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## ***Summary***

This paper reports my observations on aircraft noise from Southampton International Airport during the 2004 noise preferred routeings trial.

I have lived in Hensting Lane, about 1Km west of the village of Owslebury, since 1997. I have an honours degree in Physics from Oxford University.

There has been a large increase in noise from aircraft over Owslebury in the past two years. This is due to the growth of low-cost scheduled flights using heavier aircraft.

Phase I of the routeings trial somewhat increased the number of aircraft over Owslebury. This was mainly due to the fact that during this phase inbound aircraft from the continent were forced two nautical miles further north.

If inbound aircraft arriving from the southerly direction took the shortest path consistent with the Flying Controls Agreement (FCA), they should be joining the runway alignment north of Twyford under Phase I rules, and south of Colden Common under Phase II rules. But they prefer to fly over Owslebury, and there is some indication that aircraft are short-cutting the paths that the FCA seeks to enforce.

Commercial aircraft flying over Owslebury produce a peak noise slightly above 70 dBA. Considering the background noise is below 40 dBA, this is quite a considerable intrusion into an essentially rural area.

Consideration should be given to amending the Flying Controls Agreement to mitigate the aircraft noise over Owslebury.

## ***Problems with the consultation process***

### **The airport seems unaware of the village of Owslebury**

Southampton Airport does not appear to be aware of the existence of the village of Owslebury. Their consultation maps show Upham (population 497) but do not show Owslebury (population 654). In Figure 1 below I have added Owslebury and Morestead to the Phase I map together with their surrounding roads, thus making it easier for local residents to see where they live in relation to the aircraft routes.

Figure 1: Phase I consultation map with Owslebury added



### The maps are misleading

Southampton Airport's consultation maps are misleading in that they show solid mauve and yellow paths, which are 0.6 nautical miles wide, and are marked as 'approach' and 'departure routes'. The Airport's information leaflet says "Departing and arriving aircraft have special Noise Preferred Routes which, wherever possible, avoid built-up residential areas". This was bound to give residents the impression that aircraft would be flying mainly within these coloured routes.

In fact, however, the Flying Controls Agreement does not require aircraft to adhere to these routes at all. It merely establishes minimum distances from the runway at which aircraft can leave, or must join, the runway alignment. I have a letter from Tony Wright, Assistant head of planning policy for Eastleigh Borough Council, which states "the yellow and mauve coloured areas on the diagrams have no relevance to the Flying Controls Agreement". Yet it is this agreement which imposes upon the airport the Noise Preferred Routes.

Figure 2 reproduces part of the consultation map for Phase I, showing the yellow route, marked 'C', for departures to the east or south. Superimposed on this I have shown, in a paler yellow colour, the area in which such departing aircraft are likely to be found. It can be seen that this area is much larger.

Figure 2: A clearer depiction of the Noise Preferred Routes for departing aircraft



It is true that the maps contain the disclaimer “This diagram is for illustrative purposes and not to scale and does not show all flight paths” but I do not accept that this disclaimer is reasonable. In the modern world there is no excuse for producing a map that is not to scale; in any case the map is broadly correct in scale. The ‘illustrative purpose’ of the map is plainly to convey to residents where aircraft are flying: it fails to do so.

- *It is submitted that the consultation maps do not convey to ordinary people where the majority of aircraft from the airport are flying.*

### Complaints are not investigated

The airport’s information leaflet states “We offer a prompt and efficient community flight comment line. We aim to respond to complaints within five working days”.

During the period of the Routeings trial, I made two complaints, one by telephone in April, and one on May 7<sup>th</sup> by email, in each case detailing the time and appearance of the aircraft concerned. There was no response to my telephone complaint. In response to the email I received a letter from Mark Gibb, head of airside operations, explaining the trial. In neither case was any attempt made to investigate the complaint.

- *The airport should either investigate complaints, or stop claiming that it does.*

The lack of response to complaints makes residents uncertain as to whether or not their complaints have been correctly logged. It is in any case entirely wrong that complaints against the airport should be logged by the airport itself, since it is an interested party.

