



Revision 1

Recommendations for Infringement Workshop on 12 July 2016

Introduction

Infringements of controlled airspace by GA and other users continue to occur despite the efforts of NATS, CAA and the Airspace Infringement Working Group (AIWG). There are approximately 1000 infringements every year and although reporting processes have changed, the number has remained unacceptably high. Following a joint CAA/NATS and FASVIG meeting in April 2016, the CAA looked to deploy an emerging action plan that included the prospect of provisional licence suspension. In support of this objective, FASVIG offered to suggest a methodology to significantly decrease the number and severity of Airspace Infringements and to comment on the Action Plan proposals made by a joint CAA/NATS working group.

To do this FASVIG needed a data based methodology, and were accordingly furnished with the best data available, 530 infringement reports over a three year period from NATS units.

This paper discusses the data that was abstracted, using objective and subjective analysis, and has used that to support some of the proposals made in the Action Plan, while raising some caveats regarding unintended consequences which may decrease, rather than increase, both safety and efficiency.

Data Analysis

FASVIG have been given by NATS the results of 530 infringement questionnaires covering infringements of NATS controlled CTRs, CTAs and TMAs for the period of 2013-2015. This represents approximately 20% of the total infringements, because:

- a proportion of the total were of non-NATS managed airspace,
- 10% of the NATS infringements were not traced,
- in 10% of cases no pilot could be identified,
- of the remainder, 25% were selected by NATS for their severity of outcome,
- of whom 90% responded.

We have analysed:

1. the 530 in objective terms regarding the nature of the flight, and
2. 100 (July – Dec 2015) subjectively for causes and the likelihood of various proposed “solutions” to have prevented or mitigated each one.

We need to be clear that we consider it likely that the results of studying the 20% who were traced, contacted and who responded, may well be significantly different from the remaining 80%. We have no evidence either way, of course, but we are concerned both that people do not ring-fence their level of engagement (ie those who don't engage in the Infringements questionnaire process may well be those who do not engage with clubs, associations, online forums, web sites etc.) and may therefore show a different level of values, behaviours and competence to those who did respond, and that there has been selection by NATS of the cases to be studied, which may result in systematic differences from the norm.

For that reason, one of our recommendations is that in the future there is some measure of obligation, or strong encouragement, from the CAA for the pilot to respond to the questionnaire, to get a fuller picture. We do acknowledge that those who are responding because they are obliged so to do may not be as truthful and forthcoming as those who volunteer, so the obligation should be designed also to encourage honesty (for example by taking action against those who are thought to be being economical with the truth.)

Although we should, of course, hope for open reporting in a no-blame culture when it comes to aviation safety, we cannot expect that ethos to prevail where the end-game is likely to be enforcement action.

Objective Analysis

The full objective analysis is at Appendix 1, but we will refer only to salient points.

- We note that the most infringed zones do not offer radar services outside controlled airspace.
- 75% of infringements were by GA SEPs.
- Not a single glider is recorded.
- 5% were military, of which half were helicopters, the remainder being evenly split between fast jets, light trainers and "utility" (C130, King Air, Islander.)
- Half of the aircraft involved had Mode S, increasing the value of listening squawks, veils etc.
- 86% had Mode C.
- Half were in receipt of a Basic Service and very few Traffic or Deconfliction Service.
- Half were not in contact with an ATS.
- 97% took place under VFR
- 60% of respondents were not members of any GA organisation or association
- 74% were not GPS equipped. Of the remainder, half were not being used. Of the GPS equipment, 15% was designed for IFR as opposed to VFR flight. So about 10% of the total were using VFR GPS equipment. (The subjective analysis suggests that half of those were not being used *effectively*, taking the likely total to 5%.)
- 35% of infringers had more than 1000 hours total time, and 16% less than 100 hours.
- 65% of infringers held a PPL or NPPL, 21% CPL or ATPL and 6% were students.
- 35% were X-country recreational flights, 27% local recreational, 12% X-country training, 11% local training, 12% military and other and 3% Commercial.
- 15% were training with an Instructor.
- Most infringers used a ½mill chart
- 85% took place in visibility better than 10k.
- 70% of infringements were horizontal and 30% vertical

Subjective Analysis

We were time and resource limited to the extent that we could only do subjective textual analysis on 100 reports. We took the deliberate decision not to select this group, except to make them recent

and to cover all seasons. For that reason we took July to December 2015. We consider that to be a valid, significant sample, being 20% of the total number of pilot reports available.

We reiterate that the total sample is skewed to those who were identified by NATS, selected for investigation and were willing to respond voluntarily.

The subjective analysis took two forms, firstly to extract what we considered to be the principal causal factors and then to use our judgement to predict whether a range of possible measures might have either prevented the infringement or mitigated its impact.

Causal Factors

In these subjective analyses, we have to be a little vague about precise numbers as there is a degree of interpretation. To give one example, for context, we might discuss whether misreading a chart is a planning error (because the pilot should have studied the chart as part of planning), a distraction error, a training shortfall or poor chart draughtsmanship.

The number of incidents which arose out of poor pre-flight planning and preparation were lower than expected at around 5-8%.

25% of incidents had distraction as a root cause.

Many incidents were the result of the lack of the pilot's capacity to maintain accurate control of the aircraft due to some sort of distraction. The distraction came from in-cockpit tasks and passenger concerns and out of cockpit distraction such as looking for other aircraft when in an area of known activity.

There were some instances where the pilot was subject to an increase in workload that they could not cope with and this led to loss of accurate control. Workload accounted for 17 of the 108 root causes. However, not all these pilots were aware at the time that they were stretched.

Together distraction and workload were evident in a significant proportion of incidents. It seems that pilots are operating at or near their personal capacity, probably due to limited experience and currency coupled with a complex airspace environment, so that when an "occurrence" happens they are unable to cope and continue to pilot the aircraft accurately.

A similar result of loss of accurate control occurred 13% of times, when a pilot was forced to change his or her plan in flight and was then unable to maintain situational awareness and accurate navigation control. This too reflects that pilots are operating at, or close to, their capacity and the "distraction" of a route change pushed them over their limit.

