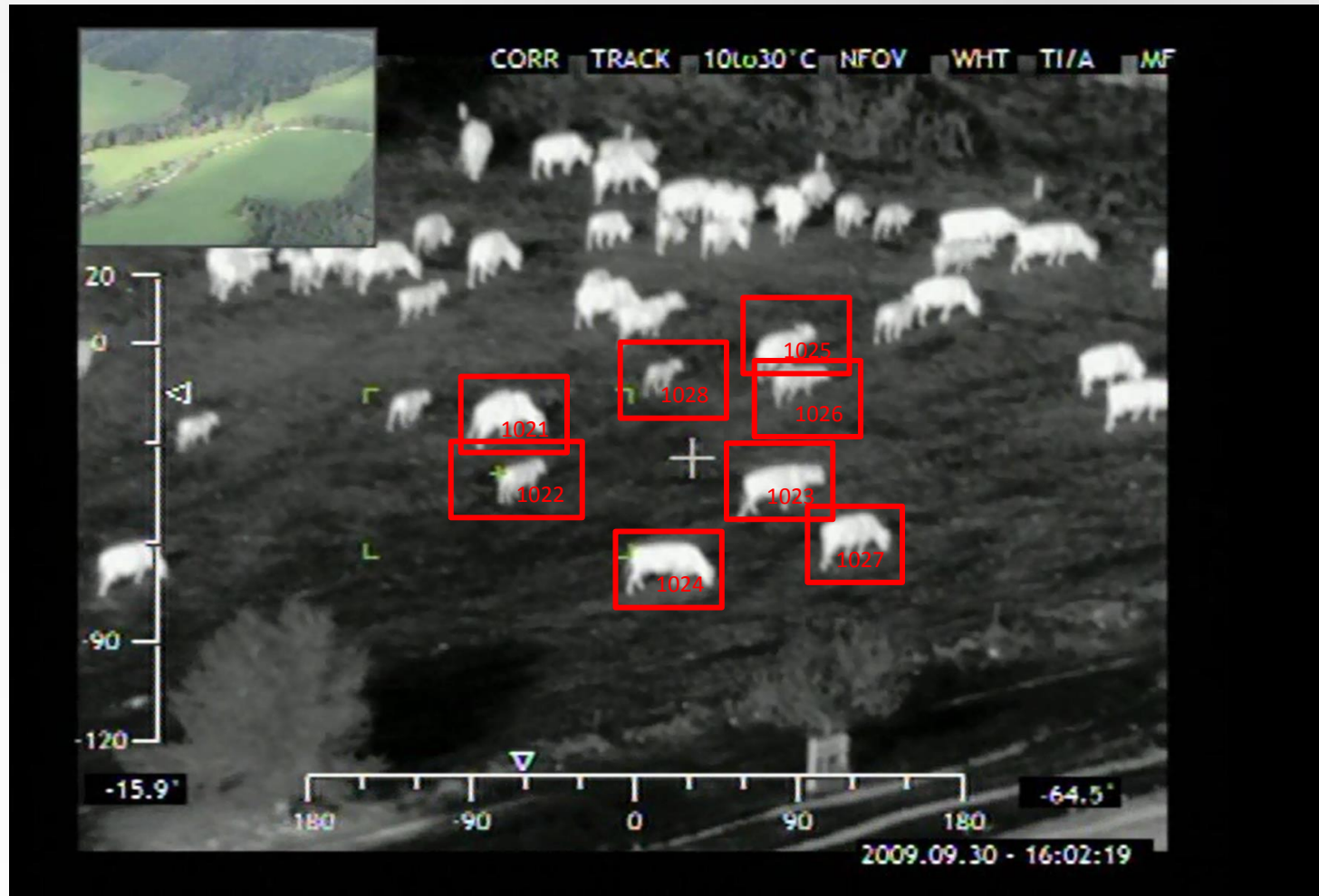
Close camera zoom



Video

After detailed documentation of dolphins for subsequent identification and counting, the crew returns to the flight lines and continues scanning

EXAMPEL FOR ANIMAL COUNTING IN GENERAL



Video

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EASA Approved Design Organisation





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03

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ACFT
42:31:48N X37°
20:53:48E 764FT

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0FT 1.500

049° MAP TGT
42:32:07N
20:53:47E

BACK