- *Ideally, complaints against the airport should be logged by the regulating authority (Eastleigh Borough Council) and not by the airport itself.*
- *Failing this, the complaints register should be opened to public scrutiny so that residents can verify their complaints have been correctly recorded.*

As I received no substantive response to my first two complaints, I did not make any more. This casts doubt upon the airport's intention to use complaint information to help to decide between the two alternative routing schemes.

### *The Flying controls Agreement does not protect Owslebury*

Owslebury is affected only by aircraft using the northern end of the runway. Because aircraft like to operate into the wind, and the prevailing wind is south westerly, Owslebury is affected 60% of the time by inbound aircraft and 40% of the time by outbound aircraft.

#### Outbound aircraft

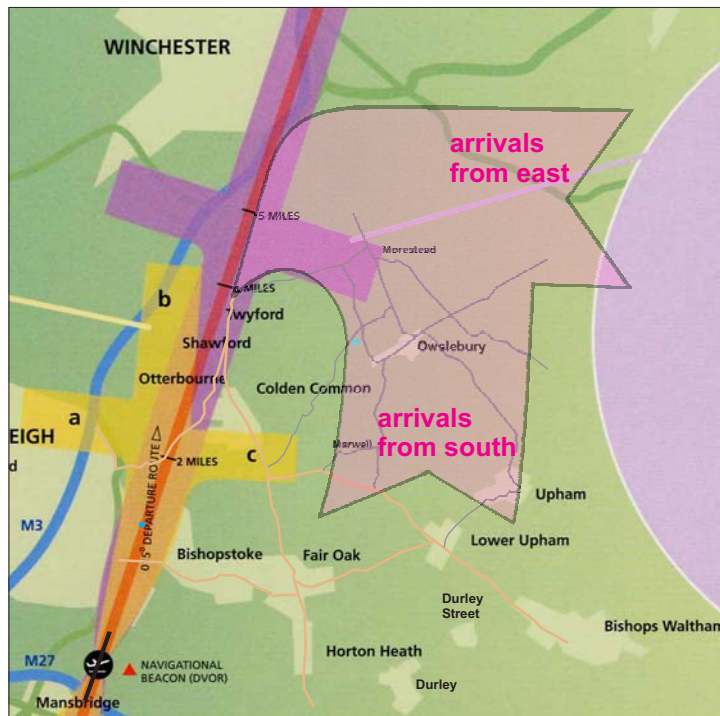
It can be seen from Figure 2 that aircraft departing from the northern end of the runway bound for southern or eastern destinations are free to pass over Owslebury. Most of them do. The experimental routing scheme does not greatly alter this.

Owslebury is on the top of a hill, and most of the village is 96 metres above the level of the runway. This means that, although outbound aircraft are climbing, they still pass fairly low over Owslebury.

#### Inbound aircraft

Figure 3 shows the situation of Owslebury as regards inbound aircraft landing at the northern end of the runway, in Phase I of the trial. Once again, Owslebury gets it in the neck.

Figure 3: inbound aircraft from the south fly over Owslebury



This is one case where the new routings (Phase I) are unconditionally worse for Owslebury than the old ones (Phase II). With the old routings, inbound aircraft from the south were permitted to join the runway alignment south of Owslebury, and thus would not be expected to pass over it. Whereas with the new routings all such aircraft are pushed 2

nautical miles further north, to the route shown in Figure 3. In addition, with the new routings, the mauve bar shown in Figure 3 is one nautical mile further south than it was in the old routings, making it more likely that inbound aircraft will pass over Owslebury.

- *The experimental routeing, Phase I, is unconditionally worse for Owslebury than the old routeing, as regards inbound aircraft.*
- *Neither routeing offers Owslebury any protection against noise from outbound aircraft.*

### ***Aircraft are not adhering to the Flying Controls Agreement***

What I have described above is what would be the case if aircraft actually complied with Noise Preferred Routeings; but they don't seem to, particularly as regards inbound aircraft.