A total of 46% of incidents resulted from various kinds of navigational error.

Complacency was evident in 11 incidents. Relying on others and relying on local area knowledge without specific planning prior to flight were two direct causes. The pilots should have spent more time and effort on pre-flight planning.

Altimeter setting errors (generally putting in the wrong setting, eg QFE instead of QNH, 1013 instead of QNH etc as opposed to getting the setting wrong) were factors in 7% of infringements.

6% of infringers were trying to enter controlled airspace but entered before a clearance was given.

There were 4% (four cases) put down to "General Incompetence."

9% of the total arose out of poor weather. There was only one case of deliberate infringement, where a (RAF Hercules) pilot decided that it was safer to climb to MSA in IMC, but did not inform ATC soon enough. However, there were also a couple of cases where pilots climbed so fast in IMC in hilly areas (to avoid CFIT) that they accidentally infringed.

There were two cases where the pilot was “instructed to infringe” by ATC. This is an area where FASVIG feels more research is necessary, as it seems to be more common than generally realised.

It is difficult to ascribe how many had poor radios as a causal factor, as it is mentioned quite often, but probably led more to distraction, which then led to the infringement, rather than a direct cause.

The misreading of a complex NOTAM was given as the primary cause in one case, but that also would have been alleviated by the use of a “NOTAM aware” moving map.

There are also a fair number of cases where the CAIT and the reporting have been rather a “non-event”, for example people failing to get to the correct altitude by 200’ a mile from a shelf. In these cases there has been no real danger, and the inconvenience caused to ATC and CAT is only as a result of CAIT effectively producing a “False Positive”. There should be some mechanism to prevent a minor problem being turned into a major incident simply because the software lacks discretion.

Effectiveness of Proposed Alleviations

We looked at the various actions which have been suggested to reduce future infringements and estimated which of the 100 we looked at would have been prevented or mitigated.

This is a highly subjective discussion. For example, would a pilot who is giving insufficient attention to infringement give it more attention under the threat of suspension or prosecution? Opinions varied within FASVIG on this point and the answer is unknowable and must be subject to trial.

We started with the following alleviations:

1. Threat of pilot suspension or prosecution
2. Publicising such enforcement actions
3. Carriage and use of VFR moving map GPS
4. Pre-flight risk assessment pro-forma
5. Training (including awareness courses, navigation refresher training, initial training and examination)
6. Known environment (Including radar-based service, co-operative veil, listening squawks)
7. Communications, developing ethos of unacceptability and publicising infringements
8. Improved data gathering

and assessed each of them primarily as to whether they would have prevented the index infringement, but also, in the cases where we think that the pilot “didn’t learn much from the experience” they might prevent future infringements.

In the case of data gathering and underlying causes, we looked at whether there was a cause that might be rectified (eg how a chart is drawn or a NOTAM promulgated).

A number of these measures are important but will take some years to be effective. This is particularly true of data gathering and education. We are aware that CAA and NATS are under pressure to achieve early results and our focus is therefore on what we think will be effective in the short term.

However, we cannot forebear to mention that GA representatives at AIWG have been pressing for the gathering and release of data for several years, and that the CAA is suddenly becoming precipitate in their desire to have an impact. Had data been released earlier, we might already have reached a measured conclusion and implemented effective mitigating actions. Urgent action is now being developed ahead of a full evidence base that otherwise might inform it.

Having made that point, FASVIG will make the best of what we have in the short term.

So there are only the following measures that could conceivably have a short-term effect:

1) Threat of penalties or sanctions

Given the level of infringements that result from distraction and lack of focus, it could be argued that the issue would be closer to the front of the pilot's mind if there existed a threat.

FASVIG can only agree that this would be effective in reducing infringements. However, we are concerned about some of the possible consequences:

- i) Because of the threat, some pilots may be tempted to switch off their transponders or Mode C. Thus the risk that an inconvenient infringement turns into a risk not only of greater disturbance but also of actual collision. It would seem that the unintended consequence could outweigh the benefits. Only a trial can tell.
- ii) By shifting the focus of pilots from other tasks to the risk of infringement, they may endanger their aircraft. Examples from our data include the Hercules which climbed into Manchester airspace and the aircraft in IMC over hills, but we also have anecdotal evidence of people tightening up turns in IMC, getting too close to other aircraft etc. It would be ridiculous for actual accidents and fatalities to result from trying to reduce infringements. This is a particularly strong argument against any pilot believing that immediate suspension without investigation is a possible outcome.
- iii) It is possible that if airlines and the military were given to understand that pilots could be suspended (particularly without notice), they might ban them altogether from private flying. The economic consequences on the GA industry of the loss of professional pilots from training, display and leisure flying could be significant, with some schools and display teams going out of business and pilots selling their shares in group aircraft.

For the threat of enforcement to have an impact on the wider pilot community it would be critical for effective communications and marketing to deliver a consistent and repeated message to all licence holders. It would travel around the internet and club bars with great speed and effectiveness to achieve our objective of changing attitudes to infringement. The use of corporate communications channels for such activity is likely to be ineffective.

2) Known Environment Trial

We have grouped together radar-based service, listening squawks and the proposed co-operative veil as different methods of achieving the same goal – communicating with an aircraft which is at risk of infringing, before it does so.

Our view is that about 80% of the infringements we studied would have been prevented (or their results very much mitigated) if infringing pilots had used any of these measures.

The GA members of AIWG have been pressing for several years for the more effective use of both radar-based services and listening squawks and we are generally supportive of their introduction in the Solent trial.

We do have some detailed concerns about the proposed trial of a known environment around Southampton and which we have already expressed in our initial response to the early draft AIC.

It is important that anyone who is inside the veil should have an ATSOCAS available if they wish. It is not acceptable that a participating aircraft might have to forego a service from Bournemouth or Farnborough radar for the sake of using a listening squawk with no surveillance service.

