CASE STUDY

Does Steep Descent Cut Aircraft Noise?

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Background

Noise reduction by trajectory management is one of the options currently considered at several airports around the world. The idea behind a “steep” descent is that the airplane would be further from the receivers on the ground, and thus by “propagation” alone, the noise level at the receiver would be lower. For example, by doubling the source-receiver distance, the noise level would decrease by 3dB. Unfortunately, the solution is not straightforward, as demonstrated later. Information fed to the media, as in the case of the newspaper cutting shown below, may generate confusion and unrealistic expectations. The journalist incorrectly refers to “jet noise”; we need to consider the overall sound level created by the airplane system.

![Newspaper discovery of steeper descent](December 2012)

Solution

The FLIGHT program is capable of simulating standard descent, steep descent and continuous descent approach. Let’s consider the case of a Boeing B737-800 landing at the airport described in the newspaper cutting above (London Heathrow, LHR), approaching from the East and landing on runway 27R. The airplane is forced on a 3.75 degree approach slope. Steeper approaches are not always possible, especially for the largest airplanes, contrary to what expressed in the newspaper article. [Ref. 1]
Figure 2 shows the result of a comparison between noise levels arising from a standard approach (3 degrees) and the steep approach (3.75 degrees). The minimum distance between aircraft and receiver increases from 119 m to 150 m. This distance effect does reduce noise. However, note that in general there can be differences in airspeed and airplane configuration (position of slats and flaps), which may cause additional noise.

![Graph showing noise level comparison](image)

Figure 2: Noise level from a Boeing B737-800 on a standard approach and a steep approach, compared.

Careful consideration must be given to the position of the noise receiver, to make sure we are comparing the correct parameters. A comparison between jet noise levels is also shown. However, these data are in [dB], whilst the overall noise level is given in the A-scale, so LA[dBA] is the A-weighted overall sound pressure. On balance, a steep approach does what we expected.

**Further References**


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