A considerable number of inbound aircraft passed directly over Owslebury from the south, in both phases of the trial, and they continue to do so. It is clear from their direction of flight—leaving Owslebury on an arc whose tangent has a bearing of approximately 280°—that they would be short-cutting the preferred routeing for Phase I. For Phase II, they would be passing further north than is required by the preferred routeing but would remain compliant with it.

A possible explanation for this is that pilots flying visually have got used to using particular land marks to guide them, have adopted an approach path that lies approximately mid-way between the two mauve bars on the Phase II map, and continue to do so regardless of the trial.

Figure 4 shows the path that inbound and outbound aircraft tend to take over Owslebury so far as can be discerned from watching them from ground level.

Figure 4: how aircraft actually fly over Owslebury



## Aircraft types

The aircraft types which are particularly prevalent over Owslebury are the 4-engined jet BAE-416-200, the 2-engined propeller-driven DHC-8-311, and its longer brother the DHC-8-402 and, less often, the EMB-145EU, a 2-engined jet with the engines just forward of its tail. Flybe (British European) and British Airways operate the first three types, and British Airways the last one. See figure 5.

Figure 5: aircraft types operating from SIA

BAE.146-200



DHC-8-311



DHC-8-402



EMB-145EU

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## Noise measurements

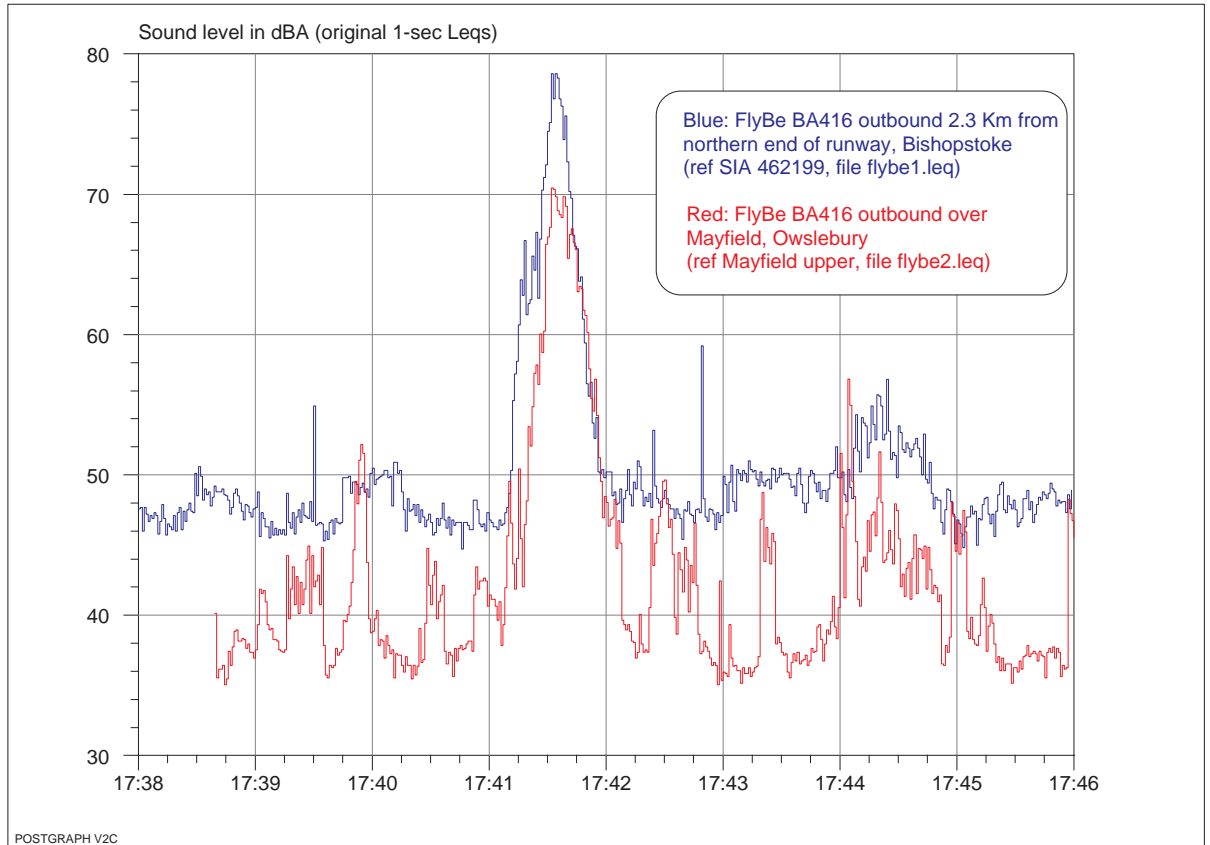
Measurements of aircraft noise were made in the garden of my bungalow in Hensting Lane, which is shown in Figure 4 as the bright blue dot to the left of Owslebury village. Measurements were also made in a field west of The Mount hospital, Bishopstoke, chosen because it is directly on the runway alignment and only 2.3 Km from the northern end. This point is also shown as a bright blue dot in Figure 4, to the left of the word Bishopstoke.