We are also concerned that the veil is not simply seen as yet more CAS to infringe. It should be very clear that all pilots have the right to enter the veil without squawking or talking, but that if they do, and subsequently infringe, the enforcement action will be considerably more severe than if they were co-operating, whether by listening squawk or ATSOCAS.

However, particularly following the experience of the Southend RMZ, we know that this trial will be a failure if pilots are not aware of it. In our experience, official promulgation will reach only a relatively small proportion of pilots, and these channels are not enough. Details should be published in the association magazines and the press, and also to filter through the internet forums and online news letters.

For any chance of success, it is most important that the electronic map-makers depict the veil from day one of the trial. It is not clear how they would do this, as it does not match any existing airspace category, so they may need to do some development, which, particularly in the case of the large manufacturers, may take an extended period.

3) Use of GPS

The number of infringing pilots who were using a VFR moving map effectively was very small compared to the overall population. We gather from this that one of the most effective ways to reduce infringements would be the widespread use of such devices and that the users were properly trained in their use.

We do not think that the CAA can mandate the use of such devices but we do think that they can take some effective actions:

- (1) Promulgate the fact that enforcement action will be less severe for those pilots who have been using such a device effectively.
- (2) Consider funding SkyDemon Light or Aware to be freely available for in-flight use along the lines that a different deal was made for the Olympics.
- (3) Incorporate moving map training into the PPL and encourage its use, even at student level.
- (4) Use coordinated and effective communications and marketing to encourage people to use such devices.

4) Reporting

Our analysis was very constrained by the lack of fully representative information. We have said above that we believe that the reports submitted may have been systematically different from the 80% that were missed.

However, although it would be very useful in the longer term to have full information, we are more interested here in the short term benefit in terms of demonstrably taking enforcement action, if all infringing pilots were obliged to complete the questionnaire following the MOR process. This would raise awareness in the online forums and magazines much more effectively than in Clued Up or AICs!

5) Ethos of Unacceptability

There is a feeling in flying club bars that infringements communications are a “bit of a bore.”

Over the last 20 years there has been a successful campaign to turn Drink-Drive and speeding from a “lark” to being socially unacceptable. We wonder if the CAA can take advice from psychologists or marketing experts to investigate how that could be transferred to infringements.

Process of Management of Infringers and Future Data Gathering

The CAA has recently published a revised infringement oversight process as CAP1404, including the provision to suspend the licence of the pilots for serious infringements whilst the case is being assessed.

In our view:

- All communication with the owner and pilot should be by the CAA and not the ANSP, even if the method of delivery was via the ANSP.
- The assessment of seriousness should be on the actions of the pilot, not on the outcome.
- It should consider all cases on initial receipt, regardless of outcome of the infringement.
- It should address the causes of infringements, regardless of outcome of the infringement.
- Most infringers are first offenders. Therefore, resources are better engaged in getting the message out that first time offenders are being dealt with robustly, than focusing on their re-education or training. When re-offenders are identified, the Infringement Co-ordination Group can always mandate custom remedial work.
- A penalty should only be applied after assessment is complete. The dangers of immediate suspension, before assessment, have been discussed above. Also, immediate suspension may have unjust consequences which could lead the CAA into defending itself in court.

There should be a standard form for infringement MORs. This should ask for the reporting ANSP to provide facts of maximum distance laterally and vertically the aircraft from the nearest edge of the airspace, the total time within the airspace, and brief details of any radio communication with the aircraft during the incident, as well as the normal information given in reports.

ANSPs should continue to be the principle source of the identification of aircraft.

For all MORs where the aircraft has been identified:

- The CAA should require the owner to give details of the pilot
- The pilot should then be advised that
 - He/she has been notified as having infringed, and that it has been recorded.
 - It is being considered for further action, and the pilot invited to complete the questionnaire, which will be taken into account for mitigation when considering possible further action.
 - Failure to complete the questionnaire truthfully is likely to incur an immediate licence suspension for an appropriate period, based on the details contained in the MOR.
 - On the information given in the questionnaire response, an appropriate length suspension may still be given in the most serious cases or repeat offence.
- The appropriate length for a suspension should be based primarily on what the pilot did, rather than the disturbance to CAT.

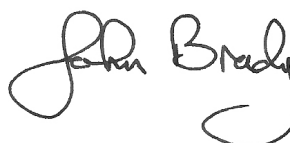
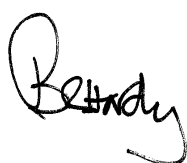
Comments on Action Plan

We have highlighted above the actions which we support in the short term to try to alleviate the number of infringements.

As there is a perceived urgency to achieve reduction in the short term, we do not think that the Action Plan should contain measures which are likely to detract from short term success, whether by occupying resources or diluting the message.

We therefore think that the Action Plan should only contain the following items:

- 1) Actively promote an ethos that it is unacceptable to infringe.
- 2) Make a response to what is currently NATS' voluntary questionnaire a requirement by CAA, with sanctions for those who do not fully co-operate.
- 3) Solent Trial, with the caveats above.
- 4) Increase sanctions and enforcement (taking care of unintended consequences outlined above) and publicise the outcomes.
- 5) Introduce suspension of licences, but only following full assessment. The term of the suspension should be assessed on an individual basis, taking into account the facts and pilot's account as to whether it should involve penalty, retraining or both.



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20th June 2016

Appendix 1 Analysis of Raw Data

The following is a data extract from the Excel spreadsheet sent by NATS.

The data itself was cleaned to some extent. Some of this cleaning was “obvious” like, for example, egbj, EGBJ, Gloucestershire, Staverton etc were all cleansed to “EGBJ Gloucester”

Others are more subjective, such that, for example, “good”, “perfect”, “30nm”, “unlimited” etc were all cleansed to 9999m. This subjective cleansing was done by a highly experienced pilot and we are confident that no significant data was lost.

Also, a number of NATS’ reports were removed as being obvious tests put in by QA. Also, in a couple of cases, there were two reports of the same incident, either because both instructor and student had responded or because the pilot had responded twice, clearly thinking that the first response had been “swallowed” by the system. It was somewhat amusing in those cases to compare the two reports, which had both subtle and unsubtle differences, but that is outside scope.

