



# Airbus A380 noise measurements

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# Background and context

- Why produce a report on noise measurements of a new aircraft type?
  - Airbus A380 is much larger than any preceding aircraft
    - 1970-1989 747 increased from 333 to 394 tonnes, increase 18%
    - A380 introduced in 2008, MTOW 569 tonnes, increase over 747-400 of 44%
    - Public noise requirements by the launch customer, Singapore Airlines
  - Commitment made in Heathrow Airport's Noise Action Plan (Ref 1.5)
- First aircraft specific noise measurement report, since CAA Paper 77007: Noise Data from the First Year of Scheduled Concorde Operations at Heathrow Airport – London
- ERCD Report 1106 available on HAL website
  - [http://www.heathrowairport.com/static/HeathrowNoise2/Downloads/PDFs/20120411-Final\\_ERCD\\_A380\\_Report\\_1106\\_2.pdf](http://www.heathrowairport.com/static/HeathrowNoise2/Downloads/PDFs/20120411-Final_ERCD_A380_Report_1106_2.pdf)

# Airbus A380

- Introduced at Heathrow in March 2008
  - Singapore Airlines to Singapore
  - Qantas Airways to Singapore
  - Emirates to Dubai
  - Adhoc Air France services to Paris
- Slow build up of flights to only two core destinations and limited resources delayed data collected, but enabled three years worth of data to be collected (Mar 2008 – Mar 2010)
- Measurements taken from fixed noise monitors and any deployed mobile monitors
- Report measured noise levels at each monitor in  $L_{Amax}$  and SEL noise indicators
- Compare with Boeing 747
  - Not as straight forward as it might first seem

# Airbus A380 summary (1)

- Noise measurements reported for all available monitors in terms of both Lmax (peak level) and Sound Exposure Level (SEL), which takes into account the duration of the noise event
- Compared with other long-haul types: Boeing 747-400, 777-300, 777-300ER, and Airbus A340-600
- Departure:
  - Confirms that the Airbus A380 is quieter than the Boeing 747-400
  - In some circumstances it is noisier than other QC/2 aircraft due to the longer distances currently flown (Singapore 5,900nm, average distance flown by the 747-400 is less than 4,000nm)
  - Noise performance is comparable with other QC/2 aircraft on departure after accounting for distance flown.
  - As a wider number of operators introduce the aircraft in future years, it is expected that the average distance flown will reduce, reducing average departure noise levels.

# Peak noise levels ( $L_{Amax}$ ) for departures to Singapore

	Monitor Site	Average Lmax (dBA)					
		89	B	F	101	76	94
	Runway	09R	27R	09R	27R	27R	27R
	Distance from SOR (km)	4.4	5.9	6.4	9.1	12.6	13.8
Aircraft	B747-400 (PW engines)	100.7	91.6	86.8	-	81.7	81.4
	B747-400 (RR engines)	99.5	91.0	82.7	81.9	80.1	79.4
	B747-400 (GE engines)	-	90.2	83.7	-	-	-
	<b>A380-800 (RR engines)</b>	<b>92.7</b>	<b>87.2</b>	<b>81.2</b>	<b>79.8</b>	<b>78.5</b>	<b>75.4</b>
	B777-300ER (GE engines)	92.6	85.2	78.0	75.8	73.8	-

# Airbus 380 summary (2)

- Approach:
  - Quieter than the Boeing 747-400
  - Wider than expected difference between the two engine types.
    - The Engine Alliance-powered variant is quieter than previous best performing wide-body aircraft, the A340-600 and B777-300ER.
    - RR-powered variant is slightly noisier than the A340-600 and B777-300ER.
      - Working with RR to understand the reasons for the difference
  - Further away from the airport, differences between aircraft differ, likely reflecting operational factors, not just source noise/technology.

# A380 & B747-400 Approach Noise Levels