Measurements were made with a Cirrus CRL 236 integrating sound level meter which records true A-weighted  $L_{eq}$  in successive 1-second periods. It complies with IEC 60804 Type 1 accuracy.

## Particular aircraft

Figure 6 shows the noise of a Flybe BAE146 aircraft taking off and passing over the two monitoring points.

Figure 6: noise of BAE146 outbound

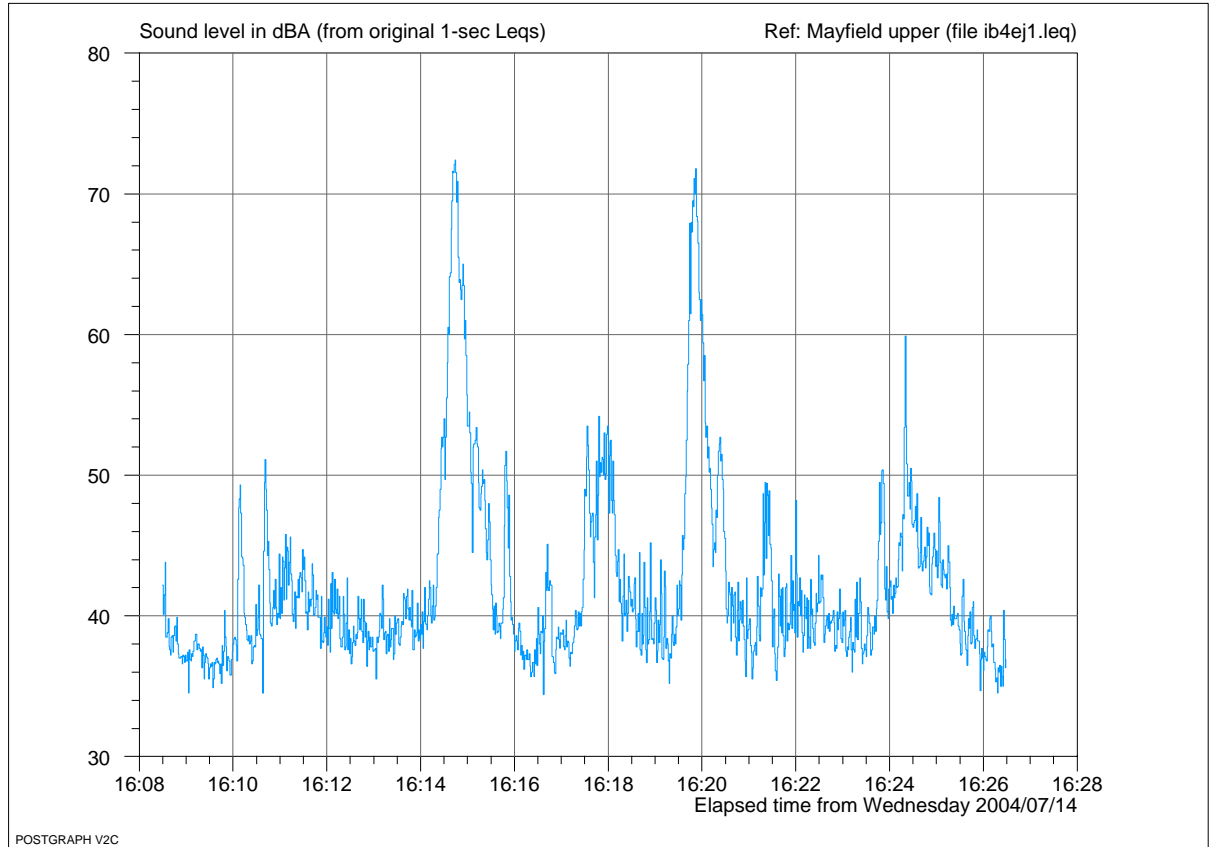


Looking at the blue trace it can be seen that the peak noise 2.3 Km after takeoff is 78 dB. By the time the aircraft gets to Owslebury (see red trace) the peak noise is 71 dB, and it remains above 60 dB for 37 seconds. In contrast with a background noise level in my garden of under 40 dB, that is quite a substantial intrusion into what is normally a quiet rural area. (It can be seen the background noise at the monitoring point in Bishopstoke is higher than that in my garden. This is because Bishopstoke is closer to the M3 motorway.)

As my bungalow is in a valley, it is 55 metres below the level of Owslebury village. Hence the same aircraft must be closer to the ground and thus slightly louder for residents in the village itself.

Figure 7 shows the noise of a Flybe BAE146 aircraft inbound over my garden. The first peak is the Flybe BAE146 aircraft; the second peak is another aircraft the identity of which I did not record. The peak noise is 72 dB, and it remains above 60 dB for 23 seconds.

Figure 7: Flybe BAE146 aircraft inbound over Owslebury



By comparison with figure 6 it can be seen that this 4-engined jet makes about the same peak noise over Owslebury whether it is inbound or outbound.

Figure 8 shows the noise of a 2-engined propeller driven DHC-8 aircraft outbound over my garden near Owslebury. The noise remains above 60 dB for 29 seconds. Figure 9 shows a similar aircraft inbound over Owslebury. The noise remains over 60 dB for 19 seconds.