All the tables refer to the remaining 530 accounts. Mostly they are represented in decreasing percentages, but in a few cases it has been more helpful to represent them as numbers, and sometimes ordered by response rather than modality.

Aircraft Registration	
G	91%
N	4%
Z	3%
D	1%
X	1%
O	1%
M	0%
L	0%
F	0%
2	0%

Airspace	
Manchester	17%
Southampton	17%
London	14%
Birmingham	10%
Stansted	7%
Bristol	6%
Luton	6%
Gatwick	6%
Glasgow	4%
Airway	3%
Other	3%
Daventry	2%
Temporary	1%
Edinburgh	1%
Cardiff	1%
Scottish	1%
Danger	1%
Belfast	1%

Arriving at Base	
	51%

Departing Base	
	61%

Local Flight	
	38%

Altitude	
FL 075+	2%
FL 060-075	2%
5000-5999 ALT	5%
4000-4999 ALT	7%
3000-3999 ALT	13%
2000-2999 ALT	34%
1000-1999 ALT	30%
0-999 ALT	7%

ATC Contact	
YES	54%
NO	46%

ATS Service	
BASIC	48%
TRAFFIC	3%
RADAR CONTROL	3%

Category	
GA SINGLE	76%
HELICOPTER	10%
MICROLIGHT	7%
GA TWIN	4%
OTHER	3%
BALLOON	0%

Days Since Last Flight	
No Response	36%
5 or less	38%
20 or less	21%
30+	5%

Flight Rules	
VFR	97%
IFR	3%

GA Organisation	
Aircraft Owners and Pilots Association (AOPA)	16%
Light Aircraft Association (LAA)	13%
Other	6%
British Microlight Aircraft Association (BMAA)	4%
British Gliding Association (BGA)	1%
British Balloon And Airship Club (BBAC)	1
None	59%

Hours	
1000+	35%
600-999	11%
400-599	9%
200-399	17%
100-199	13%
50-99	11%
0-49	5%

Hours On Type	
100+	56%
40-99	23%
20-39	11%
0-19	10%

Training with Instructor	
NO	85%
YES	15%

GPS Equipped	
NO	74%
YES	26%

GPS Used	
YES	56%
NO	44%

Type of GPS	
Garmin Handheld	15.3%
GNS430	11.1%
SkyDemon	7.7%
G1000	3.4%
Skyforce Skymap	2.1%
Airbox	1.5%
GNS530	1.5%
AWARE	0.8%
Proline 21	0.6%
Garmin 155	0.6%
Bendix King Skymap	0.4%
Bendix King	0.4%
KMD150	0.4%
AvMap	0.4%
iPad	0.4%
Unknown	0.4%
Panel mount	0.4%
Trimble	0.2%
King AV80R	0.2%
Flymap	0.2%
Flight Angel	0.2%
Filser LX500 TR GPS	0.2%
Filser LX500 TR	0.2%
Farming	0.2%
EDEX KING	0.2%
Tablet with Caa Chart overlay.	0.2%
BLUMAX	0.2%
Garmin GTS650	0.2%
Bendix King KMD 150	0.2%
Bendix King Skymap	0.2%
Trimble 2101	0.2%
Trimble TA24/CMC CMA-9000	0.2%
Trimble with Honeywell 550 multifunction display	0.2%
Avidyne	0.2%
Twin GPS with twin INS	0.2%
Aera 500	0.2%
DYNON skyview	0.2%
Sandal SN3308	0.2%

Type of GPS	
Rolling map	0.2%
Runway HD	0.2%
not known	0.2%
Nexus 7 with Airspace avoid	0.2%
Moving Map	0.2%
Military No Map	0.2%
Military	0.2%
Timearc 6	0.2%
Memorymap pilot 7000	0.2%
Road Angel	0.2%
Sandel	0.2%
Honeywell TAS	0.2%
GTN750	0.2%
GTN650	0.2%
Sentinel GPS	0.2%
Skybox	0.2%
Skymap KMD150	0.2%
MGL IEFIS	0.2%

Visibility	
9999	85.8%
9000	0.2%
8000	2.1%
7000	2.3%
6000	2.3%
5000	1.7%
4000	0.4%
3000	1.3%
2000	0.8%
1000	0.4%
VMC/IMC	0.2%
IMC	1.5%
Variable	0.8%
Decreasing	0.2%
Cannot remember	0.2%

VFR Chart Used	
CAA 1:500,000	80%
CAA 1:250,000	13%
Jeppesen	2%
Other	5%

XPNDR Type	
S	49%
C	42%
A	6%
NONE	3%

Mode C On	
Yes	86%
No	5%

Licence	
PPL	58%
CPL	14%
NPPL	7%
ATPL	7%
OTHER	6%
STUDENT	6%
FAA	1%

Last 24 Hours	
0	47%
1	21%
2	15%
3	8%
4	3%
5	3%
6	2%
7	1%
9	0%
10	1%

Last 28 days	
0-5	46%
6-10	24%
11-15	10%
16-20	5%
21-25	5%
26-30	4%
31-35	7%

Last 90 days	
0-5	19%
6-10	22%
11-15	14%
16-20	9%
21-25	8%
26-30	5%
31-35	23%

Last12Months	
No response	36%
12 or less	9%
13 -25	12%
26-50	12%
51-100	15%
100+	16%

Nature of Flight	
X-Country Recreational	35%
Local Recreational	27%
Other	12%
X-Country Training	12%
Local Training	11%
Commercial	3%

Ownership	
Club	38%
Private Owner	30%
Group-share	19%
Other	14%

TimeOfDay	
04:00 - 04:59	0.4%
05:00 - 05:59	0.0%
06:00 - 06:59	0.2%
07:00 - 07:59	0.4%
08:00 - 08:59	1.7%
09:00 - 09:59	5.1%
10:00 - 10:59	13.2%
11:00 - 11:59	12.8%
12:00 - 12:59	11.5%
13:00 - 13:59	12.1%
14:00 - 14:59	14%
15:00 - 15:59	14.3%
16:00 - 16:59	8.3%
17:00 - 17:59	3.8%
18:00 - 18:59	1.9%
20:00 - 20:59	0.4%
21:00 - 03:59	0.0%

