RNN TRIAL ENVIRONMENTAL ANALYSIS

NOISE MONITOR ANALYSIS

SEPTEMBER 2019

HELIOS

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INTRODUCTION

Context

Gatwick airport is planning a trial to reduce noise from arriving aircraft at night. The trial aims to reduce the incidences of ‘outlier’ arrivals by reducing the number of aircraft flying unduly noisy profiles and/or flying at unnecessarily low altitudes.

Document purpose

To show the expected impact of the trial procedures on noise, this document contains noise analysis from Mobile Noise Monitor Terminals (NMTs) around Gatwick airport.

These Mobile NMTs have been used in recent years to monitor noise around Gatwick. It should be noted that the *data presented herein was not collected from the same mobile noise monitors that will be used for the trial. The trial monitors are currently being deployed*.

The data is illustrative but not statistically representative because there is not enough data available from the noise monitors.

Scope

The mobile noise monitor data is compared for the following types of arrival:

1) An ‘outlier’ arrival (an actual, recorded arrival) flying an unduly lower profile than other aircraft
2) A ’Trial-like’ arrival (an actual, recorded arrival) flying a similar profile to a trial aircraft.

Only noise monitors 10-20 NM (Nautical Miles) from the runway are expected to show a reduction in noise due to the trial. Readings from monitors closer-in are included to show that the noise here is similar between both arrivals.

INTRODUCTION

Approach

- For a sample of runways/aircraft types, two real historic flights have been compared, one low altitude outlier and one flight flying a ‘Trial-like’ procedure.
- The flights pairs selected for comparison were the same aircraft types that overflew the same monitors to the same runways in the same month.
- The mobile noise monitor data from both flights has been compared to show the difference.
- The mobile noise monitor readings further from the runway (more than about 10NM) should show the benefit of the trial aircraft since this is where the trial procedure has an impact.
- Results from NMTs nearer to the runway (closer than 10NM) should show little difference between the two flights. This is because within 10NM the aircraft is on its final approach procedures and not on the trial procedures. A small variation (higher or lower) is to be expected in this range.

NOISE MONITOR TERMINAL (NMT) LOCATIONS

Distance to runway (NM)	
Site	**RWY 08L/R**
Russ Hill	1.65
Orltons	2.03
Oaklands Farm	2.07
Ruckmans	6.72
Alford	12.42

Distance to runway (NM)	
Site	**RWY 26L/R**
Bellwood	2.2
Moat House	2.21
Hever Castle	11
Withyham	13.12
Rusthall	15.10