Figure 8: 2-engined propeller-driven DHC-8 aircraft outbound over Owslebury

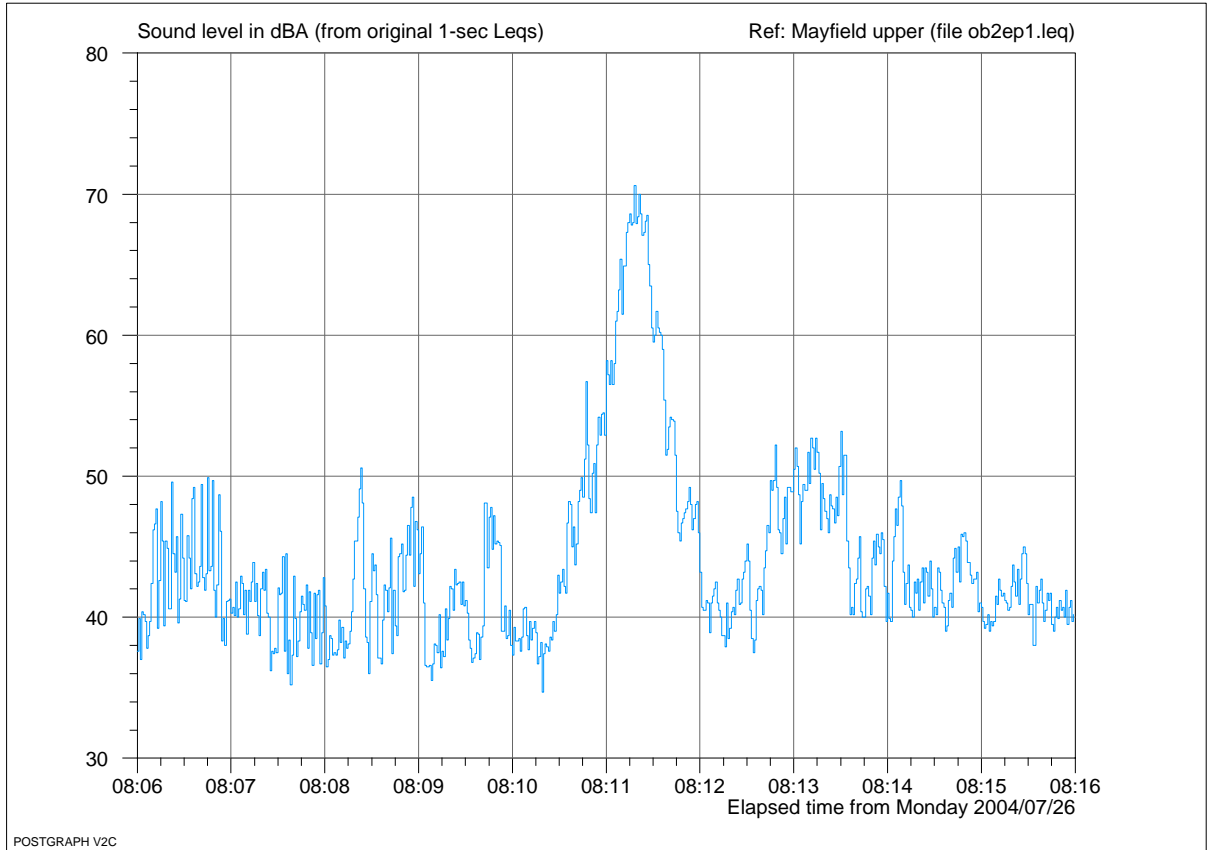
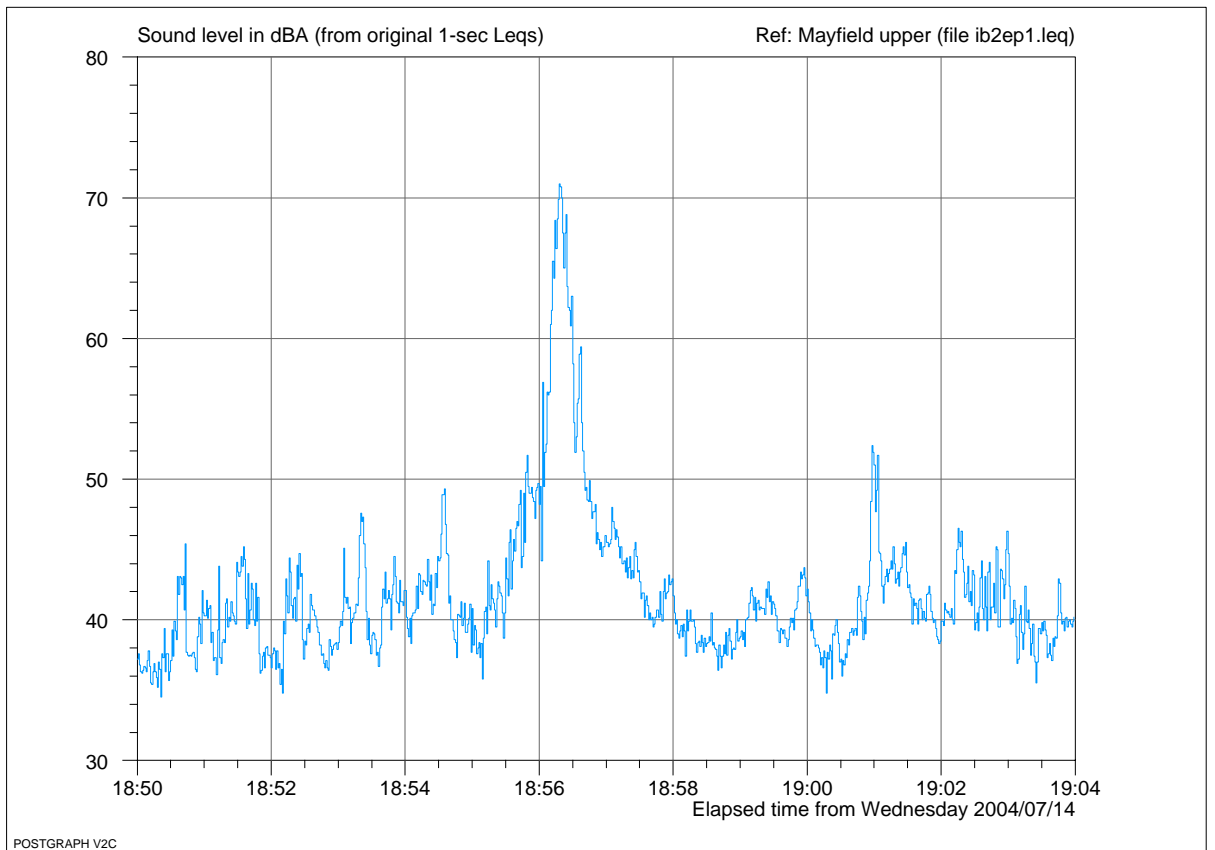