IAS (Kts)	
10	0.19%
45	0.19%
60	0.57%
65	0.57%
70	1.7%
75	1.7%
80	5.28%
85	3.02%
90	17.17%
95	6.23%
100	18.68%
105	2.45%
110	8.3%
115	3.58%
120	11.7%
124	0.19%
125	2.08%
130	3.02%
135	1.32%
140	5.09%
145	0.75%
150	1.7%
160	1.51%
170	0.75%
180	0.38%
200	0.19%
210	0.19%
220	0.38%
250	0.19%
300	0.19%
350	0.38%
390	0.19%
420	0.19%

Base Airfield	
EGCB Barton	6%
EGSG Stapleford	4%
EGBW Wellesbourne	3%
EGKR Redhill	3%
EGTB Wycombe	3%
EGBJ Gloucester	3%
EGCV Sleaf	3%
EGLM White Waltham	3%
EGTR Elstree	3%
ZZZZ Private Site	2%
EGHR Goodwood	2%
EGHF Lee on Solent	2%
EGSX North Weald	2%
EGTF Fair Oaks	2%
EGGP Liverpool	2%
EGLD Denham	2%
EGPG Cumbernauld	2%
EGTC Cranfield	2%
EGBP Kemble	2%
EGHH Bournemouth	2%
EGKA Shoreham	2%
EGNH Blackpool	2%
EGTO Rochester	2%
EGHO Thrupton	1%
EGBE Coventry	1%
EGLS Old Sarum	1%
EGSC Cambridge	1%
EGTK Oxford	1%
EGBG Leicester	1%
EGBK Sywell	1%
EGBM Tatenhill	1%
EGBO Halfpenny Green	1%
EGNS Isle of Man	1%
EGBS Shobdon	1%
EGHP Popham	1%
EGKB Biggin Hill	1%
EGLK Blackbushe	1%
EGNE Gamston	1%
EGNF Netherthorpe	1%
ZZZZ Halesland	1%
ZZZZ Roughay	1%

Base Airfield	
EGCW Welshpool	1%
EGDY RNAS Yeovilton	1%
EGJB Guernsey	1%
EGKH Lashenden (Headcorn)	1%
EGMC Southend	1%
EGOS RAF Shawbury	1%
EGPT Perth	1%
EGTE Exeter	1%
EGTH Old Warden	1%
ZZZZ Lower Upham	1%
ZZZZ Nuthampstead	1%
EGBN Nottingham	0%
EGBT Turweston	0%
EGDX RAF St Athan	0%
EGGD Bristol	0%
EGHL Lasham	0%
EGKL Deanland	0%
EGMD Lydd	0%
EGOW RAF Woodvale	0%
EGPK Prestwick	0%
EGPN Dundee	0%
EGSL Andrewsfield	0%
EGSR Earls Colne	0%
EGTN Shenstone	0%
EGTU Dunkeswell	0%
EGVP AAC Middle Wallop	0%
EGWE Henlow	0%
EGWN RAF Halton	0%
ZZZZ Hinton-in-the-Hedges	0%
ZZZZ Stainsby Hall	0%
EBAW Antwerp	0%
EBKT Kortrijk	0%
EGAA Aldergrove	0%
EGAD Newtownards	0%
EGBD Derby	0%
EGBL Long Marston	0%
EGCJ Sherburn-in-Elmet	0%
EGCK Caernarfon	0%

Base Airfield	
EGCL Fenland	0%
EGDM MoD Boscombe Down	0%
EGDN Netheravon	0%
EGEG Glasgow Heliport	0%
EGFF Cardiff	0%
EGFH Swansea	0%
EGHA Compton Abbas	0%
EGHN Sandown	0%
EGHQ Newquay	0%
EGKK Gatwick	0%
EGLF Farnborough	0%
EGLG Panshanger	0%
EGMA Fowlmere	0%
EGMF Farthing Corner	0%
EGML Damyns Hall	0%
EGNG Bagby	0%
EGNJ Humberside	0%
EGNR Hawarden	0%
EGNT Newcastle	0%
EGNX East Midlands	0%
EGNY Beverley	0%
EGOQ RAF Mona	0%
EGPD Aberdeen	0%
EGPF Glasgow	0%
EGPH Edinburgh	0%
EGSO Crowfield	0%
EGSV Old Buckenham	0%
EGUB Benson	0%
EGUO Colerne	0%
EGUY RAF Wyton	0%
EGVF Fleetlands	0%
EGVN RAF Brize Norton	0%
EGVO RAF Odiham	0%
EGWU RAF Northolt	0%
EGXC RAF Coningsby	0%
EGXP RAF Scampton	0%
EGYD RAF Cranwell	0%
EGYJ Liverpool	0%
EGYM RAF Marham	0%
EINC Newcastle, Eire	0%

Base Airfield	
EIWT Weston	0%
ELLX Luxembourg	0%
KICT Wichita	0%
LFMD Cannes	0%
LFQW Frotey	0%
ZZZZ Arclid	0%
ZZZZ Audley End	0%
ZZZZ Benwick	0%
ZZZZ Bleaze Hall	0%
ZZZZ Chiltern Park	0%
ZZZZ Clench Common	0%
ZZZZ Doynton	0%
ZZZZ Draycott	0%
ZZZZ East Fortune	0%
ZZZZ Eaton Bray	0%
ZZZZ Eggesford	0%
ZZZZ Fadmoor	0%
ZZZZ Farley Farm	0%
ZZZZ Fern Farm	0%
ZZZZ Forwood Farm	0%
ZZZZ Hamilton Farm	0%
ZZZZ Haywood	0%
ZZZZ High Cross	0%
ZZZZ Holmbeck Farm	0%
ZZZZ Lichfield	0%
ZZZZ Little Baddow	0%
ZZZZ Little Snoring	0%
ZZZZ Manton	0%
ZZZZ Plaistows	0%
ZZZZ Podington	0%
ZZZZ Ringmer	0%
ZZZZ Rochdale	0%
ZZZZ Shacklewell	0%
ZZZZ Thorny	0%
ZZZZ Warrington	0%
ZZZZ Yalding	0%