NMTs further than 10 NM from the airport

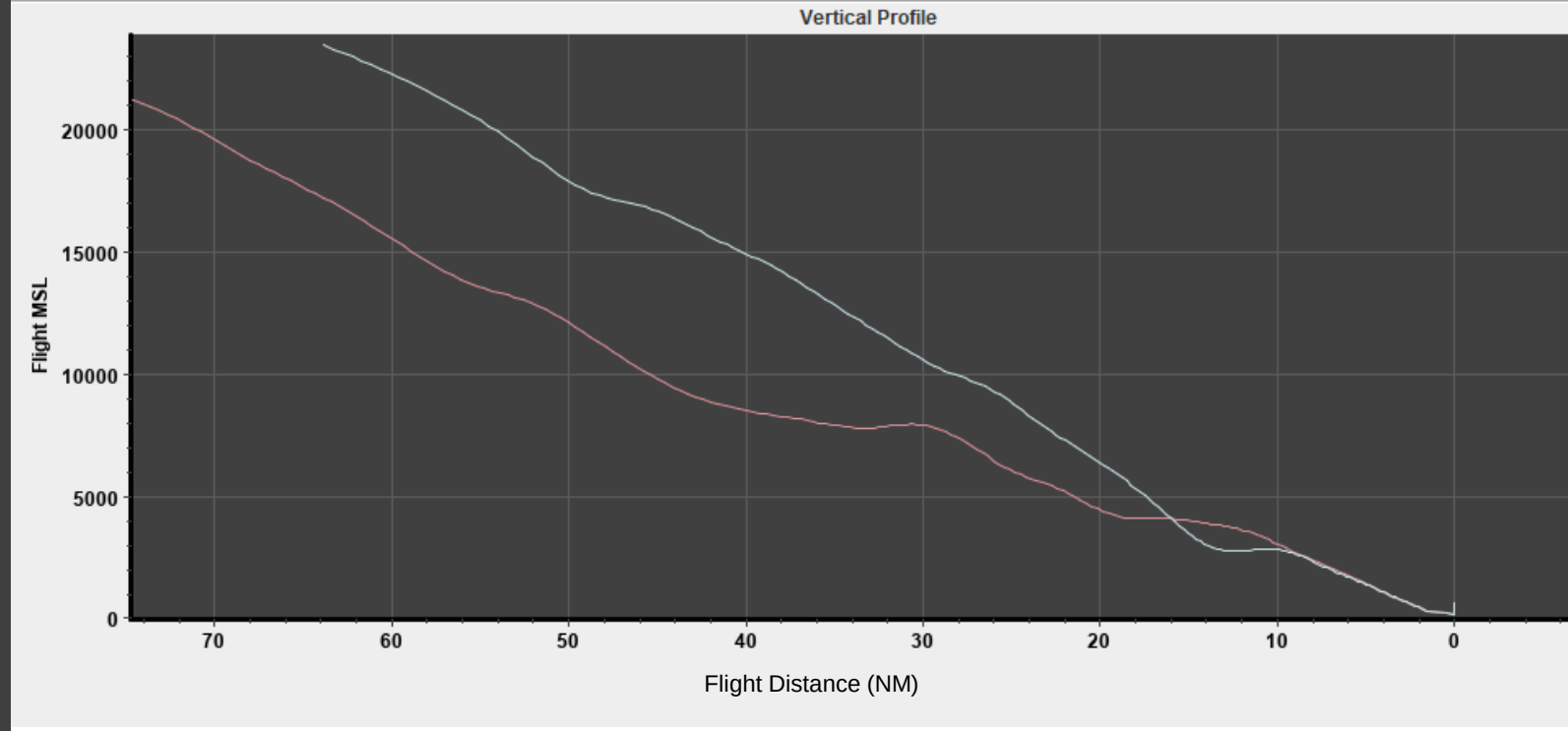
- The current Gatwick NMT locations are shown above, it is these monitors that have detected the noise readings used in this report. (More NMTs will be deployed before the trial)
- The distance (in NM) to the runway of each monitor used in the analysis are shown in tables.
- These distances are ‘as the crow flies’ and the distance an aircraft has to fly to the runway when it overflies a monitor could be considerably more depending on the flight track.

https://aircraftnoise.gatwickairport.com/overview-of-noise-data/

- The impact of the trial will be further than 10NM from the runway, so NMTs in this range will see the benefit of the trial procedure. These NMTs are highlighted in the table.
- The NMTs nearer than 10NM from the runway should see no substantive impact from the trial. The noise recordings from these are given in the following pages only to show that they should not change by a substantial amount.

COMPARISON 1

- Boeing 789
- Runway 08R
- Outlier arrival (04/08/19)
- Trial-like arrival (27/08/29)