Figure 9: 2-engined propeller-driver DHC-8 aircraft inbound over Owslebury



It can be seen that this aircraft also makes about the same amplitude of noise whether it is inbound or outbound over Owslebury.

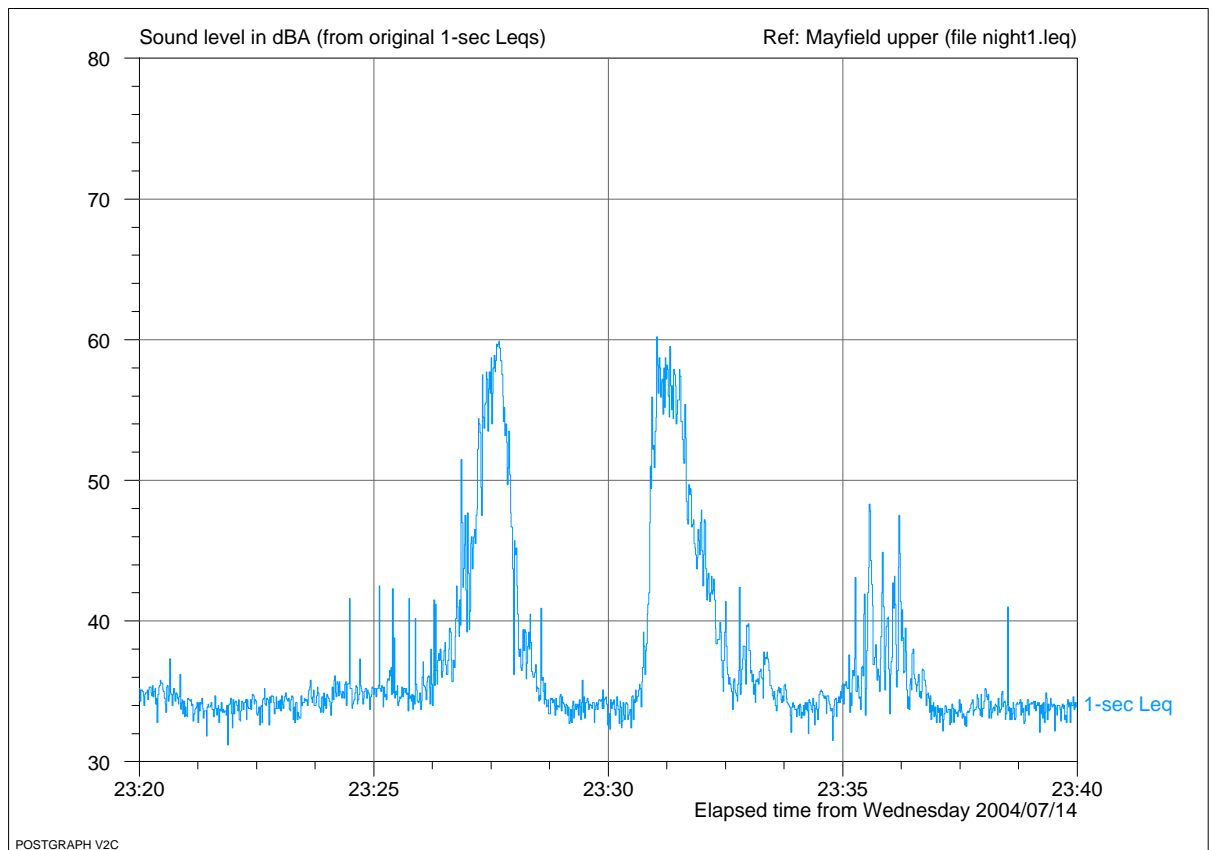
**Inbound versus outbound noise**

As already noted, because of the prevailing wind, Owslebury is affected by inbound aircraft for 60% of the time and by outbound aircraft for the other 40%. Also, it appears that the inbound aircraft are audible for a shorter period of time. But the peak noise created by inbound aircraft is just as loud as that of outbound ones.

**Night flights**

The airport generally adheres to the restriction of no scheduled flights after 23:00. Occasionally loud aircraft do pass over later at night and can clearly be heard in my bedroom. Figure 10 shows an example.

Figure 10: noise at night



No sleep disturbance has been experienced by me.

**Measurements over time**

Noise was monitored in my garden on various days for periods of about 24 hours, with continuous recording of 1-second  $L_{eq}$ . This was done for a total of 281 hours in Phase I, and 388 hours in Phase II. The data was then processed automatically by software to detect aircraft events by looking for appropriately-shaped peaks in the sound level, and manually to remove anomalies caused by weather or local noise events.

I had hoped by this means to provide clear evidence that one routing scheme was better for Owslebury than the other, but this has not proved possible at the present time due to the difficulty of eliminating various confounding factors. More time is needed to analyse the data properly.

Preliminary analysis suggests as follows. Considering only the hours between 7 AM and 11 PM, it appears that aircraft noise was audible for 16% of the time monitored during Phase I, and for 12% of the time during Phase II. Not all of this noise would have been caused by aircraft associated with SIA. (Aircraft noise is considered to be audible if it is identifiable by its shape in the time domain as an aircraft, and if it is at least 3 dB above the  $L_{90}$ ) The number of aircraft events per hour, averaged over the period 7 AM to 11 PM, was 3.7 in Phase I and 3.0 in Phase II.