Base Airfield MOD	
EGDY RNAS Yeovilton	3
EGOS RAF Shawbury	3
EGDX RAF St Athan	2
EGOW RAF Woodvale	2
EGVP AAC Middle Wallop	2
EGWN RAF Halton	2
EGDM MoD Boscombe Down	1
EGOQ RAF Mona	1
EGUY RAF Wyton	1
EGVN RAF Brize Norton	1
EGVO RAF Odiham	1
EGWU RAF Northolt	1
EGXC RAF Coningsby	1
EGXP RAF Scampton	1
EGYD RAF Cranwell	1
EGYM RAF Marham	1

Base Airfield Foreign	
(One each)	
EBAW Antwerp	
EBKT Kortrijk	
EINC Newcastle, Eire	
EIWT Weston	
ELLX Luxembourg	
KICT Wichita	
LFMD Cannes	
LFQW Frotey	

Departure Point	
EGCB Barton	4.9%
EGKR Redhill	3.4%
EGBW Wellesbourne	3.2%
EGSG Stapleford	3%
EGCV Sleaf	2.8%
EGBJ Gloucester	2.8%
EGTR Elstree	2.8%
EGHF Lee on Solent	2.6%
EGHR Goodwood	2.5%
EGLM White Waltham	2.1%
EGKA Shoreham	1.9%
EGPG Cumbernauld	1.9%
EGSX North Weald	1.9%
EGTB Wycombe	1.9%
EGBP Kemble	1.7%
EGTC Cranfield	1.7%
EGBS Shobdon	1.5%
EGHH Bournemouth	1.5%
EGTK Oxford	1.3%
EGBO Halfpenny Green	1.3%
EGHO Thrupton	1.3%
EGSC Cambridge	1.1%
EGNS Ronaldsway	1.1%
EGNH Blackpool	1.1%
EGTO Rochester	1.1%
EGLD Denham	1.1%
EGTF Fairoaks	1.1%
EGHJ Bembridge	1.1%
EGBK Sywell	1.1%
EGBM Tatenhill	1.1%
EGHA Compton Abbas	1.1%
EGHP Popham	0.9%
EGBE Coventry	0.9%
EGGP Liverpool	0.9%
EGLS Old Sarum	0.9%
LFAT Le Touquet	0.8%
EGTU Dunkeswell	0.8%
EGBN Nottingham	0.8%
ZZZZ Shenstone	0.8%
EGOS RAF Shawbury	0.8%

Departure Point	
EGHN Sandown	0.8%
EGNR Hawarden	0.8%
EGKH Headcorn	0.8%
EGLG Panshanger	0.8%
EGND Crosland Moor	0.8%
EGBT Turweston	0.6%
ZZZZ Lower Upham	0.6%
EGKB Biggin Hill	0.6%
EGTH Old Warden	0.6%
EGCW Welshpool	0.6%
EGWN RAF Halton	0.6%
EGPT Perth	0.6%
ZZZZ Private Site	0.6%
ZZZZ Halesland	0.6%
EGNE Gamston	0.6%
EGMD Lydd	0.6%
EGSR Earls Colne	0.4%
EGAD Newtownards	0.4%
EGNF Netherthorpe	0.4%
EGDY RNAS Yeovilton	0.4%
EGSU Duxford	0.4%
EGCK Caernarfon	0.4%
EGLK Blackbushe	0.4%
EGPK Prestwick	0.4%
EGSL Andrewsfield	0.4%
EGSH Norwich	0.4%
EGFH Swansea	0.4%
EGOW RAF Woodvale	0.4%
EGMC Southend	0.4%
EGUB Benson	0.4%
EGUO RAF Colerne	0.4%
EINC Newcastle Ireland	0.4%
ZZZZ Hinton in The Hedges	0.4%
ZZZZ Roughay	0.4%
ZZZZ Loch Lomond	0.4%
ZZZZ Little Baddow	0.2%
ZZZZ Plaistows	0.2%
EGFF Cardiff	0.2%
ZZZZ Nuthampstead	0.2%

Departure Point	
ZZZZ Musgrave Park Hosp	0.2%
ZZZZ Mount Airy	0.2%
ZZZZ Meppershall	0.2%
ZZZZ Marton	0.2%
EGDX RAF St Athan	0.2%
ZZZZ Little Staughton	0.2%
ZZZZ Portavadie	0.2%
ZZZZ Lichfield	0.2%
ZZZZ Leominster	0.2%
EGHS Henstridge	0.2%
ZZZZ Lamberhurst	0.2%
ZZZZ High Cross	0.2%
ZZZZ Hereford	0.2%
ZZZZ Farley	0.2%
EGHL Lasham	0.2%
ZZZZ Stones Farm	0.2%
EGAC Belfast City	0.2%
ZZZZ Wickford	0.2%
EGBB Birmingham	0.2%
EGBD Derby	0.2%
ZZZZ Warrington	0.2%
ZZZZ Trevet EITT	0.2%
ZZZZ Thorney	0.2%
EGBL Long Marston	0.2%
EGDM MoD Boscombe Down	0.2%
ZZZZ Stretton	0.2%
ZZZZ Evesham	0.2%
ZZZZ Springfield	0.2%
ZZZZ Rufforth E	0.2%
ZZZZ Ringmer	0.2%
ZZZZ Rhyll	0.2%
ZZZZ Rhinehouse Hotel	0.2%
EGCL Fenland	0.2%
ZZZZ Crewe	0.2%
ZZZZ Podington	0.2%
ZZZZ Swindon	0.2%
EGWC RAF Cosford	0.2%
ZZZZ Eggesford	0.2%