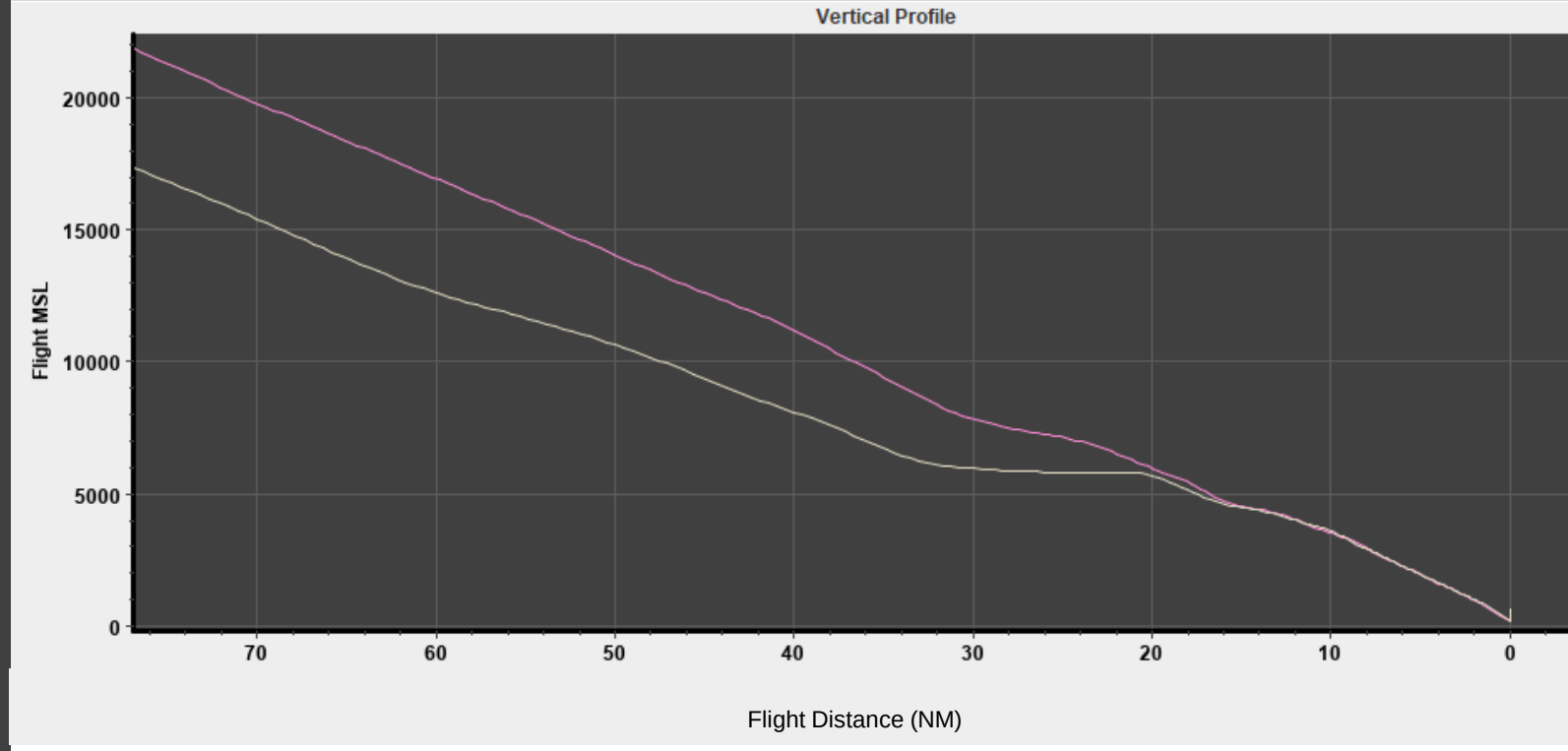


Outlier arrival Trial-like arrival

NMT Location	Outlier arrival			Trial-like arrival			Trial-like arrival compared to outlier arrival
	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	
Russ Hill	84.5	756	274	85.5	48	389	1% bigger
Orltons	72.1	788	390	74.7	417	556	4% bigger
Oaklands Farm	73.6	1038	328	74.6	344	461	1 % bigger
Ruckmans	68.5	247	2147	68	351	2148	1% smaller
Alford	62.7	983	3954	62.4	1247	3173	8% smaller

COMPARISON 2

- Boeing 789
- Runway 26L
- Outlier arrival (10/08/19)
- Trial-like arrival (10/08/19)