## ***Suggestions***

Aircraft noise over Owslebury is noticeable, and intrusive, particularly considering the formerly quiet and rural nature of the area. On some afternoons, sitting in the garden, there is scarcely a quiet moment from one hour to the next. But Owslebury is by no means the worst affected place. More SIA-related aircraft must pass over Bishopstoke, Brambridge and parts of Colden Common, although the background noise there may well be higher.

Not all residents of Owslebury are concerned about aircraft noise. There are some people who consider the noise acceptable in view of the benefits of air travel, and others who do not notice the noise at all.

It does seem that the Phase I routings increased the number of aircraft flying over Owslebury, and that the motivation for this was, in part, to reduce aircraft noise over other areas which lie closer to, and more directly on the runway alignment of, Southampton Airport. Owslebury residents will resist this on the ground that deliberately switching aircraft noise from places where it has always occurred to places where it was not expected constitutes a violation of residents' legitimate expectations.

The question is whether it is necessary for aircraft to pass over Owslebury or whether, with better regulation, the amount of aircraft noise could be reduced. There would seem to be two possible ways in which the noise could be reduced. One would be to ban aircraft over 18,000 Kg from flying directly over Owslebury. This would concentrate the noise to the east and west of Owslebury village, resulting in more annoyance in these less populated areas. Alternatively, pilots could be required to vary their flight path from day to day so as to avoid flying repeatedly over the same properties, as they now do.

Experience suggests that neither of these methods would be effective unless rigorously enforced with the benefit of track keeping software.

- ***Serious consideration should be given to amending the Flying Controls Agreement in order to reduce the incidence of aircraft noise over Owslebury***
- ***Residents should be consulted on the best means of doing so***