Departure Point	
EGPF Glasgow	0.2%
EGPH Edinburgh	0.2%
EGPJ Fife	0.2%
EGZZ Weeton	0.2%
EGPN Dundee	0.2%
EGYM RAF Marham	0.2%
EGYD RAF Cranwell	0.2%
LFAC Calais	0.2%
EGWE RAF Henlow	0.2%
EGNY Beverley	0.2%
BIKF Keflavik	0.2%
EGVP AAC Middle Wallop	0.2%
ZZZZ Yalding Kent	0.2%
EGVO RAF Odiham	0.2%
EGVN RAF Brize Norton	0.2%
EGVF Fleetlands	0.2%
EGTE Exeter	0.2%
EGUY RAF Wyton	0.2%
EGTG Filton	0.2%
EGXC RAF Coningsby	0.2%
ZZZZ Boarhunt	0.2%
ZZZZ Eaton Bray	0.2%
EGTN Enstone	0.2%
EGLW Battersea	0.2%
EGMA Folwmere	0.2%
ZZZZ Clench Common	0.2%
ZZZZ Chiltern Park	0.2%
EGMF Farthing Corner	0.2%
EGML Damyns Hall	0.2%
GB0005	0.2%
EGNC Carlisle	0.2%
EGSM Beccles	0.2%
ZZZZ Billingshurst	0.2%
ZZZZ Bath	0.2%
ZZZZ Balado	0.2%
EGNJ Humberside	0.2%
ZZZZ Audley End	0.2%
ZZZZ Arclid	0.2%
EGNT Newcastle	0.2%

Departure Point	
EGNV Teesside	0.2%
EGNX East Midlands	0.2%
EGMT Thurrock	0.2%

Destination	
EGCB Barton	5.1%
EGHR Goodwood	3.2%
EGTB Wycombe	3.2%
EGTR Elstree	2.8%
EGBW Wellesbourne	2.8%
EGHF Lee on Solent	2.8%
EGPG Cumbernauld	2.6%
EGCV Sleaf	2.5%
EGTF Fair Oaks	2.3%
EGKR Redhill	2.3%
EGSG Stapleford	2.3%
EGSX North Weald	2.1%
EGBK Sywell	1.9%
EGHH Bournemouth	1.9%
EGBJ Gloucester	1.9%
EGLS Old Sarum	1.7%
EGHN Sandown	1.7%
EGBO Halfpenny Green	1.5%
EGNH Blackpool	1.5%
EGBE Coventry	1.5%
EGTC Cranfield	1.5%
EGHA Compton Abbas	1.3%
EGLD Denham	1.3%
EGTK Oxford	1.1%
EGSC Cambridge	1.1%
EGBP Kemble	1.1%
EGSU Duxford	1.1%
EGKA Shoreham	0.9%
EGGP Liverpool	0.9%
EGHJ Bembridge	0.9%
EGHP Popham	0.9%
ZZZZ Stretton	0.8%
EGMD Lydd	0.8%
EGLM White Waltham	0.8%
EGKH Headcorn	0.8%

Destination	
EGKB Biggin Hill	0.8%
EGTO Rochester	0.8%
EGTU Dunkeswell	0.6%
EGHO Thrupton	0.6%
EGOS RAF Shawbury	0.6%
ZZZZ Halesland	0.6%
EGNF Netherthorpe	0.6%
EGHQ Newquay	0.6%
EGDY RNAS Yeovilton	0.6%
EGJA Alderney	0.6%
EGPH Edinburgh	0.6%
EGPF Glasgow	0.6%
EGNS Ronaldsway	0.6%
EGNR Hawarden	0.6%
EGNE Gamston	0.6%
EGTE Exeter	0.6%
LFAT Le Touquet	0.6%
EGBS Shobdon	0.6%
EGBM Tatenhill	0.6%
EGCJ Sherburn-in-Elmet	0.6%
EGCK Caernarfon	0.6%
EGCW Welshpool	0.6%
EGBT Turweston	0.6%
EGDX RAF St Athan	0.4%
EGLS Andrewsfield	0.4%
EGTN Enstone	0.4%
EGLF Farnborough	0.4%
EGLK Blackbushe	0.4%
EGKL Deanland	0.4%
EGPT Perth	0.4%
EGBR Brighton	0.4%
EGPK Prestwick	0.4%
ZZZZ Lower Upham	0.4%
EGPD Aberdeen	0.4%
EGMC Southend	0.4%
EGND Crosland Moor	0.4%
EGLG Panshanger	0.4%
LFRC Cherbourg	0.4%
EGWE RAF Henlow	0.4%
EGDM MoD	0.4%

Destination	
Boscombe Down	
VRP Needles IOW	0.4%
ZZZZ Roughay	0.4%
ZZZZ Stoke Golding	0.2%
EGLT Ascot Racecourse	0.2%
EGLW Battersea	0.2%
EGDN Netheravon	0.2%
ZZZZ Rochdale	0.2%
EGML Damyns Hall	0.2%
EGLP Brimpton	0.2%
EGNC Carlisle	0.2%
ZZZZ Stones Farm	0.2%
ZZZZ Stow Maries	0.2%
EGFH Swansea	0.2%
EGBD Derby	0.2%
EGGD Bristol	0.2%
ZZZZ Shacklewell	0.2%
ZZZZ Otherton airfield	0.2%
ZZZZ Rhyl	0.2%
EGJB Guernsey	0.2%
ZZZZ Rhinehouse Hotel	0.2%
EGHL Lasham	0.2%
ZZZZ Portadown Police Station	0.2%
ZZZZ Nympsfield	0.2%
EGLA Bodmin	0.2%
EGCF Sandtoft	0.2%
ZZZZ Oulton Park	0.2%
EGKG Goodwood Racecourse Heliport	0.2%
ZZZZ Rufforth	0.2%
ZZZZ Rufforth E	0.2%
ZZZZ Nuthampstead	0.2%
ZZZZ Audley End	0.2%
EGVF Fleetlands	0.2%
EGVO RAF Odiham	0.2%
EGVP AAC Middle Wallop	0.2%
EGWN RAF Halton	0.2%
EGXC RAF Coningsby	0.2%