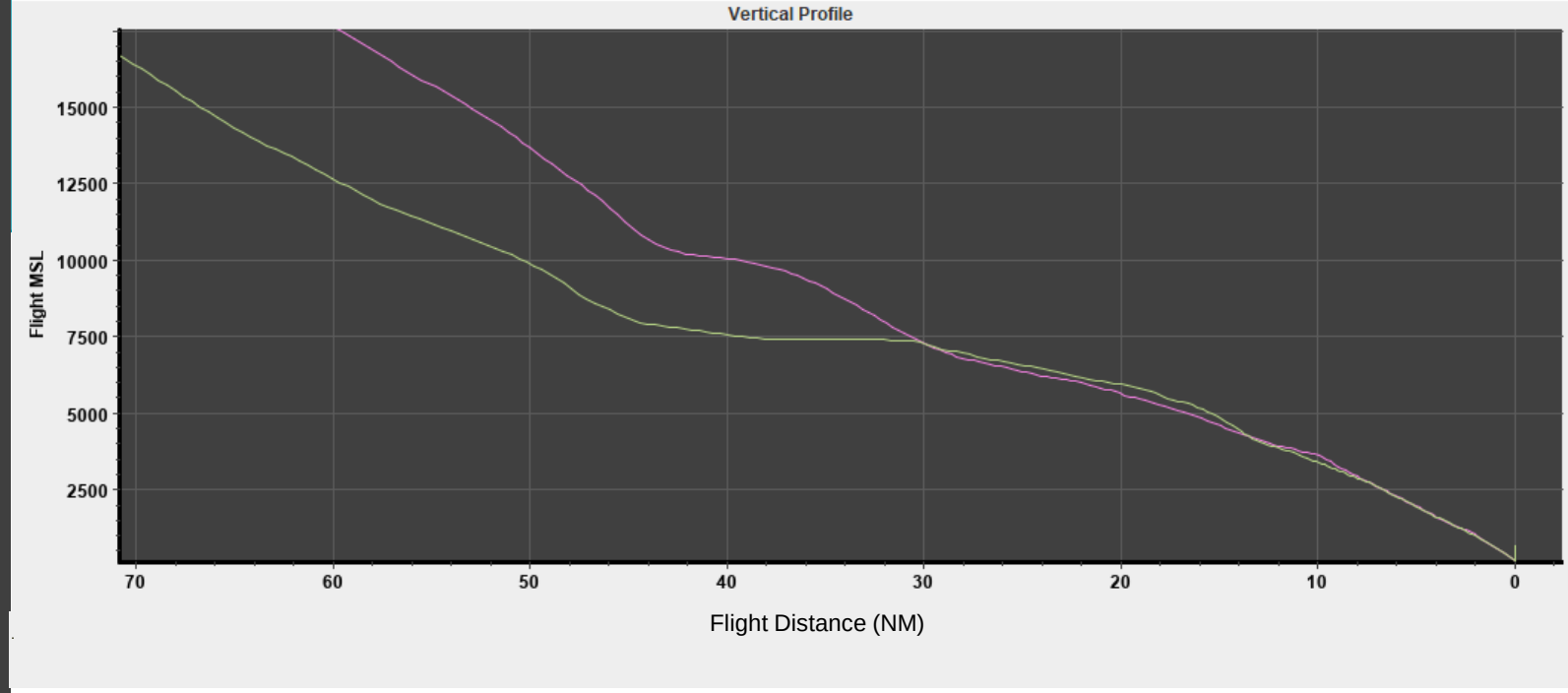


Outlier arrival Trial-like arrival

NMT Location	Outlier arrival			Trial-like arrival			Noise compared to outlier arrival
	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	
Bellwood	78.4	241	725	77.1	233	648	2% smaller
Moat House	77.5	186	679	78.5	245	632	1% bigger
Hever Castle	73	2003	3870	61.4	Data unavailable		16% smaller
Withyham	74	1247	4586	55.8			25% smaller

COMPARISON 3

- Airbus A321 neo (32Q)
- Runway 26L
- Outlier arrival (10/08/19)
- Trial-like arrival (01/08/29)



Outlier arrival

Trial-like arrival

NMT Location	Outlier arrival			Trial-like arrival			Noise compared to outlier arrival
	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	L_{max} (dB)	Horiz. distance at L_{max} (m)	Height at L_{max} (ft)	
Bellwood	77	199	684	74.1	196	698	4% smaller
Moat House	77.1	180	680	75.5	182	703	2% smaller
Rusthall	67.9	2644	5122	57.5	1224	4440	15% smaller

SUMMARY

- Of the readings from NMT further than 10NM from the runway:
  - 100% of the readings show reductions in noise for the ‘Trial-like’ profiles
  - The reductions range from less than 1dB to 18dB. In most cases they are over 10dB
- Of the readings closer than 10NM:
  - Differences are small (generally 1-2dB and in one case 3dB)
  - The Trial-like procedure is generally quieter but not always
- These results are in line with expectations

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