Destination	
EGXG Leeds E	0.2%
EGYD RAF Cranwell	0.2%
EGYK Elvington	0.2%
EIWF Waterford	0.2%
LFAC Calais	0.2%
LFRD Dinard	0.2%
QE2 BRIDGE	0.2%
EGOQ RAF Mona	0.2%
ZZZZ Ashcroft	0.2%
EGTW Oaksey Park	0.2%
ZZZZ Beaulieu	0.2%
ZZZZ Benwick	0.2%
ZZZZ Boarhunt	0.2%
ZZZZ Broadway	0.2%
ZZZZ Cheddar	0.2%
ZZZZ Chewton Glen	0.2%
ZZZZ Doynton	0.2%
ZZZZ Draycott	0.2%
ZZZZ East Fortune	0.2%
ZZZZ Englefield	0.2%
ZZZZ Farley Farm	0.2%
ZZZZ Forest Row	0.2%
VRP Old Seven Bridge	0.2%
EGSH Norwich	0.2%
EGNJ Humberside	0.2%
EGNT Newcastle	0.2%
EGNX East Midlands	0.2%
EGNY Beverley	0.2%
EGSF Conington	0.2%
EGOW RAF Woodvale	0.2%
ZZZZ Forwood Farm	0.2%
EGPJ Fife	0.2%
EGPN Dundee	0.2%
EGPO Stornoway	0.2%
EGQS RAF Lossiemouth	0.2%
EGAD Newtownards	0.2%
EGUO RAF Colerne	0.2%
ZZZZ Warrington	0.2%
EGUB Benson	0.2%
EGSM Beccles	0.2%

Destination	
EGSN Bourn	0.2%
EGSQ Clacton	0.2%
EGSR Earls Colne	0.2%
ZZZZ Little Snoring	0.2%
EGSV Old Buckenham	0.2%
ZZZZ Kirkbride	0.2%
ZZZZ Inverkip	0.2%
ZZZZ Hunsdon	0.2%
ZZZZ Hamilton Farm	0.2%
EGTP Perranporth	0.2%
ZZZZ Glossop	0.2%
ZZZZ Northallerton	0.2%
ZZZZ Long Mynd	0.2%

Type	
PA28	24.5%
C152	9.2%
C172	6.2%
Robin	4.3%
AA5	3%
Ikarus C42	2.5%
DA40	2.1%
Eurostar	2.1%
PA38	2.1%
R44	2.1%
Eurocopter	1.9%
Grob	1.7%
PA32	1.5%
RV6	1.3%
C182	1.1%
DA42	1.1%
Jodel	0.9%
Kingair	0.9%
RV7	0.9%
Bonanza	0.8%
Maule	0.8%
PA34	0.8%
SR20	0.8%
TB10	0.8%
AC11	0.6%
Bell 206	0.6%

Type	
C210	0.6%
CTSW	0.6%
Europa	0.6%
MD500	0.6%
P2002	0.6%
PA31	0.6%
Rotax Falke	0.6%
Sportcruiser	0.6%
T67	0.6%
A109	0.4%
Aztec	0.4%
C208	0.4%
Chinook	0.4%
Fixed Wing Microlight	0.4%
Flexwing Microlight	0.4%
Gyroplane	0.4%
H500	0.4%
Hawk TMk1	0.4%
HR20	0.4%
Lynx	0.4%
P149	0.4%
PA18	0.4%
PA30	0.4%
Quik	0.4%
R22	0.4%
RV9	0.4%
Skyranger Swift	0.4%
Squirrel	0.4%
SR22	0.4%
TB20	0.4%
Tutor	0.4%
Zenith Zodiac	0.4%
8KCAB	0.2%
Beagle Pup	0.2%
Bell 205	0.2%
Bell 212	0.2%
BN2T	0.2%
Bo105	0.2%
Bo208	0.2%
Bo209	0.2%

Type	
C130J	0.2%
Calidus autogyro	0.2%
Cameron Hot Air Balloon	0.2%
CAP10b	0.2%
Chisten Eagle	0.2%
Commander 114	0.2%
Condor (D6CR)	0.2%
COZY	0.2%
CRUZ Sportcruiser	0.2%
DA20	0.2%
DHC1 Chipmunk	0.2%
Diamond Katana	0.2%
EA50	0.2%
Extra 300	0.2%
Fournier RF5	0.2%
Foxbat	0.2%
Glasair 3	0.2%
Griffin (Bell 412)	0.2%
GT 450	0.2%
H269	0.2%
H300	0.2%
H36	0.2%
Harvard	0.2%
HU269	0.2%
Jet Provost Mk3a	0.2%
KIS2	0.2%
LSA	0.2%
M20M	0.2%
M7	0.2%
MCR01 Club	0.2%
MX-7-180	0.2%
PA24	0.2%
PA44	0.2%
PARO	0.2%
Pioneer 300	0.2%
PULSAR	0.2%
PULS-R	0.2%
Puma HC 2	0.2%
R66	0.2%
RV8	0.2%

Type	
SA 341	0.2%
Sea King	0.2%
SIRA	0.2%
Stampe SV4	0.2%
Steen Skybolt biplane	0.2%
TB9	0.2%
Tecnam P2002	0.2%
Tornado GR4	0.2%
TRIN	0.2%
Typhoon FGR4	0.2%
Vans	0.2%
VARGA KACHINA	0.2%
Westland Scout	0.2%
Yak 52	0.2%

Military Types	
Chinook	2
Eurocopter	2
Lynx	2
Squirrel	2
Bell 212	1
Griffin (Bell 412)	1
Puma HC 2	1
Sea King	1
Kingair	1
BN2T	1
C130J	1
Grob	3
Tutor	2
Tornado GR4	1
Hawk TMk1	2
Typhoon FGR4	1